Sustainable development in the European Union

MONITORING REPORT ON PROGRESS TOWARDS THE SDGS IN AN EU CONTEXT

2017 edition

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Foreword of First Vice-President Timmermans and Commissioner Thyssen

The global nature of the challenges that we face today such as climate change, violent conflicts, mass migration and growing inequality means that we need ambitious and united answers. This goal underpins the UN 2030 Agenda for Sustainable Development and the 17 Sustainable Development Goals adopted by more than 150 world leaders in September 2015.

The European project is a living example of how shared values and aspirations such as peace, freedom, tolerance and solidarity can serve both national and collective interests. Economic growth, social inclusion and environmental protection are firmly anchored in the EU Treaties. The EU is fully committed to be a frontrunner today and in the future in implementing the 2030 Agenda and the Sustainable Development Goals together with its Member States. The 2030 Agenda provides a historic opportunity for the EU and its Member States to be global pioneers in the area of sustainable development.

Our work on sustainable development will define the future of next generations, of the Union and of our planet. That is why we need to develop a long-term vision through the lenses of the Sustainable Development Goals and ensure that these goals are fully integrated in the European policy framework. This vision will guide the course of action we take in every area, be it our economic and industrial strategy, our social priorities, our energy and climate goals, or our research and innovation programmes.

Knowing where we stand and monitoring our progress is the first step in achieving our shared objectives. In this respect, this first Eurostat monitoring report on the Sustainable Development Goals from an EU perspective provides essential evidence to identify the gaps which need to be closed in order to achieve them and to make informed policy choices.

Frans Timmermans
First Vice-President
European Commission

Marianne Thyssen
Commissioner
European Commission
Employment, Social Affairs,
Skills and Labour Mobility
Responsible for Eurostat

Foreword of Eurostat's acting Director-General

In November 2016, the European Commission released a Communication entitled 'Next steps for a sustainable European future: European action for sustainability'.

It was the European Union's answer to the 2030 Agenda for Sustainable Development, adopted at a UN summit in 2015, and constituting a new world-wide policy framework.

This publication describes progress towards the achievement of Sustainable Development Goals (SDGs) in an EU context. It also supplements EU reports on individual policy areas.

The publication builds on Eurostat's long experience in monitoring Sustainable Development in the European Union. It is based on a set of 100 relevant EU SDG indicators, selected in accordance with the quality criteria of the European Statistics Code of Practice.

The EU SDG indicator set is the result of a wide consultation process involving Member States' statistical authorities, European Council Committees, Commission services, the European Statistical Advisory Committee, members of academia and various international and non-governmental organisations.

The EU SDG indicator set will be regularly reviewed to take into account future policy developments and progress in the area of methodology, technology and access to data sources.

I hope that the 2017 monitoring report will be useful to interested European citizens, policymakers, researchers and also business people.

It should help them to identify the main challenges the EU is facing at this moment and inspire them to undertake new sustainable development actions.

Mariana Kotzeva
Acting Director-General of Eurostat

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Data coverage and direct links to Eurostat's database

The data presented in this publication were extracted in late October 2017.

An online data code available under each table/figure can be used to directly access the most recent data on Eurostat's website, at:

http://ec.europa.eu/eurostat/data/database

For more information please consult

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Disclaimer

Synopsis

Sustainable development objectives have been at the heart of European policy for a long time, firmly anchored in the European Treaties ([1]) and mainstreamed in key projects, sectoral policies and initiatives. The 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs) and 169 targets, adopted by the United Nations (UN) in September 2015, have given a new impetus to global efforts to achieve sustainable development. The EU is committed to playing an active role to maximise progress towards the SDGs, as outlined in its Communication (COM (2016) 739) 'Next steps for a sustainable European future' ([2]).

The Communication provides for regular monitoring of progress towards the SDGs in an EU context. This publication entitled 'Sustainable development in the European Union — Monitoring report on progress towards the SDGs in an EU context (2017 edition)' is the first of these regular monitoring exercises. It builds on the EU SDG indicator set that was developed for the purpose of monitoring progress towards the SDGs in an EU context and adopted in May 2017 ([3]) (see Annex II on page 361).

The aim of this publication is not to exhaustively assess EU progress towards the 169 targets of the 2030 Agenda. The indicators selected have strong links with the above-mentioned Commission Communication and the accompanying Commission Staff Working Document 'Key European action supporting the 2030 Agenda and the Sustainable Development Goals' ([4]).

The indicator set comprises 100 indicators that are structured along the 17 SDGs. Each goal has six indicators primarily attributed to it, except for goals 14 and 17 which only have five. Forty-one of the 100 indicators are multi-purpose, i.e. are used to monitor more than one SDG. The EU SDG indicator set will be open to regular reviews in line with future policy developments and will take into account new indicators as they become available with new methodologies, technologies and data sources.

This synopsis chapter provides a first statistical overview of trends relating to the SDGs in the EU over the past five years ('short-term'), based on the 100 indicators chosen. Whenever data availability allows, the more detailed analyses in the thematic chapters of this report also look at trends over the past 15 years ('long-term'), to reflect the 15-year scope of the 2030 Agenda.

The indicator trends are described on the basis of a set of specific quantitative rules. For indicators for which EU policy targets exist, this publication looks at progress towards those targets. This applies to 16 out of the 100 indicators, mainly in the areas of climate, energy consumption, education, poverty and employment. All other indicators are analysed according to the direction and speed of change.

([1]) Articles 3 (5) and 21 (2) of the Treaty on European Union (TEU).
([2]) European Commission (2016), *Next steps for a sustainable European future: European action for sustainability*, COM(2016) 739.
([3]) European Commission (2017), EU SDG indicator set.
([4]) European Commission (2016), *Key European action supporting the 2030 Agenda and the Sustainable Development Goals*, SWD(2016) 390 final.

The trends of the individual indicators are visualised in the form of arrows. The arrows show whether the indicator has moved in the desired direction or away from the sustainable development objective, as well as the speed of this movement. A vertical upward green arrow (↑) indicates significant progress towards the sustainable development objectives, a diagonal upward green arrow (↗) means moderate progress towards the sustainable development objectives, a diagonal downward red arrow (↘) signals moderate movement away from the sustainable development objectives, and a vertical downward red arrow (↓) is used for significant movement away from the sustainable development objectives. The approach applied throughout this report is explained in more detail in the introduction (see p. 24).

This synopsis also presents progress at goal level, obtained as an average of progress of the individual indicators of the respective SDGs. The multipurpose indicators also contribute to the summary of the overall progress towards the goals they refer to.

The findings presented in this publication are based on developments over a five-year time span. Studies and reports which consider current status, different indicators or different time spans may come to different conclusions.

How has the EU progressed towards the SDGs?

The figure on page 11 shows a statistical summary of EU progress towards the 17 SDGs over the last five years ([5]). Over this period, the EU made progress towards all goals. Progress in some goals has been faster than in others, and within goals, movement away from the sustainable development objectives also occurred in specific areas. A description of trends for each indicator can be found in the thematic chapters on the individual SDGs.

The EU has made significant progress over the last five years towards the overall achievement of SDG 7 'affordable and clean energy', SDG 12 'responsible consumption and production', SDG 15 'life on land', SDG 11 'sustainable cities and communities' and SDG 3 'good health and well-being'.

It should be noted that progress towards a given goal does not necessarily mean that the status of that goal is satisfactory for the EU. For example, in the case of SDG 15, which focuses on terrestrial ecosystems, the indicators chosen mostly show good progress, but this should not lead to the conclusion that ecosystems or biodiversity in the EU are in good health.

Over the last five years, the EU made moderate progress in eight SDGs. Such moderate trends can be seen in SDG 4 'quality education', SDG 17 'partnership for the goals', SDG 9 'industry, innovation and infrastructure', SDG 5 'gender equality', SDG 8 'decent work and economic growth', SDG 1 'no poverty', SDG 2 'zero hunger' and SDG 10 'reduced inequalities'.

In the case of four goals — SDG 6 'clean water and sanitation', SDG 13 'climate action', SDG 14 'life below water' and SDG 16 'peace, justice and strong institutions' — trends cannot be calculated due to insufficient data over the past five years ([6]).

Summary at goal level

EU progress is visible in almost all areas related to **SDG 7 'affordable and clean energy'**. The EU reduced its energy consumption of both primary energy and final energy, and improved its energy productivity while increasing the share of renewable energies. European citizens reduced their energy consumption at home, and fewer people were unable to keep their home adequately warm.

([5]) The presentation is based on the trends over the past five years ('short term') only. For future monitoring it is envisaged to expand it to 'long-term' development (i.e. 15 years) depending on the availability of longer time series.
([6]) The share of indicators for which it is possible to calculate a five-year trend (i.e. with an arrow) has to be at least 75 % to calculate the summary result; below this threshold the number of available indicators is considered insufficient to make a representative statement on the goal level.

EU progress towards the 17 SDGs

(past 5-year period)

▲ *moderate progress*

▲ *significant progress*

Goals for which trends cannot be calculated (*)

(*) Due to lack of time series for more than 25% of the indicators

Concerning **SDG 12 'responsible consumption and production'**, the EU has achieved considerable gains in resource and energy productivity and is on track to meet its targets for primary and final energy consumption, as well as for the share of renewable energy. Progress was less significant but still visible with regard to waste generation and treatment, consumption of toxic chemicals, volume of freight transport relative to GDP, and CO_2 emissions from new passenger cars.

The summary result for **SDG 15 'life on land'** stems from the combination of the selected indicators. The EU has achieved progress in the management of forest areas, water quality, sufficiency of terrestrial sites designated under the EU Habitats Directive and, to some extent, in halting the decline in the number of common bird species. Against these positive developments, artificial land cover per capita has increased and the rate of land take and soil sealing has accelerated. However, it should be noted that EU reports and evaluations based on different indicators conclude that the status of ecosystems and biodiversity in the EU has not (yet) sufficiently improved, and that progress in reducing the impacts of EU consumption patterns on global biodiversity has been insufficient ([7]).

Indicators related to **SDG 11 'sustainable cities and communities'** mostly show progress towards sustainable development objectives, in particular in the area of quality of life. Fewer Europeans live in deprived or overcrowded housing conditions, suffer from noise or are victims of crime, violence and vandalism. The EU has also made great strides in reducing its environmental impact with regard to municipal waste management and the urban population's exposure to air pollution. Progress in the area of sustainable transport has however been less pronounced, with the share of public transport (bus and train) in total inland passenger transport increasing only slightly in the past few years. Moreover, the number of fatal road accidents has decreased but is not yet on track to meeting the EU target of halving the number of people killed between 2001 and 2020.

In relation to **SDG 3 'good health and well-being'**, the EU has made progress concerning life expectancy at birth, death rates due to chronic diseases, suicides, and accidents at work, as well as regarding health determinants such as exposure to air pollution by particulate matter and noise pollution. However, developments related to self-perceived health and self-reported unmet needs for medical care have moved away from the objectives. Similarly, as mentioned above, the EU is not yet on track towards the target of halving the number of people killed in road accidents by 2020 compared to 2001.

Looking at **SDG 4 'quality education'**, more children are participating in early childhood education and care, fewer pupils are leaving school early and more people are attaining tertiary education. In contrast to these positive developments, however, underachievement in reading, maths and science has increased, and the EU does not seem to be on track to meet its 2020 benchmarks for the employment rate of recent graduates and adult participation in learning.

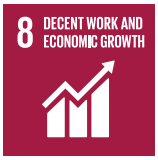
The development of **SDG 17 'partnership for the goals'** mainly reflects the progress in the area of 'global partnership', where the EU's official development assistance as a share of gross national income, its overall financial support to developing countries and imports from these nations increased. The picture is more mixed when considering financial governance within the EU. Shares of environmental taxes in total tax revenues have stagnated at a low level, and many Member

([7]) See European Environment Agency (2015), *State of nature in the EU: biodiversity still being eroded, but some local improvements observed* and the *Mid-term review of the EU Biodiversity Strategy to 2020 (COM/2015/0478 final)*.

States' government debts remain above the reference level of 60 % of GDP.

As regards **SDG 9 'industry, innovation and infrastructure'**, the share of R&D personnel has increased, as has the share of people working in high- and medium-high technology and service sectors. Moreover, transport patterns for both freight and passengers have become more environmentally friendly over the past five years. However, the EU is not on track to meet its target of raising its gross domestic expenditure on R&D to 3 % by 2020, and the number of patent applications has stalled since the onset of the economic crisis.

SDG 5 'gender equality' is also characterised by progress in several areas, in particular when it comes to women's employment and leadership. The gender gaps for early leavers from education and training and employment have narrowed, and the proportion of women in both national parliaments and in senior management positions of the largest listed companies has increased. In contrast, significant differences in the non-participation of women and men in the labour market remain. The gender gap observed for inactivity due to caring responsibilities has increased considerably, and the gender gaps in tertiary educational attainment and in the employment rate of recent graduates have also been widening, while the gender pay gap has remained almost unchanged since 2010.



With regard to **SDG 8 'decent work and economic growth'**, indicator trends related to sustainable economic growth, employment and decent work are moving towards the respective sustainable development objectives. The EU increased its real GDP per capita, while significantly improving resource productivity. Also, the European labour market started to improve again, with long-term unemployment and the number of young people not in employment, education or training declining, while visible progress was made in creating safer working environments. The EU's employment rate has risen substantially since 2013. If the rate continues to increase at this pace, the Europe 2020 target to achieve an employment rate of 75 % is still within reach.

SDG 1 'no poverty' calls for the eradication of extreme poverty and halving poverty in all its dimensions by 2030. This adds a more universal approach to poverty reduction which makes it directly relevant for the EU, for which the Europe 2020 strategy sets a target of 'lifting at least 20 million people out of the risk of poverty or social exclusion' by 2020 compared to 2008. In the last five years, fewer people in the EU faced problems such as housing deprivation, overcrowding or severe material deprivation, although the levels of poverty have remained stable in recent years. In the long-term, the number of people at risk of poverty or social exclusion has declined, but not steadily. The number steeply increased following the onset of the economic crisis in 2008, which took the EU off its path to reach the Europe 2020 poverty target. Significant improvements can however be observed from 2012 onwards, when the number of people at risk of poverty or social exclusion started decreasing again. Despite this improvement, trends in the number of people at risk of income poverty and people living in households with very low work intensity point to a movement away from the sustainable development objectives over the last five years.

With regard to **SDG 2 'zero hunger'**, the area of land under organic agriculture in the EU has steadily increased, and the nitrogen balance on agricultural land has slightly improved. However, other problems related to agricultural production, such as increasing ammonia emissions from agriculture and a considerable decline in farmland bird species, have intensified in the short term. Agricultural factor income per work unit and government support to agricultural R&D have also moved away from the respective objectives.

Concerning **SDG 10 'reduced inequalities'**, the number of indicators showing progress is more or less the same as the number moving away from their objectives. Most indicators measuring inequalities between countries have improved over the past five years. Looking only at EU countries, disparities in disposable household income have been converging. Considering EU action relevant to reducing global inequalities, EU financing to developing countries and EU imports from developing countries have been on the rise. These positive developments have, however, occurred against a trend of increasing disparities in GDP per capita and increasing inequalities within countries. Relative poverty and the depth of poverty have both intensified, while the Gini coefficient of equivalised disposable household income and the income share of the bottom 40 % of the population have both deteriorated. It should be noted that the overall picture of long-term trends in SDG 10 is more favourable. This can be attributed to the contrasting positive trend in disparities in GDP per capita in the long term, as well as the stronger deterioration of the poverty-related indicators in the short-term.

For **SDG 6 'clean water and sanitation'**, available data make it possible to calculate five–year trends only for water quality and some sanitation aspects. The share of people without improved sanitation facilities in their households has been steadily decreasing in the EU, with the vast majority of Member States already having universal access to sanitation. Freshwater quality has also improved, as indicated by the decrease in biochemical oxygen demand and phosphate concentrations in European rivers. Europeans are also enjoying improved inland bathing water quality. Nitrate concentrations in European groundwater bodies are within EU drinking-water standards (50 mg/L), but the overall positive outlook does not reflect the fact that nitrate concentrations might still pose serious problems at regional or local level.

For **SDG 13 'climate action'**, data coverage is sufficient for the topic 'climate mitigation', while trends of indicators on 'climate impacts' and 'climate initiatives' cannot be calculated due to insufficient availability of data. Indicators in the sub-theme 'climate mitigation' predominantly show progress, with the EU being well on track to reach its targets for greenhouse gas emissions, renewable energies and energy consumption.

For **SDG 14 'life below water'**, the available data only allow trends to be calculated for the indicators related to overexploitation of fish stocks and bathing water quality, while trends cannot be calculated for other aspects such as 'marine conservation' and 'ocean health'. In the case of the two indicators with sufficient data, significant progress is visible: the proportion of overexploited fish stocks in the North-East Atlantic has declined considerably over the past five years, and the share of coastal bathing sites with excellent water quality has risen continuously since 2011.

The indicators for **SDG 16 'peace, justice and strong institutions'** show that life in the EU has become safer over the past few years: deaths due to homicide or assault and the perceived occurrence of crime, violence and vandalism in European neighbourhoods have both fallen considerably over the past few years. In addition, the decline in citizens' confidence in EU institutions observable since 2000 has come to a halt, with slight gains in trust levels for the main EU bodies since 2011. However, trends cannot be calculated for other SDG 16 issues, such as perceived independence of the justice system and perceived corruption.

Introduction

1. About this publication

Sustainable development objectives have been at the heart of European policy for a long time, firmly anchored in the European Treaties ([1]) and mainstreamed in key cross-cutting projects, sectoral policies and initiatives. The 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs), adopted by the United Nations (UN) in September 2015, have given a new impetus to global efforts for achieving sustainable development. The EU and all its 28 Member States are committed to this historic global framework agreement and are responsible for implementing it at each level to maximise progress towards the SDGs. Eurostat supports this process through regular monitoring and reporting on progress towards the SDGs in an EU context. 'Sustainable development in the European Union — Monitoring report on progress towards the SDGs in an EU context (2017 edition)' is the first edition of Eurostat's future series of monitoring reports, which provide a quantitative overview of progress of the EU towards the achievement of the SDGs.

Eurostat has a track record in producing statistics for monitoring sustainable development at the EU level. Since 2005 and up to 2015 Eurostat has regularly produced biennial monitoring reports of the EU Sustainable Development Strategy (EU SDS) ([2]), based on the EU set of Sustainable Development Indicators (SDIs). Eurostat also monitors the Europe 2020 Strategy ([3]), which promotes smart, sustainable and inclusive growth in the EU. Eurostat's 2016 publication 'Sustainable development in the European Union — A statistical glance from the viewpoint of the UN Sustainable Development Goals' ([4]) provided a first overview of the current situation of the EU and its Member States on sustainable development in relation to the SDGs. This publication, which is based on the EU SDG indicator set ([5]), continues the tradition of Eurostat's monitoring reports on sustainable development in the EU.

It is important to note that although the EU SDG indicator set has been aligned as far as appropriate with the UN list of global indicators, it does not intend to cover all aspects of the SDGs or to fully reproduce the UN global list. Instead, it includes indicators relevant to the EU, which allow SDGs to be monitored in the context of long-term EU policies.

([1]) Articles 3 (5) and 21 (2) of the Treaty on European Union (TEU).
([2]) Göteborg European Council (2001), *Presidency conclusions, 15 and 16 June 2001.*; Council of the European Union (2006), *Review of the EU Sustainable Development Strategy (EU SDS) — Renewed Strategy*, 10917/06.
([3]) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.
([4]) Eurostat (2016), *Sustainable development in the European Union — A statistical glance from the viewpoint of the UN Sustainable Development Goals*, Luxembourg: Publications Office of the European Union.
([5]) See section 3.2 on p. 22.

The publication begins with a brief presentation of the policy background at global and EU level and the monitoring process of EU sustainable development. This is followed by 17 thematic chapters, one for each of the 17 SDGs. The overview of the indicators presented in this publication as well as notes on methods and sources are included in the annex.

2. Policy background

The 2030 Agenda for Sustainable Development

'Development which meets the needs of the current generations without compromising the ability of future generations to meet their own needs' ([6]). This is the definition of sustainable development which was first introduced in the 'Brundtland report' ([7]) by the World Commission on Environment and Development (WCED) in 1987 and which is the most widely used nowadays. Following the 'Brundtland report', the UN Conference on Environment and Development (Rio Earth Summit), the Millennium Development Goals (MDGs) and the UN Conference on Sustainable Development (Rio+20) were the three milestones in the international pursuit of sustainable development, which paved the way forward for the 2030 Agenda (see Figure 0.1).

In September 2015, the UN General Assembly (UNGA) adopted at the UN sustainable development summit the document 'Transforming our world: the 2030 agenda for sustainable development' ([8]). The 2030 Agenda is the new global sustainable development strategy. At the core of the 2030 Agenda is a list of 17 Sustainable Development Goals (SDGs) (see Box 0.1) and 169 related targets to end poverty, protect the planet, and ensure prosperity and peace. The Agenda also calls for revitalised global partnership to ensure its implementation. The SDGs are unprecedented in terms of significance and scope and go far beyond the MDGs by setting a wide range of economic, social and environmental objectives and calling for action by all countries, poor, rich and middle-income. The Agenda emphasises that strategies for ending poverty and promoting sustainable development for all must go hand-in-hand with actions that address a wider range of social needs and which foster peaceful, just and inclusive societies, protect the environment and help tackle climate change. Although the SDGs are not legally binding, governments are expected to take ownership and establish national frameworks for the achievement of the 17 Goals.

Monitoring of the SDGs is foreseen to take place at various levels — national, regional, global and thematic. The High-level Political Forum (HLPF) is the UN's central platform for follow-up and review of the 2030 Agenda and the SDGs at the global level. The regular follow-up and review at the HLPF is to be informed by national reviews

Figure 0.1: The road to Agenda 2030

([6]) World Commission on Environment and Development (1987), *Our Common Future*.
([7]) Named after the former Norwegian prime minister Gro Harlem Brundtland who acted as chair of the WCED.
([8]) United Nations General Assembly (2015), '*Resolution adopted by the General Assembly on 25 September 2015: Transforming our world: the 2030 agenda for sustainable development*.' A/RES/70/1.

that the 2030 Agenda encourages UN member states to conduct ([9])([10]). Regular reviews by the HLPF are to be voluntary, state-led, undertaken by both developed and developing countries, and shall provide a platform for partnerships, including through the participation of major groups and other relevant stakeholders ([11]). In view of this, many countries are updating their national sustainable development strategies based on the 2030 Agenda ([12]).

Box 0.1: List of SDGs adopted by the UN General Assembly in September 2015

Paragraph 54 of the United Nations Resolution A/RES/70/1 of 25 September 2015 sets out the following 17 'Global Goals', together with 169 targets:

Goal 1. End poverty in all its forms everywhere

Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 3. Ensure healthy lives and promote well-being for all at all ages

Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Goal 5. Achieve gender equality and empower all women and girls

Goal 6. Ensure availability and sustainable management of water and sanitation for all

Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation

Goal 10. Reduce inequality within and among countries

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12. Ensure sustainable consumption and production patterns

Goal 13. Take urgent action to combat climate change and its impacts ([13])

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Goal 17. Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development

([9]) 'Conduct regular and inclusive reviews of progress at the national and sub-national levels, which are country-led and country-driven' (paragraph 79) of '*Transforming our world: the 2030 agenda for sustainable development*'.
([10]) The UN Department of Economic and Social Affairs (DESA) has established an online platform to compile inputs from countries participating in the national voluntary reviews of the annual session of the HLPF. See: https://sustainabledevelopment.un.org/hlpf
([11]) United Nations General Assembly (2015), '*Resolution adopted by the General Assembly on 25 September 2015: Transforming our world: the 2030 agenda for sustainable development,*' A/RES/70/1, paragraph 84.
([12]) Information about the national sustainable development strategies of EU countries could be found on the European Sustainable Development Network (ESDN) website: http://www.sd-network.eu/?k=country profiles
([13]) Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.

In June 2016 the UN released a first Report of the Secretary-General on 'Progress towards the Sustainable Development Goals' ([14]), followed by a glossy SDG report for the broader public ([15]). The latter provides an overview of progress on each of the 17 SDGs based on selected indicators from a global indicator framework. New editions of both reports were published in June 2017 in the run-up to the HLPF 2017 ([16]).

The establishment of a set of global indicators to follow up and review the goals and targets is foreseen by the 2030 Agenda (paragraph 75). The UN Statistical Commission (UNSC) ([17]) oversees this work stream.

- At its 47th meeting in March 2016, the UNSC agreed on a first indicator set 'as a practical starting point […] subject to future technical refinement' ([18])([19]).
- At its 48th session in March 2017, the UNSC agreed to a draft resolution titled 'The work of the UN Statistical Commission pertaining to the 2030 Agenda for Sustainable Development' ([20]), which includes a slightly refined version of the indicator framework.
- The resolution was adopted by United Nations Economic and Social Council (ECOSOC) on 7 June 2017 and by the UN General Assembly in July 2017.

The global indicator set adopted in 2017 includes 232 different indicators covering all the 169 targets of the 2030 Agenda (as some indicators are used to monitor more than one target, the set overall includes 244 indicators). However, only 35 % of those indicators are ready to use (these are called 'tier 1' in a UNSC classification), as for 26 % data are available only for a limited number of countries worldwide ('tier 2') and for the remaining part a methodology still has to be agreed ('tier 3'). Data gaps exist not only in developing but also in developed countries, and filling these gaps requires financial resources as well as knowledge sharing and investments in human capital. The UNSC foresees the possibility of yearly refinements to the global indicator framework, and of two comprehensive reviews in 2020 and in 2025. The Inter-Agency and Expert Group on the Sustainable Development Goal Indicators (IAEG-SDGs) is further working on refining and improving the global indicator framework, including the definition of possible additional indicators and the development of methodologies for tier 3 indicators. The exploration of new data sources and technologies for data collection such as geo-spatial information has a key role to play in this process ([21]). To address specific areas relevant to SDG indicator implementation the IAEG-SDGs has formed three working groups on Geo-spatial information, Interlinkages and Statistical Data and Metadata Exchange (SDMX), respectively. Eurostat is a member of IAEG-SDGs sub-groups on SDMX and Geo-spatial information and is also engaged in the methodological development of the tier 3 indicators.

The 2030 Agenda foresees that global indicators are complemented by indicators at the regional and national levels. The development of these

([14]) United Nations Economic and Social Council (2016), *Progress towards the Sustainable Development Goals. Report of the Secretary-General*.
([15]) United Nations (2016), *The Sustainable Development Goals Report 2016*.
([16]) United Nations Economic and Social Council (2017), *Progress towards the Sustainable Development Goals. Report of the Secretary-General*; United Nations (2017), *The Sustainable Development Goals Report 2017*.
([17]) The United Nations Statistical Commission, established in 1947, is the highest body of the global statistical system. It brings together the Chief Statisticians from member states from around the world. It is the highest decision making body for international statistical activities especially the setting of statistical standards, the development of concepts and methods and their implementation at the national and international level.
([18]) United Nations Statistical Commission (2016), Decisions, Forty-seventh session, 8–11 March 2016.
([19]) Please note that the list on which general agreement has been reached includes 230 indicators, although the total number of indicators listed in the final indicator proposal is 241. The difference is due to the fact that nine indicators repeat under two or three different targets.
([20]) United Nations Statistical Commission (2017), *The work of the UN Statistical Commission pertaining to the 2030 Agenda for Sustainable Development*. Draft Resolution.
([21]) See Report of the IAEG-SDGs to the 47th session of the UN Statistical Commission, 19 February 2016, §33.

regional and national indicator sets entails separate processes.

Meeting the global sustainable development objectives critically depends on a global partnership to enable the mobilisation of means of implementation, including financial and non-financial resources. Therefore, next to the definition of the SDGs and targets and the development of a global indicator framework, the mobilisation of resources for sustainable development represents another important element of Agenda 2030. A main milestone in the intergovernmental negotiations for financing of sustainable development was the Third International Conference on Financing for Development (FfD), which took place in July 2015 in Addis Ababa, Ethiopia. The conference adopted an outcome document, which presents concrete actions for mobilising means of implementation as an integral part of the 2030 Agenda ([22]).

2.2 Sustainable development in the European Union

2.2.1 Sustainable development as an EU policy objective

Sustainable development has long been a central policy objective for the European Union, enshrined in its treaties since 1997. The first EU Sustainable Development Strategy (EU SDS), adopted in 2001 ([23]), sets out a single, coherent plan on how to meet the challenges of sustainable development in the EU. The EU SDS, which was revised in 2006 ([24]) and later reviewed in 2009 ([25]), reaffirms the overall aim of a continuous improvement in the quality of life of citizens while ensuring prosperity, environmental protection and social cohesion.

On 17 June 2010, the European Council adopted the Europe 2020 strategy — the EU's agenda for growth and jobs for the current decade ([26]). The Europe 2020 strategy puts forward the three mutually reinforcing priorities of smart, sustainable and inclusive growth. For each of the three priorities the strategy defines one or more targets in five areas: employment; research and development (R&D) and innovation; climate change and energy; education; and poverty and social exclusion ([27]). The strategy's objectives and targets are further supported by seven thematic flagship initiatives ([28]). The eight targets adopted under the three key priorities give recognition to the economic, social and environmental dimensions of sustainable development by bringing policy focus on education and innovation, low carbon emissions, climate resilience and environmental impact, and job creation and poverty reduction.

Europe 2020's vision of economic development facilitates the transition to a more sustainable society. In this sense, Europe 2020 can be seen as the practical implementation of the EU's policy agenda for sustainable development. In a broader policy perspective, the Europe 2020 strategy plays an important role in addressing the internationally adopted 2030 Agenda for Sustainable Development and hence puts the European Union on the right track to achieving a sustainable future.

([22]) See: United Nations (2015), *Outcome document of the Third International Conference on Financing for Development: Addis Ababa Action Agenda*, A/CONF.227//L.1.
([23]) Göteborg European Council (2001), *Presidency conclusions*, 15 and 16 June 2001.
([24]) Council of the European Union (2006), *Review of the EU Sustainable Development Strategy (EU SDS) — Renewed Strategy*, 10917/06.
([25]) European Commission (2009), *Mainstreaming sustainable development into EU policies: 2009 review of the European Union Strategy for Sustainable Development*, COM(2009) 400 final, Brussels.
([26]) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM (2010)2020 final, Brussels.
([27]) For more information on the Europe 2020 targets please see: https://ec.europa.eu/info/strategy/european-semester/framework/europe-2020-strategy_en
([28]) The Europe 2020 flagship initiatives include 'Innovation Union', ,Youth on the move' (ended in December 2014), 'A digital agenda for Europe', 'Resource efficient Europe', 'An industrial policy fort he globalisation era', 'An agenda for new skills and jobs' and 'European platform against poverty and social exclusion'.

2.2.2 The role of the EU in the 2030 Agenda for sustainable development process

Fully consistent with its vision for a sustainable development future, the EU has played an active role in shaping the global 2030 Agenda. The EU published a number of important position documents in the run-up and follow-up to the adoption of the SDGs ([29]).

On 22 November 2016, the European Commission issued three communications that outline its approach to achieving the 2030 Agenda. The Communication (2016) 379 'Next steps for a sustainable European future: European action for sustainability' ([30]) presents the EU's answer to the 2030 Agenda and includes two work streams. The first work stream is to fully integrate the SDGs in the European policy framework and current Commission priorities, assessing where we stand and identifying the most relevant sustainability concerns. A second track is related to reflection work on further developing our longer-term vision after 2020, preparing for the long-term implementation of the SDGs. The Communication also announces a detailed regular monitoring of the SDGs in an EU context from 2017 onwards, and the development of a reference indicator framework for this purpose. The Commission also outlines the following key actions and governance elements that it will use to deliver the 2030 Agenda:

- Regular reporting of the EU's progress towards the implementation of the 2030 Agenda as of 2017;
- Continued work with external partners to promote sustainable development around the world;
- Launch of a multi-stakeholder Platform with a role in the follow-up and exchange of best practices on SDG implementation across sectors, at Member State and EU level;
- Taking the implementation of the 2030 Agenda forward with the Council and the European Parliament as the co-legislators and budgetary authority of the EU, and with other European institutions, international organisations, civil society organisations, citizens and other stakeholders.

The Communication is accompanied by a staff working document ([31]) which gives an overview of key European actions and policies in relation to the 17 SDGs.

Further, the Communication 'Proposal for a new European Consensus on Development: Our World, our Dignity, our Future' ([32]), also adopted on 22 November 2016, proposes a new European Consensus on Development, which aims to update the EU's development response to current global challenges and promote the Agenda 2030 implementation in partnership with developing countries. The Commission proposal formed the basis for negotiations towards the final Consensus on Development ([33]), signed at the European Development Days in June 2017. This complements EU actions to take forward implementation within Europe. It also underlines the commitment to Policy Coherence for Development, which requires the objectives of development cooperation to be taken into account in policies that are likely to affect developing countries.

Finally, a Joint Communication from the Commission and the High Representative of the EU for Foreign Affairs and Security Policy, entitled

([29]) European Commission (2013), *A decent life for all: Ending poverty and giving the world a sustainable future*, COM(2013) 92 final; European Commission (2014), A Decent Life for All: From vision to collective action, COM(2014) 0335 final; European Commission (2015), *A Global Partnership for Poverty Eradication and Sustainable Development after 2015*, COM(2015) 44 final.
([30]) European Commission (2016), *Next steps for a sustainable European future: European action for sustainability*, COM(2016) 739, Brussels.
([31]) Commission Staff Working Document (2016), *Key European action supporting the 2030 Agenda and the Sustainable Development Goals*. SWD(2016) 390 final, Brussels.
([32]) European Commission (2016), *Proposal for a new European Consensus on Development: Our World, our dignity, our future*, COM(2016) 740 final, Brussels.
([33]) Joint statement by the Council and the representatives of the governments of the Member States meeting within the Council, the European Parliament and the Commission, *The New European Consensus on Development: Our World, our dignity, our future.*

'A renewed partnership with the countries of Africa, the Caribbean and the Pacific (ACP)' ([34]), sets out ideas and building blocks for a new phase of political partnership with the ACP countries after the expiration of the Cotonou Partnership Agreement in 2020. The proposed priorities outlined in the Communication largely built on the UN 2030 Agenda.

On 20 June 2017 the Council adopted conclusions on 'A sustainable European future: The EU response to the 2030 Agenda for Sustainable Development' ([35]). The Council also called upon the Commission to carry out detailed regular monitoring of the SDGs at EU level, including where relevant in the context of the European Semester, and to develop a reference indicator framework for this purpose, drawing on existing indicators and data provided by the Member States, institutions and international organisations, and accompanied by a qualitative assessment of the progress made. It also called on the Commission, and where appropriate Member States, to use this indicator framework to assess progress and trends and to inform evidence-based decision-making ([36]). In addition, the Council underlined the need to ensure that the EU's and individual Member States' progress in the implementation of the 2030 Agenda is reported in the context of the High-level Political Forum on sustainable development (HLPF) at regular intervals. The Council invited the Commission to prepare for the first EU report on the internal and external implementation of the 2030 Agenda at the HLPF by 2019 ([37]).

3. Monitoring sustainable development in the EU

3.1 The EU sustainable development indicators set

The EU Sustainable Development Indicator set was proposed following the adoption of the first EU SDS in 2001 ([38]) and was endorsed by the Commission in 2005 ([39]). The set was slightly revised after the review of the first EU SDS ([40]) that led to an adoption of a renewed strategy in 2006 ([41]). Since then, several reviews of the SDI set have been carried out by the Commission with the assistance of a technical Working Group composed of statisticians and policy representatives at national and EU level. Since 2005 and up to 2015 Eurostat has produced regular biannual reports on monitoring the EU SDS ([42]).

In 2016, parallel with the Commission Communication COM (2016) 739 'Next steps for a sustainable European future: European action for sustainability' ([43]), Eurostat published 'Sustainable development in the European Union — A statistical glance from the viewpoint of the UN

([34]) European Commission and High Representative of the European Union for Foreign Affairs and Security Policy (2016), *A renewed partnership with the countries of Africa, the Caribbean and the Pacific*, JOIN(2016) 52 final, Brussels.
([35]) A sustainable European future: The EU response to the 2030 Agenda for Sustainable Development — Council conclusions (20 June 2017), Brussels.
([36]) Id, paragraph 39.
([37]) Id, paragraph 37.
([38]) Göteborg European Council (2001), *Presidency conclusions*, 15 and 16 June 2001.
([39]) Communication from Mr Almunia (2005), *Sustainable development indicators to monitor the implementation of the EU Sustainable Development Strategy*, SEC(2005) 161.
([40]) Commission Communication (2005), *On the review of the Sustainable Development Strategy — A platform for action*, COM(2005) 658.
([41]) Council of the European Union (2006), *Review of the EU Sustainable Development Strategy (EU SDS) — Renewed Strategy*, 10917/06.
([42]) See last monitoring report: Eurostat (2015), *Sustainable Development in the European Union — 2015 monitoring report of the EU Sustainable Development Strategy*, Luxembourg: Publications Office of the European Union.
([43]) European Commission (2016), *Next steps for a sustainable European future: European action for sustainability*, COM(2016) 739, Brussels.

Sustainable Development Goals' ([44]). The ad hoc publication provides a first overview of where the EU and its Member States stand in relation to the SDGs.

3.2 The EU SDG indicator set

The European Commission is committed to monitoring progress towards the Sustainable Development Goals in an EU context. Eurostat has led the development of a reference indicator framework for this purpose in close cooperation with other Commission services and with Eurostat's partners in the European Statistical System (ESS). Work on the selection of an EU SDG indicator list has been carried out in an open and inclusive way, involving Council Committees (Employment Committee, Social Protection Committee and Economic and Financial Committee), the European Statistical Advisory Committee (ESAC), agencies such as the European Environment Agency, non-governmental organisations, academia and other international organisations. Many proposals have been screened in the light of pre-established principles and criteria on policy relevance and quality requirements.

The EU SDG indicator set, which received the favourable opinion of the European Statistical System Committee in May 2017, comprises 100 indicators, of which 41 are 'multi-purpose', meaning they are used to monitor more than one goal. This allows the link between different goals to be highlighted and enhances the narrative of this monitoring report. For the overall progress at the goal level, multi-purpose indicators are considered with equal weight as all the other indicators.

The EU SDG indicator set is structured along the 17 SDGs and covers the social, economic, environmental and institutional dimension of sustainability as represented by the Agenda 2030. The 100 indicators are evenly distributed across the 17 goals, so that progress in each SDG is measured by five or six indicators primarily attributed to them (without considering the multipurpose indicators), which reflect its broad objective and ambition.

The indicators have been selected taking into account their policy relevance from an EU perspective, availability, country coverage, data freshness and quality. With a few exceptions, the indicators stem from already existing indicator sets used for monitoring long-term EU policies, such as the EU Sustainable Development Indicators, the Europe 2020 headline indicators and the set of impact indicators for Strategic Plan 2016–2020 (10 Commission priorities) or other policy or initiative as reported in the staff working document 'Key European action supporting the 2030 Agenda and the Sustainable Development Goals' ([45]), accompanying the Communication COM (2016) 739 'Next steps for a sustainable European future: European action for sustainability' ([46])'.

The indicators do not aim at representing the importance of particular targets in the 2030 Agenda, as these are of equal significance. Elements of the 2030 Agenda that are less relevant for the EU because they focus on other parts of the world (for instance where targets specifically refer to developing countries) are not considered. The indicator set for SDG 17 includes indicators on financial and trade flows to developing countries, since the goal relates to means of implementation for the 2030 Agenda, including issues such as external flows.

The EU SDG indicator set will be open to regular reviews in line with future policy developments and to consider new indicators as methodologies, technologies and data sources evolve over time. Eurostat is working with other services of the European Commission to consider the use of new data sources such as the integration of

([44]) Eurostat (2016), *Sustainable development in the European Union — A statistical glance from the viewpoint of the UN Sustainable Development Goals*, Luxembourg, Publications Office of the European Union.
([45]) Commission Staff Working Document (2016), *Key European action supporting the 2030 Agenda and the Sustainable Development Goals*, SWD(2016) 390 final, Brussels.
([46]) European Commission (2016), *Next steps for a sustainable European future: European action for sustainability*, COM(2016) 739, Brussels.

Earth observation data and information from Copernicus, the European Earth Observation Programme, whenever they contribute to the increased availability, quality, timeliness and disaggregation of data ([47]).

3.3 Data coverage and sources

Data in this report are mainly presented for the aggregated EU-28 level. In the cases when EU-28 aggregated data are not available, EU-27 data are presented instead, referring to the situation of the 27 EU Member States before the accession of Croatia to the EU in July 2013. Also, whenever EU-28 data are only available for a very short time period, the EU-27 data are presented in addition to the EU-28 ([48]).

In addition to the 28 EU Member States, data for EU candidate countries and the countries of the European Free Trade Association (EFTA) are included in the country-level comparisons throughout the report when available, complementing the EU-level analysis. When data availability allows, global comparisons of the EU with other large economies in the world (such as the United States, Japan and China) are also presented.

In order to reflect the 15-year scope of Agenda 2030, the analysis of trends is as far as possible based on data for the past 15 years. For a number of indicators, in particular those based on the EU Statistics on Income and Living Conditions (EU SILC), data are available for shorter periods only.

The data presented in this report were mainly extracted in late October 2017. Most of the data used to compile the indicators stem from the standard Eurostat collection of statistics through the European Statistical System (ESS), but a number of other data sources have also been used, including other European Commission services, the European Environment Agency (EEA), the European Institute for Gender Equality, the OECD, the World Bank and others.

Eurostat's website contains a section dedicated to the EU SDG set. Eurostat online data codes, such as tsdec100 and nama_10_gdp ([49]), allow easy access to the most recent data on Eurostat's website ([50]). Eurostat's website includes also a section called 'Statistics Explained' ([51]). This is an official Eurostat website presenting the full range of statistical subjects covered by Eurostat, including the EU SDG indicator set, in an easy-to-understand way. It works in a similar way to Wikipedia. Together, the articles make up an encyclopaedia of European statistics for everyone, completed by a statistical glossary clarifying all terms used and by numerous links to further information and the latest data and metadata, a portal for occasional and regular users.

3.3.1 Treatment of breaks in time series

Breaks in time series occur when the data collected in a specific year are not completely comparable with the data from previous years. This could be caused by a change in the classification used, the definition of the variable, the data coverage and/or other reasons. Breaks in time series could affect the continuity and consistency of data over time. However, it should be noted that such breaks do not undermine the reliability of the data.

In the course of preparing this monitoring report, a case-by-case assessment of breaks in times series has been conducted to determine the extent to which a break would affect the assessment of an

([47]) See Commission Staff Working Document (2016), *Key European action supporting the 2030 Agenda and the Sustainable Development Goals*, SWD(2016) 390 final, Brussels, p. 76.

([48]) EU aggregates are back-calculated when sufficient information is available. For example, the EU-28 aggregate is often presented for periods prior to the accession of Croatia in 2014 and the accession of Bulgaria and Romania in 2007, as if all 28 Member States had always been members of the EU. The label is changed if the data refer to another aggregate (EU-27 or EU-25) or a note is added if the data refer to a partial aggregate created from an incomplete set of country information (no data for certain Member States or reference years).

([49]) There are two types of online data codes: tables have eight-character codes the first of which is the letter 't' — for example tps00001 and tsdph220, while databases have codes that use an underscore '_' within the syntax of the code, for example nama_gdp_c or demo_pjan.

([50]) In this report, these online data codes are given as part of the source below each table and figure. The reader is led directly to the most recent data when clicking on the online data code. Online data codes lead to an open dataset which generally contains more dimensions and longer time series using the Data Explorer interface. Alternatively, data can be accessed by entering the data code into the search field on the Eurostat's website. The complete set of indicators is presented in Annex II of this publication.

([51]) http://ec.europa.eu/eurostat/statistics-explained/index.php/Main_Page.

indicator. In cases where a break was considered significant enough to affect the calculation of the trend for the indicator or the comparability between countries, the analysis of the indicator was adjusted accordingly.

Breaks in times series are indicated throughout the report in footnotes below the graphs.

3.4 Calculation of indicator trends

3.4.1 How are trends calculated?

This publication provides a first statistical overview of trends towards EU objectives and targets that are related to the SDGs. The main reference is the Staff Working Document 'Key European action supporting the 2030 Agenda and the Sustainable Development Goals' ([52]), accompanying the Commission Communication COM (2016) 739 'Next steps for a sustainable European future' from 22 November 2016 ([53]), which addresses EU policy frameworks such as Europe 2020, the 10 Commission priorities, the 7th Environmental Action Programme, the Circular Economy Package and other relevant long-term policies and initiatives.

The methodology for calculating progress is for this report only, and considers whether an indicator has moved in the desired direction or away from the sustainable development objective, as well as the speed of this movement. It does not look at the 'sustainability' ([54]) of the situation at any point in time.

Ideally, the trends observed for each indicator would be compared against theoretical trends necessary to reach either a quantitative target set within the political process or a scientifically established threshold. However, for many indicators in the EU SDG indicator set an explicit quantified and measurable target does not exist in the EU context. In these cases, a consistent, transparent and simple approach across all these indicators is applied, to avoid ad hoc value judgments.

Table 0.1: Trend categories and associated symbols

Category	Symbol
Significant progress towards SD objectives	↑
Moderate progress towards SD objectives	↗
Moderate movement away from SD objectives	↘
Significant movement away from SD objectives	↓
Contextual indicator or not enough data available	:

The analysis is based on the evolution of data at the EU level, not on trends observable in the individual Member States. Where appropriate and possible, comparisons of the EU with other economies in the world are presented for contextual purposes.

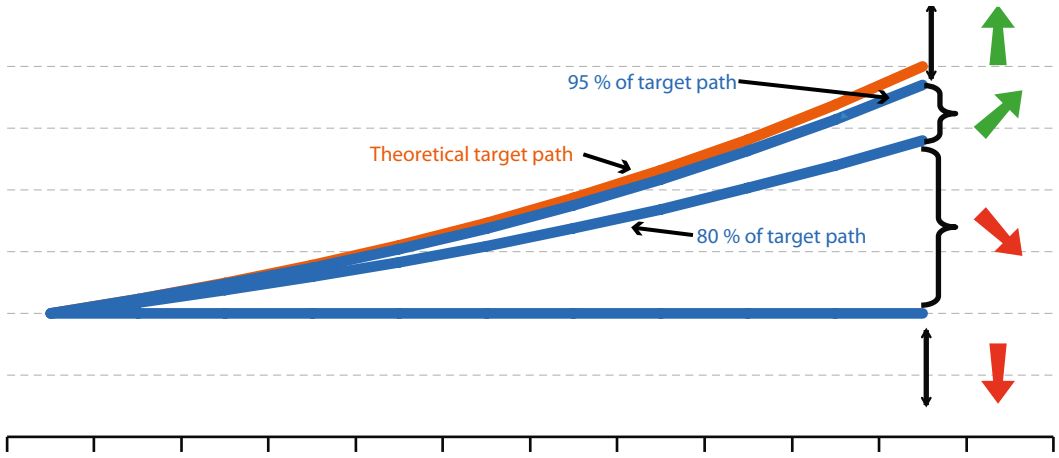
3.4.2 How are trends presented?

The trends of the individual indicators are visualised in the form of arrows (see Table 0.1). The arrows show whether the indicator moves in the desired direction or away from the sustainable development objective and the speed of this movement.

To highlight whether a trend has been continuous over time or not, in particular in recent years, the analysis for each indicator in this publication is presented for two time periods:

([52]) Commission Staff Working Document (2016), *Key European action supporting the 2030 Agenda and the Sustainable Development Goals*, SWD(2016) 390 final, Brussels.
([53]) European Commission (2016), *Next steps for a sustainable European future: European action for sustainability*, COM(2016) 739, Brussels.
([54]) The concept of sustainable development should be distinguished from that of sustainability. 'Sustainability' is a property of a system, whereby it is maintained in a particular state through time. The concept of sustainable development refers to a process involving change or development. The strategy aims to 'achieve continuous improvement of quality of life', and the focus is therefore on sustaining the process of improving human well-being. Rather than seeking a stable equilibrium, sustainable development is a dynamic concept, recognising that changes are inherent to human societies.

Figure 0.2: Schematic representation of the approach for indicators with quantitative targets



- The **long-term trend**, which is based as far as possible on the evolution of the indicator over the past 15-year period (usually 2000 to 2015 or 2001 to 2016) and requires data availability for at least 10 consecutive years,
- The **short-term trend,** which is based on the evolution of the indicator during the past five-year period (usually 2010 to 2015 or 2011 to 2016) and requires data availability for at least three consecutive years.

Two arrows — one for the long-term trend and one for the short-term trend — are therefore usually shown for each indicator, providing an indication of whether a trend has been continuous over the years or whether the recent trend has deviated from its long-term path at a certain point in time.

Both the long and the short-term trends are based on the 'compound annual growth rate' (CAGR) formula, which shows the pace and direction of the evolution of an indicator (for a detailed description of the calculation method see Annex III). This method uses the data from the first and the last years of the analysed time span and calculates the average annual rate of change of the indicator (in %) between these two data points.

Depending on the type of indicator and the presence or absence of a quantitative EU policy target, two different calculation methods are applied, which are explained below.

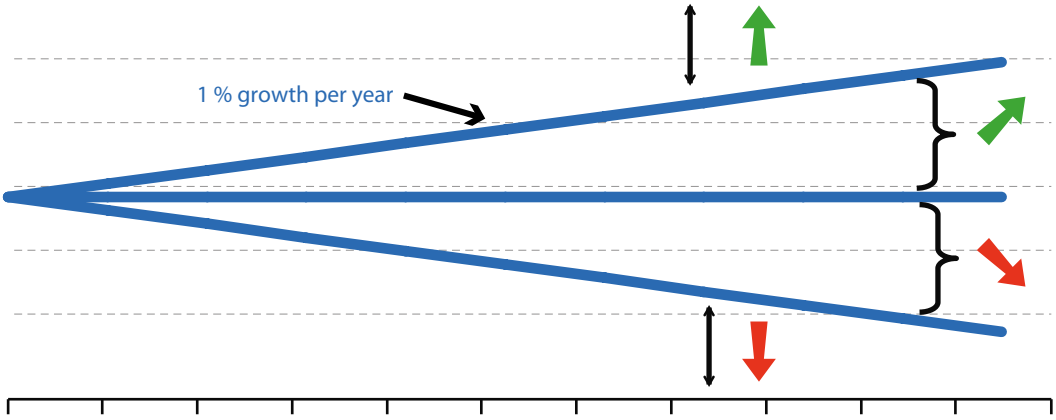
3.4.3 Indicators with quantitative targets

Whenever possible, the calculation of indicator trends takes into account concrete targets set in relevant EU policies and strategies. The main point of reference for identifying relevant policy targets is the Commission Staff Working Document (SWD) 'Key European action supporting the 2030 Agenda and the Sustainable Development Goals' ([55]) accompanying the Commission Communication COM (2016) 379 'Next steps for a sustainable European future: European Union action for sustainability' from 22 November 2016 ([56]).

In the presence of a quantified political target (for example, the Europe 2020 targets), the actual rate of change of the indicator (based on the CAGR as described in Annex III) is compared with the theoretical rate of change that would be required to meet the target in the target year (see Figure 0.2). If

([55]) European Commission (2016), *Key European action supporting the 2030 Agenda and the Sustainable Development Goals*, SWD(2016) 390 final, Strasbourg.
([56]) European Commission (2016), *Next steps for a sustainable European future: European action for sustainability*, COM(2016) 739 final, Strasbourg.

Figure 0.3: Schematic representation of the approach for indicators without quantitative targets



the actual rate is 95 % or more of the required rate, the indicator shows significant progress towards sustainable development (SD) objectives ('on target path'). Between 80 % and 95 % the trend shows moderate progress towards SD objectives ('close to target path'), and between 0 % and 80 % the trend shows a moderate movement away from SD objectives ('far from the target path'). The trend shows a significant movement away from SD objectives when it points in the wrong direction, i.e. away from the target path.

3.4.4 Indicators without quantitative targets

In the absence of a quantified target, only the observed rate of change of the indicator is calculated (based on the CAGR as described in Annex III), using the following thresholds: a change of more than 1 % per year is considered significant (see Figure 0.3). Depending on the direction of the change, this corresponds to the categories 'significant progress towards SD objectives' or 'significant movement away from SD objectives' from Table 0.1. A change between 0 % and 1 % per year is considered moderate, which refers to the categories 'moderate progress towards SD objectives' or 'moderate movement away from SD objectives' in Table 0.1, again depending on the direction of the change.

3.4.5 Summary of progress at goal level

Overall progress at goal level (as presented in the synopsis) is calculated as simple average of the short-term (past five years) trends of the individual indicators for each SDG (including the multi-purpose indicators), giving equal weight to all indicators ([57]). Indicators for which a trend cannot be calculated (usually due to insufficient time series) are not taken into account for the summary. The share of indicators for which it is possible to calculate a trend (i.e. with an 'arrow' symbol) has to be at least 75 % to compute the summary result; below this threshold the available indicators are considered insufficient to make a representative statement at the goal level.

([57]) For the purpose of the calculation, numbers from 1 to 4 are assigned to the symbols: ↑ = 1, ↗ = 2, ↘ = 3, ↓ = 4

1 End poverty in all its forms everywhere

The global perspective on SDG 1

More than 700 million people in the world still live in extreme poverty and are struggling to meet their most basic needs such as health, education and access to water and sanitation. Although most of these people live in developing countries, poverty also affects developed countries. SDG 1 calls for an eradicating of extreme poverty and for halving poverty in all its dimensions over the next 15 years. It envisions shared prosperity, a basic standard of living and social protection benefits for people everywhere, including the poorest and most vulnerable. To empower people to raise themselves out of poverty, SDG 1 seeks to ensure equal rights and access to economic and natural resources as well as technology, property and basic and financial services. It also calls for support for communities affected by conflict and climate-related disasters. SDG 1 emphasises policy commitment and mobilisation of resources as essential levers for accelerating poverty eradication ([1]).

eurostat supports the SDGs

Monitoring SDG 1 'no poverty' in an EU context focuses on the sub-themes 'multidimensional poverty' and 'basic needs'. Multidimensional poverty refers to income poverty, material deprivation and low work intensity, all of which are combined in the Europe 2020 headline indicator 'people at risk of poverty or social exclusion'. Basic needs refer to the housing situation and access to health care. As shown in Table 1.1, the EU's progress in these areas has been rather mixed.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 1.1: Indicators measuring progress in SDG 1, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Multidimensional poverty			
People at risk of poverty or social exclusion	↘ (1)(2)	↓ (2)(3)	p. 32
People at risk of income poverty after social transfers	↘ (1)	↓	p. 35
Severely materially deprived people	↑ (4)	↑	p. 37
People living in households with very low work intensity	↗ (1)	↘	p. 39
Basic needs			
Housing cost overburden rate	:	↓	p. 41
Self-reported unmet need for medical care (*)	:	↘	SDG 3, p. 82
Population unable to keep home adequately warm (*)	:	↗	SDG 7, p. 160
Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor	:	↑	p. 42
Population having neither a bath, nor a shower, nor indoor flushing toilet in their household (*)	↑ (1)	↑	SDG 6, p. 132
Overcrowding rate (*)	↑ (1)	↑	SDG 11, p. 223

Note: An explanation of the method for measuring progress and the meaning of the arrows is given in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Trends for EU-27; past 10-year period.
(2) Trends in relation to the Europe 2020 target of lifting 20 million people out of the risk of poverty or social exclusion by 2020.
(3) After the onset of the economic crisis, the number started to increase in 2009, before returning to a decreasing trend in 2012.
(4) Trends for EU-27; past 11-year period.

Poverty in the EU: overview and key trends

Poverty can harm people's lives and limit their opportunities to achieve their full potential. It is linked to poor health, low salaries, unemployment and low educational outcomes. Poverty has a tendency to persist, meaning that children born into poverty bear a higher risk of poverty in adult life than the average population ([2]). Without effective educational, health, social, taxation and employment systems, the risk of poverty is passed from one generation to the next. This can further cause a long-term loss of economic productivity and hamper inclusive and sustainable economic growth. To prevent this downward spiral, in 2010 the EU made 'inclusive growth' one of the three priorities of the Europe 2020 strategy ([3]). It has set a target to lift at least 20 million people out of the risk of poverty and social exclusion by 2020.

Multidimensional poverty

In addition to the target for eradicating extreme poverty, which focuses primarily on developing countries in continuity with the earlier Millennium Development Goals (MDGs), SDG 1 calls for the eradication of extreme poverty and at least halving poverty in all its dimensions by 2030. This universal approach to poverty reduction is directly relevant for the EU, and the Europe 2020 strategy already sets a target of 'lifting at least 20 million people out of the risk of poverty or social exclusion' by 2020 compared to the year 2008. As poverty is a multidimensional phenomenon, a broader picture is captured in the EU by the three sub-indicators 'income poverty', 'very low work intensity' and 'severe material deprivation' that together constitute the indicator 'people at risk of poverty or social exclusion' — the headline indicator of the Europe 2020 strategy. By referring to both income poverty and social exclusion, the indicator highlights other issues, in addition to relative low income, that can put people at a disadvantage compared with the rest of the population in their country. It also emphasises that these issues are closely interlinked. Combined, they reflect the extent to which parts of the population are at risk of exclusion and marginalisation from economic, social and cultural activities that other people regularly participate in.

In 2015, 119.0 million people, or 23.8 % of the EU population, were **at risk of poverty or social exclusion**. This means less than one in four people in the EU experienced at least one of three forms of poverty or social exclusion: income poverty, severe material deprivation or very low work intensity. Compared to 2005, the number of people at risk of poverty or social exclusion had declined, but not steadily. After the onset of the economic crisis, the number started to rise in 2009 before falling again from 2012. However, this recent improvement has not been enough to put the EU back on track to meeting the Europe 2020 strategy's target of lifting 20 million people out of the risk of poverty or social exclusion by 2020.

The three aspects of poverty tend to overlap: some people are affected by two or even all three forms. Income poverty was the most widespread form of poverty in 2015. In that year, 86.8 million people (17.3 % of the EU population) were living **at risk of poverty after social transfers**. This means these people had an equivalised disposable household income below the at-risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income. Because income poverty is a relative measure, the at-risk rate may remain stable or even increase even though the average or median income increases. In the EU, the number of people at risk of poverty after social transfers has been increasing over the long term (15 years). This increase appears to have intensified in the short term (five years).

Complementing the indicator on income poverty, **severe material deprivation** refers to a person's inability to afford some items considered by most people to be desirable or even necessary to lead an adequate life. It is an absolute measure of

([2]) For more information, see Eurostat, *Statistics Explained, Intergenerational transmission of disadvantage statistics*.
([3]) See p. 19 in the Introduction for a more detailed description of the Europe 2020 strategy; also see https://ec.europa.eu/info/strategy/european-semester/framework/europe-2020-strategy_en.

poverty and gives an indication of the proportion of people whose living standards are affected by a lack of resources. It is likely to decrease during economic revivals when people are generally financially better off. Severe material deprivation affected 37.5 million people or 7.5 % of the EU population in 2016. Unlike the income poverty rate, the number of people affected by material deprivation has declined in the long term.

Very low work intensity is the third form of poverty included in the composite indicator. In 2015, 39.8 million people, or 10.7 % of the EU population aged 0 to 59 were **living in households with very low work intensity**. The number of people affected by very low work intensity in the EU-27 has slightly decreased over the long term since 2005. However, a small increase was recorded over the short term.

Basic needs

Being at risk of poverty can have a severe impact on a person's ability to meet their basic needs such as afford adequate housing, keep their home adequately warm or receive medical treatment when needed. People living below the poverty threshold were over seven times more likely to suffer from **housing cost overburden** than people living above the poverty threshold. In 2015, 39.2 % of poor people spent more than 40 % of their disposable income on housing, compared to 5.4 % of people above the poverty threshold. Overall, 11.3 % of the EU population was 'overburdened' by housing costs in 2015. This was a 0.6 percentage point increase on the 2010 level.

Access to health care services may help break the spiral of poor health that contributes to, and results from, poverty and exclusion. In turn, this may contribute to increased productivity, improved quality of life and reduced costs associated with social protection systems. Barriers to accessing health services include cost, distance and waiting times. In 2015, only 3.2 % of people in the EU reported **unmet needs for medical care**, mainly due to monetary reasons. This average figure, however, masks considerable differences between income groups. While only 1.4 % of the richest 20 % of the population reported unmet care needs, this was the case for 5.5 % of people in the poorest population quintile. The situation has remained almost unchanged since 2010.

Low-income households also tend to face greater difficulties in keeping their home adequately warm. In 2015, 9.4 % of all households reported an **inability to keep the home adequately warm**. However, the share was much higher for households living below the poverty threshold, at 22.7 %. While the overall figure has remained unchanged since 2010, the situation has slightly worsened for poor households, with the share of households not able to keep the home adequately warm increasing by 1.6 percentage points since 2010.

People at risk of poverty tend to be more exposed to housing deficiencies, such as lack of certain basic sanitary facilities and problems in the general condition of the dwelling (leaking roof or dwelling being too dark). At the EU level, the main housing problem was found to be the '**leaking roof**' (leaking roof or damp walls, floors or foundation, or rot in window frames or floor), which affected 15.2 % of the population in 2015. This is 0.9 percentage points lower than the share of the population reporting such deficiency in living conditions in 2010. Living conditions in European countries have also improved regarding basic sanitary facilities. In 2015, 2.0 % of the EU population **lacked a bath/shower or indoor flushing toilet**, compared to 2.6 % in 2010.

Many EU citizens not only live in dire conditions but also share a dwelling with more people than there is space for, thus face **overcrowding** within the household. Such living situations can significantly affect quality of life by restricting opportunities for movement, rest, sleep, privacy and hygiene. In 2015, 16.7 % of the EU population lived in an overcrowded household. The incidence of overcrowding was almost twice as high for people with an income below the poverty threshold, with 29.6 % of poor people being affected. Improvements are visible for the past five years, although at a slightly slower pace than for the other two indicators on housing deprivation mentioned above.

Poverty in the EU

Multidimensional poverty

Risk of poverty or social exclusion in 2015
119.0 million persons
+ 1.2 % since 2010

Income poverty in 2015
86.8 million persons
+ 6.0 % since 2010

Material deprivation in 2016
37.5 million persons
- 14.6 % since 2011

Low work intensity in 2015
39.8 million persons
+ 2.6 % since 2010

Basic needs

Housing cost overburden in 2015
11.3 % of population
+ 0.6 pp since 2010

Unmet need for medical care in 2015
3.2 % of population aged 16 and over
+ 0.1 pp since 2010

Inability to keep home warm in 2015
9.4 % of population
No improvement since 2010

Poor dwelling conditions in 2015
15.2 % of population
- 0.9 pp since 2010

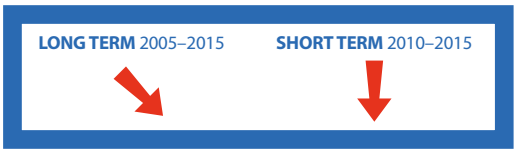
Lack of sanitary facilities in 2015
2.0 % of population
- 0.6 pp since 2010

Overcrowding rate in 2015
16.7 % of population
- 1.0 pp since 2010

Source: Eurostat (online data codes: sdg_01_10, sdg_01_20, sdg_01_30, sdg_01_40, sdg_01_50, sdg_03_60, sdg_07_60, sdg_06_10, sdg_01_60 and sdg_11_10)

People at risk of poverty or social exclusion

The number of people at risk of poverty or social exclusion has fallen since 2005. However, a strong increase between 2009 and 2012 has pushed the EU considerably off the path to meeting is target to lift 20 million people out of this situation. Since 2012, the number of people at risk has fallen continuously.

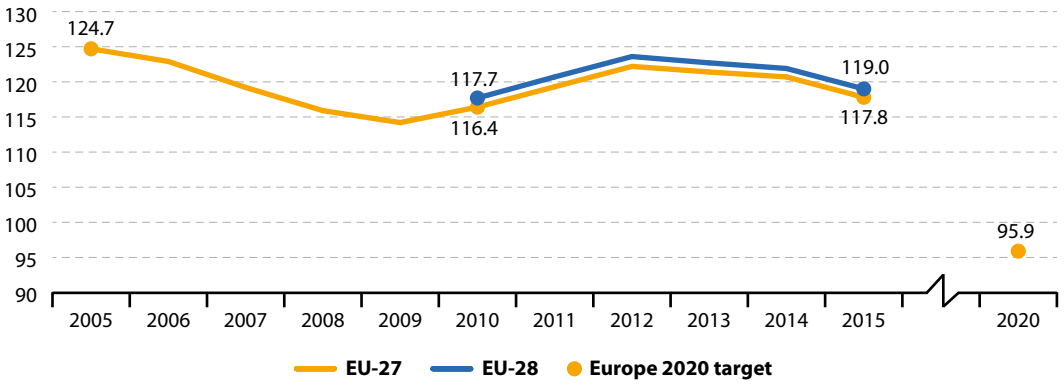


The Europe 2020 strategy promotes social inclusion, in particular through the reduction of poverty, by aiming to lift at least 20 million people out of the risk of poverty and social exclusion compared with 2008 levels ([4]). This indicator corresponds to the number of people who are in at least one of the following situations: (1) at risk of income poverty or (2) severely materially deprived or (3) living in households with very low work intensity. People are only counted once even if they are present in several sub-indicators. For more detailed information on the methodology behind the three sub-indicators please see the following sections. Data presented in this section stem from the EU Statistics on Income and Living Conditions (EU-SILC).

In 2015, 119.0 million people, or 23.8 % of the EU population, were at risk of poverty or social exclusion, meaning almost a quarter of the EU population experienced at least one of the three forms of poverty or social exclusion covered by this indicator.

The development of risk of poverty or social exclusion in the EU over the past decade has been marked by two turning points: in 2009, when the number of people at risk started to rise because of the delayed social effects of the economic crisis and in 2012, when this trend reversed ([5]). By 2015,

Figure 1.1: People at risk of poverty or social exclusion, EU-27 and EU-28, 2005–2015
(million people)



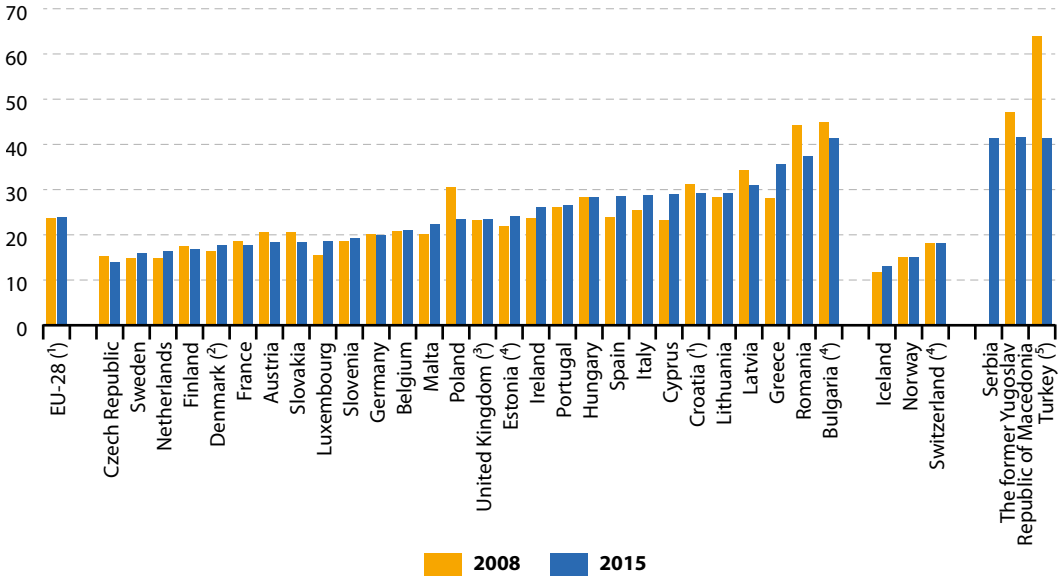
Note: Data for 2005 and 2006 are estimates.

Source: Eurostat (online data code: sdg_01_10)

([4]) Due to the structure of the survey on which most of the key social data is based (EU Statistics on Income and Living Conditions), a large part of the main social indicators available in 2010, when the Europe 2020 strategy was adopted, referred to 2008 as the most recent year of data available. This is why 2008 data for the EU-27 are used as the baseline year for monitoring progress towards the Europe 2020 strategy's poverty target. For the same reason, the country breakdowns in this chapter use the year 2008 for comparison. As 115.9 million people were at risk of poverty or social exclusion in the EU-27 in 2008, the target value to be reached is 95.9 million by 2020.

([5]) For the development following 2009, see European Commission Directorate General for Economic and Financial Affairs (2014), *Poverty developments in the EU after the crisis: a look at main drivers, Economic Brief*, Issue 31 May 2014.

Figure 1.2: People at risk of poverty or social exclusion, by country, 2008 and 2015
(% of population)



(1) 2010 data (instead of 2008).
(2) Break in time series in 2011.
(3) Break in time series in 2012.
(4) Break in time series in 2014.
(5) Break in time series in 2013.

Source: Eurostat (online data code: sdg_01_10)

The country-specific recommendations under the European Semester aim to encourage fiscal and structural reforms (including social policies) that contribute to reducing both poverty and inequality.

the number of people at risk had fallen almost to 2010 levels, reaching 119.0 million people. Despite this recent decline, the gap to the Europe 2020 target has widened to about 23 million people compared with 2008, putting the EU considerably off its target path.

The overall rate of people at risk of poverty or social exclusion masks considerable differences between different groups of people. It is therefore necessary to look at breakdowns by group to identify those most at risk:

- **By sex**: In 2015, women were more likely to experience poverty or social exclusion than men by 1.4 percentage points (the rate for women was 24.5 % while for men it was 23.1 %). Women were worse off in all EU countries except for Poland and Spain, where men were at higher risk of poverty or social exclusion, and Finland, where the risk was equal for men and for women. In 2015, the gender gaps were highest in the Baltic States of Latvia (5.5 percentage points) and Estonia (3.8 percentage points) as well as in Bulgaria (3.5 percentage points), the Czech Republic and Slovenia (3.3 percentage points each).
- **By age group**: Young people aged 18 to 24 were the age group most at risk of poverty or social exclusion — almost a third were at risk in 2015 (31.8 % of women and 30.8 % of men). Moreover, the situation of young people aged 18 to 24 has deteriorated the most since 2010 compared to other age groups. Although their risk of poverty or social exclusion had been falling until 2009, it climbed back up in the following

years. The year 2015 showed a slight reduction compared to 2014. Children had the second highest risk of poverty or social exclusion, with 27.1 % at risk in 2015. In contrast, older people aged 65 or over had the lowest rate of poverty or social exclusion, at 17.4 % in 2015 ([6]). Rates for this group showed a steady decline between 2011 and 2015. As a result, the age gap between younger and older people widened during this period and has remained stable after that.

- **By degree of urbanisation**: On average, EU citizens in rural areas were slightly more likely to live at risk of poverty or social exclusion than those in urban areas (25.5 % in rural areas compared with 24.0 % in urban areas) in 2015. Those living in towns or suburbs were the least likely to be at risk (22.1 %). However, the figures vary greatly between Member States. In 15 Member States, people living in rural areas were at the highest risk of being poor or socially excluded. The countries with the highest risk of poverty or social exclusion in rural areas compared with urban areas were Romania (26.7 percentage points higher) and Bulgaria (23.1 percentage points higher) ([7]). In other countries, such as Denmark, Austria, Belgium, the United Kingdom and Germany, the opposite was true: a clearly larger share of urban residents lived in poverty or social exclusion compared to residents in rural areas or towns. In other countries, such as the Czech Republic, Finland and Slovenia, the poverty rates in urban, rural or suburban areas differed only slightly.
- **By household type**: Among households of single people with one or more dependent children, 48.1 % were at risk at risk of poverty or social exclusion in 2015. This was just over twice the average rate and higher than for other household types. However, this group also experienced the largest decline in the risk-of-poverty rate since 2010 when the rate was 52.1 %. In general, households with only one adult — both with children and without — and households with three or more children are at a higher risk of poverty or social exclusion. In single-adult households there is no partner to help cushion temporary disruptions such as unemployment or sickness. Single parents also face the challenge of being both the primary breadwinner and caregiver for the family. The group with the lowest poverty rate in 2015 was that of households with two adults where at least one person was aged 65 years or over.
- **By educational attainment**: In 2015, 34.3 % of people with at most lower secondary educational attainment were at risk of poverty or social exclusion. In comparison, only 11.7 % with tertiary education were in the same situation. This shows that the least educated people were almost three times more likely to be at risk than those with the highest education levels. This is also reflected in the data on employment which shows that the likelihood of being employed rises in line with educational level (see the respective analysis in chapter 8 'Decent work and economic growth').
- **By country of birth**: People living in the EU but born in a non-EU country had a 40.3 % risk of living in poverty or social exclusion in 2015. The risk was lower for people born in an EU-country other than the one they were living in, at 25.0 %. Among the people whose country of residence corresponded to their country of birth, 21.8 % were at risk of poverty or social exclusion. Thus, people born outside the EU were almost twice as likely to be at risk of poverty or social exclusion compared with those born in the same country. Compared to migration from a country from outside the EU, migration within the EU bears a far smaller risk of poverty or social exclusion.
- **By disability status**: In 2015, people with disabilities were at higher risk of poverty than people with no disabilities in the EU ([8]). In that year, 30.2 % of the population aged 16 or more and who had a disability were at risk of poverty

([6]) Reasons for this could include that many elderly people receive regular pensions, have accrued some wealth and have often paid off their housing situation.
([7]) The same holds true for Malta, but the data is of low reliability.
([8]) In EU-SILC, disability is approximated according to the concept of global activity limitation, which is defined as a 'limitation in activities people usually do because of health problems for at least the past six months'. This is considered to be an adequate proxy for disability, both by the scientific community and disabled persons' organisations.

or social exclusion, compared with 20.8 % of those with no disability.

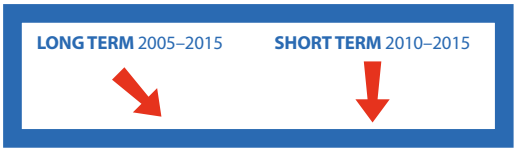
- **Children, by educational attainment level of parents**: In 2015, 65.6 % of children (aged 0–17) of parents with at most pre-primary and lower secondary education were at risk of poverty or social exclusion. Young children (aged 0–6) of such parents were at an even higher risk, at 68.2 %. This was over six times higher than for children of parents with first- or second-stage tertiary education. Moreover, between 2010 and 2015 the increase in the risk of poverty or social exclusion was particularly high for children of parents with the lowest educational attainment, while the increase was minimal for the other children. Thus, education, which is a strong determinant of poverty or social exclusion for adults, also influences whether children live in poverty or social exclusion. Children who live in such circumstances are more likely to attain a lower level and quality of education (leaving school early) than those who do not live in poverty or social exclusion. Therefore, they are also at higher risk of poverty in their adult life.

Income poverty was the most widespread form of poverty in 2015. There were 86.8 million people (17.3 % of the EU population) living at risk of poverty after social transfers in that year. This was more than twice as many as those with severe material deprivation (40.4 million people or 8.1 % of EU citizens) and very low work intensity (39.8 million people or 10.7 % of EU-citizens aged 0–59) ([9]). Almost 39 million people, or nearly one-third (32.5 %) of all people at risk of poverty or social exclusion, were affected by more than one dimension of poverty over the same period. Out of those, 9.2 million people, or one in twelve of those at risk of poverty or social exclusion (7.7 %), were affected by all three forms.

The share of people at risk of poverty or social exclusion varied across the EU in 2015, ranging from 14.0 % to 41.3 %. In Bulgaria, Greece, Cyprus and Hungary, the largest group of people at risk of poverty or social exclusion were those affected by severe material deprivation without experiencing income poverty or living in a household with very low work intensity. In all other Member States, income poverty was the most prevalent form of poverty in 2015.

People at risk of income poverty after social transfers

The number of people at risk of income poverty after social transfers has been growing since 2005. This increase has intensified since 2010.

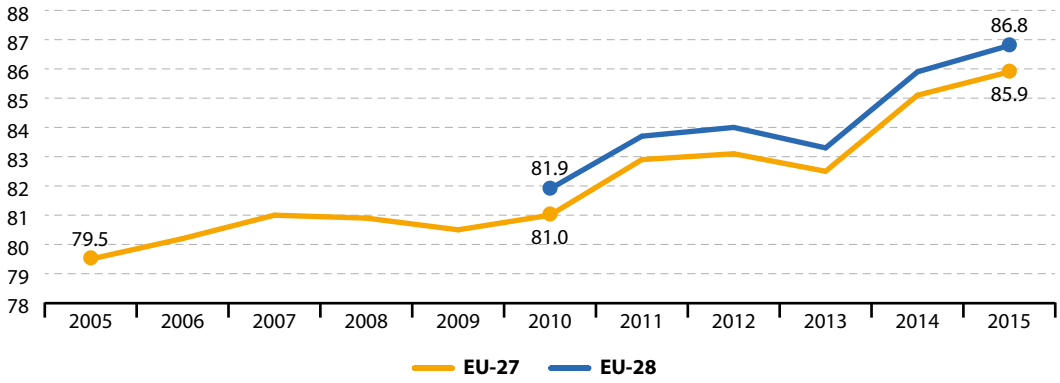


People at risk of poverty have an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income (after social transfers). Data presented in this section stem from the EU Statistics on Income and Living Conditions (EU-SILC).

In 2015, 86.8 million people or 17.3 % of the EU population had an equivalised disposable income below the national poverty threshold. This represents an increase compared with 2010, when 81.9 million people fell below this line. It is important to note that the at-risk-of-poverty rate is a relative measure of poverty. Relative poverty occurs when someone's standard of living and income are much worse than the general standard in the country or region they live in. They may struggle to live a normal life and to participate in ordinary economic,

([9]) The dimension 'very low work intensity' is only measured among those aged 0–59. Therefore, people over the age of 59 are considered at risk of poverty or social exclusion only if the criteria of one of the two dimensions 'income poverty' or 'severe material deprivation' are met.

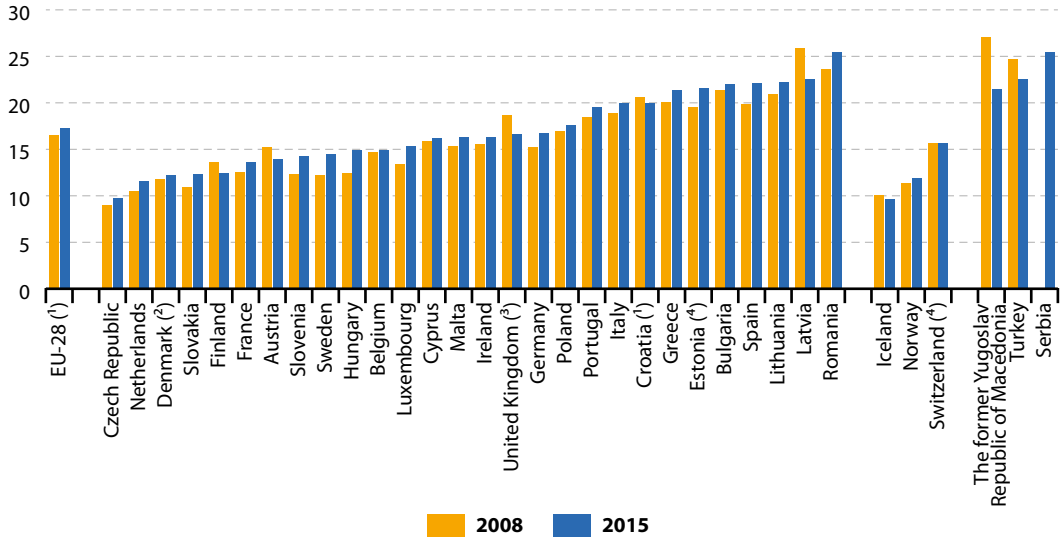
Figure 1.3: People at risk of income poverty after social transfers, EU-27 and EU-28, 2005–2015
(million people)



Note: 2005 and 2006 data are estimates.
Source: Eurostat (online data code: sdg_01_20)

The European Commission is working towards a European pillar of social rights ([10]), which will enable upwards convergence as regards social and labour market performances, thereby contributing to reducing poverty and inequalities.

Figure 1.4: People at risk of income poverty after social transfers, by country, 2008 and 2015
(% of population)



(1) 2010 data (instead of 2008).
(2) Break in time series in 2011.
(3) Break in time series in 2012.
(4) Break in time series in 2014.
Source: Eurostat (online data code: sdg_01_20)

([10]) European Commission, *Establishing a European Pillar of Social Rights*, COM(2017) 250 final, Brussels, 2017.

social and cultural activities. Relative poverty varies greatly between Member States. The threshold also varies over time and in a number of Member States it has fallen in recent years in the aftermath of the financial and economic crisis.

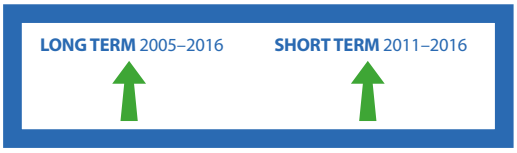
Compared with the main economies worldwide, the share of people suffering from income poverty in the EU was low (17.3 %), despite increases since 2005. In most non-EU OECD countries, this value was roughly between 20 % and 25 %. Commonwealth countries in the OECD outside the EU as well as Asian OECD countries including Russia were at the bottom end of this range, with 19.1 % in Korea, 19.3 % in Canada, 19.6 % in New Zealand, and 20.5 % in Australia as well as 21.9 % in Japan and Russia. Income poverty was even more prevalent in the Latin American OECD countries Chile (23.3 %) and Mexico (23.7 %) as well as the United States (23.6 %), Turkey (25.1 %) and Israel (25.8 %) ([11]).

The share of people at risk of income poverty varied moderately across the EU, ranging from 9.7 % to 25.4 % in 2015. Between 2008 and 2015, most countries experienced growth in the number of people below the income poverty line, regardless of whether they had low or high levels to begin with.

To reduce the risk of poverty or social exclusion within their populations, governments provide social security in the form of social transfers, such as unemployment benefits and sickness and invalidity benefits, among others. The effectiveness of monetary social provision can be assessed by comparing the at-risk-of-poverty rate before and after social transfers ([12]). In the EU, social transfers reduced the share of people at risk of poverty by 8.8 percentage points in 2015, from 26.1 % to 17.3 %. However, the extent to which Member States were able to reduce this rate through social transfers varied between 19.9 and 3.9 percentage points.

Severely materially deprived people

The number of people affected by severe material deprivation has fallen over the long term as well as the short term.

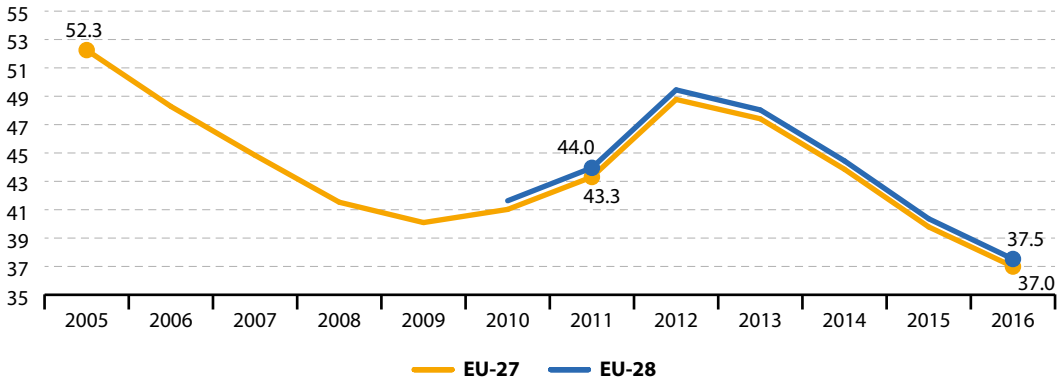


Severely materially deprived people have living conditions that are severely constrained by a lack of resources and cannot afford at least four out of these nine deprivation items: i) to pay rent or utility bills, ii) to keep their home adequately warm, iii) face unexpected expenses, iv) to eat meat, fish or a protein equivalent every second day, v) a week-long holiday away from home, vi) a car, vii) a washing machine, viii) a colour TV, or ix) a telephone. Data presented in this section stem from the EU Statistics on Income and Living Conditions (EU-SILC).

In 2016, 37.5 million people in the EU, or 7.5 % of the total EU population, were living in conditions severely constrained by a lack of resources. It is worth noting that out of the three sub-indicators making up the 'risk of poverty or social exclusion' indicator presented above, severe material deprivation has shown the strongest fluctuations over time, with a decline of almost 12 million people over the past four years. It has thus been the main driver behind the recent overall reduction in people at risk of poverty or social exclusion in the EU.

([11]) These values are taken from the OECD dataset on Income Distribution and Poverty and correspond to the newest data available in this set (2014: Australia, Canada, New Zealand, 2015: Israel, Korea, Mexico, Turkey, 2015: Chile and the United States, 2012: Japan, 2011: Russia). All data except for that of Russia is based on the OECD's new income definition, which includes the value of goods produced for own consumption as a component of self-employed income, an element not considered in the EU SILC income definition.
([12]) Pensions, such as old-age and survivors' (widows' and widowers') benefits, are counted as income (before social transfers) and not as social transfers.

Figure 1.5: Severely materially deprived people, EU-27 and EU-28, 2005–2016
(million people)

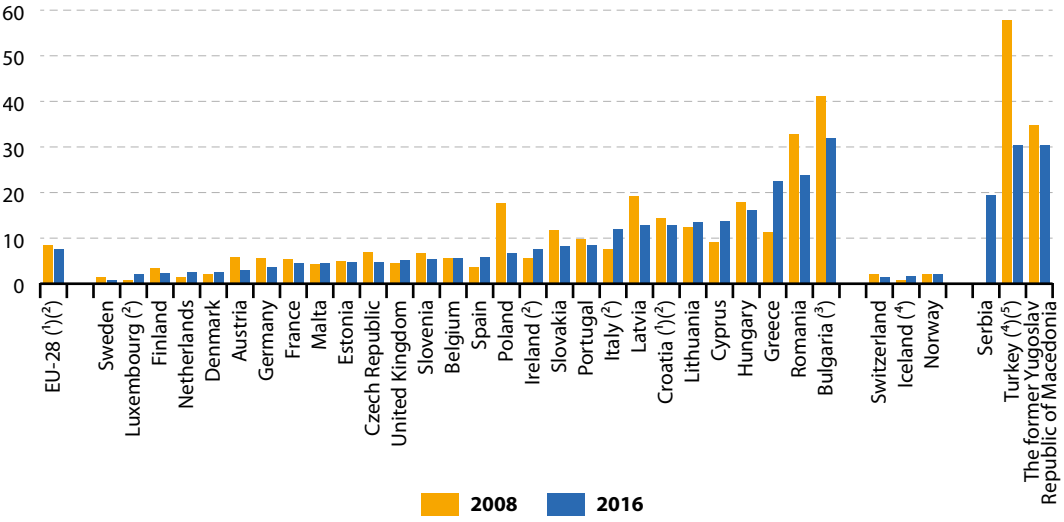


Note: 2005, 2006, 2009 and 2016 data are estimates.

Source: Eurostat (online data code: sdg_01_30)

The European Social Fund (ESF) ([13]) is Europe's main tool for promoting employment and social inclusion — helping people to get a job (or a better job), integrating disadvantaged people into society and ensuring fairer life opportunities for all.

Figure 1.6: Severely materially deprived people, by country, 2008 and 2016
(% of population)



(1) 2010 data (instead of 2008).
(2) 2016 data are provisional and/or estimates.
(3) Break in time series in 2016.
(4) 2015 data (instead of 2016).
(5) Break in time series in 2013.

Source: Eurostat (online data code: sdg_01_30)

([13]) Regulation (EU) No 1304/2013 of the European Parliament and of the Council of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006.

The share of the population suffering from severe material deprivation varied considerably across EU countries, ranging from less than 1 % to 31.9 %. A comparison with the at-risk-of-poverty rate (see previous section) reveals that in a few Member States the share of people living in poor conditions was much higher than the prevalence of income poverty. This shows that the structure of poverty is different across the Member States. For example, in Bulgaria the proportion of people living in severely deprived conditions was about 1.4 times as high as the share living in income poverty. In contrast, in a few countries with higher living standards, such as Spain, Sweden, Estonia and Luxembourg, the income poverty rate clearly exceeded the rate of people suffering from severe material deprivation.

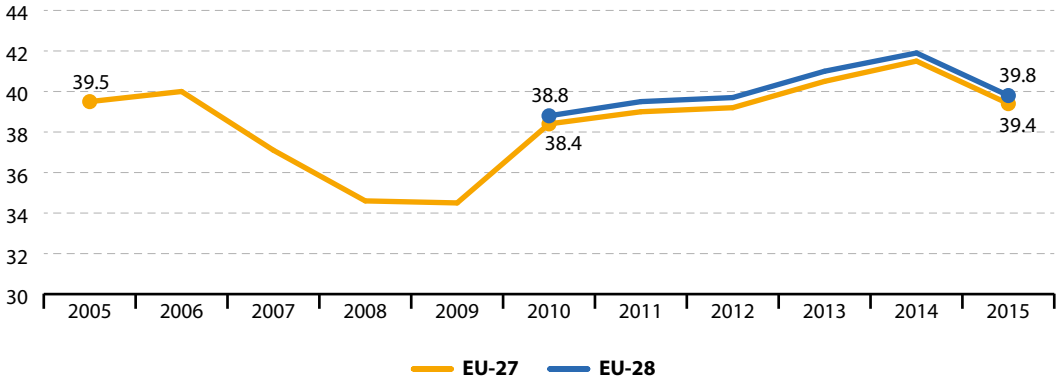
People living in households with very low work intensity

The number of people affected by very low work intensity in the EU-27 has slightly decreased over the long term since 2005. However, a small increase was recorded over the short term due to the economic crisis.

In 2015, 10.7 % (or 39.8 million) of the EU population aged 0 to 59 were living in households with very low work intensity. This means the working-age members of the household worked no longer than 20 % of their potential working time during the previous year. Data presented in this section stem from the EU Statistics on Income and Living Conditions (EU-SILC).

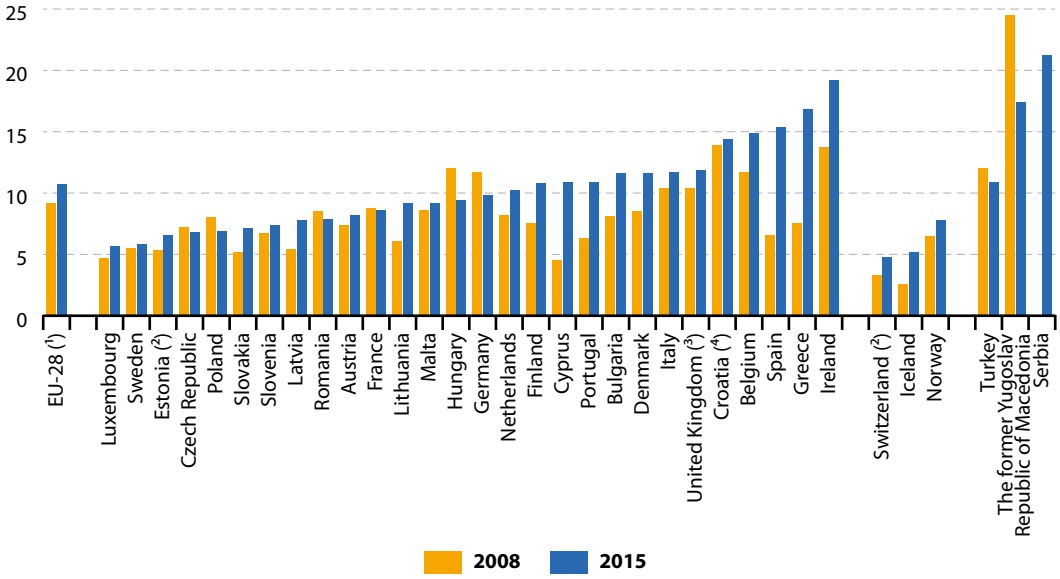
Even though the share of the population aged 0 to 59 who were living in households with very low work intensity increased by only 1.5 percentage points across the EU between 2008 and 2015, the

Figure 1.7: People living in households with very low work intensity, EU-27 and EU-28, 2005–2015
(million people aged less than 60)



Note: 2005 and 2006 data are estimates.
Source: Eurostat (online data code: sdg_01_40)

Figure 1.8: People living in households with very low work intensity, by country, 2008 and 2015
(% of population aged less than 60)



(1) 2008 data refer to EU-27 (instead of EU-28).
(2) Break in time series in 2014.
(3) Break in time series in 2012.
(4) 2010 data (instead of 2008).

Source: Eurostat (online data code: sdg_01_40)

share changed considerably in some Member States, as shown in Figure 1.8.

The incidence of very low work intensity varied across the EU in 2015, ranging from 5.7 % to 19.2 %. In some countries, low work intensity levels do not seem to correspond to the extent of the other forms of poverty or social exclusion. Belgium, the United Kingdom and Denmark, for example, had a higher-than-average proportion of households with very low work intensity (14.9 %, 11.9 % and 11.6 % respectively), despite their risk of income poverty and severe material deprivation being below the EU average. In contrast, Latvia and Romania were among the Member States with the highest proportion of their population at risk of income poverty in 2015 while having some of the lowest shares of households with very low work intensity (7.8 % and 7.9 %, respectively) ([14]).

([14]) This can be the case for a number of reasons, such as a high amount of social transfers in one country or a generally low income level in another.

Housing cost overburden rate

The percentage of the EU population spending more than 40 % of income on housing has increased since 2010.

LONG TERM	SHORT TERM 2010–2015
X	↓
INSUFFICIENT DATA TO CALCULATE TREND	

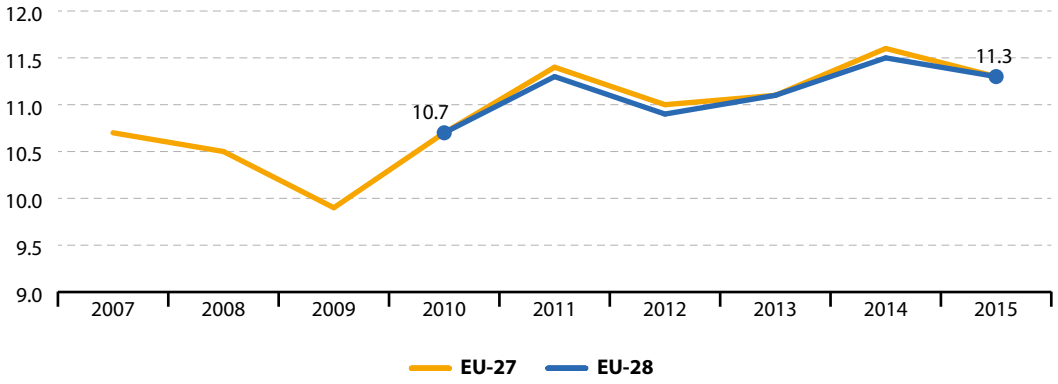
Housing affordability is measured by the housing cost overburden rate, which shows the share of population living in households that spend 40 % or more of the household disposable income on housing. Housing costs include rental or mortgage interest payments but also the cost of utilities such as water, electricity, gas or heating. The data presented in this section stem from the EU Statistics on Income and Living Conditions (EU-SILC).

The proportion of the population whose housing costs exceeded 40 % of their equivalised disposable income was highest for tenants with market price rents (27.0 %) and lowest for people in owner-occupied dwellings with a mortgage or a loan (6.7 %).

People living below the poverty threshold (with an income below 60 % of the median equivalised income) were more than seven times more likely to suffer from housing cost overburden. Some 39.2 % of poor people spent more than 40 % of their disposable income on housing, compared to 5.4 % of people above the poverty threshold.

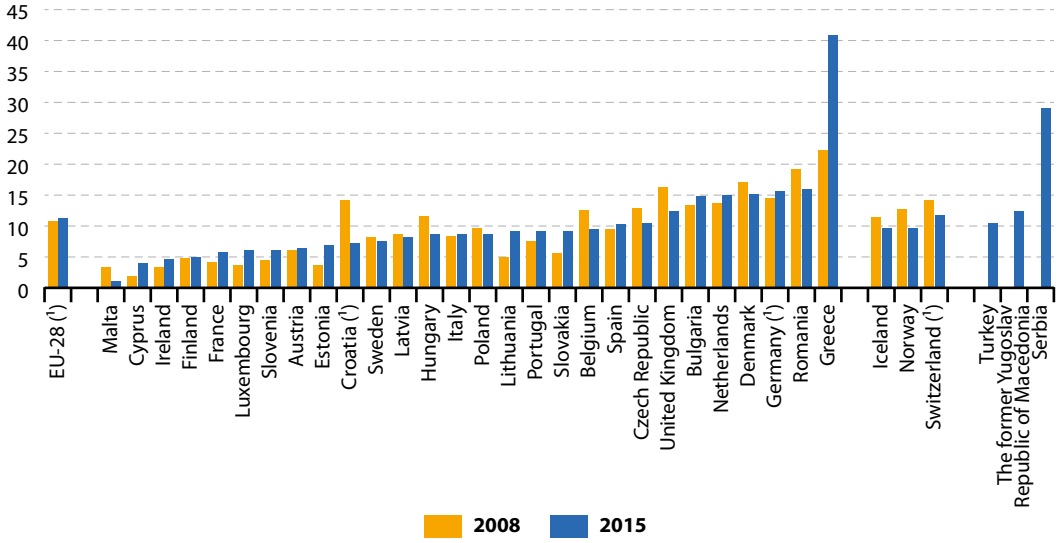
Housing cost overburden rates varied considerably across the EU in 2015, mainly due to the exceptionally high rate for Greece (40.9 %). The average national figures shown in Figure 1.10, however, mask considerable in-country variations between people who are at risk of poverty and those who are not. In Malta, the total housing cost overburden rate was 1.1 %, whereas the rate for poor people was only 3.5 percentage points higher. In Cyprus, the difference amounted to 9.2 percentage points. All other countries showed differences above 10 percentage points. In Denmark, Germany and the Netherlands, total housing cost overburden ranged around 15 %, whereas more than 50 % of poor people were affected by housing cost overburden. In Greece, 95.8 % of poor people faced housing cost overburden in 2015.

Figure 1.9: Housing cost overburden rate, EU-27 and EU-28, 2007–2015
(% of population)



Note: 2007–2009 data are estimates.
Source: Eurostat (online data code: sdg_01_50)

Figure 1.10: Housing cost overburden rate, by country, 2008 and 2015
(% of population)

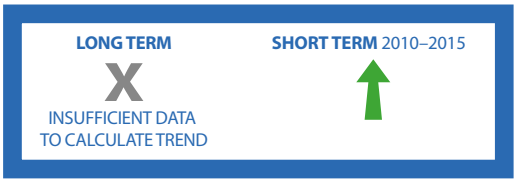


(1) 2010 data (instead of 2008).

Source: Eurostat (online data code: sdg_01_50)

Population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor

The share of EU population experiencing basic deficiencies in their housing conditions has declined since 2010.

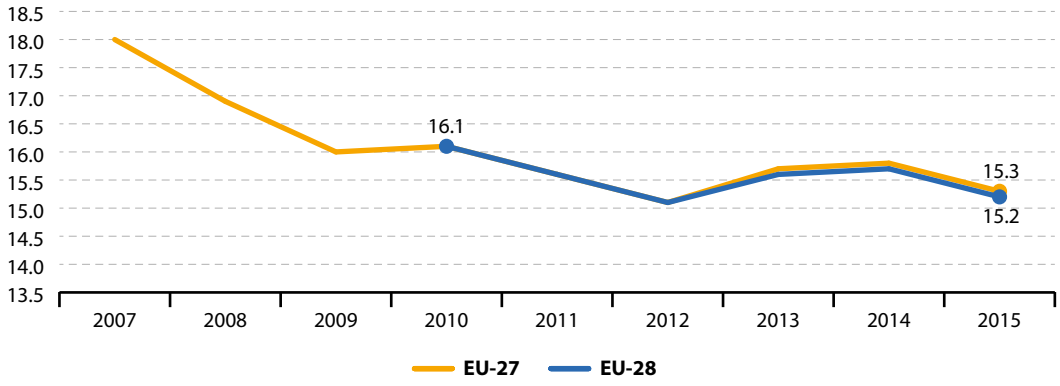


The indicator captures the share of the population experiencing at least one of the following basic deficits in their housing condition: a leaking roof, damp walls, floors or foundation, or rot in window frames or floor. The data presented in this section stem from the EU Statistics on Income and Living Conditions (EU-SILC).

In 2015, almost one in seven Europeans (15.2 %) experienced at least one of the housing deficiencies covered by this indicator. This was 0.9 percentage points lower than the share of the population reporting such deficiency in living conditions in 2010. At the EU level, the problem of 'leaking roof or damp walls, floors or foundation, or rot in window frames or floor' largely exceeded other forms of housing deprivation measured under the housing dimension in EU-SILC such as 'darkness of the dwelling' (5.5 %) or lack of basic sanitary facilities (lack of a bath or shower and indoor flushing toilet) (2.4 %) ([15]).

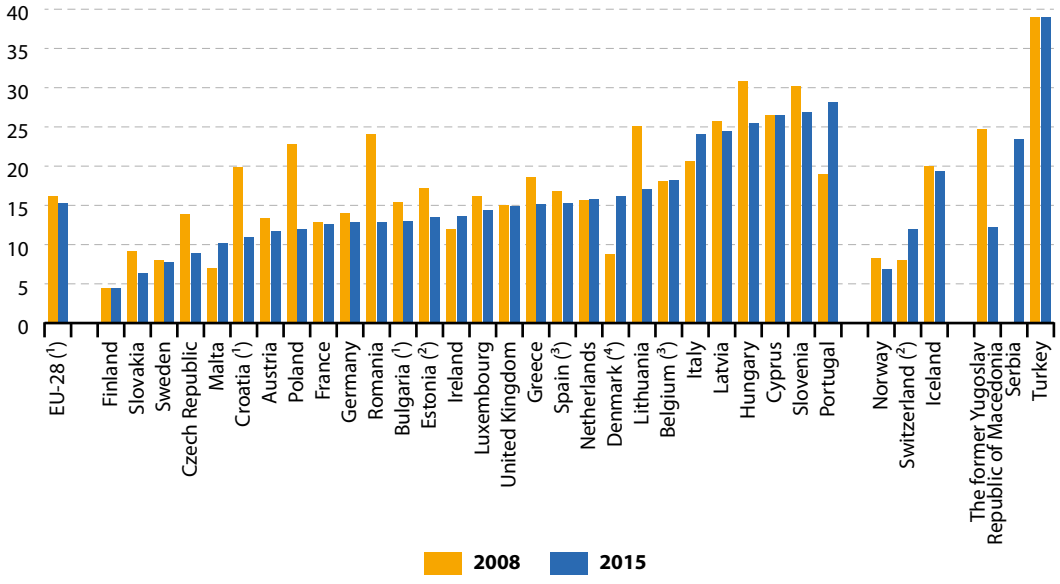
([15]) Eurostat, *Statistics Explained, Housing conditions* (Data extracted in February 2017).

Figure 1.11: Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor, EU-28 and EU-27, 2007–2015
(% of population)



Source: Eurostat (online data code: sdg_01_60)

Figure 1.12: Population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor, by country, 2008 and 2015
(% of population)



(1) 2010 data (instead of 2008).
(2) Break in time series in 2014.
(3) Break in time series in 2009.
(4) Break in time series in 2011.

Source: Eurostat (online data code: sdg_01_60)

Those at risk of income poverty tended to be more exposed to housing deficiencies, with the incidence of low housing quality being almost two times higher among people living below the poverty threshold (with an income below 60 % of median equivalised income), at 24.0 %, compared to 13.4 % for people above the poverty threshold. Looking at different household types, poor housing conditions were especially pronounced among single women with dependent children (23.1 %) and three or more adults with dependent children (19.1 %). These population groups also faced some of the highest risk of poverty or social exclusion and thus tended to suffer from cumulative disadvantages.

The occurrence of housing deficiencies according to the reasons analysed here varies considerably between Member States, ranging from 4.4 % to 28.1 % of the population in 2015. Some southern and eastern European countries with relatively high poverty levels reported the highest incidence of housing deficiencies in 2015. Portugal led the ranking, with one in four Portuguese households suffering from housing deficiencies, compared to only one in 25 Finnish households.

Progress has been most remarkable in Romania, which managed to almost halve the share of households affected by basic housing deficiencies compared to 2008 levels. In contrast, several Member States with relatively low poverty levels (see people at risk of poverty or social exclusion above) experienced increases in their housing deprivation rate in the same period.

Further reading on poverty

European Commission (2017), *Employment and Social Developments in Europe, Annual Review 2017*, Luxembourg: Publications Office of the European Union.

European Commission (2016), *European Semester Thematic Factsheet, Social Inclusion*.

European Union (2016), *Social Protection Committee, Annual Report 2016*, Luxembourg: Publications Office of the European Union.

European Union (2017), *Monitoring social inclusion in Europe, 2017 edition*, Luxembourg: Publications Office of the European Union.

United Nations (2017), *The Sustainable Development Goals Report*, New York: United Nations Publications.

2 End hunger, achieve food security and improved nutrition and promote sustainable agriculture

The global perspective on SDG 2

One in nine people around the world today (795 million) are undernourished. SDG 2 seeks to end hunger and malnutrition and ensure access to enough safe and nutritious food. For this to occur the agricultural productivity and incomes of small-scale food producers will need to double. Sustainable and resilient food production systems are a key factor in achieving this goal. Implementing sustainable agricultural practices that protect biodiversity and genetic resources can help ensure future food security in the face of increasing demand and a changing climate. This will require increased investment in rural infrastructure as well as research and development in agriculture, food and nutrition. However, even with increased agricultural production, for many people food security and improved nutrition will remain elusive if price and information distortions in world markets persist. Policy makers have a role to play here in promoting sustainable production systems, ensuring food commodity markets function properly and market information remains accessible ([1]).

eurostat supports the SDGs

The EU has largely overcome problems of hunger, although new challenges related to nutrition are emerging, such as rising obesity. However, the EU can contribute to SDG 2 by ensuring the long-term productivity of its agricultural sector and reducing the negative environmental impacts of food production. Monitoring SDG 2 'zero hunger' in an EU context therefore focuses on the sub-themes 'malnutrition', 'sustainable agricultural production' and 'adverse impacts of agricultural production'. As shown in Table 2.1, the EU's progress in these areas has been rather mixed.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets: '*Why it matters*' and World Bank Group (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 2.1: Indicators measuring progress in SDG 2, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Malnutrition			
Obesity rate	:	:	p. 51
Sustainable agricultural production			
Agricultural factor income per annual work unit (AWU)	↑ (1)	↘	p. 53
Government support to agricultural research and development	:	↘	p. 55
Area under organic farming	↑ (3)	↑	p. 57
Gross nitrogen balance on agricultural land	:	↗	p. 59
Adverse impacts of agricultural production			
Ammonia emissions from agriculture	↗	↘	p. 61
Nitrate in groundwater (*)	↑ (2)(4)	↑ (4)	SDG 6, p. 137
Farmland bird index (*)	↓	↓	SDG 15, see Common Bird Index, p. 309
Estimated soil erosion by water (*)	↑ (2)	:	SDG 15, p. 307

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Past 11-year period.
(2) Past 12-year period.
(3) Past 10-year period.
(4) Trend for European aggregate referring to the EEA member countries; trend in relation to the maximum concentration of 50 mg/L of nitrate in groundwater that is used for drinking water specified by the Drinking Water Directive.

Zero hunger in the EU: overview and key trends

Food security and the eradication of hunger are central aspects of SDG 2. While food security, in terms of sufficiency and supply, may not be a major concern for Europe, within some Member States there are still issues regarding availability and access to food, particularly for low-income groups. Malnutrition problems in Europe can result from diets that are too low in calories and also ones that are highly caloric but nutritionally deficient. Addressing malnutrition is not only a matter of access to nutritious food, but also involves behaviour change in consumer preferences. On a global level, Europe is a major economy and producer of agricultural goods, which plays an important role in food security. Furthermore, it is an active worldwide player through international trade and development aid. Europe's role in contributing to the achievement of SDG 2 depends on improving the long-term productivity and sustainability of agriculture in the EU and reducing the negative impacts of the sector on the environment. This chapter, therefore, focuses both on the nutritional aspects of food security and efforts to reduce agriculture's negative environmental impacts.

Malnutrition

Obesity is a malnutrition problem that is on the rise across Europe and the world. In the age of globalisation and mechanisation, consumption habits have changed. Supporting a balanced nutritional diet with an adequately active lifestyle is a challenge for many. The causes of obesity vary between people, however, the problem is attributed to poor diet from fatty foods, lifestyle choices characterised by low physical activity and high caloric consumption, as well as sociological and hereditary factors. Obesity affected 15.9 % of Europeans over the age of 18 in 2014 and is on the rise in many Member States. Higher levels of obesity particularly affect older people and individuals with lower levels of education. Chronic diseases (cardiovascular, diabetes, cancers) linked to poor diet continue to negatively affect quality of life, strain public health systems and reduce economic productivity ([2]).

Sustainable agricultural production

To contribute to achieving SDG 2, Europe's agricultural sector must provide a stable food supply produced in a sustainable way at affordable prices for more than 500 million Europeans and the international market. Sustainable farming methods are key for long-term productivity and resilience in the face of changing climatic conditions and increasing demand. The challenge is maintaining and improving already high levels of productivity without jeopardising environmental factors such as air, water, soil quality and biodiversity.

Increasing the **area under organic farming** can have a positive impact on agricultural sustainability. Organic farming avoids or reduces the use of synthetic fertilisers, pesticides, genetically modified organisms, antibiotics and growth hormones in agricultural and livestock production. As a result, it promotes soil health and biodiversity and uses less energy than conventional farming but is also associated with lower productivity levels. The area under organic farming has increased in the EU. Since 2010, the percentage of agricultural land farmed using organic production methods has risen by 19 %, reaching 6.2 % in 2015.

The **gross nitrogen balance on agricultural land** gives information about the environmental impacts of nutrient use and management on farms. While low nitrogen levels may indicate poor soil fertility, persistently high levels can

([2]) Devaux, M, and F. Sassi (2015), *The Labour Market Impacts of Obesity, Smoking, Alcohol Use and Related Chronic Diseases*, OECD Health Working Paper No. 86.

cause nitrate leaching (water pollution), ammonia emissions and ecosystem disruptions (see next section on adverse impacts of agricultural production). The gross nitrogen balance in the EU had been falling steadily until 2010 but has since stagnated and remains high at 51 kilograms per hectare (kg/ha). Most of the nitrogen surplus, some 80 %, results from mineral fertilisers and manure.

Investments in agricultural R&D and innovation allow farmers to meet growing demand and maintain market competitiveness. R&D and innovation can find ways to increase productivity and produce more nutritious foods or produce it in a more environmentally friendly way. EU policies can encourage the uptake of new, more sustainable methods. R&D and innovation programmes are targeted at projects that aim to help transform and 'future-proof' European food systems to make healthy and sustainable food accessible for all. Despite a robust policy framework for funding at European level, **government support to agricultural R&D** in Member States has stagnated around EUR 3 billion annually, with a gradual decline since 2011. The amount of government support given to agriculture is dependent on Member States' national resources and funding priorities.

Economic viability of farms is another vital part of productive and sustainable food systems. The **agricultural factor income per annual work unit (AWU)** is an indicator of labour productivity, which is the value generated by units engaged in agricultural production activity per labour input measure. In the agricultural accounts, this indicator has historically been computed as an index. It has increased over the past decade in the EU, but flattened off in the past five years.

Adverse impacts of agricultural production

Agriculture provides environmental benefits such as maintaining specific farmland ecosystems and diverse landscapes. However, considerable increases in agricultural productivity in Europe since 1950 has also magnified its harmful environmental impacts. Several indicators on the adverse impacts of agriculture can help determine the overall sustainability of agricultural production.

Farmland bird populations is an important indicator of the adverse impacts agriculture has on the environment, specifically biodiversity. Farmland bird populations have been on the decline since 1990 in most Member States, decreasing by more than 30 % across the EU. This downward trend stabilised for endangered species through conservation measures adopted under the EU Birds Directive, however, this has not stopped overall declines in farmland bird species.

Fertiliser surplus from agriculture can reduce groundwater quality by causing eutrophication. The level of **nitrates in groundwater** is therefore an important marker of the impact of agricultural practices on groundwater and water quality. The overall average for nitrate concentrations at the EU level are within the limits defined by the Nitrates and Drinking Water Directive and most Member States have reduced nitrate levels in groundwater in both the short and the long terms. Despite the overall decline, nitrate concentrations vary and pollution hotspots persist because of differences in agricultural systems between and within countries, as shown by reporting under the Nitrates Directive. Therefore, the overall trend does not reflect the fact that nitrate concentrations might still pose serious problems at regional or local level ([3]). This variability in gross nutrient

([3]) More specific information on nitrates from agriculture can be found in the four-yearly *Reports from the Commission to the Council and the European Parliament on the implementation of Council Directive 91/676/EEC (the Nitrates Directive) concerning the protection of waters against pollution caused by nitrates from agricultural sources*.

balances in groundwater between Member States can be seen through legislative enforcement, with some states brought before the European Court of Justice to address these failings, such as with France in 2014 ([4]) and more recently Germany in 2016 ([5]).

Livestock manure and fertiliser application are the main sources of **ammonia emissions**. When released into the atmosphere, ammonia pollutes the air and can cause environmental damage mainly through acidification and eutrophication. The agricultural sector accounts for 94 % of total ammonia emissions in the EU ([6]). In comparison to 1990, European countries have reduced the amount of ammonia emissions from agriculture by reducing livestock density, changing agricultural management practices and decreasing nitrogen fertiliser use. Similar to nitrate concentrations, however, livestock densities and fertiliser application can be very high regionally or locally, but be levelled out by the national average and the EU average. Between 2010 and 2013, ammonia emissions levelled off at around 3.6 million tonnes per year. Since 2012, ammonia emissions have risen slightly, increasing by 1.9 % between 2014 and 2015. Increased ammonia emissions are likely to stem from increased agricultural production and productivity. However, the relative contribution in terms of nitrate pollution from livestock manure, mineral fertilisers and other sources of pollution varies among and within Member States, depending on a variety of factors, including the type and intensity of farming activities, soil conditions and others.

The estimated rate of loss of organic matter and nutrient content by water, or **soil erosion by water**, provides insights on the impact of current agricultural production and the future productivity of the soil. In the EU, the total land area estimated as under severe erosion by water has fallen considerably since 2000 due to the introduction of mandatory cross-compliance for Common Agricultural Policy (CAP) payments. In 2012, severe soil erosion was estimated to affect slightly more than 5 % of the land area.

([4]) European Commission (2014), *Judgment of the Court (Second Chamber) 4 September 2014*, Info-Curia—Case-law of the Court of Justice.
([5]) European Commission (2016), *Water: Commission refers GERMANY to the Court of Justice of the EU over water pollution caused by nitrates*, European Commission Press Release Database.
([6]) Eurostat, Statistics Explained, (2016), *Ammonia emission statistics*.

Zero hunger in the EU

Malnutrition

Obesity rate in 2014
15.9 % of population aged 18 or over

Sustainable agricultural production

Agricultural factor income in 2016
109.1 Index 2010 = 100
- 0.8 index points since 2011

Government support to agricultural R&D in 2016
3 263 million EUR
- 2.3 % since 2011

Organic farming in 2015
6.2 % of utilised agricultural area
+ 1.0 pp since 2010 (1)

Gross nitrogen balance in 2013
51 kg per hectare
- 3.8 % since 2008

Adverse impacts of agriculture production

Ammonia emissions from agriculture in 2015
3.8 million tonnes
+ 3.1 % since 2010

Nitrate in groundwater in 2012
19.1 mg NO_3 per litre
- 6.4 % since 2007

Farmland bird index (2) in 2014
68.5 Index 1990 = 100
- 4.8 index points since 2009

Soil erosion by water in 2012
5.2 % of total non-artifical erosive area
- 0.8 pp since 2000

(1) 2010 data refer to EU-27.
(2) The EU aggregate changes depending on countries joining the Pan-European Common Birds Monitoring Scheme.

Source: Eurostat (online data codes: sdg_02_10, sdg_02_20, sdg_02_30, sdg_02_40, sdg_02_50, sdg_02_60, sdg_06_40, sdg_15_60 and sdg_15_50)

Obesity rate

Obesity affected 15.9 % of Europeans over the age of 18 in 2014, with a further 35.7 % being pre-obese. Combined, these groups indicate that more than half of European adults were overweight in 2014.

X INSUFFICIENT DATA TO CALCULATE TREND

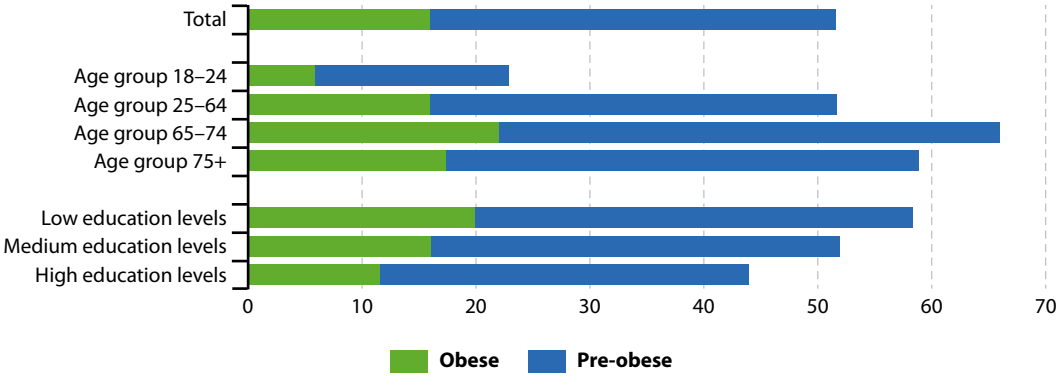
The obesity indicator is based on the body mass index (BMI), which is defined as the weight in kilos divided by the square of the height in metres. People aged 18 years or over are considered obese with a BMI equal to or greater than 30. Other categories are: underweight (BMI less than 18.5), normal weight (BMI between 18.5 and less than 25) and pre-obese (BMI between 25 and less than 30). The category overweight (BMI equal or greater than 25) combines the two categories pre-obese and obese. The data presented in this section stem from the European Health Interview Survey (EHIS), which consists of four modules on health status, health determinants, health care and background variables.

Some factors such as age and education seem to affect the prevalence of obesity in a population, while other factors such as gender are less determinant. The prevalence of obesity generally increases with age, with the exception of the oldest population aged 75 or over, which shows a decrease from the most obese age bracket of 65 to 74 years of age. In 2014, 22 % of people aged 65 to 74 year old were obese, compared to 5.8 % of people aged 18 to 24, 15.9 % aged 25 to 64 and 17.3 % for those 75 or over. Obesity among older adults can be attributed to increased inactivity, poor nutritional habits and basal metabolism, and nutritional need reduction.

On the EU level, there is negligible difference in obesity levels between men and women. However, this average masks gender differences in some Member States, with some countries having a higher percentage of obese men (such as Ireland, Cyprus, Slovenia, Croatia and Malta) and other countries having a higher percentage of obese women (such as Lithuania, Latvia and the Netherlands).

A low level of educational attainment appears to correlate with a higher rate of obesity. The prevalence of obesity was highest (19.9 %) in the lowest levels of educational attainment and lowest (11.5 %) in the highest levels of educational

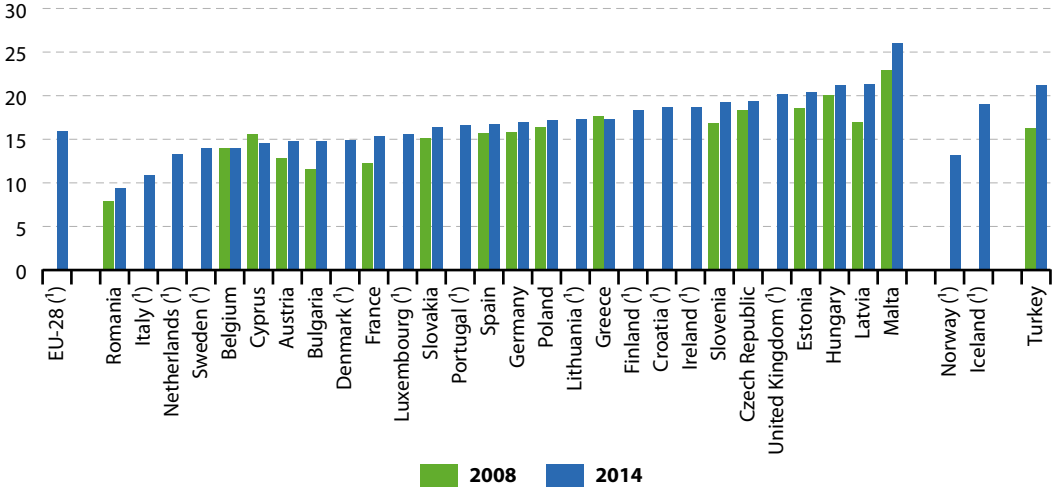
Figure 2.1: Obesity rate by body mass index (BMI), by age group and educational attainment, EU-28, 2014
(% of population aged 18 or over)



Note: the educational attainment levels used in the graph refer to the following ISCED 2011 levels: 'low' = Less than primary, primary and lower secondary education (levels 0–2); 'medium' = Upper secondary and post-secondary non-tertiary education (levels 3 and 4); 'high' = Tertiary education (levels 5–8).

Source: Eurostat (online data code: sdg_02_10)

Figure 2.2: Obesity rate by body mass index (BMI), by country, 2008 and 2014
(% of population aged 18 or over)



(1) No data for 2008.

Source: Eurostat (online data code: sdg_02_10)

EU food policy includes nutrition initiatives and work with Member States on the EU Action Plan on Childhood Obesity 2014–2020, on food reformulation (the EU Framework for National Salt Initiatives (7) and the EU Framework for National Initiatives on Selected Nutrients (8)) or on public procurement of food for health in school settings (9).

attainment. Because lower levels of education correlate with poverty and societal disadvantage, it is clear that obesity disproportionately affects disadvantaged communities (10).

Of particular concern is the percentage of pre-obese people, which is at least twice as high as the obesity rate in all age brackets. Pre-obesity affects 17.1 % of individuals aged 18 to 24, 35.8 % of individuals aged 25 to 64, 44.0 % of individuals aged 65 to 74 and 41.6 % of individuals aged over 75. The cumulative number of obese and pre-obese individuals indicates a European-wide health and weight problem.

While Europe's obesity rate is lower than the United States, Mexico and Australia, some EU countries have seen a rapid growth in levels, such as the United Kingdom with 20.1 % of its population affected (11). Compared to non-western countries such as Japan and Korea where obesity rates are much lower, at 3.5 % and 4.1 % respectively, the rate in Europe is concerning (12).

Across Member States, the proportion of obese individuals aged 18 or older ranged from slightly below 10 % (Romania) to over 26 % (Malta) in 2014. Although data for 2008 are only available for a few countries, in most cases these point to a general trend towards increasing obesity in the EU.

(7) European Commission (2009), *EU Framework for National Salt Initiatives*.
(8) European Commission (2011), *EU Framework for National Initiatives on Selected Nutrients*.
(9) European Commission and Maltese Presidency (2017), *Public Procurement of Food for Health: Technical report on the school setting*.
(10) OECD (2011), *Exploring the relationship between education and obesity*, p. 122.
(11) OECD (2014), *Obesity Update*, p. 1.
(12) OECD (2010), *Obesity and the Economics of Prevention: Fit not Fat*, Country Key Findings.

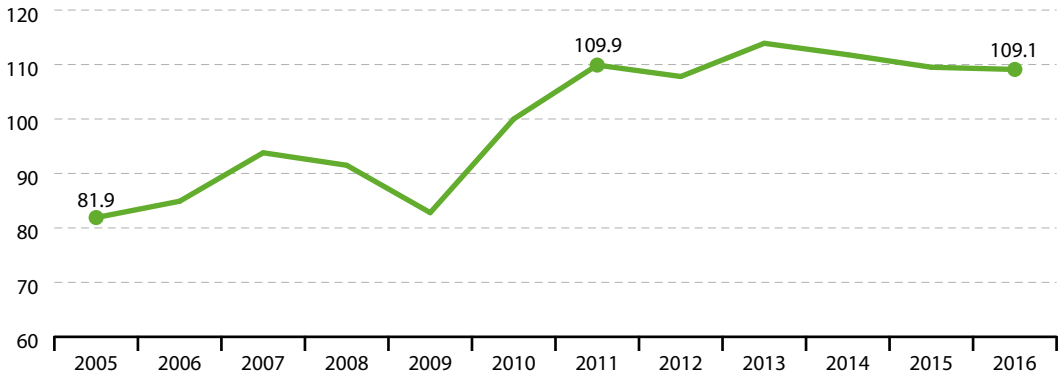
Agricultural factor income per annual work unit

The agricultural factor income per annual work unit (AWU) rose between 2005 and 2011, but has stagnated since then.

Agricultural factor income per annual work unit (AWU) is an important measure of the productivity of the agricultural sector. The data stem from the Economic Accounts for Agriculture (EAA), which provide detailed information on income in the agricultural sector. The EAA are satellite accounts of the European System of Accounts (ESA2010) ([13]) providing complementary information and concepts adapted to the particular nature of the agricultural industry. Annual work units (AWUs) are defined as full-time equivalent employment (corresponding to the number of full-time equivalent jobs), which is calculated by dividing total hours worked by the average annual number of hours worked in full-time jobs within the economic territory. A distinction is drawn between non-salaried and salaried AWUs, which together make up total AWUs. Agricultural factor income represents income generated by farming ([14]) which is used to remunerate borrowed or rented factors of production (capital, wages and land rents) as well as own production factors (own labour, capital and land). The agriculture factor income presented in this section corresponds to the deflated (real) net value added at factor cost of agriculture. The implicit price index of GDP is used as the deflator.

As indicated in Figure 2.3, real factor income per AWU has remained relatively unchanged between 2011 and 2016. Real factor income per AWU dropped most substantially in 2009, by 8.7 percentage points, due to the financial crisis and changes in commodity markets. Increases in real factor income occurred in 2007 and most substantially in 2010 and 2011 when commodity

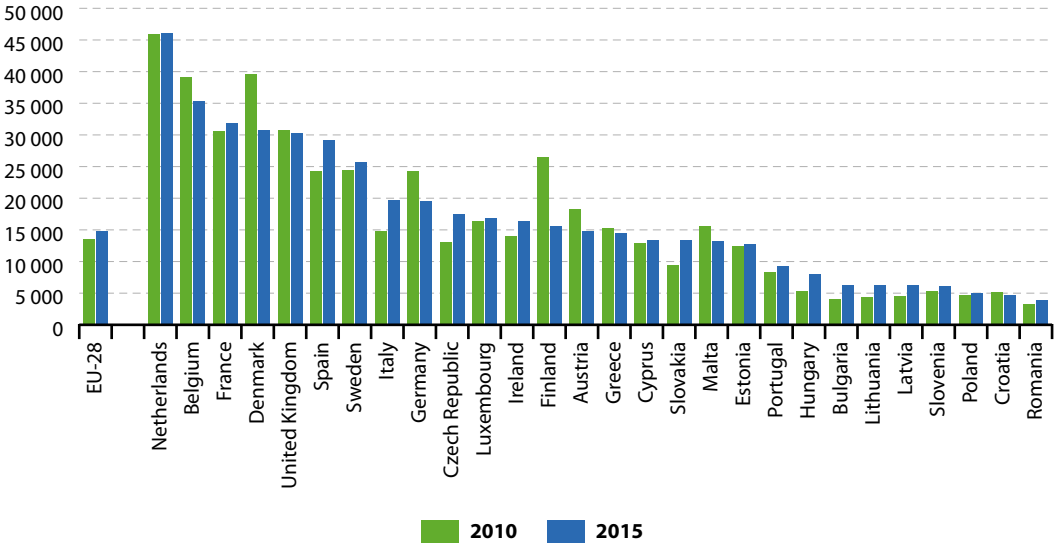
Figure 2.3: Agricultural factor income per annual work unit (AWU), EU-28, 2005–2016
(index 2010=100)



Note: 2009 and 2010 data are provisional, 2016 data are estimates.
Source: Eurostat (online data code: sdg_02_20)

([13]) See Eurostat, Statistics Explained (2016), *European system of national and regional accounts — ESA 2010*.
([14]) Agricultural factor income must not be confused with the total income of individuals or farming households.

Figure 2.4: Agricultural factor income per annual work unit (AWU), by country, 2010 and 2015
(chain linked volumes (2010) in EUR)



Source: Calculations made by the Directorate-General for Agriculture and Rural Development based on Eurostat data (Eurostat online data code: sdg_02_20)

One of the five general objectives of the Common Agricultural Policy (CAP) is to ensure a fair standard of living for farmers. The CAP is financed by two funds: the European Agricultural Guarantee Fund (EAGF), which finances direct payments to farmers as well as market measures, and the European Agricultural Fund for Rural Development (EAFRD) under which rural development programmes are financed. EU subsidies and direct payments have become an important share of the agriculture factor income ([15]).

prices rose. Overall growth in real factor income per AWU was also influenced by the fall in the farm labour force between 2005 and 2016, which contracted by 3.38 million annual work units in total ([16]).

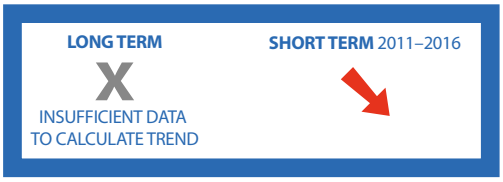
The agricultural factor income per AWU varies considerably between Member States ([17]).

Increases in income per annual work unit between 2010 and 2015 can in many cases be attributed to rising incomes, often combined with a reduced labour force, resulting in stronger rises for average factor income per work unit due to higher labour productivity. In contrast, decreases observable in other countries are predominantly due to a fall in agricultural factor income.

([15]) Regulation (EU) No 1306/2013 of the European Parliament and of the Council of 17 December 2013 on the financing, management and monitoring of the common agricultural policy and repealing Council Regulations (EEC) No 352/78, (EC) No 165/94, (EC) No 2799/98, (EC) No 814/2000, (EC) No 1290/2005 and (EC) No 485/2008.
([16]) See Eurostat, Statistics Explained, *European system of national and regional accounts — ESA 2010*.
([17]) Caution should be exercised when comparing absolute levels of agricultural factor income per AWU as they are influenced by different calculations depending on national rules and therefore not specifically designed to be comparable across countries.

Government support to agricultural research and development

EU government support to agricultural research has declined and remains just above EUR 3 billion annually.

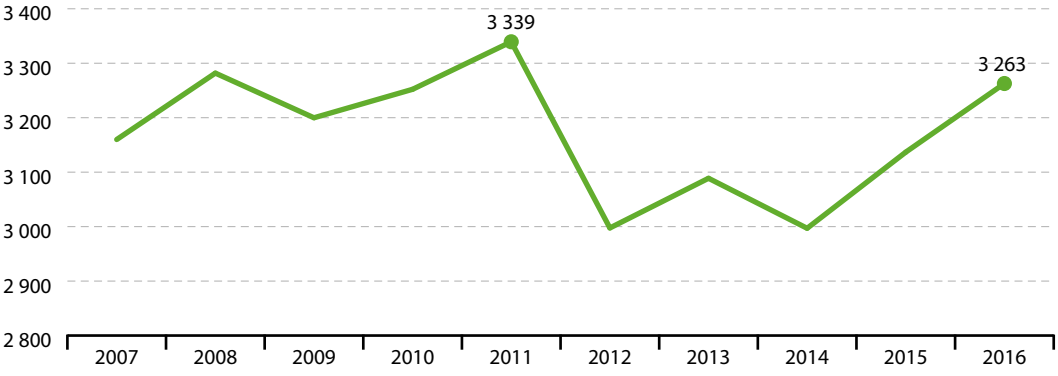


The data presented here refer to government budget appropriations or outlays on R&D (GBAORD). GBAORD data measure government support to research and development (R&D) activities, or in other words, how much priority governments place on public funding of R&D. GBAORD data are built up using the guidelines laid out in the proposed standard practice for surveys of research and experimental development, the OECD's Frascati Manual from 2002 ([18]). GBAORD data are broken down by socio-economic objectives according to the nomenclature for the analysis and comparison of scientific programmes and budgets (NABS 2007) ([19]). The data presented here refer to NABS 2007 chapter 08 'Agriculture'. The data refer to all final budget appropriations by government institutions and organisations, at national level, aimed at supporting agriculture R&D projects and encompass any kind of funding of R&D projects, including the national co-funding of EU-sponsored R&D projects or programmes.

Since 2007, EU government support to agricultural R&D has consistently exceeded EUR 3 billion annually. However, government support fell steeply in 2012 and has not fully recovered to its earlier level despite the development of a robust policy framework for the distribution of funds to agriculture (R&D).

Total government support to R&D (GBAORD) increased by 12.4 % between 2007 and 2015 ([20]) while spending on agriculture R&D decreased by 0.7 %. Lower levels of government support on agricultural R&D could stem from competition with other sectors such as technology. In relative terms, government support to agricultural R&D

Figure 2.5: Government support to agricultural research and development, EU-28, 2007–2016
(million EUR, in current prices)

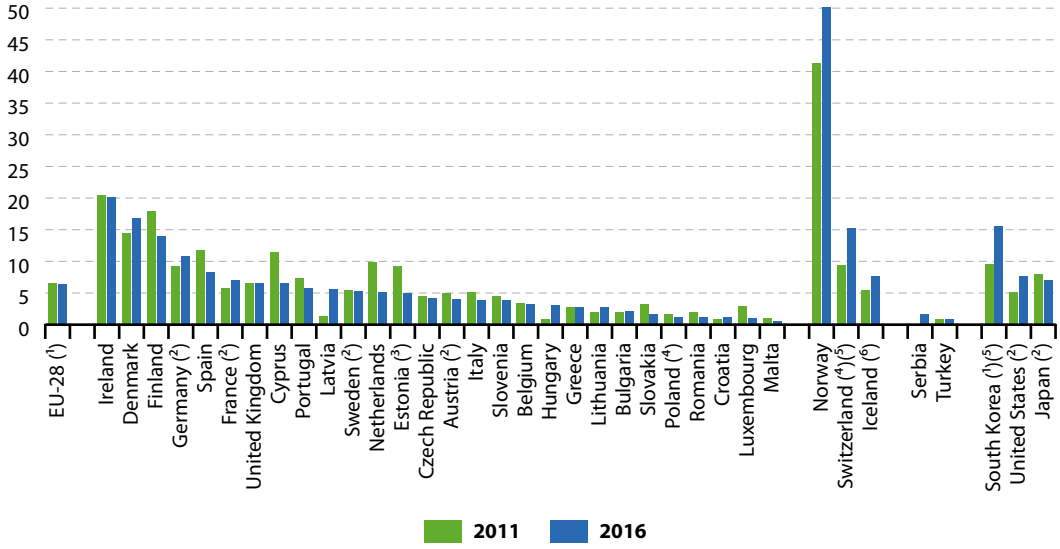


Note: data for 2007 and for 2009–2011 are estimates; 2016 data are provisional.

Source: Eurostat (online data code: sdg_02_30)

([18]) OECD (2002), *Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development*, 6th edition.
([19]) Eurostat (2017), *Government budget appropriations or outlays on R&D (GBA): New Structure of the NABS*.
([20]) Eurostat, total government budget appropriations or outlays on R&D (GBAORD) by funding mode (online data code: gba_fundmod).

Figure 2.6: Government support to agricultural research and development, by country, 2011 and 2016
(EUR per capita, in current prices)



(1) 2011 data are estimates.
(2) Definition differs.
(3) Estimated data.
(4) 2012 data (instead of 2011).
(5) 2015 data (instead of 2016).
(6) 2014 data (instead of 2011).

Source: Eurostat (online data code: sdg_02_30)

EU support to agricultural research and innovation comes from the Directorate General Research and Innovation Horizon 2020 programmes as well as the Directorate General Agriculture and Rural Development's Common Agricultural Policy (CAP). Some EUR 4 billion have been allocated to the Horizon 2020's Societal Challenge 2 (2014–2020) ([21]). 'Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the bioeconomy' for the 2016–2017 funding period. Within CAP, funds for innovation and research in agriculture are mostly distributed with co-financing from Member States.

accounted for 3.4 % of total GBAORD in 2016, down from 3.6 % in 2011. The objective of R&D in agriculture is to foster competitiveness, ensure sustainable management of natural resources and provide economic opportunities to rural economies and communities.

Despite agriculture dominating land use in the EU, accounting for about 40 % of EU surface area, per capita investment in agriculture R&D decreased between 2011 and 2015 in several Member States. This is also reflected in the EU average, which has fallen slightly from EUR 6.6 per capita in 2011 to EUR 6.4 in 2016 ([22]). Disparities in support to agricultural R&D between individual Member States are considerable and not necessarily related to the share of land used for agricultural production or proportion of agriculture to GDP.

([21]) European Commission (2017), *Horizon 2020 Work Programme 2016–2017*, European Commission Decision C(2017)2468 of 24 April 2017.
([22]) Eurostat (2013), *LUCAS: The EU's land use and land cover survey*.

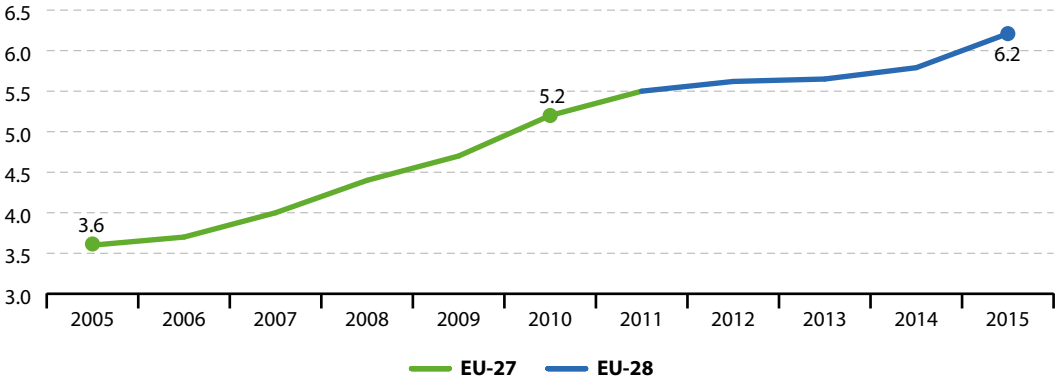
Area under organic farming

Organic farming exists in all Member States and has steadily risen since 2005. In 2015, 6.2 % of the EU's agricultural area was farmed using organic methods.

This indicator is defined as the share of total utilised agricultural area (UAA) occupied by organic farming (existing organically farmed areas and areas in the process of conversion). Organic farming is a production method that puts the highest emphasis on environmental protection and, with regard to livestock production, animal welfare considerations. It avoids or largely reduces the use of synthetic chemical inputs such as fertilisers, pesticides, additives and medical products. Farming is only considered to be organic at the EU level if it complies with Council Regulation (EC) No 834/2007 on organic production and labelling of organic products ([23]). This sets up a comprehensive framework for the organic crop and livestock production and for labelling, processing and marketing organic products. It also governs imports of organic products into the EU. The detailed rules for implementing this regulation are laid down in Commission Regulation (EC) No 889/2008 ([24]). Organic farming on average generates lower levels of production per hectare than conventional agriculture, but it is recognised to produce high-quality food and to contribute to environmental protection, animal welfare and rural development.

Agricultural area under organic farming in the EU has steadily increased over the past decade, accounting for 6.2 % of the EU's agricultural area or 11.1 million hectares in 2015. As a result of growing consumer demand for organic products, the organic market has grown from EUR 16 billion in 2007 to EUR 26 billion in 2014 ([25]).

Figure 2.7: Area under organic farming, EU-27 and EU-28, 2005–2015
(% of utilised agricultural area (UAA))

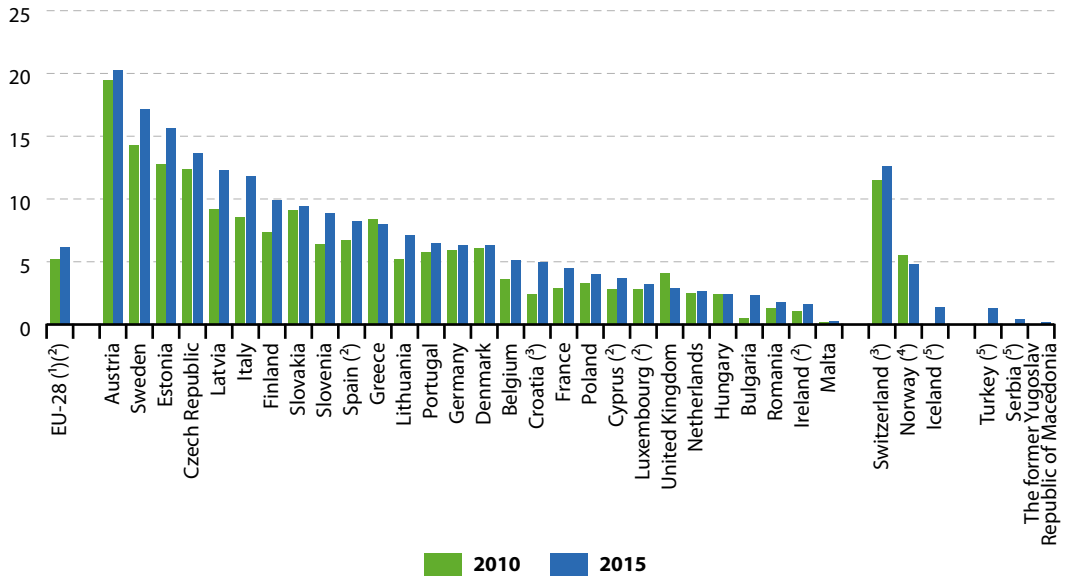


Note: 2005–2011 data are estimates.

Source: Eurostat (online data code: sdg_02_40)

([23]) Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91.
([24]) Commission Regulation (EC) No 889/2008 of 5 September 2008 laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling and control.
([25]) Organic Market Info (2016), *European organic market grew to more than 26 billion euros in 2014*.

Figure 2.8: Area under organic farming, by country, 2010 and 2015
(% of utilised agricultural area (UAA))



(1) 2010 data refer to EU-27.
(2) 2010 data are estimates.
(3) 2012 data (instead of 2010).
(4) 2009 data (instead of 2010).
(5) No data for 2010.

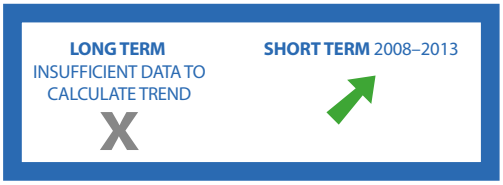
Source: Eurostat (online data code: sdg_02_40)

While organic farming is not explicitly mentioned in Agenda 2030, the EU has identified increasing the area under organic farming as a means of achieving a more sustainable use of using natural resources. The EU Common Agriculture Policy (CAP) has put in place exemptions for organic farmers from greening obligations in the first pillar 'direct payments to farmers' and subsidies for organic farming in the second pillar 'rural development policy'.

Despite significant differences in the proportion of land used for organic agriculture across the EU, all Member States show an increase in area under organic production between 2010 and 2015, with the exception of Greece and the United Kingdom. Norway is also an exception, falling slightly between 2010 and 2015. Member States that joined the EU in 2004 or later showed some of the fastest growth rates in the organic sector over this period.

Gross nitrogen balance on agricultural land

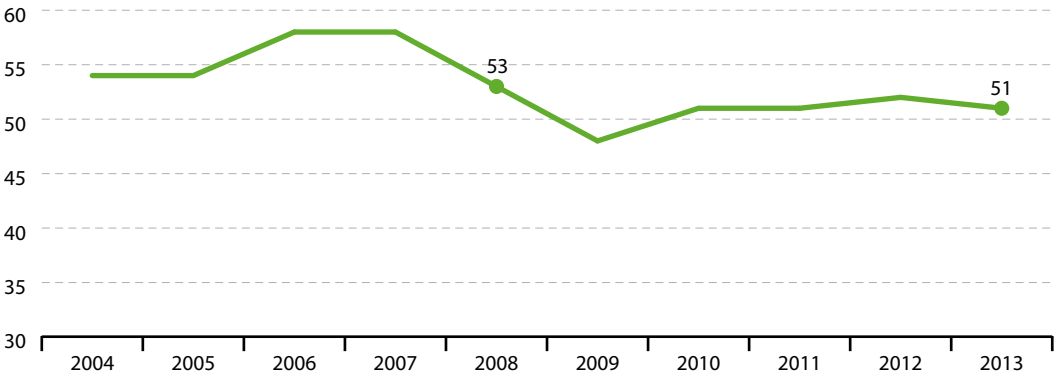
EU countries spread more nitrogen on agricultural land than can be used by plants. On average, the current nitrogen surplus is 51 kg/ha. The surplus has fallen since 2004 but levels are still high and have stagnated in recent years.



The gross nitrogen balance represents the total potential threat that a surplus or a deficit of nitrogen in agricultural soils poses to the environment. A lack of nitrogen in agricultural land reduces soil fertility, while an excess causes pollution and water eutrophication. Manure and fertiliser introduce nitrogen to the soil while the harvesting of crops, removal of residues and runoff remove it. Nitrogen inputs represented in the data come from multiple sources, including fertiliser consumption, livestock population, crop production and areas of various types of crops. The land types included are arable land,

Member States have established Nutrient Management Plans (NMPs) to meet requirements under the Water Framework Directive ([26]) and Nitrates Directive ([27]) for nutrient standards. These plans aim to help farmers improve their nutrient management. Furthermore, Rural Development Programmes 2014–2020 finance actions to better address and manage nutrient uses in agriculture, many of which make reference to NMPs ([28]). The adoption of NMPs has been instrumental in reducing nitrogen since the mid-1980s.

Figure 2.9: Gross nitrogen balance on agricultural land, EU-28, 2004–2013
(kg per hectare)

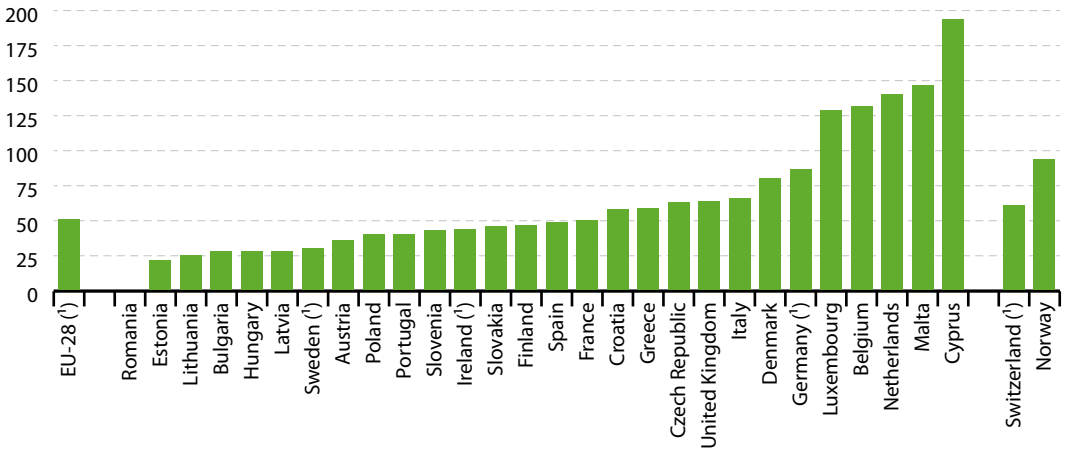


Note: Estimated data.

Source: Eurostat (online data code: sdg_02_50)

([26]) Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.
([27]) Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91 / 676 /EEC).
([28]) Eurostat, Statistics Explained, *Agri-environmental indicator — mineral fertiliser consumption*.

Figure 2.10: Gross nitrogen balance on agricultural land, by country, 2014
(kg per hectare)



Note: Estimated or provisional data for most countries.
(1) 2013 data (instead of 2014).

Source: Eurostat (online data code: sdg_02_50)

permanent crops and permanent grassland. The unit of measure used is kilograms (kg) of nitrogen per hectare (ha) of land.

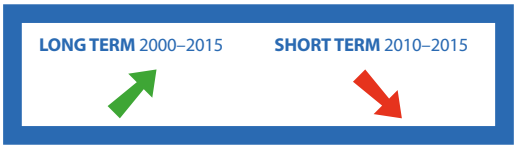
Nitrogen surpluses on agricultural land in Europe show an overall decreasing trend since the 1990s as a result of the Nitrates Directive, which was introduced in 1991 to lower fertiliser use, especially inorganic fertilisers. Nitrogen surpluses were lowest in 2009 but have stabilised since 2004. Mineral fertilisers and manure currently account for over 80 % of nitrogen inputs ([29]).

All EU countries had a nitrogen surplus as of 2014, with the exception of Romania, which had a slight deficit of 1 kg/ha. Nitrogen surpluses vary significantly between countries, influenced by the type of agricultural production, livestock density and geological factors such as soil and land composition. Nitrogen fertiliser has been a key driver of high yields in modern agriculture. However, it needs to be used more efficiently to maintain and increase yields while reducing overall fertiliser application and the negative environmental impacts.

([29]) Eurostat, Statistics Explained, *Agriculture and environment — pollution risks*.

Ammonia emissions from agriculture

Following substantial reductions in the period 1990 to 1995, ammonia emissions from agriculture fell slowly as of 2000. However, the trend seems to have reversed in the short term with a slight increase since 2010.

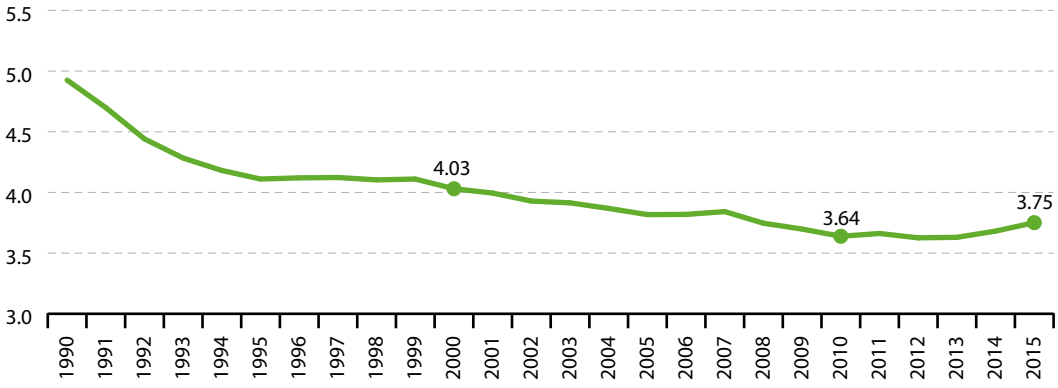


Ammonia (NH_3) is a colourless, pungent-smelling and corrosive gas that is produced by decaying organic vegetable matter and from the excrement of humans and animals. When released into the atmosphere it contributes to air pollution. Once deposited in water and soils, it can cause two major types of environmental damage: acidification and eutrophication (where over-fertilisation causes oxygen depletion in water bodies as they become suffocated with weeds). Both of these conditions can harm sensitive vegetation systems, biodiversity and water quality. This section is based on data collected and published by the European Environment Agency (EEA).

Since 1990, the EU has reduced its ammonia emissions from agriculture. Changes in agricultural practices brought about reductions in the use of nitrogenous fertilisers, improved management of organic manures and reduced livestock numbers. Reductions in ammonia emissions continued through the 2000s but the trend has reversed in recent years. Since 2012, aggregate ammonia emissions have increased slightly, with the highest increase occurring between 2014 and 2015. The slight increasing trend between 2012 and 2015

Measures implemented under the Common Agricultural Policy (CAP) and the Water Framework Directive ([30]) have led to reductions in agricultural emissions in the EU since the 1990s. Specifically, measures to change agricultural practices brought about reductions in the use of nitrogenous fertilisers and reduced livestock density per hectare across the EU-15.

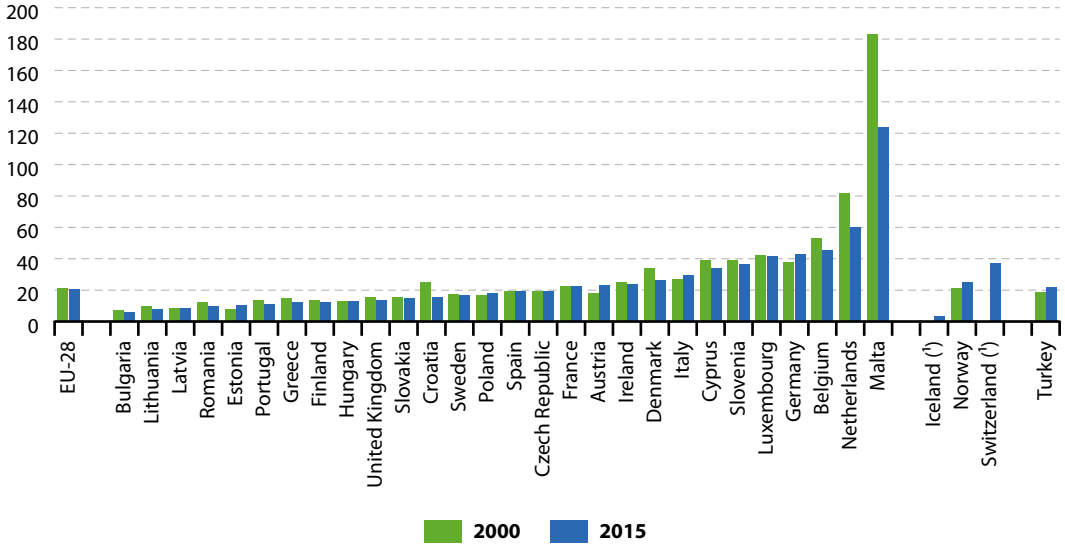
Figure 2.11: Ammonia emissions from agriculture, EU-28, 1990–2015
(million tonnes)



Source: European Environment Agency (EEA) (Eurostat online data code: sdg_02_60)

([30]) Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

Figure 2.12 Ammonia emissions from agriculture, by country, 2000 and 2015
(kg per hectare)



(1) No data for 2000.

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_02_60)

was mainly driven by increases in emissions from Germany and Spain, and is not representative of rising ammonia emissions across all EU countries. In 2015, several Member States as well as the EU as a whole exceeded their respective emissions limits under the United Nations Convention on Long-range Transboundary Air Pollution (LRTAP).

The agricultural sector continues to be the overwhelming contributor to ammonia emissions in the EU, accounting for about 94 % of ammonia emissions in 2015.

Despite overall reductions in ammonia emissions from agriculture, emission levels per hectare have hardly budged, suggesting that the overall declines may be due to reductions in agricultural area rather than in emissions. Some experts attribute this slow reduction to EU policy focusing on reducing ammonia emissions from industry rather than from agriculture ([31]). The countries with the greatest rate of reduction, Malta and the Netherlands, also have the highest levels of ammonia emissions per hectare of utilised agricultural area. It should be noted that livestock farming can also take place on zero-hectare farms, and thus is worsening the ammonia emissions calculated per available utilised agricultural area (UAA).

([31]) Grennfelt, P. (2006), *Why has nitrogen control failed with various policies*, IVL Swedish Environmental Research Institute.

Further reading on zero hunger

Food and Agriculture Organization of the United Nations (UN FAO) (2016), *Food and Agriculture: Key to achieving the 2030 Agenda for Sustainable Development*, FAO Publishing, Rome.

OECD (2010), *Obesity and the Economics of Prevention: Fit not Fat*, OECD Publishing, Paris.

European Environment Agency (2014), *Greening Europe's agriculture*.

European Environment Agency (2012), *Food Security and environmental impacts*.

3 Ensure healthy lives and promote well-being for all at all ages

The global perspective on SDG 3

Despite significant strides in increasing life expectancy and reducing the burden of communicable diseases, more than six million children still die before their fifth birthday each year, and only half of all women in developing regions have access to the health care they need. SDG 3 aims to ensure health and well-being for all at all ages by improving reproductive, maternal and child health; ending the epidemics of major communicable diseases; and reducing non-communicable and mental diseases. SDG 3 also calls for reducing behavioural (drugs and alcohol abuse, tobacco) as well as environmental health risk factors (traffic accidents, chemicals and air, water and soil pollution and contamination). The main prerequisite for meeting these objectives are universal health coverage; access to sexual and reproductive health-care services and to safe, affordable and effective medicines and vaccines for all. Other crucial steps for addressing persistent and emerging health issues are support for research and development of vaccines and medicines, increased health financing and health workforces in developing countries and strengthened capacity for early warning and management of health risks ([1]).

eurostat supports the SDGs

Monitoring SDG 3 'good health and well-being' in an EU context focuses on four sub-themes. 'Healthy lives' refers to objective and subjective measurements of health, while 'health determinants' looks into both environmental and behavioural determinants of health. 'Causes of death' analyses the main reasons for mortality in the EU and 'access to healthcare' investigates the barriers for accessing medical care services. As shown in Table 3.1, the EU has made moderate progress in these areas.

([1]) Source: United Nations http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 3.1: Indicators measuring progress in SDG 3, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Healthy lives			
Life expectancy at birth	↗ (1)	↗	p. 72
Self-perceived health	↗ (2)(3)	↘	p. 74
Health determinants			
Obesity rate (*)	:	:	SDG 2, p. 51
Smoking prevalence	:	:	p. 76
Exposure to air pollution by particulate matter (*)	↘ (4)	↑ (5)	SDG 11, p. 231
Population living in households considering that they suffer from noise (*)	:	↑	SDG 11, p. 225
Causes of death			
Death rate due to chronic diseases	↑ (6)	↑ (5)	p. 78
Suicide rates	↗ (4)	↗	p. 80
People killed in accidents at work (*)	:	↑	SDG 8, p. 178
People killed in road accidents (*)	↗ (4)(7)	↘ (7)	SDG 11, p. 228
Access to health care			
Self-reported unmet need for medical care	:	↘	p. 82

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Past 11-year period.
(2) Trend for EU-27.
(3) Past 10-year period.
(4) Past 14-year period.
(5) It should be noted that although the average concentrations of fine particulate matter have decreased during the past five years, the overall adverse health impacts of urban population exposure to air pollution by particulate matter $PM_{2.5}$ remain significant. The annual mean for fine particulate matter continues to be above the World Health Organization's recommended level.
(6) Past 12-year period.
(7) Trend in relation to the target of halving the number of people killed in road accidents by 2020 (compared to 2001).

Good health and well-being in the EU: overview and key trends

SDG 3 calls for action to ensure healthy lives and promote well-being for all at all ages. The World Health Organisation (WHO) defines health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' ([2]). Good health is not only of value to the individual as a major determinant of quality of life, well-being and social participation, but it also contributes to general social and economic growth. Health is influenced by socio-economic factors, such as living conditions, and by environmental factors, such as air quality and noise. Thus, the achievement of the SDG for good health is strongly linked to other areas related to sustainable development. Universal health coverage is a core objective of the EU and the Commission supports Member States in their efforts to strengthen the effectiveness, accessibility and resilience of their health systems ([3]). The State of Health in the EU, a two-year cycle of knowledge brokering, together with the OECD and the European Observatory on Health Systems and Policies, is providing the evidence base ([4]). The joint OECD-Commission report 'Health at a Glance: Europe 2016' ([5]), which is the first product of the Commission's State of Health in the EU cycle, has provided guidance and support to the current chapter.

Healthy lives

Life expectancy at birth has increased continuously across Europe during the past century as a result of economic development and improvements in some environmental conditions (for example in many urban areas) as well as improved lifestyles and advances in healthcare and medicine, including reduced infant mortality ([6]). Rising life expectancy is an indicator of a population's improved general health and lower mortality rates. EU countries have some of the highest life expectancy rates in the world. However, rates vary among Member States and according to sex and educational level, resulting in health inequalities within each country. Overall, the EU achieved a moderate increase in life expectancy between 2004 and 2015.

While life expectancy gives an objective assessment of how long people can expect to live, it does not show whether people live their lives in good health. The indicator healthy life years (HLY) — also called disability-free life expectancy (DFLE) — measures the number of years a person at birth is expected to live without functional limitations or a disability. Overall, the number of years people were expected to live in good health in the EU has increased since 2004. The number of healthy life years at birth was 63.3 years for women and 62.6 years for men in 2015. Consequently, women are expected to live for about three-quarters and men four-fifths of their life without disability.

Another useful complementary measure is **self-perceived health**, in which people provided an assessment of their own general health. Despite its subjective nature, this indicator provides an additional insight into the well-being of individuals and is found to be a good predictor of future health care use ([7]). In the EU, the share of people who perceive their health to be good or very good rose moderately between 2005 and 2010, but has slightly fallen since then. More men, young people and people with higher incomes tend to

([2]) WHO (1946), *Constitution of the World Health Organization*.
([3]) European Commission (2014), *Communication from the Commission on effective, accessible and resilient health systems,* COM(2014) 215 final.
([4]) European Commission (2017), *Summary,* State of Health in the EU.
([5]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle,* OECD Publishing, Paris.
([6]) Eurostat (2016), *Mortality and life expectancy statistics,* Statistics Explained.
([7]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle,* OECD Publishing, Paris, p. 72.

perceive their health as being good compared to women, older people or those with low incomes, respectively.

Health determinants

Many factors together affect the health of individuals and populations. These include the state of the environment, opportunities of access and use of health services, and a person's individual characteristics and behaviour ([8]). **Obesity** is a serious public health problem, as it significantly increases the risk of chronic diseases such as cardiovascular disease, type-2 diabetes, hypertension, coronary heart diseases and certain cancers. For specific individuals, obesity may further be linked to a wide range of psychological problems. For society as a whole, it has substantial direct and indirect costs that put a considerable strain on health care and social resources. In 2014, 15.9 % of people over the age of 18 in the EU were obese; an additional 35.7 % were pre-obese. As a result, more than half of the people above the age of 18 were overweight. There is little difference at the EU level when it comes to gender, but some groups do stand out. For example, people aged 65 and above are more likely to be obese than younger people; the rate is also higher for people with lower education levels than for those with a tertiary education.

Another important health determinant is **tobacco smoking**. According to the WHO, tobacco is one of the biggest threats to health worldwide, killing more than six million people a year ([9]). The European Commission's Directorate-General for Health and Food Safety describes tobacco consumption as 'the single largest avoidable health risk in the European Union' ([10]). Many forms of cancer, cardiovascular and respiratory diseases are linked to tobacco use. Around half of smokers die prematurely, depriving their families of income and raising the burden of health care. In many countries, the prevalence of smoking has stabilised or declined in recent decades, but still almost one-fifth of adults smoke daily. Women, older people and people with tertiary education tend to smoke less than men, younger people and people with lower education.

While obesity and smoking concern a person's individual characteristics and behaviours, there are also external factors that affect health. **Air pollution**, for example, has a significant impact on health. It can lead to or aggravate many chronic and acute respiratory and cardiovascular diseases. In addition, it reduces life satisfaction and perception of well-being. Air pollution has been one of Europe's main environmental policy concerns since the late 1970s. Air pollutants are emitted as a result of human activities, mainly fuel combustion. Urban populations are particularly exposed to air pollution because of the high concentration of human activities and industry in EU cities and the daily flow of commuters. Exposure to air pollution by fine particulate matter ($PM_{2.5}$) — one of the most harmful components of air pollution for human health, which can lead to or aggravate many chronic and acute respiratory and cardiovascular diseases ([11]) — had been increasing in the EU until 2011, but this negative trend has reversed in the short term. However, substantial air pollution hotspots remain and the annual mean for $PM_{2.5}$ continues to be above the level recommended by the World Health Organization (10 µg/m^3 annual mean).

Another environmental factor that affects health is prolonged **exposure to noise**, for example from traffic, industry or construction. This can have serious health effects such as high blood pressure, sleep disturbance, cardiovascular diseases, annoyance, cognitive impairment and mental health problems ([12]). Exposure to noise can also impact EU economies, for example, through

([8]) WHO (2017), *The determinants of health, Introduction.*
([9]) WHO (2017), *Tobacco.*
([10]) Directorate-General for Health and Food Safety, *Tobacco Policy.*
([11]) World Health Organization, *World Health Statistics 2016: Monitoring Health for the SDGs*, 2016, p. 37.
([12]) European Commission, *Noise.*

loss of worker productivity, increased burden on health care systems and depreciation of real-estate value ([13]). The EU has made substantial progress in this area, with households' self-perceived exposure to noise being reduced from 23 % in 2007 ([14]) to 18 % in 2015. However, because the assessment of noise pollution is a subjective measure, a fall in the value of the indicator may not necessarily indicate a similar reduction in actual noise pollution levels.

Causes of death

Causes of death are among the oldest medical statistics available and play a key role in the general assessment of health in the EU. It may be used to determine which preventive and medical-curative measures or investments in research might increase a population's life expectancy. **Chronic diseases** such as cardiovascular diseases, cancer, chronic respiratory diseases and diabetes are the leading cause of mortality in the world ([15]) and the EU ([16]). They are evoked or worsened by a number of risk factors including smoking, obesity, lack of physical activity, poor diet and alcohol consumption. In addition, air pollution is also associated with premature mortality from cardiovascular disease and certain cancers. High mortality due to chronic diseases, combined with the fact that many cases are preventable, has led to increasing efforts to prevent lifestyle-related risk factors. Awareness initiatives on health promotion and disease prevention have been carried out at the national and EU-levels. Chronic disease management programmes in primary care have also been implemented. Premature deaths occur before a person reaches an expected age and many of these deaths are considered to be preventable. In the EU, deaths due to chronic diseases before the age of 65 fell steadily between 2002 and 2014.

Communicable diseases such as HIV, tuberculosis and hepatitis are also highlighted as targets in the Sustainable Development Goals. The EU has also committed to eliminating tuberculosis and HIV by 2020 and reducing hepatitis ([17]). HIV, tuberculosis and hepatitis together account for around 15,000 EU deaths each year ([18]). While deaths from HIV and tuberculosis have been declining gradually, the number of deaths from hepatitis has stagnated over the past few years.

Suicide, while not a major cause of death in many Member States, is considered as an indication for underlying issues, such as access to mental health services, that may need to be addressed. Suicide is often linked to depression and alcohol and substance abuse ([19]). Early detection of these psycho-social problems in high-risk groups is an important part of suicide prevention campaigns, together with the provision of effective support and treatment. Further efforts are needed to remove the stigma associated with seeking care ([20]). While suicide rates declined between 2000 and 2014, the pace of decline has slowed since 2008.

Accidents were one of the most common causes of death within the EU, leading to more than 152 000 deaths in 2014 ([21]). Such accidents may occur in the workplace. **Fatal accidents at work** are accidents during the course of work that lead to the death of the victim within one year. A safe and healthy working environment is not only a crucial factor in an individual's quality of life, it is also a collective concern. Therefore, improving the working environment to protect workers' health and safety is recognised as an important objective by the EU and its Member States ([22]). The EU made progress between 2009 and 2014, reducing the non-standardised incidence rate of fatal accidents at work per 100 000 persons employed from 2.01

([13]) Ibid.
([14]) Data refer to EU-27.
([15]) WHO (2017), *Chronic diseases and health promotion.*
([16]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle,* OECD Publishing, Paris.
([17]) European Commission, *Next steps for a sustainable European future: European action for sustainability, COM(2016) 739, Brussels, 2016;* European Parliament resolution on the EU's response to HIV/AIDS, Tuberculosis and Hepatitis C.
([18]) WHO (2017), European detailed mortality database: http://data.euro.who.int/dmdb/
([19]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle,* OECD Publishing, Paris, p. 68.
([20]) OECD (2014), *Making Mental Health Count: The Social and Economic Costs of Neglecting Mental Health Care,* OECD Publishing, Paris.
([21]) Eurostat (2016), *Accidents and injuries statistics, Context.*
([22]) Treaty on the Functioning of the European Union, Article 153.

to 1.83. However, the rate is more than ten times higher for men than for women, and the gender gap widened has widened since 2009.

Injuries and deaths may also be the result of road traffic accidents. Ninety percent of global road deaths occur in low- and middle-income countries ([23]), but road safety is also an issue in Europe. Therefore, halving the number of **deaths from road traffic accidents** is not only a global goal, but also a goal of EU policies ([24]). The 52 % reduction in the number of fatalities due to road accidents in the EU between 2001 and 2015 indicates that EU roads have become safer. Nevertheless, the stagnation in road casualties in the last three years has put the EU slightly off-track from reaching its target.

Access to health care

Achieving universal health coverage is a fundamental objective for the EU, and all European countries endorse equity of **access to health care** for all people as an important policy objective ([25]). A decrease in unmet health care needs may result in better health status for the affected population, particularly low income groups ([26]). This may reduce health inequalities, which in turn can contribute to higher economic and social cohesion. Barriers to accessing health services include cost, distance and waiting times. Between 2008 and 2015, there were no substantial changes in the share of people reporting unmet care needs.

([23]) WHO (2016), *Road Traffic Injuries*.
([24]) European Commission (2010), *Road Safety Programme 2011—2020,* Memo/10/343.
([25]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle,* OECD Publishing, Paris, p. 154.
([26]) Ibid.

Good health and well-being in the EU

Healthy lives

Life expectancy at birth in 2015

♀ **83.3** years
+ 0.5 years since 2010

♂ **77.9** years
+ 1.0 years since 2010

Self-perceived health in 2015
67.0 % of population feeling in (very) good health
- 1.4 pp since 2010

Health determinants

Obesity rate in 2014
15.9 % of population aged 18 or over

Smoking prevalence in 2014
19.2 % of population being daily smokers

Concentration of particulate matter
smaller than 2.5 µm in 2014
15.2 µg/m³
-12.6 % since 2009

Disturbance by noise in 2015
18.0 % of population
- 2.5 pp since 2010

Causes of death

Death due to chronic diseases in 2014
123.3 per 100 000 persons aged less than 65
- 11.9 % since 2009

Suicide rate in 2014
11.3 per 100 000 persons
- 4.2 % since 2009

People killed in accidents at work in 2014
1.8 per 100 000 employed people
- 9.0 % since 2009

People killed in road accidents in 2015
5.1 per 100 000 persons
- 19.0 % since 2010

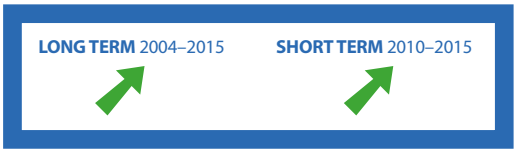
Access to health care

Unmet need for medical care in 2015
3.2 % of population aged 16 and over
+ 0.1 pp since 2010

Source: Eurostat (online data codes: sdg_03_10, sdg_03_20, sdg_02_10, sdg_03_30, sdg_11_50, sdg_11_20, sdg_03_40, sdg_03_50, sdg_08_60, sdg_11_40 and sdg_03_60)

Life expectancy at birth

Life expectancy at birth increased by 1.8 years for women and 2.7 years for men between 2004 and 2015. While life expectancy increased throughout most of this period, it declined between 2014 and 2015.



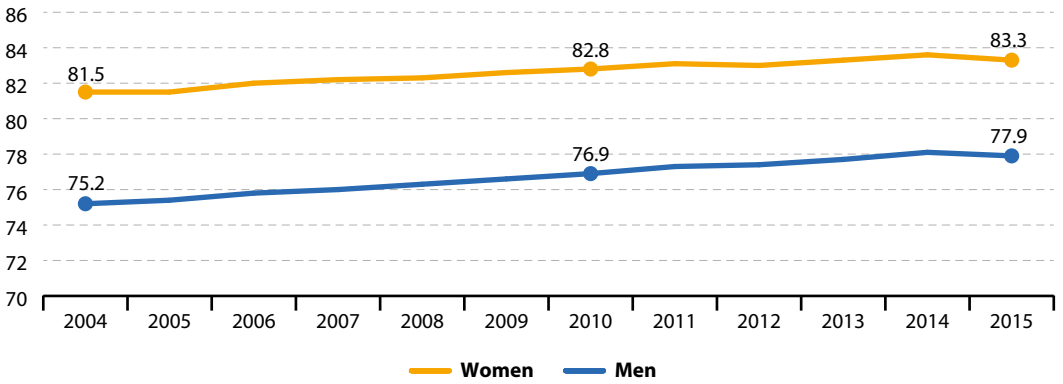
The indicator life expectancy at birth is a conventional measure of a population's general health and overall mortality level. It represents the mean number of years a person can expect to live at birth based on current mortality conditions (age-specific probabilities of dying).

Life expectancy in the EU increased by 1.8 years for women and 2.7 years for men between 2004 and 2015. Life expectancy has also increased over the short term between 2010 and 2015. In comparison to 2010, women born in 2015 could expect to live on average 0.5 years and men 1.0 year longer.

For the first time in the past decade life expectancy fell between 2014 and 2015, for both women and men, by 0.3 years and 0.2 years, respectively. It is not possible to say whether this reduction is only momentary or whether it marks a new trend.

The recent decline in life expectancy at birth was visible in most EU countries. Nevertheless, life expectancy remained the same or increased for women in five countries and for men in 12 countries. The reasons for the falls seem to vary between Member States ([27]). In France, the reduction in 2015 may be attributed to an increase in death rates among people aged over 65 due to 'cyclical' factors such as an exceptionally long flu epidemic and some exceptional weather fluctuations ([28]). In Italy, the increase was concentrated among elderly people aged over 75 ([29]). In Belgium, it may be attributed to a particularly severe flu epidemic ([30]).

Figure 3.1: Life expectancy at birth, by sex, EU-28, 2004–2015
(years)



Note: Breaks in time series in 2010, 2011, 2012, 2014 and 2015; 2013–2015 data are provisional estimates.
Source: Eurostat (online data code: sdg_03_10)

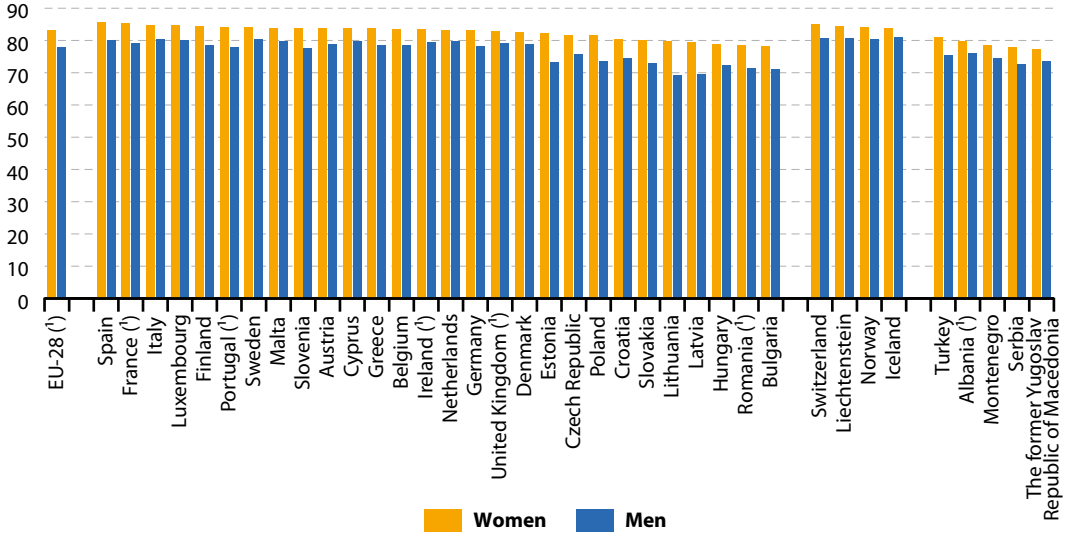
([27]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, OECD Publishing, Paris, p. 56.
([28]) V. Bellamy and C. Beaumel (2016), *Bilan démographique 2015* (Demographic Data 2015), INSEE, France.
([29]) ISTAT (2016), *Demographic Indicators: Estimates for the Year 2015*, Italy, published on 19 February 2016.
([30]) ISEPS (2017), *Espérance de vie et mortalité*.

In 2015, girls born in the EU could expect to live 83.3 years on average. This was 5.4 years more than boys born in the same year, who could expect to live 77.9 years on average. As described above, life expectancy of men has increased more strongly than for women since 2004, indicating a closing of the life expectancy gender gap. This can at least partly be attributed to women adopting similar risk-increasing behaviours as men, such as smoking, and to a sharp reduction in deaths from cardiovascular diseases among men ([31]). In addition, with just 0.7 years difference in favour of women, the gender gap was considerably smaller in terms of healthy life years in 2015. Men therefore tend to spend a greater proportion of their somewhat shorter lives free from activity limitations.

Among the G20 members, Japan had the highest life expectancy for both women (87 years) and men (80 years) in 2013 ([32]). In two G20 members, life expectancy at birth remained below 70 years for both women and men in 2013: in India it was 68 years for women and 65 years for men; and in South Africa it was 64 years for women and 57 years for men ([33]). The relatively low life expectancy for South Africa may be largely attributed to the impact of an HIV/AIDS epidemic ([34]).

Member States have the main responsibility for their health care policies and for organising their health care systems. However, EU Cohesion Policy aims to reduce disparities between EU regions, also in terms of endowment of health services. In addition, the EU climate and environmental policy also increases health and well-being.

Figure 3.2: Life expectancy at birth, by sex, by country, 2015
(years)



(1) Estimated and/or provisional data.

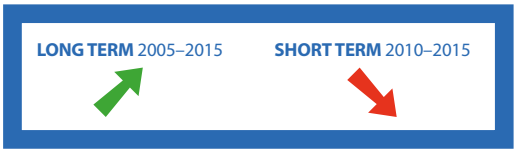
Source: Eurostat (online data code: sdg_03_10)

(31) OECD/EU (2014), *Health at a Glance: Europe 2014*, OECD Publishing, Paris, p. 16.
(32) Data is from the World Health Statistics of the World Health Organization. See also Eurostat (2016), *The EU in the World — 2016 Edition*, Publications Office of the European Union, Luxembourg, p. 46.
(33) Ibid.
(34) Eurostat (2016), *The EU in the World — 2016 Edition*, Publications Office of the European Union, Luxembourg, p. 46.

While life expectancy rose in all Member States from 2004 to 2015, differences remain among countries. In 2015, life expectancy varied by 7.5 years for women, from 85.7 years in Spain to 78.2 years in Bulgaria. The variation was greater for men, with a gap of 11.2 years, ranging from 80.4 years in Sweden to 69.2 years in Lithuania. Variation in life expectancy across countries can be explained by many factors. One explanation is that higher health spending per capita is generally associated with higher life expectancy at birth. But the relationship becomes less pronounced the higher the health spending per capita ([35]). Another explanation might be differences in national income, but there are also notable differences in life expectancy between countries with similar income per capita ([36]). Within countries, life expectancy varies not only by gender but also by education. Generally, in most of the countries for which data is available, life expectancy increases with educational attainment, meaning higher educated people tend to live longer than lower educated people, for both men and women ([37]).

Self-perceived health

The share of people perceiving themselves to be in good or very good health was higher in 2015 than in 2005. However, the share slightly decreased between 2010 and 2015.



Self-perceived health is a subjective measure of how people judge their health in general on a scale from 'very good' to 'very bad'. The data stem from the EU Statistics on Income and Living Conditions (EU SILC). Indicators of perceived general health have been found to be a good predictor of people's future health care use and mortality ([38]).

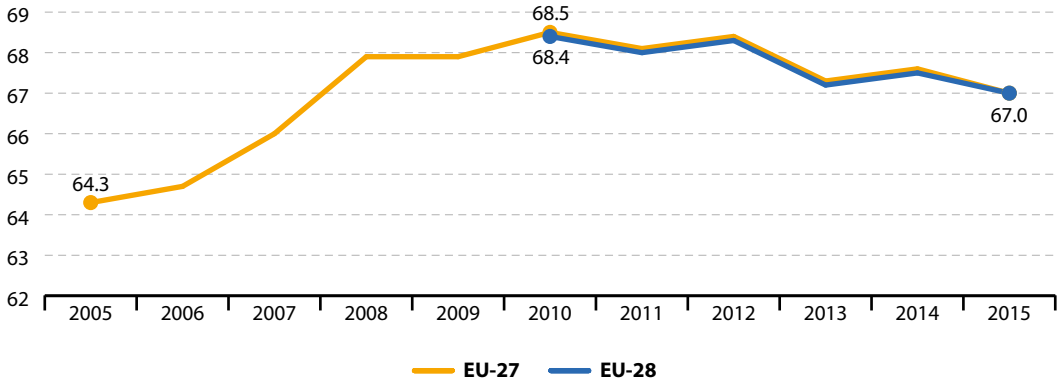
People in the EU generally rate their health quite positively. Two-thirds of the EU population (67.0 %) judge their health as being either good or very good and only 9.6 % judged their health to be bad or very bad (see Figure 3.4). Self-perceived health has increased since 2005 when the rate was 64.3 %. However, while the rate increased steadily between 2005 and 2010, it fell by 1.4 percentage points between 2010 and 2015. There seems to be no straightforward explanation, which might be an indication of the complexities underlying self-perceived health.

Although women are expected to live longer than men, they are less likely to rate their health as being very good or good in all Member States. Self-perceived health also has a distinct age pattern with fewer people in the older age groups tending to rate their health as being very good or good, while the share reporting bad or very bad health increases with age. In addition, the gender gap is not only observed in all age groups, but it also increases with age.

Though each Member State is different, their health systems all share the ultimate aim of contributing to the good health and well-being of their population. The Commission's main role is to support Member States in this aim. Further information can be found in the 2014 'Commission Communication on effective, accessible and resilient health systems' ([39]).

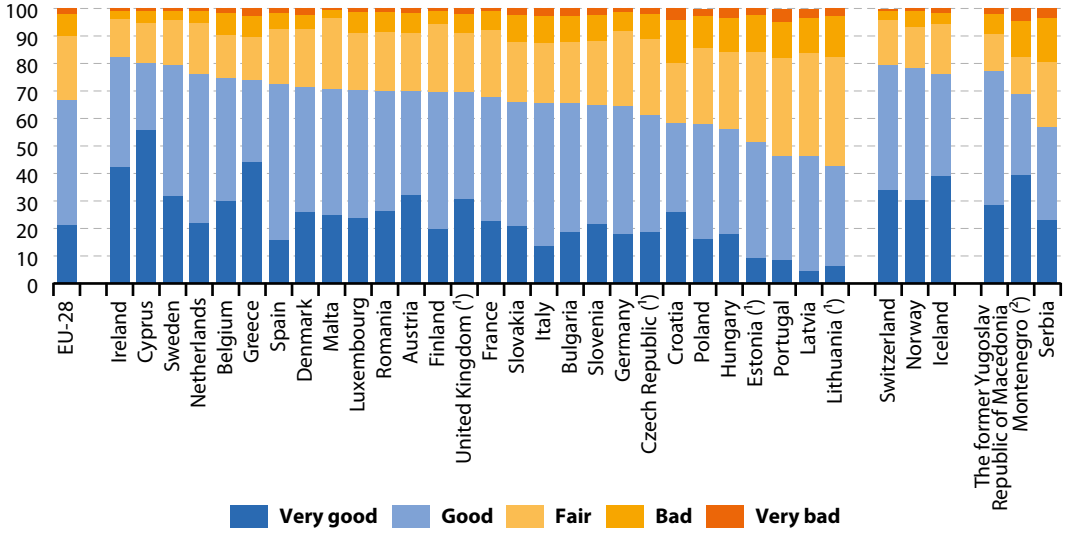
([35]) OECD (2015), *Health at a Glance 2015: OECD Indicators*, OECD Publishing, Paris, p. 46–47.
([36]) Ibid.
([37]) V. Corsini (2010), *Highly Educated Men and Women Likely to Live Longer: Life Expectancy by Educational Attainment*, Eurostat Statistics in Focus 24/2010, European Commission, Luxembourg; data available in Eurostat (online data code: demo_mlexpecedu).
([38]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, OECD Publishing, Paris, p. 72.
([39]) European Commission (2014), *Communication from the Commission on effective, accessible and resilient health systems*, COM(2014) 215 final.

Figure 3.3: People perceiving themselves to be in good or very good health, EU-27 and EU-28, 2005–2015
(% of population)



Note: 2005 and 2006 data are estimates.
Source: Eurostat (online data code: sdg_03_20)

Figure 3.4: Self-perceived health, by level of perception, by country, 2015
(% of population)



(1) Data with low reliability.
(2) 2013 data.
Source: Eurostat (online data code: sdg_03_20)

There are large disparities in self-reported health across different socio-economic groups, as measured by income or educational level. In all countries, the 20 % of the population in the highest income group is much more likely to report being in good health than the 20 % in the lowest income group. On average across European countries, 77.6 % of people in the highest income quintile report being in good or very good health, compared with just over 59.7 % for people in the lowest income quintile ([40]).

The share of people who perceive themselves to be in good or very good health varies strongly across Member States, ranging from 82.4 % to 42.8 % in 2015. The variation was even bigger when focusing on just those who perceived themselves to be in very good health.

Caution is needed when making cross-country comparisons of perceived general health because of the subjective nature of this assessment, which can be affected by social and cultural backgrounds. In addition, older people report poor health more often than younger people. Thus, countries with a larger proportion of elderly people may have a lower proportion of people reporting good or very good health ([41]).

Smoking prevalence

Almost one-fifth of adults smoke daily. Women, older people and people with higher education tend to smoke less than men, younger people and people with lower education.

The proportion of daily smokers is defined as the percentage of the population aged 15 years and over who report tobacco smoking every day. Other forms of smokeless tobacco products, such as oral tobacco in Sweden, are not included in prevalence figures. Estimates from the European Health Interview Survey (EHIS) 2014 are based on self-reports of daily smoking ([42]).

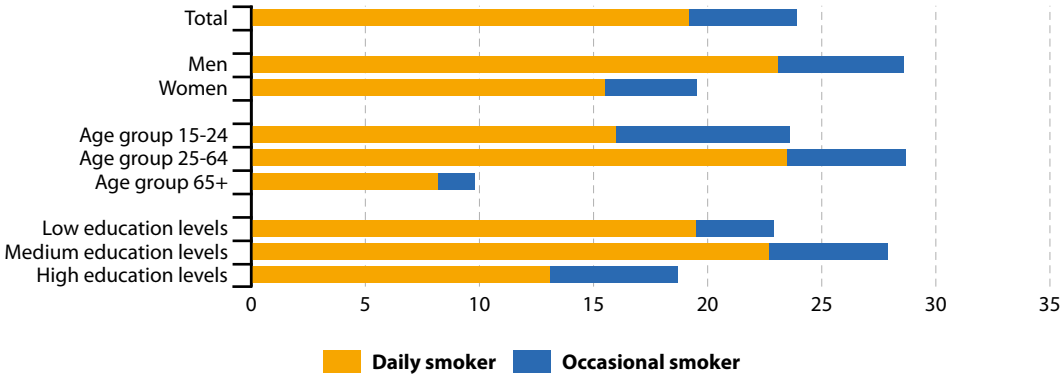
In 2014, slightly less than one-fourth of people aged 15 or over (23.9 %) were occasional or daily smokers. Almost one-fifth of the same age group smoked daily (19.2 %). Smoking was more common among men than women. The figures for men show 23.1 % smoked daily and another 5.5 % smoked occasionally, compared with 15.5 % and 4.0 % of women, respectively. While in 2014 there were still fewer women smoking than men, the gender gap has decreased in recent years ([43]). According to a report by the OECD ([44]), the decreasing gender gap in life expectancy can partially be explained by women adopting similar risk-increasing behaviours, such as smoking, as men.

In 2014, daily tobacco smoking was least common among people aged 65 and more (8.2 %). The group with the most daily smokers were people aged 25 to 64 (23.5 %). The rate among young people aged 15 to 24 (16.0 %) is lower than for those aged 25 to 64, but still almost twice as high as that of the over 65s. Nevertheless, results from the Health Behaviour in School-aged Children surveys show that tobacco smoking among 15-year-old children has fallen since 2000 ([45]). Figure 3.5 shows that the proportion of occasional smokers is highest among people aged 15 to 24 and lowest among people 65 and older.

Smoking was more prevalent among people with a lower level of education. While 19.5 % of people with a low level of education smoked on a daily

([40]) Self-perceived health by sex, age and income quintile, Source: Eurostat (online data code: hlth_silc_10).
([41]) Ibid.
([42]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, OECD Publishing, Paris, p. 90.
([43]) Ibid.
([44]) OECD (2014), *Health at a Glance: Europe 2014*, OECD Publishing, Paris, pp. 16 and 17.
([45]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, OECD Publishing, Paris, p. 88.

Figure 3.5: Smoking prevalence, by sex, age and educational attainment, EU-28, 2014 (% of population aged 15 or over)



Note: The educational attainment levels used in the graph refer to the following ISCED 2011 levels: 'low' = Less than primary, primary and lower secondary education (levels 0–2); 'medium' = Upper secondary and post-secondary non-tertiary education (levels 3–4); 'high' = Tertiary education (levels 5–8).

Source: Eurostat (online data code: sdg_03_30)

A new Tobacco Products Directive ([46]), adopted in February 2014, lays down rules governing the manufacture, presentation and sale of tobacco and related products. The Directive, which became applicable in EU countries on 20 May 2016, requires large mandatory combined health warnings on cigarette packages, bans all promotional and misleading elements on tobacco products, and prohibits cigarettes with characterising flavours, such as fruit or candy. From a public health perspective, the Directive aims to protect citizens from the hazardous effects of smoking and other forms of tobacco consumption, by helping them to quit or to not start smoking at all.

basis and 3.4 % occasionally, only 13.1 % of people with tertiary education smoked daily and an additional 5.6 % smoked occasionally.

The proportion of smokers among adults varied greatly across European countries. In 2014, more than every third person in Bulgaria (34.7 %), but only every sixth person in Sweden (16.7 %) smoked occasionally or daily. The reasons for the differences in smoking rates between the EU countries are complex. A research paper from 2010 suggests that national differences may be explained by differences in inequality, cigarette prices, regulation (such as ban of smoking in public places) or more generally in acceptance of evidence that smoking causes harm ([47]). A more recent paper from 2016 found an association between tobacco control policies, which includes cigarette prices or restrictions on smoking in public places, and smoking cessation mostly among higher socioeconomic groups ([48]).

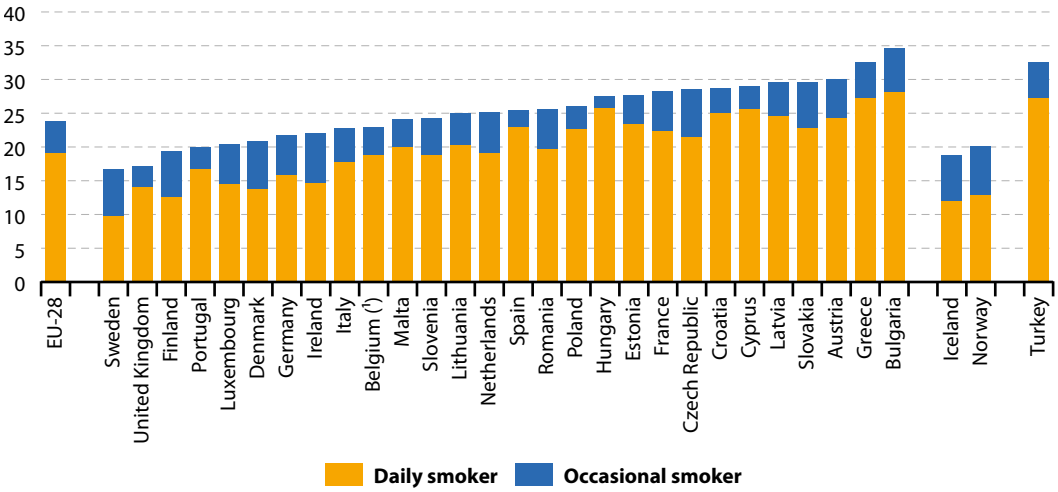
The share of daily or occasional smokers was higher among men than women in all considered countries. Looking at daily smokers, Sweden was the only country where the share of women

([46]) *Directive 2014/40/EU of the European Parliament and of the Council of 3 April 2014 on the approximation of the laws, regulations and administrative provisions of the Member States concerning the manufacture, presentation and sale of tobacco and related products and repealing Directive 2001/37/EC.*

([47]) See also: F. Pampel (2010), *Divergent Patterns of Smoking Across high-Income Nations,* in: E. Crimmins, S. Preston, and B. Cohen (eds.), International Differences in Mortaliy at Older Ages: Dimensions and Sources. Washington (DC), National Academies Press, p. 136.

([48]) J. R. Bosdriesz et al. (2016), *Tobacco control policy and socio-economic inequalities in smoking in 27 European countries*, Drug & Alcohol Dependence, Vol. 165, p. f79.

Figure 3.6: Smoking prevalence, by country, 2014
(% of population aged 15 or over)



(1) Data with low reliability.

Source: Eurostat (online data code: sdg_03_30)

(10.3 %) exceeded that of men (9.2 %). The difference in daily smoking between genders was small (< 3 percentage points) in Denmark, Ireland and the UK, as well as in the EFTA countries Iceland and Norway. In contrast, this gender difference was particularly large (22 to 25 percentage points) in Cyprus, Latvia, Lithuania and Romania, and even larger in the candidate country Turkey (28.7 percentage points).

Data from 2013 of G20 countries showed that in Indonesia 37.9 % of the population aged 15 and over smoked daily. Not only did Indonesia have the highest rate, but also the largest gender gap with 71.8 % of men and only 4.0 % of women smoking daily. In all countries, smoking was more common among men than women. More than 30 % of men in China, Japan, Russia, South Africa, South Korea and Turkey smoked daily ([49]).

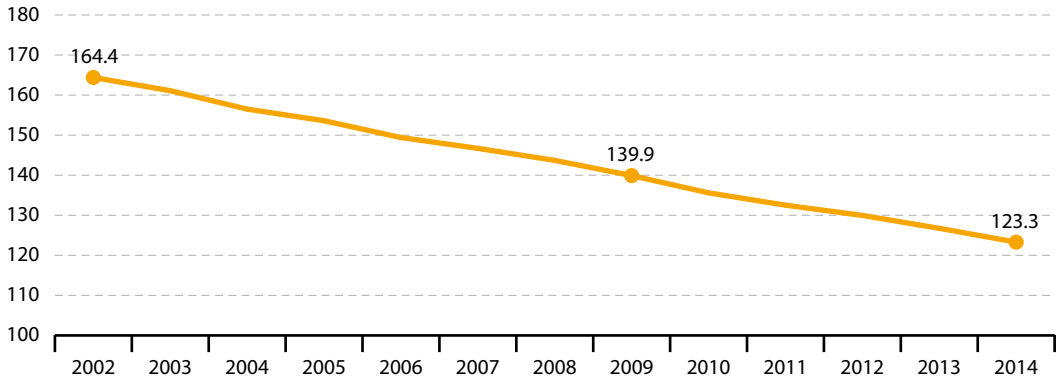
Death rate due to chronic diseases

There was a steady decrease in the premature death rate due to chronic diseases between 2002 and 2014.

The death rate due to chronic diseases is defined as the standardised death rate of certain chronic diseases. Death due to chronic diseases is considered premature if it occurs before the age of 65. The rate is calculated by dividing the number of people under 65 who die due to a chronic disease by the total population under 65. This value is then weighted with the European Standard Population ([50]). Thus, standardised death rates take

([49]) Eurostat (2016), *The EU in the World — 2016 Edition*, Publications Office of the European Union, Luxembourg, p. 49.
([50]) Eurostat (2013), *Revision of the European Standard Population. Report for Eurostat's Task Force*, Publications Office of the European Union, Luxembourg.

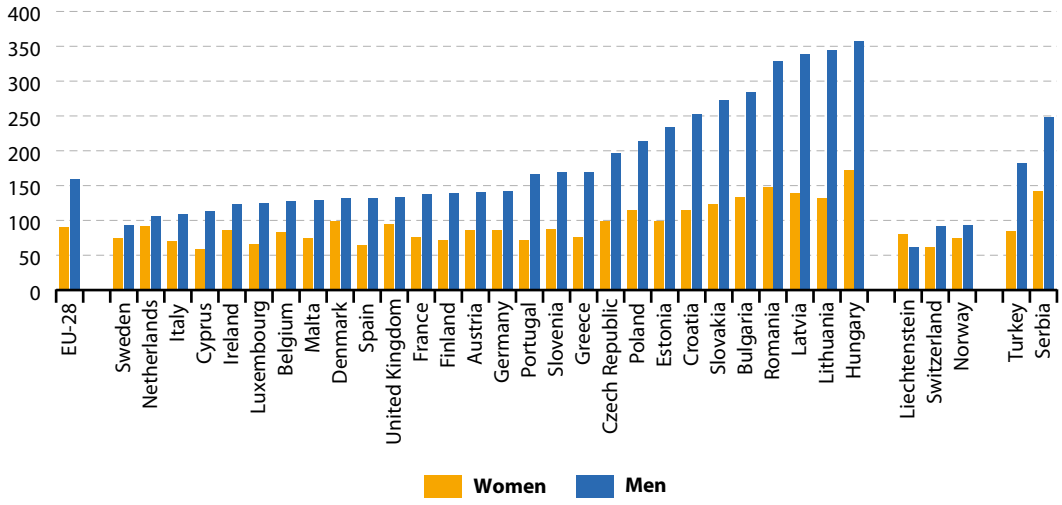
Figure 3.7: Death rate due to chronic diseases, EU-28, 2002–2014
(number per 100 000 persons aged less than 65)



Note: Data for 2002, 2004, 2005 and 2010 are provisional.
Source: Eurostat (online data code: sdg_03_40)

Supporting cooperation and networking in the EU in relation to preventing and improving the response to chronic diseases is one of the priorities of the EU's Third Health Programme ([51]). For example, in 2017 the Commission co-funded a joint action with Member States on cancer.

Figure 3.8: Death rate due to chronic diseases, by sex, by country, 2014
(number per 100 000 persons aged less than 65)



Source: Eurostat (online data code: sdg_03_40)

([51]) Regulation (EU) No 282/2014 of the European Parliament and of the Council of 11 March 2014 on the establishment of a third Programme for the Union's action in the field of health (2014–2020) and repealing Decision No 1350/2007/EC.

into account the fact that countries with larger shares of older inhabitants also have higher death rates. Chronic diseases included in the indicator are malignant neoplasms, diabetes mellitus, ischaemic heart diseases, cerebrovascular diseases, chronic lower respiratory diseases and chronic liver diseases.

The death rate due to chronic diseases before the age of 65 decreased annually by 2.37 % between 2002 and 2014. The decrease remained steady throughout the long- and short-term period. While in 2002 there were 164.4 deaths per 100 000 people under the age of 65 because of chronic diseases, this rate had fallen by 25 % to 123.3 in 2014.

For people under 65 years of age, the leading cause of mortality was cancer, with 79 deaths per 100 000 inhabitants in the EU in 2014. Contrary to the data for the whole population, respiratory diseases did not figure among the three most prevalent causes of mortality for those aged less than 65 and was even lower than the death rate for suicide. The death rates fell between 2004 and 2014 for each of the main causes of death, with the exception of lung cancer.

Standardised premature death rates due to chronic diseases vary considerably across the EU. The difference between the countries with the lowest and highest rate was slightly less than three-fold for women and almost four-fold for men. In addition, there were substantial differences between men and women within countries. Lower death rates translate into higher life expectancy and can partially explain the gender gap in the life expectancy indicator.

There are a number of explanations for these gender differences. First, in all countries, death rates for ischemic heart diseases (IHD) are much higher for men than for women ([52]). The IHD mortality rates have declined in all countries since 2000, due to reductions in tobacco use and improved medical care ([53]). Second, also in all countries, cancer mortality rates are higher for men than for women ([54]). This gap can be explained partly by men being more exposed to risk factors and the reduced availability or use of screening programmes for cancers affecting men ([55]). Last, in most countries, more men than women die from respiratory diseases ([56]). This was partly due to higher smoking rates among men, which is an important risk factor for many respiratory diseases ([57]).

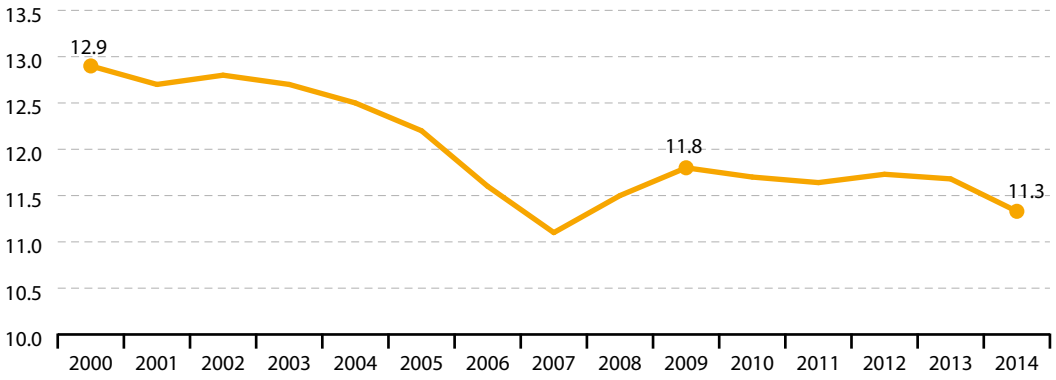
Suicide rate

While the suicide rate has decreased overall since 2000, there were still more suicides in 2014 than in 2007.

The World Health Organization defines suicide as an act deliberately initiated and performed by a person in the full knowledge or expectation of its fatal outcome ([58]). The number of suicides in certain countries may be under-reported because of the stigma associated with the act (for religious, cultural or other reasons). Caution is also required when comparing and interpreting variations in suicide rates between countries because of differences in reporting criteria, including how a person's intention of killing him- or herself is ascertained or who is responsible for completing the death certificate ([59]). Crude death rates are shown, meaning data is not adjusted for the age structure of a population.

([52]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, OECD Publishing, Paris, p. 62.
([53]) Ibid.
([54]) Id., p. 64.
([55]) Ibid.
([56]) Id., p. 66.
([57]) Ibid.
([58]) WHO (2001), *The World Health Report 2001, Mental Health: New Understanding, New Hope*, WHO Library Cataloguing in Publication Data, p. 37.
([59]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, OECD Publishing, Paris, p. 68.

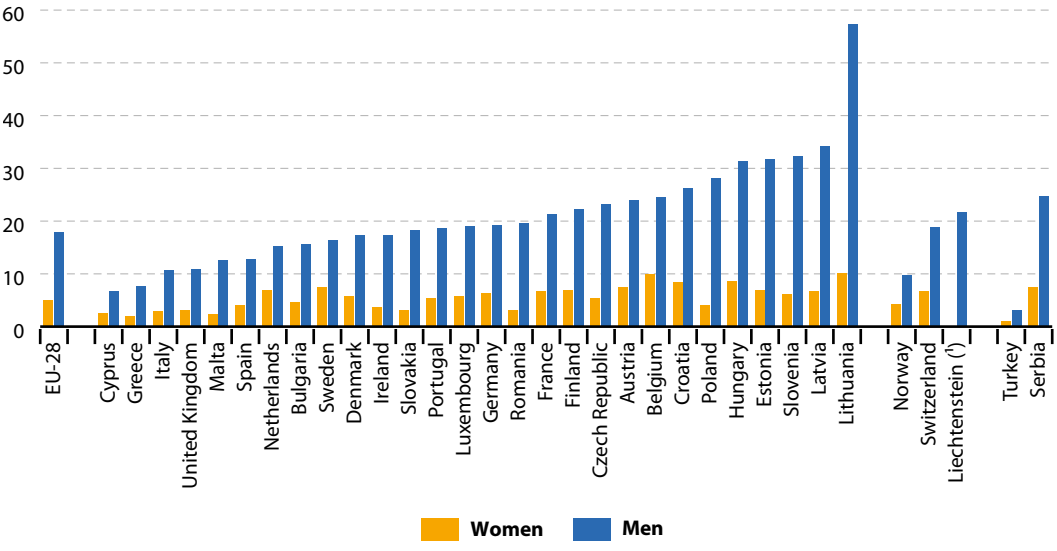
Figure 3.9: Suicide rate, EU-28, 2000–2014
(number per 100 000 persons)



Note: Data for 2000-2002, 2004, 2005 and 2010 are provisional.
Source: Eurostat (online data code: sdg_03_50)

The EU-Compass for Action on Mental Health and Well-being, launched in 2015, is a mechanism to collect and exchange information on policies and activities related to mental health. Priorities include preventing suicide, preventing depression and better access to mental health services.

Figure 3.10: Suicide rate, by sex, by country, 2014
(number per 100 000 persons)



(1) No data for women.
Source: Eurostat (online data code: sdg_03_50)

On average, there were 11.3 deaths per 100 000 inhabitants due to suicide in the EU in 2014. The number of suicide deaths has decreased by 1.6 deaths per 100 000 persons since 2000. While there was also a decrease in the past five years (– 0.5 deaths per 100 000 persons), the suicide rate of 2014 was higher than in 2007 (11.1 deaths per 100 000 persons).

Previous studies have shown a strong link between adverse economic developments and higher suicide rates ([60]). In a number of European countries, suicide rates rose slightly at the start of the economic crisis in 2008, mainly among men ([61]), but this trend did not persist in most countries ([62]).

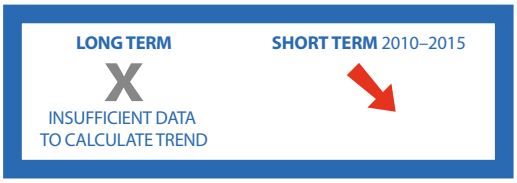
As a recent World Bank report showed, high suicide rates are not restricted to any one region. However, rates for all ages tend to be higher in Europe as well as Central Asia and high-income countries ([63]).

In all EU, EFTA and candidate countries, suicide rates were higher for men than for women in 2014. On average across EU countries, the rate was 3.5 times greater for men than for women. The gender gap was narrower for attempted suicides, reflecting the fact that women tend to use less fatal methods than men ([64]). In addition, suicide risk also generally increased with age ([65]).

As mentioned above, the comparability of suicide data between countries is affected by a number of factors. In 2014, suicide rates for men varied widely across countries. There was a more than eight-fold difference between the country with the highest rate and the country with the lowest rate. The suicide rates for women varied less in 2014, but there was still a more than five-fold difference.

Self-reported unmet need for medical care

There were no substantial changes in the share of people reporting unmet care needs between 2008 and 2015.

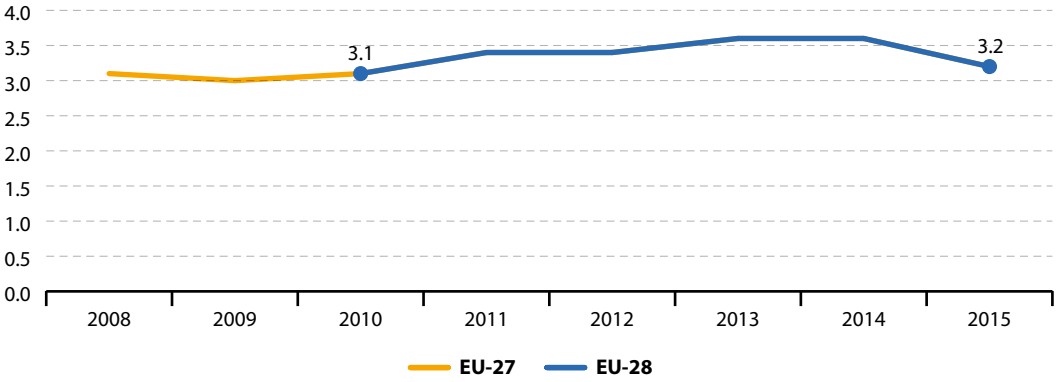


Self-reported unmet needs for medical care concern a person's own assessment of whether he or she needed examination or treatment for a medical condition but did not have it or seek it because of at least one of the following three reasons: 'financial reasons', 'waiting list' and 'too far to travel'. The data for the indicator is gained through the European Union Statistics on Income and Living Conditions survey (EU SILC). Inequalities within countries are measured by comparing the responses of the first and fifth income quintile groups ([66]). Since social norms and expectations may affect responses to questions about unmet care needs, caution is required when comparing inequalities across countries ([67]).

Most people in the EU did not report that they had unmet medical care needs. In 2015, only 3.2 % of the EU population reported an unmet need for medical examination or treatment. There were no substantial changes in the share of the population

([60]) See e.g. K. van Gool and M. Pearson (2014), *Health, Austerity and Economic Crisis: Assessing the Short-term Impact in OECD Countries*, OECD Health Working Papers, No. 76, OECD Publishing, Paris.
([61]) S.S. Chang et al. (2013), *Impact of 2008 Global Economic Crisis on Suicide: Time Trend Study in 54 Countries*, British Medical Journal, Vol. 347, p. f5239.
([62]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, OECD Publishing, Paris, p. 68.
([63]) World Bank (2017), *Atlas of Sustainable Development Goal 2017: World Development Indicators*, World Bank; Washington, DC, p. 15 and 17.
([64]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, OECD Publishing, Paris, p. 68.
([65]) Ibid.
([66]) Income quintile groups are computed based on the total equivalised disposable income attributed to each member of the household. The first quintile group represents the 20 % of the population with the lowest income, and the fifth quintile group represents the 20 % of the population with the highest income.
([67]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, OECD Publishing, Paris, p. 154.

Figure 3.11: Self-reported unmet need for medical care, EU-27 and EU-28, 2008–2015 (% of population aged 16 and over)



Note: Reasons include: too expensive, too far to travel, and waiting list.

Source: Eurostat (online data code: sdg_03_60)

Universal health coverage is an objective of the EU Charter of Fundamental Rights ([68]). One of the three priorities of the EU's health policy is increasing accessibility to health care. Further information can be found in the 2014 Commission Communication: On effective, accessible and resilient health systems ([69]). In addition, one of the 20 principles of the European Pillar of Social Rights ([70]) is that everyone has the right to timely access to affordable, preventive and curative health care of good quality.

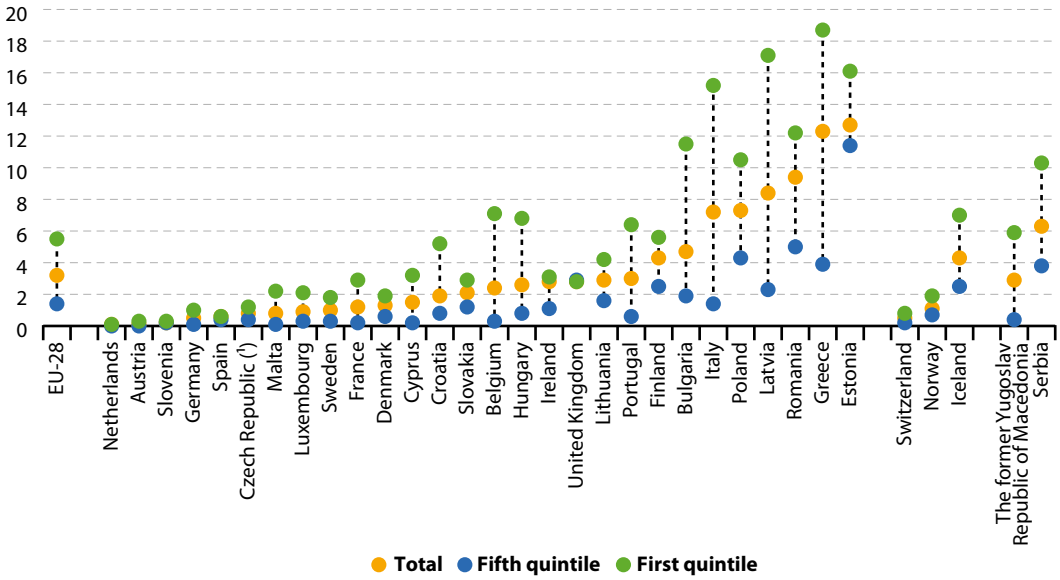
reporting unmet need for medical examination or treatment between 2008 and 2015. However, there was a more or less continuous increase between 2009 and 2014, which can also be seen as a sign of the financial and economic crisis ([71]). The share only started to drop again between 2014 and 2015, falling by 0.4 percentage points. This drop might have been due to changes in methodology in some countries.

In 2015, only 1.4 % of the high-income group in the EU reported unmet care needs. However, from the low-income group, almost four times more, 5.5 % of people, reported unmet care needs in 2015. The increase in unmet care needs was particularly noticeable among people in low-income groups. In Greece and Portugal, the percentage of people reporting unmet care needs not only increased on average, but also particularly among the low-income group since the crisis in 2008 ([72]). Differences also exist between age groups. In 2015, the share of people reporting unmet care needs was 1.3 % among people aged 16 to 24, but 4.6 % among people aged 75 to 84.

There were considerable differences between countries and their rates of people reporting unmet need for medical examination and treatment. While in eight countries less than 1 % of people reported unmet health care needs in 2015, this share was more than 12 % in Greece and Estonia. The two countries' rates were almost four times higher than the EU average. There are multiple reasons for the differences between

([68]) *Charter of Fundamental Rights of the European Union (2000/C 364/01).*
([69]) European Commission (2014), *Communication from the Commission on effective, accessible and resilient health systems,* COM(2014) 215 final.
([70]) European Commission, *Establishing a European Pillar of Social Rights*, COM(2017) 250 final, Brussels, 2017.
([71]) Expert Panel on effective ways of investing in health (EXPH) (2016), *Access to health services in the European Union,* final opinion approved at the 14th plenary meeting of 3 May 2016 after public consultation.
([72]) OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle,* OECD Publishing, Paris, p. 154.

Figure 3.12: Self-reported unmet need for medical care, by income quintile, by country, 2015 (% of population aged 16 and over)



(1) Data have low reliability.

Source: Eurostat (online data code: sdg_03_60)

countries. One reason could be the public coverage for medical care. Data shows that there are higher proportions of unmet needs for dental care than for medical care, which reflects the fact that public coverage for dental care is generally lower in most countries ([73]).

There were not only considerable differences between countries, but also within countries. Countries with the lowest rates of people reporting unmet need for medical examination and treatment also had smaller differences between the highest and lowest income groups. For example, in Greece and Latvia, where the unmet needs were among the highest in the EU, the difference between the low and high income groups was 14.8 percentage points for both countries. The main reason given by people in the low income group for reporting unmet health care needs was that care was too expensive ([74]). Age was also a factor linked to unmet needs for medical care. Generally, Member States with high shares of unmet needs for medical care displayed particularly high shares for older people ([75]).

([73]) European Commission, *Establishing a European Pillar of Social Rights*, COM(2017) 250 final, Brussels, 2017.
([74]) Ibid.
([75]) Eurostat, Statistics Explained, *Unmet health care needs statistics.*

Further reading on good health and well-being

European Commission (2016), *State of Health in the EU: Summary.*

OECD/EU (2016), *Health at a Glance: Europe 2016 — State of Health in the EU Cycle*, OECD Publishing, Paris.

Coffey International Development et al. (2015), *Ex-post evaluation of Ex-smokers campaign, Executive Summary*, Publication Office of the European Union, Luxembourg.

Coffey International Development et al. (2015), *Ex-post evaluation of the Health Programme (2008-2013)*, final report, Publication Office of the European Union, Luxembourg.

European Centre for Disease Prevention and Control (2013), *Health inequalities, the financial crisis, and infectious disease in Europe*, ECDC, Stockholm.

European Observatory on Health Systems and Policies (2016), *Health System Efficiency: How to make measurement matter for policy and management*, Partnership hosted by the World Health Organization.

J. Medeiros and C. Schwierz (2015), *Efficiency estimates of health care systems*, Economic Papers 549, Publications Office of the European Union, Luxembourg.

World Bank (2017), *Atlas of Sustainable Development Goals 2017: World Development Indicators*, World Bank; Washington, DC.

World Health Organization (2015), *Health in 2015: from MDGs, Millennium Development Goals to SDGs, Sustainable Development Goals*.

World Health Organization (2016), *World health statistics 2016: monitoring health for the SDGs, Sustainable Development Goals*.

4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

The global perspective on SDG 4

The goal of achieving universal education reaffirms the belief that education is one of the most powerful and proven drivers for improving people's lives and sustainable development. SDG 4 seeks to ensure people have access to equitable and quality education through all stages of life, from early childhood education and care, through primary and secondary schooling, to technical, vocational training and tertiary education. In addition to promoting formal qualifications, SDG 4 also aims to increase the number of youths and adults with relevant skills for employment, decent jobs and entrepreneurship. Furthermore, it envisions a world with no gender disparities in education and where vulnerable people, including those with disabilities, have equal access to all levels of education and vocational training. Achieving universal literacy and numeracy and acquiring knowledge and skills to promote sustainable development are also considered crucial for empowering people to live independent, healthy and sustainable lives. To accelerate progress with all these objectives, SDG 4 calls for more educational facilities to be built and upgraded, more higher education scholarships to be made available to developing countries and a greater supply of qualified teachers ([1]).

eurostat supports the SDGs

Education is one of the main crucial aspects of the human development, being important throughout all life stages. Therefore, monitoring SDG 4 'quality education' in an EU context focuses on the sub-themes 'basic education', which covers the earliest stages in people's educational pathway, 'tertiary education', which includes higher educational attainment and its impact on employment, and 'adult education', which looks into systematic and sustained self–educating activities in order to gain new forms of knowledge and skills. As shown in Table 4.1, the EU's progress in these areas has been rather mixed.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, *Atlas of Sustainable Development Goals 2017 from World Development Indicators*, 2017.

Table 4.1: Indicators measuring progress in SDG 4, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Basic education			
Early leavers from education and training	↑ (1)	↑	p. 92
Early childhood education and care	↑ (1)	↑	p. 94
Underachievement in reading, maths and science	↘ (2)	↓	p. 96
Young people neither in employment nor in education and training (*)	↗ (1)	↑	SDG 8, p. 173
Tertiary education			
Tertiary educational attainment	↑ (1)	↑	p. 98
Employment rate of recent graduates	↓ (3)	↘	p. 100
Adult education			
Adult participation in learning	↘ (1)	↘	p. 102

Note: The indicators, except for the multi-purpose indicator on 'Young people neither in employment nor in education and training', are identical to the indicators used in the Education and Training 2020 (ET 2020) framework, and progress is measured against the respective ET 2020 benchmarks. The approach applied in this report and the meaning of the symbols is explained in the Introduction.

(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Past 14-year period.
(2) Trend for 'reading performance' only.
(3) Past 10-year period.

Education in the EU: overview and key trends

Education and training are key drivers for growth and jobs as they help boost productivity, innovation and competitiveness. In the broader sense, education is also seen as key to achieving many of the other Sustainable Development Goals (SDGs). A quality education helps people to escape the poverty cycle. Education therefore helps to reduce inequalities and reach gender equality. It also empowers people everywhere to live healthier lives and adopt a more sustainable lifestyle. Education also fosters tolerance between people and contributes to more peaceful societies.

Education and Training 2020 (ET 2020) is the strategic framework for European cooperation in education and training. It provides common strategic objectives to help Member States further develop their educational and training systems. The framework takes into consideration the whole spectrum of education and training systems from a lifelong learning perspective, covering all levels and contexts (including non-formal and informal learning). ET 2020 defines several benchmarks that guide the analysis in this chapter.

Basic education

Basic education covers the earliest stages in children's educational pathway, ranging from early childhood education to primary and secondary education. **Early childhood education and care** (ECEC) can bring wide-ranging social and economic benefits for individuals and for society. Quality ECEC provides the foundation for effective adult learning and future educational achievements. It also paves the way for later success in life in terms of well-being, employability and social integration, especially for children from disadvantaged backgrounds. Investment in pre-primary education also offers higher medium- and long-term returns and is more likely to help children from low socio-economic status than investment at later educational stages ([2]). The ET 2020 framework recognises ECEC's potential for addressing social inclusion and economic challenges. It has set a benchmark to ensure that at least 95 % of children aged between four and the starting age of compulsory education participate in ECEC. In the EU, participation in ECEC has been steadily increasing since 2003 and the ET 2020 benchmark of 95 % was within reach in 2015.

An inclusive and quality education for all, eliminating school segregation, is an essential element of sustainable development. SDG 4 calls not only for all girls and boys to have access to primary and secondary education but also to be able to complete their schooling, because leaving school early has a big impact on people's lives. People with a low level of education may not only face greater difficulties in the labour market but also have a higher risk of poverty and social exclusion ([3]). To mark the importance of educational attainment, the indicator **early leavers from education and training** provides an insight into progress towards these objectives by measuring the proportion of a country's population aged 18 to 24 who have at most lower secondary education and are not in any education or training. The fall from 17.0 % in 2002 to 10.7 % in 2016 represents a considerable progress towards the ET 2020 benchmark of 10 %.

SDG 4 focuses on granting greater and more equitable access to education and training and ensuring it is of high quality. An important objective is that education systems deliver high levels of numeracy and literacy and enable other foundational skills to be acquired. The indicator on **underachievement in reading, maths and science** provides key insights into the performance of school systems and pupils' basic skills attainment. The ET 2020 framework acknowledges the increasing importance of these individual skills and has set a target to reduce the share of 15 year olds achieving low levels of reading, maths and science to less than 15 % by 2020. In 2015, about every fifth of 15 year olds showed insufficient abilities in these

([2]) European Commission/EACEA/Eurydice/Eurostat (2014), *Key Data on Early Childhood Education and Care in Europe*, p. 19.
([3]) European Commission (2016), *Education and Training Monitor 2016*, p. 38.

skills. Compared to 2012 this is a step backward, meaning the EU is lagging behind in all three domains when it comes to reaching its target.

Young people (15 to 29 year olds) are among the most vulnerable groups, facing low employment rates and greater job insecurity. Jobs for young people are important for social, economic and political inclusion. Moreover, an individual's first job tends to be an indicator of their lifelong earnings and people with poor job prospects risk falling into 'low-pay traps'. Young people who are **not engaged in employment nor in education and training (NEET)** might lack skills and suffer from erosion of competences. This puts them at an even higher risk of labour market and social exclusion and means they are more likely to depend on benefits. The NEET rate in the EU improved slightly between 2002 and 2016 from 15.6 % to 14.2 %.

Tertiary education

Continuing education after the basic level is important because people with higher qualifications are more likely to be employed and less likely to face poverty in a knowledge-based economy. Therefore investing efficiently in education and training systems that deliver high-quality and up-to-date services lays the foundation for a country's prosperity. Moreover, employment rates overall rise with educational level. People holding a doctoral degree are the most likely to be employed, followed by those with a master's degree and graduates with a bachelor's degree. On the other hand, low levels of tertiary educational attainment can hinder competitiveness, innovation and productivity and undermine growth potential. The ET 2020 framework therefore aims to raise the share of the population aged 30 to 34 that have completed **tertiary or equivalent** education to at least 40 %. The EU, with a tertiary educational attainment rate of 39.1 % in 2016, seems to be on track to reach the target in 2020.

The ET 2020 framework acknowledges the important role of education and training in raising employability. It has set a benchmark that at least 82 % of recent graduates' (20 to 34 year olds) should have found employment no more than three years after leaving education and training. The **employment rate of recent graduates** from at least upper secondary education and not in any education or training increased in 2016 for the third consecutive year and stood at 78.2 %. Nonetheless, the employment rate for recent EU graduates has not yet regained the pre-economic crisis peak of 82 % in 2008 and it is thus not on track to meeting the 2020 target of 82 %.

Adult education

Underpinning the ongoing quest for a high-quality labour force with up-to-date skills is the goal of **adult learning**; fostering democratic citizenship and social inclusion are equally important objectives. Adult education and training covers the longest time span in the process of learning throughout a person's life. After an initial education and training phase, adult learning is crucial for maintaining good health, remaining active in the community and being fully included in all aspects of society, as well as improving and developing skills, adapting to technical developments, advancing a career or returning to the labour market. The ET 2020 framework includes a benchmark that aims to raise the share of adults who stated that they received formal or non-formal education and training in the four weeks before the survey to at least 15 %. In 2016, the rate stood at 10.8 %, basically stagnating over the past four years. The EU thus does not seem to be on track towards meeting this benchmark by 2020.

Quality education in the EU

Basic education

Early leavers from education in 2016
10.7 % of population aged 18 to 24
- 2.7 pp since 2011

Early childhood education in 2015
94.8 % of children aged between 4 and the starting age of compulsory education
+ 1.9 pp since 2010

Underachievement in reading, maths and science in 2015
% of 15-year-old students who fail to reach PISA level 2

19.7 %
+ 0.2 pp since 2009

22.2 %
- 0.1 pp since 2009

20.6 %
+ 2.9 pp since 2009

Not in employment, education or training in 2016
14.2 % of population aged 15 to 29
- 1.2 pp since 2011

Tertiary education

Tertiary educational attainment in 2016
39.1 % of population aged 30 to 34
+ 4.3 pp since 2011

Employed recent graduates in 2016
78.2 % of population aged 20 to 34
+ 1.2 pp since 2011

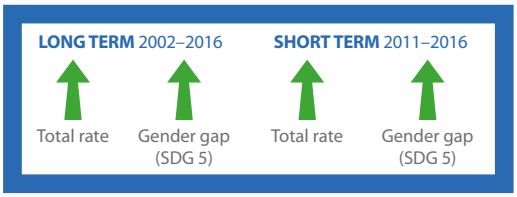
Adult education

Adult learning in 2016
10.8 % of population aged 25 to 64
+ 1.7 pp since 2011

Source: Eurostat (online data codes: sdg_04_10, sdg_04_30, sdg_04_40, sdg_08_20, sdg_04_20, sdg_04_50 and sdg_04_60)

Early leavers from education and training

The share of early leavers from education and training in the EU has fallen continuously since 2002 and is well on track to reaching the 10 % target in 2020. The gender gap has also narrowed, with men slowly catching up to women.



The EU has defined upper secondary education as the minimum desirable educational attainment level for EU citizens. The skills and competences gained in upper secondary education are considered essential for successful entry into the labour market and as the foundation for lifelong learning. The indicator 'early leavers from education and training' measures the share of the population aged 18 to 24 with at most lower secondary education who were not involved in any education or training during the four weeks preceding the survey. Data presented in this section stem from the EU Labour Force Survey (EU-LFS).

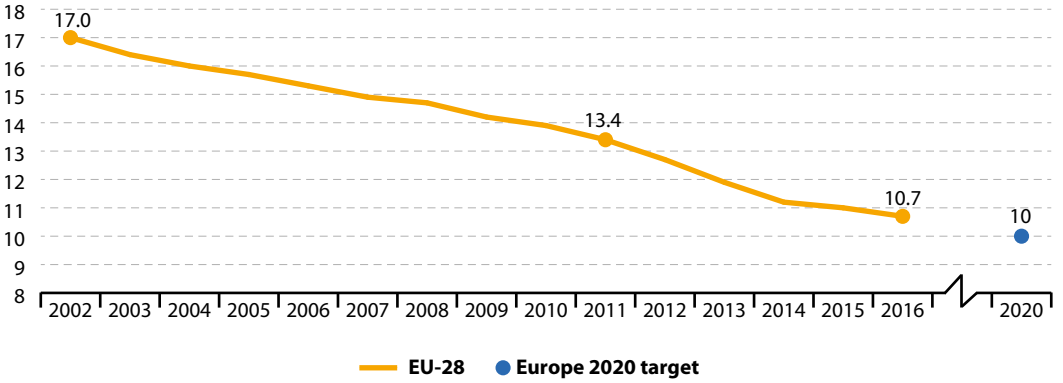
Figure 4.1 shows that the share of early leavers has been falling continuously in the EU since 2002, albeit more slowly in recent years.

Despite marked overall progress towards reaching the Europe 2020 target, significant disparities exist between women and men and between native inhabitants and those born elsewhere. Men tend to leave education and training earlier than women in the EU. Although this gap has been narrowing since 2004, it remained substantial with 12.2 % of men on average and 9.2 % of women leaving early in 2016.

A person's country of birth is another factor that strongly influences the rate of early leaving. There is clear evidence that foreign-born people tend to find it more difficult to complete their education than the native population. In 2016, the share was twice as high for people born outside the EU than for people studying in their country of birth. Most at risk are foreign-born men, with an early leaving rate of 21.1 % in 2016 ([4]).

People with disabilities — people who are limited in work activity because of a long-standing health problem or a basic activity difficulty (such as sight, hearing, walking or communicating

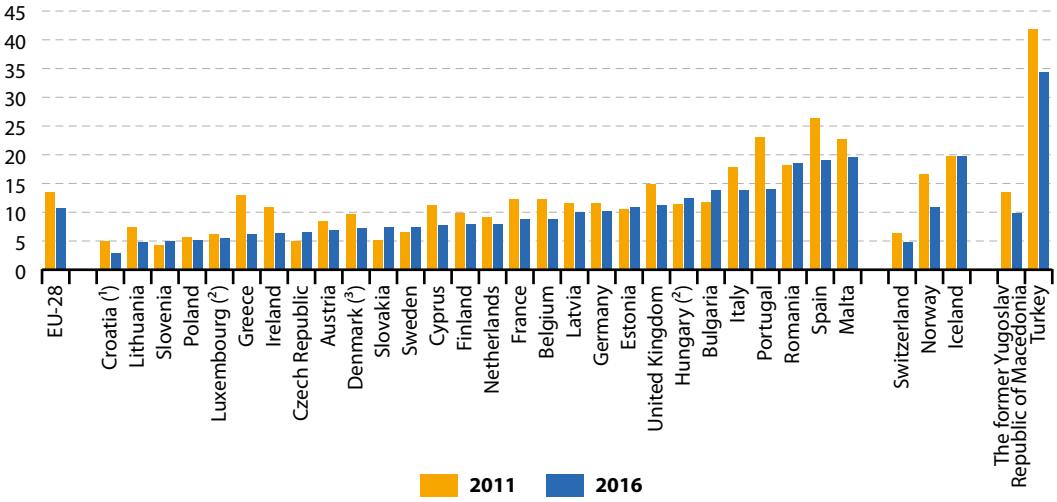
Figure 4.1: Early leavers from education and training, EU-28, 2002–2016
(% of population aged 18 to 24)



Note: Breaks in time series in 2003, 2006 and 2014.
Source: Eurostat (online data code: sdg_04_10)

([4]) Early leavers from education and training by sex and country of birth. Source: Eurostat (online data code: edat_lfse_02).

Figure 4.2: Early leavers from education and training, by country, 2011 and 2016
(% of population aged 18 to 24)



Note: For all countries there is a break in the time series in 2014 (switch from ISCED 1997 to ISCED 2011), data are comparable for all countries except for Estonia.

(1) 2016 data have low reliability.
(2) Break in time series in 2015.
(3) Break in time series in 2016.

Source: Eurostat (online data code: sdg_04_10)

The ET 2020 framework (5) aims to reduce the rates of early school leaving to below 10 %. The Europe 2020 strategy (6) includes this benchmark as one of its headline targets. Reducing early leaving is also a priority of the European Social Fund (7).

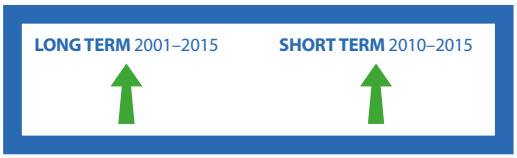
difficulties) (LHPAD) — appear extremely disadvantaged. In 2011, 31.5 % of disabled people left education and training early compared to 12.3 % of non-disabled young people (8). Low educational attainment, referring to at most lower secondary education, influences other socioeconomic variables. The most important of these are employment, unemployment and the risk of poverty or social exclusion. Early leavers and low-educated young people face particularly severe problems in the labour market, because about 58 % of 18 to 24 year olds with at most lower secondary education and who were not in any education or training were either unemployed or inactive in 2016. The situation for early leavers has worsened over time. Between 2008 and 2016, the share of 18 to 24 year old early leavers who were not employed but who wanted to work grew from 30.6 % to 37.4 % (9).

As 4.2 shows, rates of early leaving varied widely across Member States, ranging from about 3 % to almost 20 %. About two-thirds of Member States showed reductions in early leaving between 2011 and 2016, with the strongest decreases reported by southern European countries like Portugal, Spain and Greece.

(5) Council of the European Union (2009), *Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020')* (2009/C 119/02).
(6) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.
(7) Regulation (EU) No 1304/2013 of the European Parliament and of the Council of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006.
(8) Eurostat, *Disability statistics — access to education and training* (accessed 19 September 2017). It is foreseen to improve the availability of disability-related indicators in LFS for future monitoring.
(9) Early leavers from education and training by sex and labour status. Source: Eurostat (online data code: edat_lfse_14).

Early childhood education and care

The share of children participating in early childhood education and care has grown continuously since 2001 and had almost met the target of 95 % in 2015.

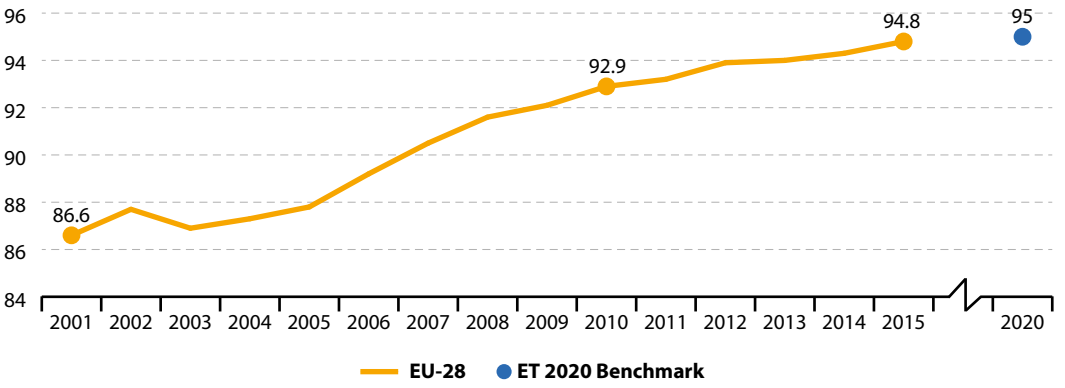


Early childhood education and care (ECEC) is increasingly recognised as an integral part of the education and training system. The EU therefore aims for all children between four years old and the age of compulsory primary education to be able to access and benefit from high-quality education and care and included the benchmark of a participation rate of at least 95 % in its ET 2020 framework ([10]). Data presented in this section stem from the joint UIS (UNESCO Institute of Statistics)/OECD/Eurostat (UOE) questionnaires on education statistics, which constitute the core database on education. The UOE data collection is an administrative data collection administered jointly by the United Nations Educational, Scientific and Cultural Organization — Institute for Statistics (UNESCO-UIS), the Organisation for Economic Co-operation and Development (OECD) and the Statistical Office of the European Union (EUROSTAT).

Participation in ECEC has grown more or less continuously in the EU since 2001. In 2015, 94.8 % of children between the age of four and the starting age of compulsory education participated in ECEC, this is 8.2 percentage points higher than in 2001. Therefore, the ET 2020 benchmark of 95 % has almost been reached in 2015.

In general, ECEC can also be applied to children from birth to the start of compulsory primary schooling. In most European countries, ECEC is therefore split into two phases: early childhood educational development programmes with educational content designed for younger children (in the age range of 0 to 2 years); and pre-primary education for children aged between three and the starting age for primary education ([11]). Contrary to the older age group, ECEC and formal childcare participation among

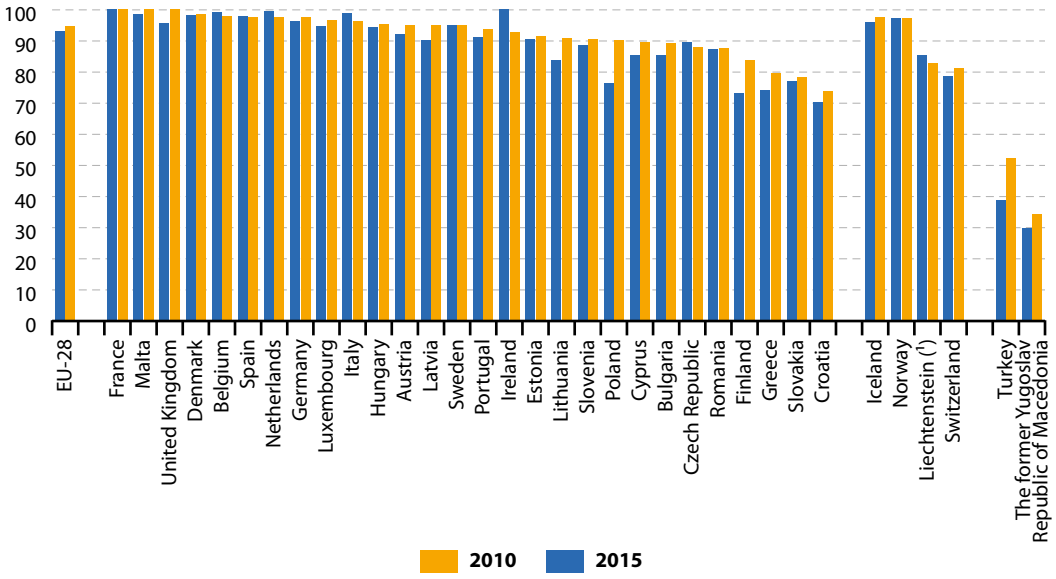
Figure 4.3: Participation in early childhood education, EU-28, 2001–2015
(% of the age group between 4 years and the starting age of compulsory education)



Note: Break in time series in 2013 (switch from ISCED 1997 to ISCED 2011).
Source: Eurostat (online data code: sdg_04_30)

([10]) See: European Commission/EACEA/Eurydice/Eurostat (2014), *Key Data on Early Childhood Education and Care in Europe*, p.11.
([11]) See: European Commission (2015), *Education and Training Monitor 2016*, p. 50.

Figure 4.4: Participation in early childhood education, by country, 2010 and 2015
(% of the age group between 4 years and the starting age of compulsory education)



Note: For all countries there is a break in the time series in 2013 (switch from ISCED 1997 to ISCED 2011).
(1) 2014 data (instead of 2015).

Source: Eurostat (online data code: sdg_04_30)

Raising the share of children participating in ECEC is part of the ET 2020 framework ([12]).

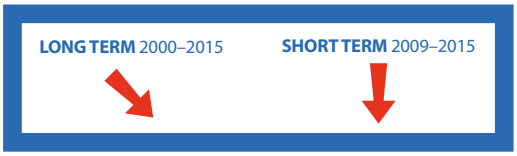
children under the age of three is very low. The participation rate in formal childcare (between 1 and 29 hours) for children less than three years stood at 14.8 % in comparison to children from three years to the minimum compulsory school age with 34.0 % ([13]).

There is considerable variation in participation in ECEC across the EU, ranging from 100 % to 73.8 % in 2015. Half of the Member States had already exceeded the ET 2020 benchmark in 2015, implying almost universal enrolment in some form of education for children between the age of four years and the compulsory education age.

([12]) Council of the European Union (2009), *Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020')* (2009/C 119/02).
([13]) Formal childcare by age group and duration — % over the population of each age group — EU SILC survey. Source: Eurostat (online data code: ilc_caindformal). Formal childcare refers to the four EU SILC survey variables: 1. Education at pre-school or equivalent; 2. Education at compulsory education; 3. Child care at centre-based services outside school hours and 4. Child care at day-care centre organised/controlled by a public or private structure.

Underachievement in reading, maths and science

One-fifth of 15-year-olds showed insufficient abilities in reading, maths and science in 2015. This share is higher than in 2012, indicating the EU is not making sufficient progress towards reaching the target in 2020.



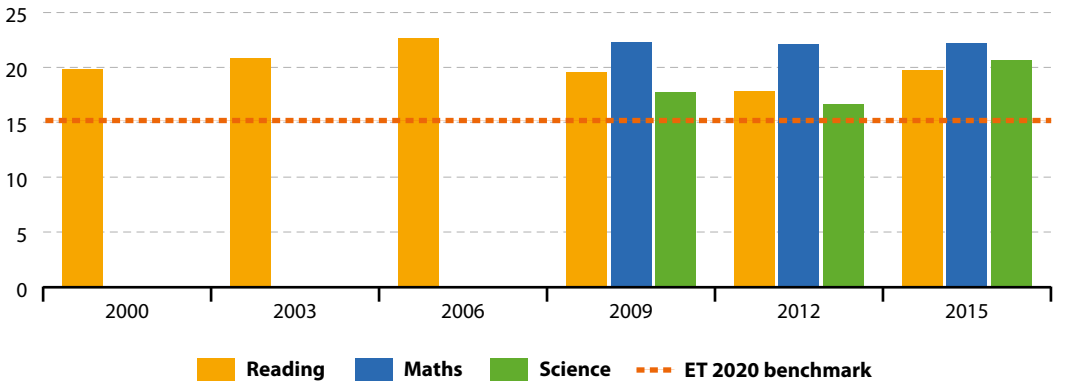
Achieving a certain level of proficiency in basic skills is a key objective of all educational systems. Basic skills, such as reading a simple text or performing simple calculations, provide the foundations for learning, gaining specialised skills and personal development. People need these skills to complete basic tasks and to participate fully in and contribute to society. The consequences of underachievement if it is not tackled successfully will be costly in the long run, for both individuals and for society as a whole ([14]).

Various factors contribute to underachievement, for example an unfavourable school climate, violence, insufficient learning support or poor teacher-pupil relationships.

The data presented in this section stem from the Programme for International Student Assessment (PISA), which is an internationally standardised assessment developed by the OECD and administered to 15-year-olds in schools. The ET 2020 framework aims to reduce the proportion of underachieving 15-year-olds in reading, maths and science to below 15 % by 2020. The benchmark refers to the OECD's PISA study ([15]), in which underachievement is defined as failing to reach level 2 ('basic skills level') on the PISA scale for the three domains.

According to most recent PISA study results, every fifth 15-year-old EU pupil showed insufficient abilities in reading, maths and science in 2015. Test results were best for reading, with a 19.7 % share of

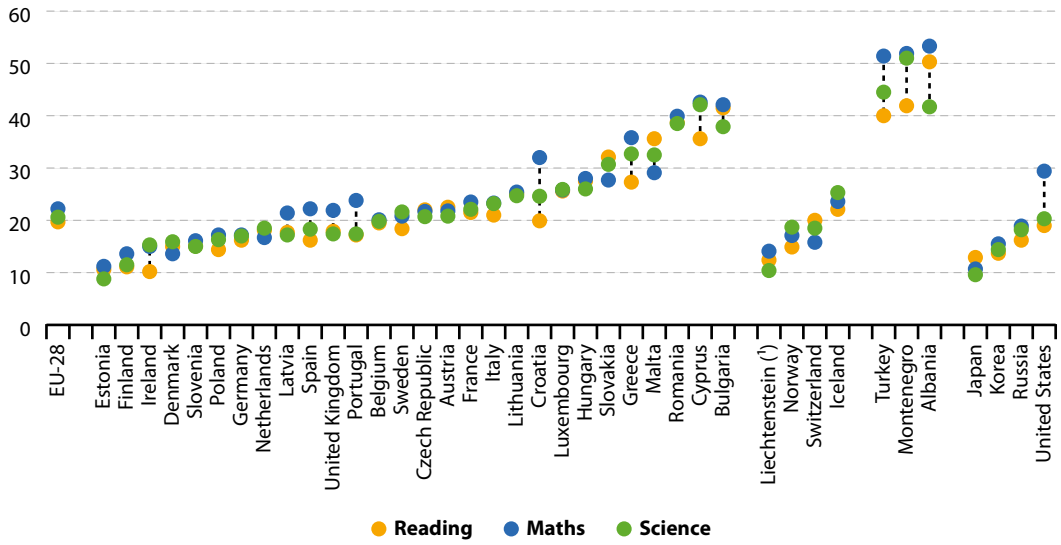
Figure 4.5: Underachievement in reading, maths and science, EU, 2000–2015
(% of 15-year-old students)



Note: Composition of EU aggregate differs for each year because not all Member States took part in all PISA editions; 2015 data refer to EU-28.
Source: OECD/PISA (Eurostat online data code: sdg_04_40)

([14]) European Commission (2016), *PISA 2015: EU performance and initial conclusions regarding education policies in Europe*, p.3.
([15]) PISA is an international study that was launched by the OECD in 1997. It aims to evaluate education systems worldwide every three years by assessing 15-year-olds' competencies in the key subjects: reading, mathematics and science. For further details see http://www.oecd.org/pisa/

Figure 4.6: Underachievement in reading, maths and science, by country, 2015
(% of 15-year-old students)



(1) 2012 data.

Source: OECD/PISA (Eurostat online data code: sdg_04_40)

In 2016, the European Commission launched the New Skills Agenda for Europe ([16]). In December 2016 the Council adopted a Recommendation 'Upskilling Pathways: new opportunities for adults', under which Member States agreed to improve their adult learning provision to specifically address the needs of low-skilled, low-qualified adults. Reducing underachievement is also a target of the ET 2020 framework ([17]).

low achievers, followed by science with 20.6 % and maths with 22.2 %.

These results show that the EU is seriously lagging behind in all three domains when it comes to progress towards the ET benchmark of less than 15 %. Compared to 2009 and 2012, the share of low achievers has increased for reading and science, while for maths it has remained stable at a high level.

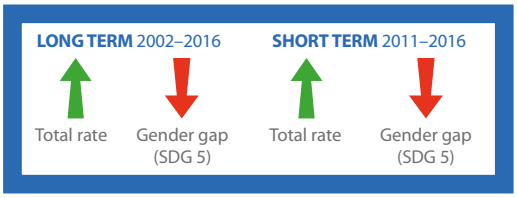
Gender differences are most pronounced for reading skills, with girls clearly outperforming boys. While only 15.9 % of 15-year-old girls scored low in this domain in 2015, the share of low-achieving boys was 23.5 %. In contrast, gender gaps in maths and science remained negligible.

Large discrepancies in reading, maths and science skills also exist across the EU. However, achievement levels of the different skills appear to be closely related, with Member States that show certain levels of achievement in one area tending to show a similar value in the others. By 2015, only Estonia and Finland had reached the ET 2020 benchmark, with a share of low achievers in all three domains below 15 %.

([16]) European Commission (2016), *A new skills agenda for Europe: Working together to strengthen human capital, employability and competitiveness*, COM(2016) 381 final, Brussels.
([17]) Council of the European Union (2009), Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020') (2009/C 119/02).

Tertiary educational attainment

The tertiary educational attainment rate of 30 to 34 year olds has increased by 15.5 percentage points since 2002 and is on track to reach the target of 40 %. But the gender gap has widened considerably, with men falling further and further behind.



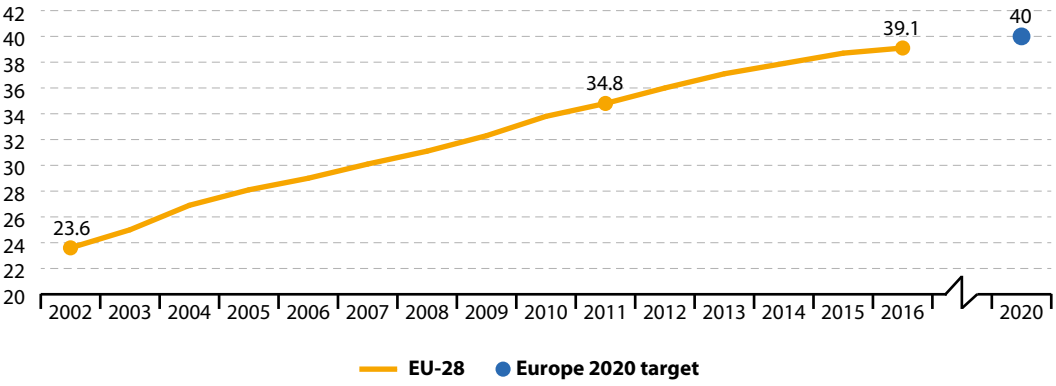
Raising the share of the population aged 30 to 34 that has successfully completed tertiary education to at least 40 % is another ET 2020 target. Educational attainment is defined according to the International Standard Classification of Education (ISCED). Tertiary educational attainment refers to ISCED 2011 level 5–8 (for data as from 2014) and to ISCED 1997 level 5–6 (for data up to 2013). The data presented in this section stem from the European Union Labour Force Survey (EU-LFS), a household survey based on European legislation.

The share of 30 to 34 year olds with tertiary educational attainment has grown steadily since 2002, mirroring increases across all Member States. This to some extent reflects Member States' investment in higher education to meet demand for a more skilled labour force. Moreover, the increases can also be ascribed to the shift to shorter degree programmes following implementation of Bologna ([18]) process reforms in some countries.

Despite the overall positive trend, the gender gap among tertiary education graduates has significantly widened across the EU. While in 2002 the share was similar for women and men, the increase up to 2016 was almost doubled for women, who in 2016 were already clearly above the ET 2020 benchmark, at 43.9 %. In contrast, the share among 30 to 34-year-old men was nearly 10 percentage points lower, at 34.4 %.

There is also difference in terms of migrant status. In 2016, the tertiary educational attainment rate was more than 4 percentage points higher for native-born residents than for the foreign-born

Figure 4.7: Tertiary educational attainment, EU-28, 2002–2016
(% of population aged 30 to 34)

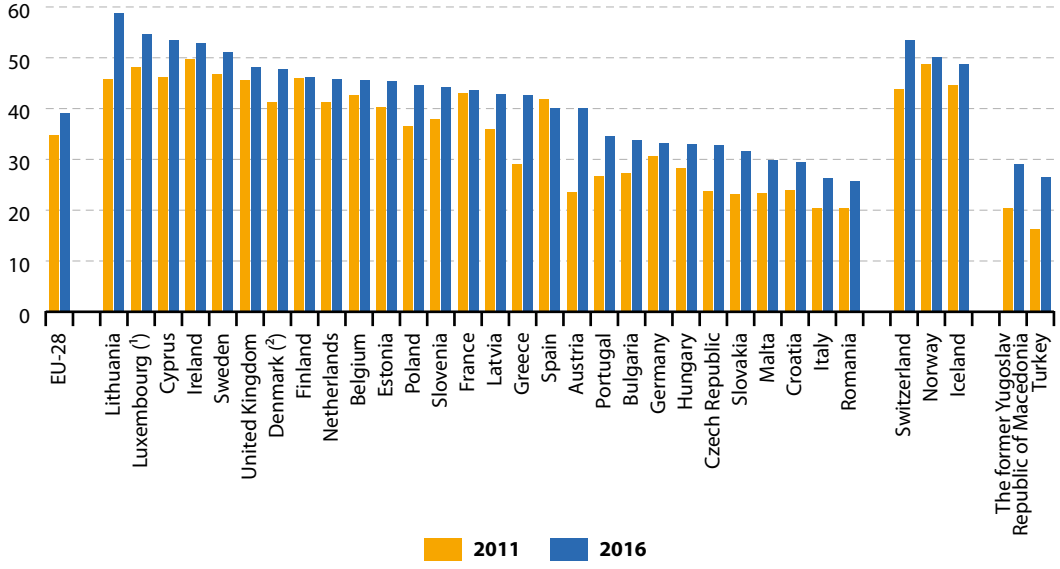


Note: Break in time series in 2014 (switch from ISCED 1997 to ISCED 2011)

Source: Eurostat (online data code: sdg_04_20)

([18]) The Bologna process put in motion a series of reforms to make European higher education more compatible, comparable, competitive and attractive for students. Its main objectives were: the introduction of a three-cycle degree system (bachelor, master and doctorate); quality assurance; and recognition of qualifications and periods of study (source: Eurostat, Education and training statistics introduced (accessed 15 May 2017)).

Figure 4.8: Tertiary educational attainment, by country, 2011 and 2016
(% of population aged 30 to 34)



Note: For all countries there is a break in the time series in 2014 (switch from ISCED 1997 to ISCED 2011); data are comparable for all countries except for Austria.

(1) Break in time series in 2015.
(2) Break in time series in 2016.

Source: Eurostat (online data code: sdg_04_20)

The ET 2020 framework (19) aims to increase rates of tertiary educational attainment to at least 40 %. The Europe 2020 strategy (20) includes this benchmark as one of its headline targets. Higher education is also a part of the European neighbourhood policy and the EU Enlargement Policy.

population. And within the foreign-born group, the rate was considerably lower for people from outside the EU than for those from another Member State. But no clear patterns can be observed at individual country level. While some Member States showed gaps of more than 30 percentage points between native-born residents and those who were foreign born, others such as Latvia and Denmark showed a reverse pattern, with the foreign-born population having higher attainment rates (21). This may reflect differences in the migrant patterns across Europe (both out- and in-flows), with some Member States attracting and retaining people with high skill levels and others attracting a lower-skilled population (22).

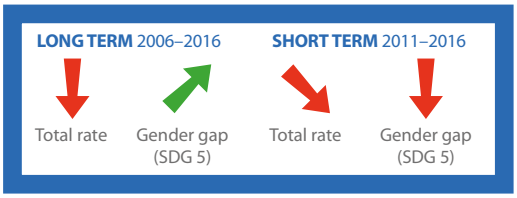
Moreover, people with disabilities find it harder to complete tertiary education. About 36 % of people aged 30 to 34 without disabilities attained this educational level in 2011 compared with around 22 % for those with a limitation caused by a LHPAD (23).

(19) Council of the European Union (2009), Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020') (2009/C 119/02).
(20) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.
(21) Population by educational attainment level, sex, age and country of birth. Source: Eurostat (online data code: edat_lfs_9912).
(22) European Commission (2015), *Education and Training Monitor 2016*, p. 50.
(23) Eurostat, *Disability statistics — access to education and training* (accessed 19 September 2017). It is foreseen to improve the availability of disability-related indicators in LFS for future monitoring.

In 2016 there was more than a twofold difference in tertiary attainment rates across Member States, ranging from 25.6 % to 58.7 %. Overall, in about two-thirds of the Member States the rate was above or equal to the overall EU figure. Although tertiary educational attainment rates have increased in almost all EU countries since 2011, the gap between the top and the bottom end of the scale has widened.

Employment rate of recent graduates

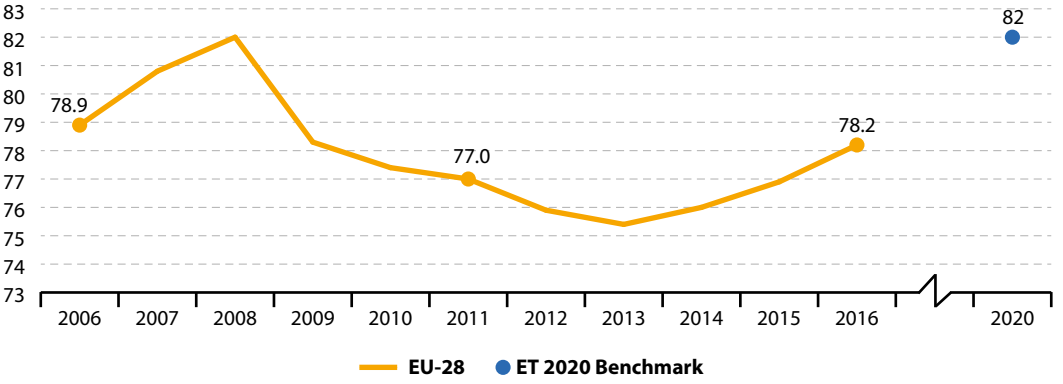
Despite recent increases, the employment rate of recent graduates aged 20 to 34 with at least upper secondary education remains far from the ET 2020 benchmark. Gender differences have increased again in recent years.



The employment rate of recent graduates is defined as the percentage of the population aged 20 to 34 with at least upper-secondary education (ISCED 2011 levels 3 to 8) who are in employment, not in any education or training during the four weeks preceding the survey, and who have successfully completed their highest educational attainment one to three years before the survey. It provides information on the transition from education to work and helps analyse access to the labour market among recent graduates. Data presented in this section stem from the EU Labour Force Survey (EU-LFS).

A look at trends for the past ten years shows that recent graduates have been particularly affected by the economic crisis. Between 2008 and 2013, employment rates among 20 to 34 year olds who had left education and training in the past one to three years fell by 6.6 percentage points. In comparison, the overall employment rate for 20 to 64-year-olds declined by 'only' 1.9 percentage points over the same period. However, 2013 seems to mark a turning point, with the share of recent graduates with a job increasing year on year, reaching 78.2 % in 2016.

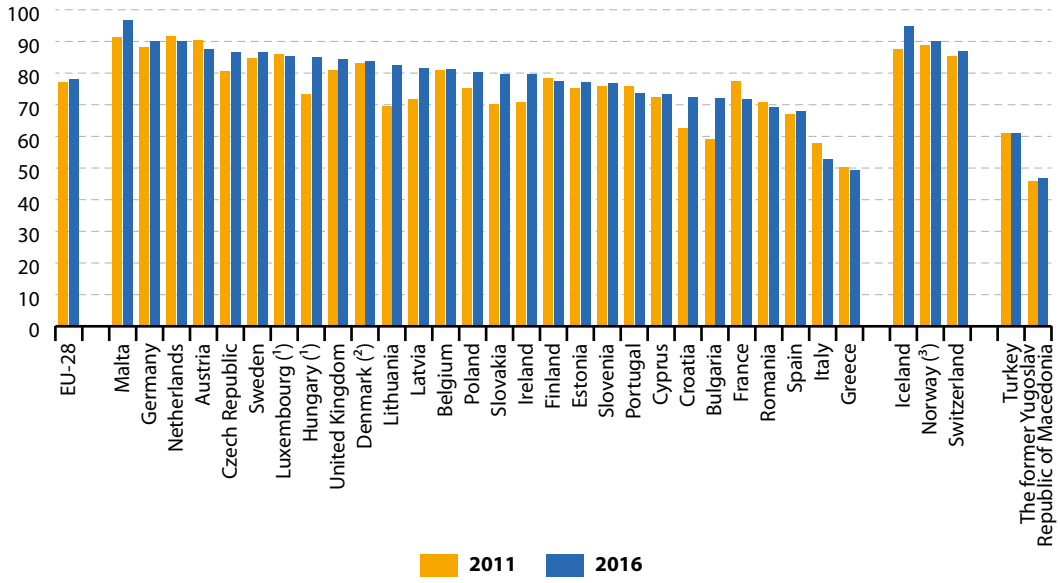
Figure 4.9: Employment rate of recent graduates, EU-28, 2006–2016
(% of population aged 20 to 34)



Note: Data refer to graduates having left education and training with at least upper secondary qualifications (ISCED 3–8); break in time series in 2014 (switch from ISCED 1997 to ISCED 2011).

Source: Eurostat (online data code: sdg_04_50)

Figure 4.10: Employment rate of recent graduates, by country, 2011 and 2016
(% of population aged 20 to 34)



(1) Break in time series in 2015.
(2) Break in time series in 2016.
(3) 2012 data (instead of 2011).

Source: Eurostat (online data code: sdg_04_50)

Note: Data refer to graduates having left education and training with at least upper secondary qualifications (ISCED 3–8); for all countries there is a break in the time series in 2014 (switch from ISCED 1997 to ISCED 2011).

Increasing the employment rate for recent graduates is one of the seven benchmarks of the ET 2020 framework ([24]). Funds of the European Social Fund ([25]) have been earmarked for raising the employability of recent graduates.

Figure 4.9 shows graduates who left education and training with at least upper secondary qualifications (ISCED levels 3 to 8). Disaggregation by educational attainment reveals that the fall in the employment rate had been slightly stronger for the lower educated cohort (– 4.4 percentage points from 2008 to 2016) than for those with tertiary education (– 4.1 percentage points from 2008 to 2016) ([26]).

In general, recent male graduates were more likely to find employment than their female counterparts. In 2016, the rate for men (80.8 %) was clearly higher than the rate recorded among women (76.0 %). This pattern has been apparent since 2006 but its intensity has changed over time. The largest gender gaps were recorded in 2005 and 2007. The gap shrank again significantly with the onset of the economic crisis, but widened in 2010 and remained within the 3.3 to 4.5 percentage point range in favour of young male graduates between 2010 and 2016. Some of these gender differences may be explained by the nature of the different fields typically studied

([24]) Council of the European Union (2009), *Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020')* (2009/C 119/02).
([25]) Regulation (EU) No 1304/2013 of the European Parliament and of the Council of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006.
([26]) Employment rates of young people not in education and training by sex, educational attainment level and years since completion of highest level of education. Source: Eurostat (online data code: edat_lfse_24).

by women and men (for example, a higher proportion of science and technology students tend to be male) and by differences in labour market demand for graduates with different skills ([27]).

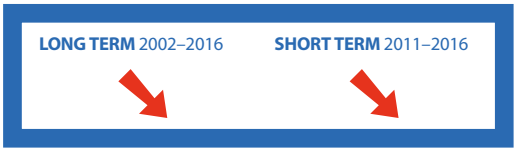
Overall, employment rates rise with educational level, indicating that a person with a higher educational attainment has a comparative advantage on the labour market. In 2016, the employment rate of recent graduates with tertiary education (ISCED 2011 levels 5–8) was 10.2 percentage points higher than people from the same age group with only middle educational attainment (ISCED 2011 levels 3 and 4). The gap has fallen slightly from 11.3 percentage points in 2011. Some of the difference between the lower educated cohort and the tertiary graduates may be linked to the latter deciding to take jobs for which they were over-qualified in order to get into the labour market. Thereby, they are boosting the employment rate for tertiary graduates while at the same time lowering the rate for other graduates. This may be especially important in those cases where labour market demand is subdued, for example, following the onset of the global financial and economic crisis ([28]).

As shown for other education indicators in this chapter, the foreign-born population is also disadvantaged as far as the employment status of recent graduates is concerned. In 2016, the proportion of employed recent graduates varied between the native-born population and the foreign-born one by 4.3 percentage points ([29]).

Employment rates of recent graduates vary widely across Member States, ranging from 96.6 % to 49.2 %. Overall, 11 Member States reported rates above the 82 % benchmark in 2016. Between countries, not only the employment rate of recent graduates varied, but also the differences between women and men. While in most EU countries more recent male graduates found a job within one to three years of leaving education, in Sweden, Latvia, Lithuania, Ireland, France, Belgium and Austria the gender gap favoured women.

Adult participation in learning

The share of 25 to 64 year olds participating in learning has stagnated over the past decade, remaining far from the 15 % target set for 2020.

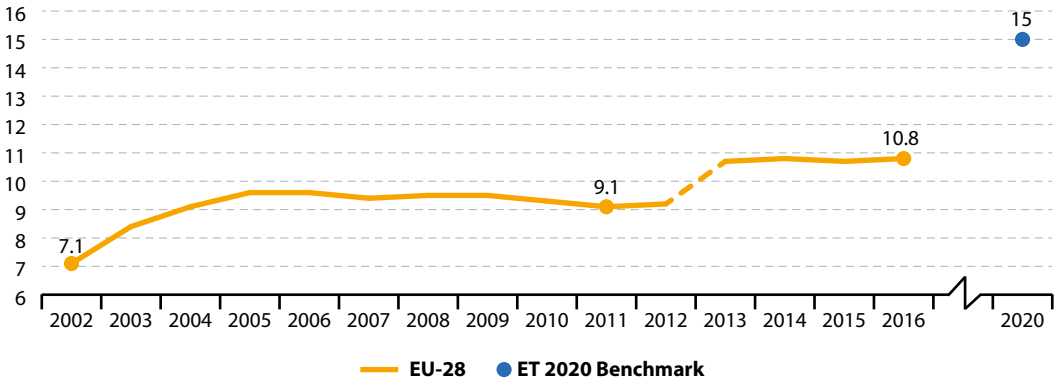


Adult participation in learning (previously named 'lifelong learning') refers to people aged 25 to 64 who stated that they received formal or non-formal education and training in the four weeks preceding the survey (numerator). The denominator consists of the total population of the same age group, excluding those who did not answer the question 'participation in education and training'. Adult learning covers formal and non-formal learning activities — both general and vocational — undertaken by adults after leaving initial education and training ([30]). The ET 2020 framework includes the target to increase the share of adults participating in learning to 15 %. Data presented in this section stem from the EU Labour Force Survey (EU-LFS).

Adult participation in learning has stagnated at a rather low level in the EU over the past decade. Pronounced increases were only observable between 2002 and 2005 and from 2012 to 2013.

([27]) Eurostat, Statistics Explained, Employment rates of recent graduates.
([28]) Ibid.
([29]) Employment rates of young people not in education and training by sex, educational attainment level, years since completion of highest level of education and country of birth. Source: Eurostat (online data code: edat_lfse_32).
([30]) The general definition of adult learning covers formal, non-formal and informal but the indicator adult participation in learning only covers formal and non-formal education and training. For more information, see: Eurostat, Participation in education and training.

Figure 4.11: Adult participation in learning, EU-28, 2002–2016
(% of the population aged 25 to 64)



Note: Breaks in time series in 2003, 2006 and 2013.
Source: Eurostat (online data code: sdg_04_60)

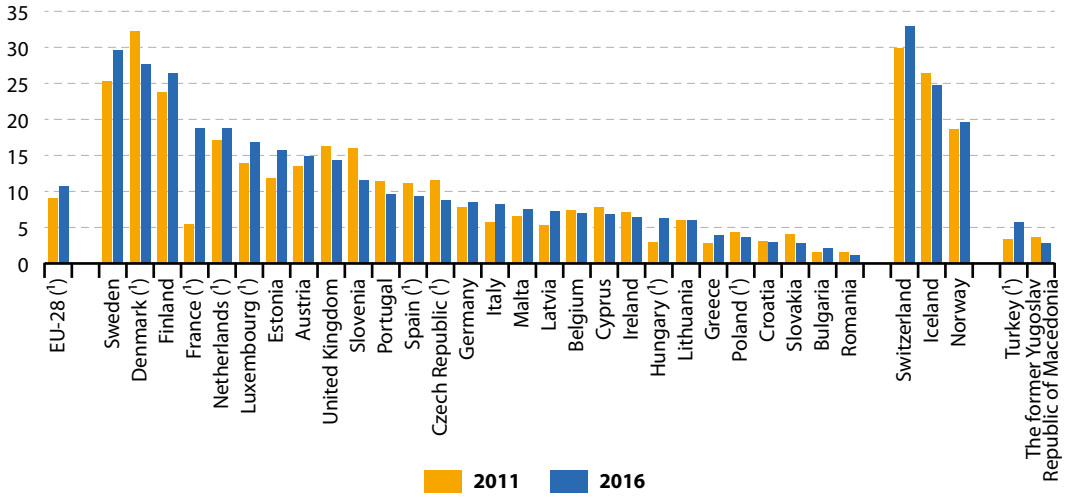
Adult learning is the key subject of The Council Resolution on a renewed European agenda for adult learning ([31]) and the ET 2020 framework ([32]). It also plays a crucial role in the Europe 2020 flagship initiative New Skills Agenda for Europe ([33]). The recently adopted Recommendation Upskilling Pathways: new opportunities for adults ([34]), aims to improve adult learning provision in order specifically to address the needs of low-skilled, low-qualified adults.

However, this most recent growth can mainly be attributed to a methodological change in the French Labour Force Survey in 2013 ([35]). Over the past four years, the share of 25 to 64 year olds participating in learning stagnated at slightly below 11 %, far from the 15 % target. Furthermore, the results of the Programme for the International Assessment of Adult Competencies (PIAAC) show that significant numbers of EU adults struggle with literacy, numeracy and digital skills.

Women are more likely to participate in adult learning than men. In 2016, the share of women engaged in adult learning was nearly two percentage points higher than that of men (11.7 % compared with 9.8 %). The women's rate was not only clearly above the men's rate, but had also been improving faster with a plus of four percentage points since 2002 compared with 3.2 percentage points for men. Women recorded higher participation rates in all Member States except for Germany and Croatia, where a slightly higher share of men were engaged in adult learning. Greece and Romania showed no perceivable difference in gender participation rates. Interestingly, the two countries with the highest adult learning shares in general showed the largest

([31]) Council of the European Union (2011), *Council Resolution on a renewed European agenda for adult learning*, (2011/C 372/01).
([32]) Council of the European Union (2009), *Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020')*, (2009/C 119/02).
([33]) European Commission (2016), *A new skills agenda for Europe: Working together to strengthen human capital, employability and competitiveness*, COM(2016) 381 final, Brussels.
([34]) Council of the European Union (2016), *Council Recommendation of 19 December 2016 on Upskilling Pathways: New Opportunities for Adults*, (2016/C 484/01).
([35]) INSEE, the French Statistical Office, has carried out an extensive revision of the questionnaire of the Labour Force Survey. The new questionnaire was used from 1 January 2013 onwards. It has a significant effect on the level of various French LFS-indicators.

Figure 4.12: Adult participation in learning, by country, 2011 and 2016
(% of the population aged 25 to 64)



(1) Break(s) in time series between 2011 and 2016.
Source: Eurostat (online data code: sdg_04_60)

gender differences: Sweden with 14.0 percentage points and Denmark with 9.9 percentage points.

There is a clear gradient of adult participation in learning and a person's educational attainment. In 2016 adults with at most lower secondary education were less engaged in learning (4.2 %) than those with upper secondary (8.8 %) or tertiary education (18.6 %).

Country-specific participation in adult learning varied considerably across the EU, with the lowest share being 25 times lower than the highest share in 2016. The Scandinavian countries stood out with by far the highest rates, followed by central European Member States. In general, adult participation in learning seems to be less common in eastern and southern European countries.

Further reading on education

European Commission/EACEA/Eurydice/Eurostat (2014), *Key Data on Early Childhood Education and Care in Europe, Eurydice and Eurostat Report*, Luxembourg: Publications Office of the European Union.

European Commission (Directorate-General for Education and Culture) (2013), *The survey of adult skills: implications for education and training policies in Europe*.

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OECD (2017), *Qualifications Systems: Bridges to Lifelong Learning*, OECD Publishing.

OECD (2015), *Education at a Glance interim Report: Update of employment and educational attainment indicators*, OECD Publishing.

OECD (2016), *Education at a Glance 2016: OECD Indicators*, OECD Publishing.

UNESCO Institute for Statistics (2012), *Global Education Digest, Opportunities lost: The impact of grade repetition and early school leaving*, Montreal.

UNESCO (2014), *Education Strategy 2014–2021*, Paris.

5 Achieve gender equality and empower all women and girls

The global perspective on SDG 5

Despite significant progress towards gender equality and women's empowerment, discrimination and violence against women and girls still persists in every part of the world. SDG 5 aims to achieve gender equality by ending all forms of discrimination, violence and any harmful practices against women and girls in the public and private spheres. It also recognises the importance of universal access to sexual and reproductive health and reproductive rights for combating gender inequality. To promote women's social and economic empowerment, SDG 5 calls for recognition and value of unpaid care and domestic work; equal rights and access to economic and natural resources, technology, property and basic and financial services; as well as full and effective participation and equal opportunities for leadership at all levels of political and economic decision-making for women. The adoption of sound policies and legislation to promote gender equality are seen as essential for eliminating gender discrimination and fostering women's empowerment in all societal spheres. Likewise, the enhanced use of enabling technologies will also help to empower women ([1]).

eurostat supports the SDGs

Empowerment of women and the realisation of gender equality depends on the balanced participation of women and men in formal education, in the labour market and in decision-making processes. Another important aspect is the elimination of physical and sexual violence against women. Monitoring SDG 5 'gender equality' in an EU context focuses therefore on the sub-themes 'gender-based violence', 'education', 'employment' and 'leadership positions'. As shown in Table 5.1, the EU's progress in these areas has been rather mixed.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 5.1: Indicators measuring progress in SDG 5, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Gender-based violence			
Physical and sexual violence to women experienced within 12 months prior to the interview	:	:	p. 112
Education			
Gender gap for early leavers from education and training (*)	↑ (1)	↑	SDG 4, p. 92
Gender gap for tertiary educational attainment (*)	↓ (1)	↓	SDG 4, p. 98
Gender gap for employment rate of recent graduates (*)	↗ (2)	↓	SDG 4, p. 100
Employment			
Gender employment gap	↑ (3)	↑	p. 114
Gender pay gap in unadjusted form	:	↗	p. 116
Inactive population due to caring responsibilities	↓ (3)	↓	p. 118
Leadership positions			
Seats held by women in national parliaments and governments	↑ (1)	↑	p. 120
Positions held by women in senior management	↑ (1)	↑	p. 122

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Past 14–year period.
(2) Past 10–year period.
(3) Past 11–year period.

Gender equality in the EU: overview and key trends

Equality between women and men is one of the EU's founding values. It goes back to 1957 when the principle of equal pay for equal work became part of the Treaty of Rome (Art. 157) ([2]). Moreover, gender equality is a fundamental human right. Without realising gender equality and the empowerment of women and girls, full achievement of human potential and of sustainable development is not possible. SDG 5 calls for action to achieve gender equality and empowerment of all women and girls.

Gender-based violence

Gender-based violence is a brutal form of discrimination and a violation of fundamental human rights. It is both a cause and a consequence of inequalities between women and men. **Physical and sexual violence against women by a partner or a non-partner** affects their health and well-being. Moreover, it can hamper women's access to employment with negative effects on their financial independence and the economy overall ([3]). Thus, eliminating all forms of violence against women and girls in the public and private spheres is crucial. Until the 1990s, most Member States considered violence against women a private matter in which the state should not interfere ([4]). In 2012, gender-based violence was still a reality in the EU, with every third woman reporting to have experienced some form of physical or sexual violence since the age of 15, and 8 % experiencing such violence in the 12 months prior to the survey.

Education

Equal access to quality education is an important foundation for gender equality and an essential element of sustainable development. Equipping people with the right skills allows them to find quality jobs and improve their chances in life. **Early leavers from education and training** may face considerable difficulties in the labour market. For example, they may find it difficult to obtain a secure foothold, because employers may be more reluctant to take them on with their limited education. In the EU, men are more likely to leave education and training early. In 2016, 12.2 % of men and 9.2 % of women aged 18 to 24 had left education and training with at most lower secondary education. Since 2002, these shares have fallen steadily. Progress was stronger for men, resulting in a narrowing of the gender gap from 4.1 percentage points in 2002 to 3 percentage points in 2016.

Nowadays, completing compulsory education is often not considered sufficient. Thus, having a degree from a university or other higher education institution is becoming more important both for men and women. Tertiary education is considered to have an essential role in society, by fostering innovation, increasing economic development and growth, and improving more generally the well-being of citizens. Since the introduction of the Bologna process, a major expansion in higher education systems has taken place in the EU. The share of the population aged 30 to 34 who completed **tertiary education** increased steadily between 2002 and 2016. However, while the proportion of women with tertiary educational attainment rose from 24.5 % to 43.9 %, the increase was much slower for men, from 22.6 % to 34.4 %. This means the gender gap increased considerably, from 1.9 to 9.5 percentage points between 2002 and 2016.

While women are more successful in education, the picture is different when it comes to employment, with the **employment rate of recent graduates** higher for men than women.

([2]) European Commission (2017), *Gender equality*, Directorate-General for Justice and Consumers.
([3]) Directorate-General for Justice and Consumers (2017), *Zero tolerance of violence against women*.
([4]) European Union Agency for Fundamental Rights (2014), *Violence against women: an EU-wide survey, Main results*, Publications Office of the European Union, Luxembourg, p. 7.

This reversed gender gap compared with the education figures above is remarkable, considering the important role of education and training in raising employability. In 2016, the share of employed graduates aged 20 to 34 with at least upper secondary qualifications and having left education and training in the past one to three years was 80.8 % among men and 76.0 % among women, very similar to the shares in 2006. Up to 2008, the employment rate of recent female graduates had been catching up to that of men, however, these improvements were cancelled out by the economic crisis in the following years.

Employment

High employment rates for both men and women is a key target of the EU. Reducing the **gender employment gap** — the difference between the employment rates of men and women aged 20 to 64 — is important for equality and a sustainable economy. While the gender employment gap narrowed between 2005 and 2016, the proportion of men of working age in employment still exceeded that of women by 11.6 percentage points.

Moreover, there is a persistent **gender pay gap**, for which there are several reasons. These include family responsibilities, gender roles and traditions, occupational possibilities for part-time employment, societal norms that affect educational and career choices, and a lack of women in senior and executive level positions ([5]). In 2015, women's gross hourly earnings in the EU were on average 16.3 % below those of men. The gender pay gap was almost the same as five years ago. Because of the gender pay gap and shorter working lives, women earn less over their lifetimes than men. This results in lower pensions and a risk of poverty in old age ([6]).

There is also a gender gap with regard to inactivity rates. Inactivity rates of women are an indication of the social customs of a country, attitudes towards women in the labour force and family structures in general ([7]). The gender gap is particularly pronounced regarding **inactivity due to caring responsibilities**. Caring responsibilities for children or incapacitated adults and other family or personal responsibilities were the main reasons why 30.7 % of women aged 20 to 64 who were not part of the labour force were economically inactive in 2016. In comparison, only 4.3 % of men outside the labour force were inactive due to caring responsibilities. This represents a considerable increase in the gender gap, from 24.1 percentage points in 2011 to 26.4 percentage points in 2016.

Leadership positions

Traditional gender roles, a lack of support to allow women and men to balance care responsibilities with work, and political and corporate cultures are some of the reasons why women are underrepresented in decision-making processes. Promoting equality between women and men in decision-making is one of the areas the EU has set as a priority for achieving gender equality. With regard to political decision-making, the **proportion of seats held by women in national parliaments** (both houses, where relevant) has risen almost steadily since 2003. Nevertheless, in 2017 women still held less than one-third (28.9 %) of seats in national parliaments across the EU.

The **proportion of women in senior management positions** has increased between 2003 and 2017. However, women still account for less than one in four (24.6 %) board members of the largest listed companies in 2017. The almost steady increase, by a total of 16.1 percentage points since 2003, was helped by binding legislations in some Member States ([8]). When considering not only board members, but executive members of the two highest decision-making bodies of the largest listed companies, the share of women has also grown in the last five years. Nevertheless, less than one out of six of all of senior executives (15.6 %) in 2017 was female.

([5]) European Commission (2014), *Tackling the gender pay gap in the European Union*, Publication Office of the European Union, Luxembourg, p. 5–7.
([6]) European Commission (2017), *2017 Report on equality between women and men in the EU*.
([7]) ILO (2015), *Key Indicators of the Labour market: Full report*, Ninth Edition, p. 17.
([8]) I. Burkevica et al. (2015), *Gender Equality in Power and Decision-Making, Review of the Implementation of the Beijing Platform for Action in the EU Member States*, Publication for the EIGE, Publications Office of the European Union, p. 7–8.

Gender equality in the EU

Gender-based violence

Physical and sexual violence in 2012
8 % of women

Education

Gender gap for tertiary educational attainment in 2016
9.5 percentage points to the disadvantage of men
+ 1.9 pp since 2011

Gender gap for early leavers from education in 2016
3.0 percentage points to the disadvantage of men
- 0.8 pp since 2011

Gender gap for employed recent graduates in 2016
4.8 percentage points to the disadvantage of women
+ 0.6 pp since 2011

Employment

Gender employment gap in 2016
11.6 percentage points to the disadvantage of women
- 1.2 pp since 2011

Gender pay gap in 2015
16.3 % of average gross hourly earnings of men
- 0.1 pp since 2010

Inactivity due to caring responsibilities in 2016

30.7 % of inactive women aged 20 to 64
+ 3.2 pp since 2011

4.3 % of inactive men aged 20 to 64
+ 0.9 pp since 2011

Leadership positions

Women in parliaments in 2017
28.9 % of seats
+ 3.6 pp since 2012

Women in senior management in 2017
24.6 % of board members
+ 8.8 pp since 2012

Source: Eurostat (online data codes: sdg_05_10, sdg_04_10, sdg_04_20, sdg_04_50, sdg_05_30, sdg_05_20, sdg_05_40, sdg_05_50 and sdg_05_60)

Physical and sexual violence to women experienced within 12 months prior to the interview

In 2012, 8 % of women in the EU had experienced physical or sexual violence by a partner or a non-partner in the 12 months prior to the interview.

X INSUFFICIENT DATA TO CALCULATE TREND

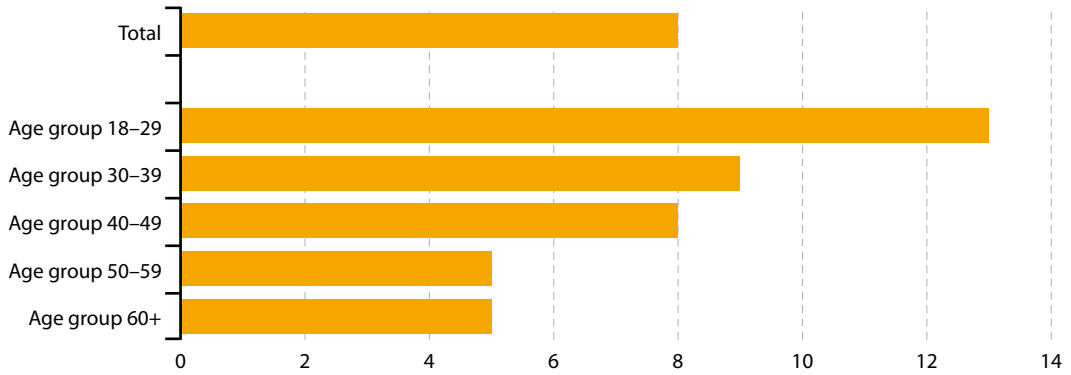
The indicator 'physical and sexual violence by a partner or a non-partner' is based on results from a survey by the European Union Agency for Fundamental Rights (FRA). Women were asked whether they had experienced physical and/or sexual violence in the past 12 months prior to the interview. The data presented here includes women who stated that they have experienced physical and/or sexual violence 'once', '2–5 times' or '6 or more times'. Partners include people with whom the respondents were, or had been, married, living together without being married or involved in a relationship without living together. Non-partners include all perpetrators other than women's current or previous partner ([9]).

In 2012, 8 % of women in the EU had experienced physical and/or sexual violence by a partner or a non-partner in the 12 months prior to the interview. Looking at longer life spans, every third woman (33 %) in the EU reported having experienced physical or sexual violence by a partner or a non-partner since the age of 15.

In 2012, younger women reported more often having experienced physical and/or sexual violence by a partner or a non-partner in the past 12 months ([10]).

Prevalence rates do not only vary greatly within countries but also across countries, as shown in

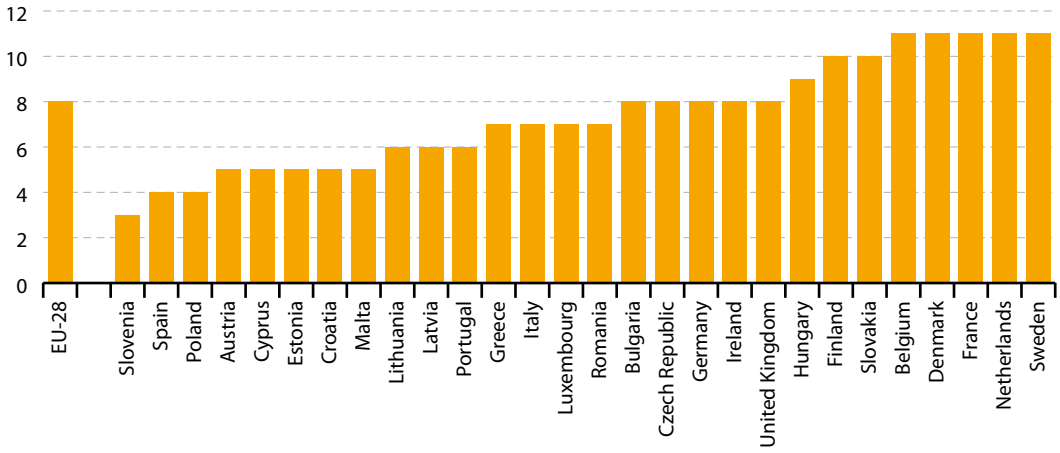
Figure 5.1: Physical or sexual violence to women experienced within 12 months prior to the interview, by age group, EU-28, 2012
(% of women)



Source: European Union Agency for Fundamental Rights (FRA) (Eurostat online data code: sdg_05_10)

([9]) European Union Agency for Fundamental Rights (2017), *Survey data explorer — Violence against women survey, Physical and/or sexual violence by a partner or a non-partner since the age of 15*.
([10]) European Union Agency for Fundamental Rights (2014), *Violence against women: an EU-wide survey, Main results*, Publications Office of the European Union, Luxembourg, p. 25.

Figure 5.2: Physical or sexual violence to women experienced within 12 months prior to the interview, by country, 2012
(% of women)



Source: European Union Agency for Fundamental Rights (FRA) (Eurostat online data code: sdg_05_10)

The EU protects women and children from gender-based violence through awareness-raising as well as legislation and practical measures on victims' rights. The Council Framework Decision on the standing of victims in criminal proceedings ([11]) from 2001 establishes basic rights for victims of crime within the EU.

Figure 5.2. However, caution is needed when comparing prevalence rates across countries, because in some countries there is a stigma associated with disclosing cases of violence against women in certain settings and to certain people, including interviewers ([12]). In addition, it can also be observed that Member States that rank highest in terms of gender equality tend also to have a greater prevalence of violence against women in the FRA survey, indicating there is a greater awareness and willingness in these countries to disclose experiences of violence to an interviewer ([13]).

Other possible explanations for observed differences between Member States in prevalence rates for violence against women may include the age structure of the society, the overall violence crime rate in a country or different drinking patterns. Alcohol is often put forward as an explanation for women's experiences of violence, particularly in intimate partner relationships. However, further research is needed to be able to understand the context in which violence occurs and to the possible explanations for reported rates in the survey ([14]).

([11]) Council Framework Decision of 15 March 2001 on the standing of victims in criminal proceedings (2001/220/JHA).
([12]) European Union Agency for Fundamental Rights (2014), *Violence against women: an EU-wide survey, Main results*, Publications Office of the European Union, Luxembourg, p. 25–26, 32.
([13]) Ibid.
([14]) Ibid.

Gender employment gap

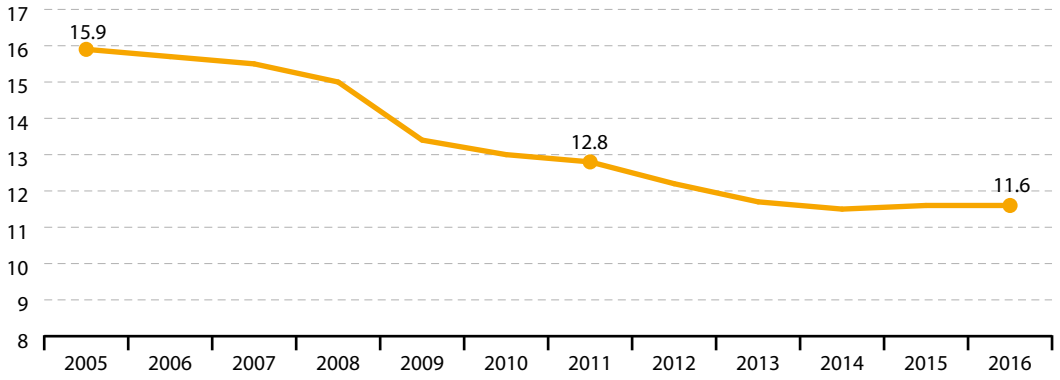
While women still tend to be less employed than men, the gender employment gap narrowed between 2005 and 2016.

The gender employment gap is defined as the difference between the employment rates of men and women aged 20 to 64. The employment rate is calculated by dividing the number of people aged 20 to 64 in employment by the total population of the same age group. The indicator is based on the EU Labour Force Survey (EU-LFS).

While the gender employment gap in the EU decreased almost continuously between 2005 and 2016, women still tend to have much lower employment rates than men. A number of factors contribute to this trend. As mentioned above, there is a considerable gender gap with regard to inactivity due to caring responsibilities. Parenthood is also an important reason for employment differences between men and women. This is especially the case in countries where childcare services or facilities taking care of elderly and other dependent relatives are unaffordable or absent ([15]). In addition, the longer women are out of the labour market or remain unemployed due to care duties, the harder it becomes for them to find a job.

Increasing female labour market participation and the equal economic independence of women and men is one of the priorities of the Strategic Engagement for Gender Equality ([16]). This strategy sets the framework for the EU's future work towards gender equality. The other priorities are reducing the gender pay, earnings and pension gaps and thus fighting poverty among women, promoting equality between women and men in decision-making, combating gender-based violence and protecting and supporting victims, and promoting gender equality and women's rights across the world.

Figure 5.3: Gender employment gap, EU-28, 2005–2016
(percentage points)



Source: Eurostat (online data code: sdg_05_30)

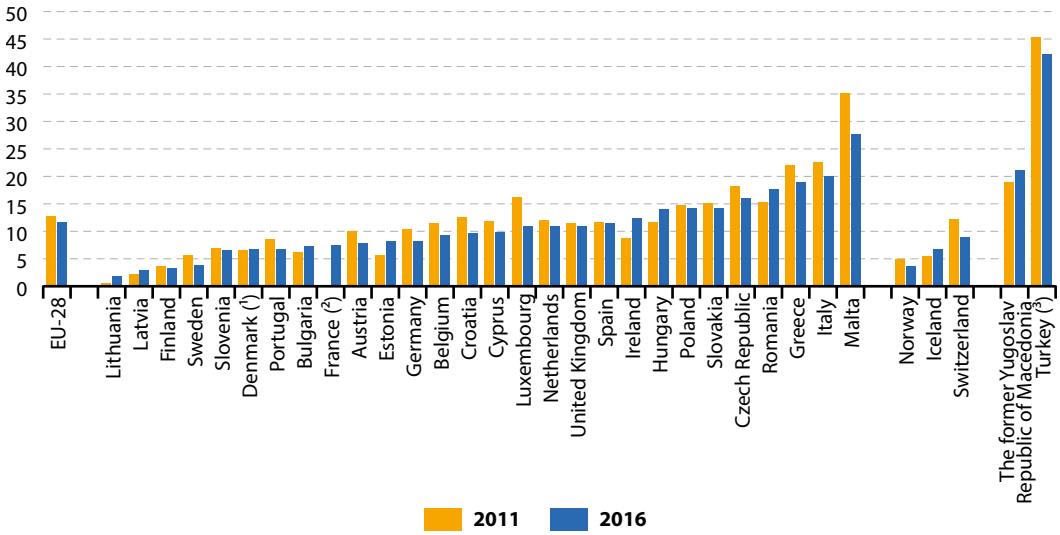
([15]) European Commission's Expert Group on Gender and Employment Issues (2009), *The provision of childcare services: A comparative review of 30 European countries*, Office for Official Publications of the European Communities, Luxembourg, p. 23–24.
([16]) European Commission (2016), *Strategic Engagement for Gender Equality 2016–2019*, Publications Office of the European Union, Luxembourg.

The European Social Fund ([17]) supports measures that promote equality between men and women in all areas, including in access to employment, career progression, reconciliation of work and private life as well as promotion of equal pay for equal work.

The gender employment gap narrowed by 4.3 percentage points between 2005 and 2016. The strongest reduction occurred during the economic crisis, partly because traditionally male-dominated industries, such as construction and automobile, were the most affected ([18]). The gap continued to shrink until 2014, but has remained stable since then.

Data on the G20 members and their gender gap with regard to the activity rate makes it possible to view the EU in a global context. The data is not directly comparable because the activity rate is the share of economically active people (employed and unemployed) in the total population aged 15 to 64. In 2014, men had higher activity rates than women in all G20 members ([19]). In addition, only in Canada and South Africa (2013 data) was the difference between male and female activity rates less than 10 percentage points. In comparison, the EU had a gender activity gap of 11.6 percentage points ([20]). The highest gender difference existed in Saudi Arabia with 42 percentage points, followed by Turkey with 37 percentage points and Mexico and

Figure 5.4: Gender employment gap, by country, 2011 and 2016
(percentage points)



(1) Break in time series in 2016.
(2) No data for 2011.
(3) Break in time series in 2014.

Source: Eurostat (online data code: sdg_05_30)

([17]) Regulation (EU) No 1304/2013 of the European Parliament and of the Council of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006.
([18]) European Commission (2009), *Economic Crisis in Europe: Causes, Consequences and Responses*, Directorate-General for Economic and Financial Affairs, p. 36.
([19]) Eurostat (2016), *The EU in the world, 2016 edition*, Publications Office of the European Union, Luxembourg, p. 67–68.
([20]) Ibid.

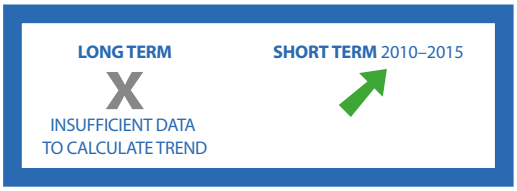
Indonesia (2013 data) with 31 percentage points ([21]). These big gender gaps correspond to particularly low activity rates of women in these countries ([22]).

In 2016, the gender employment gap varied by a considerable 25.8 percentage points across Member States. In addition, eight countries reported a widening of the gender employment gap in the past five years, by up to 3.5 percentage points.

The four countries with the biggest gap in 2016 also had employment rates of women below 60 %. However, the gender gap in the Czech Republic reflected a particularly high male employment rate. In addition, Finland and Lithuania had similar female employment rates, but ranked very differently with regard to gender employment gap.

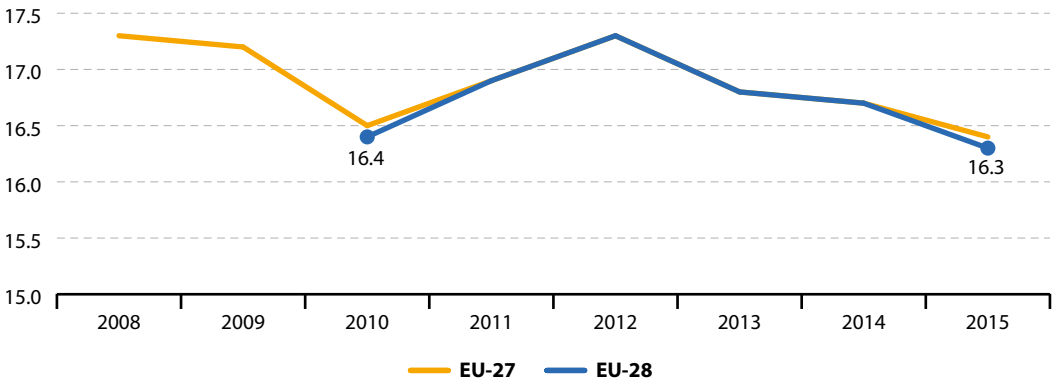
Gender pay gap in unadjusted form

Women's gross hourly earnings were on average 16.3 % lower than those of men in 2015. The situation has not improved significantly since 2010.



The gender pay gap in unadjusted form represents the difference between average gross hourly earnings of male paid employees and of female paid employees as a percentage of average gross hourly earnings of male paid employees. The indicator has been defined as unadjusted because it gives an overall picture of gender inequalities in terms of pay and measures a concept which is broader than the concept of equal pay for equal work. A part of the earnings difference can be explained by individual characteristics of employed men and women such as level of education or position and by sectoral and occupational gender segregations. The gender pay gap is based on the methodology of the structure of earnings survey (SES) ([23]), which is

Figure 5.5: Gender pay gap in unadjusted form, EU-27 and EU-28, 2008–2015
(% of average gross hourly earnings of men)

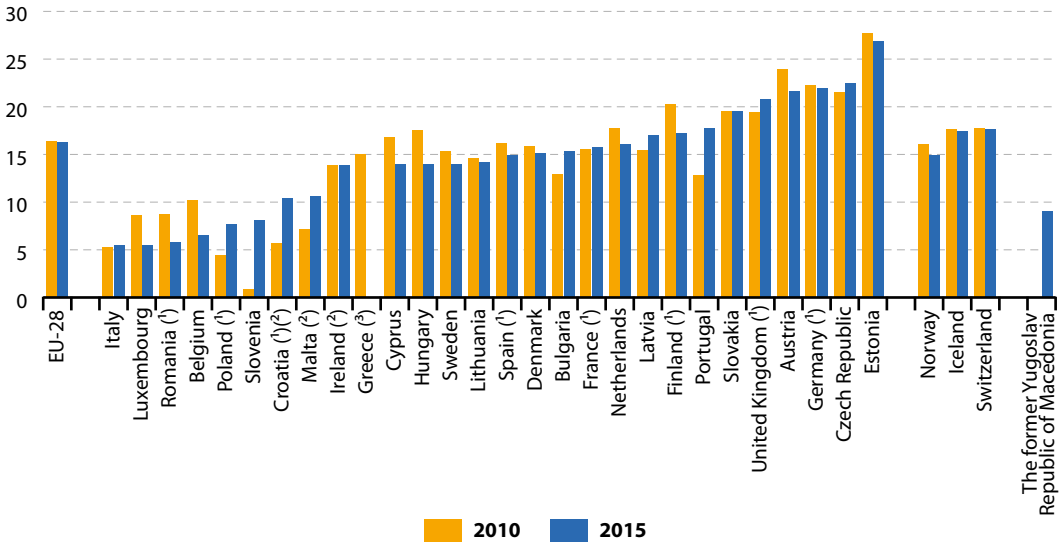


Note: 2009 data are provisional.

Source: Eurostat (online data code: sdg_05_20)

([21]) Eurostat (2016), *The EU in the world, 2016 edition*, Publications Office of the European Union, Luxembourg, p. 68.
([22]) Ibid.
([23]) According to Regulation (EC) No 530/1999, the new unadjusted gender pay gap is based on the methodology of the structure of earnings survey (SES) from reference year 2006 onwards.

Figure 5.6: Gender pay gap in unadjusted form, by country, 2010 and 2015
(% of average gross hourly earnings of men)



(1) Most recent data are provisional or estimates.
(2) 2014 data (instead of 2015).
(3) No data for 2015.
(4) No data for 2010.

Source: Eurostat (online data code: sdg_05_20)

Equal pay for equal work is one of the EU's founding principles, embedded in the Treaties since 1957. Article 157 of the Treaty on the Functioning of the European Union provides that each Member State shall ensure that the principle is applied. Directive 2006/54/EC enshrines the principle of equal pay. Closing the gender pay gap is also one of the objectives of the Commission's Strategic engagement for gender equality ([24]) as well as the European Pillar of Social Rights ([25]) (see box under 'inactive population due to caring responsibilities').

carried out every four years. The most recent reference years available for the SES are 2010 and 2014. Eurostat based the gender pay gap for these years on this survey. For the intermediate years (2011–2013 and 2015–2017), Member States provided Eurostat with gender pay gap estimates benchmarked to the SES results.

In 2015, women's gross hourly earnings were on average 16.3 % below those of men in the EU. The gender pay gap in 2015 was still similar to the 2010 gap. There are various reasons for the existence and size of a gender pay gap such as the kind of jobs held by women in terms of sectors or occupations, consequences of breaks in career or part-time work due to childbearing and decisions in favour of family life. Thus, the pay gap is linked to a number of legal, social and economic factors which go far beyond the single issue of equal pay for equal work.

In 2015, the gender pay gap was generally much lower for new labour market entrants and tended to widen with age. In all Member States,

([24]) European Commission (2016), *Strategic Engagement for Gender Equality 2016–2019*, Luxembourg: Publications Office of the European Union.
([25]) European Commission (2017), *Establishing a European Pillar of Social Rights*, COM(2017) 250 final, Brussels.

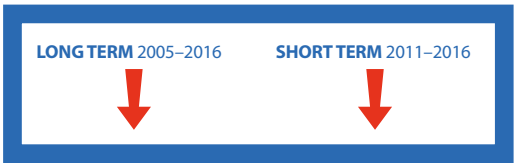
except Spain, the gender pay gap in the financial and insurance activities was higher than in the business economy as a whole. The majority of EU countries also recorded higher gender pay gaps in the private sector than in the public sector.

A slowdown in pay convergence can also be noticed in the OECD ([26]). The data available refer to median wages of full-time employees in 2010, thus a direct comparison with the numbers in this chapter is not possible. On average, OECD countries had a gender pay gap of about 16 % among full-time employees in 2010, and the gap increased with age and during childbearing. In many OECD countries, the wage gap at the top of the earnings distribution was also wider than at the median point.

Across Member States, the gender pay gap varied considerably in 2015, by 21.4 percentage points. In addition, 11 countries reported a widening of the gender pay gap in the past five years, by up to 7.2 percentage points. Between countries, the proportion of women working and their characteristics differ significantly, particularly because of institutions and attitudes governing the balance between private and work life, which have an impact on the careers and thus the pay of women ([27]).

Inactive population due to caring responsibilities

Caring responsibilities were by far the main reason for inactivity among women in 2016. The gender gap has increased considerably since 2005.



The economically inactive population comprises individuals that are not actively seeking work, so they are neither employed nor unemployed and considered to be outside the labour force. This definition used in the European Union Labour Force Survey (EU-LFS) is based on the guidelines of the International Labour Organization (ILO) ([28]). While several reasons may exist for why somebody is not seeking employment, only the main one is considered. Inactivity due to caring responsibilities refers to the reasons 'looking after children or incapacitated adults' and 'other family or personal responsibilities'. In this section, data are presented on the share of inactive people aged 20 to 64 who state that their main reason for being inactive was caring responsibilities.

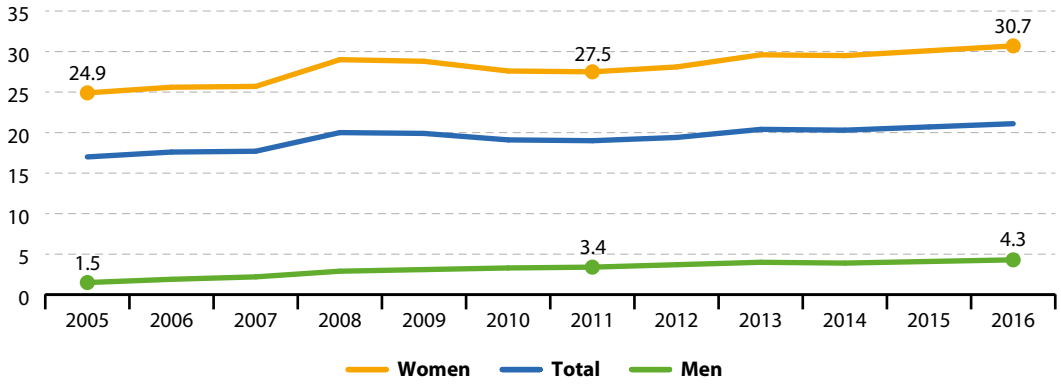
Inactivity due to caring responsibilities was the main reason for women not being part of the labour force, with almost every third women (30.7 %) reporting this reason in 2016. In contrast, only 4.3 % of inactive men reported to be so due to caring responsibilities. For them, the main reasons for being inactive were illness or disability (26.4%), retirement (25.1 %) or being in education or training (21.2 %).

The share of men out of the labour force due to caring responsibilities steadily increased between 2005 and 2016. However, as the share of inactive women due to caring responsibilities increased even more over the same period, the gender gap increased from 23.4 percentage points in 2005 to 26.4 percentage points in 2016.

In 2016, there were considerable differences among the EU countries with regard to inactivity due to caring responsibilities. The share of inactive women due to caring responsibilities varied between 6.9 % and 58.0 % for EU countries and

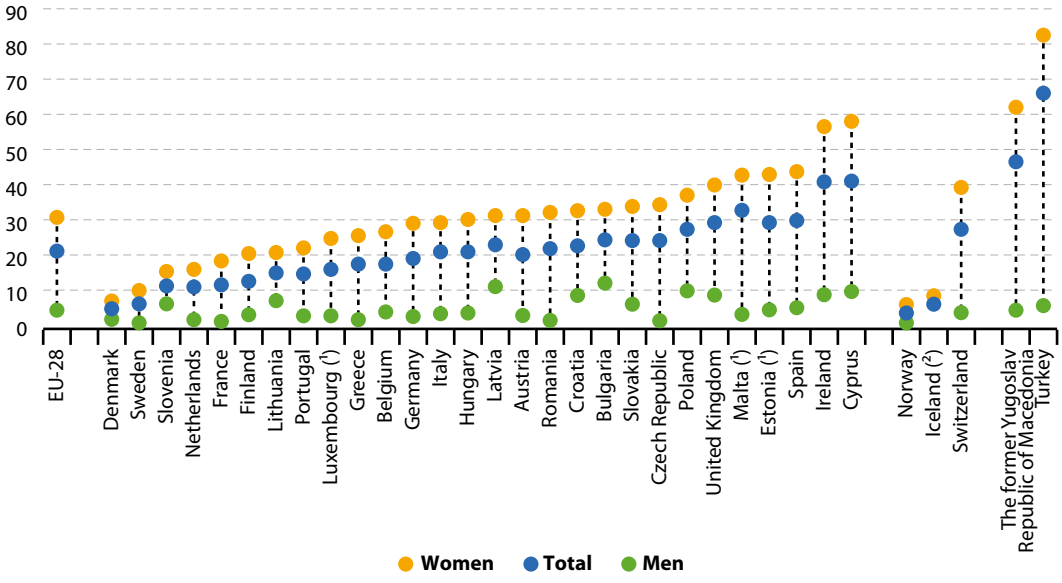
([26]) OECD (2012), *Closing the Gender Gap: Act Now*, OECD Publishing, p. 166–169.
([27]) Eurostat (2017), *Gender pay gap statistics*, Statistics Explained.
([28]) See also ILO (2015), *Key Indicators of the Labour Market — 13. Persons outside the labour force*, ILO, Geneva.

Figure 5.7: Inactive population due to caring responsibilities, by sex, EU-28, 2005–2016
(% of inactive population aged 20 to 64)



Source: Eurostat (online data code: sdg_05_40)

Figure 5.8: Inactive population due to caring responsibilities, by sex, by country, 2016
(% of inactive population aged 20 to 64)



(1) Data for men have low reliability.

(2) No data for men.

Source: Eurostat (online data code: sdg_05_40)

The European Pillar of Social Rights ([29]) is about delivering new and more effective rights for citizens and builds upon 20 key principles. Ensuring equality of treatment and opportunities between men and women is a key concern of the Pillar. Beyond existing legislation, positive action is required in all areas to foster proactively equality between men and women.

One of the principles addresses the specific challenge of the gender pay gap and stipulates that women and men have the right to equal pay for work of equal value. Another principle addresses work-life balance and stipulates that parents and people with caring responsibilities have the right to suitable leave, flexible working arrangements and access to care services. In addition, women and men shall have equal access to special leaves of absence to fulfil their caring responsibilities and be encouraged to use them in a balanced way. One of the deliverables is the 'New Start' initiative that according to the Communication from the Commission ([30]) addresses the work-life balance challenges faced by working parents and carers.

the share of men between 0.7 % and 12.0 %. The gender gap also varied considerably and was generally higher for countries where more inactive women stated that caring responsibilities was the main reason. The gender gap was nine times higher in the EU country with the most women out of the labour force due to caring responsibilities than in the country with the fewest. Childcare services have shown to strongly influence the participation of women in the labour market ([31]).

Seats held by women in national parliaments and governments

Less than one in three seats in national parliaments were held by women in 2017, but the share has steadily increased since 2003.

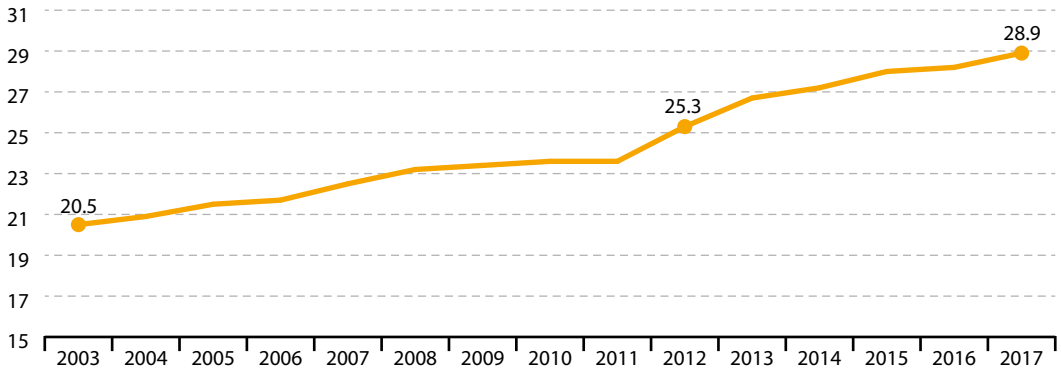
The national parliament is the national legislative assembly, consisting of one or two chambers/houses. The indicator presented here refers to the proportion of women in national parliaments in both chambers (lower house and an upper house, where relevant). The count of members of a parliament includes the president/speaker/leader of the parliament ([32]). The data presented in this section stem from the European Institute for Gender Equality Gender Statistics Database.

Women held 28.9 % of seats in national parliaments in the EU in the second quarter of 2017. The share has increased almost steadily since 2003, when women accounted for about one-fifth of members in national parliaments. However, the share of men in national parliaments is still considerably higher across the EU as a whole and there was no single EU country where women held more seats than men.

The EU average was higher than the global average. The global average proportion of women holding seats in parliaments was 23.3 % in 2016, representing an increase of six percentage points

([29]) European Commission, *Establishing a European Pillar of Social Rights*, COM(2017) 250 final, Brussels, 2017.
([30]) European Commission, *An initiative to support work-life balance for working parents and carers*, COM/2017/0252 final, Brussels.
([31]) European Commission (2015), *Labour Market Participation of Women*, European Semester Thematic Fiche, p. 4.
([32]) European Institute for Gender Equality (2017), *National parliaments: presidents and members*, Metadata.

Figure 5.9: Seats held by women in national parliaments, EU-28, 2003–2017
(% of seats)



Note: Data refer to fourth quarter for each year except for 2003 (third quarter) and 2017 (second quarter).
Source: European Institute for Gender Equality (EIGE) (Eurostat online data code: sdg_05_50)

The European Commission supports Member States in improving the gender balance in decision-making positions, by monitoring the situation and disseminating information, data and analysis of trends in the field, in particular through its annual reports on equality between women and men. In addition, there is a Mutual Learning Programme in Gender Equality to exchange good practices, for example in a seminar on promoting women in political decision making positions organised in 2016.

over the past decade ([33]). Factors contributing to this under-representation include that women are seldom leaders of major political parties, which are instrumental in forming future political leaders, or gender norms and expectations reducing the pool of female candidates for selection as electoral representatives.

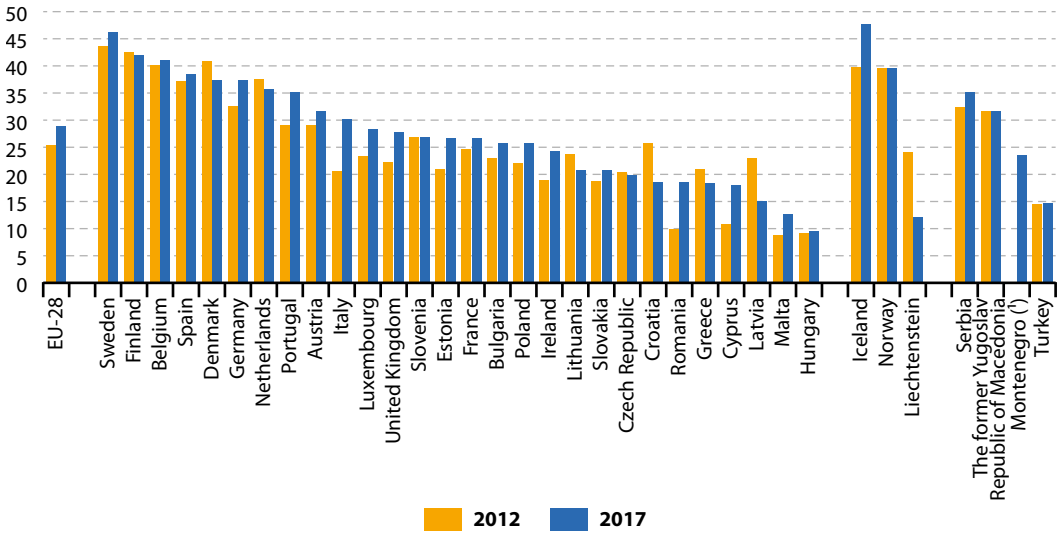
The share of female members of government (senior and junior ministers) in the EU increased from 23.3 % in 2003 to 27.7 % in 2017. The number of female presidents and prime ministers in EU countries was also higher in 2017 than in 2003. In 2017, there were three female heads of government (10.7 %) in comparison to none in 2003. In the time period considered, the share of female heads of government was never higher than 14.3 %, meaning that there were never more than four women in this executive position at the same time.

Women were also under-represented in political leadership positions worldwide. The number of female heads of state or governments has increased over the past 20 years, but women in these positions still remain a minority ([34]). As of March 2015, there were 19 countries with a female head of state or government, a slight improvement compared to 12 female heads of state or government in 1995. In addition, only 18 % of appointed ministers were women in 2015, and they were usually tasked with social issues ([35]).

The share of seats held by women in national parliaments varied considerably between EU countries in 2017. In Sweden, almost half of the seats were held by women, which was only

([33]) European Parliamentary Research Service and European University Institute (2017), *Empowering women in the EU and beyond*, p. 1.
([34]) Only elected Heads of State have been considered. Countries with Kings or Queens, Governor-Generals or Sultans are excluded in the count of Heads of States.
([35]) UNSTAT (2015), *Power and Decision-Making: Politics and governance*, p. 2.

Figure 5.10: Seats held by women in national parliaments, by country, 2012 and 2017
(% of seats)



(1) No data for 2012.

Source: European Institute for Gender Equality (EIGE) (Eurostat online data code: sdg_05_50)

outperformed by the EFTA country Iceland. In Hungary, the share of women in parliaments was almost five times lower. Between 2012 and 2017, the proportion of seats held by women in national parliaments increased in the majority of EU countries. However, the proportion decreased in eight EU countries, by up to 7 percentage points. Effectively designed electoral gender quotas ([36]) as well as proportional representation systems ([37]) may explain the higher representation of women in some cases.

Positions held by women in senior management

Despite a steady increase since 2003, less than a quarter of the board members of the largest listed companies were women in 2017.

The indicator 'proportion of women in senior management' positions measures the share of female board members in the largest publicly listed companies. Publicly listed means that the shares of the company are traded on the stock exchange. The 'largest' companies are taken to be the members (max. 50) of the primary blue-chip index, which is an index maintained by the stock exchange and covers the largest companies by

([36]) L. Freidenvall, D. Dahlerup and E. Johansson (2013), *Electoral Gender Quota, Systems and their Implementation in Europe*, Brussels, p. 5.
([37]) European Parliament (2017), *Women in parliaments*, At a glance, Infographic, p. 2.

market capitalisation and/or market trades. Only companies which are registered in the country concerned are counted ([38]). Board members cover all members of the highest decision-making body in each company (such as chairperson, non-executive directors, senior executives and employee representatives, where present). The highest decision-making body is usually termed the supervisory board (in case of a two-tier governance system) or the board of directors (in a unitary system) ([39]). The data presented in this section stem from the European Institute for Gender Equality Gender Statistics Database.

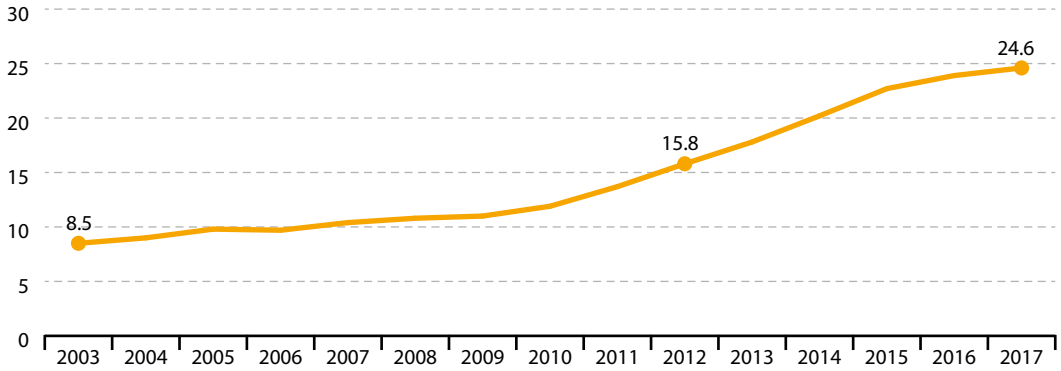
The share of women in boards of the largest listed companies was 24.6 % in 2017. In the years between 2003 and 2017, there was an almost steady increase of a total of 16.1 percentage points. However, the numbers mean that three out of four board members of largest listed companies are still men.

The data on board members provide evidence of the positive impact of legislative action on the issue of female representation in boards ([40]).

The share of women is even lower if the members of the second highest decision-making body of the largest listed companies (such as management board in case of a two-tier governance system and executive/management committee in a unitary system) are considered in addition to board members. In 2017, the share of female members in the two highest decision-making bodies was 15.6 % across the EU; in 2012, it was 10.4 %. The fact that senior management positions are more likely

Promoting gender equality in decision-making is a priority area for the European Commission and one of the key areas for action of the Strategic Engagement for Gender Equality ([41]). The goal of at least 40% representation of the under-represented gender among non-executive directors of companies listed on stock exchanges is confirmed. In addition, the importance of a better gender balance among executive directors and in the talent pipeline is also recognised.

Figure 5.11: Positions held by women in senior management, EU-28, 2003–2017
(% of board members)

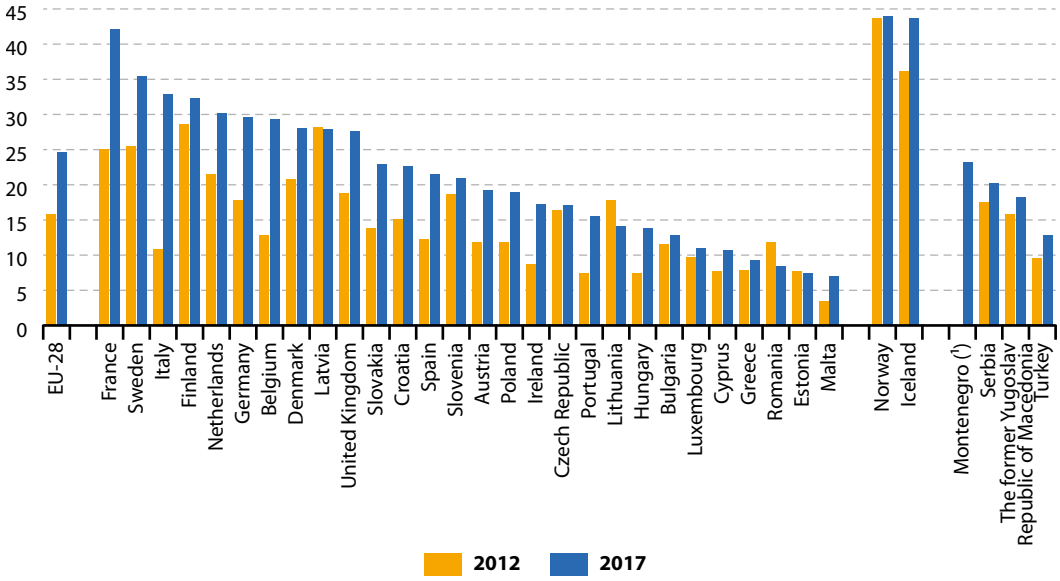


Note: Data refer to second half of each year except for 2017 (first half).

Source: European Institute for Gender Equality (EIGE) (Eurostat online data code: sdg_05_60)

([38]) Therefore, the number of companies covered by the data may be lower than the number of constituents in the relevant blue-chip index.
([39]) European Institute for Gender Equality (2017), *Largest listed companies: presidents, board members and employee representatives*, Metadata.
([40]) European Commission (2017), *2017 Report on equality between women and men in the EU*, Publication Office of the European Union, Luxembourg, p. 29.
([41]) European Commission (2016), *Strategic Engagement for Gender Equality 2016–2019*, Publications Office of the European Union, Luxembourg.

Figure 5.12: Positions held by women in senior management, by country, 2012 and 2017
(% of board members)



(1) No data for 2012.

Source: European Institute for Gender Equality (EIGE) (Eurostat online data code: sdg_05_60)

to be held by men is one of the reasons for the gender pay gap ([42]).

At the global level, data confirm that the 'glass ceiling' exists in the largest corporations and prevents women rising beyond a certain level in the hierarchy. In 2014, less than 4 % of CEOs of the world's 500 leading corporations were women ([43]). Data provided in 2014 show that the share of women among corporate board members of large companies was also very low. Among countries for which data exist, Norway had the highest proportion of seats held by women on executive boards with 41 % ([44]). Qatar, Saudi Arabia and the United Arab Emirates had 1 % or fewer women on corporate boards ([45]).

The share of female board members varied considerably between EU countries. In 2017, France was the closest to parity in boards with 42.1 % female members. In the same year, Malta had only 7.0 % female board members. In countries with binding legislative measures (Belgium, Germany, France and Italy), the proportion of female board members increased by 23.8 percentage points between 2010 and 2016; in countries without such measures, the increase was only 7.6 percentage points in the same time span ([46]).

The shares of women varied also considerably when taking into account not only the board members but also the members of the second highest decision-making body of the largest listed

([42]) European Commission (2017), *Employment and Social Developments in Europe, Annual Review 2017,* Publications Office of the European Union, Luxembourg, p. 34.
([43]) United Nations, Department of Economic and Social Affairs, Statistics Division (2015), *The World's Women 2015: Trends and Statistics*, p. 138.
([44]) Id., p. 136.
([45]) Ibid.
([46]) European Commission (2017), *2017 Report on equality between women and men in the EU*, Publication Office of the European Union, Luxembourg, p. 29.

companies. In 2017, women made up almost one-third of members in Estonia (31.7 %) but only 5.5 % in Austria. Between 2012 and 2017, the share of women in these positions increased in all but two EU countries.

It is interesting to note that Estonia had the highest share of women when considering the members of both decision-making body in 2017, but had the second lowest share of female board members in 2017. Another interesting case is Italy that was among the countries with the lowest share of women considering members of both decision-making bodies in 2017 (10.1 %), but had the third highest share of female board members in 2017.

Further reading on gender equality

European Commission (2014), *Tackling the gender pay gap in the European Union*, Publication Office of the European Union, Luxembourg.

European Commission (2016), *Magnitude and Impact Factors of the Gender Pay Gap in EU Countries*, Publications Office of the European Union, Luxembourg.

European Commission (2017), *2017 Report on equality between women and men in the EU,* Publication Office of the European Union, Luxembourg.

European Institute for Gender Equality (2017), *Gender equality in political decision-making*.

European Union Agency for Fundamental Rights (2014), *Violence against women: an EU-wide survey*, Main results, Publications Office of the European Union, Luxembourg.

I. Burkevica et al. (2015), *Gender Equality in Power and Decision-Making, Review of the Implementation of the Beijing Platform for Action in the EU Member States*, Publication for the EIGE, Publications Office of the European Union.

United Nations, Department of Economic and Social Affairs, Statistics Division (2015), *The World's Women 2015: Trends and Statistics*.

UN Women (2016), *Progress of the World's Women 2015–2016: Transforming Economies, Realizing Rights*.

6 Ensure availability and sustainable management of water and sanitation for all

The global perspective on SDG 6

Water scarcity affects more than 40 % of the global population and this number is expected to rise as a result of climate change. Water and sanitation-related diseases are a main cause of death for millions of people each year, especially children. To address this problem, SDG 6 calls for ensuring universal access to safe and affordable drinking water, sanitation and hygiene, and ending open defecation. It also aims to improve water quality and water-use efficiency and encourage sustainable abstraction and supply of freshwater. Protecting and restoring water-related ecosystems such as forests, mountains, wetlands and rivers is essential for mitigating water scarcity, as is the implementation of integrated water resources management. More international cooperation is also needed to support developing countries in water- and sanitation-related activities and programmes and to help local communities improve water and sanitation management ([1]).

eurostat supports the SDGs

Water provides one of our basic physical needs. It is also an important economic input and serves as the backbone for biodiversity, climate and ecosystem regulation. Protecting water ecosystems from pollution and using water sustainably are crucial to meeting the demands of current and future generations. Monitoring SDG 6 'clean water and sanitation' within an EU context, therefore, focuses on the sub-themes 'sanitation', 'water quality' and 'water use efficiency'. As shown in Table 6.1, the EU has made progress in these areas.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 6.1: Indicators measuring progress in SDG 6, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Sanitation			
Population having neither a bath, nor a shower, nor indoor flushing toilet in their household	↑ (1)	↑	p. 132
Population connected to at least secondary wastewater treatment	:	:	p. 134
Water quality			
Biochemical oxygen demand in rivers	↑ (2)(3)	↑ (3)	p. 135
Nitrate in groundwater	↑ (2)(3)(4)	↑ (3)(4)	p. 137
Phosphate in rivers	↑ (2)(3)	↑ (3)	p. 139
Bathing sites with excellent water quality (*)	:	↑	SDG 14, p. 289
Water use efficiency			
Water exploitation index	:	:	p. 141

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Trends for EU-27, past 10-year period.
(2) Past 12-year period.
(3) Trends for European aggregate referring to the EEA member countries.
(4) Trend in relation to the maximum concentration of 50 mg/L of nitrate in groundwater that is used for drinking water specified by the Drinking Water Directive.

Clean water and sanitation in the EU: overview and key trends

Sustainable management and use of water resources has long been one of the cornerstones of European environmental policy. In recent decades, the introduction of innovative legislation has provided a high level of protection in areas such as water quality and the promotion of wastewater treatment. Lately, the European action for sustainability describes the main actions the EU should take to contribute to the SDG 6: (1) to use wastewater as an important element of a water resources (circular economy), (2) to promote safe re-use of treated wastewater, minimum requirements for reused water, and (3) to protect water ecosystems as a key for the quality of life.

Sanitation

A major objective of SDG 6 is to achieve adequate and **equitable sanitation and hygiene** for all and to end open defecation by 2030. This ambition mainly focuses on the situation in developing and least-developed countries. To understand the situation at the EU level, the population having neither a bath, nor a shower, nor indoor flushing toilet in their household can be considered the most appropriate indicator for this objective. The availability and accessibility of basic sanitation facilities is crucial for a healthy life and people's well-being. Households are considered to be deprived if they do not have sanitation facilities. Since 2005, the share of people without improved sanitation facilities in their households has been steadily decreasing. In 2015, the EU average figure amounted to 2.0 % of the EU population. A closer look at country data reveals actually only very few countries had problems with access to sanitation, while in most Member States this was not an issue.

Apart from improved sanitation facilities, **wastewater needs to be treated safely** to secure the health of both humans and water bodies.

Therefore, SDG 6 also targets improved water quality by halving the proportion of untreated wastewater. During wastewater treatment, organic material is consumed by microorganisms and thereby removed from effluent water. If these contaminants were to enter water bodies, they would upset natural ecosystems and harm water quality. Trends in most EU countries have been positive, with connection rates to at least secondary wastewater treatment increasing. For the EU, this target resembles the main obligations under the Urban Waste Water Treatment Directive (UWWTD) to collect and treat wastewater for settlements with more than 2000 inhabitants ([2]). However, connection rates are still low in some countries, posing a serious risk to environmental health.

Water quality

Ensuring healthy inland waters not only relies on safe water supplies, sanitation and wastewater treatment, but also on tackling the water cycle issues of **water quality**. In this regard, pressures such as urbanisation, intensive agriculture, industry and climate change influence water quality and long-term water security.

SDG 6 aims to improve water quality by preventing pollution, eliminating dumping and reducing the release of hazardous chemicals and materials by 2030. As a direct result of improved wastewater treatment, the **biochemical oxygen demand** (BOD) in European rivers has shown a long-term decline of 2.5 % per year on average since 2000. The Water Framework Directive (WFD) ([3]) requires a 'good ecological status' and 'good chemical status' for all water bodies. Although the WFD does not set reference values for BOD, a reduction in the average BOD level in European rivers towards the natural background conditions will certainly contribute to the Directive's overall objective.

([2]) Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment.
([3]) Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

Another achievement in improving the water quality is the significant decrease of average **phosphate concentrations** in European rivers between 2000 and 2012. This positive trend is a result of the implementation of measures under the Urban Waste Water Treatment Directive over the past two and a half decades and the introduction of phosphate-free detergents.

Water abstractions, either from groundwater or running surface water, are the main sources of drinking water in Europe. A variety of chemicals, including nitrate, can infiltrate and potentially contaminate the groundwater. In some cases, safe levels are exceeded and thus further treatment of groundwater is needed to avoid threats to human health. On average, **nitrate concentrations** in European groundwater bodies are within the EU drinking water standard of 50 milligrams per litre. However, the overall positive outlook does not reflect the fact that nitrates concentrations might still pose serious problems at regional or local level ([4]), and pollution levels are worsening in some Member States. For example, in some regions concentrations in rivers are still high enough to cause eutrophication in coastal waters ([5])([6]). The Nitrates Directive ([7]) is taking action to prevent nitrates from agricultural sources polluting ground and surface waters by promoting the use of good farming practices. In addition, the WFD and the Groundwater Directive ([8]) aim to achieve good quantitative and chemical status of groundwater bodies by setting monitoring and quality standards requirements.

Pure, clean water is not only vital to human health but also for well-being. The new Bathing Water Directive ([9]) requires Member States to identify and assess the quality of all fresh and coastal marine bathing waters. It also required Member States to have reached at least 'sufficient' status in all sites by 2015. In this respect, the share of inland freshwater **bathing sites** with excellent water quality in the EU has increased since 2011. In 2016, 94.3 % of all inland bathing sites achieved at least 'sufficient' quality and 82 % of all inland bathing sites were classed as 'excellent' in terms of water quality. The share of inland bathing sites with excellent water quality is lower than for the marine bathing sites (87 %), mainly as a result of wastewater pollution and less dilution of water discharges. In comparison with the 2015 season, the inland bathing water quality has improved slightly.

Water use efficiency

To manage water resources sustainably and to decrease water scarcity, all relevant sectors need to use freshwater efficiently. Generally, water abstraction has reduced in Europe over the past decade. At the same time, water use efficiency has increased. However, water use efficiency still needs to be improved, particularly in southern Europe ([10]). The EU's aim to increase resource efficiency and the sustainable use of water resources can be monitored by the **water exploitation index**. The index describes the share of the available, renewable freshwater resources that is abstracted per year. An index of 10 to < 20 % indicates low stress, and below 10 % indicates a non-stressed country ([11]). An index below 20 % has been calculated for 16 out of 20 Member States for which data are available. Severe water stress is assumed for an index above 40 %, which is the case for two countries in the Mediterranean region.

([4]) More specific information on nitrates from agriculture can be found in the four-yearly report from the Commission to the Council and the European Parliament on the implementation of Council Directive 91/676/EEC (the Nitrates Directive) concerning the protection of waters against pollution caused by nitrates from agricultural sources, http://ec.europa.eu/environment/water/water-nitrates/reports.html
([5]) Eurostat, Statistics Explained (2016), Agri-environmental indicator — nitrate pollution of water.
([6]) EEA Indicator CSI023.
([7]) Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91 / 676 /EEC).
([8]) Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration.
([9]) Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC.
([10]) EEA (2017), *Use of freshwater resources in Europe*.
([11]) EEA (2003), *Indicator Fact Sheet — (WQ01c) Water exploitation index*.

Clean water and sanitation in the EU

Sanitation

Lack of sanitary facilities in 2015
2.0 % of population
- 0.6 pp since 2010

Population connected to wastewater treatment in 2015
> 80 % in 15 reporting Member States

Water quality

Biochemical oxygen demand in rivers in 2012
2.2 mg O_2 per litre
- 7.2 % since 2007

Nitrate in groundwater in 2012
19.1 mg NO_3 per litre
- 6.4 % since 2007

Phosphate in rivers in 2012
0.065 mg PO_4 per litre
- 29.3 % since 2007

Bathing water quality in 2016
82.0 % of inland bathing sites with excellent water quality
+ 11.6 pp since 2011

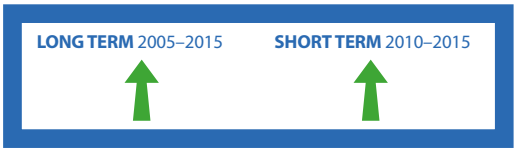
Water use efficiency

Water exploitation index in 2015
Water exploitation is at sustainable level in 16 of 20 reporting Member States
Malta and Cyprus show severe water scarcity in 2015

Source: Eurostat (online data codes: sdg_06_10, sdg_06_20, sdg_06_30, sdg_06_40, sdg_06_50, sdg_14_40 and sdg_06_60)

Population having neither a bath, nor a shower, nor indoor flushing toilet in their household

The share of the EU population having neither a bath, nor a shower, nor indoor flushing toilet in their household is already very low and has fallen noticeably since 2005.

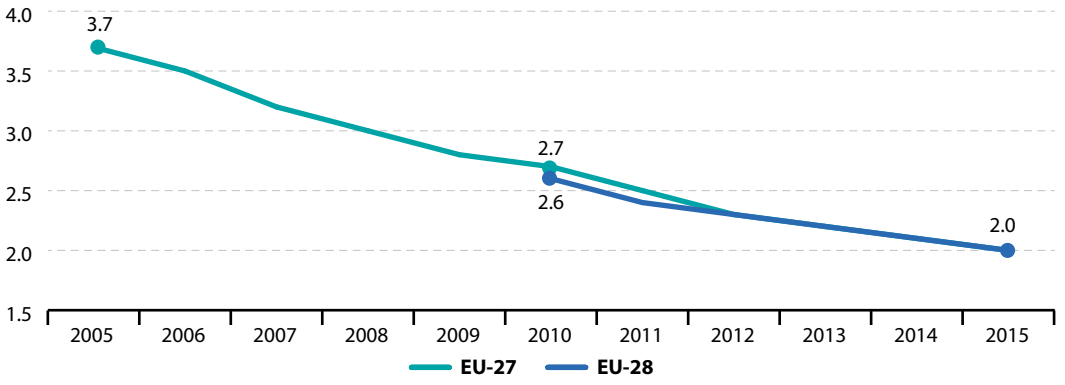


The indicator shows the share of the total population having neither a bath, nor a shower, nor an indoor flushing toilet in their household. The data are collected through the EU Statistics on Income and Living Conditions (EU SILC). A bath, shower and indoor flushing toilet are basic household facilities. Their availability is important for healthy livelihoods and people's well-being. Households without them are considered to be deprived ([12]). Furthermore, accessibility to these facilities, specifically within one's household, contributes to the end of open defecation, promoting a healthy environment and reducing human health risks.

On average 2.0 % of the EU population did not have access to a bath, a shower, nor an indoor flushing toilet in 2015 (see Figure 6.1), equalling around 10 million citizens, predominantly from a few eastern European countries. In most Member States these facilities were present in almost every household.

Poor people are more likely to lack basic sanitation facilities. Across the EU, 6.2 % of people earning less than 60 % of the median equivalised national income (the so-called poverty threshold) did not have a bath, a shower or an indoor flushing toilet in their household in 2015. For people with an income above the poverty threshold the rate was only 1.1 %.

Figure 6.1: Population having neither a bath, nor a shower, nor indoor flushing toilet in their household, EU-27 and EU-28, 2005–2015
(% of population)

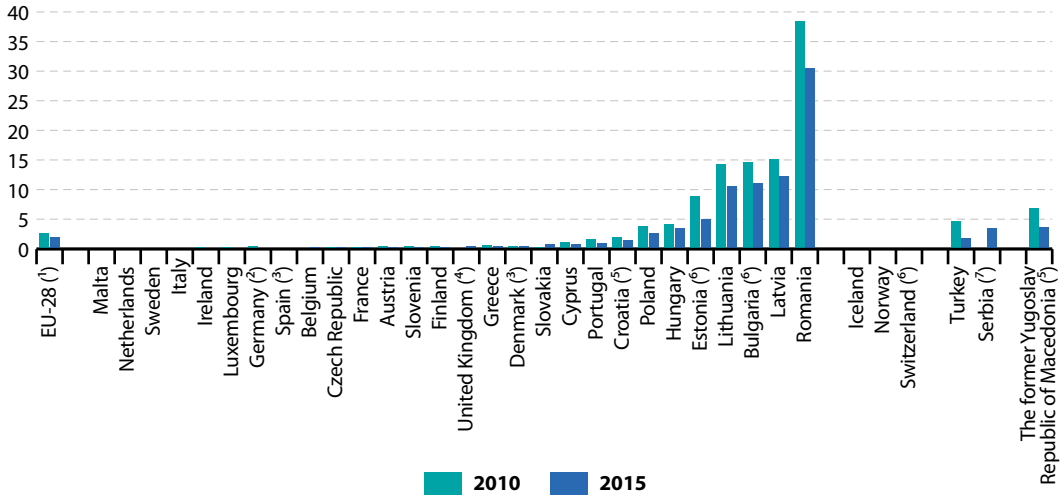


Note: Estimated data.

Source: Eurostat (online data code: sdg_06_10)

([12]) In addition to no bath or shower and no indoor toilet, housing deprivation may also result from other problems such as a leaking roof or a dark dwelling.

Figure 6.2: Population having neither a bath, nor a shower, nor indoor flushing toilet in their household, by country, 2010 and 2015
(% of population)



(1) Estimated data.
(2) 2012 data (instead of 2015).
(3) 2011 data (instead of 2010).
(4) Break in time series in 2012.
(5) 2012 data (instead of 2010).
(6) Break in time series in 2014.
(7) No data for 2010.

Source: Eurostat (online data code: sdg_06_10)

Protection of water resources, water ecosystems, and drinking and bathing water is a cornerstone of EU water policy, as confirmed in the 7th Environment Action Programme ([13]). The EU health and food safety policy also contributes to high water and sanitation standards in terms of preventing the spread of communicable diseases. The EU in its external relations, its development cooperation policy (through the European consensus and the Agenda for Change), the European Neighbourhood Policy and the EU Enlargement Policy is supporting third countries' efforts to achieve this sustainable development goal through bilateral assistance programmes or regional initiatives.

Despite the low EU average, a handful of countries had a considerably high share of people without a bath, shower or indoor flushing toilet (see Figure 6.2). Romania stands out as the most extreme case, with 30.5 % of the population lacking access to such basic facilities. Latvia, Bulgaria and Lithuania each reported figures above 10 %. Estonia, Hungary, Poland and Croatia made up a third group, with levels between 1 % and 5 %. For all other Member States, the rate was less than 1 %.

Particularly high shares were reported from poor people in the four countries at the bottom end of the spectrum. In Bulgaria, Latvia and Lithuania almost one-third of people living below the poverty threshold did not have access to basic sanitation facilities in 2015. The situation was worst in Romania, with almost two-thirds (64.7 %) of the poor population facing this situation. Notably, in this country almost 20 % of the wealthier people also lacked such access.

([13]) Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.

Population connected to at least secondary wastewater treatment

Since 2000, the share of the population connected to at least secondary wastewater treatment has increased in all Member States.

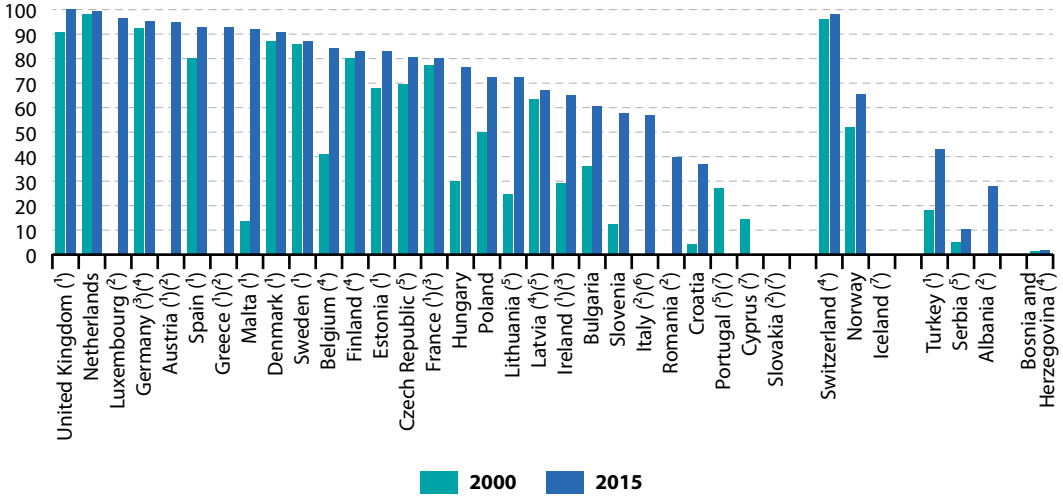
X INSUFFICIENT DATA TO CALCULATE TREND

This indicator shows the percentage of the population connected to wastewater treatment systems with at least secondary treatment. Secondary wastewater treatment generally involves biological treatment with a secondary settlement or other process to remove organic material. This reduces the wastewater's biochemical oxygen demand (BOD) by at least 70 % and its chemical oxygen demand (COD) by at least 75 %. In comparison, primary treatment involves solely physical or chemical processes (such as sedimentation), which reduce BOD and suspended solids by only 20 % and 50 % respectively.

Rates of wastewater connection in the EU range from below 40 % in Croatia to 100 % in the United Kingdom. From 2013–2015, nine Member States reported that more than 90 % of the population were connected to at least secondary wastewater treatment plants, while 15 reported that this was the case for more than 80 %. Across the EU, the highest connection rates are generally observable in the 'old' (EU-15) Member States, which started to implement secondary treatment earliest across the EU after stricter wastewater policies were put in place.

European legislation recognises that it may not be suitable to connect 100 % of the population to a sewerage collecting system, either because it would produce no environmental benefit or

Figure 6.3: Population connected to at least secondary wastewater treatment, by country, 2000 and 2015
(% of population)



(1) 2014 data (instead of 2015).
(2) No data for 2000.
(3) 2001 data (instead of 2000).
(4) 2013 data (instead of 2015).
(5) 2002 data (instead of 2000).
(6) 2012 data (instead of 2015).
(7) No data for 2015.

Source: Eurostat (online data code: sdg_06_20)

EU water policy provides a framework to comprehensively address water protection and for achieving good status for inland surface waters, transitional waters, coastal waters and groundwater. The EU health and food safety policy also contributes to high standards for water and sanitation in terms of preventing the spread of communicable diseases. The EU through its external relations, its development cooperation policy (through the European consensus and the Agenda for Change) and through the European Neighbourhood Policy and the EU Enlargement Policy is supporting third countries' efforts to achieve this sustainable development goal through bilateral assistance programmes or regional initiatives. The EU Enlargement Policy promotes the extension of EU norms to candidate countries covering water quality, waste water treatment, but also water management and flood prevention.

would be too costly. In these cases, individual solutions or other appropriate systems which achieve the same level of environmental protection should be used. For example, in countries such as those in Scandinavia or the Alpine region, where settlements are small and scattered, secondary treatment may not be required. Therefore in Austria, Denmark, Finland or Sweden, for example, no further connection rates may be expected ([14]). In contrast, in some 'old' EU Member States such as Ireland and France there is still room for improvement.

Biochemical oxygen demand in rivers

Since 2000, the biochemical oxygen demand (BOD) in European rivers has shown an average long-term decline of 2.5 % per year for reporting countries due to improved wastewater treatment.

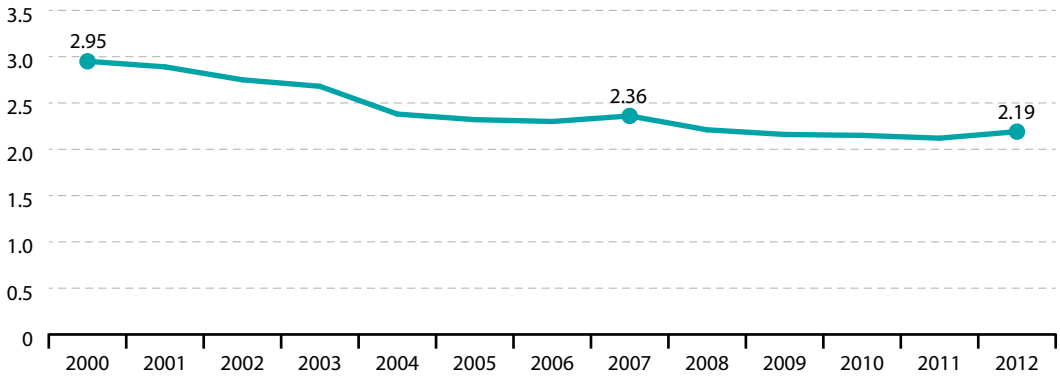
Biochemical oxygen demand (BOD) is used to measure water quality and this indicator is defined as the annual mean of BOD5 in monitored European rivers. BOD5 is a measure of the amount of oxygen aerobic microorganisms use to decompose organic substances in a water sample over five days in the dark at 20 °C. High levels are usually a sign of organic pollution, which affects water quality. The cleanest rivers have a five-day BOD of less than 1 milligram per litre. Moderately and heavily polluted rivers show values ranging from 2 to 8 mg/L. Since 2000, BOD values have been measured at 1 235 river monitoring stations in 20 countries, of which 18 are EU Member States. The data presented in this section are collected by the European Environment Agency (EEA).

BOD in European rivers fell between 2000 and 2012, indicating improvement in water quality. The average yearly decrease in BOD from 2000 to 2012 was 2.5 % and 1.5 % from 2007 to 2012, indicating a slowing down of the improvement over time. Based on a statistical assessment by the EEA, from 1992 to 2012 the majority of river stations report a negative trend in BOD, while only a small share reported increases ([15]).

More than half of the reporting Member States had low BOD levels below 2.0 mg O2/L in 2012. Particularly low BOD concentrations of less than

([14]) European Commission (2016), *Eighth Report on the Implementation Status and the Programmes for Implementation (as required by Article 17) of Council Directive 91/271/EEC concerning urban waste water treatment*, p. 4.
([15]) European Environment Agency (2015), *Oxygen consuming substances in rivers (CSI 019/WAT 002) — Assessment*, published February 2015, accessed on 10 March, 2015.

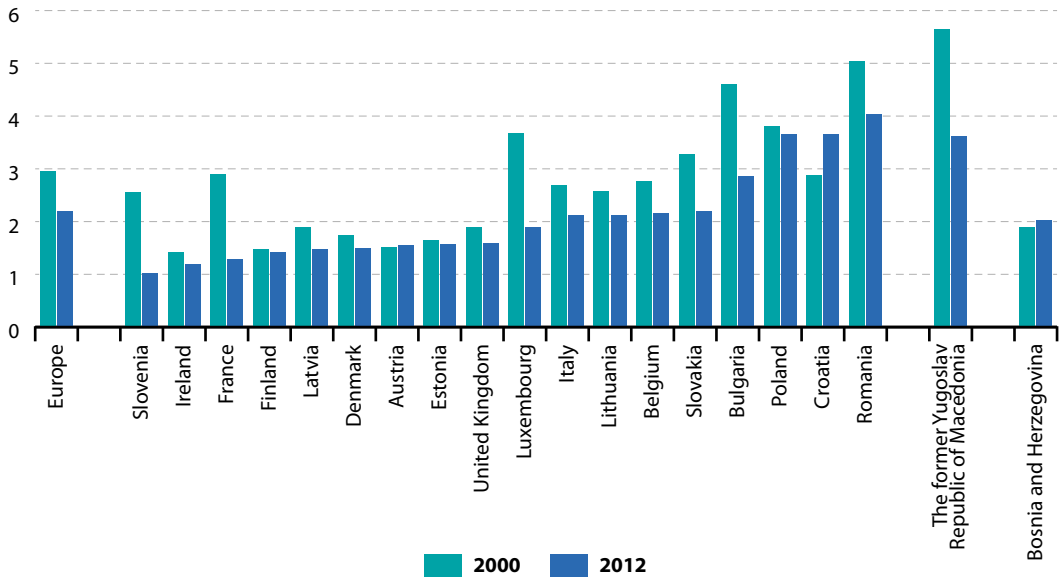
Figure 6.4: Biochemical oxygen demand in rivers, Europe, 2000–2012
(mg O_2 per litre)



Note: Monitoring stations included: Europe (1235), Austria (49), Belgium (36), Bosnia and Herzegovina (13), Bulgaria (91), Croatia (37), Denmark (38), Estonia (53), Finland (34), France (246), Ireland (54), Italy (165), Latvia (19), Lithuania (28), Luxembourg (3), The former Yugoslav Republic of Macedonia (19), Poland (106), Romania (116), Slovakia (15), Slovenia (14), United Kingdom (99).

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_06_30)

Figure 6.5: Biochemical oxygen demand in rivers, Europe, 2000 and 2012
(mg O_2 per litre)



Note: Monitoring stations included: Europe (1 235), Austria (49), Belgium (36), Bosnia and Herzegovina (13), Bulgaria (91), Croatia (37), Denmark (38), Estonia (53), Finland (34), France (246), Ireland (54), Italy (165), Latvia (19), Lithuania (28), Luxembourg (3), The former Yugoslav Republic of Macedonia (19), Poland (106), Romania (116), Slovakia (15), Slovenia (14), United Kingdom (99).

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_06_30)

Protection of water resources, water ecosystems, and drinking and bathing water is a cornerstone of EU environmental policy, as confirmed in the 7th Environment Action Programme ([16]). EU water policy provides a framework to comprehensively address water protection and for achieving good status for inland surface waters, transitional waters, coastal waters and groundwater.

1.4 mg/L were reported in Slovenia, Ireland and France. However, no country, even Slovenia which had the lowest concentration (1.02 mg/L), met the threshold for the cleanest river category of less than 1.0 mg/L BOD. On the other hand, eight countries had BOD levels greater than 2.0 mg/L and therefore have moderately to heavily polluted rivers; however, none exceeded the 8.0 mg/L upper limit for this category. Romanian rivers exhibited the highest levels of BOD concentration of 4.03 mg/L.

Some of the year-to-year variation in values measured at river stations can be explained by variation in precipitation and runoff. However, the long-term positive trend in BOD indicates that wastewater treatment (secondary and tertiary) has improved, which is a direct result of the implementation of the Urban Waste Water Treatment Directive. This trend could also indicate a possible reduction in untreated discharges and agricultural emissions (see the chapter on SDG 2).

Nitrate in groundwater

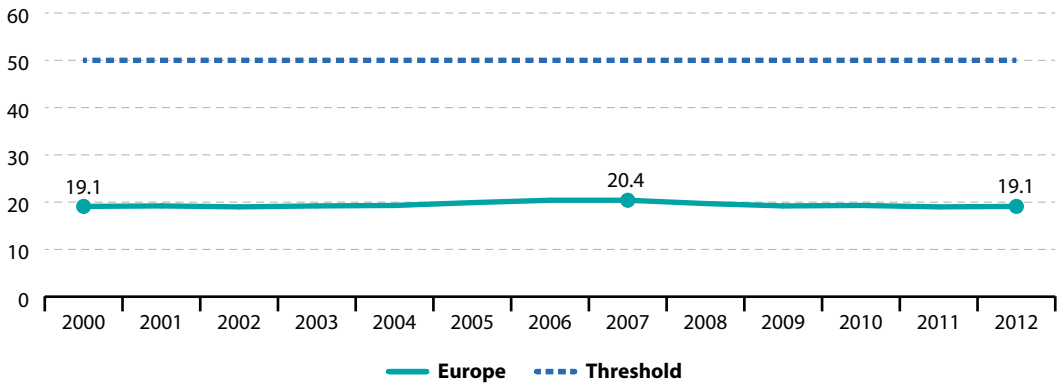
Since 2000, average nitrate concentrations in European groundwater bodies have remained within the EU drinking-water standard of 50 mg/L.

Nitrate can persist in groundwater for a long time. It can accumulate to high levels when inputs from anthropogenic sources (mainly agriculture) are steady and there can be some lag-time before groundwater concentrations reflect changes in input. Nitrate levels in groundwater are measured as milligrams of NO_3 per litre (mg NO_3/L), taken from well samples and aggregated to annual average values. According to the Drinking Water Directive ([17]), nitrate levels must not exceed 50 mg/L in groundwater that is used for drinking water. The Nitrates Directive ([18]) requires the designation of vulnerable zones based on this threshold for all waters including groundwater. Furthermore, the Nitrates Directive links directly to the Water Framework Directive (Annex VI) and the Groundwater Directive (Annex IV, part B). The data presented in this section are collected by the European Environment Agency (EEA).

The average concentration of nitrate in European groundwater had been increasing very slowly up to 2006 and 2007, reaching 20.4 mg/L, before starting to fall again, returning to its 2000 level of 19.1 mg/L in 2012. Despite the 1.3 mg/L reduction in nitrate contamination levels over the past five years, the lack of a longer-term improvement since 2000 suggests nitrates concentrations could still pose serious problems at regional or local level ([19]).

([16]) Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.
([17]) Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption.
([18]) Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91 / 676 /EEC).
([19]) More specific information on nitrates from agriculture can be found in the four-yearly report from the Commission to the Council and the European Parliament on the implementation of Council Directive 91/676/EEC (the Nitrates Directive) concerning the protection of waters against pollution caused by nitrates from agricultural sources, http://ec.europa.eu/environment/water/water-nitrates/reports.html

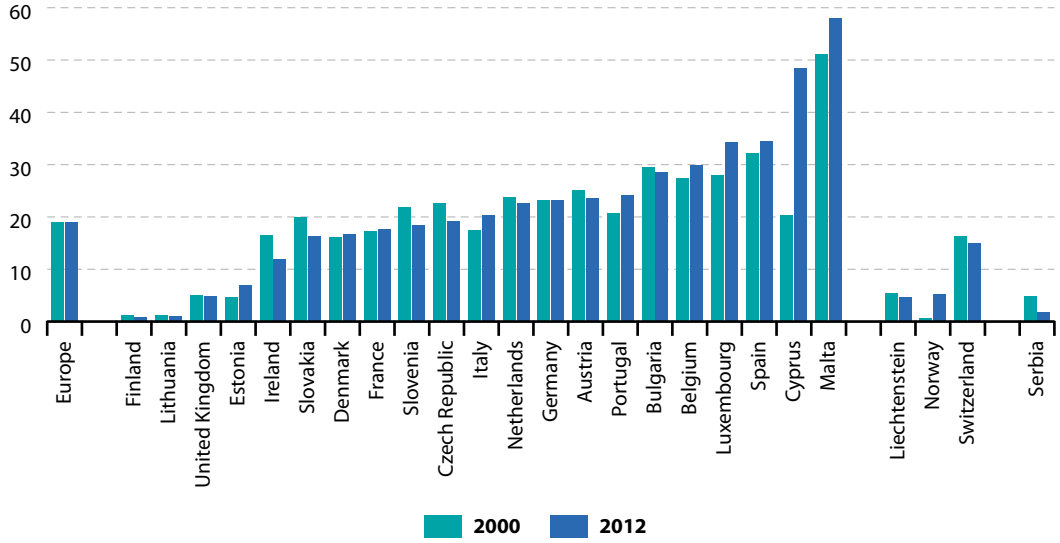
Figure 6.6: Nitrate in groundwater, Europe, 2000–2012
(mg NO_3 per litre)



Note: Groundwater bodies included: Europe (1242), Austria (14), Belgium (38), Bulgaria (42), Cyprus (4), Czech Republic (63), Denmark (108), Estonia (27), Finland (34), France (220), Germany (217), Ireland (89), Italy (7), Liechtenstein (1), Lithuania (3), Luxembourg (3), Malta (2), Netherlands (9), Norway (1), Portugal (10), Serbia (21), Slovakia (10), Slovenia (4), Spain (158), Switzerland (30), United Kingdom (127).

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_06_40)

Figure 6.7: Nitrate in groundwater, by country, 2000 and 2012
(mg NO_3 per litre)



Note: Groundwater bodies included: Europe (1242), Austria (14), Belgium (38), Bulgaria (42), Cyprus (4), Czech Republic (63), Denmark (108), Estonia (27), Finland (34), France (220), Germany (217), Ireland (89), Italy (7), Liechtenstein (1), Lithuania (3), Luxembourg (3), Malta (2), Netherlands (9), Norway (1), Portugal (10), Serbia (21), Slovakia (10), Slovenia (4), Spain (158), Switzerland (30), United Kingdom (127).

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_06_40)

Protection of water resources, water ecosystems, and drinking and bathing water is a cornerstone of EU environmental policy, as confirmed in the 7th Environment Action Programme ([20]). EU water policy provides a framework to comprehensively address water protection and for achieving good status for inland surface waters, transitional waters, coastal waters and groundwater.

In the majority of reporting EU countries, the nitrate concentrations in groundwater were above the European average of 19.1 mg/L but below the 50 mg/L concentration limit. However, nitrate levels are worsening in some Member States.

Malta with its scarce water resources and high population density was the only country with a groundwater nitrate concentration above the maximum limit. For Malta and Cyprus frequent fertiliser and manure application are the main reasons for the high values ([21]).

Phosphate in rivers

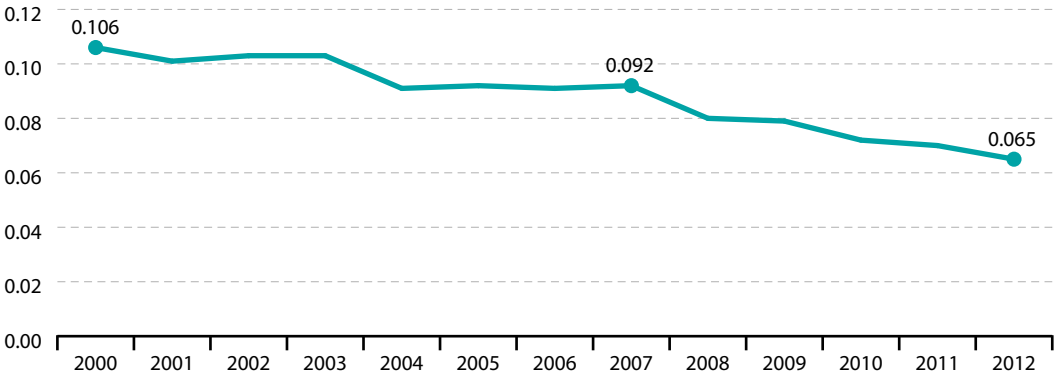
The average concentrations of phosphate in European rivers show a significant decrease over the period 2000 to 2012. This positive trend is a result of improvements in wastewater treatment and the introduction of phosphate-free detergents.

Phosphorus can be a limiting factor in some aquatic ecosystems and especially in freshwaters. Natural waters and wastewaters contain phosphorus predominately as phosphates. The most readily available form of phosphorus for biota is called 'orthophosphate' or 'reactive phosphorus'. It is measured as milligrams of phosphate per litre (mg PO4/L) in the dissolved phase from water samples from river stations and aggregated to annual average values. At high levels it can cause water quality problems, such as eutrophication, by triggering the growth of macrophytes and algae. This process can lead to dangerously low oxygen levels, which, when occurring in lakes, can harm water oxygen dependant organisms such as macroinvertebrates and fish and ultimately reduce the ecological status of the water body. Additionally, high phosphate levels can affect the use of water bodies, whether a river, lake or reservoir, by humans, for example, for consumption or recreation. The main sources of phosphate in rivers are fertilisers, animal waste and wastewater containing phosphate, for example from the use of phosphate detergents. The data presented in this section are collected by the European Environment Agency (EEA).

The implementation of the Urban Waste Water Treatment Directive and the introduction of phosphate-free detergents have strongly contributed to the lower phosphate concentrations found in European rivers over the recent decades ([22]). Additionally, the average phosphate concentration in running water in Europe has been decreasing at a higher annual

([20]) Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.
([21]) See: Christophi C., Constantinou C. (2011), *Nitrogen sources and denitrification potential of Cyprus aquifers, through isotopic investigation on nitrates*. In: Lambrakis N., Stournaras G., Katsanou K. (eds), *Advances in the Research of Aquatic Environment*, Environmental Earth Sciences. Springer, Berlin, Heidelberg;
Stuart M E, P J Chilton and T H E Heaton (2008), *A preliminary study on the nitrate contamination in groundwater in Malta; Conclusions and policy recommendations*, British Geological Survey Commissioned Report, CR/08/160. 25pp.
([22]) European Environment Agency (2017), *Nutrients in freshwater.*

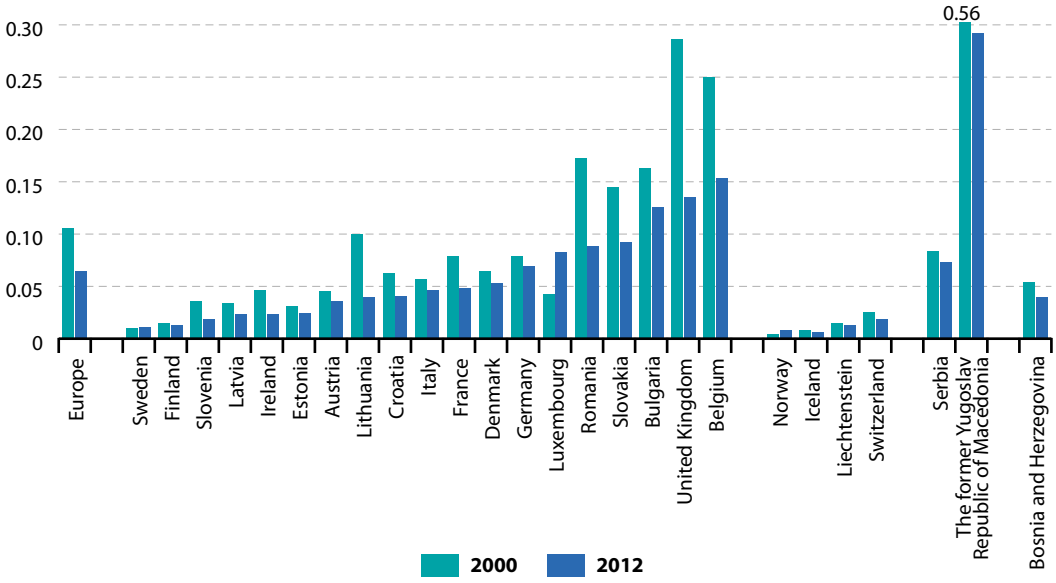
Figure 6.8: Phosphate in rivers, Europe, 2000–2012
(mg PO_4 per litre)



Note: River stations included: Europe (1 470), Austria (49), Belgium (35), Bosnia-Herzegovina (17), Bulgaria (84), Croatia (37), Denmark (41), Estonia (53), Finland (98), France (246), Germany (132), Iceland (1), Ireland (35), Italy (89), Latvia (21), Liechtenstein (13), Lithuania (28), Luxembourg (3), The former Yugoslav Republic of Macedonia (19), Norway (10), Romania (118), Serbia (37), Slovakia (9), Slovenia (14), Sweden (110), Switzerland (16), United Kingdom (155).

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_06_50)

Figure 6.9: Phosphate in rivers, by country, 2000 and 2012
(mg PO_4 per litre)



Note: River stations included: Europe (1 470), Austria (49), Belgium (35), Bosnia-Herzegovina (17), Bulgaria (84), Croatia (37), Denmark (41), Estonia (53), Finland (98), France (246), Germany (132), Iceland (1), Ireland (35), Italy (89), Latvia (21), Liechtenstein (13), Lithuania (28), Luxembourg (3), The former Yugoslav Republic of Macedonia (19), Norway (10), Romania (118), Serbia (37), Slovakia (9), Slovenia (14), Sweden (110), Switzerland (16), United Kingdom (155).

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_06_50)

Protection of water resources, water ecosystems, and drinking and bathing water is a cornerstone of EU environmental policy, as confirmed in the 7th Environment Action Programme ([23]). EU water policy provides a framework to comprehensively address water protection and for achieving good status for inland surface waters, transitional waters, coastal waters and groundwater.

rate over the last five years of measurements, showing an average reduction of 0.005 mg PO4/L per year.

Phosphate concentrations in rivers vary considerably across the EU due to population density and progress made in wastewater treatment with tertiary treatment (retention of phosphate). Concentrations have reduced in most countries since 2000, with values ranging from 0.01 mg PO4/l to 0.15 mg PO4/l in 2012. Phosphate levels are highest in the rivers in parts of central and eastern Europe, which are more exposed to agricultural pressures and population density. Eastern European rivers also show relatively high phosphate levels because not all treatment plants in those countries are equipped with tertiary treatment yet.

Water exploitation index

In 2015, water exploitation was at sustainable levels in 16 of the 20 Member States for which data are available. Two countries experienced severe water stress.

X INSUFFICIENT DATA TO CALCULATE TREND

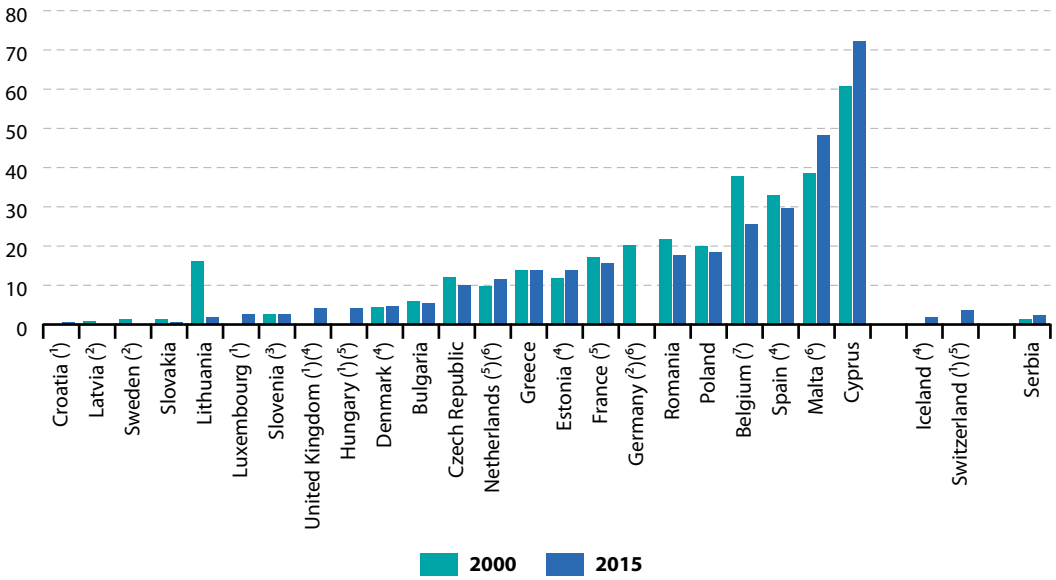
The water exploitation index (WEI) presents the annual total fresh water abstraction in a country as a percentage of its long-term annual average available water (LTAA) from renewable fresh water resources (groundwater and surface water). Lower indicator values are associated with lower pressures on groundwater resources. Total fresh water abstraction includes water removed from any fresh water source, either permanently or temporarily. Mine water and drainage water as well as water abstractions from precipitation are included, whereas water used for hydroelectricity generation (in situ use) is excluded. Generally, the WEI's information value is limited by the fact that it is dependent on the weather and water use in the given year and does not consider returns to the system. The minimum period taken into account for the calculation of long-term annual averages is 20 years. Values above 20 % indicate that a region is suffering water stress, with severe scarcity occurring where the WEI exceeds 40 %.

At the annual time scale, water stress in Member States is so far still a rare observation. The water exploitation index values for Cyprus and Malta are above the severe water scarcity threshold of 40 %, and have been worsening since 2000. A further two countries are above the 20 % threshold: Belgium and Spain. Apart from Belgium, all of these countries are located in the water scarce Mediterranean region.

Belgium's situation can be explained by the fact that a large part (66.2 % in 2011 ([24])) of the abstracted water is used for cooling purposes in nuclear energy generation ([25]). Because the country has a relatively small amount of available renewable freshwater ([26]), the share of abstracted

([23]) Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.
([24]) Eurostat, Statistics Explained, *Water Use in Industry*.
([25]) Share of 38 % on overall energy production in 2014, World Nuclear Association (2017), *Nuclear Power in Belgium*.
([26]) Eurostat, Statistics Explained, *Water statistics*.

Figure 6.10: Water exploitation index, by country, 2000 and 2015
(% of long-term average available water (LTAA))



(1) No data for 2000.
(2) No data for 2015.
(3) 2002 data (instead of 2000)
(4) 2014 data (instead of 2015).
(5) 2012 data (instead of 2015).
(6) 2001 data (instead of 2000).
(7) 2011 data (instead of 2015).

Source: Eurostat (online data code: sdg_06_60)

The 7th Environmental Action Programme ([27]) of the European Commission aims to increase resource and thus water efficiency. To ensure water use in appropriate quantity is one objective of the Water Framework Directive ([28]).

water appears disproportionately high. While the cooling water is redirected to rivers after use (returns) in some countries, the indicator sums up all abstracted water shares without this distinction.

Comparing the indices for 2000 and 2015, seven reporting countries (five of them being EU Member States) showed an increasing trend regarding the pressure on water resources from total water demand. Interestingly, the data do not show a clear-cut distinction between the dry and thus water-stressed region of southern Europe and the wetter North. This might be due to the second shortcoming of the indicator, that it does not take into account the temporally and regionally varying precipitation patterns.

To overcome the shortcomings of the water exploitation index, the European Environment Agency is working on an improved indicator, the water exploitation index + (WEI+). By applying the WEI+ indicator, it could be shown that around 13 river basin districts in the Mediterranean region, including Greece, Portugal and Spain, were facing water stress conditions in 2014 ([29]).

([27]) Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.
([28]) Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.
([29]) EEA (2017), *Use of freshwater resources*.

Further reading on clean water and sanitation

European Commission (2016), *Eighth Report on the Implementation Status and the Programmes for Implementation (as required by Article 17) of Council Directive 91/271/EEC concerning urban waste water treatment*, COM(2016) 105 final, Brussels: European Commission.

European Commission (2016), *The EU Water Framework Directive — integrated river basin management for Europe*.

European Commission (2016), *Urban waste water*.

European Commission (2013), *Annex accompanying the document Seventh Report on the Implementation of the Urban Waste Water Treatment Directive (91/271/EEC)*, COM(2013) 574 final, Brussels: European Commission.

European Environment Agency (2017), *Use of freshwater resources*.

European Environment Agency (2017), *Nutrients in freshwater*.

European Environment Agency (2015), *Oxygen consuming substances in rivers (CSI 019/WAT 002) — Assessment*.

European Environment Agency (2015), *Urban waste water treatment*.

European Environment Agency (2003), *Indicator Fact Sheet — (WQ01c) Water exploitation index*.

European Investment Bank, *Water and wastewater management*.

European Environment Agency (2016), *European water policies and human health — Combining reported environmental information*.

7 Ensure access to affordable, reliable, sustainable and modern energy for all

The global perspective on SDG 7

One in five people still lack access to modern electricity and as the world population continues to grow, so will the global demand for affordable electricity. At the same time, reliance on fossil fuels and the resulting increase in greenhouse emissions is leading to drastic changes in our planet's climate. In response to these challenges, SDG 7 calls for ensuring universal access to modern energy services, improving energy efficiency and increasing the share of renewable energy. To accelerate the transition to an affordable, reliable and sustainable energy system, countries need to facilitate access to clean energy research and promote investment in energy infrastructure and clean energy technology. Enhanced international cooperation is also necessary for expanding infrastructure and upgrading technology for energy services in developing countries([1]).

eurostat supports the SDGs

Monitoring SDG 7 'affordable and clean energy' in an EU context focuses on three sub-themes: 'energy consumption' looks at the level of primary and final energy consumption, energy productivity and the carbon intensity of energy consumption, while 'energy supply' and 'access to affordable energy' cover aspects related to the sustainability, security and affordability of energy provision. As shown in Table 7.1, the EU has made moderate progress in these areas.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 7.1: Indicators measuring progress in SDG 7, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Energy consumption			
Energy consumption	Primary ↗ Final (1) ↑	Primary ↑ Final (1) ↑	p. 150
Final energy consumption in households per capita	↗	↑	p. 153
Energy productivity	↑	↑	p. 155
Greenhouse gas emissions intensity of energy consumption (*)	↗	↗	SDG 13, p. 265
Energy supply			
Share of renewable energy in gross final energy consumption	↑ (2)(3)	↑ (3)	p. 156
Energy dependence	↘	↘	p. 158
Access to affordable energy			
Population unable to keep home adequately warm	:	↗	p. 160

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Trend in relation to the Europe 2020 target of increasing energy efficiency by 20% by 2020 (compared to projections); for monitoring purposes this target has been translated in absolute target values for primary energy consumption (1 483 million tonnes of oil equivalents) and final energy consumption (1 086 million tonnes of oil equivalents) to be met by 2020.
(2) Past 11-year period.
(3) Trend in relation to the Europe 2020 target of raising the share of renewable energies in gross final energy consumption to 20% by 2020.

Affordable and clean energy in the EU: overview and key trends

Everyday life depends on reliable and affordable energy services such as heating and cooling, electricity supply and transport systems. Energy enables the smooth functioning of all economic sectors: from business and industry to agriculture. However, the EU faces a number of challenges in securing affordable, reliable and sustainable energy supplies. For many decades, fossil fuels such as coal, crude oil and natural gas have been the major source of energy. However, the process of burning fossil fuels to produce energy releases greenhouse gas emissions, which contribute to climate change (see chapter on SDG 13) and air pollution which harms human well-being. Even though a cleaner and more sustainable renewable energy production has been rising in the EU, the region increasingly depends on imports of fossil fuels from abroad to cover all of its energy needs. These imports can also have an impact on affordability as energy prices are mainly determined by global energy prices, as well as national taxing and levies. Rising energy prices combined with poor, energy-inefficient, housing quality affect parts of the EU population that suffer from a lack of access to affordable energy, meaning they cannot afford to keep their homes adequately warm. To mitigate these negative effects, the EU aims to use energy more efficiently and to shift towards using domestic renewable energy sources.

Energy consumption

Increasing the economy's energy efficiency is one of the main pillars for reaching an affordable, reliable, sustainable and modern energy system as envisaged in SDG 7. Efficient energy systems reduce the energy consumption of services and products, leading to reduced costs, dependencies and environmental impacts linked to energy supply and use. To improve its energy efficiency along the whole energy supply chain the EU aims to reduce both its primary and final **energy consumption**. It appears the EU has made gains in this respect, with falls in primary and final energy consumption since 2000 more than compensating for slight increases in consumption during the period up to 2006. As a result, the EU is close to meeting its target to increase energy efficiency by 20 % by 2020. The short-term trends of the indicators are more positive than the long-term because the base year 2010 had a particularly cold winter, leading to rather high heating requirements throughout Europe.

Households account for about a quarter of final energy consumption. At home, people use electricity and fuels in particular for heating, cooling, warm water, lighting and appliances. Thus, the **consumption of each citizen at home** mainly depends on temperatures, building efficiency and the level of comfort, as well as the use and efficiency of electric appliances. In 2015, EU citizens on average consumed less energy at home than in 2000.

For centuries economic activities have grown in line with energy consumption, but it is also possible for an economy to grow without increasing energy inputs. Increased energy efficiency and economic restructuring result in higher **energy productivity**, meaning that an economy produces more output from the same energy input. Since 2000, the EU has continuously increased its energy productivity, with all Member States contributing to this positive trend.

Energy consumption is mainly covered by fossil energy sources which emit greenhouse gas emissions when burned and contribute to climate change (see chapter on SDG 13). The **greenhouse gas emissions intensity** of energy consumption has improved since 2000, in particular due to higher shares of renewables and less consumption of oil products and coal.

Energy supply

To achieve the SDG 7 aim of ensuring an affordable and clean energy system, the EU seeks to increase the **share of renewable energy in gross final consumption of energy**. Renewable energy sources are practically inexhaustible or renew within a human lifetime. In contrast, fossil energy sources regenerate over millions of years and are the main source of man-made greenhouse gas emissions, thus contributing significantly to climate change. The EU highlights the importance of renewable energies in the context of its climate change mitigation targets and the decarbonisation of its energy system (see also SDG 13). Since 2004, the EU has steadily increased its share of renewables in gross final energy consumption and is on track towards its target to increase its share of renewable energy in energy consumption to 20 % by 2020.

Ensuring an affordable and clean energy system also means the EU has to reduce its **dependency on energy imports** which mostly comprise natural gas, crude oil and coal imports. Dependence on imports of energy carriers exposes the European economy to significant costs as well as to the risk of supply shortages, for example, due to geopolitical conflicts. In this context, the EU highlights the need for domestic energy production, increased energy efficiency and completion of necessary infrastructure. However, since 2000, the EU has been unable to alleviate its energy dependence and has steadily increased its energy imports from non-EU countries.

Access to affordable energy

SDG 7 emphasises the need for affordable energy for reasons of social equality and justice. The inability to keep the home adequately warm is a survey-based indicator used to monitor access to affordable energy throughout the EU. A lack of access to affordable energy is strongly linked to income levels in general, and reducing overall poverty (see chapter on SDG 1) will improve access to affordable energy.

After the drawbacks of the economic crisis and its impacts on employment, wage levels and social payments, which led to an intermittent increase in the reported inability to keep the home adequately warm, the EU has made slight progress on improving access to affordable energy. In 2015, the indicator was slightly below 2007 levels.

Affordable and clean energy in the EU

Energy consumption

Energy consumption in 2015

primary energy
1 530 Mtoe
- 7.7 % since 2010

final energy
1 082 Mtoe
- 6.9 % since 2010

Energy consumption in households per capita in 2015
540 in kgoe
- 14.7 % since 2010

Energy productivity in 2015
8.3 EUR per kgoe
+ 13.7 % since 2010

Emissions intensity of energy consumption in 2015
89.1 % Index 2000 = 100
- 3.7 index points since 2010

Energy supply

Share of renewable energy in 2015
16.7 %
+ 3.8 pp since 2010

Energy dependence in 2015
54.0 % of imports in total energy consumption
+ 1.4 pp since 2010

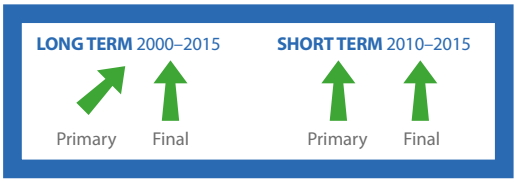
Access to affordable energy

Inability to keep home warm in 2015
9.4 % of population
No improvement since 2010

Source: Eurostat (online data codes: sdg_07_10, sdg_07_11, sdg_07_20, sdg_07_30, sdg_13_20, sdg_07_40, sdg_07_50 and sdg_07_60)

Energy consumption

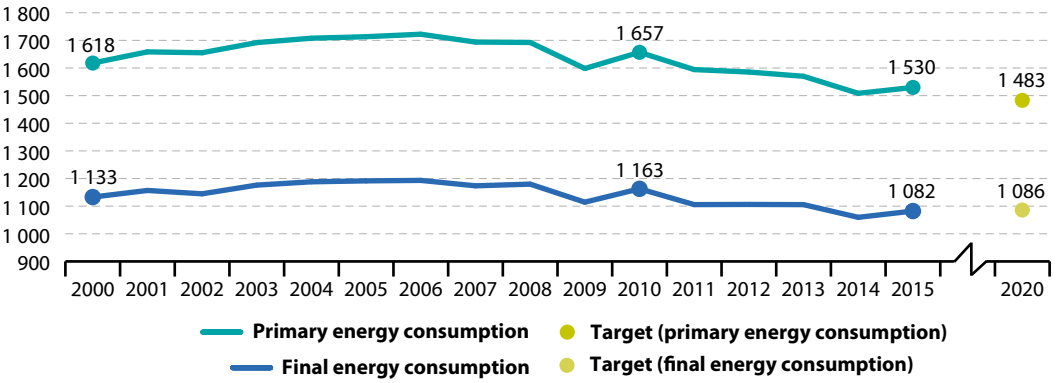
The EU is on track to meeting its 2020 energy efficiency target. Growth in primary and final energy consumption between 2000 and 2006 was later offset by rapid declines up to 2015, in particular for primary energy consumption.



The EU aims to increase its energy efficiency by 20 % by 2020. In absolute terms this means that by 2020, EU energy consumption should not exceed 1 483 million tonnes of oil equivalents (Mtoe) of primary energy or 1 086 Mtoe of final energy (see Energy Efficiency Directive ([2])). Increasing energy efficiency means less energy is needed for producing the same economic output. Primary energy consumption measures a country's total energy demand. It covers consumption of the energy sector itself, losses occurring during transformation and distribution of energy, and final energy consumption by end users. In comparison, final energy consumption only covers the energy consumed by end users, such as households, industry, agriculture and transport. It excludes the energy used by the energy sector itself.

In 2015, the EU was on track to meeting its primary and the final energy consumption target ([3]). This was mainly due to energy productivity improvements as a result of Member States implementing energy efficiency policies and slower economic growth as a consequence of the economic crisis. In 2010, an especially cold winter caused a sharp increase in demand for space heating — mainly in residential buildings (see also indicator 'Final energy consumption in households per capita') — which accounts for a quarter of final energy consumption in the EU ([4]). The slight increase in 2015 reflects a return

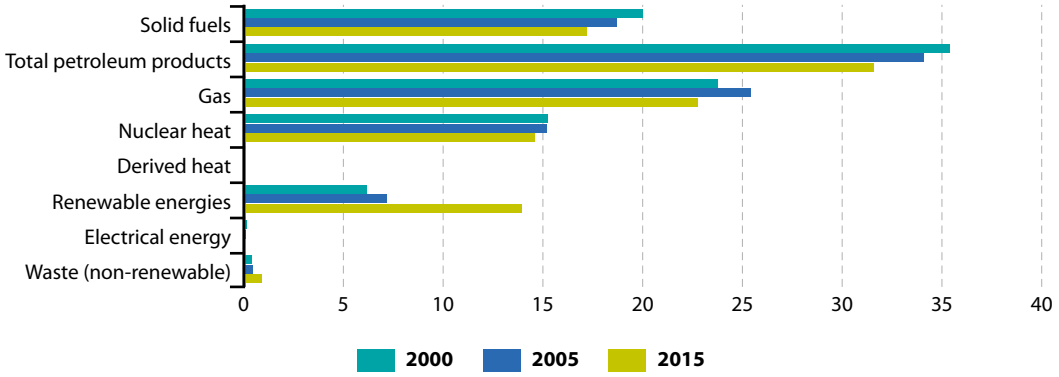
Figure 7.1: Primary energy consumption and final energy consumption, EU-28, 2000–2015
(million tonnes of oil equivalents)



Source: Eurostat (online data codes: sdg_07_10 and sdg_07_11)

([2]) Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency and Directive 2013/12/EU of 13 May 2013 adapting Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency, by reason of the accession of the Republic of Croatia.
([3]) See also: European Environment Agency (2016), *Trends and projections in Europe 2016 — Tracking progress towards Europe's climate and energy targets*.
([4]) Calculated based on: European Commission (2016), *Review of available information — Accompanying the document: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on an EU Strategy for Heating and Cooling*, SWD(2016) 24 final.

Figure 7.2: Primary energy consumption, by fuel type, EU-28, 2000, 2005 and 2015
(share of fuel types in total consumption, %)



Source: Eurostat (online data code: nrg_100a)

The EU aims to improve energy efficiency by 20 % as highlighted in its Europe 2020 strategy ([5]) and by at least 27% (with a view to 30%) according to its 2030 Climate and Energy Policy Framework ([6]). The year 2005 was chosen as the base year for measuring progress towards these targets. The Energy Union strategy ([7]) highlights energy efficiency as one of its five main pillars. EU Cohesion Policy ([8]) invests EUR 29 billion in sustainable energy, including energy efficiency, renewable energy, smart energy infrastructure and low-carbon research and innovation.

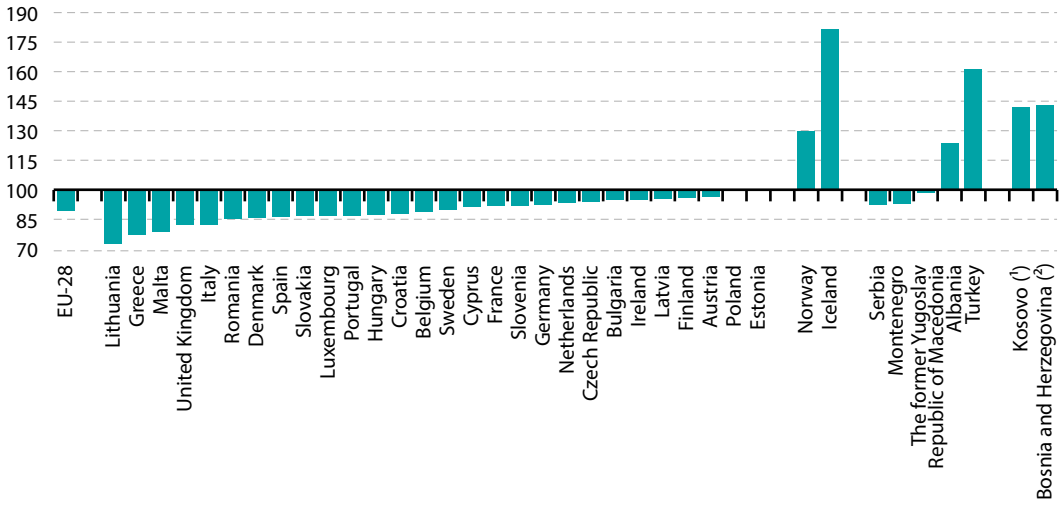
to more average heating demand compared to the exceptionally warm year 2014 ([9]). The trend in final energy consumption has closely followed the trend in primary energy consumption. The trends in primary and final energy consumption underline the need to further pursue energy-efficiency measures. Continuous effort will ensure the EU returns to a downward path and remains on it even when economic growth accelerates and puts pressure on energy resources (see also the indicator 'Energy productivity').

The EU reduced its primary energy consumption by 5 % between 2000 and 2015. The reductions mostly came from a fall in fossil fuel use, in particular petroleum products and solid fuels. Although petroleum products experienced the greatest reduction in consumption, of 88.4 million tonnes of oil equivalent (Mtoe), they remained the largest energy carrier consumed. Consumption of solid fuels also fell, while natural gas remained stable. Renewable energies in contrast increased their share from 2000 to 2015.

Reductions in primary energy consumption were mainly the result of lower final energy consumption. A breakdown by sector for final energy consumption shows that between 2000 and 2015 the industrial sector made the greatest absolute reductions of roughly 59 Mtoe, followed by the residential sector with 17 Mtoe and agriculture/forestry with 4.6 Mtoe. Reductions by industry also compensated for increases in the service sector (+ 26 Mtoe) and transport sector (+ 14 Mtoe). The economic crisis, structural changes and improvements in end-use efficiency were the main

([5]) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final.
([6]) European Commission (2014), *A policy framework for climate and energy in the period from 2020 to 2030*, COM(2014) 15 final.
([7]) European Commission (2015), *A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy*, COM(2015) 80 final.
([8]) European Commission (2015), *European Structural and investment Funds 2014–2020: Official texts and commentaries*.
([9]) bid.

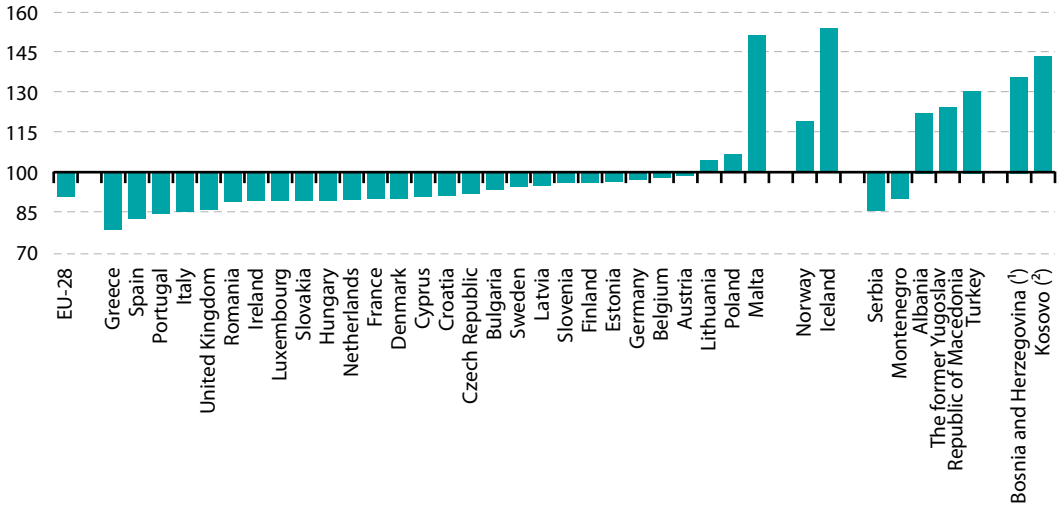
Figure 7.3: Change in primary energy consumption, by country, 2015
(Index 2005 = 100)



(1) This designation is without prejudice to positions on status and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.
(2) 2013 data.

Source: Eurostat (online data code: sdg_07_10)

Figure 7.4: Change in final energy consumption, by country, 2015
(Index 2005 = 100)



(1) 2013 data.
(2) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

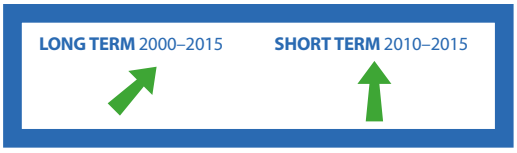
Source: Eurostat (online data code: sdg_07_11)

drivers of reductions, particularly in industry, the service sector and the transport sector.

Most Member States reduced their consumption of primary and final energy between 2005 and 2015. Exceptions include Poland and Estonia with increased primary energy consumption and Lithuania, Poland and Malta with increased final energy consumption. As Malta and Lithuania increased their final energy consumption (i.e. energy end use) while reducing their primary energy consumption, it can be concluded that their energy sectors have become more efficient. As explained above, the main difference between primary and final energy consumption is the consumption of the energy sector itself (transformation and distribution of energy). Estonia in contrast reduced its final energy consumption while primary consumption increased which means that transformation losses and self-consumption of the energy sector increased more than the reductions realised in the end-consumer sectors.

Final energy consumption in households per capita

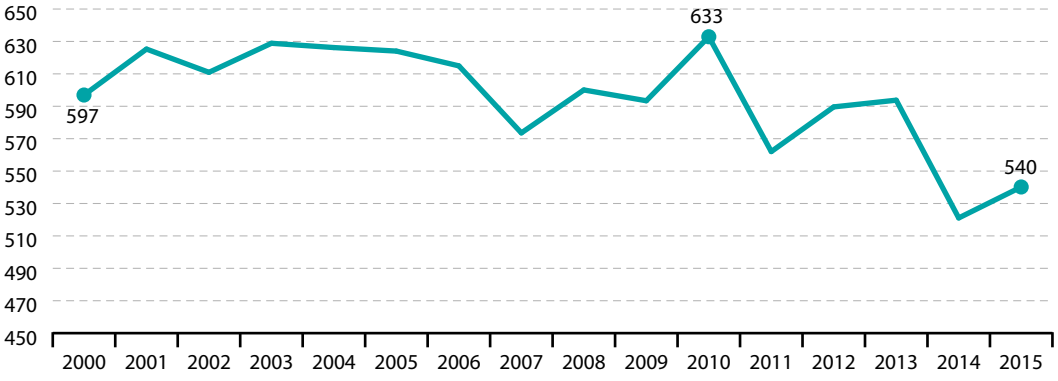
In 2015, on average EU citizens consumed less energy at home than in 2000. The decline did not follow a steady downward trajectory though; in 2010 final energy consumption peaked to levels above those in 2000, followed by a steep decline until 2015.



Final energy consumption of households per capita shows how much electricity and heat every citizen consumes at home, excluding transport. The indicator only measures the energy used by end consumers and excludes consumption by the energy sector itself.

Data are not temperature adjusted which means that variations from year to year are strongly influenced by weather conditions as households use more heat during cold winters than in warmer ones.

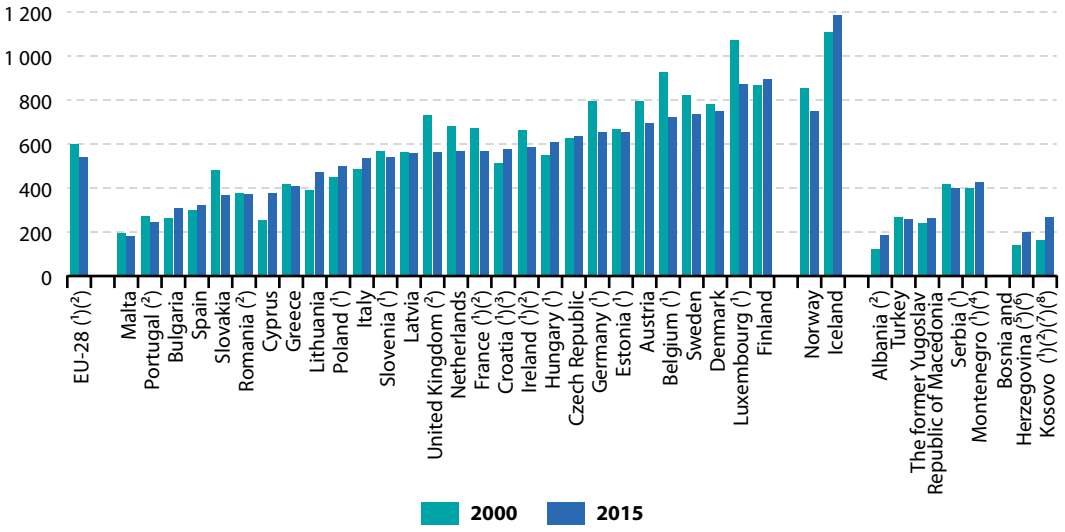
Figure 7.5: Final energy consumption in households per capita, EU-28, 2000–2015
(kg of oil equivalent)



Note: population data: breaks in time series in 1991, 1998, 2000, 2001, 2008, 2010, 2011, 2012, 2014 and 2015; data for 2013–2015 are provisional estimates

Source: Eurostat (online data code: sdg_07_20)

Figure 7.6: Final energy consumption in households per capita, by country, 2000 and 2015
(kg of oil equivalent)



(1) Break(s) in time series for population data between 2000 and 2015.
(2) Population data for 2015 are provisional and/or estimates.
(3) Population data for 2000 are estimates.
(4) 2005 data (instead of 2000).
(5) 2013 data (instead of 2015).
(6) Provisional data.
(7) 2003 data (instead of 2000).
(8) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: sdg_07_20)

The Covenant of Mayors for Climate and Energy ([10]), which was initiated in 2008, seeks to ensure the access to secure, sustainable and affordable energy at local and regional level. The EU's digital policy ([11]) aims to contribute to energy efficiency at the household level, for example, through actions on and support for smart metering and smart cities.

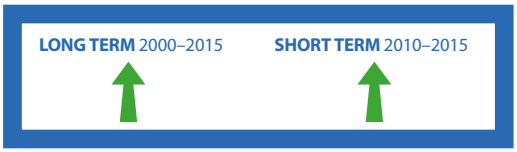
Overall energy consumption of households has remained relatively stable since 1990 while population has grown by 7 % or 33 million citizens ([12]). Thus, efficiency improvements, in particular in space heating as well as in the size of dwellings and number of electrical appliances, could balance the increase in population. In addition, households have reduced their direct consumption of fossil fuels for heating while consuming more renewable energy and electricity ([13]).

Because energy consumption of households per capita is linked to weather conditions, households in colder northern countries generally consumed more than those in the south in 2015. Over the period 2000 to 2015, most citizens reduced their consumption of energy at home. However, as mentioned above, yearly comparisons are difficult, since the data are not temperature adjusted. Reasons for increased final energy consumption in households include higher levels of heating or cooling comfort, increased living space and increased use of electric appliances, assuming constant levels of efficiency in energy use ([14]).

([10]) Covenant of Mayors for Climate and Energy (2017), Leaflet.
([11]) European Commission (2015), *A Digital Single Market Strategy for Europe*, COM(2015) 192 final.
([12]) Population change, Source: Eurostat (online data code: demo_gind).
([13]) Eurostat, Final energy consumption in households by fuel (online data code: t2020_rk210).
([14]) Odyssee-Mure (2017), *Key indicators on energy efficiency*.

Energy productivity

The EU's energy productivity has increased nearly continuously since 2000.



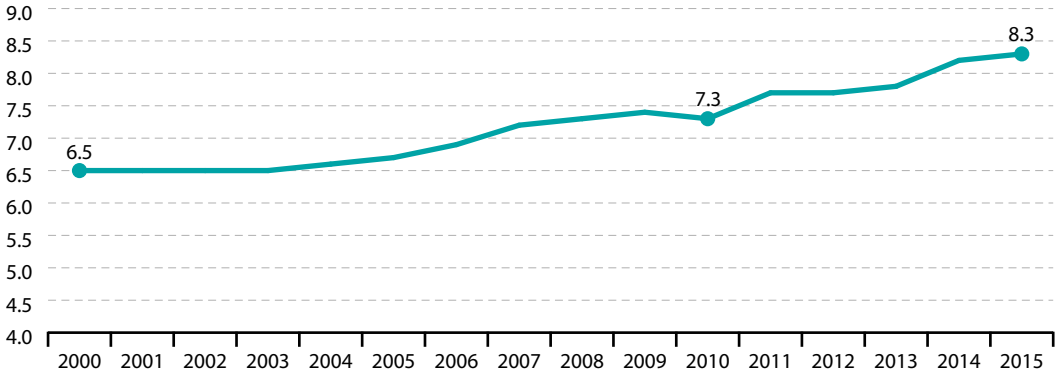
The energy productivity indicator measures the amount of economic output produced per unit of gross inland energy consumption. The gross inland energy consumption is the primary energy consumption (PEC) plus energy carriers employed for non-energy purposes. Economic output is either given as euros in chain-linked volumes to the reference year 2010 at 2010 exchange rates or in the unit PPS (purchasing power standard). The former is used to observe the evolution over time for a specific region while the latter allows comparisons of Member States in a given year.

The more or less steady rise in energy productivity in the EU, as shown in Figure 7.7, is the result of reduced gross inland energy consumption, which has fallen by 5.9 % since 2000 and by 7.8 % since 2010, and growth in GDP by 21.2 % and 5.7 % over the same time spans ([15]).

To compare Member States, PPS are used instead of euros to adjust for price level differences. There are large disparities in energy productivity, ranging from 4.6 to 17.1 PPS per kilogram of oil equivalent. However, differences do not necessarily result only from differences in countries' efficiency levels, but can also reflect a country's economic specialisation, for example, energy-intensive industries or service-based economies.

The particularly low energy productivity levels in Estonia, Finland and Bulgaria need to be attributed to inefficiencies in different sectors depending on the country's characteristics. Ireland, Malta and Denmark have the highest energy productivity among Member States mainly due to their low industrial energy intensity ([16]).

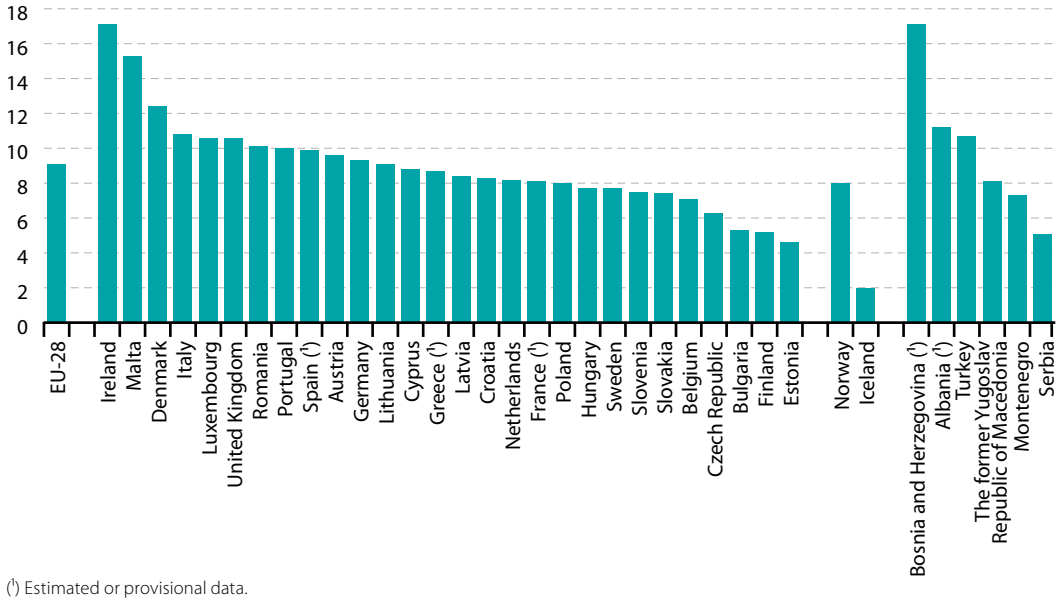
Figure 7.7: Energy productivity, EU-28, 2000–2015
(Chain linked volumes (2010) in EUR per kg of oil equivalent)



Source: Eurostat (online data code: sdg_07_30)

([15]) Eurostat, Gross inland energy consumption, (online data code: tsdcc320) and Eurostat, GDP at market prices, chain linked volumes (2010), million euros, (online data code: nama_10_gdp).
([16]) Odyssee-Mure (2017), *Key indicators on energy efficiency*.

Figure 7.8: Energy productivity, by country, 2015
(chain-linked volumes 2010) in PPS per kg of oil equivalent)



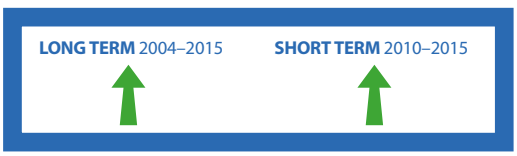
(1) Estimated or provisional data.

Source: Eurostat (online data code: sdg_07_30)

The Europe 2020 strategy ([17]) highlights the need for smart, sustainable and inclusive growth while reducing energy consumption, reflected in the choice of energy efficiency as one of its headline targets.

Share of renewable energy in gross final energy consumption

The EU is on track to meet its renewable energy target in 2020 due to constantly rising shares of renewables in electricity, heating and cooling and in transport.

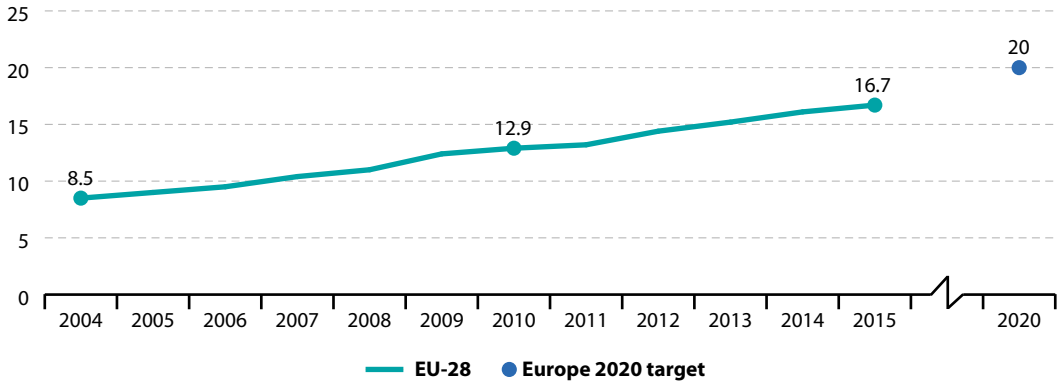


Renewable energy generation is given as a share of renewable energy consumption to the gross final energy consumption according to the Renewable Energy Directive ([18]). The gross final energy consumption is the energy used by end-consumers (final energy consumption) plus grid losses and self-consumption of power plants. The data series starts in 2004.

The use of renewable energy has been increasing continuously in the EU, with its share almost

([17]) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final.
([18]) Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources.

Figure 7.9: Share of renewable energy in gross final energy consumption, EU-28, 2004–2015 (%)



Source: Eurostat (online data code: sdg_07_40)

The Europe 2020 strategy ([19]) sets the target to increase the share of renewable energies in final energy consumption to 20 % by 2020. By 2030, the share should further increase to at least 27 % according to the 2030 Climate and Energy Policy Framework ([20]). The Energy Union strategy ([21]) highlights renewable energies as part of the required efforts for the decarbonisation of the energy system. EU Cohesion Policy (2014 to 2020) ([22]) invests EUR 29 billion in sustainable energy, including energy efficiency, renewable energy, smart energy infrastructure and low-carbon research and innovation.

doubling since 2004 when renewables covered only 8.5 % of gross final energy consumption. Support schemes and obligations for renewable energies and falling renewable energy system costs were the two main drivers of this increase.

The share of renewables increased in all of the three application areas namely electricity, heating and cooling and in transport. In 2015, the renewable share was highest in electricity generation with 28.8 %. This was followed by heating and cooling, where renewables supplied 18.6 %, and transport, with only 6.7 %. However, since 2004 the share of renewables in transport has increased fivefold, up from only 1.4 %. The second largest increase was realised in electricity generation with renewables doubling their share, followed by heating and cooling where their share increased 1.8 times. In 2015, renewable electricity was mainly generated by hydropower and wind energy while biomass supplied most of the renewable heating. Biofuels were the main source of renewable transport fuels.

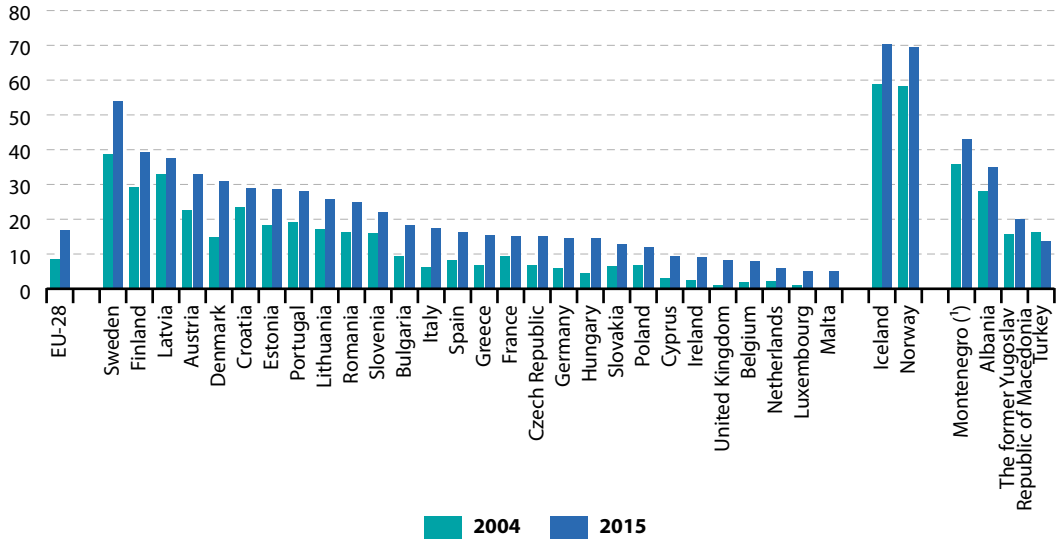
In 2015, there were wide variations among Member States in the share of renewable energy in final energy consumption, depending on available renewable sources and the financial and regulatory support provided.

Sweden had a substantial lead with a share of more than 50 %, followed by Finland and Latvia with shares close to 40 %. These particularly high

([19]) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final.
([20]) European Commission (2014), *A policy framework for climate and energy in the period from 2020 to 2030*, COM(2014) 15 final.
([21]) European Commission (2015), *A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy*, COM(2015) 80 final.
([22]) European Commission (2015), *European Structural and investment Funds 2014–2020: Official texts and commentaries*.

Figure 7.10: Share of renewable energy in gross final energy consumption, by country, 2004 and 2015

(%)



(1) 2005 data (instead of 2004)

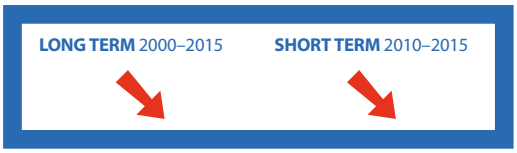
Source: Eurostat (online data code: sdg_07_40)

shares were mainly reached through the use of hydropower and solid biofuels. Wind and solar energy have also increasingly contributed to rising shares of renewable energy in final energy consumption in EU countries.

The EFTA countries Iceland and Norway generally consume more renewable energy in relation to their gross final energy consumption than any EU Member State because of their significant hydropower and geothermal resources.

Energy dependence

The EU has constantly expanded its energy imports to meet its energy consumption. In particular, imports of crude oil, natural gas and hard coal have increased since 2000.

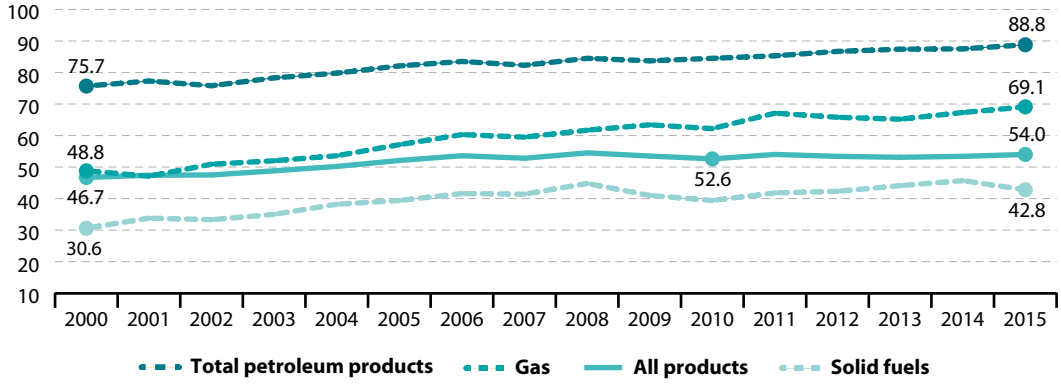


Energy dependence is the share of total inland energy needs met by imports from other countries. Dependence on imports of energy carriers exposes the European economy to volatile world market prices and the risk of supply shortages, for example, due to geopolitical conflicts. The risks increase with dependency on single countries, for example, determined by the supply infrastructure.

The EU's energy dependence has increased significantly over the past decade as domestic primary production of hard coal, lignite, crude oil, natural gas and more recently nuclear energy has declined ([23]). Since 2004, more than half of

([23]) Eurostat (2016), *Statistics Explained: Energy production and imports*.

Figure 7.11: Energy dependence by products, EU-28, 2000–2015
(% of imports in total energy consumption)



Note: 'All products' is not the average of the other three fuel categories shown. It also includes other energy sources, such as renewable energy or nuclear energy, which are treated as domestic sources.

Source: Eurostat (online data code: sdg_07_50)

The Energy Security Strategy ([24]) outlines the need for domestic energy production, increased energy efficiency and completion of missing infrastructure and the Energy Union strategy ([25]) highlights energy security as one of its five pillars. EU Cohesion Policy ([26]) invests EUR 29 billion in sustainable energy, including energy efficiency, renewable energy, smart energy infrastructure and low-carbon research and innovation.

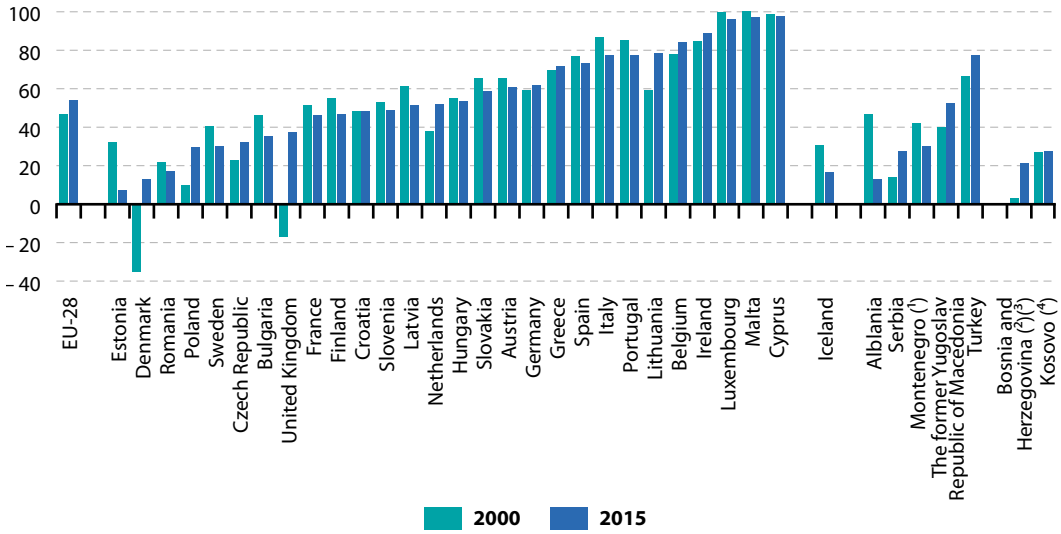
the energy consumed in the EU each year has been imported from outside. Imports of fossil energy carriers such as petroleum products, natural gas and hard coal are mostly responsible for this increase, with most of the increase being attributable to exhausted or uneconomic domestic sources. By contrast, most renewable energy can be sourced domestically, thus lessening the import dependence.

The main supplier of energy to the EU in 2015 was Russia. It accounted for 37.3 % of gas imports, 32.8 % of imports of petroleum products and 29.1 % of solid fuel imports from non-EU countries. Following Russia, the second largest supplier of gas were European countries that were not part of the EU (mainly Norway), delivering 33.0 % of gas imports. Regarding petroleum products, Africa and the Middle East were the next largest suppliers after Russia with 19.0 % and 16.9 %, respectively. The second largest source for solid fuels to the EU was Central and South America with 24.3 %, followed by North America with 17.3 % ([27]).

In 2015, all Member States were net importers of energy, with 16 Member States importing more than half of their total energy consumption from other countries (EU countries and non-EU countries). In particular island countries had to import substantial shares. The largest increases over the past 15 years took place in Denmark and UK, both of which were net exporting countries (of petroleum products and gas) in 2000 but by 2015 had changed to net importers. Denmark was still a net exporter of gas but had to import petroleum

([24]) European Commission (2014), *European Energy Security Strategy*, COM(2014) 330 final.
([25]) European Commission (2015), *A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy*, COM(2015) 80 final.
([26]) European Commission (2015), *European Structural and investment Funds 2014–2020: Official texts and commentaries*.
([27]) Eurostat (online data codes: nrg_122a, nrg_123a and nrg_124a).

Figure 7.12: Energy dependence, by country, 2000 and 2015
(% of imports in total energy consumption)



Note: Norway is not displayed in this graph as it is a large net exporter of energy (2000: – 733.1 % and 2015: – 585.9 %)
(1) 2005 data (instead of 2000).
(2) 2014 data (instead of 2015).
(3) Provisional data.
(4) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

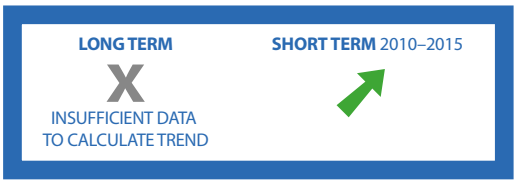
Source: Eurostat (online data code: sdg_07_50)

products while the UK was a net importer of petroleum products and of gas in 2015.

The largest progress in reducing energy dependence was observed in Estonia. This was realised through increases in domestic production of solid fuels and petroleum products, which allowed it to reduce imports while increasing its own consumption. Sweden in contrast reduced its dependence by reducing its fossil energy consumption.

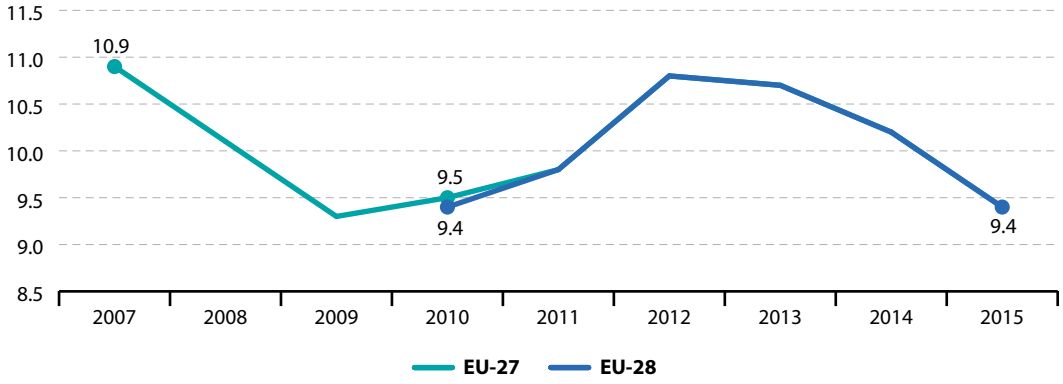
Population unable to keep home adequately warm

The EU has made slight progress in reducing the reported inability to keep the home adequately warm since 2012 following setbacks due to the economic crisis.



The 'inability to keep the home adequately warm' is an indicator to monitor access to affordable energy throughout the EU. The indicator values are being collected as part of the European Union Statistics on Income and Living Conditions (EU-SILC) to monitor the development of poverty and social inclusion in the EU. The data collection is based on a survey, which means that indicator values are self-reported.

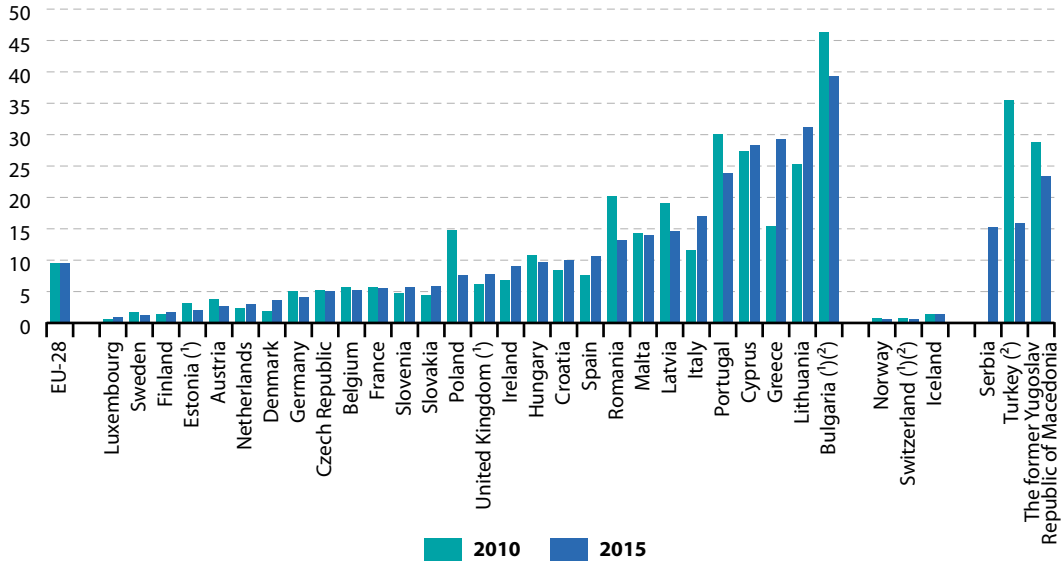
Figure 7.13: Population unable to keep home adequately warm, EU-27 and EU-28, 2007–2015
(% of population)



Source: Eurostat (online data code: sdg_07_60)

The EU Cohesion Policy (2014–2020) ([28]) provides about EUR 350 billion of investments into smart, sustainable and inclusive growth from 2014 to 2020. One of its objectives is to combat poverty through its investments in housing and regeneration of deprived urban and rural areas.

Figure 7.14: Population unable to keep home adequately warm, by country, 2010 and 2015
(% of population)



(1) Break(s) in time series between 2010 and 2015.
(2) 2011 data (instead of 2010).

Source: Eurostat (online data code: sdg_07_60)

([28]) European Commission (2015), *European Structural and investment Funds 2014–2020: Official texts and commentaries*.

Following this indicator, 9.4 % of the EU population were affected in 2015. This is 1.5 percentage points lower than in 2007 ([29]). Gains were being made until the economic crisis of 2009, which caused a rise in unemployment and put pressure on wage levels and social payments. This resulted in rising indicator values in many Member States until 2012 when it reached almost the same level as in 2007. After 2012, inability to keep the home adequately warm became less prevalent with steady reductions each year.

The ability to keep the home adequately warm greatly depends on income. People who are at risk of poverty are also likely to find energy difficult to afford (see also SDG 1). In 2015, 22.7 % of people with an income below 60 % of the median equivalised income (the 'poverty threshold') reported being unable to keep their homes adequately warm. At the same time, only 6.6 % of people with an income above 60 % of the median equivalised income reported this lack of access to affordable energy. Household type (for example, single, older and younger people, parents with dependent children) seems to have a more limited effect on the indicator. Nevertheless, it is observable that single households seem to be affected more often, especially single parents with dependent children. Within this group, the share that report being unable to keep their home adequately warm was at 14.6 % in 2015 ([30]).

In 2015, 18 Member States reported less than 10 % of their population had an inability to keep their homes adequately warm. Northern and most of western European countries, with particularly cold winters, had the lowest shares of people with access to heating. In contrast, it was a wide-spread problem in southern and eastern Europe. This distribution can be traced back mainly to building efficiency, including the lack of suitable heating systems and insulation predominantly in southern countries, leading to low indoor temperatures during winter; the general income level which affects housing standards and ability to pay for fuels; and the existence and design of financial interventions by the respective governments ([31])([32]).

Further reading on affordable and clean energy

European Commission (2017), *2nd Report on the State of the Energy Union*.

European Commission (2017), *Progress reports on energy efficiency and renewable energies. Latest submission in 2015: Energy Efficiency progress report*, SWD(2015) 245 final and Renewable energy progress report, SWD(2015) 117 final, Brussels.

European Environment Agency (2016), *Trends and projections in Europe 2016 — Tracking progress towards Europe's climate and energy targets*.

Eurostat (2016), *Energy from renewable sources, Statistics Explained*, Data extracted in February 2016.

Eurostat (2016), *Energy production and imports, Statistics Explained*, Data extracted in July 2016.

Schumacher, K. et al. (2015), *How to end energy poverty? Scrutiny of current EU and Member States instruments*, Study for the European Parliament's Committee on Industry, Research and Energy.

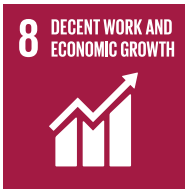
Pye, S. and Dobbins, A. et al. (2015), *Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures*.

([29]) 2007 data refer to the EU-27.
([30]) Source, Eurostat, (online data code: ilc_mdes01).
([31]) Pye, Steve et al. (2015), *Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures. Insight_E policy report*.
([32]) Andrei, Anamaria-Cristina (2015), *Energy poverty — Proved of the effectiveness of the public heating systems? In: Proceedings of the 9th international management conference 'Management and innovation for competitive advantage'*, Bucharest, Romania.

8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

The global perspective on SDG 8

About half the world's population still lives on the equivalent of about USD 2 a day and in many parts of the world having a job still does not guarantee an escape from poverty. SDG 8 recognises the importance of sustained economic growth and high levels of economic productivity for the creation of well-paid, quality jobs and the achievement of global prosperity. That said, it envisions inclusive and sustainable economic growth, which leaves no one behind and does not harm the environment. SDG 8 calls for opportunities for full and productive employment and decent work for all while eradicating forced labour, human trafficking and child labour and promoting labour rights and safe and secure working environments. It draws particular attention to creating opportunities for the youth who are not in education, employment and training in order to prevent future erosion of skills and to ensure they are not discouraged from looking for a job. SDG 8 also foresees enhanced international cooperation to support growth and decent employment in developing countries through increased 'aid for trade', development-oriented policies and a global strategy for youth employment ([1]).



eurostat supports the SDGs

Monitoring SDG 8 'decent work and economic growth' in an EU context focuses on three sub-themes. 'Sustainable economic growth' looks not only at the performance of our economies, but also at their resource productivity. The sub-theme 'employment' presents the developments observed in the labour market, including the situation of the most vulnerable groups. 'Decent work' brings up the issues of non-standard contracts as well as health and safety at work. As shown in Table 8.1, the EU's progress in these areas has been rather mixed.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 8.1: Indicators measuring progress in SDG 8, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Sustainable economic growth			
Real gross domestic product (GDP) per capita	↗	↗	p. 168
Resource productivity and domestic material consumption (*)	↑	↑	SDG 12, p. 242
Employment			
Total employment rate	↘ (1)	↘ (1)(2)	p. 170
Young people neither in employment nor in education or training	↗ (3)	↑	p. 173
Long-term unemployment rate	↗ (4)	↗	p. 175
Inactive population due to caring responsibilities (*)	↓ (4)	↓	SDG 5, p. 118
Decent work			
Involuntary temporary employment	↘ (5)	↓	p. 177
People killed in accidents at work	:	↑	p. 178

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Trend in relation to the Europe 2020 target of raising the employment rate of 20 to 64 year olds to 75 % by 2020.
(2) The onset of the economic crisis in 2008 has put the EU off the path towards this target. However, if the employment recovery recorded from 2013 onwards can be maintained the target may still be met.
(3) Past 14-year period.
(4) Past 11-year period.
(5) Past 10-year period.

Decent work and economic growth in the EU: overview and key trends

Economic growth and decent employment are of key importance for the development and prosperity of European countries and for the well-being and personal realisation of individuals. However, when sustained economic growth is not accompanied by eco-efficiency improvements and social inclusion policies, it can harm the natural environment it depends on, damage the social fabric of European countries and undermine the well-being of future generations. Therefore, harmonising the three pillars of sustainable development — economic development, protection of the environment and social inclusion — is a prerequisite for achieving sustained prosperity. That is why SDG 8 calls for ensuring economic prosperity and providing full and productive employment for all while minimising environmental pressures and eradicating social injustice and exploitation of human labour.

Sustainable economic growth

The ability of Europeans to enjoy high living standards depends on the output from production activities in the economy. **Growth in gross domestic product (GDP)** is the best-known measure for economic performance and it is commonly used as a proxy for increases in a country's socioeconomic development. Economic growth does not directly measure welfare. Nevertheless, it gives an indication of an economy's potential to satisfy people's needs and its capacity for job creation, and serves a wide range of uses relevant for development. If not outweighed by population growth, GDP growth can provide resources, for example, for investment in research and development, promotion of health care, education, employment and poverty eradication. Real GDP per capita in 2016 was 15.4 % higher than in 2001, representing an average annual growth of about 1.0 % between 2001 and 2016.

While economic growth is important for economic and social security, when pursued without a consideration for the natural environment it might come at the expense of future well-being. Utilising natural resources more efficiently reduces the pressure that production and consumption place on the environmental without compromising economic and social objectives. **Resource productivity** monitors the relationship between what an economy produces in terms of GDP and the materials it uses based on its domestic material consumption (DMC). Hence it depicts an aggregate measure of an economy's material efficiency. The EU increased its resource productivity by 38.6 % between 2001 and 2016, which represents an average annual growth of 2.2 %. The good progress made in this area can be explained by the GDP growth mentioned above and a simultaneous 13.0 % decrease of DMC.

Employment

Economic growth is not an end in itself. Instead, it forms the basis for people to be able to make a decent living and to provide for their families. Decent **employment** for all, including women, people with disabilities, youth, the elderly and migrants is crucial for improving well-being of the society as a whole. Apart from generating the resources needed for a decent living, paid work provides opportunities for meaningful engagement in society, promoting a sense of self-worth, purpose and social inclusion. Increased employment is a key condition for making societies more inclusive by reducing poverty and inequality in and between both regions and social groups. In 2016, the employment rate reached 71.1 % in the EU, which is an improvement of 4.2 percentage points compared to 2001 values and higher than the pre-crisis peak of 70.3% in 2008. A distance of 3.9 percentage points remains to the Europe 2020 employment target of 75 %, which could however still be met if employment keeps rising at the pace recorded from 2013 onwards.

Young people are among the most vulnerable groups in the labour market. In particular young people who are **not engaged in employment nor in education and training (NEET)** might fail to gain new skills and suffer from erosion of competences. Therefore, they are at a higher risk of labour market and social exclusion and are more likely to depend on benefits in their further working life. The NEET rate for 15 to 29 year olds in the EU improved slightly between 2002 and 2016 from 15.6 % to 14.2 %, respectively.

Unemployment, in particular **long-term unemployment**, could have long-lasting negative implications for individuals and society as a whole. Depending on the adequacy and resilience of social protection systems, long-term unemployment can reduce individual and household incomes and thus increase the risk of falling into poverty. Beyond material living standards, it can also lead to deterioration of individuals' skills and health, thus hindering future employability, productivity and earnings. At a societal level, prolonged unemployment could not only have negative fiscal implications because of higher social transfers, but could also harm economic growth and social cohesion. In 2016, 9.6 million people or 4 % of the active population in the EU were long-term unemployment, which is the same share as in 2005. However, the proportion of long-term unemployed among all unemployed rose from 45.2 % in 2005 to 46.4 % in 2016.

Economically inactive people do not participate in the labour market. There are various reasons for this, such as being in education or training, own illness, early retirement or people who gave up looking for a job to name a few. **Inactivity due to caring responsibilities** focuses on people who are out of the labour market because they have caring responsibilities for children or incapacitated adults and other family or personal responsibilities. Low participation in the labour market leads to shorter working lives and may results in lower pensions and therefore a higher risk of poverty in old age. In 2016, 21.1 % of the inactive population aged 20 to 64 were in this situation because of caring responsibilities, 4.1 percentage points more than in 2005. Women typically spend much more time on unpaid care work than men, and this gender gap has increased considerably since 2005.

Decent work

From a sustainable development perspective, it is important that economic growth generates not just any kind of employment but 'decent' job opportunities. The basis on which people are employed can have an impact on career prospects and achievement of life goals. For example, fixed-term contracts may provide greater flexibility for both employers and workers. Employers can enhance the capability to adapt to demand fluctuations and may use temporary contracts as a way to screen new hires. Some employees may prefer temporary contracts that require less commitment and allow a better work–life balance. In addition, temporary jobs can be a stepping-stone for young people into the labour market and towards a permanent employment. However, there is also the risk that people stay trapped in a series of **involuntary temporary employment** contracts. Moreover, temporary jobs are associated with lower wages, worse career prospects and more difficultly in accessing training opportunities and benefits. In 2016, 7.8 % of European employees were involuntarily working on temporary contracts, corresponding to 58.8 % of all temporary employees. The share increased slightly over the past decade.

A prerequisite for decent work is a safe and healthy working environment. Although EU Member States and other advanced countries have made large strides in ensuring minimum labour standards, safe and secure working environments remain an issue. In 2014, the incidence rate of **fatal accidents at work** amounted to 1.8 fatal accidents per 100 000 persons employed. The rate has fallen in recent years, indicating progress towards safer working places. However, the rate is more than ten times higher for men than for women and during 2009 to 2015 stronger declines for women than for men have widened the gender gap.

Decent work and economic growth in the EU

Sustainable economic growth

Real GDP per capita in 2016
27 000 EUR per capita, chain-linked volumes (2010)
+ 4.7 % since 2011

Resource productivity in 2016
2.07 EUR per kg
+ 17.3 % since 2011

Employment

Employment rate in 2016
71.1 % of population aged 20 to 64
+ 2.5 pp since 2011

Not in employment, education or training in 2016
14.2 % of population aged 15 to 29
- 1.2 pp since 2011

Long-term unemployment in 2016
4.0 % of active population
- 0.1 pp since 2011

Inactivity due to caring responsibilities in 2016
21.1 % of inactive population aged 20 to 64
+ 2.1 pp since 2011

Decent work

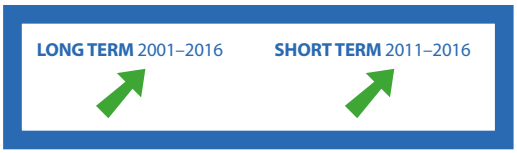
Involuntary temporary employment in 2016
7.8 % of total employees
+ 0.4 pp since 2011

People killed in accidents at work in 2014
1.83 per 100 000 employed persons
- 9.0 % since 2009

Source: Eurostat (online data codes: sdg_08_10, sdg_12_20, sdg_08_30, sdg_08_20, sdg_08_40, sdg_05_40, sdg_08_50 and sdg_08_60)

Real gross domestic product (GDP) per capita

Although weakened by the effects of the economic crisis, real GDP per capita has been following an overall upward trend in the long term and the short term.



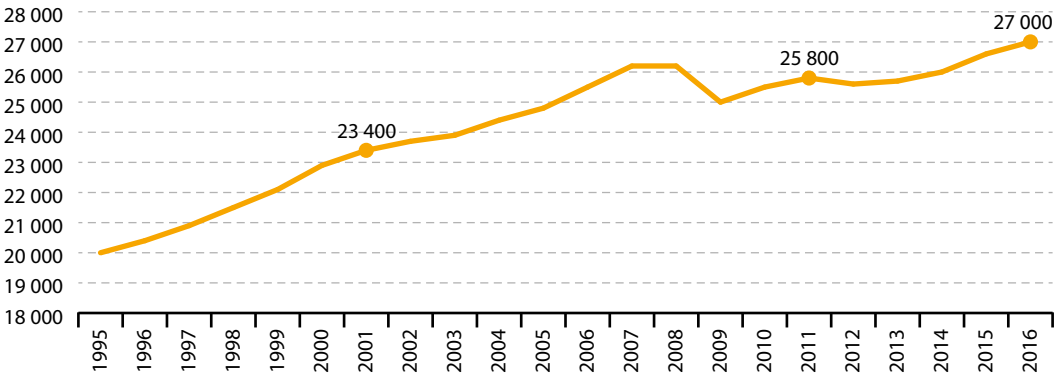
Gross domestic product (GDP) is a measure of economic activity and is commonly used as a proxy for developments in a country's material living standards. It refers to the value of total final output of goods and services produced by an economy within a certain period of time. Figure 8.1 shows that based on GDP per capita Europeans have continued to enjoy rising living standards over recent decades, despite the effects of the economic crisis.

Although per capita GDP rebounded in the years after the severe economic slump (+ 1.1 % per year on average between 2009 and 2016), the economic recovery still seems to be fragile. In 2016, the EU had to cope with numerous challenges, including the lowest pace of global and trade growth since 2009, geopolitical tensions, terrorist attacks in several Member States, stressed banking sectors, the UK's vote to leave the EU and a mounting backlash against globalisation ([2]).

Nevertheless, real GDP grew by 1.5 % in 2016 and is expected to grow continuously at a similar pace in 2017 and 2018. However, for a lasting economic upswing wages and investment need to rise more strongly. Over the past few years, private consumption has been the main growth driver. Yet, the temporary rise in consumer inflation is set to eat into the purchasing power of households. In addition, investment growth is not expected to rise as policy uncertainty, the modest medium to long-term demand outlook, and remaining deleveraging needs, continue to weigh on investment decisions ([3]).

In comparison, world's GDP growth is projected to increase, from 3.0 % in 2016 to 3.7 % in 2018. In most major advanced economies, growth is projected to continue along its current modest path. In the United States GDP growth is projected to pick from 1.6 % in 2016 to 2.5 % in 2018, supported by an expected fiscal expansion,

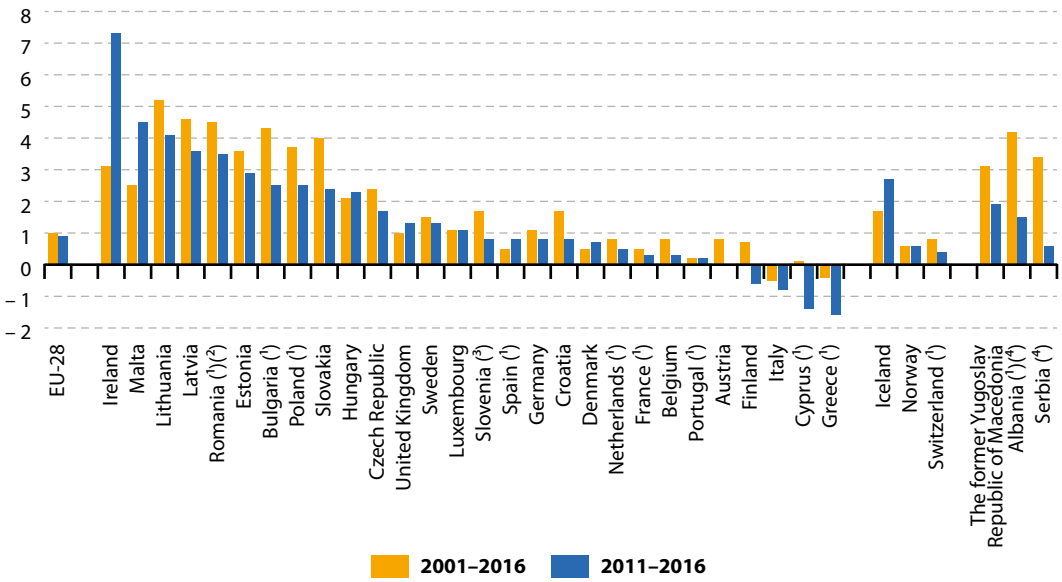
Figure 8.1: Real GDP per capita, EU-28, 1995–2016
(Chain linked volumes (2010) in EUR per inhabitant)



Source: Eurostat (online data code: sdg_08_10)

([2]) European Commission (2017), *European Economic Forecast Winter 2017*, p. 1.
([3]) European Commission (2017), *European Economic Forecast Spring 2017*, p. 1.

Figure 8.2: Real GDP per capita, growth rate, by country, 2001–2016 and 2011–2016
(annual average growth rate in %)



(1) Provisional or estimated data.
(2) Break in time series in 2012.
(3) Break in time series in 2008.
(4) Change until 2015.
(5) Change until 2014.

Source: Eurostat (online data code: sdg_08_10)

In 2015 the European Commission launched an Investment Plan for Europe (4) to unlock more than EUR 315 billion of investment over three years.

The EU Capital Markets Union (5) aims to tackle investment shortages head-on by increasing and diversifying business funding and investment financing.

The EU launched the External Investment Plan (6) in 2016 to encourage investment in partner countries in Africa and the EU neighbourhood region, to strengthen partnerships and contribute to the achievement of the Sustainable Development Goals, with the aim of addressing some root causes of migration.

especially in 2018, despite higher long-term interest rates and continued headwinds from the stronger US dollar. In contrast, growth in China is expected to shrink from 6.7 % in 2016 to 6.3 % in 2018 as its economy undergoes necessary transitions, including shifting towards consumption and services, adjustment in several heavy industries, working off excess housing supply and ensuring credit developments are sustainable. Higher commodity prices and easing inflation are supporting a recovery from deep recessions in Brazil, Russia and some other commodity producers, although short-term supply restrictions will limit the positive impact of

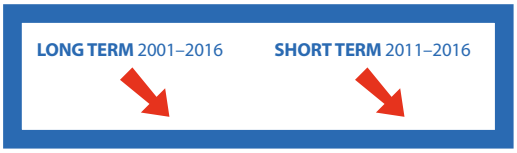
(4) European Commission (2015), *An Investment Plan for Europe*.
(5) European Commission (2015), *Capital Markets Union: an Action Plan to boost business funding and investment financing*.
(6) European Commission (2017), *EU External Investment Plan — Factsheet*.

higher oil prices on production in some countries. Strong growth should continue in India over the next two years, helped by the implementation of key structural reforms and strong public sector wage growth ([7]).

Growth in per capita output has not been uniform among Member States and over the short term (2011 to 2016) it has ranged from 7.3 % per year in Ireland to – 1.6 % per year in Greece. These disparities result from different general economic conditions and production capacities as well as asymmetries in the size and nature of the economic shock. Some economies, particularly those that had accumulated large macroeconomic imbalances before 2008, have been more exposed to the effects of the crisis and experienced larger dips in 2008 and 2009 as well as in 2012 and 2013.

Total employment rate

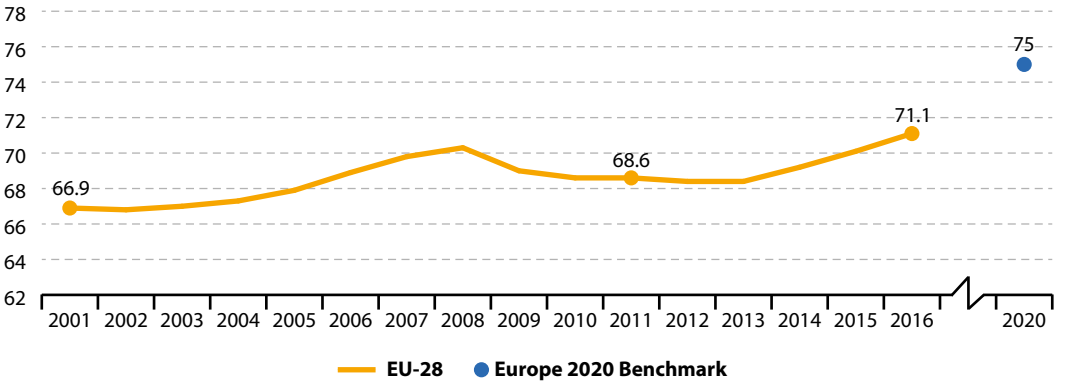
The EU's employment has risen in both the long and short terms but remains at a distance from the 75 % target set in the Europe 2020 strategy. However, the target may still be met if the recovery in employment rates recorded from 2013 onwards can be maintained.



The employment rate is defined as the share of the population in employment. The data analysed here focus on the population aged 20 to 64 in order to monitor the Europe 2020 strategy target of raising employment rates among this age group to 75 % by 2020 ([8]). Data presented in this section stem from the EU Labour Force Survey (EU-LFS).

Employment represents an essential cornerstone of socioeconomic development by fostering economic prosperity, social inclusion and quality of life. The economic recovery in the EU in the past

Figure 8.3: Total employment rate, EU-28, 2001–2016
(% of population aged 20 to 64)



Source: Eurostat (online data code: sdg_08_30)

([7]) OECD (2017), *Economic Outlook*, Volume 2017 Issue 1, p. 20 ff.
([8]) In a majority of Member States 15 to 19 year olds are still in education or training and few are not seeking employment (even part-time). Therefore, the lower age limit of the Europe 2020 strategy's employment target has been set at 20 years. The upper age limit for the employment rate is usually set to 64 years, taking into account statutory retirement ages across Europe.

The European pillar of social rights ([9]) sets out a number of key principles and rights to support fair and well-functioning labour markets and welfare systems. It will serve as a compass for a renewed process of convergence towards better working and living conditions among participating member states. It is primarily conceived for the euro area, but is applicable to all member states wishing to participate.

The Active Inclusion Approach ([10]) is a commissions' recommendation to enable every citizen, notably the most disadvantaged, to fully participate in society, including having a job. The Social Investment Package ([11]) stresses the importance of activating and enabling services such as job training and search assistance, access to basic bank accounts, energy inclusion and adequate income support.

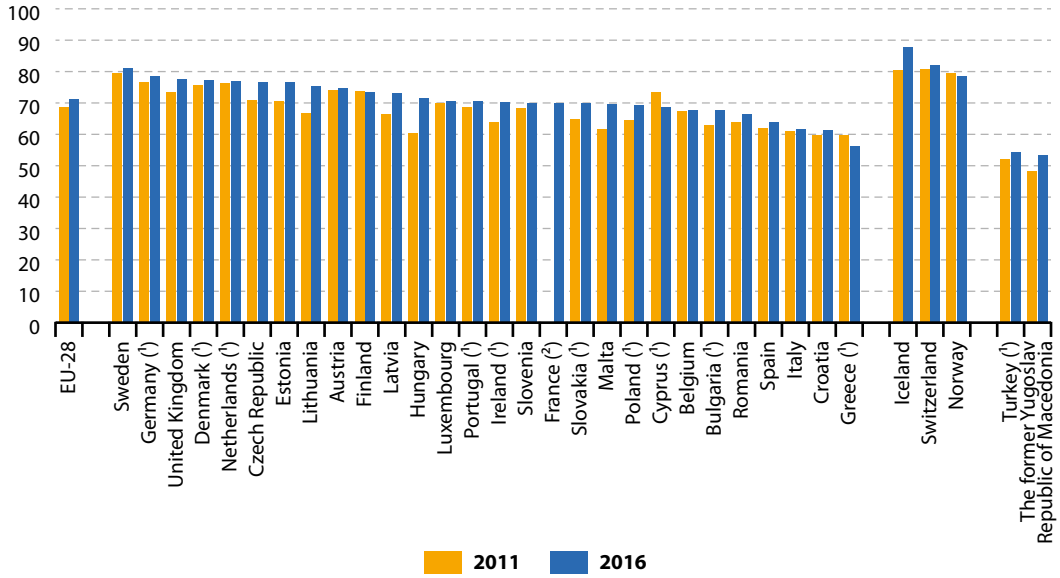
Furthermore, the EU supports growth, job creation and competitiveness through funding instruments such as the European Fund for Strategic Investments, the European Structural and Investment Funds, Horizon 2020, the Employment and Social Innovation Programme ([12]) (EaSI), the Programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME), the Emergency Support Instrument, the Connecting Europe Facility, the Creative Europe Programme, the Youth Guarantee ([13]) and the Youth Employment Initiative.

few years has also been reflected in people's ability to find a productive and paid job. Overall, the EU employment rate has increased in recent years. In 2016, 71.1 % of Europeans where employed which is beyond the pre-crisis level of 70.3 % in 2008. The onset of the economic crisis in 2008 pushed the EU off its path towards its employment target of 75 % by 2020. However, if the employment rate keeps increasing at the same pace recorded since 2013, the 2020 target may still be achieved.

People in their early 20s (age group 20–24) and late career paths (age group 55–64) are underrepresented in the job market. In 2016, 50.6 % of people aged 20 to 24 and 55.3 % of 55 to 64 year olds were employed. For the younger age group, it is plausible that their employment rate is below average as a considerable share is pursuing tertiary education. However, the employment rates for these two age groups have developed quite differently over the past decade. The prospects for young people aged 20 to 24 of finding a job has been most heavily affected by the economic crises, which has meant the employment rate for this group in 2016 was still more than 4 percentage points below their 2008 level of 54.8 % ([14]). The reason for this development may be that new entrants into the labour market, who have limited work experience and are often employed through temporary and part-time contracts or pursue a traineeship, are more easily dismissed during weak economic cycles ([15]). In contrast, the job situation of people in their late career (age group 55–64) was not affected by the economic slowdown and their employment rate actually increased by 9.7 percentage points between 2008 and 2016 ([16]). This trend could be linked to structural factors such as cohorts with higher educational attainment moving up the age pyramid but also to recent pension reforms, such as increasing the pensionable age, the age for early retirement and

([9]) European Commission (2017), *Establishing a European Pillar of Social Rights*, COM(2017) 250 final.
([10]) European Commission (2008), *Recommendation on the active inclusion of people excluded from the labour market, notified under document number C(2008) 5737*.
([11]) European Commission (2013), *Towards Social Investment for Growth and Cohesion — including implementing the European Social Fund 2014–2020*, COM(2013) 83 final.
([12]) Regulation (EU) No 1296/2013 of the European Parliament and of the Council of 11 December 2013 on a European Union Programme for Employment and Social Innovation ('EaSI') and amending Decision No 283/2010/EU establishing a European Progress Microfinance Facility for employment and social inclusion.
([13]) European Commission (2013), *Recommendation on establishing a Youth Guarantee*, 2013/C 120/01.
([14]) Source: Eurostat (online data code: lfsa_ergan).
([15]) European Commission (2016), *European Semester Thematic Factsheet Youth Employment*, p.1.
([16]) Source: Eurostat (online data code: lfsa_ergan).

Figure 8.4: Total employment rate, by country, 2011 and 2016
(% of population aged 20 to 64)



(1) Break(s) in time series between 2011 and 2016.

Source: Eurostat (online data code: sdg_08_30)

length of contribution, which had led to longer working lives ([17]).

In an increasingly knowledge-based economy, such as the EU is today, educational attainment is crucial for securing a job and adequate income. Indeed, in 2016 a person aged 20 to 64 living in Europe with tertiary education was much more successful in landing a job (employment rate of 83.4 %) compared to those with upper secondary or post-secondary non-tertiary education (employment rate of 71.6 %) and with lower secondary or lower education (employment rate of 53.6 %). While the gap between tertiary and upper secondary educational levels was relatively stable with a slight downwards trend over the period from 2002 (13.5 percentage points) to 2016 (11.8 percentage points), the gap between those with a tertiary education and those with lower secondary or less was widening (from 27.9 percentage points in 2002 to 29.8 percentage points in 2016) ([18]). And despite the fact that women are increasingly well qualified and even out-performing men in terms of educational attainment (see also chapter 4 'Quality education'), the employment rates of women are lower than those for men. However, for all age groups, the gender employment gap (which is analysed in chapter 5 'Gender equality') — the difference in employment rates between men and women — has been decreasing over time.

In 2014, the employment rate of people with disabilities at the European level was 23.8 percentage points lower compared to people without disabilities. About 48.7 % of people with disabilities were employed compared to 72.5 % of those without disabilities. For disabled women the rate was 45.7 %, while for disabled men it was 52.3 %. The degree of disability is also an important factor affecting the employment rate. At the EU level, the employment rate of severely disabled

([17]) European Commission (2016), *Employment and Social Developments in Europe 2015*, p. 22.
([18]) Source: Eurostat (online code: tsdec430).

people was 28.3 %, while for people with a moderate disability it stood at 56.7 % in 2014 ([19]).

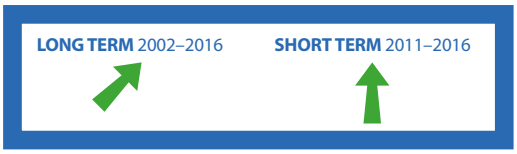
Country of origin can impact the labour market performance of individuals in the EU. Migrant workers from countries outside the EU not only tend to occupy low-skilled and insecure jobs with temporary contracts and poorer working conditions, they also show much lower employment rates than EU citizens ([20]). Migrants were particularly affected by the economic crisis, being among the first to lose their jobs, therefore the gap between the average EU employment rates and those of non-EU citizens widened from 7.8 percentage points in 2008 to 14.5 percentage points in 2016 ([21]). One explanation for the large variation in employment rates between EU citizens and third-country nationals might be the level of qualifications, with a large proportion of non-EU citizens being less highly educated. However, analysis shows this is not the norm and the share of third-country migrants with at least upper secondary education who work in low-skilled occupations is higher than for the native population. It should be considered that in many Member States a large share of non-EU citizens have migrated not for economic reasons but to join family members, for education and training or to seek international protection ([22]). However, migration, especially economic migration, provides an opportunity for dealing with a shrinking labour force and potential skills shortages. Without migration the working-age population will shrink by 7 % in 2030 and by 27 % in 2060 compared with 2016 levels ([23]).

Employment rates among Member States ranged from 56.2 % to 81.2 % in 2016. Low employment levels were reported by countries from south-eastern Europe. Some of the best performing countries such as Sweden, Germany and the United Kingdom also recorded high regional employment rates ([24]).

Compared with the world's other main economies, the EU employment rate of 66.6 % in 2016 for the age group 15 to 64 ([25]) was in the middle of the range. In most non-EU G20 countries, the employment rate ranged between 74.3 % (Japan) and 61 % (Mexico). Three countries experienced lower levels in 2016, Saudi Arabia (52.5 %), India (49.9 %) and South Africa (43.7 %) ([26]).

Young people neither in employment nor in education and training

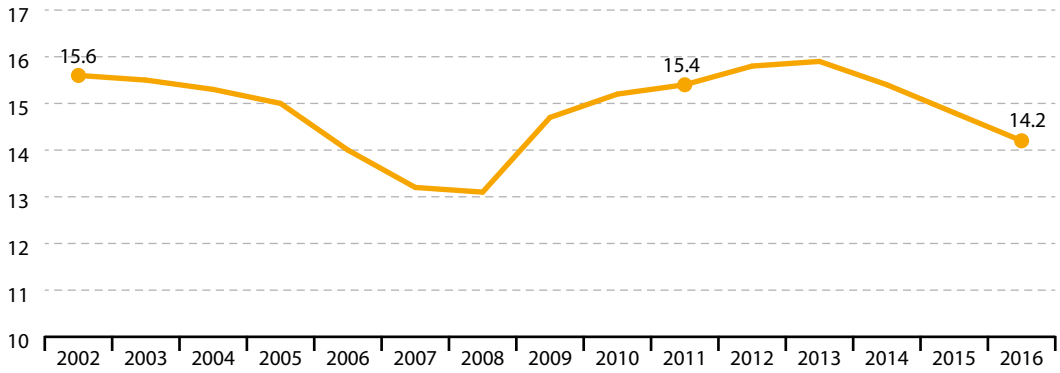
The rate of young people neither in employment nor in education and training has improved slightly since 2002. The trend has however not been continuous and most progress has occurred in recent years.



A considerable proportion of young people aged 15 to 29 in the EU are economically inactive. For some this is due to the pursuit of education and training. Others, however, have withdrawn from the labour market or are not entering it after leaving the education system. Those who struggle with the transition from education to work are captured by the indicator monitoring the rates of young people neither in employment nor in education and training (NEET rate). Data presented

([19]) Academic Network of European Disability experts (2017), *European comparative data on Europe 2020 & People with disabilities*, p. 58 ff.
([20]) European Commission (2016), *Employment and Social Developments in Europe 2015*, p. 177.
([21]) Source: Eurostat (online data code: lfsa_ergan).
([22]) European Commission (2016), *Employment and Social Developments in Europe 2015*, p. 14.
([23]) Source: Eurostat (online data code: demo_pjan and proj_15npms).
([24]) Eurostat (2017), *Eurostat regional yearbook 2017*, p.97.
([25]) International data for the age group 20 to 64 are not available, therefore the comparison with other main economies refers to the age group 15 to 64.
([26]) Source: Eurostat (online data code: lfsi_emp_a) and the International Labour Organisation (ILOSTAT).

Figure 8.5: Young people neither in employment nor in any education and training, EU-28, 2002–2016
(% of population aged 15 to 29)



Note: Breaks in time series in 2003 and 2006.
Source: Eurostat (online data code: sdg_08_20)

The European Social Fund ([27]) and the Youth Employment Initiative support measures that focus on quality employment and quality apprenticeships. The EU has also contributed to the elaboration of the Youth Guarantee ([28]) to support the employment and education of young people.

in this section stem from the EU Labour Force Survey (EU-LFS).

In 2016, 14.2 % of young people aged 15 to 29 in the EU were not employed and were not receiving further education or training. As shown in Figure 8.5 the long-term trend was heavily influenced by the economic crisis.

Nowadays, upper secondary education is considered the minimum level Europeans should attain before leaving the education and training system. Therefore, low educational attainment is one of the key determinates of young people entering the NEET category (see also chapter 4 'Quality education'). Other factors include having a disability or coming from a migrant background.

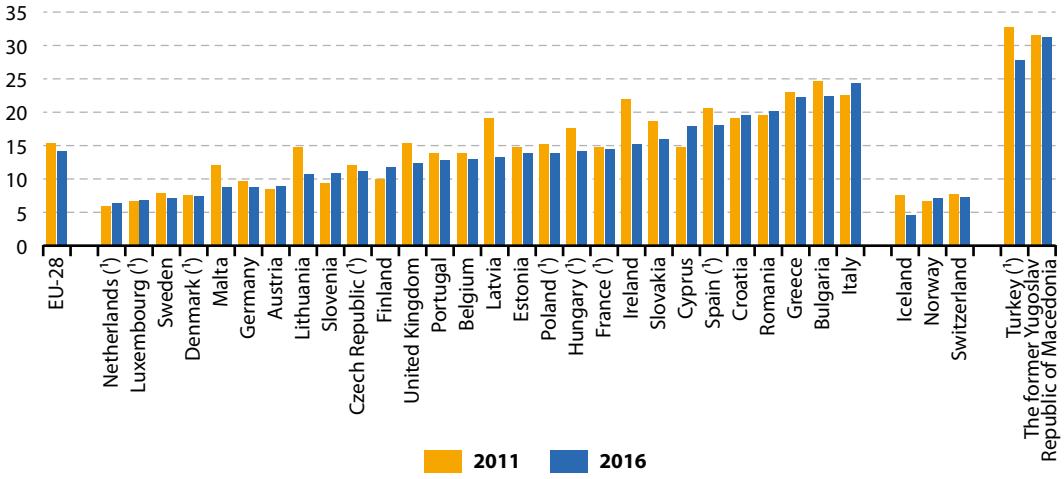
In 2016, 8.0 % of 15 to 29 year olds were inactive and neither in education nor training, which means more than half of NEETs were not looking for a job. Inactive NEETs have been stable around 8 % since 2002. So fluctuations in the NEET rate have been fully triggered by variations in unemployment. However, only a fraction of young people do not want to work (in 2016, only 4.7 % of 15 to 29 year olds were neither in education nor training and did not want to work). This indicates that nearly a quarter of NEETs would have liked to work but were not actively seeking employment or gave up looking for a job.

The EU total conceals very large variations in NEET rates between Member States, ranging from 6.3 % in the Netherlands to 24.3 % in Italy in 2016.

The differences in the NEET rate across Member States are also reflected in the distribution of NEET rates within countries. The highest regional NEET rates were mainly recorded in regions in Mediterranean and eastern European counties. At the other end of the scale, the lowest rates were observed mainly in regions from central and northern Europe ([29]).

([27]) Regulation (EU) No 1304/2013 of the European Parliament and of the Council of 17 December 2013 on the European Social Fund and repealing Council Regulation (EC) No 1081/2006.
([28]) European Commission (2013), *Recommendation on establishing a Youth Guarantee*, 2013/C 120/01.
([29]) Eurostat (2017), *Eurostat regional yearbook 2017*, p. 80.

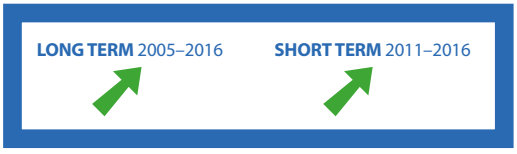
Figure 8.6: Young people neither in employment nor in any education and training, by country, 2011 and 2016
(% of population aged 15 to 29)



(1) Break(s) in time series between 2011 and 2016.
Source: Eurostat (online data code: sdg_08_20)

Long-term unemployment rate

The long-term unemployment rate rose considerably after the onset of the economic crisis. However, it started to fall again in 2013 and in 2016 it returned to its 2005 level.



Long-term unemployment refers to people aged 15 to 74 who have been unemployed for 12 months or more. The long-term unemployed in the EU have about half the chance of finding employment compared to the short-term unemployed ([30]). Data presented in this section stem from the EU Labour Force Survey (EU-LFS).

In 2016, 9.6 million people or 4 % of the active population in the EU were long-term unemployed.

Since 2013, the long-term unemployment rate has dropped by 1.1 percentage points. The differences between men and women have disappeared over the past six years.

Long-term unemployment emerges as the main employment legacy of the crisis as the proportion of long-term unemployed among all unemployed rose from 36.9 % in 2008 to 46.4 % in 2016. Long-term unemployment usually follows strong changes in unemployment, but with some delay. Therefore, slight decreases in long-term unemployment only started being observed in 2014, after the start of the recovery in 2013 ([31]).

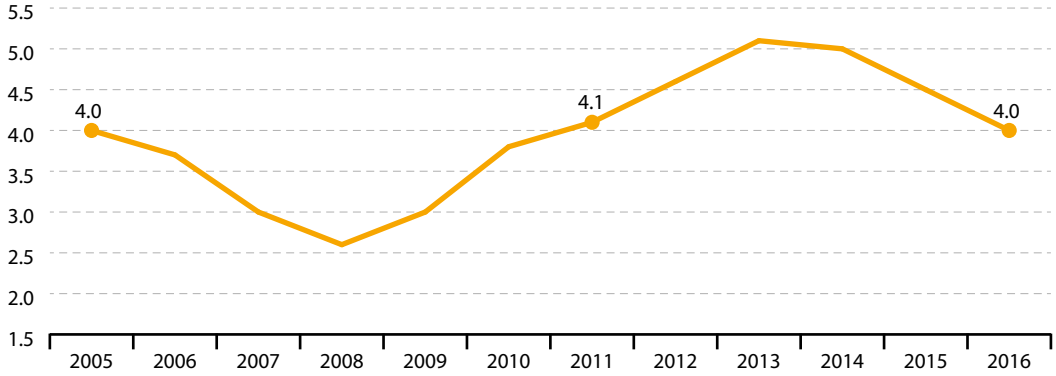
The risk of being long-term unemployed was highest for migrants from outside the EU (48.1 %). The lowest risk faced mobile EU citizens (43.1 %), while the rate for people living in their country of birth was 47.1 % in 2016 ([32]).

([30]) European Commission (2016), *Employment and Social Developments in Europe 2015*, p. 13.
([31]) European Commission (2017), *Employment and Social Developments in Europe 2017*, p.29.
([32]) Source: OECD.

Compared with other main economies in the world the share of long-term unemployed among the EU's unemployed is rather high. In most non-EU OECD countries, this value was between 0.4 % (Korea) and 57 % (South Africa) in 2015. Japan faced a share of 35.5 %, Australia of 23.5 % the US of 18.7 % and the share in Canada was 11.6 % ([33]).

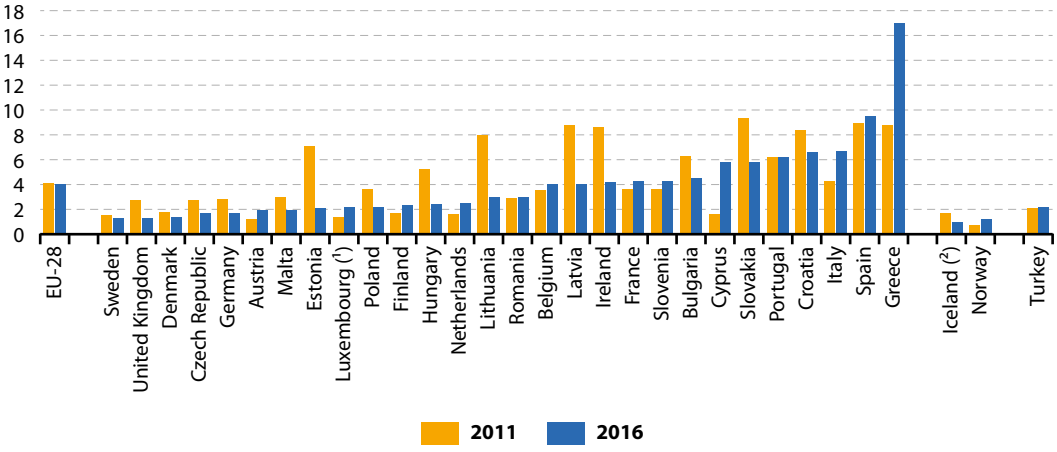
In 2016, huge differences in long-term unemployment persisted among Member States, from 1.3 % of the active population in Sweden to 17.0 % in Greece. Roughly the same country patterns shown in Figure 8.8 were observed for the share of long-term unemployment in total unemployment in 2016. The shares ranged from 18.3 % in Sweden to 72 % in Greece ([34]).

Figure 8.7: Long-term unemployment rate, EU-28, 2005–2016
(% of active population)



Source: Eurostat (online data code: sdg_08_40)

Figure 8.8: Long-term unemployment rate, by country, 2011 and 2016
(% of active population)



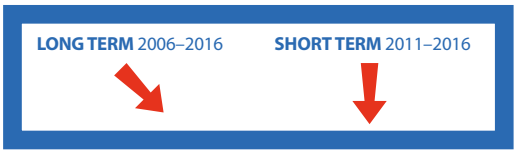
(1) 2011 data have low reliability.
(2) 2013 data (instead of 2016).

Source: Eurostat (online data code: sdg_08_40)

(33) Source: Eurostat (online data code: lfsa_upgacob).
(34) Source: Eurostat (online data code: une_ltu_a).

Involuntary temporary employment

The share of employees working involuntarily on fixed-term contracts has risen since 2006, mainly due to a strong increase in the past four years.



Involuntary temporary employment refers to employees working on fixed-term contracts because they were unable to find a permanent job, expressed as a share of total employees. Data presented in this section stem from the EU Labour Force Survey (EU-LFS).

In 2016, 13.3 % of employees aged 20 to 64 were working on a fixed-term contract in the EU. Temporary employment in the EU has been relatively stable at around 13 % since 2006 ([35]). However, many people are not employed on a fixed-term contract by choice. In 2016, 58.8 % of those working on fixed-term contracts did so because they could not find a permanent job.

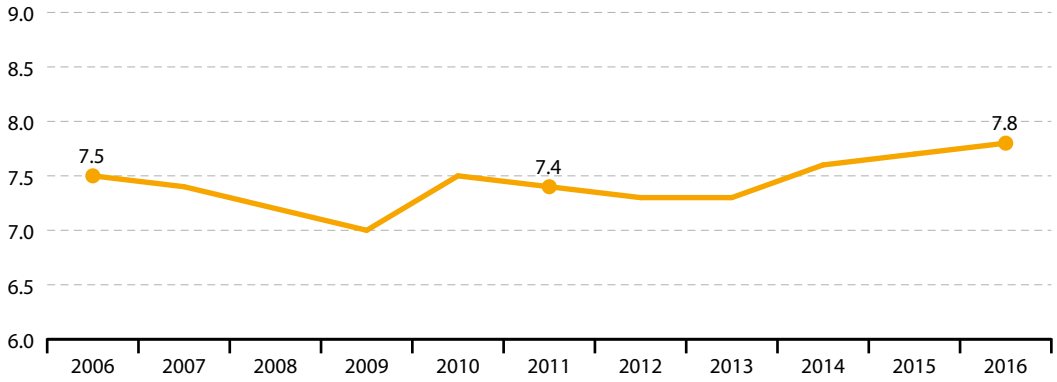
It seems involuntary temporary employment declines with age. While 14.1 % of young employees aged 15 to 24 involuntarily worked on fixed-term contracts in 2016, the share nearly halved for the age group 25 to 49 (8.4 %) and fell to only 4.4 % for elder workers (50–64 years).

For all age groups the share of women employed involuntarily on a fixed-contract exceeded that of men in 2016. The overall gender gap (age group 20 to 64) was 0.6 percentage points. The difference was highest for 25 to 49 year olds (1.0 percentage points), followed by 0.7 percentage points for the age group 15 to 24. The gender gap was lowest for the elderly (aged 50 to 64), with a difference of only 0.1 percentage points.

The overall gender gap decreased over the past decade, mainly because of a rising share or men working involuntary on temporary contracts. The gap only widened for the age group 15 to 24. In 2006 more men than women of this age group worked involuntary on temporary contracts (0.1 percentage points difference). This reversed until 2016, when the gap was 0.7 percentage points to the disadvantage of women.

In 2016, the share of involuntary temporary employees among all employed people ranged from 0.7 % in Estonia to 22.7 % in Spain. Because

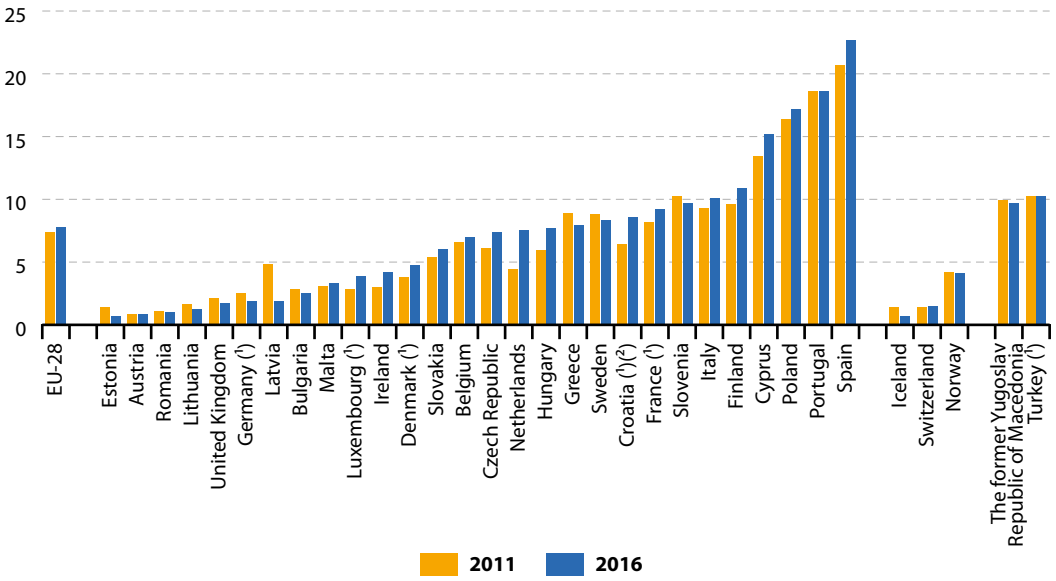
Figure 8.9: Involuntary temporary employment, EU-28, 2006–2016
(% of total employees)



Source: Eurostat (online data code: sdg_08_50)

([35]) Source: Eurostat (online data code: lfsa_etgar).

Figure 8.10: Involuntary temporary employment, by country, 2011 and 2016
(% of total employees)



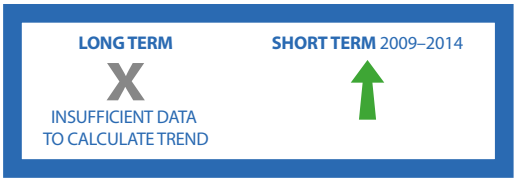
(1) Break(s) in time series between 2011 and 2016.
(2) 2015 data (instead of 2016).

Source: Eurostat (online data code: sdg_08_50)

a similar country pattern as shown in Figure 8.10 can be seen for the usage of temporary contracts, these differences between Member States may be partly explained by the unequal spread of temporary contracts across the EU. In Poland 27.1 % of employed worked on a temporary contract, followed by Spain (26.0 %) and Portugal (21.8 %). On the other end of the scale less than 2 % of employees in Romania and Lithuania worked on temporary terms in 2016.

People killed in accidents at work

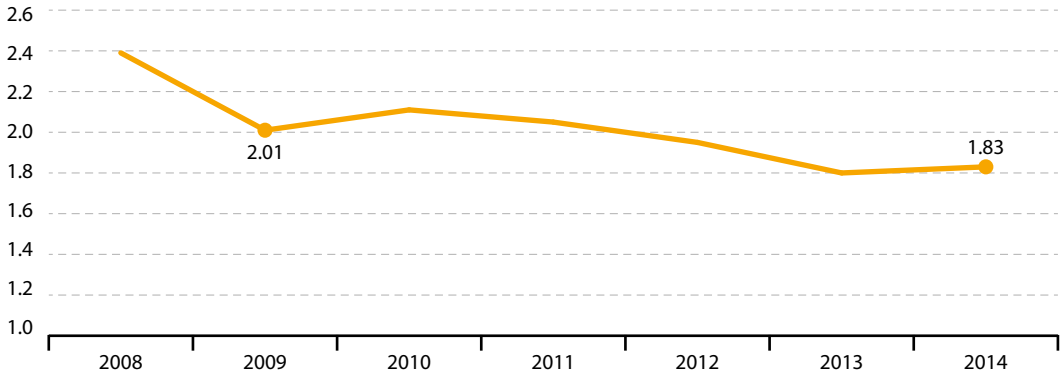
Fatal accidents at work fell by 9 % between 2009 and 2014.



Fatal accidents at work are those occurring during the course of work and lead to the death of the victim within one year. The incidence rate refers to the number of accidents per 100 000 persons in employment. Data presented in this section are collected in the framework of the administrative data collection 'European Statistics on Accidents at Work (ESAW)'. The national ESAW sources are the employers' declarations of accidents at work, either to the relevant insurance companies, the national social security system, labour inspections or similar national authorities. As an exception, accident data for the Netherlands are based on survey data.

The decline in fatal accidents at work, as shown in Figure 8.11, went hand in hand with falls in non-fatal accidents leading to at least four calendar days of absence, indicating improvement in

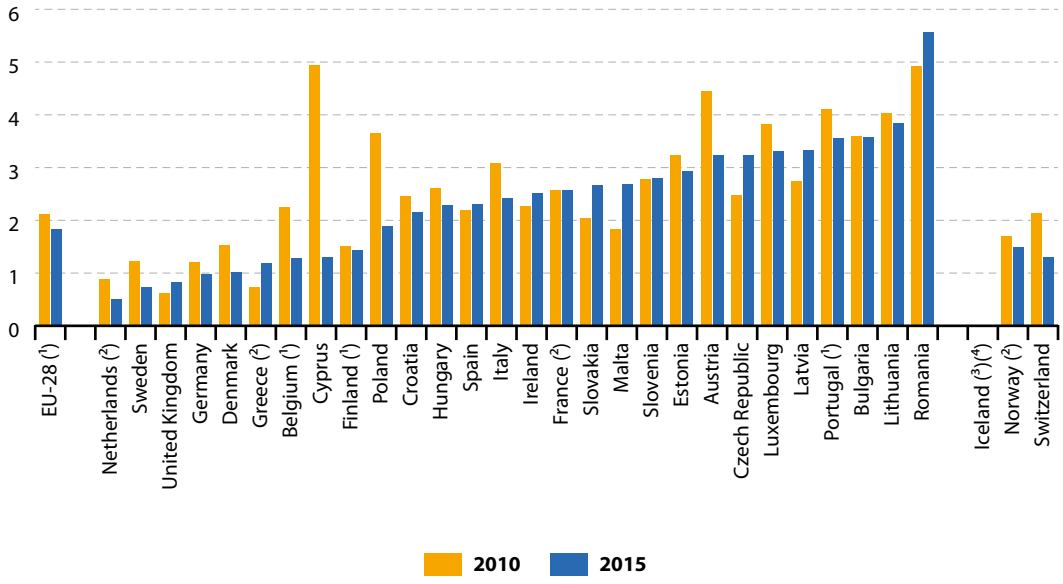
Figure 8.11: Fatal accidents at work, EU-28, 2008–2014
(number per 100 000 persons employed aged 25 to 64)



Note: 2013 data are provisional.

Source: Eurostat (online data code: sdg_08_60)

Figure 8.12: Fatal accidents at work, by country, 2010 and 2015
(number per 100 000 persons aged 25 to 64)



(1) 2014 data (instead of 2015).
(2) Break in time series in 2014.
(3) 2011 data (instead of 2009).
(4) 2013 data (instead of 2015).

Source: Eurostat (online data code: sdg_08_60)

working conditions in the EU. In fact, the ratio between fatal and non-fatal accidents at work at EU level has remained stable throughout the years. This holds true although non-fatal accidents suffer in some Member States from high levels of under-reporting (meaning that accidents occur but are not reported to public authorities for various reasons). On average, there are about 1.2 fatal accidents for 1 000 non-fatal accidents at EU level.

When disaggregated by gender, the data reveal that in 2014 the incidence rate of fatal accidents was more than ten times higher for men than for women. One reason for this gap is that incidence rates vary greatly between different economic activities and are higher for male-dominated economic activities, such as construction, transport and agriculture. Between 2009 and 2014, the decline in fatal accidents at work was considerably stronger for women than for men, and as a consequence the gender gap has widened.

The risk of fatal accidents rises with age; workers aged 55 to 64 face the highest risk of fatal accidents.

In 2015, the rates of fatal incidents per 100 000 employed persons ranged from 0.5 in the Netherlands to 5.6 in Romania. However, the absolute number of fatal accidents in smaller Member States is rather low and therefore the corresponding incidence rates can vary strongly from one year to the next. For example, in Cyprus the rate decreased by 73.8 %, as a result of a drop from 18 cases in 2010 to 4 in 2015 ([36]).

Further reading on decent work and economic growth

European Commission (2017), *Employment and Social Developments in Europe 2017*, Luxembourg, Publications office of the European Union.

European Commission (2017), *European Economic Forecast Spring 2017*, Luxembourg, Publications office of the European Union.

OECD (2017), *Interim Economic Outlook*.

Eurofound (2015), *Recent developments in temporary employment: Employment growth, wages and transitions*, Luxembourg Publications Office of the European Union.

International Labour Organisation (ILO) webpage on 'decent work and the 2030 agenda for sustainable development'.

European Commission (2015), *An Investment Plan for Europe*.

European Commission (2015), *Capital Markets Union: an Action Plan to boost business funding and investment financing*.

European Commission (2017), *EU External Investment Plan — Factsheet*.

European Commission (2017), *Establishing a European Pillar of Social Rights*, COM(2017) 250 final.

European Commission (2008), *Recommendation on the active inclusion of people excluded from the labour market, notified under document number C(2008) 5737*.

European Commission (2013), *Towards Social Investment for Growth and Cohesion — including implementing the European Social Fund 2014-2020*, COM(2013) 83 final.

European Commission (2013), *Recommendation on establishing a Youth Guarantee*, 2013/C 120/01.

([36]) Source: Eurostat (online data code: hsw_mi01).

9 Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation

The global perspective on SDG 9

SDG 9 calls for building resilient and sustainable infrastructure, which supports sustainable development and human well-being. The goal promotes inclusive and sustainable industrialisation as a core driver for ending poverty and improving living standards. While it seeks to boost industry's share of employment and gross domestic product (GDP), SDG 9 calls for industrialisation to be pursued in an environmentally sound way. SDG 9 recognises the importance of technological progress and innovation for finding lasting solutions to social, economic and environmental challenges such as the creation of new jobs and promotion of resource and energy efficiency. To foster innovation and entrepreneurship, SDG 9 also seeks to increase access to financial services for small-scale enterprises and to bridge the digital divide by increasing access to information and communication technologies. The achievement of the above listed goals requires enhanced international cooperation and support for infrastructure and technology development, research and innovation in developing countries ([1]).

eurostat supports the SDGs

Monitoring SDG 9 'industry, innovation and infrastructure' in an EU context focuses on the sub-themes 'R&D and innovation' and 'sustainable transport'. R&D and innovation covers both input (R&D expenditure, R&D personnel, employment in high- and medium-high technology manufacturing sectors) and output aspects related to innovation (patent applications). Sustainable transport looks at the environmental performance of new passenger cars and the modal split of passenger and freight transport. As shown in Table 9.1, the EU's progress in these areas has been rather mixed.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 9.1: Indicators measuring progress in SDG 9, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
R&D and innovation			
Gross domestic expenditure on R&D	 (1)	 (1)	p. 186
Employment in high- and medium-high technology manufacturing sectors and knowledge-intensive service sectors	:		p. 188
R&D personnel	 (2)		p. 190
Patent applications to the European Patent Office (EPO)			p. 191
Sustainable transport			
Average CO_2 emissions per km from new passenger cars (*)	:	 (3)	SDG 12, p. 284
Share of collective transport modes in total passenger land transport			p. 193
Share of rail and inland waterways activity in total freight transport	 (4)		p. 195

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Trend in relation to Europe 2020 target of raising R&D expenditure to 3 % of GDP by 2020.
(2) Past 13-year period.
(3) Trend in relation to the target of reducing average CO_2 emissions per km from new passenger cars to 95 grams by 2021.
(4) Past 14-year period.

Industry, innovation and infrastructure in the EU: overview and key trends

European societies face a wide range of political and economic challenges, including slow growth and persistently high unemployment in some EU Member States. Additionally, there are sustainability challenges ranging from climate change, pollution and sustainable energy supply to an ageing population and migration. Research and Development (R&D) and innovation drive economic growth, job creation, labour productivity and resource efficiency. They are crucial for a knowledge-based economy and to ensuring EU companies remain competitive. Similarly, sustainable and energy-efficient transport and mobility systems are key elements for a competitive economy. It is for these reasons that SDG 9 calls on countries to build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.

R&D and innovation

The EU economy is facing increasing global competition and can only remain competitive by strengthening its scientific and technological base. Moreover, the well-being of the EU population depends on innovative solutions to addressing global societal challenges such as climate change and clean energy, security and active and healthy ageing. Innovation and the creation of new, more sustainable industries are spurred by investments in R&D. EU **expenditure on R&D** has slightly increased during the past 15 years, from 1.77 % of gross domestic product (GDP) in 2000 to 2.03 % in 2015. However, the rate of progress observed in the past few years is not enough to meet the Europe 2020 target of spending 3 % of GDP on R&D by 2020.

R&D and innovation are major drivers of competitiveness and employment in a knowledge-based economy. Greater investment in R&D provides new jobs in business and academia, increasing demand for scientists and researchers in the labour market. Knowledge-intensive sectors are key drivers of economic growth and productivity and are a source of high value-added and well-paid jobs. However, these sectors are not growing fast enough in the EU. Employment **shares in high- and medium-high technology manufacturing** and in **knowledge-intensive service sectors** in Member States have grown only slightly, from 42.9 % in 2008 to 45.8 % in 2016. Similarly, the share of **R&D personnel** in the active population, including researchers and other staff employed directly in R&D, increased from 0.94 % to 1.20 % between 2002 and 2015.

Innovation creates value by introducing new or improved products, processes and logistics or distribution methods. A dynamic business environment is crucial for the promotion and diffusion of innovations. The challenge is to make use of R&D through entrepreneurship and creativity to trigger innovation and foster economic competitiveness. **Patents** encourage companies to innovate by conferring some exclusive rights to inventors in return for disclosing the invention. The number of patent applications in the EU increased almost continuously between 1997 and 2007, before growth was interrupted by the economic turmoil in 2008. Since then, the number of patent applications to the European Patent Office (EPO) has remained more or less constant, indicating a stagnation in innovation output from European businesses following the economic crisis.

Sustainable transport

Innovative technologies can also contribute to a transition to a more energy efficient and decarbonised transport sector. Among the various initiatives put forward to foster innovation in transport, the EU has set mandatory limits for **average CO_2 emissions per kilometre from new passenger cars**. The limit value for 2015 is 130 grams of CO_2 per kilometre. In the EU, average CO_2 emissions per km from new passenger cars fell

by 13 % between 2011 and 2016, with the EU fleet average target reached in 2012. Further progress will be needed to reach the 2021 target value of 95 grams of CO_2 per km.

In addition to fuel and engine technologies, progress in intelligent transport systems (ITS) and connectivity also enhance vehicle performance and trip efficiency in terms of sustainable individual mobility and overall traffic management. Rethinking future mobility includes optimising the use of all modes of transport, car sharing and multimodal integration between the different modes of collective transport such as train, tram, metro, bus and taxi. More efficient and intelligent mobility solutions are expected to increase the **share of collective transport modes in total passenger land transport**. The share of collective transport modes (bus and train) in total passenger land transport in the EU fell from 17.6 % in 2000 to 16.4 % in 2009. Since then it has improved slightly, reaching 16.9 % in 2015.

The free movement of goods is an essential component of the EU internal market and important for maintaining the competitiveness of European industry and services. The volume of freight has increased considerably since the 1990s. This increase has been largely accommodated by road transport, which accounted for 75.8 % of EU freight transport performance in 2015. Since 2001, the **share of rail and inland waterways activity in total freight transport** has fallen, from 25.2 % to 22.6 % in 2009. In the short term, however, a modest modal shift towards more environmentally friendly modes of freight transport can be observed, with the share of rail and inland waterways increasing to 24.2 % by 2015. It should also be noted that rail and inland waterways do not distribute last-mile freight, which leaves in certain cases no alternative to road transport.

Industry, innovation and infrastructure in the EU

R&D and innovation

R&D expenditure in 2015
2.03 % of GDP
+ 0.10 pp since 2010

Employment in high-tech manufacturing and knowledge-intensive services in 2016
45.8 % of total employment
+ 1.2 pp since 2011

R&D personnel in 2015
1.2 % of active population
+ 0.1 pp since 2010

Patent applications in 2014
56 753
- 0.1 % since 2009

Sustainable transport

CO_2 emissions from new passenger cars (1) in 2016
118.1 gr CO_2 per km
- 13.0 % since 2011

Collective passenger transport in 2015
16.9 % of total inland passenger-km
+ 0.3 pp since 2010

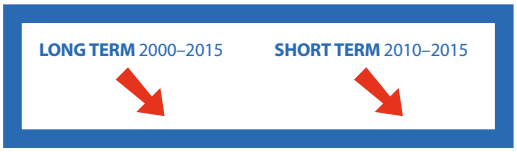
Rail and waterways freight transport in 2015
24.2 % of total inland tonne-km
+ 0.4 pp since 2010

(1) 2011 data refer to EU-27.

Source: Eurostat (online data codes: sdg_09_10, sdg_09_30, sdg_09_20, sdg_09_40, sdg_12_30, sdg_09_50 and sdg_09_60)

Gross domestic expenditure on R&D

Expenditure on R&D as a share of GDP has increased only slightly since 2000, with the most growth occurring between 2007 and 2009. At the current pace of progress, the 3 % R&D intensity target is unlikely to be met.



Gross domestic expenditure on research and development (R&D) reflects the extent of R&D undertaken in a country in terms of the resources used. Data on R&D intensity are expressed as a percentage of GDP. Expenditure on R&D is important for maintaining a competitive advantage over other world leaders concerning high-quality science and innovative products.

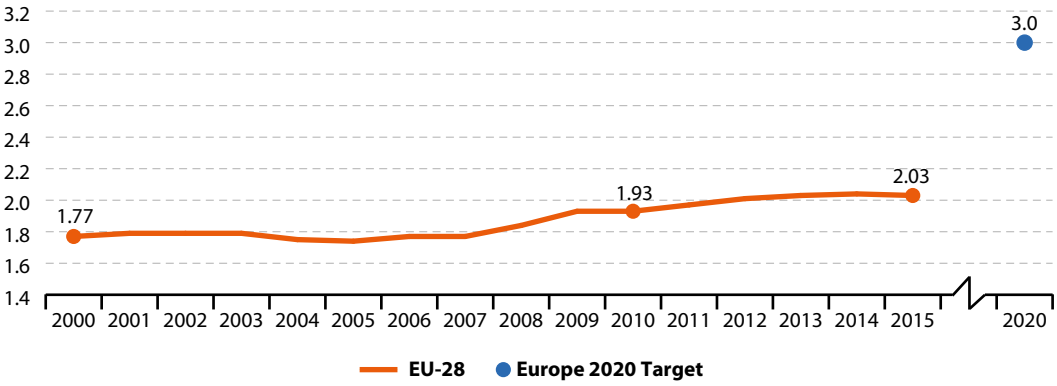
Figure 9.1 shows a prolonged stagnation of R&D intensity between 2000 and 2007. By 2009, at the onset of the economic crisis, R&D intensity had increased to 1.93%. One of the reasons for the increase between 2007 and 2009 was that GDP was falling more rapidly than overall R&D expenditure. Since 2011, R&D expenditures have continued to grow slowly, stabilising at around 2.03% for the years 2013 to 2015.

At the global level, the EU significantly lags behind other leading players such as the United States (2.73% in 2013), Japan (3.59% in 2014) and South Korea (4.29% in 2014) in terms of R&D intensity, with only the best Member States surpassing the United States ([2]).

R&D activities in the EU are carried out by four main institutional sectors: business enterprise, government, higher education and private non-profit. The business sector is the largest source of R&D investment, accounting for almost two-thirds of total R&D expenditure since 2000. The slight increase in R&D intensity since 2010 has been mainly driven by growing business R&D expenditures, while R&D intensity in the other sectors has stagnated.

R&D intensity shows a rather mixed picture across Member States, ranging from 0.46 % to 3.26 % in 2015. The large range in R&D investment can be explained to a large extent by structural factors

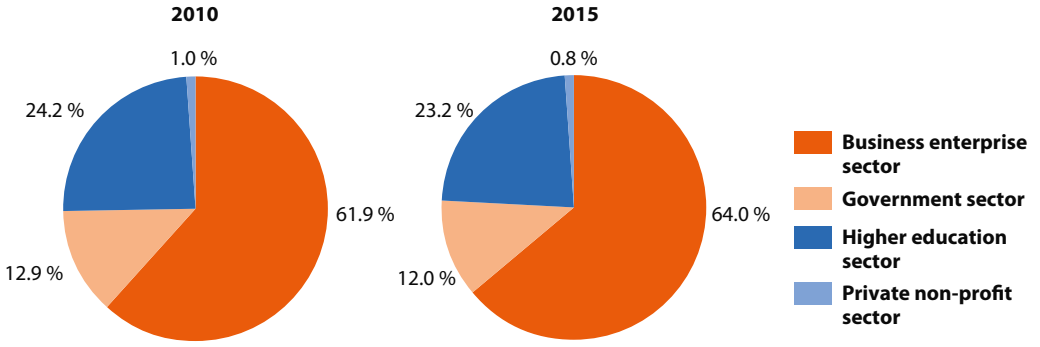
Figure 9.1: Gross domestic expenditure on R&D, EU-28, 2000–2015
(% of GDP)



Note: Data for 2000 to 2002 are estimates, 2015 data are provisional.
Source: Eurostat (online data code: sdg_09_10)

([2]) European Commission (2016), *Science, Research and Innovation performance of the EU*.

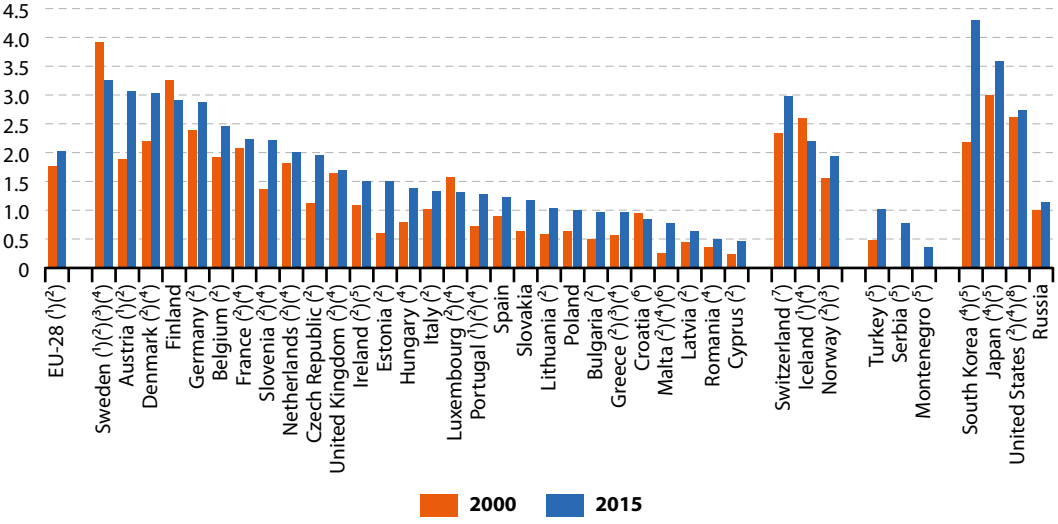
Figure 9.2: Gross domestic expenditure on R&D, by sector, EU-28, 2010 and 2015
(%)



Note: 2010 data for the private non-profit sector are estimates; 2015 data are provisional.
Source: Eurostat (online data code: rd_e_gerdtot)

The Europe 2020 strategy ([3]) sets the target of 'improving the conditions for innovation, research and development' and the European Commission has committed to invest at least 3% of the EU's GDP in R&D by 2020 in the 2014 Commission Communication 'Taking stock of the 2020 strategy for smart, sustainable and inclusive growth' ([4])

Figure 9.3: Gross domestic expenditure on R&D, by country, 2000 and 2015
(% of GDP)



(1) Data for 2000 are estimates.
(2) Data for 2015 are provisional and/or estimates.
(3) 2001 data (instead of 2000).
(4) Break(s) in time series between 2000 and 2015.
(5) 2014 data (instead of 2015).
(6) 2002 data (instead of 2000).
(7) 2012 data (instead of 2015).
(8) 2013 data (instead of 2015).
Source: Eurostat (online data code: sdg_09_10)

([3]) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.
([4]) European Commission (2014), *Taking stock of the 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final/2.

such as the varying shares of R&D-intensive sectors in the Member States. Moreover, countries whose R&D efforts rely predominantly on the public sector tend to have low R&D to GDP ratios. The strongest growth rates of R&D intensities between 2000 and 2015 were reported from economies in central and eastern Europe with generally low R&D spending, such as Estonia, Bulgaria or Malta.

Employment in high- and medium-high technology manufacturing sectors and knowledge-intensive service sectors

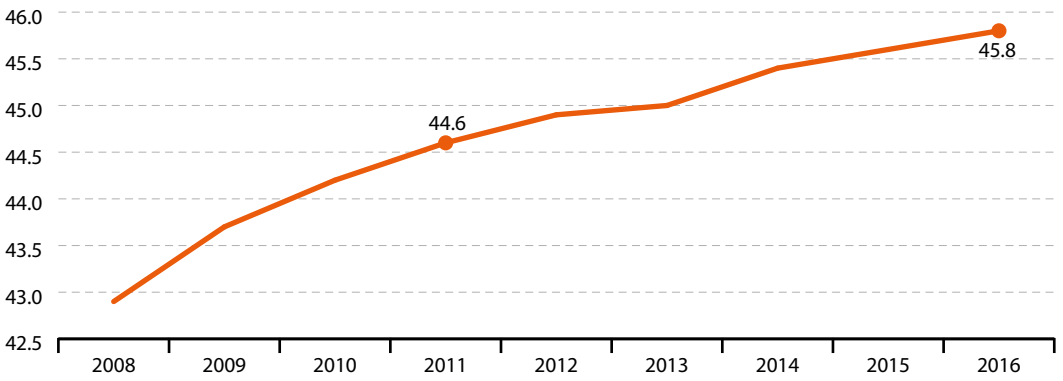
The EU has experienced a slight but continuous increase in employment levels in high- and medium-high technology manufacturing and in knowledge-intensive sectors since 2011.

LONG TERM	SHORT TERM 2011–2016
X INSUFFICIENT DATA TO CALCULATE TREND	↗

Manufacturing industries are grouped into high-technology and medium-high technology sectors based on their R&D intensity levels. An activity is classified as knowledge intensive if more than 33 % of the employees working in it are tertiary educated ([5]). Climate change mitigation and the transition to a green and low-carbon economy requires significant innovation and creates new scientific and technical occupations in key manufacturing and energy sectors.

The share of employed people working either in high- and medium-high technology manufacturing or in knowledge-intensive service sectors increased slightly from 42.9 % in 2008 to 45.8% in 2016. However, this aggregated figure masks different trends in the respective manufacturing and service sectors. Employment in high- and medium-high technology manufacturing sectors has stagnated at below 6 % of total employment since 2008. One reason

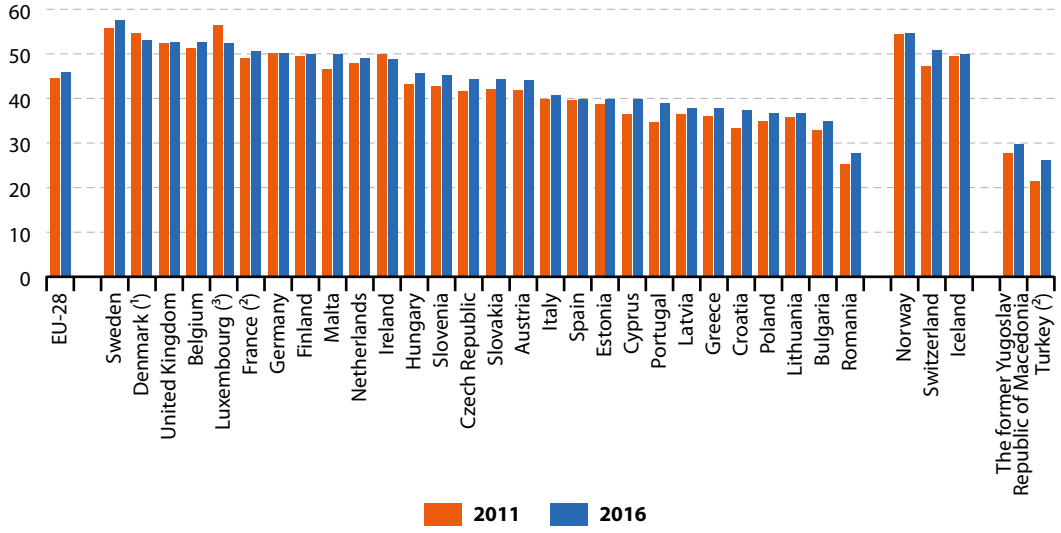
Figure 9.4: Employment in high- and medium-high technology manufacturing sectors and knowledge-intensive service sectors, EU-28, 2008–2016
(% of total employment)



Source: Eurostat (online data code: sdg_09_20)

([5]) Eurostat (2017), *High-tech industry and knowledge-intensive sectors*.

Figure 9.5: Employment in high- and medium-high technology manufacturing sectors and knowledge-intensive service sectors, by country, 2011 and 2016
(% of total employment)



(1) Break in time series in 2016.
(2) Break in time series in 2014.
(3) Break in time series in 2015.
Source: Eurostat (online data code: sdg_09_20)

for this includes the share of the EU workforce working in technology-intense industries such as pharmaceuticals, electronic and optical products or machinery stagnating at a low level since 2008. This is due to an increasing demand for manufactured goods in OECD countries that is being met by workers in emerging countries. Since the onset of the economic crisis, both large and small firms have shed jobs, particularly in manufacturing. Broad deindustrialisation across OECD countries has been accompanied by waves of industrialisation in non-OECD countries ([6]). The EU tends to specialise in medium-high technology manufacturing sectors (for example, automobiles and parts), while its share of high-tech manufacturing (for example, ICT, pharmaceuticals, and biotech) is lower than that of the US and much lower than South Korea ([7]).

In contrast, the share of employment in knowledge-intensive services has increased slightly since 2008, reaching 40 % of total employment in 2016. However, a growing share of employment in knowledge-intensive sectors does not necessarily indicate a shift towards a more knowledge-based economy. It could also be a result of total employment decreasing faster than employment in knowledge-intensive sectors ([8]).

In 2016, women made up 54.5 % of total employment in technology and knowledge-intensive sectors in the EU. In all countries, more women were employed in technology and knowledge-intensive sectors than men.

Industrial activities continue to account for the largest share (68 %) of EU exports as well as research and innovation. They also provide a range of high-skilled jobs. In 2016, the manufacturing sector's gross value added accounted for 14.4 % of the EU's GDP.

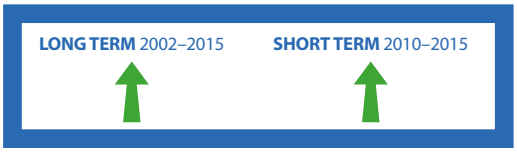
Across the EU, employment shares in high- and medium-high technology manufacturing and knowledge-intensive service sectors in 2016

([6]) OECD (2015), *OECD Science, Technology and Industry Scoreboard 2015: Innovation for growth and society*.
([7]) European Commission (2016), *Science, Research and Innovation performance of the EU*.
([8]) OECD (2011), *OECD Science, Technology and Industry Scoreboard 2011: Innovation and Growth in Knowledge Economies*.

ranged from 27.8 % to 57.6 %. The employment shares also varied considerably when considering just the high- and medium-high technology manufacturing sectors. The highest shares were observed in the Czech Republic (11.5 %), Slovakia (10.8 %) and Germany (9.8 %). In terms of people employed in knowledge-intensive service sectors, Sweden and Luxembourg recorded the highest shares, accounting for 53.2 % and 51.5 % of total employment, respectively.

R&D personnel

The share of R&D personnel in the EU labour force has increased steadily since 2002.



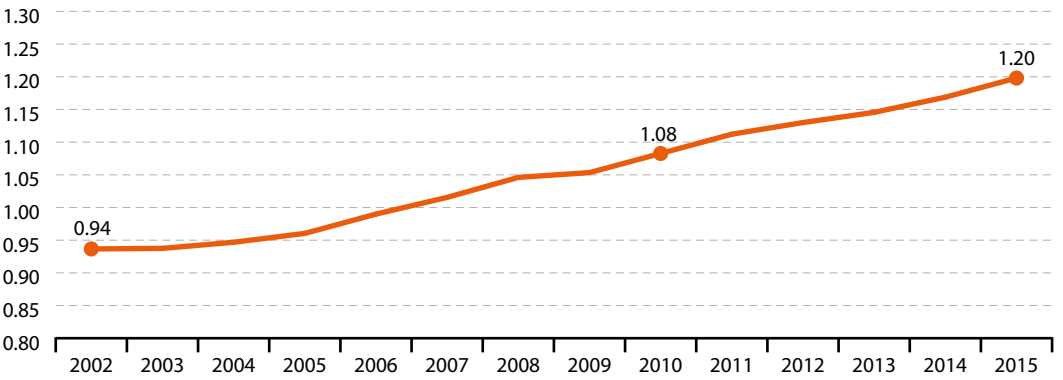
R&D personnel include employees in the four institutional sectors: business enterprise, government, higher education and private non-profit. Data are presented in full-time equivalents as a share of the economically active population (the 'labour force').

At the EU level, R&D personnel accounted for 1.2 % of the active population in 2015, translating into more than 2.8 million full-time equivalent positions. The business sector employed more than a half of all R&D personnel (54.4 %).

The increase in the share of R&D personnel among the labour force between 2002 and 2015 was supported by growth in three of the four institutional sectors. However, growth rates varied between the sectors. It was strongest for the business enterprise sector, growing by 0.17 percentage points from 2002 to 2015, followed by the higher education sector, which grew by 0.08 percentage points.

Variation in the share of R&D personnel in labour forces across Member States largely follow the patterns observed for R&D intensity (see Figure 9.3). Luxembourg is an exception, with a below-average R&D intensity of only 1.3 % of GDP but with the second highest share of R&D personnel (2.0 %) in 2015.

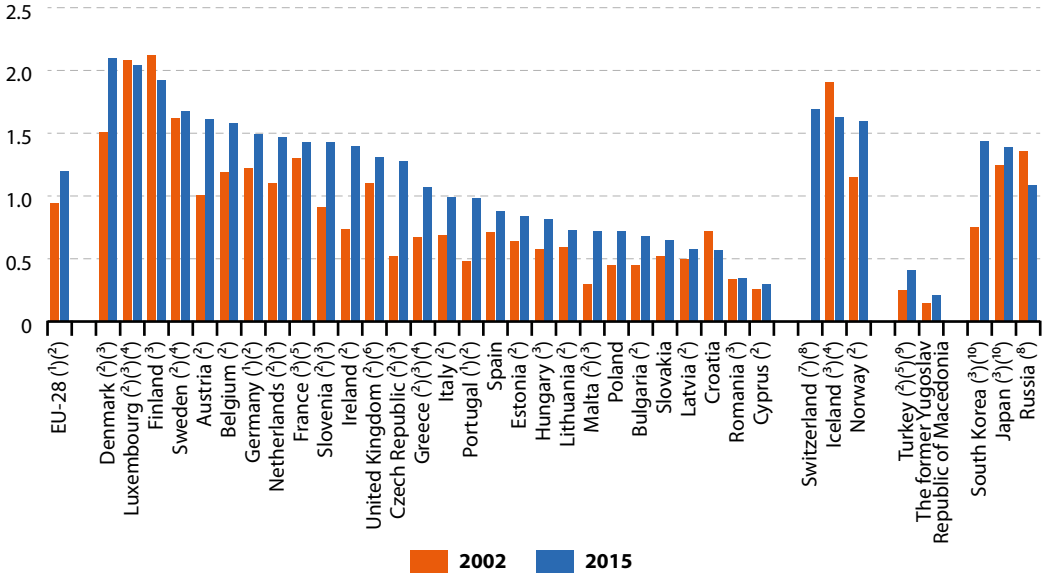
Figure 9.6: R&D personnel, EU-28, 2002–2015
(% of active population in full-time equivalents)



Note: Data for 2002–2004 and 2008–2010 are estimates; 2015 data are provisional.

Source: Eurostat (online data code: sdg_09_30)

Figure 9.7: R&D personnel, by country, 2002 and 2015
(% of active population in full-time equivalents)



(1) Data for 2002 are estimates.
(2) 2015 data are provisional and/or estimates.
(3) Break in time series between 2002 and 2015.
(4) 2003 data (instead of 2002).
(5) 2014 data (instead of 2015).
(6) 2005 data (instead of 2002).
(7) No data for 2002.
(8) 2012 data (instead of 2015).
(9) 2006 data (instead of 2002).
(10) 2011 data (instead of 2015).

Source: Eurostat (online data code: sdg_09_30)

Patent applications to the European Patent Office (EPO)

EU patent applications have increased considerably since 1999, reaching a peak in 2007. Since then, however, patent applications have fallen by 3 %.

Patents are legal instruments that encourage companies to foster innovations by conferring some exclusive rights to inventors or assigners in return for the disclosure of an innovation. Thus, patents provide a valuable measure of the exploitation of research results and of inventiveness of countries, regions and companies.

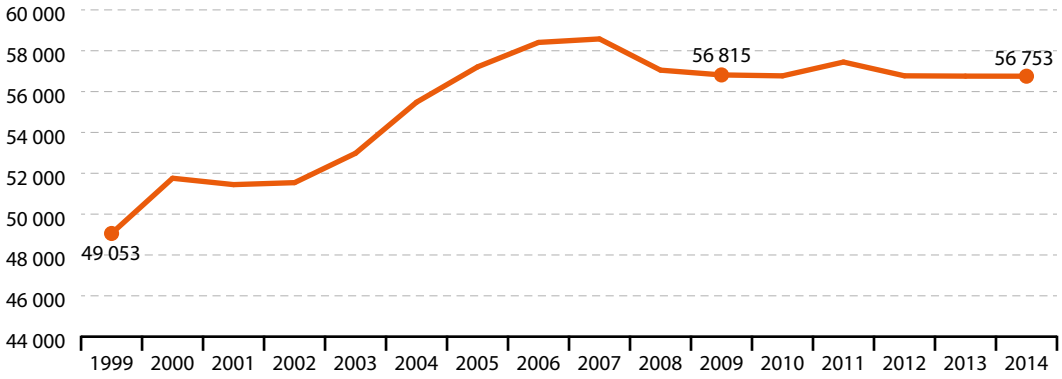
Between 1999 and 2007, total patent applications in the EU increased almost continuously until the global economic and financial crisis started to emerge in 2008. This was the first reduction in patent applications in over a decade. According to literature, a company's propensity to file patents is influenced by three factors, namely R&D efforts, strategic considerations and the competitive environment (9).

(9) Harhoff, D et al (2007), *The strategic use of patents and its implications for enterprise and competition policies*.

One fifth of patent applications in 2012 were from the performing operations and transporting sector (20.4 %), followed by electricity (17.6 %) and human necessities (16.0 %).

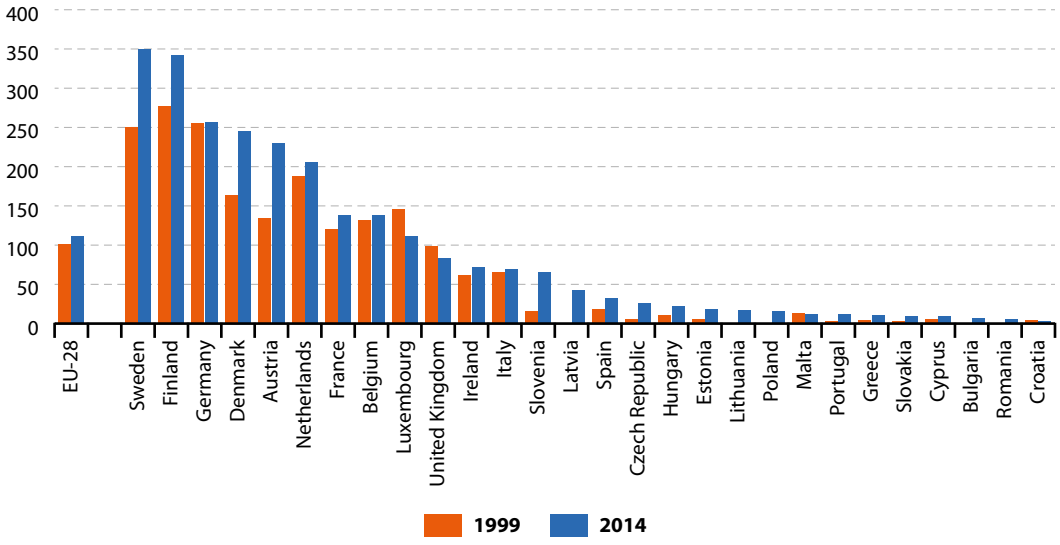
Patent applications to the EPO varied considerably across the EU, ranging from 3.4 to 350.4 patents per million inhabitants in 2014. It is interesting to note that the countries with the highest R&D to GDP ratios (see Figure 9.3) also had the highest numbers of per capita patent applications.

Figure 9.8: Patent applications to the European Patent Office, EU-28, 1999–2014
(total number)



Source: Eurostat (online data code: sdg_09_40)

Figure 9.9: Patent applications to the European Patent Office, by country, 1999 and 2014
(number per million inhabitants)



Source: Eurostat (online data code: sdg_09_40)

Share of collective transport modes in total passenger land transport

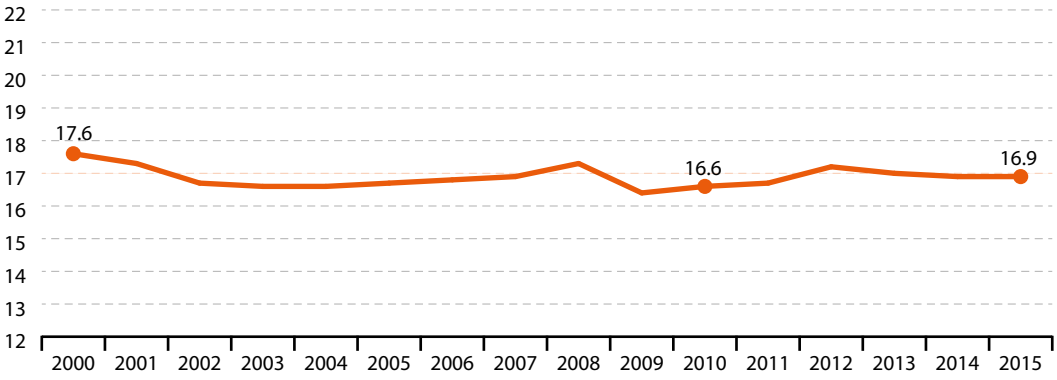
The share of collective transport modes in total passenger land transport has moderately fallen since 2000. However, a slight increase is visible since 2009.

In this publication, collective transport modes refer to buses, including coaches and trolley-buses, and trains. Data are shown as a share in total inland passenger transport performance, expressed in passenger-kilometres (pkm). All data should be based on movements within national territories, regardless of a vehicle's nationality. However, the data collection methodology is voluntary and not fully harmonised at the EU level. Other collective transport modes, such as tram and metro

In 2011, the European Commission adopted a roadmap of 40 concrete initiatives to reduce greenhouse gas emissions in transport by 60% by 2050. Further information can be found in the 2011 Transport White Paper ([10]).

With the 2016 'Strategy on low-emission mobility' and the initiatives foreseen by the 2017 'Europe on the Move' package, the European Commission is taking action for a fundamental modernisation of European mobility and transport. The aim is to help the sector to stay competitive in a socially fair transition towards clean energy and digitalisation. Further information can be found on the website of the Directorate-General for Mobility and Transport.

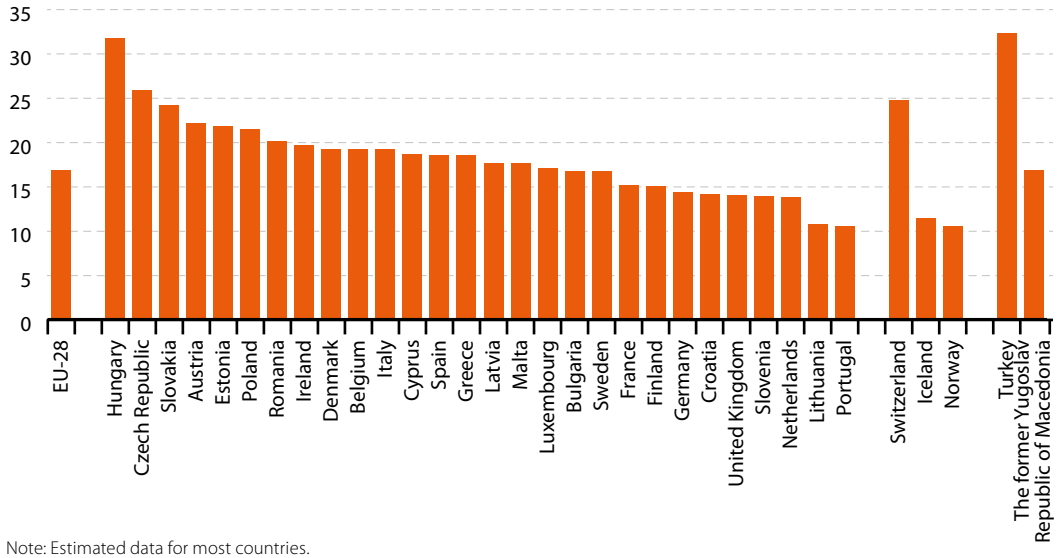
Figure 9.10: Share of collective transport modes in total passenger land transport, EU-28, 2000–2015
(% of total inland passenger-km)



Source: Eurostat (online data code: sdg_09_50)

([10]) European Commission (2011), *White Paper Roadmap to a Single European Transport Area — Towards a competitive and resource efficient transport system*, COM(2011) 144 final.

Figure 9.11: Share of collective transport modes in total passenger land transport, by country, 2015
(% of total inland passenger-km)



Note: Estimated data for most countries.
Source: Eurostat (online data code: sdg_09_50)

systems, are also not included due to the lack of harmonised data.

The shares of different transport modes in total passenger land transport have not changed substantially since 2000, with passenger cars still accounting for more than 80 % of the EU's modal split in land passenger transport.

Passenger transport by train has grown slightly but steadily, increasing from 7.2 % of total transport in 2000 to 7.7 % in 2015. In contrast, the share of passenger transport by buses and coaches has shown a heavy fall, from 10.4 % to 9.2 %, contributing to the reduction in the modal split of collective transport modes from 17.6 % in 2000 to 16.9 % in 2015.

The modal split of passenger transport shows little variation across Member States. In 2015, road transport shares ranged between 68 % and 90 % of total inland passenger-kilometres across EU countries. Major shifts in the modal split can only be observed in the long run since 2000. The largest increases in road transport shares were recorded in the youngest Member States, partly reflecting their economic growth and the increase in personal income.

Share of rail and inland waterways activity in total freight transport

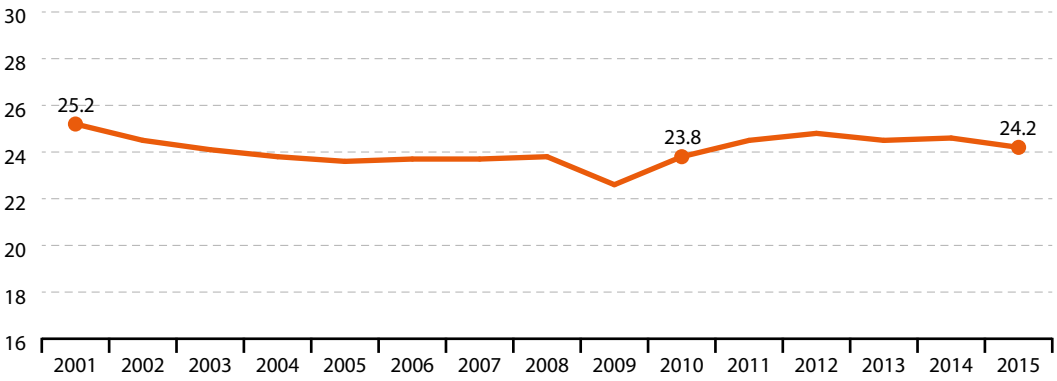
The modal split of rail and inland waterways activities in total inland freight transport has slightly fallen since 2000. However, they have regained shares since 2009.

This indicator shows the share of rail and inland waterways in total inland freight transport, expressed in tonne-kilometres (tkm). Road transport is based on all movements of vehicles registered in the reporting country. Rail and inland waterways transport is generally based on movements on national territory, regardless of the nationality of the vehicle or vessel, but there are some variations in definitions from country to country.

Similar to the modal split of passenger transport, the choice of transport mode for inland freight transport has not changed substantially since 2001. Road transport continues to have by far the largest share of EU freight transport performance among the three inland transport modes (75.8 % in 2015). Despite the EU policy objectives of shifting freight from road to rail, the share of road transport has grown since 2001. Over the period from 2001 to 2015, the share of inland waterways fluctuated between 5.7 % and 6.7 %, reaching 6.3 % in 2015. At the same time, rail activity fell from 18.8 % in 2001 to 17.9 % in 2015. After dropping to 16.6 % in 2009, it recovered and has remained stable at around 18.0 % since 2011.

Compared with passenger transport, the modal split of freight transport shows more variation across Member States. In three countries (Latvia, Austria and Switzerland) freight transport by rail and inland waterways had an almost equal or even larger modal split than road. Since the early 1990s Switzerland has pursued a consistent, long-term transport policy which has enabled the expansion and modernisation of the railway infrastructure. No other European country has more railway tracks per square kilometre ([11]).

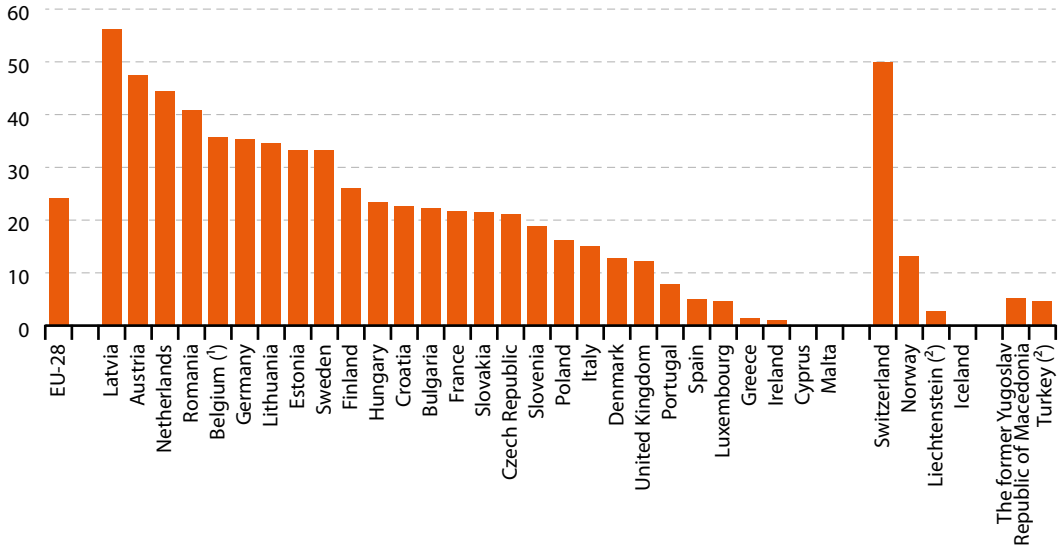
Figure 9.12: Share of rail and inland waterways activity in total freight transport, EU-28, 2001–2015
(% of total inland tonne-km)



Source: Eurostat (online data code: sdg_09_60)

([11]) Verband öffentlicher Verkehr (VÖV) (2016/2017), *Facts & Figures: Swiss Public Transport*.

Figure 9.13: Share of rail and inland waterways activity in total freight transport, by country, 2015
(% of total inland tonne-km)



(1) Estimated data.
(2) 2013 data.
Source: Eurostat (online data code: sdg_09_60)

Both Austria and Switzerland have imposed strict road transport policies, including higher taxes and charges schemes, together with the implementation of incentives for rail transport, with the intention to increase rail traffic share ([12]). Statistics for rail transport are not available for Malta and Cyprus because they do not have railways.

Countries that joined the EU in 2004 and 2007 have recorded the largest increases in the share of road transport in total inland freight tonne-kilometre. One reason for this is that the extension and integration of the common market is interlinked with transport demand. Road transport is the easiest to interconnect and cheaper than other modes ([13]).

Further reading on industry, innovation and infrastructure

Centre on Regulation in Europe (CERRE) (2014), *Development of rail freight in Europe: What regulation can and cannot do*.

European Commission (2016), *Science, Research and Innovation performance of the EU*.

European Commission (2016), *European Innovation Scoreboard 2016*.

European Court of Auditors (2016), *Rail freight transport in the EU: still not on the right track*.

European Commission (2011), *Roadmap to a Single European Transport Area — Towards a competitive and resource efficient transport system*.

OECD (2015), OECD Science, *Technology and Industry Scoreboard 2015: Innovation for growth and society*.

([12]) Centre on Regulation in Europe (CERRE) (2014), *Development of rail freight in Europe: What regulation can and cannot do*.
([13]) European Court of Auditors (2016), *Rail freight transport in the EU: still not on the right track*.

10 Reduce inequality within and among countries

The global perspective on SDG 10

Despite growing material prosperity worldwide, the gap between the rich and the poor has deepened, with the richest 10 % earning up to 40 % of total global income, while the poorest 10 % earn just 2 % to 7 %. This rising income inequality threatens social cohesion, drags down economic growth and stalls progress in poverty reduction, health and well-being. In recognition of the benefits that social cohesion brings, SDG 10 calls for nations to adapt polices and legislation to increase the income of the bottom 40 % of the population and to reduce inequalities based on income, sex, age, disability, race, class, ethnicity, religion and opportunity. It also aims to improve the regulation and monitoring of financial markets and institutions. SDG 10 addresses inequalities between countries by encouraging development assistance and foreign direct investment to the regions with the greatest need, promoting the principle of special and differentiated trade treatment for developing countries and the representation of developing countries in decision-making in global economic and financial institutions. The goal seeks to promote social inclusion globally through the facilitation of safe, orderly and regular migration and the reduction of transaction costs of migrant remittances ([1]).

eurostat supports the SDGs

Monitoring SDG 10 'reduced inequalities' in an EU context focuses on the sub-themes 'inequalities between countries', 'inequalities within countries' and 'migration and social inclusion'. 'Inequalities between countries' refers to income disparities between EU countries as well as the EU support to developing countries, which contributes to reducing global inequalities. The sub-theme 'inequalities within countries' looks into different measures of inequality in income distribution. The last sub-theme refers to the social inclusion challenges related to the recent surge of migration into the EU. As shown in Table 10.1, the EU's progress in these areas has been rather mixed.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 10.1: Indicators measuring progress in SDG 10, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Inequalities between countries			
Disparities in purchasing power adjusted GDP per capita (1)	↗	↘	p. 202
Disparities in adjusted gross disposable income of households per capita in PPS (1)	↑ (2)	↑	p. 204
EU financing to developing countries (*)	↑	↑	SDG 17, p. 342
EU Imports from developing countries (*)	↑ (3)	↗	SDG 17, p. 344
Inequalities within countries			
People at risk of income poverty after social transfers (*)	↘ (2)(4)	↓	SDG 1, p. 35
Relative median at-risk-of-poverty gap	↘ (2)(4)	↓	p. 206
Gini coefficient of equivalised disposable income	↘ (2)(4)	↘	p. 208
Income share of the bottom 40 % of the population	↘ (2)(4)	↘	p. 210
Migration and social inclusion			
Asylum applications	:	:	p. 212

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.

(1) Calculation of trend based on coefficient of variation.
(2) Past 10-year period.
(3) Past 12-year period.
(4) Trend refers to EU-27.

Inequalities in the EU: overview and key trends

It is widely agreed that economic prosperity alone will not achieve social progress. Economic growth that does not include all parts of society risks leaving behind unrealised human potential, damaging social cohesion, hindering economic activity and undermining democratic participation, to name a few examples. Although economists believe that some inequality encourages entrepreneurs to take risks and employees to be more productive to increase financial gains, an ever-widening gap between the rich and the poor is a matter of concern. Reducing income inequalities is a key to preventing inequality spreading into other domains such as health, education and employment, and as such is at the core of the European Pillar of Social Rights proposed by the European Commission in 2017 ([2]).

Inequalities between countries

We live in an interconnected world, where problems and challenges — be they poverty, climate change, migration or economic crises — are rarely confined to one country or region. Therefore, combating inequalities between countries and world regions is important, not only from a social justice perspective but also as a prerequisite for solving many interdependent problems. In particular, sharing prosperity and reducing trade barriers allow nations to cooperate on meeting global challenges, which by definition cannot be addressed by the EU alone.

Not only have incomes and living standards improved across the EU as a whole, they have also been converging between countries. Disparities in **GDP per capita** between Member States narrowed moderately between 2004 and 2015, although this convergence has recently drawn to a halt. A clearer trend towards reduced inequalities between EU countries is shown by the coefficient of variation in **household income** over time. Disparities in adjusted gross disposable income of households per capita fell substantially in both the short and the long term.

The EU's values of social and economic justice and equality apply not just to its own territories but also to global development in general. The assistance given by the EU and its Member States to developing countries is an expression of solidarity with their efforts to eradicate poverty and vulnerability, improve their population's well-being and reach the standards of living enjoyed by industrialised countries. The EU is the world-leading donor in this respect, providing over 50 % of all global development aid. Total EU **financing** for developing countries, encompassing flows from the public and private sector, has almost doubled since 2000. The private sector was the single largest source for development financing.

The EU's actions to help countries in need, which also help to reduce global inequalities between countries, go beyond official development assistance and other financial flows. Trade openness is another objective to help countries achieve lasting economic development and independence from ODA. Through trade cooperation, the EU aims to help developing and least-developed countries join the global economy and reap the benefits this provides for economic specialisation, growth and job creation. The EU has made much progress in this area, with **imports from developing countries** more than doubling between 2002 and 2014.

Inequalities within countries

While income inequality between countries across the world has reduced modestly over recent decades, as some of the large emerging economies have caught up with industrialised ones, inequality within countries, notably high-income ones, seems to be on the rise. Although many factors have played a role, there is a large consensus that technological innovation and

([2]) European Commission, *Establishing a European Pillar of Social Rights*, COM(2017) 250 final, Brussels, 2017.

financial globalisation, favouring people with specific skills and those with accumulated wealth, have been the main driving forces behind increasing inequality within countries ([3]). Various measures of inequality point out that the EU is not an exception.

Inequality and poverty are closely interrelated. How resources are distributed within a country has a direct bearing on the extent and depth of poverty. The EU still faces a high level of income poverty despite its overall wealth. In 2015, 86.8 million people — about 17.3 % of the EU population — were **at risk of poverty after social transfers**. In other words, their disposable income was below their national at-risk-of-poverty threshold. The number of people living in income poverty in the EU has risen substantially since 2005 (+ 8.1 %), with the largest increases occurring in recent years.

Social inclusion objectives aim not only to reduce the level of poverty but also its depth. The relative median at risk of poverty gap measures how far the income of those at risk of poverty falls below the poverty threshold. In 2015, the relative median at risk of poverty gap in the EU was 24.8 % of the risk of poverty threshold. This represents an increase of 1.5 percentage points since 2005 ([4]).

A broader picture of inequality in the EU can be obtained by analysing the whole income distribution. One measure of this, the **Gini coefficient of equivalised disposable income**, shows a slight increase between 2005 and 2015.

This pattern confirms the general deterioration of social cohesion in the EU as depicted by other inequality measures.

The overall change in living standards of those with the lowest incomes over a number of years can be analysed by looking at the **income share of the bottom 40 % of the population** in the total equivalised disposable income. The income share of the bottom 40 % of the distribution has been shrinking over time, from 21.5 % in 2005 to 20.9 % in 2015.

Migration and social inclusion

Social inclusion in the EU has been challenged not only by high income inequalities and poverty levels, but also by the human tragedies of people crossing EU borders, often after a treacherous sea voyage, to seek international protection from war, prosecution or natural disaster. These people face serious humanitarian and protection challenges due to the hardship of the journey, abuses of smugglers and criminal gangs, and tightening borders ([5]). The EU has recently experienced an unprecedented surge of **migration**. Member States received 1.2 million first-time asylum applications in 2016, more than five times more than the number registered in 2008 (225 150) ([6]). Almost one in three first-time asylum seekers in 2016 came from Syria, where armed conflict has persisted since 2011. During 2016, 710 635 people received a positive decision granting protection status (at first and final instance).

([3]) Darvas, Z. and Wolff, B. (2016), *An Anatomy of Inclusive Growth in Europe*, pp.14–15.
([4]) Data refer to the EU-27.
([5]) UNHCR (2015), *The sea route to Europe: The Mediterranean Passage in the age of refugees*, p.3.
([6]) 2008 data refer to total number of asylum applicants, including repeat applicants.

Reduced inequalities in the EU

Inequalities between countries

Disparities in GDP per capita in 2016
42.9 % variation coefficient
+ 0.3 pp since 2011

Disparities in disposable household income in 2015
25.7 % variation coefficient
- 4.1 pp since 2010

Financing to developing countries in 2015
178 billion EUR
+ 39.8% since 2010

Imports from developing countries in 2016
861 billion EUR
+ 2.3 % since 2011

Inequalities within countries

Income poverty in 2015
17.3 % of population
+ 0.8 pp since 2010

At-risk-of-poverty gap in 2015
24.8 % distance to poverty threshold
+ 1.9 pp since 2010

Gini coefficient in 2015
31 scale from 0 (maximal equality) to 100 (maximal inequality)
+ 0.5 points since 2010

Income share of bottom 40 % of population in 2015
20.9 % of income
- 0.4 pp since 2010

Migration and social inclusion

Asylum applications in 2016
2 364 per million inhabitants

Source: Eurostat (online data codes: sdg_10_10, sdg_10_20, sdg_17_20, sdg_17_30, sdg_01_20, sdg_10_30, sdg_10_40, sdg_10_50 and sdg_10_60)

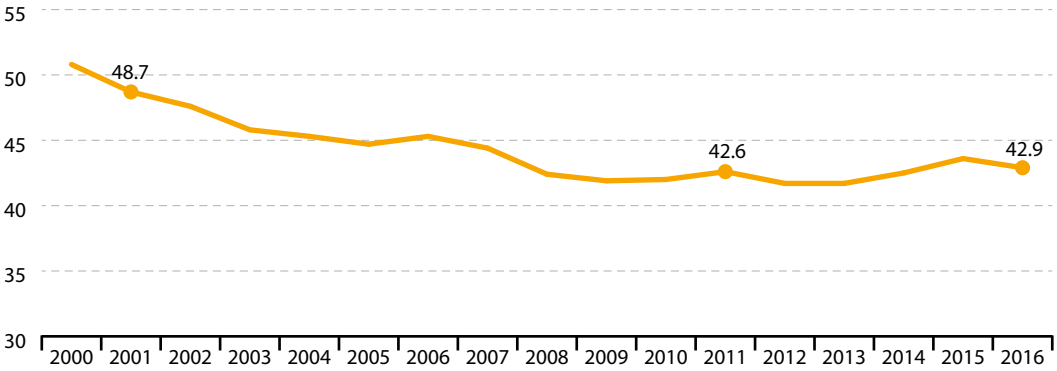
Purchasing power adjusted GDP per capita

The coefficient of variation in GDP per capita across Member States has reduced by almost six points since 2001, pointing to a long-term convergence of living standards. However, since 2008 convergence in the EU has stalled.

Gross domestic product (GDP) is a measure of economic activity. It refers to the value of the total output of goods and services produced by an economy, less intermediate consumption, plus net taxes on products and imports. GDP per capita is calculated as the ratio of GDP to the average population in a specific year. As a measure of average income, it is often used as an indicator of how well off people are in a given country. Basic figures are expressed in purchasing power standards (PPS) ([7]), which represents a common currency that eliminates the differences in price levels between countries to allow meaningful volume comparisons of GDP. The coefficient of variation of GDP per capita is calculated as the ratio of the standard deviation to the mean. It can be used as a measure of inequalities between countries: bigger disparities are associated with the highest coefficient of variation.

In the EU, the coefficient of variation in GDP per capita in PPS has decreased moderately over the long term, indicating that economic disparities between countries have reduced over time. According to the 2016 Annual Review of Employment and Social Developments in Europe ([8]), this was mainly a result of rising GDP in countries that joined the EU in 2000 and later. However, most of this convergence took place in the period leading up to the economic crisis of 2008 to 2009. Although the economic recovery allowed GDP per capita in the EU to return to pre-crisis level ([9]), disparities in GDP per head across Member States have stagnated since then.

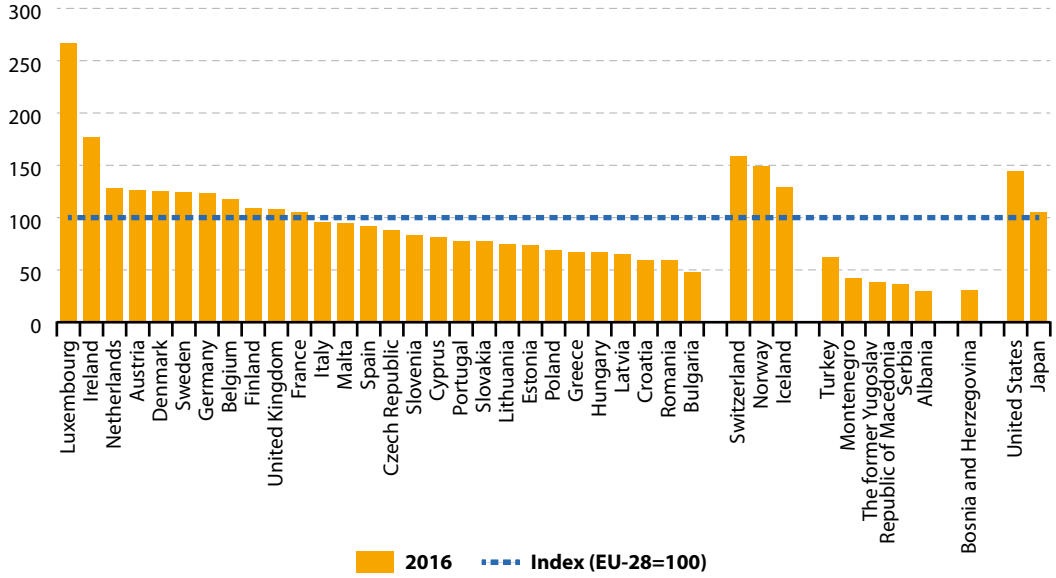
Figure 10.1: Purchasing power adjusted GDP per capita, EU-28, 2000–2016
(coefficient of variation, in %)



Source: Eurostat (online data code: sdg_10_10)

([7]) The purchasing power standard (PPS) is an artificial currency unit. Theoretically, one PPS can buy the same amount of goods and services in each country. However, price differences across borders mean that different amounts of national currency units are needed for the same goods and services depending on the country. PPS are derived by dividing any economic aggregate of a country in national currency by its respective purchasing power parities. PPS is the technical term used by Eurostat for the common currency in which national accounts aggregates are expressed when adjusted for price level differences using PPPs. Thus, PPPs can be interpreted as the exchange rate of the PPS against the euro.
([8]) European Commission, *Employment and Social Developments in Europe, Annual Review 2016*, 2016, p. 46.
([9]) Source: Eurostat (online data code nama_10_pc)

Figure 10.2: Purchasing power adjusted GDP per capita, by country, 2016
(index EU-28 = 100)



Source: Eurostat (online data code: sdg_10_10)

The recently adopted European Pillar for Social Rights ([10]) sets out a number of key principles to support fair and well-functioning labour markets and welfare systems. Those principles address topics related to inequality, by tackling both inequality of outcomes (income and wealth inequality) and inequality of opportunities: from wage-setting to social protection systems (including minimum income), gender equality, enabling social services, childcare and support to children, old-age income, health care and access to housing.

Despite the moderate convergence in GDP per capita in PPS over the long term, the incomes and standards of living enjoyed by citizens still vary considerably between EU countries. To illustrate this gap, in 2015, the GDP per capita in the Netherlands and Austria was almost three times higher than that in Bulgaria ([11]) (see Figure 10.2).

A clear north-south and west-east divide is evident when looking at the geographical distribution of GDP per capita in the EU in 2015. All eastern and southern European countries, with the exception of France, displayed GDP per capita levels below the EU average, with Member States joining after 2007 (Bulgaria, Romania and Croatia) showing the largest gaps. This diverging pattern is broadly reflected in other fields of economic performance such as employment, R&D expenditure and resource productivity (see chapters 8, 9 and 12) as well as in social dynamics in terms of levels of poverty and social exclusion (see chapter 1).

Regional differences in GDP per capita reflect largely existing country disparities, with regions in the north and west recording higher levels of GDP per capita than those to the east and south. As a general trend, the highest levels of GDP per capita in EU countries are concentrated in capital

([10]) European Commission, *Establishing a European Pillar of Social Rights*, COM(2017) 250 final, Brussels, 2017.
([11]) While the GDP per capita in Luxembourg and Ireland is even higher than in the Netherlands and Austria, these extremely high values are due to distinct features of their economies — a very high share of foreign workers in the case of Luxembourg and a high share of foreign-owned enterprises in Ireland.

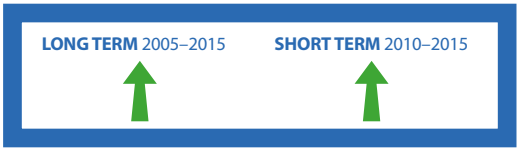
EU cohesion policy promotes economic, social and territorial cohesion by investing in smart, sustainable and inclusive growth in all EU regions. The European Structural and Investment Funds are the financial instrument for implementing these policy actions.

regions. The only two Member States with more than two NUTS 2 regions where the regions with the highest GDP levels per capita are not the capital regions are Germany and Italy. Wealthier regions are often characterised by specialisation in particular economic activities such as financial and business services, research and innovation or technology and ICT.

Stark regional disparities in GDP per capita can be seen in the United Kingdom, France and Romania. In 2015, the ratio between the regions with the highest and the lowest GDP per capita in these Member States ranged between 8.5 and 4. Conversely, the most equal geographical distribution of GDP per capita was found in Finland and Portugal, where this ratio was only 1.6.

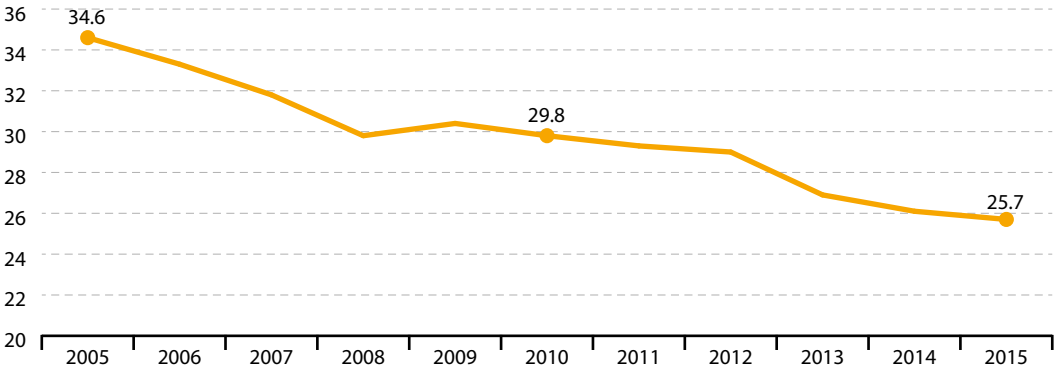
Adjusted gross disposable income of households per capita

Disparities in gross disposable household income across EU Member States have been decreasing almost continuously since 2005.



While GDP per capita is used to measure the economic performance of a country, gross household disposable income provides an indication of the average material well-being of people. Gross household disposable income reflects the purchasing power of households and their ability to invest in goods and services or save for the future, by accounting for taxes and

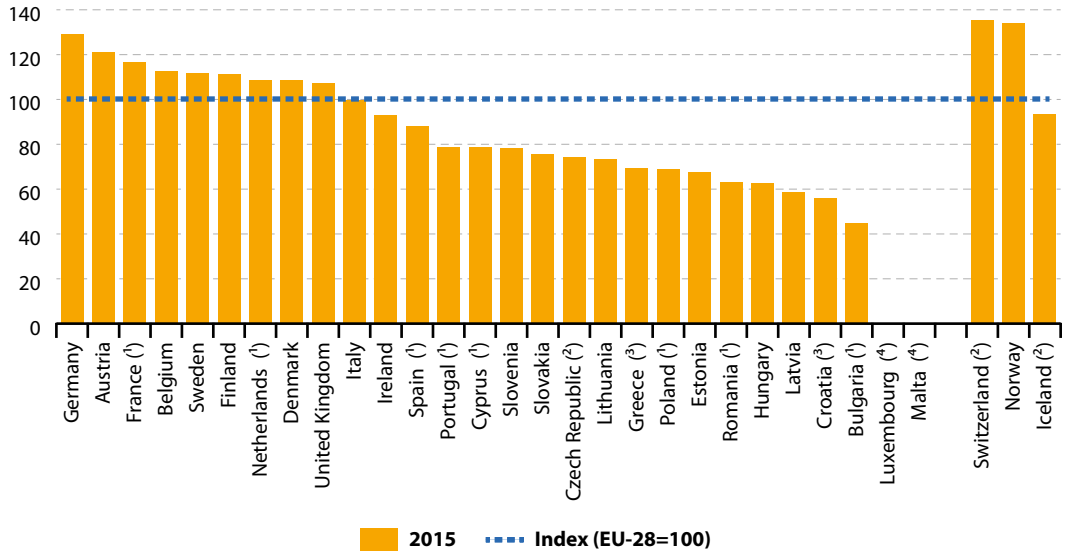
Figure 10.3: Adjusted gross disposable income of households per capita, EU, 2005–2015
(coefficient of variation, in %)



Note: EU aggregate excluding Malta and Luxembourg (whole time series), Croatia (no data for 2013-2015) and Czech Republic (no data for 2015).

Source: Eurostat (online data code: sdg_10_20)

Figure 10.4: Adjusted gross disposable income of households per capita, by country, 2015
(index EU-28 = 100)



(1) Data are provisional or estimates.
(2) 2014 data (instead of 2015).
(3) 2012 data (instead of 2015).
(4) No data available.

Source: Eurostat (online data code: sdg_10_20)

social contributions and monetary in-kind social benefits. The two indicators differ as GDP per capita measures income that might not necessarily accrue to households and does not capture household income received from investments abroad, for example, in the form of dividends and interest receipts.

The coefficient of variation in adjusted gross disposable income of households per capita at country level reveals even a more positive trend of socio-economic convergence across Member States. In contrast to the coefficient of variation in GDP per capita, recent developments in gross household disposable income across the EU do not point to a short-term stagnation, but rather a further improvement, albeit at a slightly slower rate than over the long term.

In 2015, adjusted gross disposable income of households per capita in PPS ([12]) showed a large variation between countries, ranging from an index of 129 to 45. EU citizens living in northern and western European countries with above average GDP per capita levels had the highest gross disposable income per capita. On the other end of the scale were eastern and southern EU countries, which displayed gross household disposable incomes and GDP per capita levels below the EU average.

It should be noted, however, that GDP per capita and gross household disposable income are not always directly related to each other. For instance, Ireland and the Netherlands ranked second and third in terms of GDP per capita in the EU, despite having gross household disposable income levels

([12]) The purchasing power standard (PPS) is an artificial currency unit. Theoretically, one PPS can buy the same amount of goods and services in each country. However, price differences across borders mean that different amounts of national currency units are needed for the same goods and services depending on the country. PPS are derived by dividing any economic aggregate of a country in national currency by its respective purchasing power parities. PPS is the technical term used by Eurostat for the common currency in which national accounts aggregates are expressed when adjusted for price level differences using PPPs. Thus, PPPs can be interpreted as the exchange rate of the PPS against the euro.

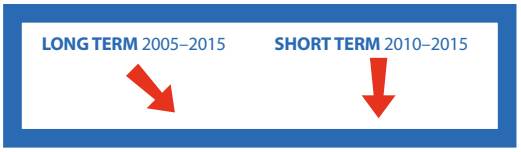
close to or below the EU average. The presence of a significant number of foreign subsidiaries of multinational enterprises, whose income increases GDP but is not reflected in gross household disposable income, might partly explain this disparity. There are also examples in the opposite direction: France had the third highest gross household disposable income in the EU although its GDP per capita was close to the EU average.

In 2014 regional variation in household net disposable income per capita ([13]) in the EU ranged from PPS 39 000 in Inner London — West to PPS 5 400 in the Bulgarian Severozapaden region ([14]). All of the other six regions in the top seven were in Germany. Similar to the regional distribution of GDP per capita, capital city regions accounted for the highest levels of disposable income in the majority of EU countries. However, in a few Member States, namely Germany, Austria, Belgium and Hungary, household disposable income per inhabitant for the capital city region was below the national average. Although disposable income per inhabitant in the capital city regions of Greece, Spain, Italy and the Netherlands was above their respective national averages, it was also not the highest in the respective country.

Excluding capital city regions, the distribution of disposable income per inhabitant was often within a relatively narrow range across the remaining regions in most of the EU Member States. This was particularly the case in Denmark, Sweden and Austria, which displayed more or less uniform distributions. In contrast, and excluding capital city regions, the largest variations in disposable income per inhabitant within Member States were recorded in France, Italy and Spain. While in France this was mainly a result of relatively low values for some of its overseas regions, the differences in Italy and Spain rather reflected north–south divides (with higher levels of disposable income in northern regions) ([15]).

Relative median at-risk-of-poverty gap

The relative median at-risk-of-poverty gap has increased by 1.5 percentage points in the long term and 1.9 percentage points in the short term. This trend indicates that the poor have become poorer in the EU.



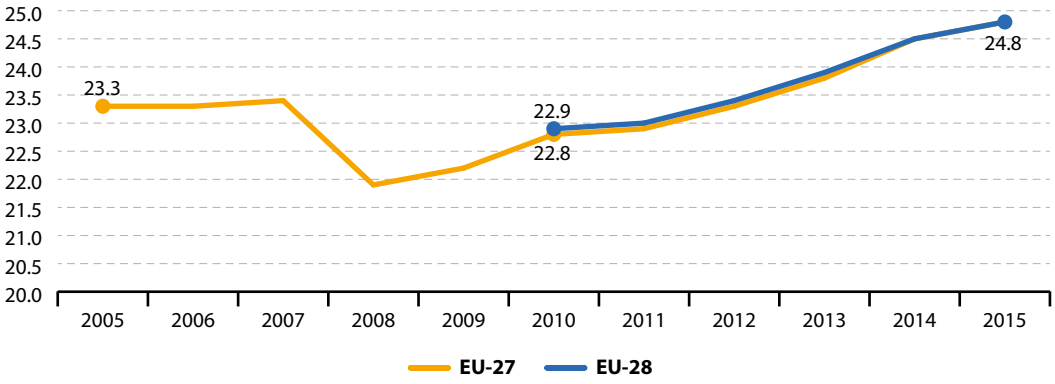
The relative median at-risk-of-poverty gap helps to quantify how poor the poor are by showing the distance between the median income of people living below the poverty threshold and the threshold itself, expressed in relation to the threshold. This threshold is set at 60 % of the national median equivalised disposable income of all people in a country and not for the EU as a whole. Therefore, the national reference income below which the depth of poverty is measured varies across Member States depending on the median equivalised disposable income in a country.

The median income of persons at risk of poverty in the EU was, on average, 24.8 % below the poverty threshold in 2015. The relative median at-risk of-poverty gap in the EU has been increasing continuously since 2008.

([13]) Real household net disposable income is defined as the sum of wages and salaries, mixed income, net property income, net current transfers and social benefits other than social transfers in kind, less taxes on income and wealth and social security contributions paid by employees, the self-employed and the unemployed. Household gross adjusted disposable income additionally reallocates "income" from government and non-profit institutions serving households (NPISHs) to households to reflect social transfers in kind. These transfers reflect expenditures made by government or NPISHs on individual goods and services, such as health and education, on behalf of an individual household.
([14]) Please note that no data are available for Luxembourg.
([15]) Eurostat, Statistics Explained, *GDP at regional level*, accessed on 20 June 2017.

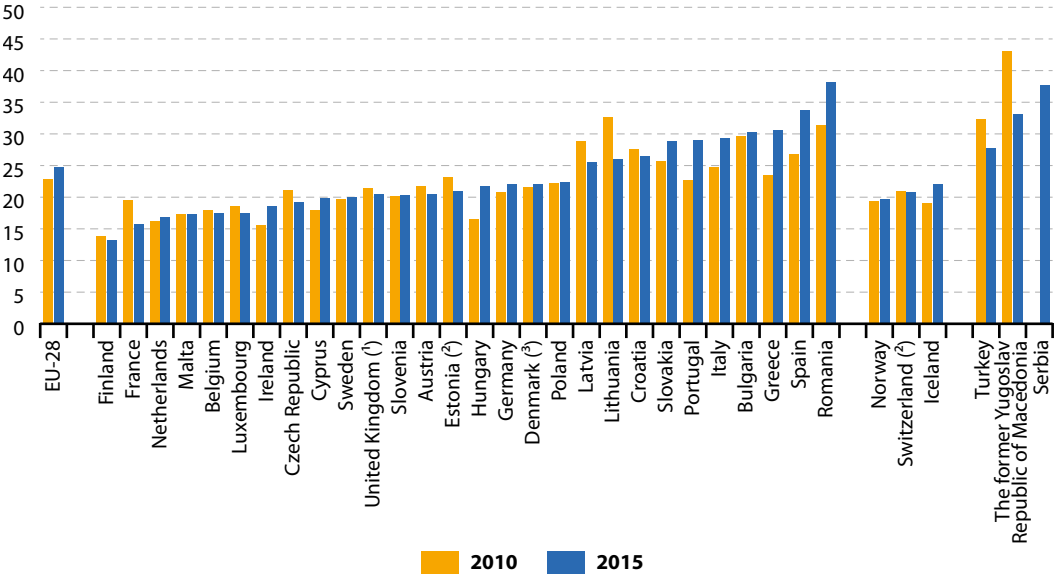
In 2015, the poverty gap in the EU varied between 13.2 % in Finland to 38.2 % in Romania. In Spain, Greece and Bulgaria the poverty gap also exceeded 30 %.The depth of poverty seems to be positively correlated with the at-risk-of-poverty rate: countries in eastern and southern Europe with high poverty rates tend to display above-average relative median at-risk-of-poverty gaps and vice versa. This points to similarities in terms of the shape of income distribution across groups of countries, whereby countries with a high level of relative poverty also show a greater

Figure 10.5: Relative median at-risk-of-poverty gap, EU-27 and EU-28, 2005–2015
(% distance to poverty threshold)



Source: Eurostat (online data code: sdg_10_30)

Figure 10.6: Relative median at-risk-of-poverty gap, by country, 2010 and 2015
(% distance to poverty threshold)



(1) Break in time series in 2012.
(2) Break in time series in 2014.
(3) Break in time series in 2011.
(4) 2012 data (instead of 2010).

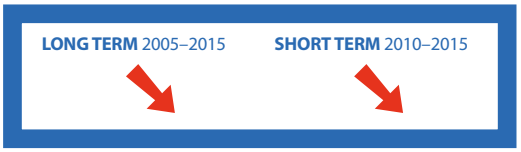
Source: Eurostat (online data code: sdg_10_30)

variation in income distribution below the poverty threshold ([16]).

However, some interesting outliers exist. For instance, Denmark had the third lowest at-risk-of-poverty rate after social transfers in the EU in 2015, but displayed a relatively high median poverty-risk gap ([17]). Conversely, Malta had one of the smallest median risk-of-poverty gaps in the EU, but was not among the countries with the lowest poverty risk (although still below the EU average). The level of poverty threshold with regards to minimum social benefits as well as the coverage of these benefits might partly explain this outlier ([18]).

Gini coefficient of equivalised disposable income

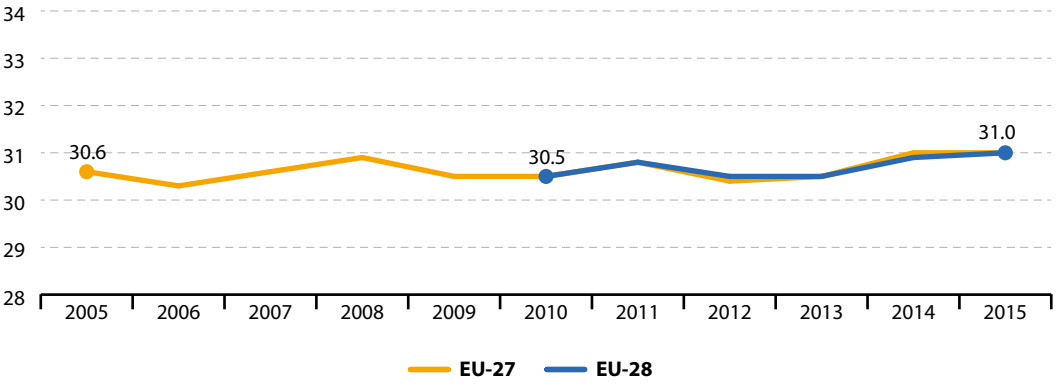
The average Gini coefficient of equivalised disposable income in the EU has increased by 0.4 points in the long term and 0.5 points in the short term, indicating that the distribution of income within Member States has become slightly less equal.



The Gini coefficient measures the extent to which the distribution of income among individuals or households within a society deviates from a perfectly equal distribution. It ranges from 0 to 100, where 0 represents perfect equality (everyone has the same income) and 100 represents maximum inequality (all income is accrued by a single household).

In the past two years (2014 and 2015) the average Gini coefficient of disposable income of Member States stabilised at 31.0, which is the highest level

Figure 10.7: Gini coefficient of equivalised disposable income, EU-27 and EU-28, 2005–2015 (scale from 0 (maximal equality) to 100 (maximal inequality))

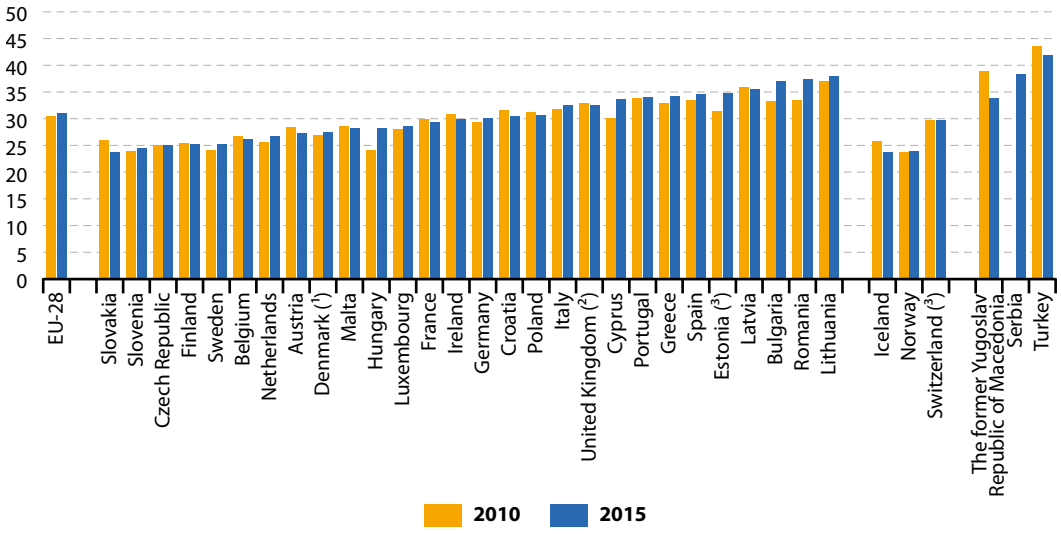


Note: 2005 and 2006 data are estimates.

Source: Eurostat (online data code: sdg_10_40)

([16]) European Centre for Social Welfare Policy and Research (2011), *Income Poverty in the EU: Situation in 2007 and Trends*, p.7.
([17]) The relatively high median poverty-risk gap in Denmark could be influenced by the definition of households used in the country. In Denmark this definition includes student households with very low income, which in other countries are generally classed with their parents' households.
([18]) Besharov, D. and Couch, K. (2012), *Counting the Poor: New Thinking about European Poverty Measures and Lessons for the United States*, Oxford University Press, Oxford, p.307.

Figure 10.8: Gini coefficient of equivalised disposable income, by country, 2010 and 2015
(scale from 0 (maximal equality) to 100 (maximal inequality))



(1) Break in time series in 2011.
(2) Break in time series in 2012.
(3) Break in time series in 2014.
(4) 2012 data (instead of 2010).

Source: Eurostat (online data code: sdg_10_40)

The country-specific recommendations under the European Semester aim to promote fiscal and structural reforms (including social policies), which can contribute to reducing inequality.

recorded since 2005 ([19]). The moderate short-term increase in the average country-specific Gini coefficient has occurred in the context of improving labour markets and GDP growth in the majority of Member States (see chapter on SDG 8), which suggests the fruits of the economic recovery have not been evenly shared among the population in most EU countries. The increase in the degree of inequality despite the economic recovery might be explained by increases in capital incomes (normally concentrated at the top) as well as increases in employment and wages among the better-off households. In addition, the fiscal tightening, in some cases with stricter access to social transfers associated with the economic recovery, might have also contributed to this trend ([20]).

The degree of income inequality within EU Member States, as measured by the Gini coefficient, varies considerably (see below), yet even the EU countries with the highest Gini coefficients in 2015 (Lithuania with 37.9 and Romania with 37.4) had somewhat more equal income distribution than the United States (39.0) and were much more equal than countries in Latin America (for instance, 45.9 in Mexico and 45.4 in Chile) ([21])([22]).

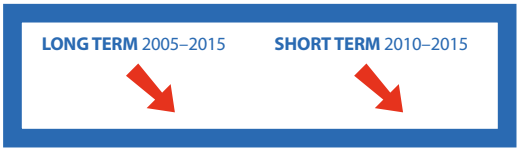
([19]) The Gini coefficient of disposable income in the EU is calculated as the average of country-specific Gini indices. Therefore, it refers to an average level of within-country inequality. For analysis of trends and developments in inequality for the overall EU distribution of income (the EU-wide population-weighted Gini, which encompasses also between-country inequality) please see Eurofound (2017), *Income inequalities and employment patterns in Europe before and after the Great Recession*, Publications Office of the European Union, Luxembourg.
([20]) OECD (2016), *Income inequality remains high in the face of weak recovery*, p. 1.
([21]) Values are not comparable to Eurostat data due to differing methodology. Chile, United States, United Kingdom: 2015 data, new income definition since 2012, Mexico: 2014 data new income definition since 2012.
([22]) Source: Eurostat (online data code: sdg_10_40) and OECD Income Distribution Database (IDD): Gini, poverty, income, Methods and Concepts.

Income inequality, as measured by the Gini coefficient, varied by about 14 points across the EU in 2015. Northern and western European countries tend to be the most egalitarian, with Gini coefficients below the EU aggregate. However, there were some clear exceptions: three central European countries recorded the lowest income inequality levels in the EU, namely Slovakia, Slovenia and the Czech Republic (index of 25 or below), while the Gini coefficient for the United Kingdom was comparable to those in some of the more unequal southern EU countries. The largest increases in the Gini coefficient since 2010 were observed in countries with already high levels of inequality, in particular Hungary, Romania and Bulgaria.

The income quintile share ratio (S80/S20) is another measure of income inequality prominently used in the EU. It focuses on the gap between the poorest and the richest strata of society by measuring the ratio of the total income received by the 20 % of the country's population with the highest disposable income (top quintile) to that received by the 20 % of the country's population with the lowest disposable income (bottom quintile). The income quintile share ratio also points to widening inequalities in the distribution of income in the EU. A population-weighted average of national figures for each of the individual Member States shows that in 2015 the top 20 % of the population (with the highest equivalised disposable income) received 5.2 times as much income as the bottom 20 % (with the lowest equivalised disposable income) ([23]). This represents a slight increase compared to 2010 when high-income earners earned 4.9 times more than low-income earners.

Income share of the bottom 40 % of the population

The income share received on average by the bottom 40 % of the population according to income in each Member State has fallen over time, recording a 0.6 and 0.4 percentage point reduction in the long term and short term, respectively. This indicates that on average total incomes in Member States have grown stronger than those of the poorer population.

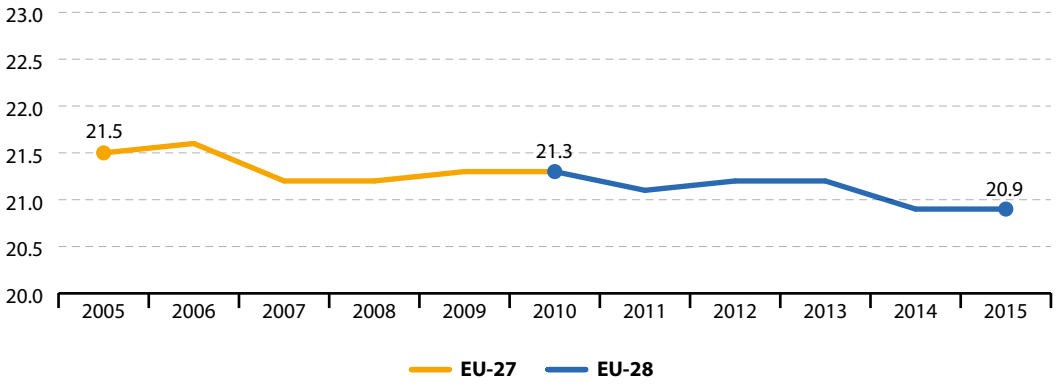


The deterioration in the income share of the bottom 40 % of the income distribution since 2005 confirms the trend of widening income inequalities despite the economic recovery. One reason for this might be the disproportionate effect of labour market improvements during the recovery, which have favoured high-income households ([24]). Despite recent declines in unemployment (see SDG 8 on p. 175), long-term unemployment, joblessness and inactivity remain high among certain groups of the population (for example, low-skilled people, people with disability and migrants). In addition, high disparities among workers in terms of job quality, work contracts or job security continue to weigh heavily on low-earning households.

Between 2010 and 2013/14, labour incomes have almost recovered to their pre-crisis levels on average, but not among low earners. This is likely to have contributed to the decreasing income share of the bottom 40 % of earners and ongoing income inequality. Households at the lower end of the income distribution are also more affected by financial distress and therefore more vulnerable to income shocks. According to the 2017 Annual Review of Employment and Social

([23]) Source: Eurostat (online data code: tessi180).
([24]) OECD (2016), *Income inequality remains high in the face of weak recovery*, p. 2.

Figure 10.9: Income share of the bottom 40 % of the population, EU-27 and EU-28, 2005–2015
(% of income)

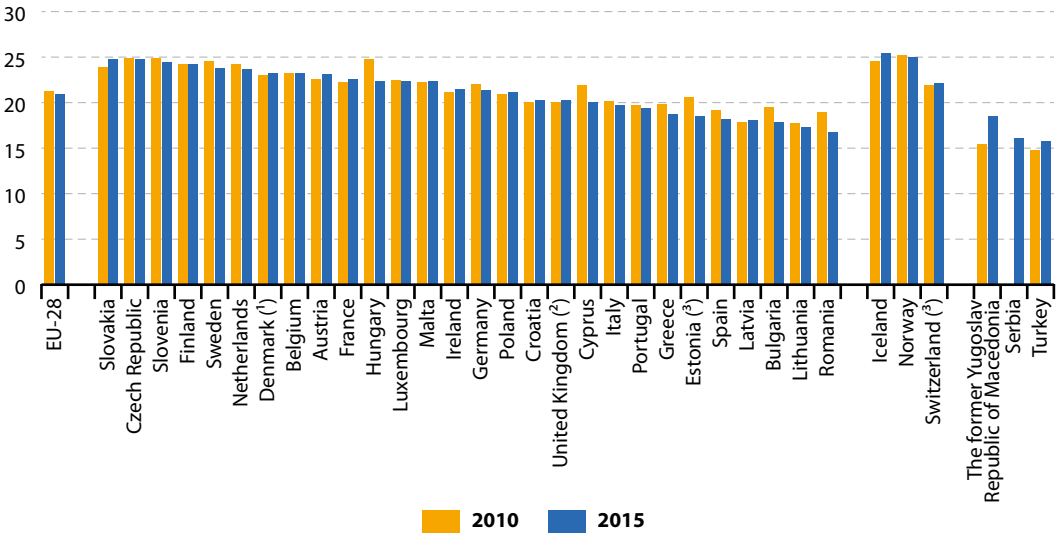


Note: 2005 data are estimates.

Source: Eurostat (online data code: sdg_10_50)

The New Skills Agenda ([25]) aims at ensuring that people in Europe have the skills they need to participate in society and be active in the labour market, thus contributing to the reduction of inequalities.

Figure 10.10: Income share of the bottom 40 % of the population, by country, 2010 and 2015
(% of income)



(1) Break in time series in 2011.
(2) Break in time series in 2012.
(3) Break in time series in 2014.
(4) 2012 data (instead of 2010).

Source: Eurostat (online data code: sdg_10_50)

([25]) European Commission (2016), *A new skills agenda for Europe: Working together to strengthen human capital, employability and competitiveness*, COM(2016) 381 final, Brussels.

Developments in Europe ([26]), 10 % of adults in the low-income quintile are in debt and a further 15 % draw on savings to cover current expenditure, compared to 5 % and 10 % for the total population, respectively ([27]).

At country level, the share of the income of the bottom 40 % of the distribution varied between 24.8 % in Slovakia and the Czech Republic and 16.8 % in Romania in 2015. Although the lower end of the spectrum is dominated by southern and eastern European countries, a number of central and eastern European countries besides Slovakia show shares above the EU average, namely the Czech Republic, Slovenia, Hungary and Poland. This pattern is broadly in line with the inequality outcomes reflected by the Gini coefficient.

As a general trend, between 2010 and 2015 the income share of the bottom 40 % of earners fell most in those Member States where it was already the smallest. An exception is Hungary, where the share shrank the most (2.4 percentage points) although it was still above the EU average. In a number of countries the income share of the bottom 40 % of the distribution has been catching up in this time period, with increases ranging between 0.1 and 0.9 percentage points.

Asylum applications

The number of first-time asylum applications has increased dramatically since 2008, mainly because of the Syrian conflict. In 2016, 1.2 million first-time asylum seekers applied for international protection in the EU, a number more than five times bigger than in 2008 ([28]) and more than double that of 2014.

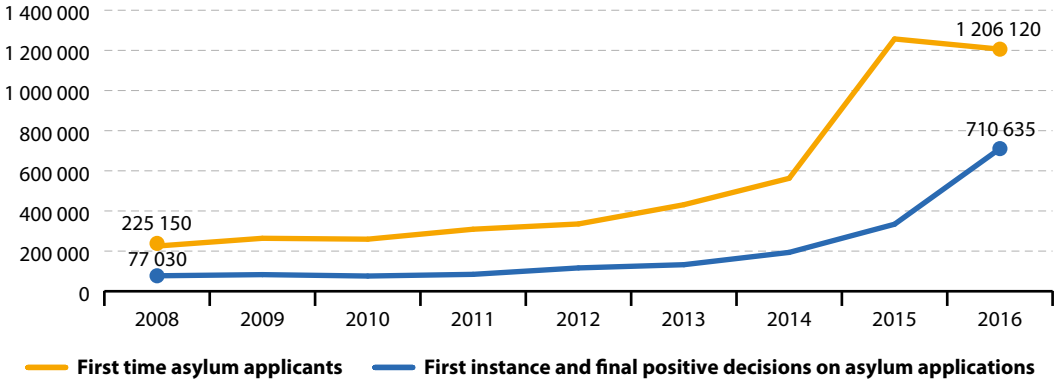
X INDICATION OF PROGRESS NOT POSSIBLE

Asylum is a form of protection given by a state on its territory based on the principle of non-refoulement (no repulsing/sending back) and internationally or nationally recognised refugee rights. The only international legal norms applying specifically to refugees at global level are the 1951 UN Convention Relating to the Status of Refugees (Geneva Convention) and its 1967 Protocol. According to Article 1 of the 1951 UN Convention, as modified by the 1967 Protocol, refugee status is granted to a person who is unable to seek protection in his/her country of citizenship and/or residence, in particular for fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion.

A first-time applicant for international protection is a person who lodged an application for asylum for the first time in a given Member State. Because this number excludes repeated applicants (in that Member State) it reflects more accurately the number of newly arrived people applying for international protection in the reporting Member State. Data on decisions on asylum applications are available for two instance levels, namely first instance decisions and final decisions. First instance decisions are decisions granted by the respective authority acting as a first instance of the administrative/judicial asylum procedure in the receiving country. In contrast, final decisions on appeal or review relate to decisions granted at the final instance of administrative/judicial asylum procedure and which result from an appeal lodged by an asylum seeker rejected in the preceding stage ([29]). The statistics presented here are based on administrative sources and are

([26]) European Commission (2017), *Employment and Social Developments in Europe, Annual Review 2017.*
([27]) Id., p. 43.
([28]) Data on first-time asylum applicants were not available for all Member States in 2008 (data available for 16 MSs).Therefore, in this comparison the number of total asylum applicants (including repeat applicants) is used.
([29]) Since asylum procedures and the number/levels of decision-making bodies differ among Member States, the true final instance may be, according to the national legislation and administrative procedures, a decision of the highest national court. However, the applied methodology defines that final decisions should refer to what is effectively a final decision in the vast majority of cases: in other words, once all normal routes of appeal have been exhausted and there is no possibility to appeal on the substance of the decision but only on procedural grounds.

Figure 10.11: Asylum applications by state of procedure, EU-28, 2008–2016
(number of applications)



Note: 2008–2013 data for first time asylum applicants refers to total asylum applicants as data for first time asylum applicants are not available for all Member States; 2008 data for total asylum applicants exclude Croatia and the United Kingdom; 2009-2012 data exclude Croatia. 2008–2011 data for first instance and final decisions on asylum applications exclude Croatia. Definition differs for 2008 and 2009 data on final instance decisions on asylum applications.

Source: Eurostat (online data code: sdg_10_60)

The European Commission's Knowledge Centre for Migration and Demography provides knowledge and evidence-based analysis for policy developments and decisions related to saving migrants' lives and securing the external borders, strengthening the common asylum policy and developing a new policy on legal migration. The Asylum, Migration and Integration Fund provide financial support for these actions.

The Fund for European Aid to the Most Deprived (FEAD) supports asylum seekers by providing them with immediate relief (food, clothing and other essential items for personal use). However, Member States define the target groups individually and the scope of support by FEAD depends on the scope of the national programme.

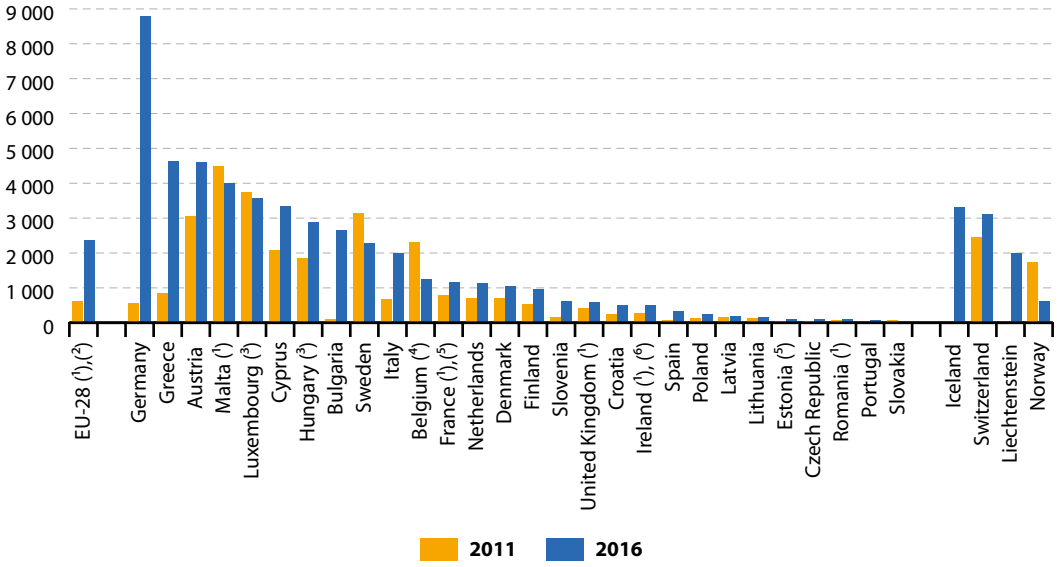
The proposed European Solidarity Corps will enable young people across the EU to volunteer their help for the reception and integration of refugees.

supplied to Eurostat by statistical authorities, home office ministries/ministries of the interior or related immigration agencies in the Member States.

Despite the unprecedented increase in first-time asylum applications in the EU between 2008 and 2016, the figure for 2016 marked a decrease of 50 910 first-time applicants in comparison with the year before. This has partly been influenced by the closure of the Western Balkans route ([30]) in early March 2016 and the EU-Turkey Statement of 18 March, which have made the irregular flow of people towards central and northern Europe more difficult and has forced migrants to use different routes across the Mediterranean (the Central Mediterranean route from North Africa to Italy, the Eastern Mediterranean route from Turkey to Greece, Bulgaria and Cyprus, and the Western Mediterranean route from North Africa

([30]) The Balkan route has been the main entry point for migrants who entered the EU through Greece and tried to make their way to western Europe via the former Yugoslav Republic of Macedonia, Serbia into Hungary and Croatia. The route became a popular passageway into the EU in 2012 when Schengen visa restrictions were relaxed for five Balkan countries: Albania, Bosnia and Herzegovina, Montenegro, Serbia and former Yugoslav Republic of Macedonia.

Figure 10.12: First-time extra-EU-28 asylum applications, by country, 2011 and 2016
(number per million inhabitants)



(1) 2016 population data are estimates/provisional.
(2) 2011 data for first time asylum applicants refer to total asylum applicants and exclude Croatia. Break in time series (population data) in 2011–2012 and 2014–2016.
(3) Break in time series (population data) in 2012.
(4) Break in time series (population data) in 2014.
(5) Break in time series (population data) in 2015.
(6) Break in time series in 2016.

Source: Eurostat (online data code: sdg_10_60)

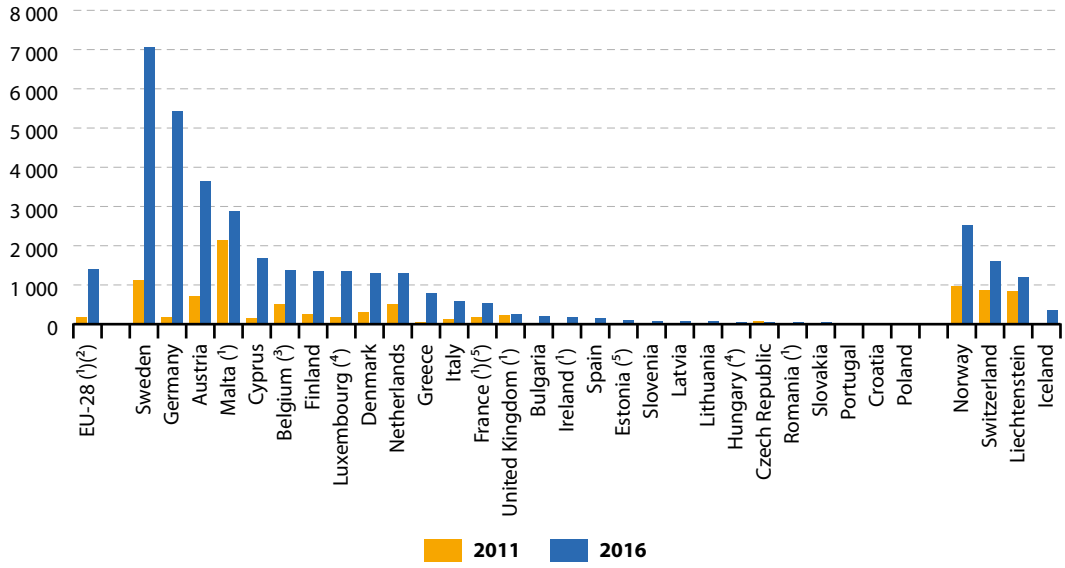
to Spain) ([31]). The largest groups of first asylum applicants in Member States in 2016, accounting for more than half of all first-time applicants, were Syrians (334 865), Afghans (182 970) and Iraqis (127 095). The distribution of first-time asylum applicants by sex shows that men were overrepresented among those seeking asylum, with about two in three (68 %) asylum seekers being male. Many of those men arrive first, hoping to find a safe place to live or work before trying to reunite with their families ([32]).

Of the first-time asylum seekers in the EU in 2016, 83 % were less than 35 years old. Those aged 18 to 34 years accounted for half of the total number of first-time applicants (51 %), while almost one-third of the total number (32 %) were minors aged less than 18. Among asylum seekers applying for international protection in the EU, a significant number of unaccompanied minors and separated children were also registered — 63 000 in 2016 ([33]).

More than 710 600 asylum applicants received a positive decision in 2016 (both at first and final instance), entitling them to remain in the EU and receive international protection, up from 77 000 in 2008. Some 55 % were granted refugee status under the Geneva Convention ([34]), which establishes protection for civilians due to a well-founded fear of persecution. More than a third (37 %) of those with a positive asylum decision did not meet the criteria for the recognition as refugees under the Geneva Convention, but received subsidiary protection

([31]) UNHCR (2017), Bureau for Europe, *Desperate Journeys: Refugees and migrants entering and crossing Europe via the Mediterranean and Western Balkans routes*, p.1–2.
([32]) UNHCR (2015), *The sea route to Europe: The Mediterranean passage in the age of refugees*, p.7.
([33]) Eurostat (2016), *63 000 unaccompanied minors among asylum seekers registered in the EU in 2016*, 87/2016.
([34]) The 1951 Geneva Convention relating to the status of refugees (as amended by the 1967 New York Protocol) has, for over 60 years, defined who is a refugee, and laid down a common approach towards refugees that has been one of the cornerstones for the development of a common asylum system within the EU. Since 1999, the EU has worked towards creating a common European asylum regime in accordance with the Geneva Convention and other applicable international instruments.

Figure 10.13: Accepted extra-EU-28 asylum applications (first instance and final decision), by country, 2011 and 2016
(number per million inhabitants)



(1) 2016 population data are estimates/provisional.
(2) Break in time series (population data) in 2011–2012 and 2014–2016.
(3) Break in time series (population data) in 2014.
(4) Break in time series (population data) in 2012.
(5) Break in time series (population data) in 2015.
Source: Eurostat (online data code: sdg_10_60)

because of a real risk of suffering serious harm if they returned to the country of origin ([35]). Finally, 8 % of those with positive decisions were granted authorisation to stay for humanitarian reasons ([36]). While refugee and subsidiary protection status are defined by EU law, humanitarian reasons are specific to national legislation and are not applicable in some Member States.

Based on data from the UN Refugee Agency (UNHCR) for 2016, some Member States accounted for the highest number of first-time asylum applications in the region of Europe, North America, Oceania and Asia ([37]). In particular, Germany ranked first with 722 364 new asylum applications. It was followed by the United States of America, which registered some 261 965 claims ([38]). Italy was the third-largest single recipient of new asylum claims in the region during 2016, with an estimated 122 124 claims, followed by Turkey (77 851 asylum applications) ([39]).

The distribution of first-time asylum applications in the EU in 2016 was very skewed, with several Member States receiving a very large number of applications relative to their population size.

([35]) Council Directive 2004/83/EC of 29 April 2004 defines serious harm as the risk of: '(a) death penalty or execution; or (b) torture or inhuman or degrading treatment or punishment of an applicant in the country of origin; or (c) serious and individual threat to a civilian's life or person by reasons of indiscriminate violence in situations of international or internal armed conflict.'
([36]) These include people who are not eligible for international protection as currently defined in the first-stage legal instruments, but are nonetheless protected against removal under the obligations that are imposed on all Member States by international refugee or human rights instruments or on the basis of principles flowing from such instruments. Examples of such categories include people who are not removable on ill-health grounds and unaccompanied minors.
([37]) Total is based on monthly data. May differ from final annual figures published by States due to retroactive changes.
([38]) Data include number of cases registered by the Department of Homeland Security (DHS), multiplied by 1.518 to reflect the estimated number of persons, and new ('defensive') requests lodged with the Executive Office for Immigration Review (EOIR), based on the number of persons.
([39]) UNHCR (2017), *New asylum applications lodged in selected countries in Europe, North America, Oceania and Asia.*

In 2016, the EU as a whole received 2 346 first time asylum applications per million inhabitants. Germany was the country receiving by far the largest number of first-time asylum applicants based on population size in this year (8 756 first-time applicants per million inhabitants). It also accounted for the largest number of first asylum applicants in total numbers (60 % of all first-time asylum applications in the EU). A high number of asylum applications relative to the population size was registered in some other countries in the north and west (for instance, Austria, Luxembourg and Sweden). These are favoured destination countries for many refugees and migrants because they are perceived as offering more effective protection, better support for asylum-seekers, a more welcoming environment and easier prospects for integration. In addition, many head to these countries as members of their families and communities have already settled there ([40]).

Some border states in the south, where most refugees first enter the EU, often after a perilous journey across the Mediterranean sea, also received relatively high numbers of first-time applications for asylum (for example, Greece, Malta, Cyprus, Bulgaria and Italy). Hungary also recorded a relatively high number of first-time asylum applications in 2016. In fact, it received the second highest absolute number of first-time asylum applications in 2015 (174 435). However, in both years Hungary had some of the lowest number of first-instance asylum decisions (total positive decisions and rejected), 3 420 in 2015 and 5 105 in 2016, which suggests it is a transit rather than a destination country for refugees.

As shown on Figure 10.13, the distribution of accepted applications (at first and final instance) across countries shows a similar imbalance, but does not necessary correspond to the distribution of first-time asylum applications ([41]). By far the highest number of accepted applications relative to population size (both at first and final instance) in 2016 was recorded in Sweden, followed by some other northern and western European countries and border states on the south, which serve as primary points of arrival. Among other factors, the ranking of receiving countries reflects the flow of asylum seekers in terms of arrival and destination countries, as well as existing national laws and asylum policies.

Further reading on inequalities

Berlin Social Science Centre (WZB) (2014), *Social inequalities in Europe: Facing the Challenge*, Berlin.

Darvas, Z. and Wolff, G.B. (2016), *An anatomy of inclusive growth in Europe,* Brussels: Bruegel Blueprint series.

Eurofound (2017), *Income inequalities and employment patterns in Europe before and after the Great Recession,* Luxembourg: Publications Office of the European Union,.

European Commission (2016), *Employment and Social Developments in Europe, Annual Review 2016*.

European Commission (2016), *Towards a reform of the common European asylum system and enhancing legal avenues to Europe*, COM(2016) 197 final, Brussels.

OECD (2016), *Income inequality update: Income inequality remains high in the face of weak recovery*.

United Nations High Commissioner for Refugees (UNHCR) (2015), *The sea route to Europe: The Mediterranean passage in the age of refugees*, Geneva.

UNHCR (2017), *Mid-year trends 2016*, Geneva.

([40]) UNHCR (2015), *The sea route to Europe: The Mediterranean passage in the age of refugees*, p.16.
([41]) It should be noted that the number of positive decisions in one year cannot be directly compared with the number of applications in the same year because decisions may be made in years following the initial application.

11 Make cities and human settlements inclusive, safe, resilient and sustainable

The global perspective on SDG 11

Cities provide a home for more than half of the world's population, a proportion that is expected to increase to 66 % by 2050. Although rapid urbanisation poses many planning challenges, it also offers important opportunities for economic growth, innovation and efficient economies of scale in the provision of basic services. SDG 11 aims to renew and plan cities and other human settlements so that they offer opportunities for all, with access to basic services, energy, housing, transportation, green public spaces and others, while improving resource use and reducing environmental impacts. With sound, risk-informed and smart planning and management, SDG 11 envisions cities as environmentally resilient human settlements, which drive sustainable development, stimulate innovation and foster community cohesion and personal safety. SDG 11 calls for the world's cultural and natural heritage to be protected and for support for positive economic, social and environmental links between urban, peri-urban and rural areas. It also stands for enhanced international cooperation and support to least-developed countries for building sustainable and resilient buildings ([1]).

eurostat supports the SDGs

Monitoring SDG 11 'sustainable cities and communities' in an EU context focuses on three sub-themes. 'Quality of life in cities and communities' covers aspects related to basic housing conditions and the quality of the wider residential area. 'Sustainable transport' looks into the availability and use of public transportation and road safety, and 'adverse environmental impacts' encompasses waste management, air pollution and the conversion of land to artificial surfaces. As shown in Table 11.1, the EU has made moderate progress in these areas.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 11.1: Indicators measuring progress in SDG 11, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Quality of life in cities and communities			
Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor (*)	:		SDG 1, p. 42
Overcrowding rate	 (1)(2)		p. 223
Population living in households considering that they suffer from noise	:		p. 225
Population reporting occurrence of crime, violence or vandalism in their area (*)	:		SDG 16, p. 322
Sustainable transport			
Difficulty in accessing public transport	:	:	p. 227
Share of collective transport modes in total passenger transport (*)			SDG 9, p. 193
People killed in road accidents	 (3)(4)	 (4)	p. 228
Adverse environmental impacts			
Population connected to at least secondary wastewater treatment (*)	:	:	SDG 6, p. 134
Exposure to air pollution by particulate matter	 (3)	 (5)	p. 231
Recycling rate of municipal waste	 (1)		p. 233
Artificial land cover per capita (*)	:	 (6)	SDG 15, p. 303
Change in artificial land cover (*)	:	 (6)	SDG 15, p. 305

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Trend for EU-27.
(2) Past 10-year period.
(3) Past 14-year period.
(4) Trend in relation to the target of halving the number of people killed in road accidents by 2020 (compared to 2001).
(5) It should be noted that although the average concentrations of fine particulate matter have decreased during the past five years, the overall adverse health impacts of urban population exposure to air pollution by particulate matter $PM_{2.5}$ remain significant. The annual mean for fine particulate matter continues to be above the World Health Organization's recommended level.
(6) Past 6-year period. Data based on EU-23 (EU-28 excluding Bulgaria, Cyprus, Croatia, Malta, Romania).

Sustainable cities and communities in the EU: overview and key trends

Almost three-quarters of the EU population lives in urban areas: cities, towns and suburbs, with over 40 % residing in cities alone ([2]). The share of the urban population in Europe is projected to rise to just over 80 % by 2050 ([3]). Cities and communities are essential for Europeans' well-being and quality of life as they serve as hubs for economic and social development and innovation. They attract many people because of the wide range of opportunities for education, employment, entertainment and culture that abound there. On the downside, this large concentration of people and wealth often comes with a range of negative side effects, which can also weigh on people's quality of life — pollution, traffic jams, crime and housing deprivation are just a few examples. Therefore, cities and communities are seen as both the source of and solution to economic, environmental and social challenges and, as such, they may be viewed as a key driver for achieving a sustainable future. It is for this reason that SDG 11 calls for actions that help make cities and communities more inclusive, safe, resilient and sustainable.

Quality of life in cities and communities

While European cities and communities provide opportunities for employment and economic activity, they often face considerable social challenges and inequalities. Poor housing quality is one of the most visible manifestations of the polarised opportunities in cities and communities.

Poor housing conditions may lead, among others, to lower life chances, health inequalities, increased risks of poverty and environmental risks. In 2015, almost one in seven EU households (15.3 %) experienced at least one of the following basic deficits in their housing condition: 'leaking roof, damp walls, floors or foundation or rot in window frames or floor' ([4]). This is 2.7 percentage points lower than the share of the population reporting such deficiency in living conditions in 2007 ([5]), indicating that the perceived quality of the housing stock in the EU has improved.

Another major element of the quality of housing conditions is the availability of adequate space in the dwelling. Living in overcrowded conditions can harm quality of life by reducing privacy and restricting opportunities for movement, rest, sleep and hygiene. In spite of the moderate improvement in the past decade, in 2015 16.7 % of the total EU population still lived in an overcrowded household. The incidence of **overcrowding** in EU cities (18.0 %) and in rural areas (17.2 %) was slightly higher than the overcrowding rate in towns and suburbs (14.6 %).

Housing quality depends not only on the basic housing conditions, but also on the wider residential area. According to the WHO, noise from road traffic is the second most harmful environmental stressor in Europe after air pollution ([6]). Prolonged **exposure to noise**, for example from traffic, industry or construction, can lead to serious health effects such as high blood pressure, sleep disturbance, cardiovascular diseases, annoyance, cognitive impairment and mental health problems ([7]). In addition, the effects of exposure to noise impact EU economies, including through a loss of productivity of workers, burden on health care systems and depreciation of real-estate value ([8]). Noise exposure in the EU

([2]) 2015 data. Source: Eurostat (online data code: ilc_lvho01).
([3]) Eurostat, (2016), *Urban Europe: Statistics on cities, towns and suburbs*, Luxembourg, Publications Office of the European Union, p. 9.
([4]) Data refers to the EU-27.
([5]) Data refers to the EU-27.
([6]) European Environment Agency, *Road traffic remains biggest source of noise pollution in Europe*, 2017, p. 4.
([7]) European Commission, Environment: Noise.
([8]) Ibid.

remains very high with more than 120 million people exposed to harmful levels of noise from transport ([9]).

Crime and vandalism is another important determinant for assessing quality of life and housing satisfaction in a residential area. It can lead to property loss or damage or increased stress and anxiety for people living in unsafe environments. Crime and vandalism were perceived as a problem by 13.6 % of the EU population in 2015, compared to 14.3 % in 2010. The incidence of crime and vandalism in cities (19.8 %) was almost three times higher than in rural areas (6.9 %) and also above the level observed in towns and suburbs (11.4 %).

Sustainable transport

Good **public transport** networks are essential for improving the quality of life in European cities and communities. They help to relieve traffic jams, reduce health-harming traffic pollution and offer more affordable ways to commute to work, to access services and to travel for leisure. Well-organised public transport can have even more far-reaching impacts by stimulating economic growth and social inclusion through improved accessibility and mobility for all.

Despite all of these advantages, convenient public transport is still not universally accessible to EU citizens. Data collected in 2012 ([10]) show that one in five Europeans (20.4 %) reported 'high' or 'very high' levels of difficulty in accessing public transport. People living in cities have easier access, with only 9.7 % of them reporting high or very high levels of difficulty, compared to 37.4 % of those living in rural areas. The availability of public transport depends on infrastructure investment and on the demand for such services, which, among other factors, is determined by residential density and the spatial organisation of urban activities.

The lack of universally accessible and convenient public transport partly explains why most passenger journeys in the EU are undertaken by car. In 2015, the **share of collective transport modes** (bus and train) in total inland passenger transport was 16.9 %. Although the share of passenger kilometres travelled by bus and train decreased slightly in the long term, these transport modes have gained shares in the short term since 2010.

Road safety is another important aspect for improving the overall performance of transport systems and ensuring citizens' safety, health and well-being. The EU has made progress in improving road safety, with the number of people killed in road accidents more than halving since 2001 to 72 people per day in 2015. Nevertheless, the stagnation in road casualties in the last three years has put the EU slightly off-track from reaching its ambitious target of halving the number of road fatalities compared to 2010 levels.

Adverse environmental impacts

While cities and communities serve as a focal point for social and economic activity, if not managed sustainably they risk causing considerable environmental damage. At the same time, large and densely populated cities provide opportunities for achieving economies of scale in the provision of ecologically relevant services such as public waste management and water treatment. **Waste management** activities promote recycling, which not only reduces the amount of waste going to landfills and the associated environmental impacts but also leads to more value being extracted from resources. Recycling also helps create jobs while reducing the demand for raw materials. In this context, both long-term and short-term trends clearly show that European municipalities have shifted to more sustainable modes of waste management. In 2015, about 45.0 % of municipal waste in the EU was recycled or composted, up from just 25.3 % in 2000 ([11]). European and national strategies prioritising efficient waste management through various instruments have largely contributed to this positive development.

([9]) Report from the Commission to the European Parliament and the Council on the Implementation of the Environmental Noise Directive in accordance with Article 11 of Directive 2002/49/EC, COM (2011) 321 final, Brussels.
([10]) The survey was carried out in 2012 only and has so far not been repeated.
([11]) 2000 data refer to the EU-27.

Cities and communities also place significant pressure on the water environment through **waste water** from households and industry that contains organic matter, nutrients and hazardous substances. In 2015, nine Member States reported that more than 90 % of the population was connected to at least secondary wastewater treatment plants, which use aerobic or anaerobic micro-organisms to decompose most of the organic material and retain some of the nutrients ([12]). More than 80 % of the population were connected to such services in 15 Member States. The shares increased in all Member States between 2000 and 2011 with the highest connection rates generally observed in the 'old' (EU-15) Member States.

The high concentration of people and industry, and the daily flow of commuters into many EU cities and communities, also present a risk for **air quality**. This can have significant impacts not only on the environment, but also on people's health. Pollutants such as tiny particles of matter suspended in the air reduce people's life expectancy and perception of well-being. Exposure to fine particulate matter can lead to or aggravate many chronic and acute respiratory and cardiovascular diseases ([13]). The population-weighted annual mean concentration of fine particulate matter ($PM_{2.5}$) in urban areas increased by 6 % between 2000 and 2014. This negative trend in air quality has been reversed in the short term, with the population-weighted concentration of $PM_{2.5}$ decreasing by 2.2 µg/m^3 between 2009 and 2014. Despite some improvements, substantial air pollution hotspots remain and the annual mean for fine particulate matter continues to be above the World Health Organization's recommended level. In addition, for a number of other air pollutants — including nitrogen dioxide and ozone — exceedances above EU air quality standards continue to be a problem.

Urbanisation and infrastructure development also pose a risk to natural ecosystems if they are not managed sustainably. In particular, the conversion of land into artificial surfaces can lead to habitat loss, fragmentation and soil degradation. Land take due to urban sprawl also limits the availability of land for agriculture and nature-based outdoor recreation. At the same time compact cities can provide a resource-efficient and environmentally sustainable way for people to live and businesses to exist. In this context, the concentration of built-up and non-built up urban infrastructure can also reduce land take. Despite EU efforts to increase land use efficiency, **artificial land cover per capita** has increased since 2012. This negative trend is also reflected in the **change in artificial land cover**, with the rate of land sealing between 2012 and 2015 growing 6 % faster than in the period 2009 to 2012. As Europe is one of the most urbanised continents in the world, these trends do not place the EU on track to halting land degradation.

([12]) European Environment Agency, *Urban wastewater treatment*, 2015.
([13]) World Health Organization, *World Health Statistics 2016: Monitoring Health for the SDGs*, 2016, p.37.

Sustainable cities and communities in the EU

Quality of life in cities and communities

Poor dwelling conditions in 2015
15.2 % of population
- 0.9 pp since 2010

Overcrowding rate in 2015
16.7 % of population
- 1.0 pp since 2010

Disturbance by noise in 2015
18.0 % of population
- 2.5 pp since 2010

Reported occurence of crime in 2015
13.6 % of population
- 0.7 pp since 2010

Sustainable transport

Access to public transport in 2012
20.4 % of population with (very) difficult access

Collective passenger transport in 2015
16.9 % of total inland passenger-km
+ 0.3 pp since 2010

People killed in road accidents in 2015
5.1 per 100 000 persons
- 19.0 % since 2010

Adverse environmental impacts

Population connected to wastewater treatment in 2015
> 80 % in 15 reporting Member States

Concentration of particulate matter smaller than 2.5 µm in 2014
15.2 µg/m³
- 12.6 % since 2009

Recycling of municipal waste in 2015
45.0 % of total waste generated
+ 6.7 pp since 2010

Artificial land cover in 2015
359 m² per capita
+ 3.3 % since 2012 (1)

Change in artificial land cover (2) in 2015
107.8 Index 2009 = 100
+ 4.1 index points since 2012

(1) 2012 data refer to EU-27.
(2) Data refer to EU-23 (not including Bulgaria, Cyprus, Croatia, Malta, Romania).

Source: Eurostat (online data codes: sdg_01_60, sdg_11_10, sdg_11_20, sdg_16_20, sdg_11_30, sdg_11_40, sdg_09_50, sdg_11_50, sdg_11_60, sdg_15_30, sdg_15_40 and sdg_06_20)

Overcrowding rate

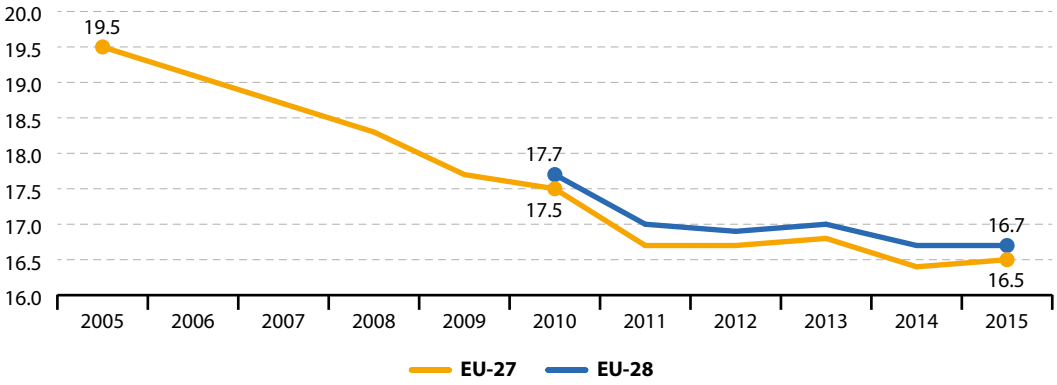
The share of people living in overcrowded conditions in the EU has been reduced by three percentage points since 2005. Progress in the past five years has continued but at a slower rate.

A person is considered to be living in an overcrowded household if the house does not have at least one room for the entire household as well as a room for a couple, for each single person above 18, for a pair of teenagers (12 to 17 years of age) of the same sex, for each teenager of different sex and for a pair of children (under 12 years of age). The data used in this section are derived from micro-data from EU statistics on income and living conditions (EU SILC). The EU-28 aggregate is a population-weighted average of individual national figures.

In 2015, overcrowding by the above definition was more widespread in the EU than housing deprivation ([14]), with almost one in six Europeans (16.7 %) living in a densely populated home. The situation has improved slightly since 2005 ([15]), but much of this progress was achieved before 2010.

There is a clear income gradient in available living space in the EU, with the prevalence of overcrowding being more than two times higher for the population below 60 % of the median equivalised income (29.6 %) compared to the population above (14.0 %) ([16]). Interestingly, the incidence of overcrowding in EU rural areas in 2015 was 17.2 %, which is only slightly below the level observed in cities (18.0 %) ([17]) despite rural dwellings tending to be larger in size ([18]). This similarity might partly be explained by rural areas

Figure 11.1: Overcrowding rate, EU-27 and EU-28, 2005–2015
(% of population)

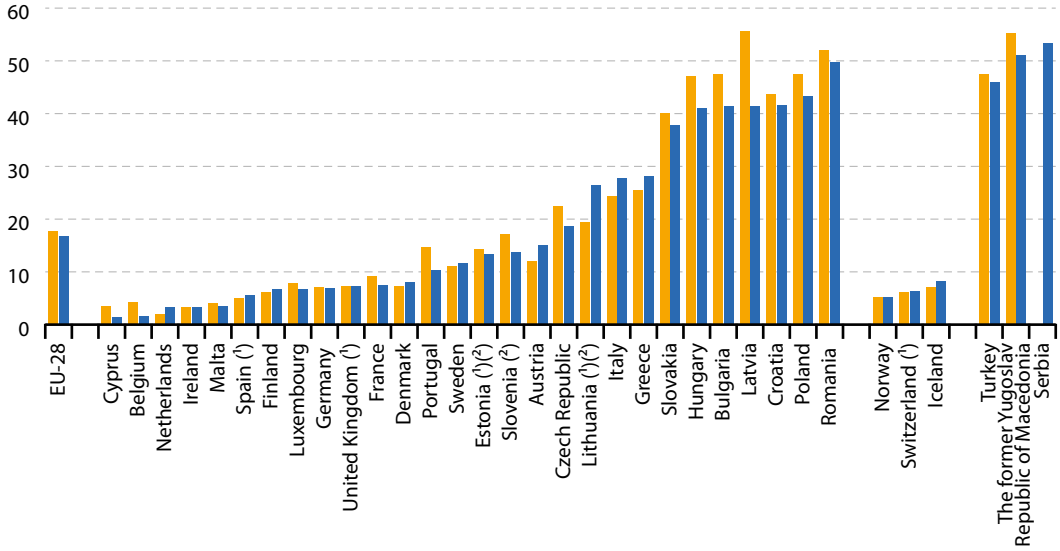


Note: 2005–2006 data are estimates.

Source: Eurostat (online data code: sdg_11_10)

([14]) Source: Eurostat (online data code: tessi291).
([15]) 2005 data refers to the EU-27 and are estimates.
([16]) Source: Eurostat (online data code: ilc_lvho05a). Data are estimates.
([17]) Source: Eurostat (online data code: tessi174). Data for rural areas are estimates.
([18]) See: Average size of dwelling by household type and degree of urbanisation. Source: Eurostat (online data ode: ilc_hcmh02).

Figure 11.2: Overcrowding rate, by country, 2010 and 2015
(% of population)



(1) Break(s) in time series between 2010 and 2015.
(2) 2011 data (instead of 2010).
(3) 2011 data (instead of 2012).

Source: Eurostat (online data code: sdg_11_10)

More than EUR 100 billion from the European Regional Development Fund will be invested in cities to create better opportunities for sustainable urban mobility, energy efficiency, urban renewal, research and innovation capacity and economic and social regeneration of deprived communities.

tending to have larger households ([19]). The lowest rate of overcrowding was observed in towns and suburbs (14.6 %).

Overcrowding rates vary widely among Member States, ranging in 2015 from 1.4 % to almost 50 %. This reflects a variety of factors, including population density and housing concentration, the price of land and housing, income distribution and the stock of housing available for rent or purchase. Overcrowding seems to be widespread in eastern European countries with low average household incomes and a legacy of housing stock composed of many small dwellings ([20]). At the extreme, every second Romanian was living in conditions considered to be overcrowded. In contrast, most northern and western Member States, characterised with higher average incomes and larger average dwellings ([21]), displayed much lower overcrowding rates (15 % or less).

([19]) For instance, see Households characteristics by degree of urbanisation. Source: Eurostat (online data code: hbs_car_t315).
([20]) Soaita, A. M. (2014), *Overcrowding and 'under-occupancy' in Romania: a case study of housing inequality*, Environment and Planning A, 46(1), 203–221.
([21]) See Average size of dwelling by income quintile and tenure status. Source: Eurostat (online data code: ilc_hcmh01).

Population living in households considering that they suffer from noise

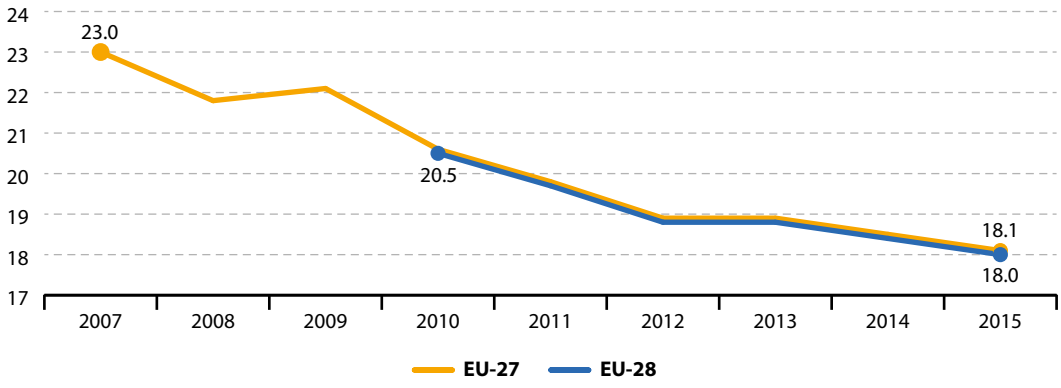
Self-perceived exposure to noise pollution from neighbours or from the street has been reduced by five percentage points in the EU since 2007.

LONG TERM	SHORT TERM 2010–2015
X INSUFFICIENT DATA TO CALCULATE TREND	↑

Apart from housing conditions, noise pollution from the wider residential area can also affect overall quality of life. Self-perceived noise pollution is assessed using data on the proportion of the population living in households considering that they suffer from noise from neighbours or from the street, which stem from the EU statistics on income and living conditions (EU SILC). It should be noted that because the assessment of noise pollution is subjective, the indicator accounts for both the levels of noise pollution as well as people's standards of what level they consider to be acceptable. Therefore, an increase in the value of the indicator may not necessarily indicate a similar increase in noise pollution levels but also a decrease of the levels that European citizens are willing to tolerate and vice versa. In fact, there is empirical evidence that perceived environmental quality by individuals is not always consistent with the actual environmental quality assessed using 'objective' indicators, particularly for noise ([22]).

In 2015, 18.0 % of the EU population lived in a dwelling where noise from neighbours or from the street was perceived as a problem, compared to 23.0 % in 2007 ([23]). According to a recent assessment by the European Environment Agency (EEA), road traffic is by far the major cause of noise pollution in Europe, with at least 100 million people being exposed to levels of traffic noise above the EU's threshold of 55 decibels (dB) for daily exposure ([24]). Railways, airports and

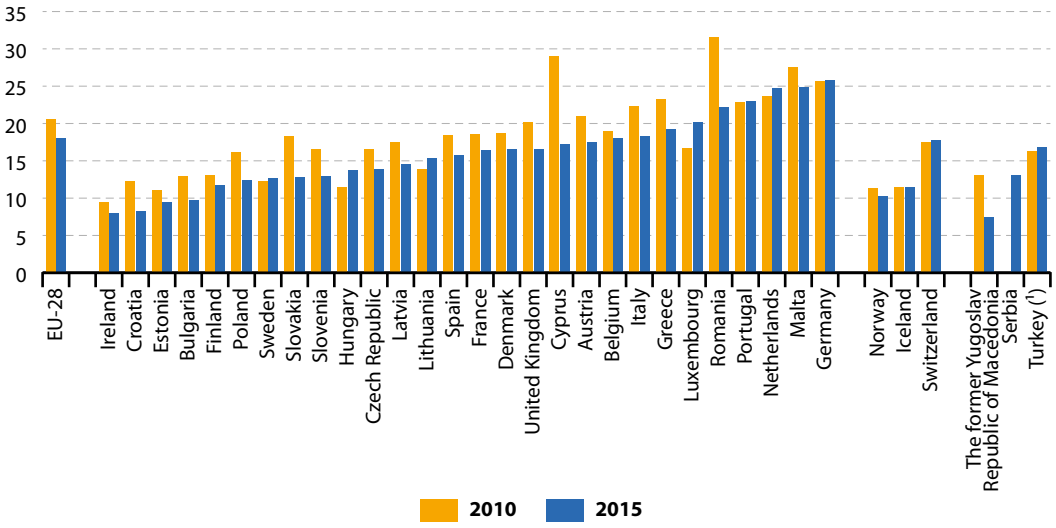
Figure 11.3: Population living in households considering that they suffer from noise, EU-27 and EU-28, 2007–2015
(% of population)



Source: Eurostat (online data code: sdg_11_20)

([22]) For instance see: Raw, G. J. and Griffiths, D., *Individual differences in response to road traffic noise, Journal of Sound and Vibration*, 1988, Volume 121, Issue 3, page 463–471 and Waye K. P., Öhrström E., *Psycho-acoustic characters of relevance for annoyance of wind turbine noise, Journal of Sound and Vibration*, 2002, 250(1), page 65–73.
([23]) 2007 data refers to the EU-27.
([24]) European Environment Agency, *Road traffic remains biggest source of noise pollution in Europe*, 2017, p.4.

Figure 11.4: Population living in households considering that they suffer from noise, by country, 2010 and 2015
(% of population)



(1) 2011 data (instead of 2010).

Source: Eurostat (online data code: sdg_11_20)

The Environmental Noise Directive ([25]) is the main EU instrument for identifying and combating noise pollution. It focuses on three action areas: determination of exposure to environmental noise; ensuring that information on environmental noise and its effects is made available to the public; preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and preserving environmental noise quality where it is good. The Directive requires Member States to prepare and publish, every five years, noise maps and noise management action plans for agglomerations with more than 100,000 inhabitants, major roads, railways and airports, consulting the concerned public.

industry are also important sources of noise pollution.

Population density is an important determinant of the perceived level of noise pollution. In 2015, people living in EU cities were more likely to report noise from neighbours or from the street (23.3 %) compared to those living in towns and suburbs (17.8 %) or in rural areas (10.7 %). For all three types of settlements there was an income gradient in the incidence of noise pollution, with lower income groups (below 60% of median equivalised income) reporting outdoor noise as a problem more often than higher income groups (above 60 % of median equivalised income). This could be explained by differences in rent and property prices, which might force poorer individuals to reside in dwellings near environmental stressors such industrial sites or roads with high traffic density ([26]). The difference in perceived exposure to noise

([25]) Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise — Declaration by the Commission in the Conciliation Committee on the Directive relating to the assessment and management of environmental noise.

([26]) Dale,L., et. al., *Socioeconomic status and environmental noise exposure in Montreal, Canada*, 2015, BMC Public Health, 15:205.

pollution between income groups was highest in cities (7.2 percentage points) and almost negligible in rural areas (0.6 percentage point) ([27]).

The distribution of the Member States in terms of perceived disturbance by noise shows a moderate variation between countries, ranging from 8 % to almost 26 %. Country differences in perceived level of noise pollution might reflect the distribution of the population living in cities and rural areas, housing type and density, urban planning, land use and traffic management as well as cultural and personal factors. Interestingly, a number of Member States, in particular Latvia, Romania and Slovakia, reported a higher incidence of noise pollution for higher income groups. In Cyprus the difference in self-perceived noise from the street or from neighbours between cities and rural areas was negligible, whereas in Norway people living in rural areas reported higher self-perceived noise pollution compared to those living in cities.

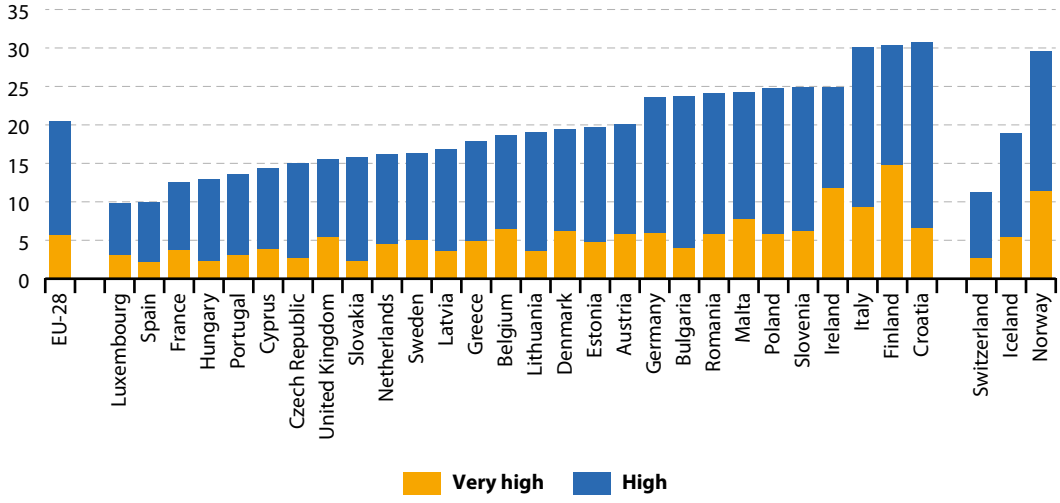
Difficulty in accessing public transport

In 2012, about one in five Europeans (20.4 %) reported experiencing 'high' or 'very high' levels of difficulty in accessing public transport. Luxembourg and Spain had the lowest barriers in access to public transport in the EU.

X INSUFFICIENT DATA TO CALCULATE TREND

Disadvantaged groups such as the young, the elderly, those at risk of poverty and those with disabilities are likely to be the most affected by barriers to accessing public transport. Access is also particularly important for people with low incomes because they are less likely to afford to buy and maintain a personal vehicle. Convenient public transport could also improve their access to jobs ([28]). EU SILC data on the distribution of population by level of difficulty in accessing

Figure 11.5: Difficulty in accessing public transport by level of difficulty, by country, 2012
(% of population)



Source: Eurostat (online data code: sdg_11_30)

([27]) Source: Eurostat (online data code: ilc_mddw04).
([28]) European Centre for social Welfare policy and research, *Housing problems and access to basic local services in the EU27. How does Austria compare?*, Policy Brief, April 2012.

The EU has established guidelines for sustainable urban mobility ([29]) planning and provides funding for related projects, including through the use of the European Regional Development Fund.

public transport by income quintile and degree of urbanisation reveal which population groups are most affected by limited accessibility in EU countries.

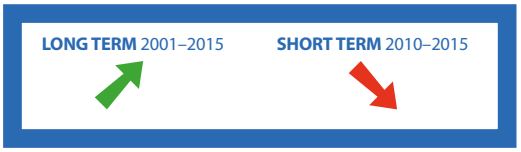
Across Member States between 10 % and 30 % of the population are limited in their use of public transport. Despite having a greater need for access to public transport, people with low incomes in the EU appear to have less access. In 2012, 21.7 % of the population with the lowest income reported high or very high difficulty compared to 17.7 % of the population with the highest income ([30]). Some eastern Member States report very high inequality in access to public transport across income groups. In Croatia, Romania, Bulgaria and Poland, the rate of people experiencing 'high' or 'very high' difficulty in access to public transport was about 20 percentage points higher for people with the lowest income compared to those with the highest.

The level of urbanisation appears to have a major influence on people's experience of catching public transport. Cities tend to provide the best access, with only 9.7 % of city dwellers reporting high or very high level of difficulty. This share increases by more than three times (37.4 %) when people in rural areas are asked about their experience. Remote and rural areas can face particular challenges in providing good access to public transport because of distribution of dwellings across large areas, low density of potential passengers and often unpredictable level of demand.

Across EU countries, the share of the population reporting difficulty in gaining access to public transport in 2012 ranged from 9.8 % to 30.8 %. Country variations tend to reflect differences in population density, investment in transport infrastructure and urban sprawl, among other factors.

People killed in road accidents

European roads are becoming safer, but further progress is needed to ensure the 2020 target on road fatalities will be met.

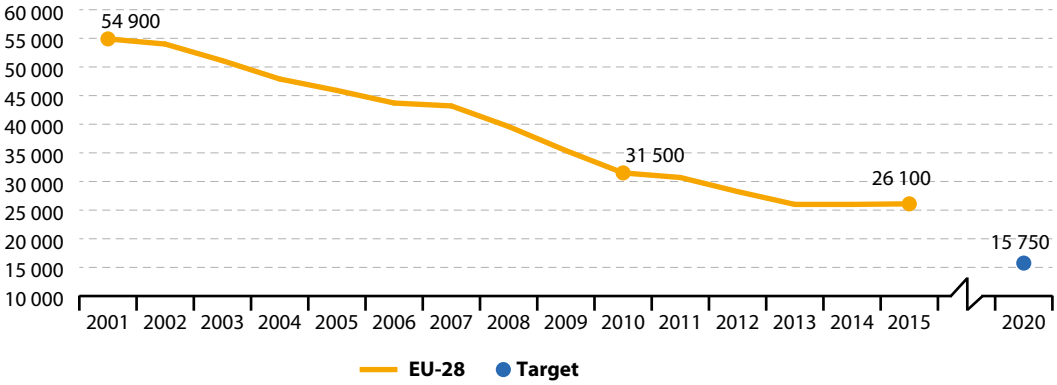


Road accident data presented in this section stem from the Community database on road accidents resulting in death or injury (CARE), which is managed by Directorate-General Mobility and Transport (MOVE). CARE comprises detailed data on individual accidents as collected by the Member States through their own national collection systems.

In 2015, about 72 people lost their lives on EU roads every day. This equalled 26 100 people for the entire year — a loss equivalent to the size of a medium town. This figure represents a long-term fall in road casualties of 52 % and is broadly in line with the 2020 target of halving the total death toll on EU roads compared to 2010. National regulations applying to vehicles and drivers and improvements to road infrastructure have largely contributed to this trend. However, the deceleration in the reduction of road fatalities

([29]) European Commission Directorate-General for Mobility and Transport (2013), *Guidelines: Developing and implementing a sustainable urban mobility plan*, Brussels.
([30]) Source: Eurostat (ilc_hcmp06).

Figure 11.6: People killed in road accidents, EU-28, 2001–2015
(number of killed people)



Source: European Commission services, Directorate-General for Mobility and Transport, CARE (EU road accidents database) database or national publications (Eurostat online data code: sdg_11_40).

In 2010 the Commission adopted the communication 'Towards a European road safety area: policy orientations on road safety 2011–2020' ([31]), setting the target of halving the overall number of road deaths in the EU by 2020 compared to 2010 and outlining 16 proposed actions divided under seven focus areas. A mix of policy measures have been put in place, which aim to make users, vehicles and infrastructure safer.

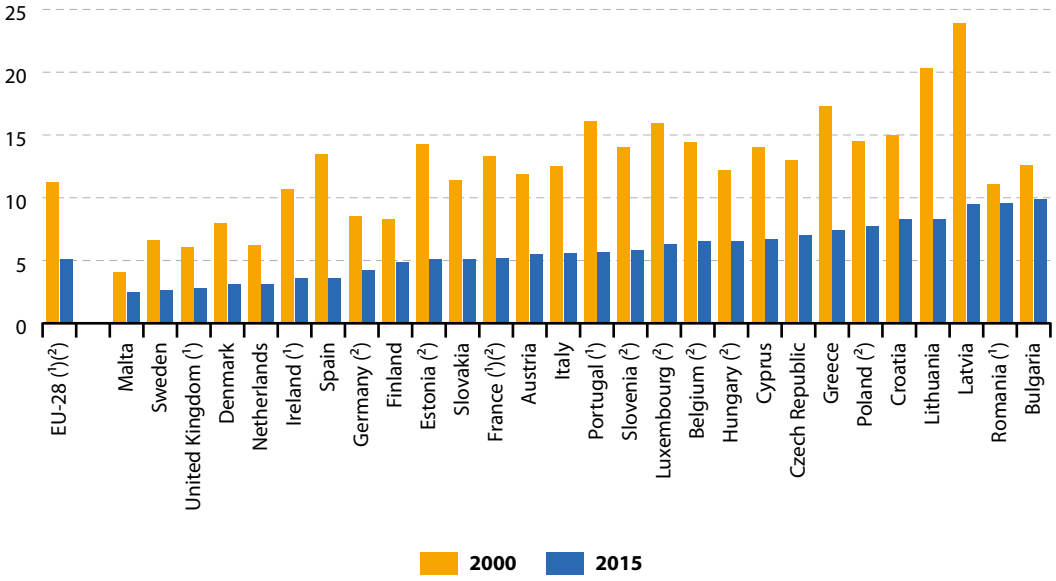
since 2010 has pushed the EU off its path to reaching the 2020 target in the short term.

In 2014, the incidence of road traffic fatalities was highest on non-motorway roads outside urban areas (54 %), followed by roads inside urban areas (38 %) ([32]). There seems to be a strong gender aspect, with 76 % of all road casualties in 2015 being male. Young people still face the highest risk of traffic accidents. Although they did not account for the majority of road deaths in 2015, young people aged between 15 and 24 years were overrepresented in road casualties, making up 11 % of the population but 16 % of all road fatalities ([33]). However, fatalities among young road users have been falling compared with a growing share of the elderly in road deaths. Drivers were the main victims of road accidents (62 %), followed by pedestrians (21 %) and passengers (17 %) ([34]).

Compared to other continents, Europe has the lowest rate of road traffic fatalities. The African continent leads the ranking in road casualties, with victims reaching 26.6 per 100 000 persons in 2013. This was 2.5 times higher than the rates registered in the United States and 5.2 higher than those in the EU for the same year ([35]). However, by looking at road traffic deaths per 100 000 persons in 2013, several economically advanced non-European countries performed better than the EU (5.1) in saving lives on the road, namely Israel and Singapore (3.6 each) and Japan (4.7) ([36]). All the

([31]) European Commission (2010), *Towards a European road safety area: policy orientations on road safety 2011–2020*, COM(2010) 389 final, Brussels.
([32]) European Commission, *Annual Accidents Report*, 2016, p.73.
([33]) Eurostat (online data code: demo_pjanind).
([34]) Own calculations based on European Commission, *Mobility and Transport. Statistics — accidents data*.
([35]) World Health Organization (WHO), *Global Status Report on Road Safety 2015, Summary*, 2015, p.1 and European Commission services, Directorate-General for Mobility and Transport, CARE database (sdg_11_40).
([36]) World Health Organization (WHO), *Global Health Observatory (GHO) data, Number of road traffic deaths*.

Figure 11.7: People killed in road accidents, by country, 2000 and 2015
(per 100 000 inhabitants)



(1) 2015 data are provisional and/or estimates. (2) Breaks in time series between 2001 and 2015.

Source: European Commission services, Directorate-General for Mobility and Transport, CARE (EU road accidents database) database or national publications (Eurostat online data code: sdg_11_40)

EFTA countries also recorded lower road fatalities rates than the EU ([37]).

In general, road fatalities show both a north-south divide and east-west divide across Europe, although there are a number of exceptions ([38]). Country variations in road fatalities can be explained by a number of factors, including the volume of car transport, the extent and quality of the road infrastructure, the characteristics of the vehicle stock, climatic and geographic conditions, population density, national regulations that apply to vehicles and driver behaviour.

European capital regions, in particular Stockholm (0.6), Vienna (0.7), Oslo (1.1), Berlin (1.4), London (1.6) and Madrid (1.7), tend to have a relatively low rate of road fatalities ([39]). The lower fatality rates in major urban regions could be explained by the wider availability and use of public transport and other transport modes such as cycling and walking. Although the heavy traffic in cities generally increases the likelihood of road accidents, lower average speed reduces the probability of serious injuries. On the other hand, there is a higher chance that pedestrians and more vulnerable users are involved in a road accident within urban areas.

([37]) World Health Organization (WHO), *Global Health Observatory (GHO) data, Number of road traffic deaths*.
([38]) European Commission, *Traffic Safety. Basic Facts 2015: Main Figures*, 2015, p. 5.
([39]) Source: Eurostat (online data code: tran_r_acci).

Exposure to air pollution by particulate matter

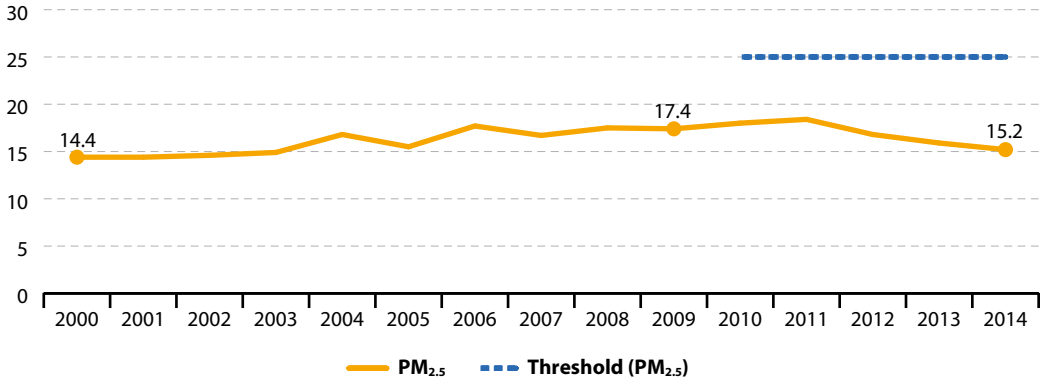
Exposure of the urban population to air pollution by fine particulate matter ($PM_{2.5}$), which is especially damaging to human health, increased by 6 % between 2000 and 2014. This negative trend in air quality was reversed in the short term, with the 2.2 µg/m³ decrease in the population-weighted concentration of $PM_{2.5}$ between 2009 and 2014.

The indicator of urban population exposure to air pollution shows the population weighted annual mean concentration of particulate matter at urban background stations in agglomerations. Fine and coarse particulates (PM_{10}) — particulates less than 10 micrometers in diameter — can be carried deep into the lungs where they can cause inflammation and exacerbate the condition of people suffering heart and lung diseases. Fine particulates ($PM_{2.5}$) — less than 2.5 micrometers in diameter — are a subset of PM_{10}. Their health impacts are even more serious than PM_{10} because they can be drawn further into the lungs and may be more toxic. The indicator is published by Eurostat based on data from the European Environment Agency (EEA).

In 2014, the EU urban population exposure to air pollution by particulate matter ($PM_{2.5}$) stood at 15.2 µg/m³. This was 14 % below the population-weighted concentration of PM2.5 in 2009, but 5 % above the 2000 value, indicating that European cities have made only partial progress in managing the environmental pressure on their air quality.

The EU average urban population exposure to $PM_{2.5}$ concentration in 2014 was below the limit value established by the EU from 2015 onward (25 µg/m³ annual mean) ([40]). However, substantial air pollution hotspots remain and the annual mean for fine particular matters continues to be above the levels recommended by the World Health Organization (WHO) (10 µg/m³ annual mean). The EU standard is set at the national level and is based on the average exposure indicator (AEI). The AEI is an averaged level of concentrations (over a three-year period), measured at urban background monitoring stations (representative of general urban

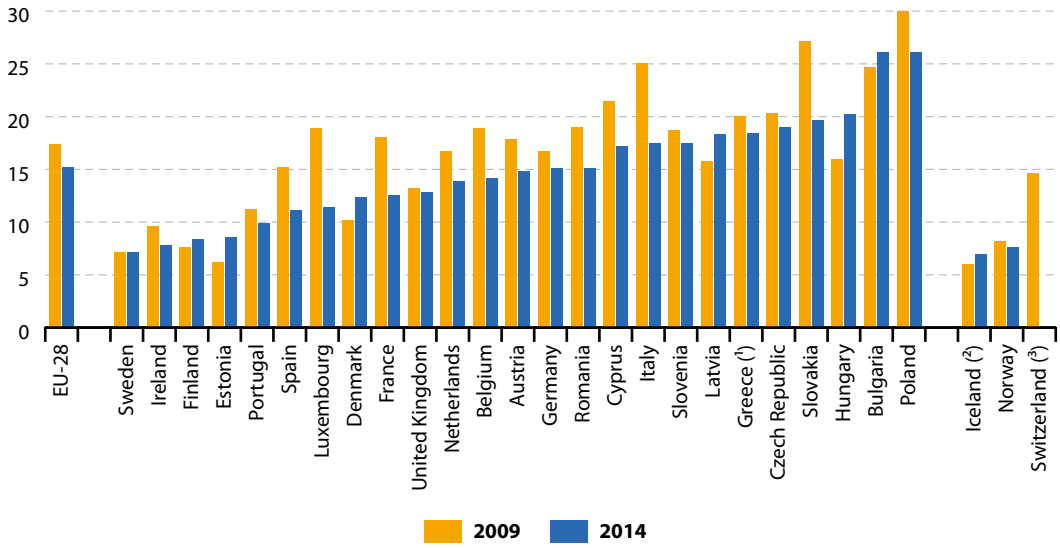
Figure 11.8: Exposure to air pollution by particulate matter, EU-28, 2000–2014
(µg/m³)



Source: European Environment Agency (EEA) (Eurostat online data code: sdg_11_50)

([40]) For $PM_{2.5}$, the Ambient Air Quality Directive 2008/50/EC introduced a target value to be attained by 2010, which became a limit value starting in 2015. For more information on EU air quality standards see: http://ec.europa.eu/environment/air/quality/standards.htm.

Figure 11.9: Exposure to air pollution by particulate matter ($PM_{2.5}$), by country, 2009 and 2014 (µg/m³)



(1) 2012 data (instead of 2014).
(2) 2013 data (instead of 2014).
(3) No data for 2014.

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_11_50)

The EU addresses the problem of air pollution through its specific air quality and industrial emissions legislation such as the Clean Air Package and the directives adopted by the Council and the European Parliament in relation to ambient air quality, as well as through co-benefits resulting from implementation of certain climate policies.

population exposure), selected for this purpose by every national authority. Emissions from coal and biomass combustion in households and from commercial and institutional buildings are the main source of air pollution from $PM_{2.5}$ in the EU, accounting for 56 % of total primary $PM_{2.5}$ emissions ([41]). However, a significant proportion of total particulate matter can subsequently form in the atmosphere from other gaseous pollutants, such as nitrogen oxides and ammonia.

Urban population exposure to PM_{10} in the EU has developed in a more positive direction. The population-weighted concentration of PM_{10} has been reduced by 22 % since 2000, reaching a decade low of 22.5 µg/m³ in 2014.

Despite recent improvements, a large proportion of the European population, especially people in cities, are still exposed to air pollution that exceeds European standards and, especially, WHO Air Quality Guidelines (AQGs). According to recent European Environment Agency's estimates, 8–12 % of the EU urban population was exposed to levels above the EU $PM_{2.5}$ limit value between 2012 and 2014. If the more stringent WHO AQG is considered (10 µg/m³ as annual mean for $PM_{2.5}$), about 85–91 % of city inhabitants were exposed to $PM_{2.5}$ concentration levels deemed harmful by WHO ([42]). Air pollution

([41]) European Environment Agency, *Air Quality in Europe 2016 Report*, 2016, p.23.
([42]) Id., p.55.

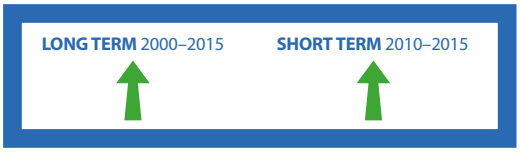
remains one of the largest environmental health hazards. According to estimates, exposure to $PM_{2.5}$ was responsible for about 436 000 premature deaths in the EU in 2013 ([43]), which is almost 17 times more deaths than from traffic road accidents in that year.

Compared to other countries in the world, the EU and its Member States have a relatively low level of annual mean concentrations of $PM_{2.5}$ in urban areas. In 2014, countries in the Middle East and South East Asia recorded the highest annual mean concentrations of fine $PM_{2.5}$ in urban areas, with Saudi Arabia (131.6 µg/m³), Qatar (105.3 µg/m³) and Egypt (101.8 µg/m³) leading the global ranking. The annual concentration of $PM_{2.5}$ in urban areas in India (73.6 µg/m³) and China (61.8 µg/m³) was five and four times the EU average, respectively. However, several advanced economies outperformed the EU in terms of air quality. The annual mean concentration of $PM_{2.5}$ in New Zealand (5.3 µg/m³) was three times lower than the EU average, in Canada and the United States it was almost half the EU average (7 µg/m³ and 8.5 µg/m³, respectively), and in Brazil and Japan it was slightly below the EU value (11.9 µg/m³ and 13 µg/m³, respectively) ([44]). Despite these variations, 90 % of the global population living in cities in 2014 were exposed to particulate matter in concentrations exceeding WHO air quality guidelines (10 µg/m³) ([45]).

The urban population in two Member States, namely Bulgaria and Poland, had average exposure to $PM_{2.5}$ concentrations exceeding the EU standard, at 26.1 µg/m³ each. The lowest population-weighted concentration of air pollution by $PM_{2.5}$ — three times or more below the annual limit value — was recorded for urban areas in northern Member States. In contrast, cities in most eastern European countries tended to have higher concentrations.

Recycling rate of municipal waste

The EU recycled or composted 45.0 % of its municipal waste in 2015, up from just 25.3 % in 2000 and 38.3 % in 2010. This indicates that the EU is clearly shifting towards more environmentally friendly modes of municipal waste management both in the long term and the short term.



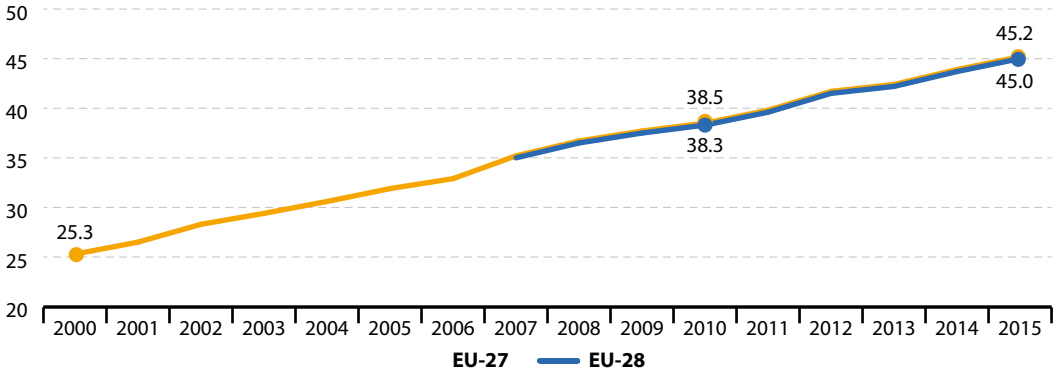
The recycling rate is the tonnage recycled from municipal waste divided by the total municipal waste arising. Recycling includes material recycling, composting and anaerobic digestion. Municipal waste consists mostly of waste generated by households, but may also include similar wastes generated by small businesses and public institutions and collected by the municipality. This latter part of municipal waste may vary from municipality to municipality and from country to country, depending on the local waste management system. For areas not covered by a municipal waste collection scheme the amount of waste generated is estimated.

The waste hierarchy is an overarching logic guiding EU policy on waste, which prioritises waste prevention, followed by re-use, recycling, other recovery and finally disposal, including landfilling, as the last resort. Although municipal waste accounts for only 10 % of total waste generated in the EU, it is highly visible, closely linked to consumption patterns and its prevention has the potential to reduce the environmental impact not only during the consumption and the waste phases but also throughout the whole life cycle of the products consumed ([46]).

In 2015, each EU citizen generated on average 1.3 kilograms of waste per day, which was just

([43]) European Environment Agency (2013), *Premature deaths attributable to air pollution in 2013*.
([44]) WHO, *World Health Statistics 2016. Monitoring Health for the Sustainable Development Goals*, 2016, pp. 103–119.
([45]) WHO, *World Health Statistics 2016. Monitoring Health for the Sustainable Development Goals*, 2016, pp. 94.
([46]) European Environment Agency (2016), *Municipal waste management across European countries. Briefing*.

Figure 11.10: Recycling rate of municipal waste, EU-27 and EU-28, 2000–2015
(% of total waste generated)



Note: 2000–2009 and 2011–2015 data are Eurostat estimates.
Source: Eurostat (online data code: sdg_11_60)

Sustainable urban development is a horizontal objective of the 7th Environment Action Programme (EAP). The Circular Economy Package supports the transition to a stronger and more circular economy where resources are used in a more sustainable way. The European Green Capital and the European Green Leaf initiatives showcase commitment to resolving urban environmental challenges.

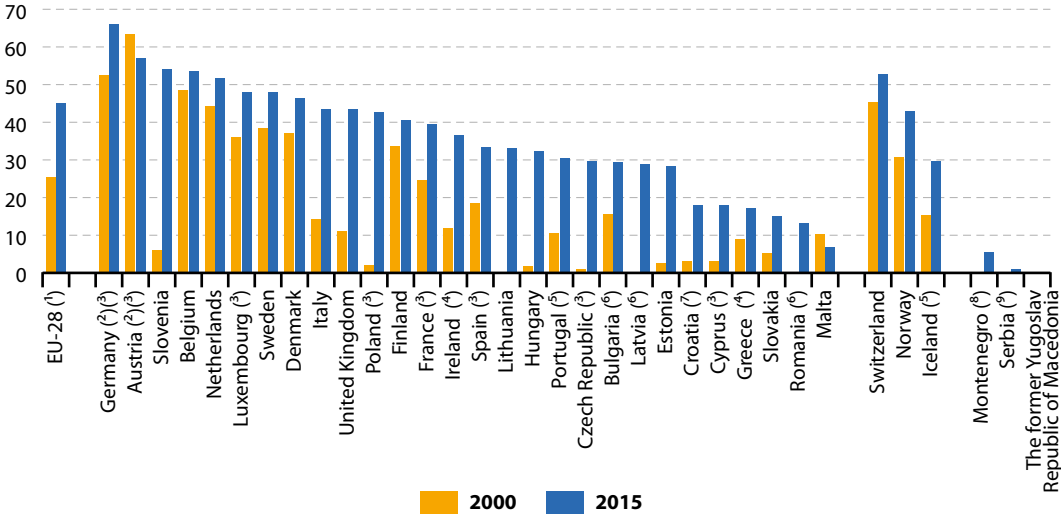
0.1 kg below the 2000 figure. Although the EU has not substantially reduced its municipal waste generation in the past 15 years, it has clearly shifted to more sustainable modes of managing a large bulk of it. Since 2000, the recycling rate has been increasing continuously by almost 4 % per year. EU and national strategies prioritising efficient waste management through various instruments have largely contributed to this movement up the 'waste hierarchy'.

Central and northern Member States with dedicated and diverse policy instruments and strict regulations on waste management tend to recycle a relatively high share of their municipal waste. Important policy measures, which have stimulated recycling in these countries include 'landfill bans on biodegradable waste or non-pre-treated municipal waste; mandatory separate collection of municipal waste types, especially biowastes; and economic instruments such as landfill and incineration taxes and waste collection fees that strongly encourage recycling' ([47]). Germany, which has a long tradition of national waste strategies and waste management plans in its federal states, has by far the highest recycling rate in the EU (66.1 %) ([48]).

In contrast, several Mediterranean and eastern Member States recycle less than 20 % of their municipal waste, with Malta and Romania recording the lowest rates, 6.7 % and 13.1 %, respectively. The main challenge for recycling expansion in Romania is the development of the infrastructure for separate collection and recycling of municipal waste ([49]), whereas in Malta the major obstacle lies in the inherently small scale of the Maltese market and the need to achieve economies of scale in recovery and recycling of waste compared to other Member States ([50]).

([47]) European Environment Agency, *Recycling of municipal waste*, Last modified on 11 April 2017.
([48]) European Topic Centre on Waste and Materials in a Green Economy, *Country fact sheet: Municipal waste management Germany*, 2016.
([49]) European Topic Centre on Waste and Materials in a Green Economy, *Country fact sheet: Municipal waste management Romania*, 2016.
([50]) European Topic Centre on Waste and Materials in a Green Economy, *Country fact sheet: Municipal waste management Malta*, 2016.

Figure 11.11: Recycling rate of municipal waste, by country, 2000 and 2015
(% of total waste generated)



(1) 2000 data refer to EU-27 and data are Eurostat estimates.
(2) 2000 data are Eurostat estimates.
(3) 2015 data are estimates.
(4) 2012 data instead of 2015.
(5) 2014 data instead of 2015.
(6) 2000 data are estimates.
(7) 2007 data (instead of 2000).
(8) 2011 data (instead of 2000).
(9) 2006 data (instead of 2000).
(10) 2008 data (instead of 2000).

Source: Eurostat (online data code: sdg_11_60)

Further reading on sustainable cities and communities

EEA (2015), *Air quality in Europe — 2016 report, EEA report No 28/2016*, Luxembourg: Publications Office of the European Union.

EEA (2015), *Urban sustainability issues — Enabling resource-efficient cities*, Luxembourg: Publications Office of the European Union.

EEA (2015), *Urban sustainability issues — What is a resource-efficient city?*, Luxembourg: Publications Office of the European Union.

EEA (2016), *Urban sprawl in Europe — joint EEA-FOEN report*, Luxembourg: Publications Office of the European Union.

EEA (2016), *Municipal waste management across European countries. Briefing*, Luxembourg: Publications Office of the European Union.

LSE (2014), *Accessibility in Cities: Transport and Urban Form: United Kingdom 2014*, LSE Publishing.

European Commission (2016), *State of European Cities 2016*, Luxembourg: Publications Office of the European Union.

European Commission (2015), *Road Safety in the European Union: Trends, statistics and main challenges*, Brussels.

Eurostat (2016), *Urban Europe: Statistics on cities, towns and suburbs*, Luxembourg: Publications Office of the European Union.

OECD (2014), *Health at a Glance: Europe*, OECD Publishing.

OECD (2016), *Regional Well-being: A user's guide*.

OECD (2017), *International Transport Forum, Transport Outlook 2017*, Paris.

Pittini, A., et. al. (2015), *The State of Housing in the EU 2015*, Brussels: Housing Europe, the European Federation for Public, Cooperative and Social Housing.

UNEP (2015), *Global Waste Management Outlook: Austria 2015*, UNEP Publishing.

United Nations, Department of Economic and Social Affairs, Population Division (2016), *The World's Cities in 2016 — Data Booklet* (ST/ESA/SER.A/392).

WHO (2015), *Global Status Report on Road Safety 2015*.

12 Ensure sustainable consumption and production patterns

The global perspective on SDG 12

Based on an estimate that the global population will reach 9.6 billion by 2050, the equivalent of almost three planets could be required to provide the natural resources needed to sustain current lifestyles. Limiting inadvertent climate change and ecological degradation requires that we urgently reduce our ecological footprint by changing the way we produce and consume goods and resources. SDG 12 aims at 'doing more and better with less', increasing net welfare gains from economic activities by reducing resource use, degradation and pollution. SDG 12 calls for action on all fronts: adoption of sustainable practices and sustainability reporting by businesses; promotion of sustainable procurement practices and rationalisation of inefficient fossil-fuel subsidies by policy-makers; environmentally-aware lifestyles of consumers; development of new technologies and production and consumption methods by researchers and scientists and others. SDG 12 envisions sustainable consumption and production, which use resources efficiently, reduces global food and other waste, disposes safely toxic waste and pollutants. It also highlights the importance of strengthening scientific and technological capacity in developing countries to move to sustainable patterns of consumption and production and developing tools to monitor sustainable development impacts for sustainable tourism ([1]).

eurostat supports the SDGs

Monitoring SDG 12 'responsible consumption and production' in an EU context focuses on three sub-themes. 'Decoupling environmental impacts from economic growth' covers aspects related to resource and energy productivity, the safe management of toxic chemicals, freight transport efficiency and the carbon intensity of new passenger cars. 'Energy consumption' encompasses energy efficiency and the use of renewable energies. 'Waste generation and management' refers to the amount of waste generated and the uptake of sustainable waste management practices. As shown in the Table 12.1, the EU has made progress in these areas.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets 'Why it matters' and World Bank Group, (2017), Atlas of Sustainable Development Goals 2017 from World Development Indicators.

Table 12.1: Indicators measuring progress in SDG 12, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Decoupling environmental impacts from economic growth			
Resource productivity and domestic material consumption (DMC)	↑	↑	p. 242
Energy productivity (*)	↑	↑	SDG 7, p. 155
Consumption of toxic chemicals	↗ (1)	↗	p. 246
Volume of freight transport relative to gross domestic product (GDP)	↗	↗	p. 247
Average CO_2 emissions per km from new passenger cars	:	↗ (2)	p. 248
Energy consumption			
Energy consumption (*)	↗ Primary ↑ Final (3)	↑ Primary ↑ Final (3)	SDG 7, p. 150
Share of renewable energy in gross final energy consumption (*)	↑ (1)(4)	↑ (4)	SDG 7, p. 156
Waste generation and management			
Generation of waste excluding major mineral wastes	↑ (5)	↗ (6)	p. 250
Recycling and landfill rate of waste excluding major mineral waste	:	↗ (6)	p. 252

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Past 11-year period.
(2) Trend in relation to the target of reducing average CO_2 emissions per km from new passenger cars to 95 grams by 2021.
(3) Trend in relation to the Europe 2020 target of increasing energy efficiency by 20% by 2020 (compared to projections); for monitoring purposes this target has been translated in absolute target values for primary energy consumption (1 483 million tonnes of oil equivalents) and final energy consumption (1 086 million tonnes of oil equivalents) to be met by 2020.
(4) Trend in relation to the Europe 2020 target of raising the share of renewable energies in gross final energy consumption to 20% by 2020.
(5) Past 10-year period.
(6) Past 4-year period.

Responsible consumption and production in the EU: overview and key trends

The increase in the living standards and quality of life in Europe since the end of the World War II has been made possible through the increases in incomes, production and consumption. However, we live on a planet with finite resources. Therefore, we cannot rely on traditional methods of consumption and production indefinitely as they may permanently and irreversibly harm the environment. How available resources are managed and consumed has real and lasting implications for prosperity and equity today and for future generations. In this context, it is important to decouple economic growth from environmental damage by increasing resource and energy productivity, safely managing chemicals, shifting away from carbon-intensive energy and transport systems, and reducing the amount of waste going to landfills. Minimising waste and resource use through maintenance, reuse, repair, refurbishing and recycling of existing materials and products to maintain their value for as long as possible would be equally important. This would not only reduce environmental pressures, but also bring major economic benefits.

Decoupling environmental impacts from economic growth

To continue improving living standards and quality of life without sacrificing the natural resource base they depend on, the EU economies needs to learn how to decouple economic growth from the consumption of natural resources. Between 2001 and 2016 resource productivity in the EU increased by 38.6 %. While the EU economy (in terms of GDP) grew by 20.7 %, domestic material consumption decreased by 13.0 %, indicating absolute decoupling of material consumption from economic growth.

Since the industrial revolution, increases in economic activities have been associated with growing energy consumption. However, focus has now turned to increasing energy productivity by improving energy efficiency and the restructuring of economies so they produce more from the same energy input. Since 2000, the EU has continuously increased its energy productivity with all Member States contributing to this goal.

Most everyday products used by businesses and consumers are produced with the help of chemicals. Chemicals are one way that farmers protect their crops from pests and they are used as ingredients in pharmaceuticals, detergents, cosmetics, textiles, the built environment and packaging. These uses make them a significant contributor to the EU economy, with sales worth EUR 519 billion in 2015 ([2]). However, their benefits should not hide the fact that many chemicals may have harmful effects. The EU seeks to ensure that the way chemicals are produced, handled and used do not pose significant threats to human health and the environment ([3]). If possible, substances of high concern should be replaced with suitable alternative substances or technologies. The consumption of toxic chemicals in the EU, both chemicals hazardous to the environment and chemicals hazardous to health, fell moderately between 2004 and 2015, by 8 %.

The ability to move goods safely, quickly and cost-efficiently to markets is important for economic development. GDP growth and freight transport volumes tend to be correlated. To reduce the environmental impacts of freight transport it is important to increase its efficiency and promote sustainable modes of freight transport such as rail and inland waterways transport. Between 2000 and 2015 volume of freight transport relative to GDP decreased slightly because GDP grew faster than the demand for transport.

([2]) The European Chemical Industry Council (2016), *European Chemical Industry Facts and Figures Report 2016*.
([3]) Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2016 on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

The passenger car fleet in almost all Member States has grown over the past decade ([4]). At the same time, cars are responsible for around 12 % of total EU emissions of carbon dioxide (CO_2), the main greenhouse gas ([5]). To reduce the negative impact of passenger cars on the environment, the EU has set mandatory emission reduction targets for new vehicles. The average CO_2 emissions per km from new passenger cars in the EU fell by 13 % between 2011 and 2016. Further progress will, however, be necessary to reach the 2021 target value of 95 grams of CO_2 per km.

Energy consumption

The availability of energy is necessary for the functioning and growth of European economies. However, increased energy consumption may put pressure on the environment, deplete fossil fuels and intensify EU's dependency on imported energy. Using energy more efficiently allows for further growth while reducing environmental impacts, dependencies and costs linked to energy supply and use. Since 2000, the EU has reduced its primary and final energy consumption, compensating for the slight increases in consumption in the period before 2006. The short-term trend since 2010 has been even more positive because the base year 2010 had a particularly cold winter, leading to rather high heating needs throughout Europe.

Shifting to more renewable energy sources may also help reduce the negative environmental impacts of energy use, such as greenhouse gas emissions, as well as the EU's dependency on energy imports from other parts of the world. The EU therefore seeks to increase its share of renewable energy in energy consumption to 20 % by 2020. Renewable energy sources are sources that are practically inexhaustible or renew within a human lifetime. They emit little or no greenhouse gas and thereby help to mitigate climate change. Since 2004, the EU has steadily increased the share of renewables in energy consumption and is on track to meeting its 2020 target.

Waste generation and management

In 2014, each European citizen generated 1 716 kilograms of waste. When not managed sustainably, all of this waste could have a huge impact on the environment, causing pollution and greenhouse gas emissions that contribute to climate change, as well as significant losses of materials ([6]). Therefore the EU aims to reduce the amount of waste generated. Towards this goal, it reduced the amount of waste it generated, excluding major mineral wastes, by 10 % between 2004 and 2014.

Unfortunately, waste can not always be avoided. Yet, waste is still a resource and recycling can prolong the life of the materials used. Therefore the EU aims to increase its share of clean recycling and safe disposal/energy recovery of wastes that can not be recycled. Improved waste management can also reduce the negative environmental impacts from waste, such as the emission of greenhouse gases. In the EU, more than half of the waste generated, excluding major mineral wastes, is recycled and about one quarter is landfilled. Between 2010 and 2014 there was a shift from landfilling to recycling.

([4]) See Passenger cars per 1 000 inhabitants, Source: Eurostat (online data code: road_eqs_carhab).
([5]) European Commission, *Climate Action, Reducing CO_2 emissions from passenger cars*, Last accessed: 22.08.2017.
([6]) European Commission (2010), *Being wise with waste: the EU's approach to waste management*.

Responsible consumption and production in the EU

Decoupling environmental impacts from economic growth

Resource productivity in 2016
2.07 EUR per kg
+ 17.3 % since 2011

Energy productivity
in 2015
8.3 EUR per kgoe
+ 13.7 % since 2010

CO_2 emissions from new passenger cars (1) in 2016
118.1 gr CO_2 per km
- 13.0 % since 2011

Consumption of toxic chemicals in 2015
127 Mt toxic to the environment
- 5.7 % since 2010
221 Mt toxic to health
- 2.5 % since 2010

Freight transport relative to GDP in 2015
90.1 Index 2005 = 100
- 3.9 index points since 2010

Energy consumption

Energy consumption in 2015

Primary energy
1 530 Mtoe
- 7.7 % since 2010

Final energy
1 082 Mtoe
- 6.9 % since 2010

Share of renewable energy in 2015
16.7 %
+ 3.8 pp since 2010

Waste generation and management

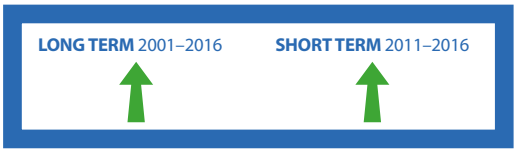
Generation of waste in 2014
1 716 kg per capita
- 1.2 % since 2010

Recycling rate in 2014
55 % of total waste treated
+ 2 pp since 2010

(1) 2011 data refer to EU-27.
Source: Eurostat (online data codes: sdg_12_20, sdg_07_30, sdg_12_10, sdg_12_40, sdg_12_30, sdg_07_10, sdg_07_11, sdg_07_40, sdg_12_50 and sgd_12_60)

Resource productivity and domestic material consumption (DMC)

Resource productivity increased considerably between 2001 and 2016, although there are significant differences in performance between countries.

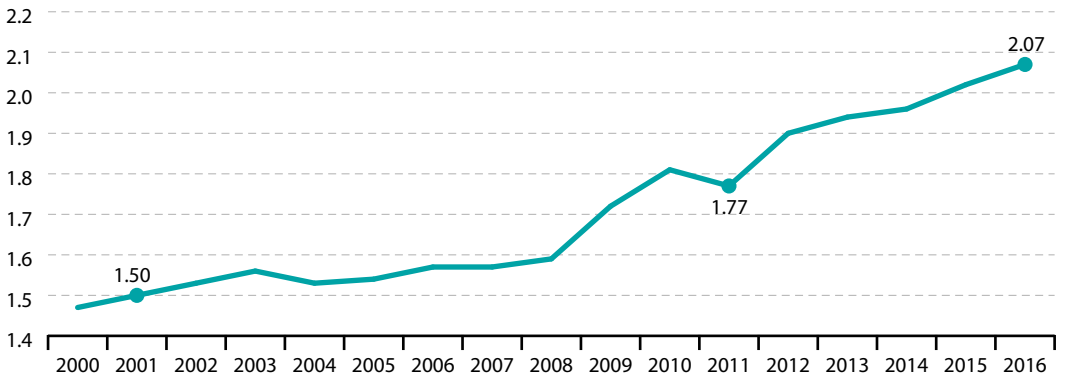


Resource productivity monitors the relationship between resource use and economic activity. It is the ratio between gross domestic product (GDP) and domestic material consumption (DMC). It is expressed in EUR per kg and shows how much economic value is generated for each kilogram of material consumed.

The strong increase in the EU's resource productivity since 2008 has been driven by diverging trends in economic growth and material consumption. After the contraction of the EU economy in 2009 due to the economic crisis (– 4.4 %), GDP grew in total by 9.8 % until 2016 ([7]). DMC dropped even more from 2008 to 2009 (– 12 %) and continued to fall by 8.8 % until 2016 ([8]). These trends indicate absolute decoupling of economic growth from resource use during this period, which is reflected in the 30.6 % rise of resource productivity since 2008.

Nevertheless, the observed trends need to be interpreted with caution as they might not be entirely due to the success of environmental policies. It is very likely that the large drop in DMC between 2008 and 2010 and the continued fall after 2012 were strongly influenced by the economic crisis ([9]). Following the onset of the crisis in 2008, the use of materials declined rapidly, with a 20.4 % decrease in total DMC between 2007 and 2016. This was mostly due to the rapid slowdown in construction activity, which accounts for the lion's share of total material use but contributes, in relative terms, much less to the EU economy ([10]).

Figure 12.1: Resource productivity, EU-28, 2000–2016
(Chain linked volumes (2010) in EUR per kg DMC)

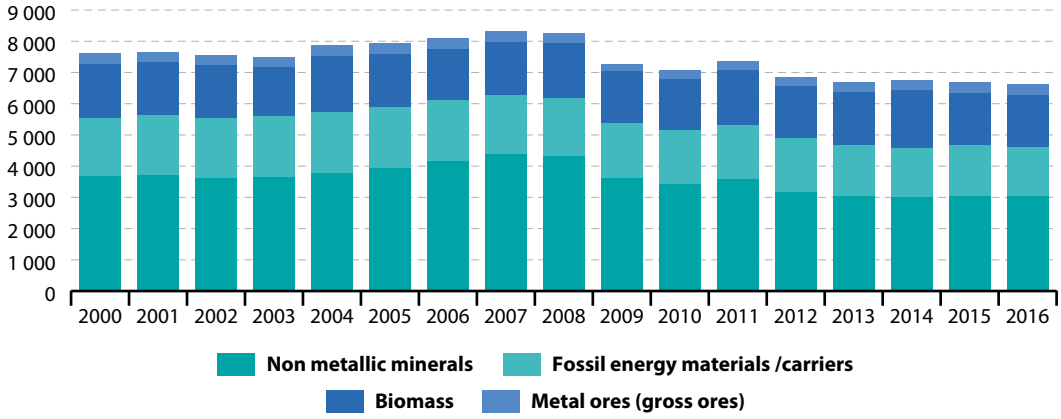


Note: Data are Eurostat estimates (whole time series); 2015 and 2016 data are provisional.

Source: Eurostat (online data code: sdg_12_20)

([7]) Source: Eurostat (online data code: nama_10_gdp).
([8]) Source: Eurostat (online data code: tsdpc230).
([9]) European Commission (2014), *Study on modelling of the economic and environmental impacts of raw material consumption*, p. 5.
([10]) EEA (2016), *More from less — material resource efficiency in Europe. 2015 overview of policies, instruments and targets in 32 countries*, *EEA report No 10/2016*, p. 38.

Figure 12.2: Domestic material consumption by material, EU-28, 2000–2016
(million tonnes)



Note: Data are Eurostat estimates and 2015 and 2016 data are provisional.

Source: Eurostat (online data code: env_ac_mfa)

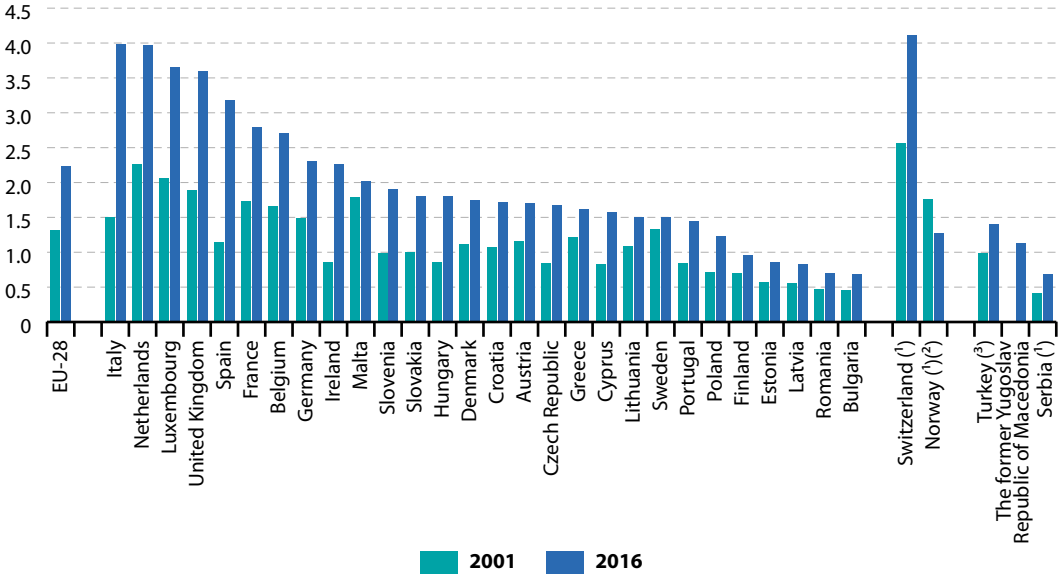
The 7th Environment Action programme ([11]), the agreed framework for EU environment policy until 2020, has put forward three key objectives: (1) to protect, conserve and enhance the Union's natural capital, (2) to turn the Union into a resource-efficient, green, and competitive low-carbon economy and (3) to safeguard the Union's citizens from environment-related pressures and risks to health and well-being. Four so-called "enablers" will help Europe deliver on these goals: better implementation of legislation, better information by improving the knowledge base, more and wiser investment for environment and climate policy, full integration of environmental requirements and considerations into other policies. Two additional horizontal priority objectives complete the programme: to make the Union's cities more sustainable and to help the Union address international environmental and climate challenges more effectively.

The Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan ([12]) includes a series of proposals on sustainable consumption and production that will contribute to improving the environmental performance of products and increase the demand for more sustainable goods and production technologies.

The Circular Economy Package, adopted by the European Commission in 2015, proposed actions which will contribute to 'closing the loop' of product life cycles through greater recycling and re-use, and bring benefits for both the environment and the economy ([13]).

([11]) Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet'.
([12]) European Commission, *Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan {SEC(2008) 2110} {SEC(2008) 2111}*, COM(2008) 397 final, Brussels.
([13]) European Commission, 2015, *Closing the loop — An EU action plan for the Circular Economy*, COM(2015) 614 final, Brussels.

Figure 12.3: Resource productivity, by country, 2001 and 2016 (PPS per kg DMC)



Note: Provisional and/or Eurostat estimated data for most countries (too numerous to be listed).
(1) 2015 data (instead of 2016).
(2) 2006 data (instead of 2000).
(3) 2014 data (instead of 2016).

Source: Eurostat (online data code: sdg_12_20)

Other economic or technical factors might have also affected the positive trend in resource productivity, including the long-term shift of the EU towards a service economy, globalisation and increasing reliance on imports, and even the nature of the indicator itself ([14]).

This development illustrates the importance of efficient management and use of materials. DMC measures the total amount, in tonnes, of material directly used in an economy, either by businesses, government and other institutions for economic production or by households. These resources include renewables such as biomass and non-renewables such as fossil fuels, metals and minerals as shown in Figure 12.2. Non-metallic minerals are the largest material category and had a share of 46.2 % of total DMC in 2016, followed by biomass (25.4 %), fossil energy carriers (23.2 %) and metal ores (5.1 %) ([15]). Consumption of non-metallic minerals, fossil energy materials/carriers and biomass has fallen over the long- and short-term period. The 19.8 % decrease in EU's use of fossil energy materials/carriers between 2001 and 2016 is especially noteworthy. This decline has been driven in part by a decrease in overall economic activity from 2008 onwards due to the economic crisis, but also by a long-term trend of increased use of energy from renewable sources, as well as the improved overall energy efficiency of the EU economies ([16]). Metal ores increased, particularly in the short term (+ 17.8 % between 2011 and 2016).

DMC comprises domestic extraction of raw material, plus all physical imports, minus all physical exports. Although DMC considers both imports and exports, it has its limitations because it does not fully account for the 'hidden flows' of raw materials embodied in the production of traded goods. Therefore, Europe's progress

([14]) EEA (2016), *More from less — material resource efficiency in Europe. 2015 overview of policies, instruments and targets in 32 countries*, *EEA report No 10/2016*, p. 38.
([15]) 'Other products' and 'waste for final treatment and disposal' accounts for 0.2 %.
([16]) EEA (2016), *More from less — material resource efficiency in Europe. 2015 overview of policies, instruments and targets in 32 countries*, *EEA report No 10/2016*, p. 35.

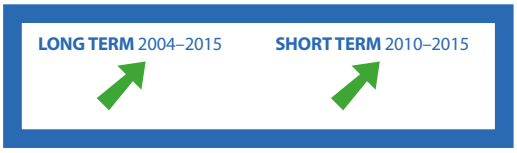
regarding resource efficiency may be overstated because of the import-intensive nature of its economy. The indicator raw material consumption (RMC) is used to fully account for all raw materials used in the complete production chain of consumed products ([17]). However, RMC is more prone to uncertainty than DMC.

At the Member State level, values of resource productivity ranged from 3.98 to 0.68 purchasing power standards (PPS) ([18]) per kg in 2016. These large variations in resource productivity result from a combination of factors such as sectoral composition and national economic structure (strong service and knowledge/technology-based as opposed to primary sector industry or raw material processing), specific resource endowments, degree of outsourcing of production, existence of resource policies encouraging recycling and re-use of resources and others ([19]).

As Figure 12.3 shows, the same four EU countries have remained at the top of resource productivity rankings, while five have remained consistently at the bottom. The top four performers keep improving resource productivity (with average annual growth rates ranging between 6.7 % and 3.8 % for the period 2001 to 2016 ([20])). In contrast, the five countries at the bottom are improving at a much slower rate (between 2.1 % and 2.7 % per annum). These trends indicate that in the long-term the gap between the best and the worst performers in the EU is increasing.

Consumption of toxic chemicals

Between 2004 and 2015 the consumption of chemicals hazardous to both the environment and to health fell moderately.

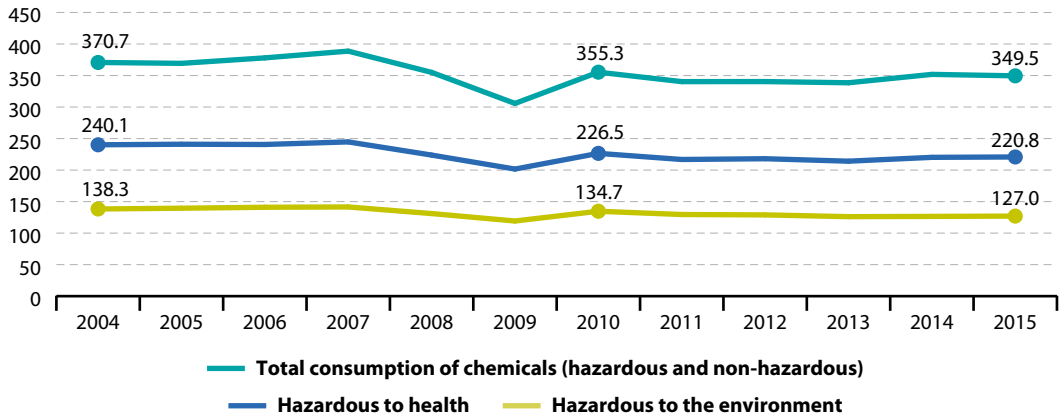


The indicator 'consumption of toxic chemicals' represents the trend in aggregated consumption of volumes of toxic chemicals. It is calculated as the sum of two production-related indicators ('production of toxic chemicals' and 'production of environmentally harmful chemicals') and data from official foreign trade statistics (imports and exports). The production-related indicators are based on official statistics on the production of industrial chemicals, compiled by National Statistical Institutes and Eurostat. Production volumes are weighted according to the toxicity of the chemicals (both for human health and environmental endpoints). The description of toxic and environmentally harmful characteristics according to the 'old' risk phrases ('R-phrases') of the Dangerous Substances Directive ([21]) was changed to the hazard statements according to the international Globally Harmonized System (GHS), as implemented in Europe by the CLP Regulation, also taking into account self-classifications under REACH.

It should be noted that the indicators do not describe the actual risks associated with the use of chemicals, but instead their level of production

([17]) For an overview on material flows in raw material equivalents see http://ec.europa.eu/eurostat/statistics-explained/index.php/Material_flow_accounts_-_flows_in_raw_material_equivalents.
([18]) PPS is an artificial currency unit. Theoretically, one PPS can buy the same amount of goods and services in each country. However, price differences across borders mean that different amounts of national currency units are needed for the same goods and services depending on the country. PPS are derived by dividing any economic aggregate of a country in national currency by its respective purchasing power parities (PPP). It is the technical term used by Eurostat for the common currency in which national account aggregates are expressed when adjusted for price level differences using purchasing power parity (PPP). Thus, PPPs can be interpreted as the exchange rate of the PPS against the euro.
([19]) SERI (2012), *Green Economies around the World? — Implications for Resource Use for Development and the Environment*, p. 50.
([20]) Calculation based on compound annual growth rate.
([21]) Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.

Figure 12.4: Consumption of toxic chemicals, EU-28, 2004–2015
(million tonnes)



Source: Eurostat (online data code: sdg_12_10)

The 'REACH' framework ([22]) aims to improve the protection of human health and the environment from the risks that can be posed by chemicals, while enhancing the competitiveness of the EU chemicals industry.

To reduce the impact from the use of toxic chemicals on humans and the environment, the 7th EAP has announced an EU strategy for a non-toxic environment (to be published in 2018). This will include actions for clean material cycles to be included in the Circular Economy Package.

in quantity terms. Indeed, production and consumption are not synonymous with exposure, as some chemicals are handled in closed systems with high risk management measures, or as intermediate goods in controlled supply chains ([23]).

Toxic chemicals pose threats to human health and the environment. In 2015, 350 million tonnes of chemicals were consumed in the EU. Of these, 127 million tonnes were classified as hazardous to the environment and 221 million tonnes as substances that might harm human health. Although consumption of toxic chemicals declined in the short term and the long term, the share of most toxic chemicals in total chemical consumption remained nearly unchanged.

In 2015, of all chemicals consumed in the EU 36.3 % were toxic to the environment and 63.2 % were toxic to health. Since 2004, the consumption of toxic chemicals has declined by 1.0 percentage points for chemical toxic to the environment and by 1.6 percentage points for chemicals toxic to health.

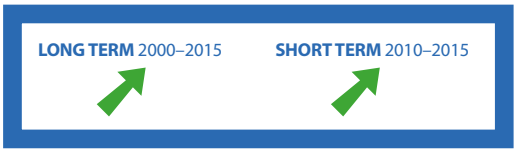
It should be noted that the indicator on consumption of chemicals that are hazardous to the environment and to human health is limited in scope in a number of ways. For example, it does not account for additional consumption of toxic chemicals or products that might have come from stockpiled chemicals. In addition, emissions to the environment from production of chemicals, which were produced in the EU, but exported to

([22]) Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.
([23]) Eurostat (2016), *Compilation of chemical indicators. Development, revision and additional analysis*, p.43.

outside the EU are also not reflected. Since effects on ecosystems or humans are caused by the total exposure to chemicals at a given time, threats to human and environmental health can also come from previous uses of persistent chemicals that accumulate in the environment or in humans.

Volume of freight transport relative to gross domestic product (GDP)

The ratio of freight transport volumes to GDP have decreased slightly over the long term and the short term.

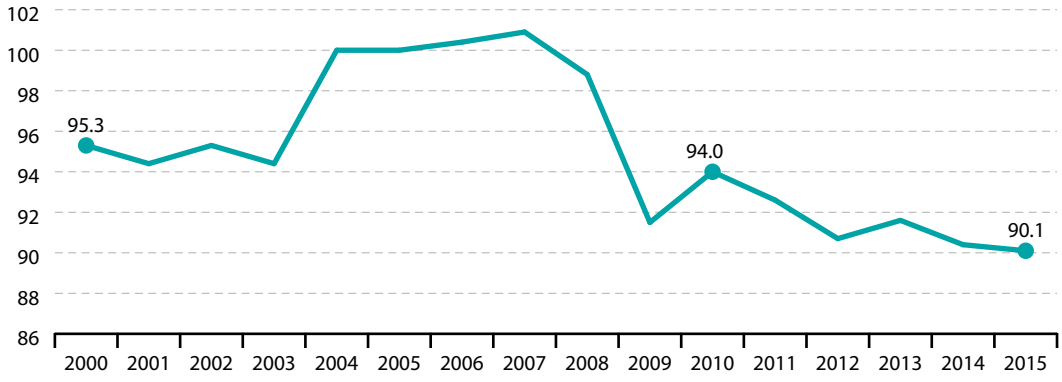


The indicator 'volume of freight transport relative to GDP' is calculated by dividing tonne-kilometres of freight transport by gross domestic product (GDP), expressed as an index. Freight transport covers transport by road, rail and inland waterways. A tonne-kilometre corresponds to one tonne of goods transported over one kilometre.

In both, the long and short terms, both GDP and transport volumes have increased in the EU. GDP has grown in total by 21.1 % since 2000 and by 5.5 % since 2010, while transport volumes have risen by 14.5 % and 1.1 %, respectively. As a result of the stronger increase in GDP, the ratio of freight transport volume to GDP in 2015 was lower than in 2000 and in 2010. The trend has however not been continuous, as depicted in Figure 12.5 In the period leading up to the economic crisis, freight transport volumes actually grew more strongly than GDP. After 2007, fuel price increases along with the onset of the economic recession in 2008 reduced demand for freight transport. The overall trend in the indicator over the period 2000 to 2015 is mainly a result of transport volumes dropping by more than 11 % from 2008 to 2009, whereas GDP only contracted by about 4.4 %.

The decoupling that occurred during the period of economic stagnation is not surprising, as manufacturing, which is associated with higher levels of freight transport, tends to respond to changes in economic activity more than the service sector does ([24]).

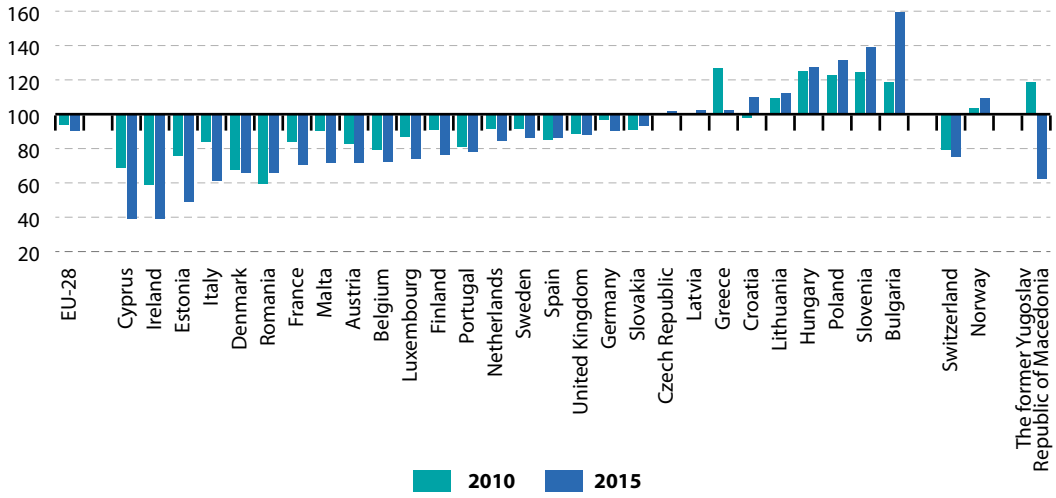
Figure 12.5: Volume of freight transport relative to GDP, EU-28, 2000–2015
(index 2005 = 100 (GDP at chain-linked volumes, 2005))



Source: Eurostat (online data code: sdg_12_40)

([24]) EEA, *Freight transport demand*, last accessed on 23 August 2017.

Figure 12.6: Volume of freight transport relative to GDP, by country, 2010 and 2015
(index 2005 = 100 (GDP at chain-linked volumes, 2005))

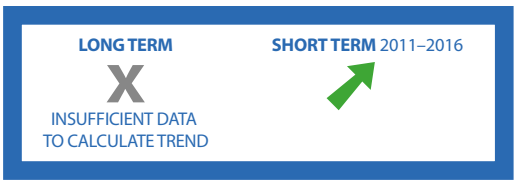


Source: Eurostat (online data code: sdg_12_40)

As shown in Figure 12.6, trends in freight transport volumes relative to GDP have developed quite differently across the EU, ranging from reductions of almost 40 % to increases of about 60 % over the period 2005 to 2015. In Belgium, Estonia, Ireland, France, Luxembourg, Malta, the Netherlands and Austria, GDP was rising while transport volumes were falling, which may indicate absolute decoupling of transport from economic growth in these countries. Relative decoupling was observed in Denmark, Germany, Sweden and the United Kingdom, meaning that GDP grew faster than transport demand in these countries. However, in some Mediterranean countries such as Greece, Italy Cyprus and Portugal as well as in Finland, declines were triggered by stronger cutbacks in transport demand than GDP. In the remaining countries the coupling of transport volumes to GDP intensified.

Average CO_2 emissions per km from new passenger cars

Newly registered passenger cars on average emitted 13 % less CO_2 in 2016 compared with 2011. Further progress will be necessary to meet the target in 2021.



This indicator is defined as the average carbon dioxide (CO_2) emissions per km by new passenger cars in a given year. The reported emissions are based on type-approval and can deviate from the actual CO_2 emissions of new cars. The EU set mandatory emission reduction targets for new cars of 130 grams of CO_2 per kilometre in 2015 and 95 grams of CO_2 per kilometre in 2021 ([25]). These targets apply to a manufacturer's overall fleet, meaning that heavier cars with emissions above the limit value are still allowed but must be offset

([25]) Regulation (EU) No 333/2014 of the European Parliament and of the Council of 11 March 2014 amending Regulation (EC) No 443/2009 to define the modalities for reaching the 2020 target to reduce CO_2 emissions from new passenger cars.

by the production of lighter cars to preserve the overall fleet average. As shown in Figure 12.7 the target for 2015 was already met two years in advance. However, further progress will be necessary to reach the 2021 target as well.

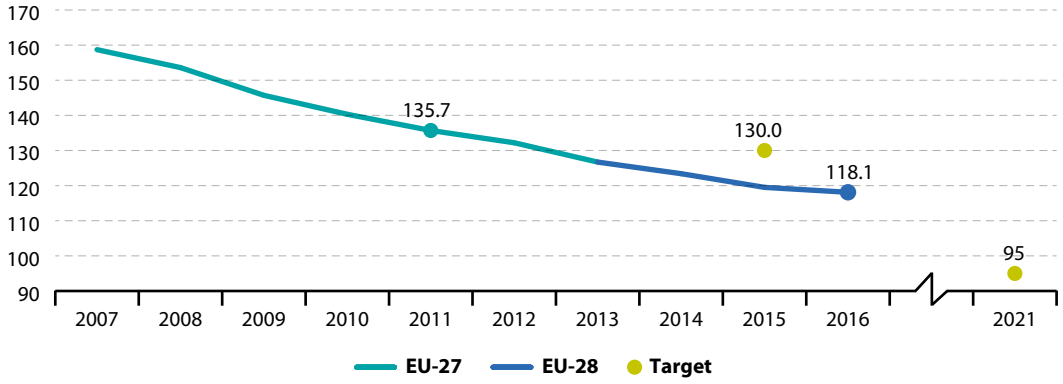
New cars are becoming more and more efficient, even though their average mass is still not steadily decreasing. However, gained reductions in emission intensity, as measured by CO_2 emissions per kilometre, are lower in reality than estimated by the indicator. Under real driving tests, new European passenger cars emitted in 2015 on average around 40 % more than in the laboratory ([26]). Currently, the New European Driving Cycle (NEDC) test procedure is used to measure CO_2 emissions of new passenger cars. Yet, the NEDC no longer corresponds to present-day's driving conditions or vehicle technologies and allows carmakers to optimise the conditions under which their vehicles are tested ([27]). In recognition of these shortcomings, the EU will shift to a new measurement procedure known as the 'Worldwide harmonized Light vehicles Test Procedure' (WLTP) between 2017 and 2019. The WLTP will provide stricter test conditions and more realistic fuel consumption and CO_2 emission values ([28]).

However, by 2015 transport was the only sector where GHG emissions were still higher than their 1990 levels (see chapter 13 'Climate action').

In 2016 the average CO_2 emissions from new passenger cars ranged from 104.7 grams of CO_2 per km in Portugal to 133.9 grams of CO_2 per km in Estonia. Member States have managed to speed up the reduction of new car CO_2 emissions by using demand-oriented incentives such as scrappage schemes, extra taxes and cars with high CO_2 emissions or incentives for low-emission vehicles such as hybrids and electric ones.

EU legislation sets mandatory emission reduction targets for new cars ([29]). This legislation is the cornerstone of the EU's strategy to improve the fuel economy of cars sold on the European market.

Figure 12.7: Average CO_2 emissions per km from new passenger cars, EU-27, 2007–2016
(gram of CO_2 per km)

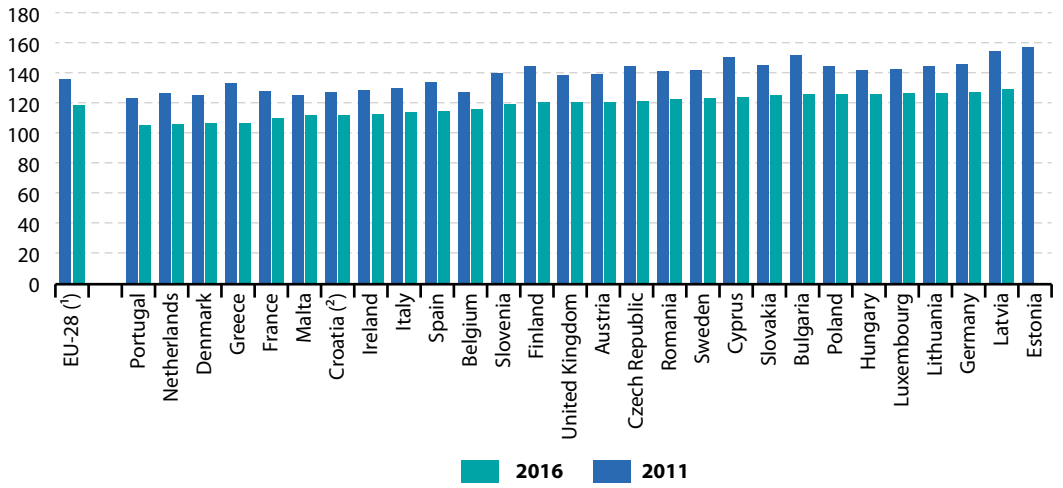


Note: 2016 data are provisional.

Source: European Environment Agency, European Commission services (Eurostat online data code: sdg_12_30)

([26]) Uwe Tietge et al. (2016), *From Laboratory to Road — A 2016 update of official and 'real world' fuel consumption and CO_2 values for passenger cars in Europe*, International Council on Clean Transportation.
([27]) EEA (2017), *Fuel efficiency improvements of new cars in Europe slowed in 2016*.
([28]) European Commission recommendation 2017/948 of 31 May 2017 on the use of fuel consumption and CO_2 emission values type-approved and measured in accordance with the World Harmonised Light Vehicles Test Procedure when making information available for consumers pursuant to Directive 1999/94/EC of the European Parliament and of the Council.
([29]) Regulation (EC) No 443/2009 of the European Parliament and of the Council of 23 April 2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO_2 emissions from light-duty vehicle.

Figure 12.8: Average CO_2 emissions per km from new passenger cars, by country, 2011 and 2016 (gram of CO_2 per km)

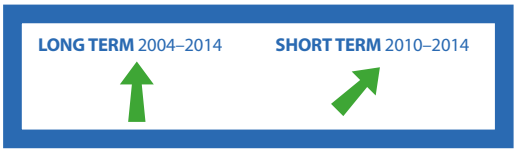


Note: 2016 data are provisional.
(1) 2011 data refer to EU-27.
(2) 2013 data (instead of 2011).

Source: European Environment Agency, European Commission services (Eurostat online data code: sdg_12_30)

Generation of waste excluding major mineral wastes

The amount of waste, excluding major mineral wastes, generated in the EU fell by 10 % between 2004 and 2014. Since 2010, however, waste generation has only decreased slightly ([30]).

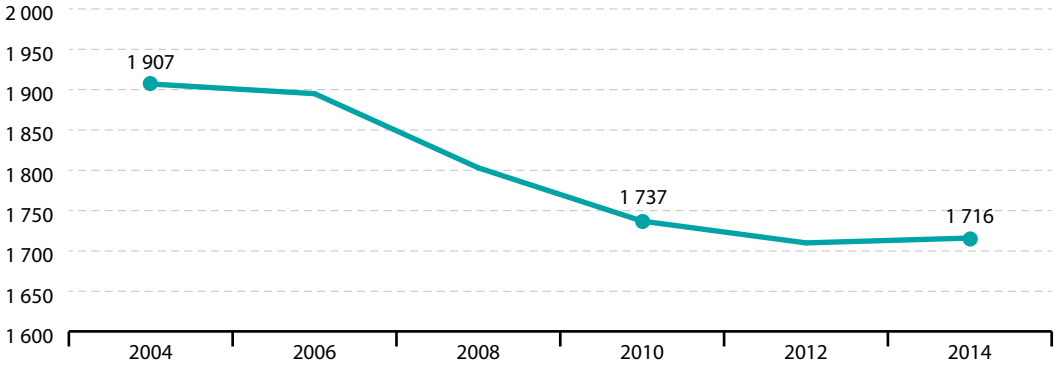


This indicator presents the amount of major mineral wastes generated, expressed in kilograms per capita per year. The indicator covers hazardous and non-hazardous waste from all economic sectors, administrations and households, including waste from waste treatment. Due to the strong fluctuations in waste generation in the mining and construction sectors and their limited data quality and comparability major mineral wastes are excluded. Thereby the indicator is considered to reflect the general trend better.

In the EU, 871 million tonnes of waste were generated in 2014, this equals 1 716 kg per inhabitant. In 2014, 7.0 % of these wastes — corresponding to 120 kg per inhabitant — were hazardous to health or the environment. The share of hazardous wastes shows different trends over the short and long term. While the share increased by 1.2 percentage point overall between 2004 and 2014, in the short term, since 2010, the share has fallen by 0.2 percentage points ([31]).

([30]) The period before 2010 is influenced by data consolidation, for details see the country specific notes.
([31]) Source: Eurostat (online data code: env_wasgen).

Figure 12.9: Generation of waste excluding major mineral wastes, EU-28, 2004–2014
(kilograms per capita)



Source: Eurostat (online data code: sdg_12_50)

Building on existing EU policies and legislation, the Circular Economy Package ([32]) establishes a programme of action with measures covering the whole cycle from production and consumption to waste management. The Package includes commitments on ecodesign, waste prevention and reuse, clean material cycles and ambitious quantitative targets on increasing recycling and reducing landfilling, obligations to improve the separate collection of waste, as well as the promotion of efficient use of bio-based resources.

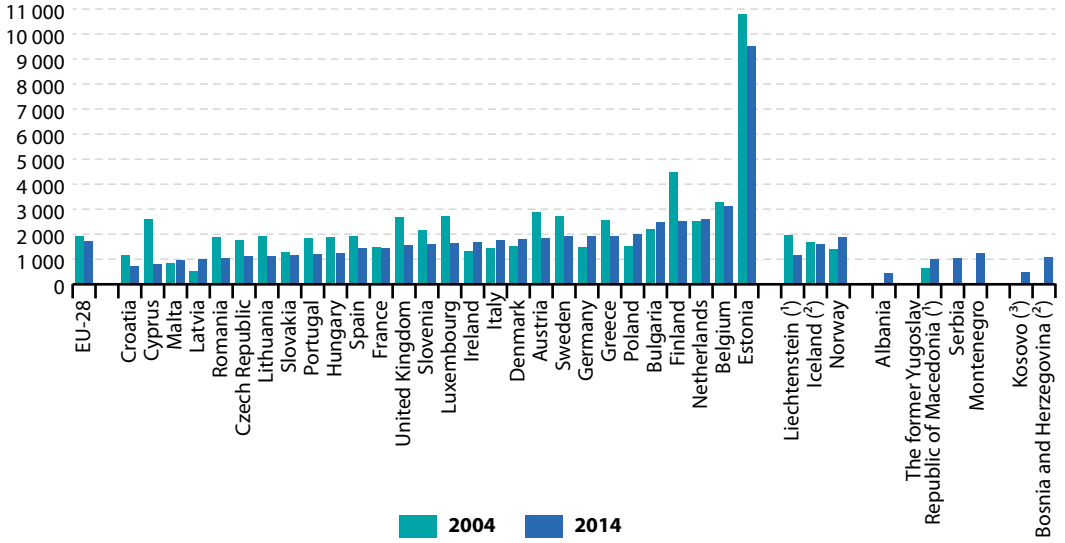
The Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan ([33]) includes a series of proposals on sustainable consumption and production that will contribute to improving the environmental performance of products and increase the demand for more sustainable goods and production technologies.

In 2014, most wastes arose within the waste management system (27 %) ([34]), followed by wastes generated by households (23 %) and manufacturing (21 %). Provision of utilities (electricity, gas, steam, and air condition) and services accounted for 10 % of waste generation each ([35]).

A third of waste excluding major mineral waste was mixed ordinary waste in 2014. This category includes wastes from households, mixed undifferentiated materials and sorting residues. Recyclable waste such as metal, glass, paper and plastic accounted for around another quarter, followed by combustion waste (15 %), animal and vegetal wastes (10 %), chemical and medical wastes (6 %) and mineral wastes from waste treatment and stabilised wastes (5 %). Common sludges and equipment had a share of around 2 % each in 2014 ([36]).

([32]) European Commission (2015), *Closing the loop — An EU action plan for the Circular Economy*, COM(2015) 614 final, Brussels.
([33]) European Commission (2008), *Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan*, COM(2008) 397 final, Brussels.
([34]) This category includes the NACE ref 2 activities waste collection, treatment and disposal activities; materials recovery (E 38), Water collection, treatment and supply; sewerage; remediation activities and other waste management services (E36, E37, E39) and wholesale of waste and scrap (G4677).
([35]) See footnote 34.
([36]) Source: Eurostat (online data code: env_wasgen).

Figure 12.10: Generation of waste excluding major mineral wastes, by country, 2004 and 2014
(kilograms per capita)



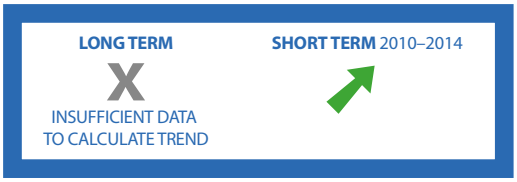
(1) 2008 data (instead of 2004).
(2) 2012 data (instead of 2014).
(3) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: sdg_12_50)

Across Member States, waste generation excluding major mineral wastes ranged from an average of 723 kg per inhabitant in Croatia to 9.5 tonnes per inhabitant in Estonia in 2014. The large quantity of waste generated in Estonia is related to energy production based on oil shale.

Recycling and landfill rate of waste excluding major mineral wastes

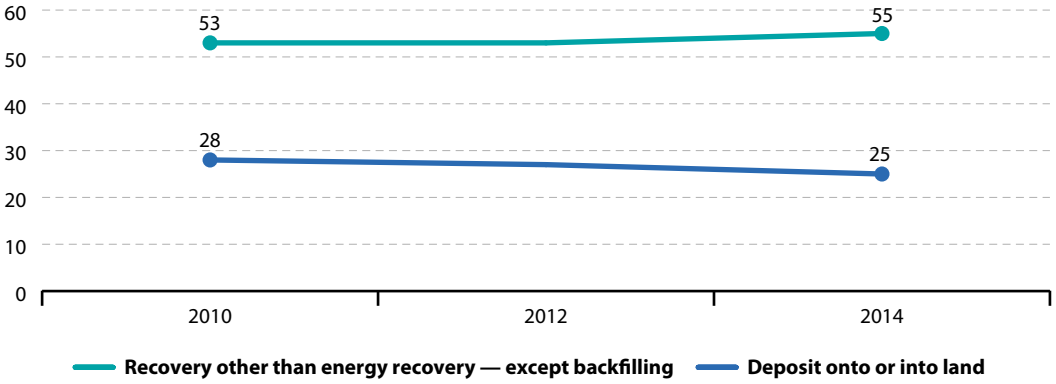
The share of waste (excluding major mineral wastes) that is recycled in the EU rose slightly between 2010 and 2014, while the share of landfilling fell.



The indicator on waste management shows how much of a country's, or the EU's, own waste, excluding major mineral waste, is recycled, incinerated (with energy recovery and without), landfilled or backfilled. The data reflect the treatment of national waste and exclude waste that is imported from non-EU countries. The information on waste treatment is broken down into six treatment types: recovery, incineration with energy recovery, other incineration, disposal on land and land treatment, and other disposal.

More than half of the waste that undergoes waste treatment in the EU is recycled. Between 2010 and 2014, the share of recycling rose from 53 % to 55 %. At the same time, the share of landfilling — referring to the deposit of waste onto or into land — fell from 28 % in 2010 to 25 % in 2014. Incineration with energy recovery was also

Figure 12.11: Recycling and landfill rate of waste excluding major mineral wastes, EU-28, 2010–2014
(% of total waste treated)

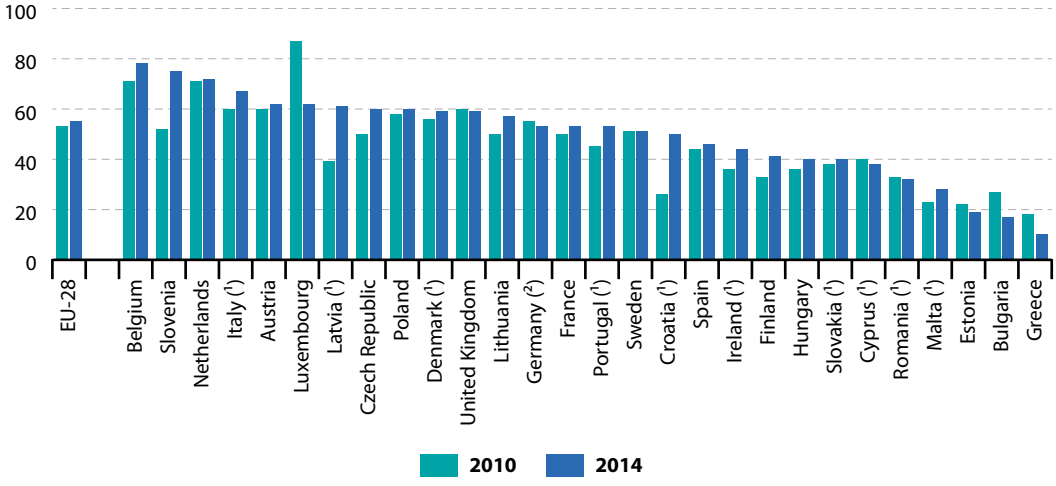


Note: 'Recycling' means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations, therefore, the category 'Recovery other than energy recovery — except backfilling' refers to recycling.

Source: Eurostat (online data code: sdg_12_60)

The Circular Economy Package ([37]) supports the transition to a stronger and more circular economy where resources are used in a more sustainable way.

Figure 12.12: Recycling rate of waste excluding major mineral wastes, by country, 2010 and 2014
(% of total waste treated))



(1) Definition differs.
(2) Estimates.

Source: Eurostat (online data code: sdg_12_60)

([37]) European Commission, 2015, *Closing the loop — An EU action plan for the Circular Economy*, COM(2015) 614 final, Brussels.

increasing, from 11 % in 2010 to 14 % in 2014. Other treatment methods collectively accounted for less than 10 % of waste treatment over the whole analysed period.

Recycling rates appear to be higher for total waste (excluding major mineral wastes) than for municipal waste; despite a considerable increase over the past decade, recycling rates of municipal waste remained below 50 % in the EU (45 % in 2015). For a more detailed analysis of recycling rates of municipal waste see the chapter on SDG 11.

In 2014 the recycling rates at Member State level ranged from 78 % in Belgium to 10 % in Greece. In Greece, Bulgaria and Estonia, with less than 20 % of the waste being recycled, more than three quarters of the waste was landfilled. Between 2010 and 2014 the strongest shifts from landfilling to recycling were observed in Croatia, Slovenia and Latvia. In contrast, Luxembourg experienced a significant drop in recycling rates, in favour of waste incineration with energy recovery.

Further reading on responsible consumption and production

European Environment Agency (2016), *The European environment — state and outlook 2015. Synthesis report — chapter 4. Resource efficiency and the low-carbon economy*, Copenhagen.

European Environment Agency (2016), *More from less — material resource efficiency in Europe*, EEA Report No 10/2016, Copenhagen.

European Environment Agency (2016), *Prevention of hazardous waste in Europe — the status in 2015*, EEA Report No 35/2016, Copenhagen.

European Environment Agency (2017), *Circular by design - Products in the circular economy*, EEA Report No 6/2017, Copenhagen.

UNEP (2016), *Global Material Flows and Resource Productivity*, An Assessment Study of the UNEP International Resource Panel, H. Schandl, M. Fischer-Kowalski, J. West, S. Giljum, M. Dittrich, N. Eisenmenger, A. Geschke, M. Lieber, H. P. Wieland, A. Schaffartzik, F. Krausmann, S. Gierlinger, K. Hosking, M. Lenzen, H. Tanikawa, A. Miatto, and T. Fishman. Paris, United Nations Environment Programme.

UNEP (2017), *Resource Efficiency: Potential and Economic Implications*, A report of the International Resource Panel. Ekins, P., Hughes, N., et al.

European Commission (2010), *Making sustainable consumption and production a reality. A guide for business and policy makers to Life Cycle Thinking and Assessment*, Luxembourg.

European Commission (2016), *Green growth for jobs and prosperity in the EU: report of the European Commission expert group 'R&I policy framework for green growth & jobs'*, Luxembourg.

13 Take urgent action to combat climate change and its impacts

The global perspective on SDG 13

The impacts of climate change, including changing seasons and weather patterns, rising sea levels and more extreme weather events, are affecting people everywhere in the world today. If left unaddressed, climate change will not only undo a lot of the development progress made over the past years, but it could also exacerbate current threats such as food and water scarcity, which can lead to hunger, poverty, conflict and increased migration. SDG 13 seeks to implement the commitment to the United Nations Framework Convention on Climate Change and operationalise the Green Climate Fund. It aims to strengthen countries' resilience and adaptive capacity to climate-related hazards and natural disasters by integrating climate change mitigation and adaptation measures into national strategies, policies and planning. This also requires improved education, awareness-raising and capacity on climate change mitigation and adaptation, as envisioned by SDG 13. Because the impacts of climate change have the biggest impact on the poorest and most vulnerable people, SDG 13 calls specifically for efforts to raise the capacity of least developed countries for climate change-related planning and management ([1]).

eurostat supports the SDGs

Monitoring SDG 13 'climate action' in an EU context focuses on the sub-themes 'climate mitigation', 'climate impacts' and 'climate initiatives'. Climate mitigation looks into key areas for fighting climate change such as reducing greenhouse gas emissions and promoting cleaner, less carbon-intensive energy. Climate impacts refers to the visible environmental changes and economic costs brought about by climate change such as mean near surface temperature deviation, mean ocean acidity and climate-related economic losses. Climate initiatives encompasses policy efforts to fight climate change such as the USD 100 billion international commitment on climate-related expenditure and Covenant of the Mayors. As shown in Table 13.1, the EU has made progress in the sub-theme climate mitigation. The trends for the other two sub-themes cannot be determined due to data availability issues.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 13.1: Indicators measuring progress in SDG 13, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Climate mitigation			
Greenhouse gas emissions	↑ (1)	↑ (1)	p. 261
Greenhouse gas emissions intensity of energy consumption	↗	↗	p. 265
Share of renewable energy in gross final energy consumption (*)	↑ (2)(3)	↑ (2)	SDG 7, p. 156
Energy consumption (*)	Primary ↗ Final (4) ↑	Primary ↑ Final (4) ↑	SDG 7, p. 150
Average CO_2 emissions per km from new passenger cars (*)	:	↗ (5)	SDG 12, p. 248
Climate impacts			
Mean near surface temperature deviation	:	:	p. 267
Climate-related economic losses	:	:	p. 269
Mean ocean acidity (*)	:	:	SDG 14, p. 291
Climate initiatives			
Contribution to the 100bn international commitment on climate-related expending	:	:	p. 271
Population covered by the Covenant of Mayors for Climate and Energy signatories	:	:	p. 273

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Trend in relation to the Europe 2020 target of reducing GHG emissions by 20 % by 2020 (compared to 1990).
(2) Trend in relation to the Europe 2020 target of raising the share of renewable energies in gross final energy consumption to 20 % by 2020.
(3) Past 11-year period.
(4) Trend in relation to the Europe 2020 target of increasing energy efficiency by 20 % by 2020 (compared to projections); for monitoring purposes this target has been translated in absolute target values for primary energy consumption (1 483 million tonnes of oil equivalents) and final energy consumption (1 086 million tonnes of oil equivalents) to be met by 2020.
(5) Trend in relation to the target of reducing average CO_2 emissions per km from new passenger cars to 95 grams by 2021.

Climate action in the EU: overview and key trends

Climate change is already a reality, and it is affecting countries all across the globe. Its effects are noticeable: higher temperatures, changing climate patterns, rising sea levels and more extreme weather events. Climate change is mainly driven by greenhouse gas emissions from human activities. If left unaddressed, climate change can undo a lot of the environmental, social and economic progress made over the past decades. It can threaten the viability of current economies and even make some regions less habitable through water and food scarcity. This can bring about mass migration and conflict, affecting the poorest and most vulnerable people the most. Fighting climate change requires promoting less carbon-intensive production and consumption of energy and creating cleaner and more resilient economies. Since climate change is a global challenge, surpassing national borders, it is an issue requiring international coordination and cooperation. Europe is taking a lead in this context. Not only has it adopted ambitious greenhouse gas emission targets, it also provides a large share of the funds needed for mitigation and adaptation measures. European cities have taken the lead in involving local governments in the fight against climate change by forming the world's biggest urban climate and energy initiative — the Covenant of Mayors for Climate and Energy.

Climate mitigation

Greenhouse gas emissions (GHG emissions), as the source of man-made climate change, is the main indicator used to track the success of mitigation measures to combat climate change. As part of its Europe 2020 strategy, the EU set a GHG emission target to reduce emissions by 20 % by 2020 compared to 1990. In 2015, the EU had already exceeded this with a reduction of 22 % since 1990.

Because most GHG emissions arise from the combustion of fuels to produce energy, **the GHG intensity of energy consumption** can be used as a measurement of progress towards shifting away from high-carbon fossil fuels to low-carbon energy technologies. High-carbon energy sources include lignite and hard coal, as well as oil. Natural gas is a less carbon-intensive fossil fuel. However, the lowest carbon emissions are emitted when renewable energy sources are used. The EU has made progress in reducing its GHG intensity of energy consumption over recent decades, although at a relatively slow pace.

This development is directly connected to the **uptake of renewable energy**, measured by its share in gross final energy consumption. Parallel to reducing its GHG emissions, the EU seeks to increase its use of renewable energy. Renewable energy sources are practically inexhaustible or renew within a human lifetime. In contrast, fossil energy sources regenerate over millions of years and are the main source for man-made greenhouse gas emissions, thus contributing significantly to climate change. The EU highlights the importance of renewable energies in the context of its climate change mitigation targets and the decarbonisation of the energy system (see also chapter 7). Since 2004, the EU has steadily increased the share of renewables in energy consumption and is on track to meeting its target of 20 % by 2020.

Another way to reduce GHG emissions from energy consumption is to reduce the use of energy. A more efficient energy system reduces the **energy consumption** of services and products. This means it also reduces costs, dependencies and environmental impacts linked to energy supply and use. The EU aims to improve its energy efficiency along the whole energy supply chain, meaning it seeks to reduce both its primary and its final energy consumption. Due to considerable reductions in energy consumption since 2006, the EU is on track to meeting its energy efficiency target to increase its energy efficiency

by 20 % by 2020 compared to a business-as-usual scenario.

The average **CO_2 emissions per km from new passenger cars** is an indicator that measures the progress towards increasing the use of low-carbon technologies in transport. In the EU, average CO_2 emissions per km from new passenger cars fell by 13 % between 2011 and 2016, and the fleet average target was met in 2012. However, actual reductions in emission intensity, as measured by CO_2 emissions per km, are lower than the indicator's estimates, which are based on the laboratory test cycle of the New European Driving Cycle (NEDC). Under real-world driving tests, new European passenger cars have been found to emit on average around 40 % more CO_2 than in the laboratory ([2])([3])([4]). Transport (excluding international aviation and shipping) accounted for 20.3 % of total EU emissions in 2015, making this sector the second largest emitter after the energy industries. The transport sector is also the only sector (including international aviation) which shows higher GHG emissions in the EU compared to 1990 levels, mainly due to an increase of passenger car traffic. As the main emission source within transport, passenger cars need to decrease their emissions at a faster pace to reach the 2021 target value of 95 grams of CO_2 per km.

Climate impacts

Climate change is affecting Europe through rising land and sea temperatures and changing precipitation patterns. In general, wet regions are becoming wetter while dry regions are becoming drier. Climate-related extremes such as heat waves, heavy precipitation and droughts are increasing in frequency and intensity in many regions, while south-eastern and southern Europe are projected to be particularly affected, as well as coastal areas of western Europe ([5]).

Long-term changes in the near-surface temperature are an important indication of a changing climate. Most impacts of climate change, including those caused by extreme climate events, increase when global near surface temperatures increase. The **near surface air temperature** is an average of temperature observations measured over land and seas by thousands of weather stations on land, buoys and ships. Records of near surface temperature are available for centuries with detailed data going back to 1850. They show that near surface temperatures have followed rises in the concentration of greenhouse gases in the atmosphere with a certain time lag. Although strategies and policies for climate mitigation are in place in Europe, near surface temperature levels continue to rise. 2016 was the hottest year ever measured worldwide, while the warmest year on record in Europe was 2014, followed by 2015. These developments raise the question whether climate action in EU and worldwide is sufficient to stop global warming.

Economic losses caused by climate extremes are an indicator of the impacts of weather and climate-related events on economies and their development over time. However, the indicator varies strongly over time because most economic losses are caused by only a few extreme events. The potential impact of weather or climate-related events depends on the vulnerability of the exposed communities.

Rising CO_2 levels in the atmosphere are not only leading to global warming, they also affect the oceans which are absorbing more and more amounts of the gas. **Ocean acidification** is one of the indicators measuring the impacts of CO_2

([2]) Uwe Tietge et al. (2016), *From Laboratory to Road — A 2016 update of official and 'real world' fuel consumption and CO2 values for passenger cars in Europe*, International Council on Clean Transportation.
([3]) To close this gap between laboratory testing and emissions in real driving, the Commission is replacing the NEDC test cycle with the new World Harmonised Light Vehicles Test Procedure (WLTP), which brings the test results closer to the real driving emissions. WLTP is being phased-in, starting with new passenger car types, from 1 September 2017, followed by all new passenger car registrations from 1 September 2018.
([4]) European Commission Directorate-General for Research and Innovation, Scientific Advice Mechanism (SAM) (2016), *Closing the gap between light-duty vehicle real-world CO_2 emissions and laboratory testing*, High Level Group of Scientific Advisors, Scientific Opinion No. 1/2016.
([5]) EEA (2017), *Climate change, impacts and vulnerability in Europe 2016 — An indicator-based report*, Luxembourg: Publications Office of the European Union.

emissions on the seas. Chemical reactions reduce carbonate ions in the water, making it more acid. Lower carbonate levels in water reduce the ability of calcifying organisms (for example, coral reefs, plankton, and mussels) to survive. Acidification also affects biological processes of organisms, such as primary producers, by changing the bioavailability of nutrients and affecting biological processes, such as photosynthesis. Thereby, ocean acidification affects the basis of marine ecosystems. Ocean acidification is closely reflecting increases in carbon dioxide in the atmosphere. The acidification of the oceans has been continually increasing since the 1980s when systematic measurements started. The largest increase in surface water acidity has been observed in the northern North Atlantic ([6]).

Climate initiatives

To support climate change mitigation and improve the resilience and capacity to adapt to climate-related hazards, the EU provides financial resources to developing countries. Developed countries, including the EU and its Member States, agreed in Copenhagen in 2010 to mobilise jointly USD 100 billion dollars a year in climate finance for climate action in developing countries. The fulfilment of this goal will come from a wide variety of sources: public and private, bilateral and multilateral, including alternative financial sources. The indicator measuring the **contribution to the USD 100 billion international commitment on climate-related expending** monitors the climate-related finance flows from EU Member States, the European Commission and the European Investment Bank to developing countries. The European contribution has increased from 2014 to 2015, with Member States' contributions being diversely distributed.

The Covenant of Mayors for Climate and Energy (CoM) was launched in 2008 as a bottom-up movement uniting local and regional authorities around a common CO_2 reduction target for 2020 and a shared vision on sustainable energy. In 2015, the initiative took on new objectives by adopting an integrated approach to mitigation and adaptation and setting more ambitions climate targets. The new Covenant of Mayors for Climate and Energy signatories commit to reduce GHG emissions by at least 40% by 2030; to enhance resilience to the impacts of climate change and to improve access to secure, sustainable and affordable energy for all. The **share of EU population covered by the CoM** is measuring the uptake of the initiative in EU municipalities. It has grown consistently over the past years, now covering more than a third of the EU population.

The initiative was further reinforced through the alliance with the Compact of Mayors. In January 2017, the Global Covenant of Mayors for Climate and Energy was launched becoming the largest global alliance committed to climate leadership, bringing together more than 7 400 cities and local governments from six continents and 121 countries representing more than 680 million residents as of September 2017.

([6]) Intergovernmental Panel on Climate Change (IPCC) (2013), *Climate Change 2013, The Physical Science Basis*, Fifth Assessment Report.

Climate action in the EU

Climate mitigation

Greenhouse gas emissions in 2015
77.9 % Index 1990 = 100
- 8.0 index points since 2010

Emissions intensity of energy consumption in 2015
89.1 % Index 2000 = 100
- 3.7 index points since 2010

Energy consumption in 2015

Primary energy
1 530 Mtoe
- 7.7 % since 2010

Final energy
1 082 Mtoe
- 6.9 % since 2010

Share of renewable energy in 2015
16.7 %
+ 3.8 pp since 2010

CO_2 emissions from new passenger cars (1) in 2016
118.1 gr CO_2 per km
- 13.0 % since 2011

Climate impacts

Near surface temperature deviation in 2016

Global:
1.09–1.20 °C temperature deviation, compared to 1850-1899 average

European:
1.80–1.84 °C temperature deviation, compared to 1850-1899 average

The earth is becoming hotter

Climate-related economic losses in 2015
11.6 billion EUR

Ocean acidity in 2014
8.07 pH
Ocean acidity is increasing

Climate initiatives

Climate-related expenditure in 2015
17.6 billion EUR

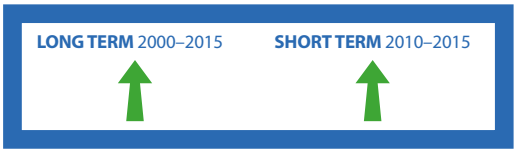
Population covered by the Covenant of Mayors for Climate and Energy in 2016
186.8 million

(1) 2011 data refer to EU-27.

Source: Eurostat (online data codes: sdg_13_10, sdg_13_20, sdg_07_10, sdg_07_40, sdg_07_11, sdg_12_30, sdg_13_30, sdg_13_40, sdg_14_50, sdg_13_50 and sdg_13_60)

Greenhouse gas emissions

The EU has reduced its GHG emissions by 22 % compared to 1990 and thereby already exceeded its 2020 target of a 20 % reduction. GHG emissions have continued to fall during the recent economic recovery.

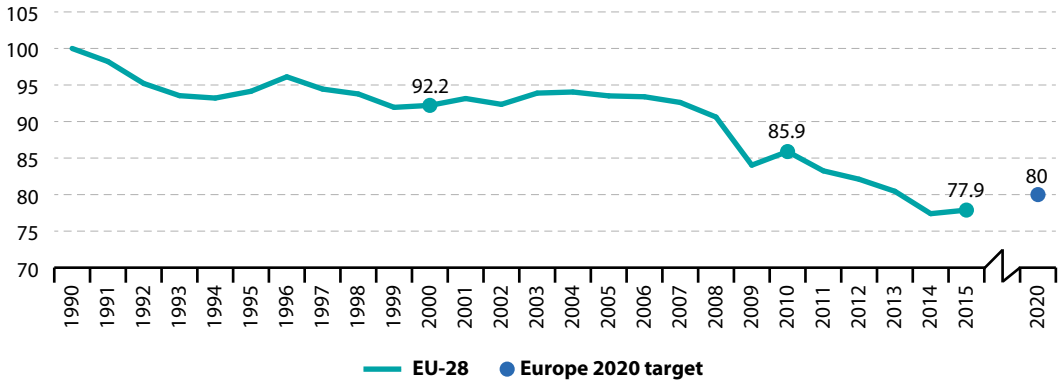


This indicator entails all man-made emissions of the so called 'Kyoto basket' of greenhouse gases, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and the so-called F-gases (hydrofluorocarbons, perfluorocarbons, nitrogen triflouride (NF_3) and sulphur hexafluoride (SF_6)). Using each gas' individual global warming potential (GWP), they are being integrated into a single indicator expressed in units of CO_2 equivalents. Emissions data are submitted annually by Member States in their reports the United Nations Framework Convention on Climate Change (UNFCCC). The indicator is published by Eurostat based on data from the European Environment Agency (EEA)

By 2015, the EU as a whole had cut man-made GHG emissions by 22 % compared to 1990 and was therefore already exceeding its 2020 GHG emission target. Emission reductions during the early 1990s were mainly the result of structural changes and modernisation of European industries, such as a shift towards service economies and an increased use of gas. In the following years until 2007, emissions more or less stabilised. In this time frame, a rise in primary energy consumption was increasingly offset with a rising share of low-carbon energy use, particularly renewable energy. Also, manufacturing industries became more energy-efficient, the waste sector reduced its footprint during this period and agriculture reduced livestock and used less nitrogenous fertilisers ([7]).

Between 2008 and 2009 the economic crisis reduced industrial production, transport volumes and energy demand sharply, thus leading to a decline in GHG emission. However, although

Figure 13.1: Greenhouse gas emissions, EU-28, 1990–2015
(index 1990=100)

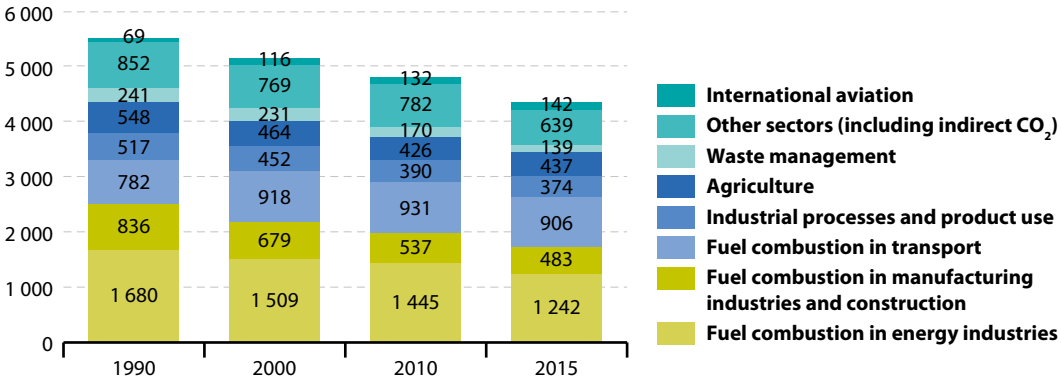


Note: Total emissions, including international aviation and indirect CO_2, but excluding emissions from land use, land use change, and forestry (LULUCF).

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_13_10)

([7]) Eurostat (2017), *Climate change — driving forces*.

Figure 13.2: Greenhouse gas emissions by sector, EU-28, 1990, 2000, 2010 and 2015
(million tonnes of CO_2 equivalent)



Source: European Environment Agency (EEA) (Eurostat online data code: env_air_gge)

GDP growth slowly picked up again in the years after, GHG emissions kept falling in the EU. Improvements in electricity generation and heat production (especially in thermal power stations), increased renewable energy generation and advances in energy efficiency contributed to this development ([8])([9])([10]). In addition, unprecedentedly high average annual temperatures and particularly warm winters in 2014 and 2015 reduced the need for heating fuel consumption.

A comparison of the years 2015 and 1990 shows all sectors contributed to the reduction of overall GHG emissions in the EU, except transport. While fuel combustion in the energy industries showed the strongest absolute decrease in emissions, it remained the main source in 2015. In contrast, transport emissions (excluding international aviation and shipping) were still 15.9 % higher in 2015 than in 1990, despite reductions achieved between 2007 and 2014. After 2007, fuel price increases along with the economic recession appear to have reduced freight transport demand, while energy efficiency improvements also contributed to emissions reductions, especially for passenger cars ([11]). However, these could not outweigh growth in passenger car traffic, caused by a rising number of cars in the EU. Transport (excluding international aviation and shipping) accounted for 20.3 % of total EU emissions and was therefore the second largest emitter in the EU after the energy industries. In addition, emissions from international aviation were almost twice as high in 2015 compared to their 1990 levels.

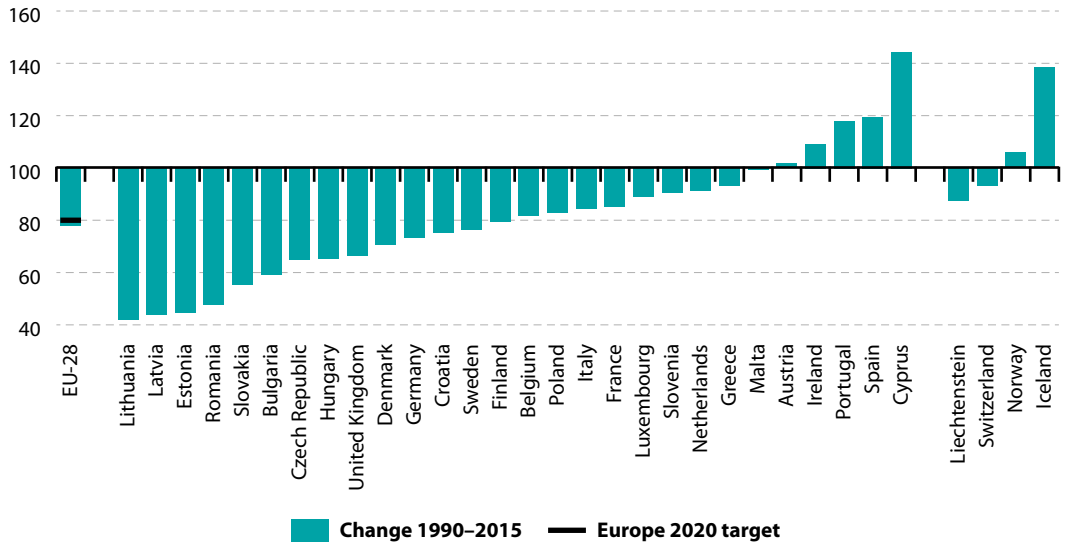
([8]) EEA (2016), *Trends and projections in Europe 2016 — Tracking progress towards Europe's climate and energy targets*, Copenhagen: European Environment Agency.
([9]) EEA (2015), *Trends and projections in Europe 2015 — Tracking progress towards Europe's climate and energy targets*, Copenhagen: European Environment Agency.
([10]) EEA (2017), *Analysis of key trends and drivers in greenhouse gas emissions in the EU between 1990 and 2015*, Luxembourg: Publications Office of the European Union.
([11]) Odyssee-Mure (2015), *Trends and policies for energy savings and emissions in transport*.

The Energy Union ([12]) supports the shift towards a resource-efficient, low-carbon economy to achieve sustainable growth through their legal frameworks and related initiatives (also see chapter on SDG 7 on p. 145). Relevant legislations have been proposed to support these policies. Most importantly, the European Council has agreed on three key targets for the year 2030: at least 40 % cuts in greenhouse gas emissions (from 1990 levels), at least 27 % share for renewable energy and at least 27 % improvement in energy efficiency. The European Commission has proposed to increase the energy efficiency target to 30 %.

With transport being one of the key sectors to meet the EU's commitments under the Paris agreement, the European Strategy for Low-Emission Mobility ([13]) makes an important contribution to reducing GHG emissions in this sector. Furthermore, the EU plans on Accelerating Clean Energy Innovation ([14]) to facilitate the clean energy transition through targeted research and innovation.

At Member State level, there are significant differences in GHG emission trends since 1990, ranging from reductions of almost 60 % to increases of more than 40 % by 2015. Most countries have reduced their emissions, with the largest relative reductions taking place in the Baltic countries and some central and south-eastern European countries. There, the economic transition after 1990 led to extensive GHG reductions, to which the modernisation in electricity and central heat production, and in direct fuel use, for example for heating purposes, also contributed.

Figure 13.3: Greenhouse gas emissions, by country, 2015 (index 1990=100)

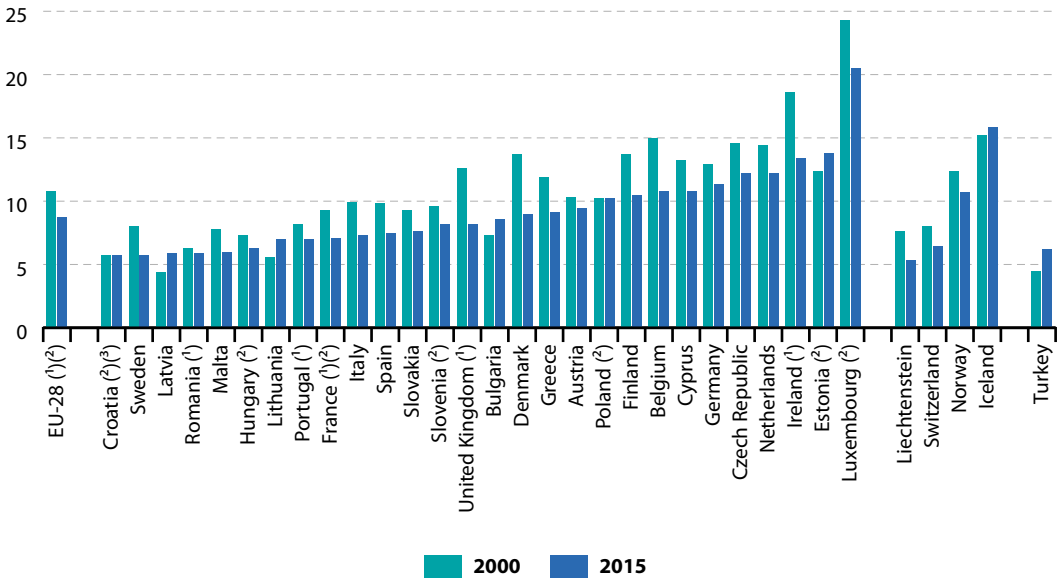


Note: Total emissions, including international aviation and indirect CO_2, but excluding emissions from land use, land use change, and forestry (LULUCF).

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_13_10)

([12]) European Commission (2015), *State of the Energy Union 2015*, COM(2015) 572 final, Brussels.
([13]) European Commission (2016), *A European Strategy for Low-Emission Mobility*, COM(2016) 501 final, Brussels.
([14]) European Commission (2016), *Accelerating Clean Energy Innovation*, COM(2016) 763 final, Brussels.

Figure 13.4: Greenhouse gas emissions, by country, 2000 and 2015
(tonnes of CO_2 equivalent per capita)



Note: Total emissions, including international aviation and indirect CO_2, but excluding emissions from land use, land use change, and forestry (LULUCF).
(1) 2015 data are provisional and/or estimates.
(2) Breaks in time series between 2000 and 2015.
(3) 2000 data are estimates.

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_13_10)

Dividing emission figures by population provides a way of comparing countries' GHG emissions on a more equal footing. Across the EU, per capita GHG emissions in 2015 ranged from 5.7 tonnes to 20.5 tonnes of CO_2 equivalents. Luxembourg by far exceeded the per capita emissions of the other Member States, which can be partly attributed to the considerable number of commuters and transit traffic ([15]) flowing into and through the country. Most countries reduced their per capita GHG emissions compared to the year 2000, except the Baltic states and Bulgaria, which, after tremendous reductions in the 1990s, have slightly increased their per capita emissions compared to 2000.

([15]) Eurostat (2010), *Using official statistics to calculate greenhouse gas emissions — A Statistical Guide,* Luxembourg: Publications Office of the European Union.

Greenhouse gas emissions intensity of energy consumption

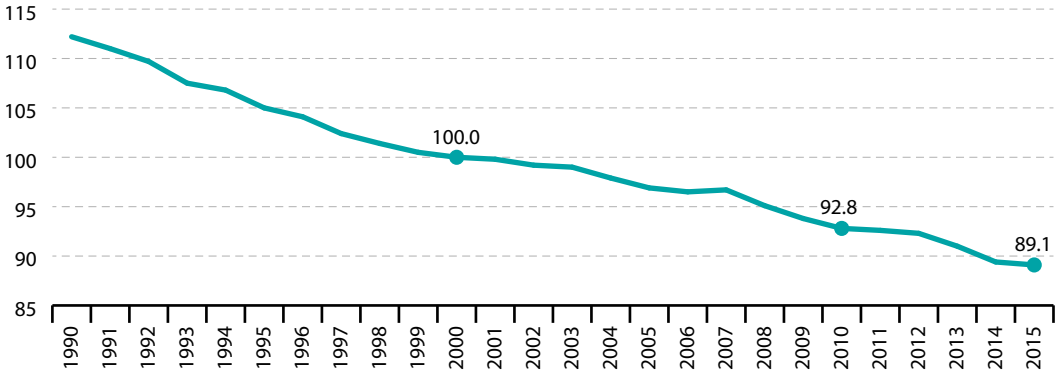
The amount of greenhouse gases emitted per unit of energy consumption has slowly but continually fallen throughout the past decades. This reduction is due to a shift towards less carbon-intensive energy sources such as renewable energy and gas.

LONG TERM 2000–2015 ↗ **SHORT TERM** 2010–2015 ↗

The GHG intensity of energy consumption is the ratio between energy-related GHG emissions and gross inland consumption (GIC) of energy. It expresses how many tonnes of CO_2 equivalent of energy-related GHGs are being emitted in a certain economy per unit of energy consumed. The data on energy emissions are sourced from the GHG emissions reported to the UNFCCC. GIC of energy figures are reported by each Member State to Eurostat and are the sum of final energy consumption, distribution losses, transformation losses and statistical differences.

The energy sector has a key role to play in the fight against climate change. The EU, based on its Energy Union ([16]) and the 2030 Climate and Energy Policy Framework ([17]), works to implement efficient sustainable energy policies that meet the greenhouse gas emission reduction objectives by increasing energy production from low-carbon energy resources, in particular renewables while improving energy efficiency, managing energy demand, increasing the stability and transparency of energy markets, developing and transferring clean energy technologies and intelligent solutions. Furthermore, the EU cooperates with developing countries to help them leapfrog towards sustainable and modern energy services and to decarbonise their energy mix to decouple economic growth from increases in harmful emissions.

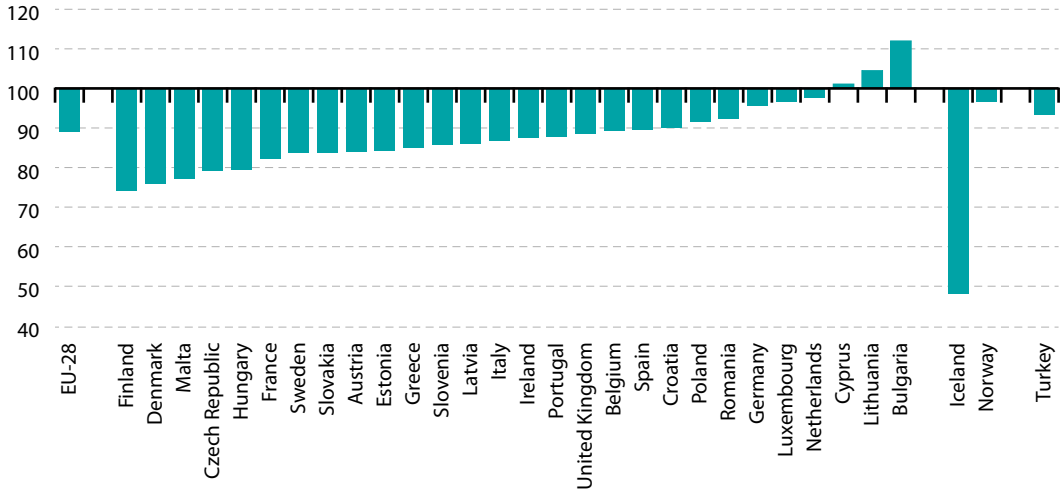
Figure 13.5: Greenhouse gas emissions intensity of energy consumption, EU-28, 1990–2015 (index 2000=100)



Source: European Environment Agency (EEA) (Eurostat online data code: sdg_13_20)

([16]) European Commission (2015), *State of the Energy Union 2015*, COM(2015) 572 final, Brussels.
([17]) European Council, *European Council (23 and 24 October 2014) — Conclusions*, EUCO 169/14, Brussels.

Figure 13.6: Greenhouse gas emissions intensity of energy consumption, by country, 2015
(Index 2000=100)



Source: European Environment Agency (EEA) (Eurostat online data code: sdg_13_20)

Because fossil fuel combustion is the primary source of GHG emissions, and fossil fuels still account for a sizeable part of total energy consumption, energy consumption has a tremendous effect on total GHG emissions. Therefore, there is a strong correlation between greenhouse gas emissions from energy and gross inland consumption of energy. However, since 1990, the extent to which energy consumption drives GHG emissions has decreased, and in 2015 was 21 percentage points lower than back then.

Between 1990 and 2015, gross inland consumption of GHG-intensive fuels such as coal (and other solid fuels) and oil has decreased from a share of 65 % of total energy consumption to 51 %. Less GHG-intensive energy sources, such as renewable energy or gas increased their market share with a rise from 4 % to 13 % and 18 % to 22 % between 1990 and 2015 respectively ([18]).

Across the EU, changes in the GHG emissions intensity of energy consumption between 2000 and 2015 ranged from reductions of almost 26 % to increases of 12 %. Notably, Iceland reduced the GHG intensity of its energy consumption by 52 % as a result of a strong growth in the share of renewable sources in its energy mix.

([18]) Eurostat (online data code: nrg_100a).

Mean near surface temperature deviation

The average global near surface temperature has been rising since the beginning of the 20th century. The year 2016 was the warmest on record, marking an increase of more than 1 °C over pre-industrial levels for the first time.

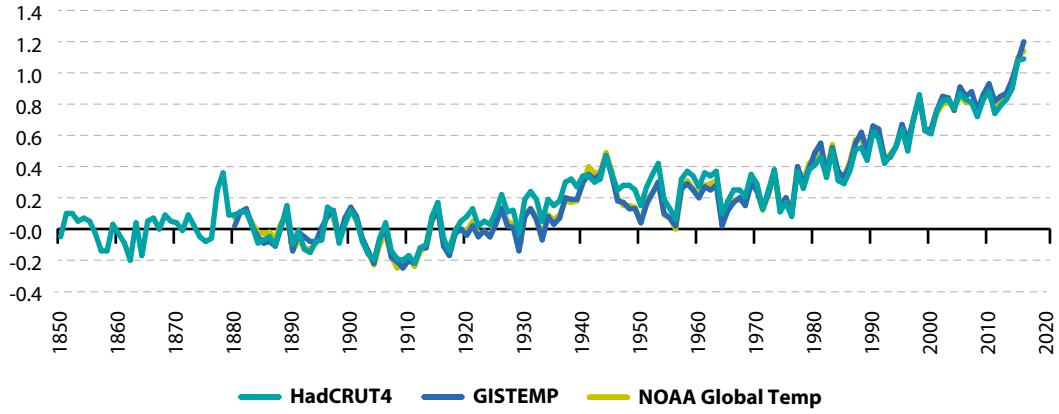
X CALCULATION OF TREND NOT APPLICABLE

This indicator tracks deviations in average near surface temperature worldwide and for Europe compared with the 1850 to 1899 average. These measurements have been taken for many decades by a dense network of stations across the globe. The data is monitored using standardised measurements and quality control and homogeneity procedures are used to ensure data are compatible and comparable. The average annual temperature in Figure 13.7 is expressed in relation to the 'pre-industrial' baseline period of 1850 to 1899, when widespread temperature measurement was being established ([19]). Data presented in this section stem from the European Environment Agency, based on Met Office Hadley Centre and Climatic Research Unit (HadCRUT4), NASA Goddard Institute for Space Studies (GISTEMP), National Centers for Environmental Information (NOAA Global Temp).

Rises in GHG levels in the atmosphere as a result of man-made emissions has led to warmer near surface temperatures. Recordings of the combined global land and marine surface temperature show a clear upward trend. Over the ten-year period from 2007 to 2016, global near surface temperature was on average 0.87 °C to 0.92 °C above pre-industrial levels (depending on the source) ([20]). This indicates that almost half of the warming towards the two degrees (2 °C) threshold has already occurred. The year 2016 was the hottest year ever measured worldwide, at 1.09 °C to 1.20 °C above pre-industrial levels.

Warming effects are stronger over land than over water ([21]). As a result, the temperature rise in the northern hemisphere is higher than in the southern hemisphere, where less land area is to

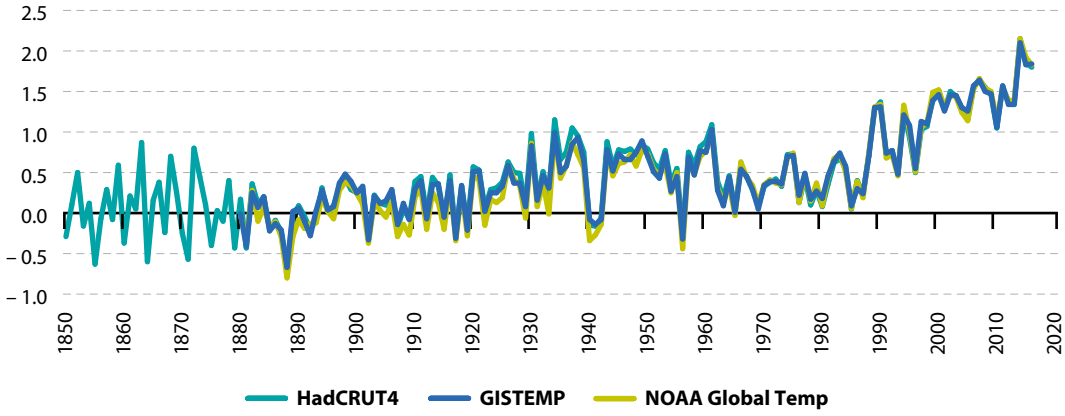
Figure 13.7: Global annual mean near surface temperature deviations, by calculation source, 1850–2016
(degree celsius)



Source: European Environment Agency (EEA) (Eurostat online data code: sdg_13_30)

([19]) EEA (2017), *Global and European temperature*.
([20]) As three different data sources are used for the analysis of mean temperature deviations (see Figures 13.7 and 13.8), temperatures at a certain point in time are included as temperature spans to show the range of values.
([21]) See footnote 19.

Figure 13.8: European annual mean near surface temperature deviations, by calculation source, 1850–2016
(degree celsius)



Source: European Environment Agency (EEA) (Eurostat online data code: sdg_13_30)

The EU seeks to integrate climate action into different strands of its work. 20% of the EU budget for 2014 to 2020 shall address climate change. The European Commission's work on climate change adaptation is channelled through the external action instruments, managed by Directorates-General for International Cooperation and Development, Neighbourhood and Enlargement Negotiations and Service for Foreign Policy Instruments.

The EU has also been at the forefront of international efforts towards the Paris global climate agreement ([22]) and the Sendai Framework for Disaster Risk Reduction ([23]). It will implement the Paris agreement under the United Nations Framework Convention on Climate Change and is committed to implement the Sendai Framework for Disaster Risk Reduction 2015 to 2030.

be found on the globe. For these reasons, the average annual temperature over the European land area has warmed by more than the global temperature.

In Europe, the decade from 2007 to 2016 was the hottest on record with an average level of 1.57 °C to 1.61 °C above pre-industrial times. The warmest year on record in Europe was 2014 with 2.10 °C to 2.15 °C, followed by 2015 with around 1.83 °C to 1.92 °C above pre-industrial levels. In 2016, the mean temperature deviation was 1.80 °C to 1.84 °C above pre-industrial times.

The greatest warming has been observed over the Iberian Peninsula, mainly during summer, throughout Northern Europe during winter, and in mountainous regions. The number of unusually warm days has also increased substantially in Europe ([24]).

([22]) United Nations (2015), *Paris Agreement*.
([23]) United Nations Office for Disaster Risk Reduction (2015), *Sendai Framework for Disaster Risk Reduction*, Geneva.
([24]) EEA (2017), *Global and European temperature*.

Climate-related economic losses

Economic losses from weather and climate-related extremes have been considerable over the past decades. However, the occurrence of extremes has varied significantly over the years, as have the events' impacts on economic losses and casualties.

X CALCULATION OF TREND NOT APPLICABLE

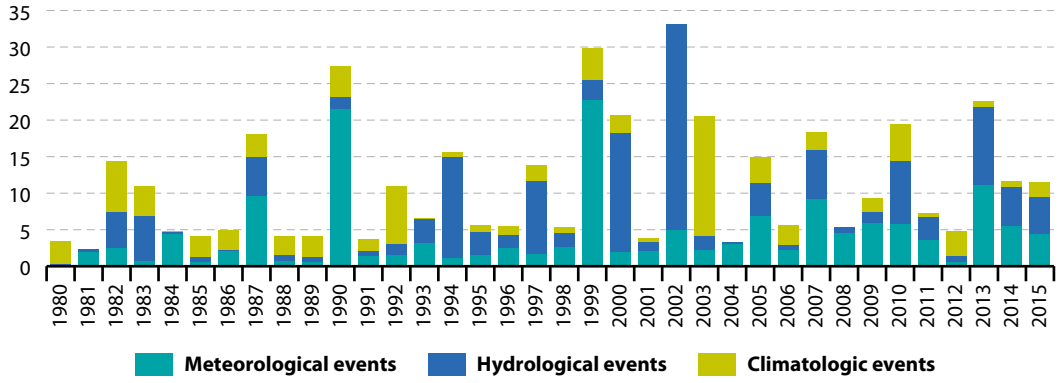
This indicator includes the overall losses from weather and climate-related disasters. It is based on data from the NatCatSERVICE managed by Munich Reinsurance Company ([25]). The NatCatSERVICE is a global database of natural catastrophe data around the world, collected since 1974.

Between 1980 and 2015 natural disasters caused by weather and climate-related extremes accounted for around 86 % of the monetary losses in the EU Member States. Throughout these 36 years, weather and climate-related losses accounted for a total of EUR 407 billion (at 2015 values) in Member States. Moreover, 86 952 casualties were registered over the period ([26]). Reported economic losses mainly reflect monetised direct damages to certain assets. Losses of human lives, cultural heritage or ecosystems services are not part of this estimate. The reported losses therefore represent only partial damage estimates.

Recorded economic losses from weather and climate-related extremes have varied substantially over time. More than 70 % of the total losses have been caused by just 3 % of disaster events. In contrast, three quarters of the registered events were responsible for approximately 0.5 % of the total losses. The most expensive climate extremes in the analysed period included the 2002 flood in Central Europe (almost EUR 20 billion), the 2003 drought and heat wave (EUR 15 billion) and the 2000 extreme precipitation event in France and Italy, all at 2015 values ([27]).

This variability makes the analysis of historical trends difficult, since the choice of years heavily influences the trend outcome. Because 2015 was a year with relatively low economic losses, the long- and short-term trends compared to five

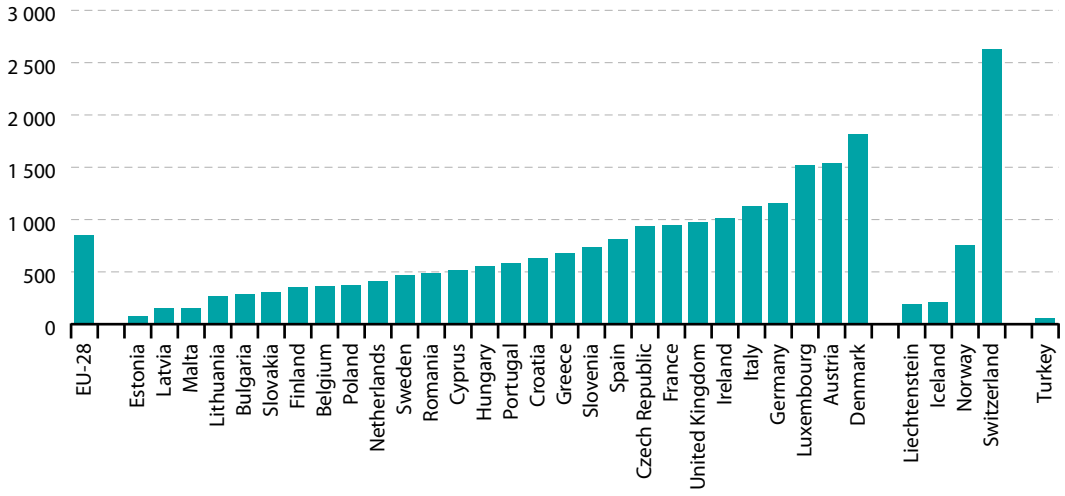
Figure 13.9: Climate-related economic losses, EU-28, 1980–2015
(billion EUR (2015 values))



Source: European Environment Agency (EEA) (Eurostat online data code: sdg_13_40)

([25]) Munich RE (2017), *NatCatSERVICE*.
([26]) EEA (2017), *Economic losses from climate-related extremes*.
([27]) Ibid.

Figure 13.10: Climate-related economic losses, by country, 1980–2015 (cumulative losses since 1980 in EUR per capita (2015 values))



Source: European Environment Agency (EEA) (Eurostat online data code: sdg_13_40)

The EU has made disaster and climate resilience a central objective of its humanitarian assistance. The EU Resilience Marker is used in all humanitarian projects to define ways to reduce disaster risks and to strengthen people's coping capacities to disasters and crises. The Action Plan for the Sendai Framework for Disaster Risk Reduction 2015–2030 ([28]) focuses heavily on climate change adaptation, linking it to disaster risk reduction strategies and their coherent implementation in EU partner countries.

and 15 years ago look rather positive. However, as can be seen in the figure, low disaster costs in the short term cannot be used as an indicator of future trends ([29]).

Past losses from weather and climate-related extremes appear to mainly be the result of greater exposure of people and economic assets, caused by population and wealth increase, and development in areas that are prone to hazards ([30]). It is not generally possible to attribute individual extreme events to climate change. However, statistical attribution studies have shown that various climate extremes in Europe and beyond have become stronger and/or more frequent as a result of global climate change ([31]).

As a first step towards policy action and monitoring weather- and climate-related losses at the European level, a scientific method is needed to record the losses at European governance levels to allow for comparison, aggregation and sharing of data. Also, international compatibility, for example with the UN, should be considered. Currently, there is no standardised mechanism for reporting of these losses by the Member States to the European Commission or the European Economic Area (EEA). However, the Joint Research Centre has developed recommendations to

([28]) European Commission (2016), *Action Plan on the Sendai Framework for Disaster Risk Reduction 2015-2030, A disaster risk-informed approach for all EU policies*, SWD(2016) 205 final/2, Brussels.
([29]) EEA (2017), *Economic losses from climate-related extremes.*
([30]) Ibid.
([31]) IPCC (2012), *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*, Special Report of the Intergovernmental Panel on Climate Change, Cambridge; New York: Cambridge University Press.

improve national databases to help record disaster losses. Once these comparable databases are available for all EEA member countries, there will be a more accurate picture of occurring costs throughout Europe ([32]).

The distribution of weather and climate-related losses across the EU was uneven, ranging from EUR 71 per capita to EUR 1 815 per capita in 2015.

Contribution to the 100 billion international commitment on climate-related expending

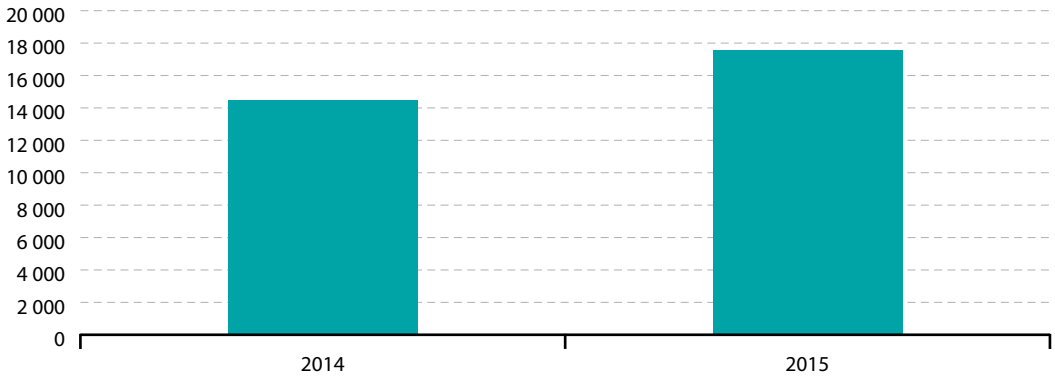
Contributions from the EU towards the goal of providing USD 100 billion in climate finance for developing countries each year by 2020 increased between 2014 and 2015. Member States' contributions varied significantly.

X CALCULATION OF TREND NOT APPLICABLE

The intention of the international commitment on climate finance under the United Nations Framework Convention on Climate Change (UNFCCC) is to enable and support enhanced action by developing countries to advance low emission and climate resilient development. The 21st UNFCCC Conference of the Parties in Paris urged developed-country Parties again to 'scale up their level of financial support, with a concrete roadmap to achieve the goal of jointly providing USD 100 billion annually by 2020 for mitigation and adaptation and to further provide appropriate technology and capacity-building support' ([33]). The data presented in this section are collected by the European Commission Directorate-General for Climate Action.

These funds are, however, not collected and distributed centrally, but represent a sum of a multitude of contributions that are being counted

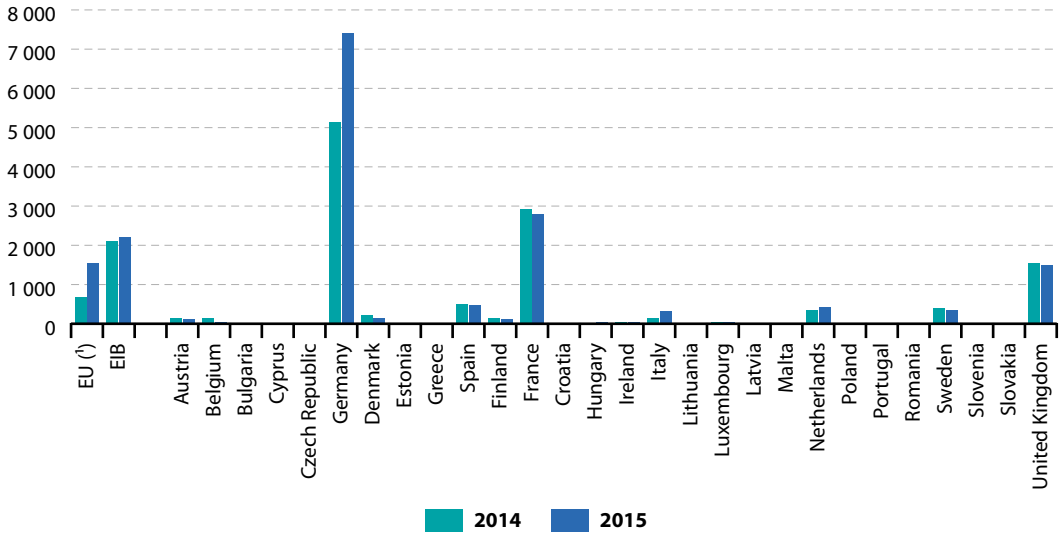
Figure 13.11: Contribution to the 100 billion international commitment on climate-related expending, EU total, 2014 and 2015
(million EUR (current prices))



Note: 'EU total' refers to expenditure by the European Commission, the EIB and the 28 Member States
Source: European Commission services and EIONET (Eurostat online data code: sdg_13_50)

([32]) JRC (2017), Disaster Loss and Damage Data.
([33]) UNFCCC (2017), Climate Finance.

Figure 13.12: Contribution to the 100 billion international commitment on climate-related expending, by country, 2014 and 2015
(million EUR (current prices))



(1) 'EU' refers to European Commission only (not EU-28 aggregate).

Source: European Commission services and EIONET (Eurostat online data code: sdg_13_50)

In 2015 the EU launched the Global Climate Change Alliance Plus (GCCA+), a seven-year thematic flagship programme to help the world's poorest and most climate-vulnerable countries shift to a climate-resilient, low-carbon future. The alliance is a platform for dialogue and exchange of experience between the EU and developing countries and is a source of technical and financial support.

towards the target. Internationally, there are no harmonised rules or guidelines governing what can count as international climate finance for this purpose. At the European level, these rules are laid down in Article 16 of the Monitoring Mechanism Regulation (MMR) ([34])([35]). There are continuing debates over what should be reported under this goal and about how to estimate the value of the contributions ([36]).

Total EU contribution towards the goal of EUR 100 billion per year increased from around EUR 14.5 billion in 2014 to EUR 17.5 billion in 2015. These numbers include financial flows from all Member States, as well as funds from the European Commission and the European Investment Bank (EIB).

The largest contributor to the international commitment in both years analysed was Germany, with contributions increasing from EUR 5.1 billion to EUR 7.4 billion, followed by France. The EIB and the European Commission were the third and fourth largest donors in 2015.

([34]) Regulation (EU) No 525/2013 of the European Parliament and of the Council of 21 May 2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC.
([35]) EEA (2017), *EIONET Reporting Obligations Database*, Reporting obligation for: Financial and technology support provided to developing countries.
([36]) Oxfam (2016), *Climate Finance Shadow Report 2016*, Oxford: Oxfam International.

Population covered by the Covenant of Mayors for Climate and Energy signatories

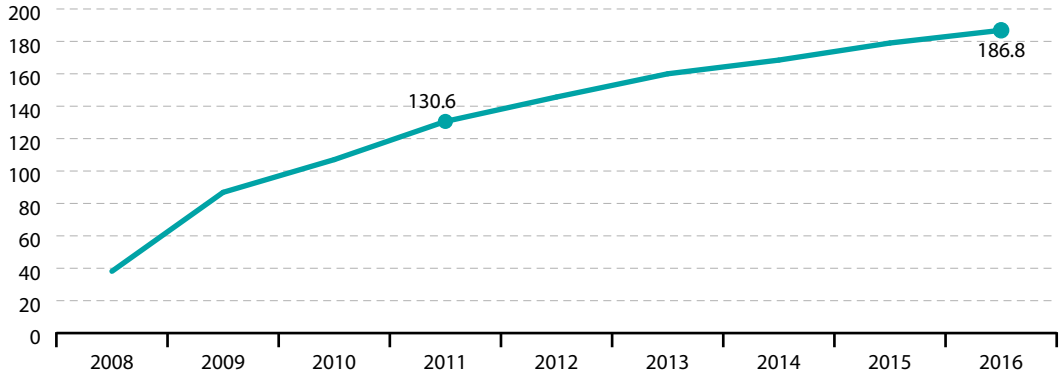
The number of signatories to the Covenant of Mayors is constantly growing. More than a third of the EU population was represented by signatory authorities in 2016.

X CALCULATION OF TREND NOT APPLICABLE

The Covenant of Mayors (CoM) is mentioned in various EU directives and strategy papers, such as the Energy Union Package, the Energy Security Strategy ([37]) or the Energy Efficiency Directive ([38]), as an important platform to deliver on strategic objectives targeted in those documents. Those objectives encompass various energy-related aspects, such as energy efficiency of buildings, energy security or renewable energy use.
By joining the CoM, participants in the past committed to submitting a Sustainable Energy Action Plan (SEAP) to the European Commission, including a baseline emission inventory, a GHG emission target for 2020 and planned actions to reach the target. Under the new CoM, new signatories are obliged to deliver integrated Sustainable Energy and Climate Action Plans (SECAPs) instead of the SEAPs, as demanded in the Clean Energy for All Europeans package ([39]). Furthermore, signatories must set up a biennial monitoring process to measure progress towards the targets. Various actors at different levels of governance, including provinces, regions, ministries, national energy agencies, metropolitan areas, groupings of local authorities, are eligible to become signatories.

According to data from the CoM office, 6 217 active authorities out of the 6 274 who had signed by the end of 2016 (status 'published', excluding 'on-hold') were from the EU-28. The signatories represented about 187 million inhabitants in the EU-28 — an increase of 56.2 million within five

Figure 13.13: EU population covered by the Covenant of Mayors for Climate and Energy, EU, 2008–2016
(million persons)

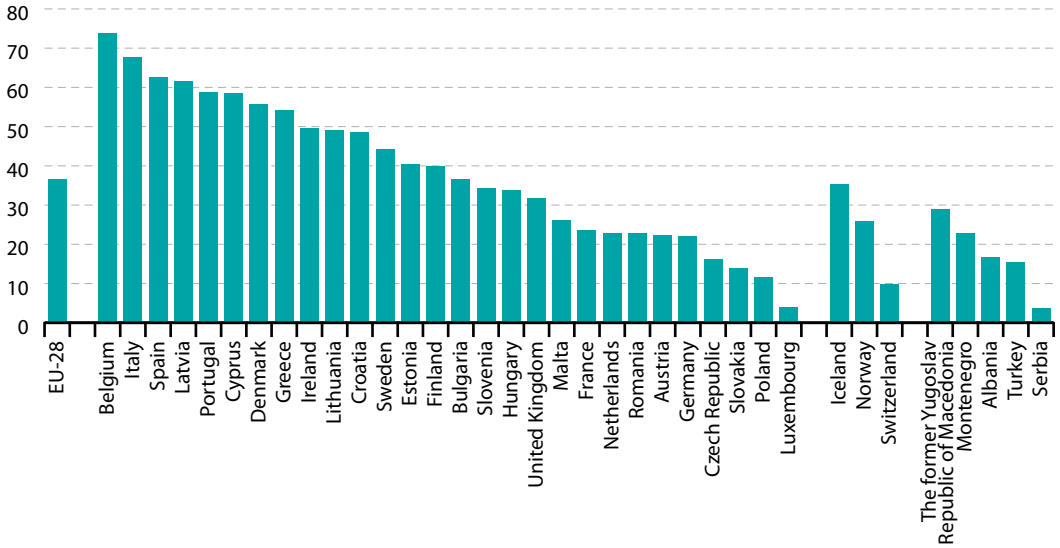


Note: excluding signatories put 'on hold'.

Source: Covenant of Mayors (Eurostat online data code: sdg_13_60)

([37]) European Commission (2014), *European Energy Security Strategy*, COM(2014) 330 final, Brussels.
([38]) Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC.
([39]) European Commission (2017), *Commission proposes new rules for consumer centred clean energy transition*.

Figure 13.14: EU population covered by the Covenant of Mayors for Climate and Energy, by country, 2016
(% of population)



Source: Covenant of Mayors (Eurostat online data code: sdg_13_60)

The European Climate Change and Adaptation Platform (CLIMATE-ADAPT) is a partnership between the European Commission and the European Environment Agency and aims to support Europe in adapting to climate change by giving access and sharing data and information on: expected climate change in Europe; current and future vulnerability of regions and sectors; EU, national and transnational adaptation strategies and actions; adaptation case studies and potential adaptation options; and tools that support adaptation planning.

years — and about 205 million inhabitants across Europe. In addition, 1 466 signatories in the EU were put 'on hold' by the CoM because they had not submitted the necessary documents for participation within the established deadlines.

Italy had the highest number of signatories at the end of 2016 with 3 217, representing 41.0 million inhabitants, followed by Spain with 1 762 signatories representing 29.1 million inhabitants. Both countries together account for 80 % of signatories and 36.7 % of the represented population within the EU. Naturally, the size of participating signatories differs. While many signatories in Italy and Spain are small municipalities, other countries have fewer but larger signatories. Germany, for example, only had 59 signatories by the end of 2016, but these represent 18.2 million people. The United Kingdom only had 35 signatories, which still represent 20.8 million inhabitants. These figures are largely determined by the participation of the largest cities in these countries, Berlin and London.

Belgium had the highest share of population covered by the CoM, followed by Italy and Spain. The lowest share was found in Luxembourg, which had two active signatories, but the city of Luxembourg, the most dense population centre of the country, was put 'on hold' at that time.

Further reading on climate action

EEA (2017), *Analysis of key trends and drivers in greenhouse gas emissions in the EU between 1990 and 2015*, Luxembourg: Publications Office of the European Union.

EEA (2017), *Climate change, impacts and vulnerability in Europe 2016 — An indicator-based report*, Luxembourg: Publications Office of the European Union

EEA (2016), *Trends and projections in Europe 2016 — Tracking progress towards Europe's climate and energy targets*, Copenhagen: European Environment Agency.

European Commission (2017), *Climate Action*.

Eurostat (2017), *Climate change — driving forces*.

Eurostat (2016), *Smarter, greener, more inclusive? Indicators to support the Europe 2020 Strategy, 2016 Edition*, Luxembourg: Publications Office of the European Union

IPCC (2014), *Climate Change 2014: Synthesis Report. Contribution of Working Group I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge; New York: Cambridge University Press

IPCC (2013), *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge; New York: Cambridge University Press

IPCC (2012), *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, Special Report of the Intergovernmental Panel on Climate Change*, Cambridge; New York: Cambridge University Press

Oxfam (2016), *Climate Finance Shadow Report 2016*, Oxford: Oxfam International

UNFCCC (2017), *Paris Agreement — Status of Ratification*.

14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development

The global perspective on SDG 14

Healthy oceans are fundamental to our existence. Not only do oceans produce an essential source of food and income for nearly 40 % of the global population, our climate, water and oxygen are all ultimately provided and regulated by the sea. SDG 14 aims to conserve this vital resource by achieving healthy and productive oceans and enhancing their sustainable use by implementing international law as reflected in UNCLOS. This includes the safeguarding of marine and coastal ecosystems, conserving at least 10 % of coastal and marine areas, and preventing and reducing marine pollution and the impacts of ocean acidification. The conservation and sustainable use of oceans, seas and marine resources also requires an end to overfishing, destructive and/or illegal fishing practices and the abolition of fisheries subsidies, which contribute to overcapacity of fishing fleets and overfishing. SDG 14 seeks to increase economic benefits to small-island developing states and least-developed countries from the sustainable use of marine resources and to provide access for small-scale artisanal fishers to marine resources and markets. It also highlights the importance of increasing scientific knowledge, research capacity and marine technology for improving ocean health ([1]).

eurostat supports the SDGs

Monitoring SDG 14 'life below water' in an EU context focuses on three sub-themes. 'Marine conservation' looks into the sufficiency of marine sites designated under the EU Habitats Directive. 'Sustainable fishery' refers to catches in major fishing areas and the assessed fish stocks exceeding fishing mortality at maximum sustainable yield and 'ocean health' encompasses bathing sites with excellent water quality and mean ocean acidity. As shown in Table 14.1, the EU's progress towards these areas is difficult to assess because of limited data availability.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 14.1: Indicators measuring progress in SDG 14, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Marine conservation			
Sufficiency of marine sites designated under the EU Habitats Directive	:	:	p. 282
Sustainable fishery			
Catches in major fishing areas	:	:	p. 284
Assessed fish stocks exceeding fishing mortality at maximum sustainable yield	↑ (1)	↑	p. 287
Ocean health			
Bathing sites with excellent water quality	:	↑	p. 289
Mean ocean acidity	:	:	p. 291

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(1) Past 12-year period.

Life below water in the EU: overview and key trends

The EU has made some advances in reducing over-fishing in the past decade. However, this trend is limited to the North-East Atlantic where about 60 % of assessed fish stocks were fished at sustainable levels with regards to fishing mortality, compared to less than 35 % in 2003. Despite this progress challenges remain, including a number of severely depleted stocks, excessive fishing pressure in the Mediterranean and Black Sea, declining biodiversity of underwater life, and the acidification and pollution of our oceans. Recent assessments of European seas ([2]) have noted that while still productive, they are neither healthy nor clean. However, there are ongoing efforts to redress this imbalance over the coming years. The EU is also working to improve the protection of marine biodiversity both through internal action and international commitments. Balancing the social, economic and environmental aspects of fisheries has always been a particular challenge. Unsustainable practices in the past meant that by the early 2000s, around two-thirds of fish stocks were overexploited. Today, some EU fish stocks are recovering due to policy reforms that have sought to increase the sustainability of the EU's approach to fisheries management. The main objectives of the EU's Common Fisheries Policy (CFP) ([3]) are to achieve environmentally, economically and socially sustainable fisheries and ensure the availability of food supplies through high long-term fishing yields for all stocks. This is referred to as maximum sustainable yield, or MSY. Projections for climate change impacts only highlight the urgency for more sustainable management of marine resources. Short-term European observations mirror the observed results from global monitoring of ocean acidification, highlighting the urgent need to act to reduce CO_2 emissions as part of ongoing efforts to mitigate climate change. Recognising the limitations of tackling these issues only at a European level, the EU has recently positioned itself to ensure a stronger system of ocean governance to achieve the conservation and sustainable use of both regional and international waters.

Marine conservation

Healthy and productive oceans are dependent on a diverse array of marine species and habitats. The loss of aquatic biodiversity and degradation of ecosystem services is a major threat to livelihoods, food security and climate stability in Europe and worldwide ([4]). One way to protect this biodiversity is through Marine Protected Areas (MPAs). In response to EU initiatives and international commitments, the spatial area of protected marine sites under the EU Habitats Directive went from 92 894 km^2 in 2008 to 395 528 km^2 in 2016, which represents more than a four-fold increase. But this still needs to significantly increase before 2020 to reach the agreed global target. The extent to which these designated areas sufficiently protect marine species and habitats cannot be understood by looking at spatial coverage alone. Monitoring the **sufficiency of marine sites designated under the EU Habitats Directive** is a useful way to understand the bigger picture. In 2013, protected areas covered only 55 % of the marine habitats and species listed under the Habitats Directive, in contrast to 92 % coverage for the terrestrial equivalents.

([2]) European Environment Agency (2015), *State of Europe's Seas*, EEA Report No 2/2015.
([3]) Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC.
([4]) Boelee E, Chiramba T & Khaka E (eds) 2011, *An ecosystem services approach to water and food security*, Nairobi: United Nations Environment Programme; Colombo: International Water Management Institute.

Sustainable fishery

Ensuring that European seas are healthy and productive with high long-term fishing opportunities depends, among many other factors, on the monitoring and management of current fishing activities. European fisheries directly affect fish stock productivity and stock size through catches. Looking at **total catches in major fishing areas** provides information on the total weight of fish caught by the European fleet, which declined by 21 % between 2000 and 2015. Catches do not provide a full picture of the sustainability of European fisheries, but are used here as a proxy indicator, until more suitable indicators become available at EU level ([5]).

In order to ensure that fish stocks are exploited sustainably, the EU aims to achieve maximum sustainable yield (MSY) — the crossover point at which the largest catch can be taken from a fish stock over an indefinite period without harming it ([6]). The data on **assessed fish stocks fished in accordance with maximum sustainable yield (F_{MSY})** shows that almost 60 % of stocks in the North-East Atlantic — the source of 77 % of all EU catches — were considered to be sustainably fished in 2015 with regards to fishing mortality. This compares to 34 % of stocks fished at F_{MSY} in 2007. Nonetheless, the status of many stocks remains unknown and in certain regional seas, such as the Mediterranean, overfishing is broadly between two and three times F_{MSY} ([7]). Against this background, complying with the CFP objective of achieving F_{MSY} for all stocks by 2020 will require more sustained efforts.

Ocean health

Efforts to ensure healthy and productive oceans are at the core of SDG 14. One aspect of this goal is preventing and reducing marine pollution. Contamination of coastal waters can be measured through indicators such as **bathing water quality** which takes into account microbiological and physicochemical parameters to monitor, for example, faecal and chemical contamination. However, the bathing water indicator provides a limited representation of the state of European seas as it only covers coastal waters and excludes marine waters beyond one nautical mile of the baseline ([8]). Bathing water quality has improved steadily since 2011. Although not all waters met the minimum quality standards required by 2015, a growing number of sites have achieved the EU Bathing Water Directive's most stringent 'excellent' quality standards.

Despite these improvements in contamination levels, human activities are leading to high levels of CO_2 being emitted and dissolved into the ocean. This leads to increased **ocean acidity** which changes ocean chemistry and endangers marine life. This is a global issue that cannot be tackled by or for any single geographical point or region. Although there is considerable variation within any given year, the decline in ocean pH is consistent and alarming. Before industrialisation, pH levels varied between 8.3 and 8.2. Annual surface ocean pH reached a new low of 8.07 in 2014 and it is projected to fall as far as 7.75 by the end of the 21st century, depending on future CO_2 emission levels ([9]). This acidification will have severe knock-on effects for marine species and ecosystems.

([5]) Catches do not include, for example, distinctions between stock size (biomass), fish abundance and diversity, fishing quotas, fishing effort and fleet capacity.
([6]) European Commission (2011), *Maximum sustainable yield.*
([7]) Scientific, Technical and Economic Committee for Fisheries (STECF) (2017), *Monitoring the performance of the Common Fisheries Policy (STECF-17-04)*, Publications Office of the European Union, Luxembourg.
([8]) Article 5 of the United Nations Convention on the Law of the Sea (UNCLOS) defines the normal baseline as the low-water mark as marked on large scale-charts by the coastal State.
([9]) European Environment Agency (2016), *Ocean acidification.*

Life below water in the EU

Marine conservation

Sufficiency of protected marine sites in 2013
55 %

Sustainable fishery

Fish catches in 2015
5 144 thousand tonnes live weight
+ 2.9 % since 2010

Overfishing in 2015
40.9 % of fish stocks
- 17.8 pp since 2010

Ocean health

Bathing water quality in 2016
87.0 % of costal bathing sites with excellent water quality
+ 5.7 pp in 2011

Ocean acidity in 2014
8.07 pH
Ocean acidity is increasing

Source: Eurostat (online data codes: sdg_14_10, sdg_14_20, sdg_14_30, sdg_14_40 and sdg_14_50)

Sufficiency of marine sites designated under the EU Habitats Directive

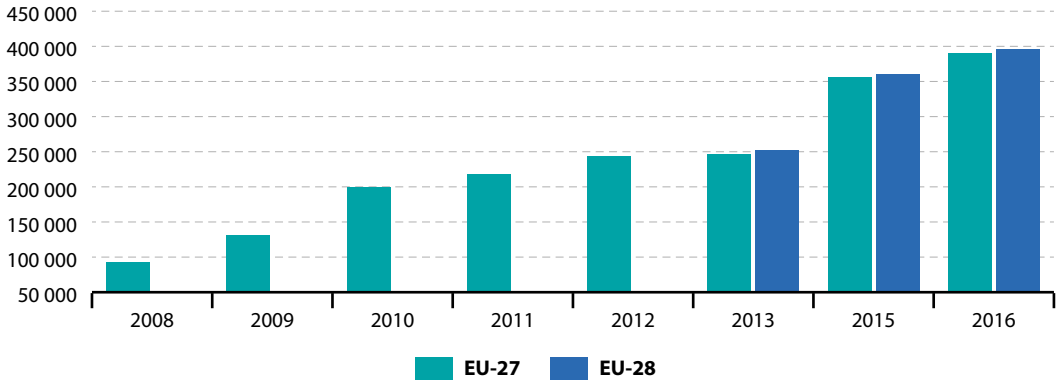
Between 2008 and 2015 the spatial coverage of marine sites designated for protection under the EU Habitats Directive quadrupled. However, these areas only sufficiently protect 55 % of listed marine species and habitats.

X INSUFFICIENT DATA TO CALCULATE TREND

The EU Habitats Directive requires Member States to designate and manage Sites of Community Importance (SCIs) to maintain or restore natural habitat types and species of EU interest to favourable conservation status. For each Member State, the marine sufficiency index expresses the share of species and habitats listed in the EU Habitats Directive for which the European Commission considers the national network of marine SCIs to be sufficient (in terms of number, extent, distribution and representativeness). The European Commission has reviewed the way the sufficiency index is calculated at least twice. These changes to calculations, as well as the addition of habitats and species (when new countries joined the EU), have led to changes in sufficiency levels as well as breaks in the time series. There was also a long delay in designating marine sites compared with terrestrial sites, explaining the strong data increase in 2015, when a catch-up took place. The data presented in this section are collected by European Commission Directorate-General for the Environment.

The Natura 2000 network designated under the Habitats and Birds Directives aims to protect the EUs marine life and biodiversity by creating Marine Protected Areas. This network is the largest single contributor of Marine Protected Areas (MPAs) in terms of area coverage of the EUs seas; Natura 2000 sites make up two-thirds of all EU MPAs (with nationally designated sites making up the remaining one-third of protected areas) ([10])([11]).

Figure 14.1: Marine sites designated under the EU Habitats Directive, EU-27 and EU-28, 2008–2016
(km^2)

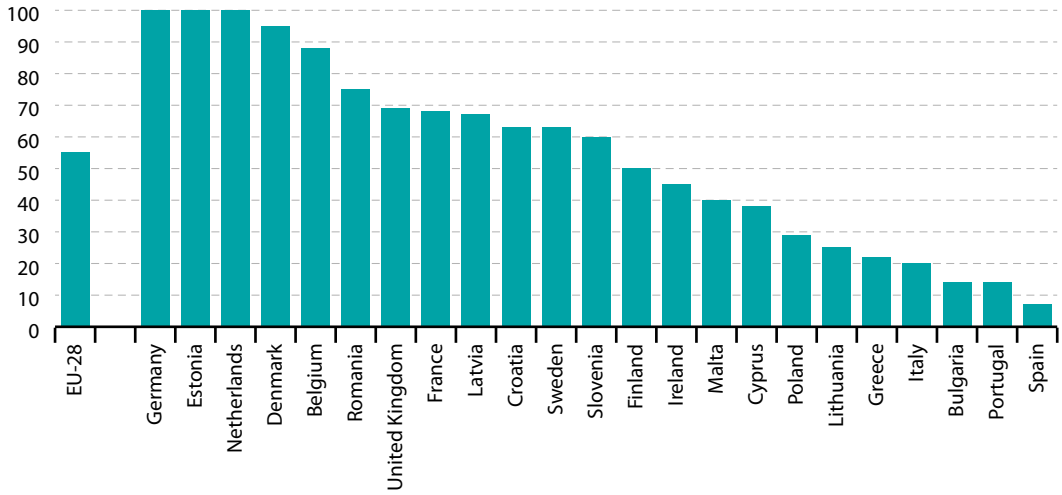


Note: No data for 2014.

Source: European Environment Agency (EEA), European Commission services (Eurostat online data code: sdg_14_10)

([10]) European Environment Agency (EEA) (2015), *Marine protected areas in Europe's seas — An overview and perspectives for the future*, EEA Report No 3/2015.
([11]) In addition, the four European Regional Seas Conventions (HELCOM, OSPAR, Barcelona and Bucharest) have established regional MPA networks. There is an almost one-to-one relationship between these and Natura 2000 sites. European Environment Agency (EEA) (2015), *Marine protected areas in Europe's seas — An overview and perspectives for the future*, EEA Report No 3/2015.

Figure 14.2: Sufficiency of marine sites designated under the EU Habitats Directive, by country, 2013
(sufficiency index (%))



Note: The indicator measures 'sufficiency', the extent to which marine species and habitats fall under the protection of marine Natura 2000 sites.

Source: European Environment Agency (EEA), European Commission services (Eurostat online data code: sdg_14_10)

The Habitats Directive ([12]) and the targets of the EU Biodiversity Strategy to 2020 ([13]) highlight the importance of preservation, conservation and restoration of habitats and species in European marine waters. The EU is also engaged in discussions at the United Nations General Assembly towards an international legally binding agreement on the conservation of biodiversity in areas beyond national jurisdiction (BBNJ).

The area of protected marine sites under the EU Habitats and Birds Directives increased from 92 894 km^2 in 2008 to 395 528 km^2 in 2016, which represents more than a four-fold increase. The sufficiency index increased by over 10 percentage points from 42 % in 2012 (EU-27) to 55 % in 2013 (EU-28).

The vast increase in the extent of protected marine areas is in part due to the EU's international commitments. There is no EU quantitative target for the coverage of marine protected areas in relation to overall marine and coastal surface area; however, the EU is bound by its commitments as a Party to the Convention on Biological Diversity. Aichi Target 11 of the global Strategic Plan for Biodiversity 2011–2020 ([14]) specifies that 10 % of marine and coastal areas are to be conserved by 2020. In 2012, it was calculated that the coverage of marine protected areas equated to 5.9 % coverage of total European coastal and marine areas ([15]), meaning there is a need to significantly increase efforts to meet the 10 % global target by 2020. An indicator to measure this progress has been developed by the European Environment Agency (EEA) and will be updated regularly, next

([12]) The Council of the European Communities, Council Directive 92 /43 /EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, No L 206/7.
([13]) European Commission (2011), *Our life insurance, our natural capital: an EU biodiversity strategy to 2020*, COM(2011) 244 final, Brussels.
([14]) Conference of the Parties to the Convention on Biological Diversity (2010),The Strategic Plan for Biodiversity 2011–2020 and the Aichi Biodiversity Targets.
([15]) European Commission (2015), *Report from the Commission to the European Parliament and the Council on the Progress in Establishing Marine Protected Areas (as Required by Article 21 of the Marine Strategy Framework Directive 2008/56/EC)*, Brussels.

in 2018, and in due course will form part of the EU monitoring reports.

Sufficiency of marine sites designated under the EU Habitats Directive varied strongly across the EU in 2013, ranging from 7 % to 100 %. Only Germany, Estonia and the Netherlands have attained sufficiency in terms of the habitats and species safeguarded in marine protected areas under the Habitats Directive. The five lowest rankings are occupied by Member States in the Mediterranean biogeographical region plus Bulgaria ([16]). It is unclear why indices are so low in this region, it may be due to a lack of political motivation or indeed a lack of adequate survey data on listed species and habitats.

There is, however, no clear correlation between extent of marine territory and sufficiency levels. A low level of sufficiency does not indicate a lack of protected marine areas. Rather it shows that the sites proposed do not sufficiently cover the marine habitats and species listed under the Habitats Directive for that Member State and/or biogeographical region. In 2013, protected areas covered only 55 % of the EU's marine habitats and species listed under the Habitats Directive, in contrast to 92 % for their terrestrial equivalents.

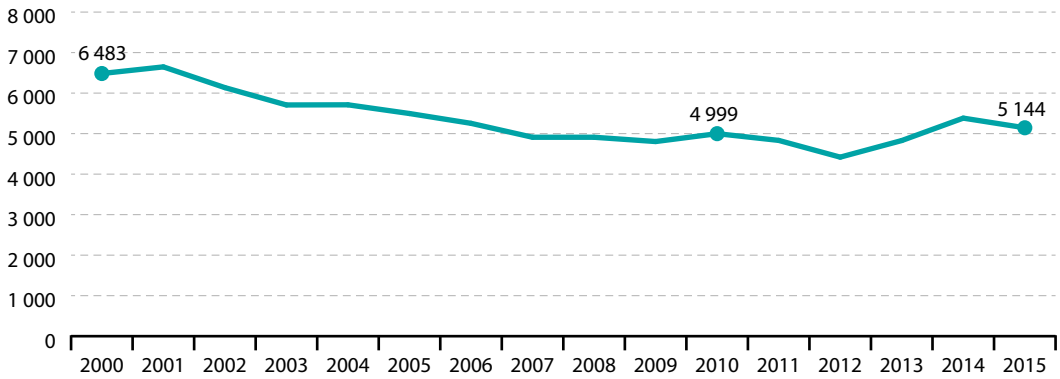
Catches in major fishing areas

Three-quarters of the total EU fish catch stems from the North-East Atlantic, primarily fished by Spain, Denmark and the United Kingdom. Catches have decreased by 21 % since 2000, but it is unclear whether this is due to efforts to reduce overfishing or the result of overfishing itself.

X CALCULATION OF TREND NOT POSSIBLE FOR THIS INDICATOR IN LIGHT OF SUSTAINABLE DEVELOPMENT OBJECTIVES

Monitoring fish catches provides a general picture of trends in capture fisheries. However, catch levels can be affected by large variations in fishing effort or fleet capacity. They must also be viewed in light of other factors that affect fish biomass such as ecosystem health and biodiversity. Because not enough information is available at EU level, total catches in major fishing areas has been chosen as a proxy indicator until more suitable indicators become available. The total EU catches in major fishing areas refers to all aquatic organisms (including fish, molluscs, crustaceans,

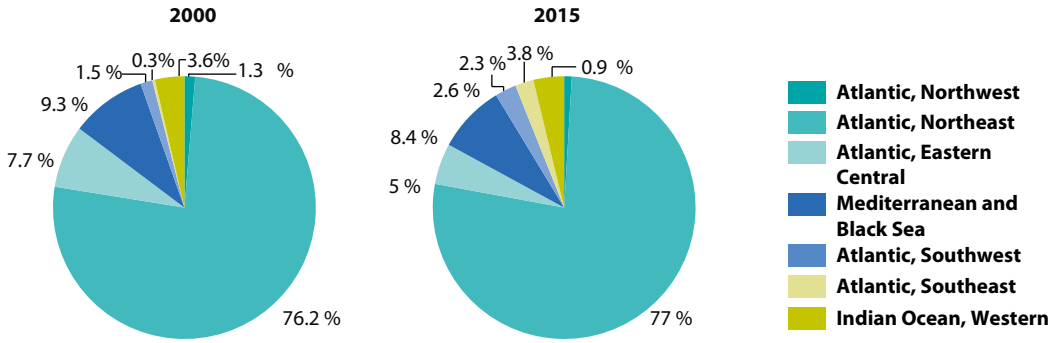
Figure 14.3: Catches from major fishing areas, EU-28, 2000–2015
(thousand tonnes live weight)



Source: Eurostat (online data code: sdg_14_20)

([16]) Area of similar character in terms of the biota (fauna & flora) present (Source: http://glossary.eea.europa.eu).

Figure 14.4: Catches from major fishing areas, by fishing area, EU-28, 2000 and 2015
(%)



Source: Eurostat (online data code: sdg_14_20)

The Common Fisheries Policy ([17]) aims to ensure the long-term sustainability of the sector by safeguarding stock reproduction for high long-term yield, improving distribution of fishing opportunities among countries, conserving marine resources and supporting the profitability of the industry.

The Marine Strategy Framework Directive ([18]) takes a comprehensive and integrated approach to the protection of the marine environment and natural resources with the aim of achieving Good Environmental Status of EU marine waters that are ecologically diverse, clean healthy and productive by 2020.

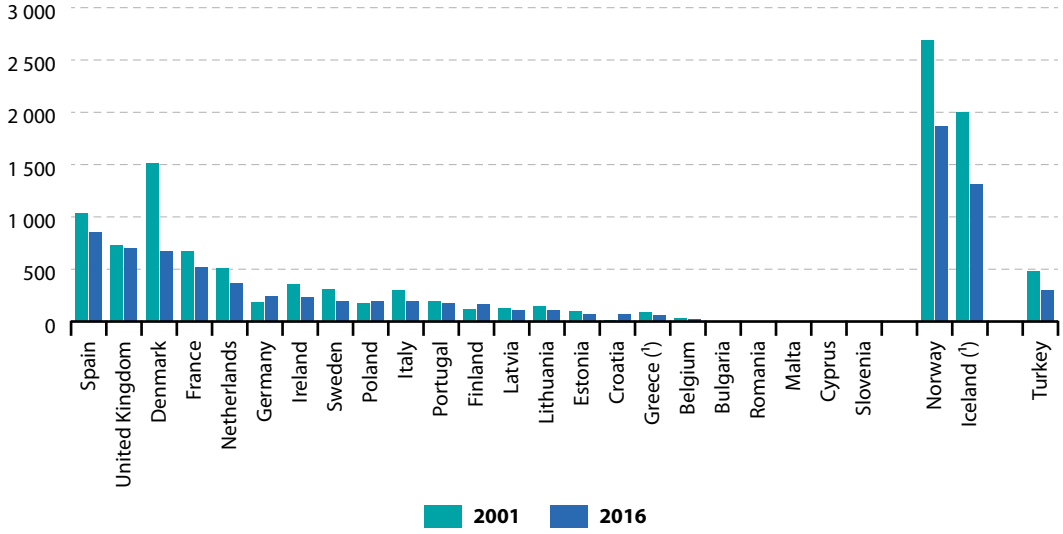
aquatic animals and plants) caught by EU vessels in their seven main fishing areas: The North-East Atlantic, the Mediterranean and Black Sea, the Eastern Central Atlantic, the Western Indian Ocean, the South-West Atlantic, the South-East Atlantic and the North-West Atlantic. Inland waters and production from aquaculture is not included.

Between 2000 and 2015, the overall EU fish catch declined by 21 %. This decline can be interpreted in different ways. On the one hand, the reduction may be the result of management efforts to reduce overfishing through measures such as lower quotas and reductions in fleet capacity. On the other hand, it could also be the direct result of overfishing itself, with catches falling as fish populations decline. However, the scientific evidence shows that stock sizes are increasing in the North-East Atlantic, indicating that smaller catches may be the result of reduced overfishing and a return to more sustainable catches. It is expected that as fishing mortality reduces and stock sizes increase, catches may increase in the medium term.

In 2015, the total EU fish catch from major fishing areas was 5 144 219 tonnes. This was higher than in 2010 but comparable to that of industrialised nations such as Japan (3 630 364 tonnes) and the United States (4 954 467 tonnes) in the same year ([19]). However, as noted, no real conclusions can be drawn on the underlying reasons for the differences in catch levels of these countries.

([17]) Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC.
([18]) Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).
([19]) United Nations Food and Agriculture Organisation (FAO) (2016), *The State of World Fisheries and Aquaculture*, p11.

Figure 14.5: Catches from major fishing areas, by country, 2001 and 2016
(thousand tonnes live weight)



(1) 2015 data (instead of 2016).

Source: Eurostat (online data code: sdg_14_20)

The geographical breakdown of the total EU fish catch has not changed significantly between 2000 and 2015. In both years most of the total EU catch (around three-quarters) came from the North-East Atlantic. The Mediterranean and Black Sea accounted for an average of around 9 % of the total catch. The biggest change was in the South-East Atlantic, where catches grew 461 % from 21 000 tonnes in 2000 to 117 000 tonnes in 2015. Although annual total allowable catches (TACs) are set, there is no quota system in place in the South-East Atlantic, which also contributes to some large year-to-year variations. Between 2000 and 2015, catches ranged from a low of 12 000 tonnes in 2005, to a high of 267 000 tonnes in 2008, when new Member States began to fish in this area.

The total fish catch varies greatly between EU countries. In 2016, Spain, the United Kingdom and Denmark together accounted for nearly half the EU total catch. The eight highest catches in the EU were exclusively from Member States bordering the Atlantic Ocean, which is the area that accounts for the greatest proportion of the total EU catch.

Of the Member States with fishing fleets, the majority (around two-thirds) have low national catches of less than 200 000 tonnes of fish. The lowest 10 catches (under 100 000 tonnes of fish each) came from eastern and south-eastern Member States, with the addition of Belgium. For these countries, marine fisheries are of low or no economic importance. One exception is Greece, where fisheries are of high socio-economic importance; despite having the eighth lowest catch, employment in the fisheries sector in Greece is the third highest in the EU ([20]). Other Member States maintain their catch on the basis of extensive subsidies; Italy for example, disburses the highest level of fisheries subsidies in the OECD ([21])([22]).

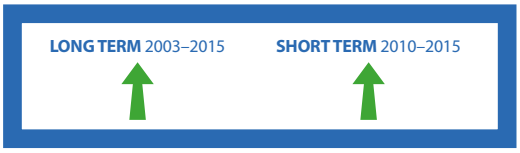
Looking at EFTA countries, Norway's fish catches (1 872 617 tonnes in 2016) were more than

([20]) European Union (2016), *Facts and figures on the Common Fisheries Policy*, p.16.
([21]) World Bank (2017), *Atlas of Sustainable Development Goals 2017: World Development Indicators*, Washington, DC: World Bank, p.81.
([22]) SDG 14 aims, by 2020, to prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing.

double the size of the EU Member State with the largest catch, Spain. This may be attributed not only to Norway's long coastline and access to very productive marine areas, but also to its long-standing tradition in sustainable and environmentally friendly fisheries management and regulations which have supported healthy fish stocks ([23]). Fish catches in both Norway and Iceland have decreased substantially (by more than 30 % and 34 % respectively) since 2001.

Assessed fish stocks exceeding fishing mortality at maximum sustainable yield

A positive downward trend in overexploitation of fish stocks shows the EU is making progress towards ensuring healthy and productive oceans. Most of the EU catch comes from the North-East Atlantic ([24]), where around 60 % of assessed stocks were fished within FMSY.

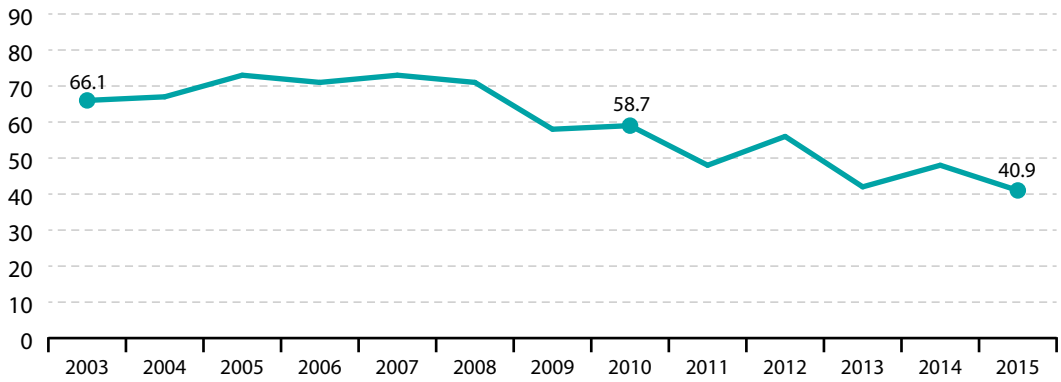


Fishing mortality (F) is a measure of fishing pressure that monitors the proportion of fish of a given age that is taken by fisheries during one year. Fishing mortality is the only variable that can be directly controlled by fisheries management. A fish stock is a group of fish from the same species that live in the same geographical area and mix enough to breed with each other when mature. Fisheries management cannot directly control stock size, but can influence it through fishing mortality. Stock size is also subject to natural variability that can overwhelm the influence of fishing from one year to the next. In order to ensure that fish stocks are exploited sustainably, the CFP aims to rebuild stocks above levels at which they can produce the maximum sustainable yield (MSY). MSY is the long-term average stock size that can be expected when stocks are fished at this level (FMSY). This indicator shows the proportion of fish stocks where fish mortality exceeds the mortality permissible to achieve MSY (F> FMSY)). Please note that this indicator excludes any assessments on reproductive capacity of fish stocks. The data presented in this section are provided by the Joint Research Centre (JRC).

The North-East Atlantic accounts for the highest proportion of the EU catch, with 77 % of total catches from the major fishing areas taking place here in 2015. In 2015, almost 60 % of stocks in this area were considered to be sustainably fished with regards to fishing mortality, compared to 34 % of stocks in 2007 ([25]). Clearly there is still some way to go with regards to the goals of the CFP, which aims to ensure high long-term fishing yields for all stocks by 2015 where possible and at the latest by 2020. Nevertheless, the reduction in the proportion of overexploited fish stocks between 2003 and 2015 is a positive sign for stock recovery. This progress is primarily due to increasing efforts towards sustainable fisheries management practices under the CFP reforms of 2002 and 2013 as well as the Marine Strategy Framework Directive ([26]) which requires that commercially exploited fish and shellfish populations are within safe biological limits with a healthy distribution of age and size. A recent report by the Scientific, Technical and Economic Committee for Fisheries (STECF) shows that across all assessed fish stocks in the North-East Atlantic, there has been a decline in the number of stocks where

([23]) United Nations Food and Agriculture Organisation (FAO) (2013), *Fishery and Aquaculture Country Profiles: The Kingdom of Norway.*
([24]) The assessment of fisheries in the North-East Atlantic includes the following Ecoregions: Baltic Sea; Bay of Biscay and the Iberian Coast; Celtic Seas; Greater North Sea.
([25]) These stocks were considered to be sustainably fished only in terms of fishing mortality, not in terms of reproductive capacity.
([26]) Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

Figure 14.6: Assessed fish stocks exceeding fishing mortality at maximum sustainable yield (FMSY) in the North-East Atlantic, 2003–2015
(% of fish stocks)



Source: Joint Research Centre, Scientific, Technical and Economic Committee for Fisheries (Eurostat online data code: sdg_14_30)

The Common Fisheries Policy ([27]) aims to ensure the long-term sustainability of the sector by safeguarding stock reproduction for high long-term yield, improving distribution of fishing opportunities, conserving marine resources and supporting the profitability of the industry. The Marine Strategy Framework Directive ([28]) takes a comprehensive and integrated approach to the protection of the marine environment and natural resources with the aim of achieving good environmental status of EU marine waters that are ecologically diverse, clean healthy and productive by 2020.

fishing mortality exceeds FMSY ([29]). These positive reductions in fishing mortality in the North-East Atlantic have resulted in increases in stock size, measured as spawning stock biomass (SSB). Average stock size increased by 35 % between 2003 and 2015 ([30]).

However, in other regions, the picture is less positive. In the Mediterranean, overfishing is broadly between two and three times FMSY for the region. Furthermore, in the Mediterranean and Black Seas, there are insufficient assessments of FMSY to allow for a realistic indication on the state of fish stocks ([31]). In the Mediterranean SSB is still chronic, with stocks showing an average biomass decline of 25 % between 2003 and 2015 ([32]). Against this background, complying with the CFP objective of achieving FMSY for all stocks by 2020 will require more sustained efforts.

Fishing mortality and SSB are also important metrics for assessing progress towards good

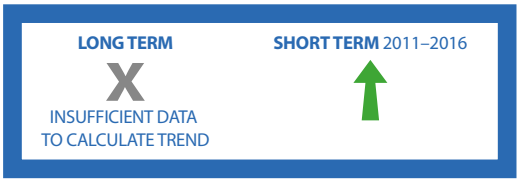
([27]) Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC.
([28]) Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).
([29]) Scientific, Technical and Economic Committee for Fisheries (STECF) (2017), *Monitoring the performance of the Common Fisheries Policy (STECF-17-04)*, Publications Office of the European Union, Luxembourg, p.25.
([30]) Id., p. 8.
([31]) See the EEA indicator 'Status of marine fish stocks' for stock information status in the European regional seas.
([32]) Scientific, Technical and Economic Committee for Fisheries (STECF) (2017), *Monitoring the performance of the Common Fisheries Policy (STECF-17-04)*, Publications Office of the European Union, Luxembourg, p. 9.

environmental status in accordance with the Marine Strategy Framework Directive. In the North-East Atlantic and the Baltic Sea, reproductive capacity (MSY Btrigger) is currently within policy thresholds, and levels of exploitation (FMSY) have been moving towards reaching this policy threshold since 1997 ([33])([34]).

The annual arithmetic mean of F/FMSY can be used as an additional tool to indicate trends in fishing pressures on a stock. The results for the North-East Atlantic mirror the downward trend in overexploited stocks, showing a reduction in pressure from 1.83 to 1.0 between the years 2003 and 2015. However, in the Mediterranean, a similar analysis shows that the mean F/FMSY has risen slightly from 2.36 to 2.5, meaning that on average fishing pressure in the Mediterranean is two and a half times greater than FMSY for this region ([35]).

Bathing sites with excellent water quality

The share of EU bathing sites with 'excellent' bathing water quality grew steadily between 2011 and 2016. However, the target of ensuring 'sufficient' bathing water quality standards in all sites by 2015 has not been met.



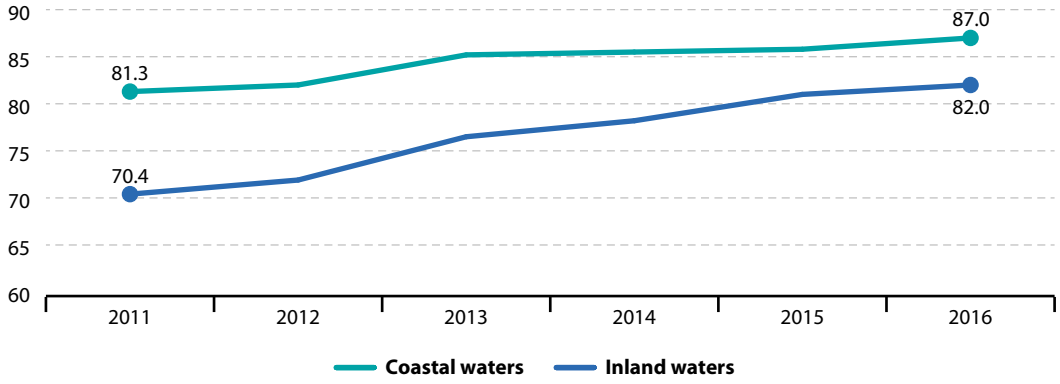
The new Bathing Water Directive ([36]) requires Member States to identify and assess the quality of all inland and marine bathing waters and to classify these waters as 'poor', 'sufficient', 'good' or 'excellent'. Bathing water quality is assessed according to standards for two microbiological parameters (intestinal enterococci and *Escherichia coli*). The data presented in this section stem from the European Environment Agency (EEA).

Member States were required to have reached at least 'sufficient' status in all sites by 2015. This target was not quite met, with only 96 % of sites meeting requirements ([37]). At the same time, a number of Member States have gone far beyond the minimum requirement with many striving to achieve the highest quality standards; a steady increase in the number of bathing sites classified as 'excellent' was visible between 2011 and 2016.

Until 2006, bathing water quality in the EU was classified on the basis of annual data ([38]). This meant that in the past, classifications of water quality could be strongly influenced by one-off events, such as heavy rainfall, that washed pollution into rivers and seas. Under the new Bathing Water Directive ([39]), the water quality is analysed during the bathing season and classified (from poor to excellent) on the basis of the previous four years of data. This may explain the low level of annual fluctuation in water quality, as the classification always takes into

([33]) Estimates of stock sizes are not currently available from scientific agencies. The International Council for the Exploration of the Sea (ICES) instead reports on MSY Btrigger, which is considered the lower bound of spawning-stock biomass fluctuation around BMSY. Analysis of stock biomass by the European Commission Scientific, Technical and Economic Committee for Fisheries (STECF) has reported a 35 % increase in average biomass in the North-East Atlantic between 2003 and 2015.
([34]) Average deviation of status compared to policy thresholds for good environmental status (GES) of fish stocks in the North-East Atlantic and Baltic seas.
([35]) Scientific, Technical and Economic Committee for Fisheries (STECF) (2017), *Monitoring the performance of the Common Fisheries Policy (STECF-17-04)*, Publications Office of the European Union, Luxembourg.
([36]) Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC.
([37]) European Environment Agency (2017), *European bathing water quality in 2016*, EEA Report No 5/2017.
([38]) Council Directive 76/160/EEC of 8 December 1975 concerning the quality of bathing water.
([39]) Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC.

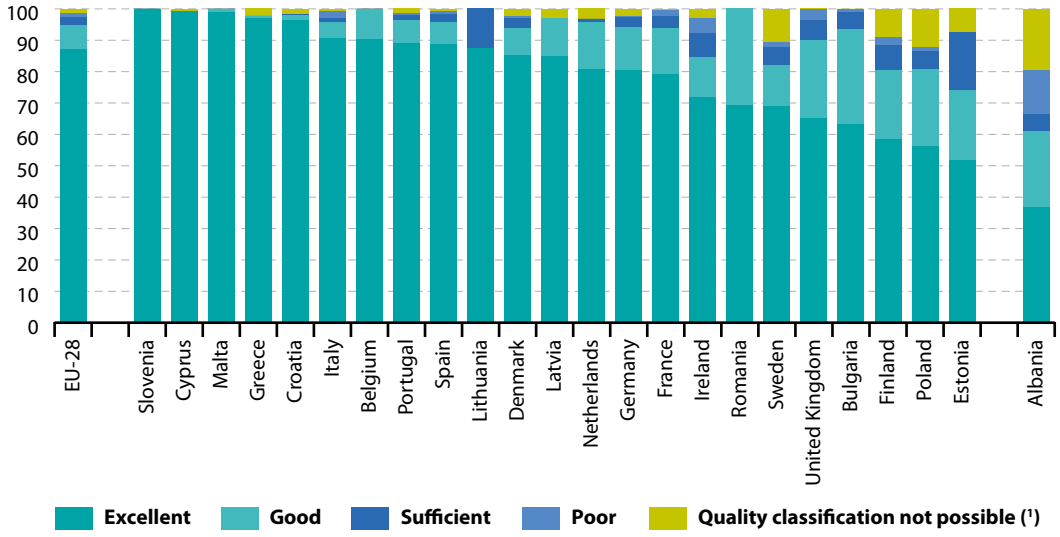
Figure 14.7: Bathing sites with excellent water quality by locality, EU, 2011–2016
(% of bathing sites)



Note: 'Coastal waters' refers to surface waters up to one nautical mile from the baseline and transitional waters (partly saline surface waters that are substantially influenced by freshwater flows). 'Inland waters' refers to inland surface waters such as rivers and lakes.

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_14_40)

Figure 14.8: Bathing sites with excellent water quality, coastal waters, by country, 2016
(% of bathing sites)



(1) Quality classification not possible: not enough samples/new bathing waters/bathing waters with changes/closed.

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_14_40)

The EU Bathing Water Directive ([40]) is one of the success stories in EU water policy and is important to protect human health and the environment. It also contributes to ensuring Good Environmental Status under the Marine Strategy Framework Directive ([41]) and Good Ecological and Chemical Status under the Water Framework Directive ([42]). To tackle marine pollution, the EU uses a wide set of instruments, including regulation on waste management and prevention, port reception facilities for ship-generated waste and cargo residues. REACH ([43]), the EU framework to improve the protection of human health and the environment from the risks that can be posed by chemicals, includes contaminants in seafood and marine litter.

account the preceding years. Improved bathing water quality can also be in part attributed to the implementation of measures under the Water Framework Directive ([44]).

This section analyses the quality of coastal bathing sites only. Please refer to Chapter 6 for a more detailed analysis of the quality of inland bathing water sites.

Member States show a moderate variation in the percentage of bathing sites that have 'excellent' bathing water quality, ranging between 100 % and 52 %. Although local sources of pollution have the greatest impact on coastal bathing water quality, some loose geographical clusters can be identified. In 2016, the six Member States with the highest proportion of 'excellent' marine water quality sites were all in the eastern Mediterranean. Countries on the North Sea also shared similar profiles.

In the Mediterranean, limited rain and river flow during summer, greater sunlight and ultraviolet radiation all contribute to the high quality of coastal bathing waters. Northern coastal waters tend to be shallower and can be affected by rain and run-off episodes during summer, leading to lower levels of water quality.

Mean ocean acidity

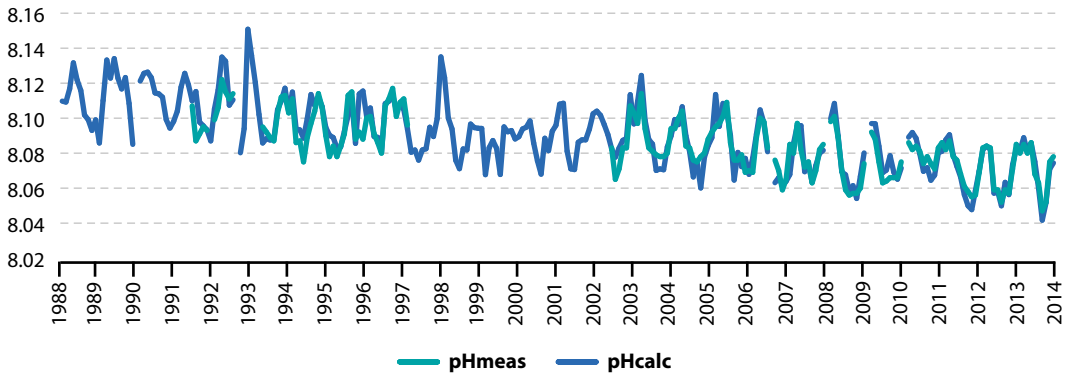
Surface ocean pH has reached an unprecedented low and is declining at a steady rate. Increased acidity is expected to have severe knock-on effects for marine species and ecosystems.

X CALCULATION OF TREND NOT APPLICABLE

Station ALOHA is the site of a long-term ocean observations programme (Hawaiian Ocean Time series (HOT)) ([45]). Its situation, in deep water (around 5 000 metres) about 100 kilometres north of the Hawaiian Island of Oahu, makes it well suited to taking such measurements as it is removed from coastal ocean dynamics and terrestrial inputs. Since October 1988, the HOT programme has measured a suite of physical and

([40]) Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC.
([41]) Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).
([42]) Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, L 327/1.
([43]) Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.
([44]) Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, L 327/1.
([45]) Hawaii Ocean Time-series (HOT).

Figure 14.9: Mean ocean acidity measured at the ALOHA station, 1988–2014
(pH)



Note: 'pHmeas' is the mean measured seawater pH, adjusted to in situ temperature, on the total scale; 'phcalc' is the mean seawater pH, calculated from DIC (mean seawater dissolved inorganic carbon concentration) and TA (mean seawater total alkalinity) at in situ temperature, on the total scale.

Source: European Environment Agency (EEA) (Eurostat online data code: sdg_14_50)

The EU has a range of strategies which aim to mitigate climate change and greenhouse gas (GHG) emissions including CO_2. These include for example, the Europe 2020 Energy Strategy ([46]) to cut GHG emissions by 20 % compared to 1990, to ensure 20 % energy from renewables and a 20 % increase in energy efficiency. The Circular Economy Package ([47]) also contributes to mitigation through greater resource and energy efficiency ([48]).

biogeochemical properties (such as salinity, DIC, TA, phosphate, silicate, and dissolved oxygen) at near monthly intervals ([49]).

Increased levels of CO_2 in the Earth's atmosphere are being absorbed by the ocean and are reducing the pH level of sea water (ocean acidification). This affects the ocean's capacity to act as a carbon sink and to regulate global CO_2 emissions. Lower pH levels also affect the structural growth of corals and species such as mussels and oysters and can impact processes such as photosynthesis with knock-on effects for entire ecosystems ([50]). The Marine Environment Monitoring Service of the European Earth Observation Programme, Copernicus, is developing methods for monitoring pH both at global scales and for European seas. The monitoring will rely on existing international databases (for example, SOCAT) and CMEMS global and regional biogeochemical models. From end of 2018 onwards, Copernicus will be used as the main source of information for the Eurostat ocean acidification indicator. In the meantime, data from the ALOHA monitoring station are used as a proxy, as observed changes over a short time period in Europe are similar to those observed at the ALOHA station ([51]).

([46]) European Commission (2010), *Energy 2020 A strategy for competitive, sustainable and secure energy*, COM(2010) 639 final.
([47]) European Commission (2015), *Closing the loop — An EU action plan for the Circular Economy*, COM(2015) 614 final.
([48]) More information can be found in the chapter for SDG 13 Climate Action.
([49]) Dore et al. 2009, Physical and biogeochemical modulation of ocean acidification in the central North Pacific. Dore, J. E., Lukas, R., Sadler, D. W., Church, M. J. and Karl, D. M. (2009), *Proceedings of the National Academy of Sciences 106*, 12235–12240. doi:10.1073/pnas.0906044106.
([50]) IPCC (2014), *Climate Change 2014 — Impacts, Adaptation and Vulnerability: Part B Regional Aspects, Chapter 30: The Ocean*.
([51]) European Environment Agency (2016), *Ocean acidification*.

Recognising the limitations of tackling ocean governance at a Member State or European level, the EU is working to ensure a stronger system of ocean governance to achieve the conservation and sustainable use of both regional and international waters ([52]).

Although there is considerable intra-annual variation, the decline in ocean pH is consistent and alarming. Before industrialisation, pH levels varied between 8.3 and 8.2. Annual surface ocean pH has reached a new low of 8.07 and it is projected to decrease as far as 7.75 by the end of the 21st century depending on future CO_2 emission levels ([53]).

Further reading on life below water

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Halpern, B.S. et al. (2015), *Patterns and Emerging Trends in Global Ocean Health*.

Nieto et al. (2015), *European Red List of marine fishes*, Luxembourg, Publications Office of the European Union.

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UNESCO (2017), *Global Ocean Science Report — The current status of ocean science around the world*, L. Valdés et al. (eds), UNESCO Publishing, Paris.

([52]) For more information on the EUs ocean governance strategy, see: Joint Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (2016), *International ocean governance: an agenda for the future of our oceans*, Brussels.
([53]) European Environment Agency (2016), *Ocean acidification*.

15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

The global perspective on SDG 15

Forests cover 30 % of the Earth's surface and are crucial for sustaining our lives and livelihoods. They provide for the food we eat, the water we drink and the air we breathe. Despite this fact, thirteen million hectares of forest are being lost every year, while 52 % of the land used for agriculture is moderately or severely affected by soil degradation. Likewise, biodiversity loss continues ([1]). To address the challenges of deforestation and desertification, SDG 15 seeks to protect, restore and promote the conservation and sustainable use of terrestrial, inland water and mountain ecosystems. This includes efforts and financial resources to sustainably manage forests and halt deforestation, combat desertification, restore degraded land and soil, halt biodiversity loss and protect threatened species. SDG 15 also calls for sharing the benefits from the use of genetic resources and promoting access to such resources as well as reducing the impact of invasive alien species on land and water ecosystems. Integration of ecosystem and biodiversity values into planning processes and poverty reduction strategies and international cooperation for combating poaching and trafficking of protected species are also seen as a priority for protecting life on land ([2]).

eurostat supports the SDGs

Monitoring SDG 15 'life on land' in an EU context focuses on the sub-themes 'ecosystem status', which looks into the status of rivers, groundwater and forests, 'land degradation', which refers to artificial land cover and soil erosion, and 'biodiversity', which covers the common bird index and the sufficiency of terrestrial sites designated under the EU Habitats Directive. As shown in Table 15.1, the EU's progress in these areas has been rather ambiguous.

([1]) Mid-term review of the EU Biodiversity Strategy to 2020 (COM/2015/0478 final).
([2]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 15.1: Indicators measuring progress in SDG 15, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Ecosystem status			
Biochemical oxygen demand in rivers (*)	↑ (1)(2)	↑ (2)	SDG 6, p. 135
Nitrate in groundwater (*)	↑ (1)(2)(3)	↑ (2)(3)	SDG 6, p. 137
Phosphate in rivers (*)	↑ (1)(2)	↑ (2)	SDG 6, p. 139
Share of forest area	:	↑ (4)	p. 301
Land degradation			
Artificial land cover per capita	:	↘ (4)	p. 303
Change in artificial land cover	:	↓ (4)	p. 305
Estimated soil erosion by water	↑ (1)	:	p. 307
Biodiversity			
Common bird index	↘	↗	p. 309
Sufficiency of terrestrial sites designated under the EU Habitats Directive	:	↑	p. 311

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Past 12-year period.
(2) Trend refers to European aggregate referring to the EEA member countries.
(3) Trend in relation to the maximum concentration of 50 mg/L of nitrate in groundwater that is used for drinking water specified by the Drinking Water Directive.
(4) Past 6-year period.

Life on land in the EU: overview and key trends

Ecosystem services provided by terrestrial ecosystems offer many benefits to society, including recreation, natural resources, clean air and water, as well as protection from natural disasters and mitigation of climate change. Given these benefits, the EU endeavours to ensure the health, sustainable use and management of these ecosystems, with its environmental legislation, such as the Birds and Habitats Directives. This policy framework supports the Natura 2000 network of protected areas ([3]), which covers 18 % of EU land ([4]); however, the majority of these protected habitats (77 %) and protected non-avian species (60 %) have an unfavourable conservation status, while almost a third of bird species (32 %) are in a non-secure state ([5]). These statistics are even worse for forest ecosystems, where the conservation status of 80 % of the assessed forest habitats is unfavourable ([6]). Furthermore, human activities that drive the spread of artificial surfaces and erosion are increasing land degradation in Europe. About 5.2 % of EU land is considered to be subject to severe soil erosion ([7]). Within this context and to preserve life on land, SDG 15 calls for targeted efforts to protect, restore and promote the conservation and sustainable use of terrestrial and other ecosystems.

Ecosystem status

Healthy ecosystems provide many ecosystem services to humans, such as clean air, water and food. Thus, pollution, degradation and destruction of ecosystems threaten the continued provision of services and ultimately human well-being.

Monitoring and conservation efforts are needed to ensure that ecosystems remain in or return to a healthy state. For example, **biochemical oxygen demand in rivers** can be used as an indicator for organic water pollution in rivers and the effectiveness of water treatment ([8]). It measures the amount of oxygen required for the microbiological decomposition of organic compounds in water, which has been continuously decreasing since 2000. This indicates a positive trend in river water quality in the EU, helping to improve the state of aquatic ecosystems and their inherent biodiversity.

Levels of **nitrate in groundwater** in the EU varied widely between Member States from 2000 to 2012. Nitrate pollution in groundwater can pose risks to public health as well as contribute to environmental degradation. As groundwater is in direct exchange with rivers, lakes and wetlands, in addition to its use as a source of drinking water and for agricultural purposes, it has a high economic, social and environmental value ([9]). High nitrate concentrations are generally caused by a high use of mineral fertilisers and intensive agricultural practices, notably the application of slurry and manure ([10]). On average, nitrate levels have remained unchanged in the EU at 19.1 milligrams per litre (mg/l), with the majority of Member States complying with the levels defined for safe use. Nevertheless there are large variations of nitrate levels in groundwater in different regions in the EU, spanning from less than 10 mg/l to more than 50 mg/l ([11]). This can also be the case for individual Member States, where the average nitrate concentrations may meet the safe level for drinking water but some sites may have nitrate

([3]) Natura 2000 sites are protected sites that do allow certain types and levels of human activities. These activities must ensure that habitats are maintained or improved for biodiversity.
([4]) European Commission (2016), *Next steps for a sustainable European future: European action for sustainability*, COM(2016) 739 final, p.5.
([5]) EEA (2015), *State of nature in the EU: Results from reporting under the nature directives 2007–12*, Technical Report No 02/2015, European Environment Agency: Copenhagen.
([6]) Id, p.161.
([7]) Eurostat, *Statistics Explained, Agri-environmental indicator — soil erosion*.
([8]) EEA (2015), *Oxygen consuming substances in rivers*.
([9]) Rohde et al. (2017), *A Global Synthesis of Managing Groundwater Dependent Ecosystems Under Sustainable Groundwater Policy*, Groundwater, (55)3, p. 293–301.
([10]) FAO (2012), *Agriculture and water quality interactions: a global overview, SOLAW Background Thematic Report —TR08*, Food and Drug Administration, p.15.
([11]) EEA (2017), *Nitrates in groundwater by country*.

concentrations that are well above such levels. For example, despite gradual reductions in gross nutrient balances, the European Court of Justice sued France in 2014 ([12]) and more recently Germany in 2016 ([13]) for failing to meet nitrate standards in groundwater.

Like nitrate, **phosphate in rivers** has negative environmental consequences, such as eutrophication in rivers and estuaries and biodiversity loss. Phosphate in rivers comes from urban wastewater, industrial discharges and agricultural production ([14]). In Europe, average phosphate concentrations have more than halved between 1992 and 2012, with the latest levels as low as 0.065 mg/l. This reduction can be linked to the introduction of measures by national and European legislation (such as the Urban Waste Water Treatment Directive ([15])) and the switch to phosphate-free detergents ([16]).

In addition to the benefits healthy freshwater ecosystems provide, sustainably managed forests provide multiple benefits too, such as mitigating climate change, regulating the microclimate, enhancing soil fertility and conserving soil moisture, boosting food production and providing habitats for animals and plants ([17]). In the face of multiple pressures impacting on EU forests, such as habitat loss and degradation from over-exploitation ([18]), EU efforts to retain and sustainably manage its forests is increasingly important. Forests and other wooded land cover 42 % of Europe's total land area. Between 2009 and 2015, EU ([19]) **forest area as a proportion of total land area** increased slightly by 2.7 percentage points, mainly through the increase in the FAO category 'other wooded land' ([20]), meaning land with a lower tree coverage than forests, often in combination with shrubs and bushes ([21]).

Land degradation

Soil as a non-renewable resource provides multiple benefits to society such as food production, storage and filtration of carbon and water, and provides raw materials ([22]). It is therefore important to retain natural landscapes and to protect soil resources to ensure they continue to deliver these benefits to society. Though land degradation is a complex issue ([23]), this chapter focuses only on two aspects: artificial land cover and soil erosion. Because other degradation processes such as contamination, loss of soil biodiversity, erosion by wind, decline in organic matter, compaction, salinisation and desertification are not covered by the indicator set, the results of the analysis are limited. The spread of artificial surfaces can have negative social and environmental consequences, such as escalating the risk of flooding, damaging biodiversity and natural habitats, contributing to global warming and reducing the amount of land available for food production ([24]). Hence, SDG 15 calls on countries to halt and reverse land degradation, including soil sealing by artificial structures. Despite EU efforts to limit land take and soil sealing and to increase land use efficiency, **artificial land cover per capita** has increased slightly since 2012 ([25]). This trend may be strongly influenced by growing demand for increased living space per person and for secondary homes ([26]). Thus further progress is needed to reverse this trend.

([12]) European Commission (2014), *Judgment of the Court (Second Chamber) 4 September 2014*, Info-Curia — Case-law of the Court of Justice.
([13]) European Commission (2016), *Water: Commission refers GERMANY to the Court of Justice of the EU over water pollution caused by nitrates*, European Commission Press Release Database.
([14]) EEA (2015), *Nutrients in freshwater*.
([15]) European Commission (1991), *Urban Waste Water Treatment Directive*.
([16]) EEA (2015), *Nutrients in freshwater*.
([17]) World Bank (2017), *Atlas of Sustainable Development Goals 2017: World Development Indicators*, p. 90; European Commission (2013), *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions 'A New EU Forest Strategy: for forests and the forest-based sector' (COM(2013) 659 final*, p.2.
([18]) EEA (2016), *European forest ecosystems — State and trends*.
([19]) Data refers to EU-23.
([20]) The data stem from Eurostat's Land Use and Cover Area frame Survey (LUCAS) but apply the FAO forest categories.
([21]) FAO (2015), *FRA 2015 — Terms and Definitions*, Food and Agriculture Organisation of the United Nations
([22]) European Commission Directorate General for the Environment (2016), *Soil*.
([23]) European Commission (2012), *The implementation of the Soil Thematic Strategy and ongoing activities COM(2012)46 final*; FAO (2015), *Status of the World's Soil Resources*, Food and Drug Administration.
([24]) European Commission Directorate General for the Environment (2016), *Soil sealing*.
([25]) The data stem from Eurostat's Land Use and Cover Area frame Survey (LUCAS).
([26]) EEA (2017), *Land take*, European Environment Agency; European Commission (2011), *Overview of best practices for limiting soil sealing or mitigating its effects in EU-27*, Ch. 2.

This negative trend is also reflected in the total **change in artificial land cover**, which grew faster between 2012 and 2015 than between 2009 and 2012 ([27]). This indicates an acceleration of land use change towards artificial and urban land use, which is one of the main causes of soil degradation in the EU. The ecosystems that are most affected by land take in the EU are in agricultural areas, and to a lesser extent forests, semi-natural and natural areas ([28]). Urban land coverage is increasing in the EU as well as the rate of change. If current trends continue, Europe will have an additional artificial surface roughly comparable to the size of Hungary within a century ([29]).

Another aspect of land degradation is soil erosion. Soil erosion by water has substantial on-site as well as off-site effects. By removing fertile topsoil it reduces soil productivity, threatening crop production, drinking water, habitats and biodiversity, and carbon stocks ([30]). Efforts to address **soil erosion by water** have led to positive results, reducing water erosion by about 14 % in Europe, with improvement observed in almost all Member States. This positive development places the EU on track to achieve its soil erosion targets.

Biodiversity

Another important aspect of SDG15 is the preservation of biodiversity. Biodiversity supports all ecosystem functions, contributing to their capacity to provide ecosystem services ([31]). However, changes in land use, as described earlier, can harm biodiversity. Birds are relatively high in food chains and are sensitive to both anthropogenic and natural environmental change. These characteristics mean bird population abundance and diversity are a good indication of wider ecosystem health. Furthermore, birds are widespread, diverse and mobile, with habitats in most terrestrial areas ([32]).

The EU **common bird index** tracks the population abundance and diversity of a selection of common bird species in the EU. Since 1990, the index of common birds has fallen by 12.6 %. Common farmland birds have experienced an even larger decline, with a reduction of 31.5 % compared to the 1990 baseline. This negative trend has seen a slight improvement in all common bird species in the short term, with an increase of 0.7 % in the past five years, while common farmland birds have continued to decline by 4.8 % during the same period. These short-term trends present a mixed picture relating to EU progress in halting biodiversity loss.

Along with sustainable forest management and halting worldwide deforestation, the EU aims to protect and conserve its terrestrial ecosystems under the Habitats Directive since 1992. Along with the Birds Directive, the Habitats Directive is the other main pillar for the protection of biodiversity and ecosystems. Consequently, Member States designate and manage Sites of Community Importance (SCIs) to maintain or restore listed habitats and species to favourable conservation status. These sites determine a Member State's **sufficiency of terrestrial sites designated under the EU Habitats Directive**. This analysis looks at the share of species and habitats listed in the Directive for which the European Commission considers the national network of terrestrial SCIs to be sufficient in terms of number, extent, distribution and representativeness. The EU has a high sufficiency index of 92 %, indicating a very positive trend in designating its valuable terrestrial ecosystems for protection. Though positive, this trend must be viewed cautiously regarding its implications for biodiversity in the EU. The Natura 2000 network, made up of SCIs, covers the majority of key habitats and species in the EU but many of these sites do not meet 'favourable conservation status' as laid out in the Habitats Directive ([33]).

([27]) The data stem from Eurostat's Land Use and Cover Area frame Survey (LUCAS).
([28]) EEA (2017), *Land take;* European Commission (2011), *Overview of best practices for limiting soil sealing or mitigating its effects in EU-27.*
([29]) European Commission Directorate General for the Environment (2012), *New guidelines to reduce soil sealing.*
([30]) European Soil Data Centre (ESDAC) (2017), *Soil erosion.*
([31]) European Commission Directorate General for the Environment (2011), *The EU Biodiversity Strategy to 2020.*
([32]) Eurostat, *Statistics Explained, Biodiversity Statistics.*
([33]) European Commission (2015), *The State of Nature in the European Union (COM(2015) 219 final).*

Life on land in the EU

Ecosystems status

Biochemical oxygen demand in rivers in 2012
2.2 mg O_2 per litre
- 7.2 % since 2007

Nitrate in groundwater in 2012
19.1 mg NO_3 per litre
- 6.4 % since 2007

Phosphate in rivers in 2012
0.065 mg PO_4 per litre
- 29.3 % since 2007

Forest area (1) in 2015
42.0 % of total land area
+ 2.7 pp since 2009

Land degradation

Artificial land cover in 2015
359 m² per capita
+ 3.3 % since 2012 (2)

Soil erosion by water in 2012
5.2 % of total non-artifical erosive area
- 0.8 pp since 2000

Change in artificial land cover (3) in 2015
107.8 Index 2009 = 100
+ 4.1 index points since 2012

Biodiversity

Common bird index (4) in 2014
87.4 Index 1990 = 100
+ 0.7 index points since 2009

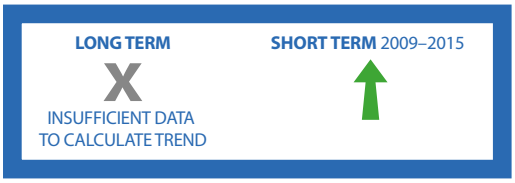
Sufficiency of protected terrestrial sites in 2013
92 %
+ 8 pp since 2008 (5)

(1) EU aggregate changes according to the context.
(2) 2012 data refer to EU-27.
(3) Data refer to EU-23 (not including Bulgaria, Cyprus, Croatia, Malta, Romania).
(4) The EU aggregate changes depending on countries joining the Pan-European Common Birds Monitoring Scheme.
(5) 2008 data refer to EU-27.

Source: Eurostat (online data codes: sdg_06_30, sdg_06_40, sdg_06_50, sdg_15_10, sdg_15_30, sdg_15_50, sdg_15_40, sdg_15_20 and sdg_15_60)

Share of forest area

Forests cover 42 % of land area in the EU. The proportion of forested area increased by 2.7 percentage points between 2009 and 2015.

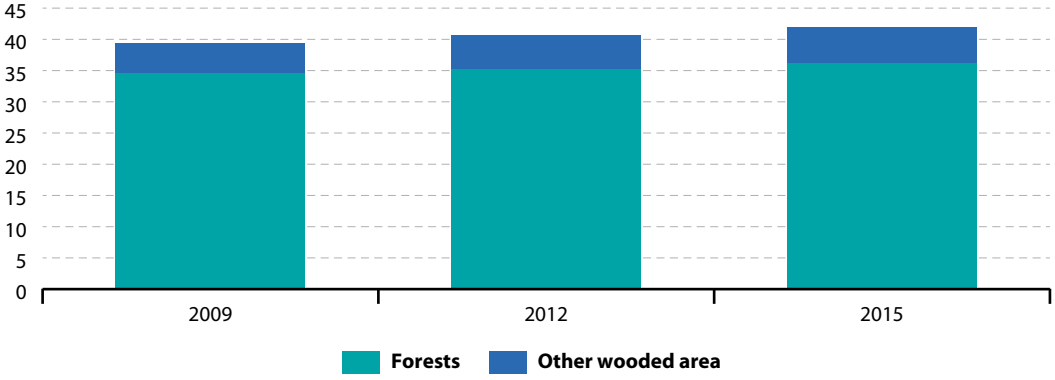


Forests play an important role in the conservation of biological diversity and in the provision of drinking water, as well as in the mitigation of climate change ([34]). Forest area as a proportion of total land area provides information on the extent of forest ecosystems in the EU in comparison to other land cover classes. As such, it does not provide information on the condition of these ecosystems. Nevertheless the indicator monitors EU efforts to retain its forested areas in the face of pressures from fragmentation, expanding urban areas, climate change and loss of biodiversity ([35]).

The data used for this indicator derives from the Land Use and Cover Area frame Survey (LUCAS), which aims to gather information on EU land use and land cover, and has been conducted by Eurostat every three years since 2006 ([36]). LUCAS surveys are carried out in situ; this means observations are made and registered in the field all over the EU. For the purpose of the analysis here and to facilitate comparability at the global level, data from LUCAS have been mapped to the FAO definitions, distinguishing between the categories 'forests' and 'other wooded land'. Figures for 2009 underestimate the FAO forest shares because the parameters allowing the mapping were not available at the time. Note that for 2009, the EU aggregate provided includes only 23 countries (Bulgaria, Croatia, Cyprus, Malta and Romania are missing). Croatia is missing from 2012 figures because it joined the EU in 2013 and did not take part in the 2012 survey. As such, Figure 15.1 only depicts EU-23 data for the whole time period (2009 to 2015) to better reflect the trends in forest area as a proportion of total land area over time.

Europe has 81 forest habitats that have been identified, according to the Habitats Directive. The majority (60 %) of these are privately owned. The

Figure 15.1: Share of forest area, EU, 2009, 2012 and 2015
(% of total land area)



Note: EU aggregate changing according to the context. Figures for 2009 may underestimate the actual forest shares (see methodological note in the beginning of the section).

Source: Eurostat (online data code: sdg_15_10)

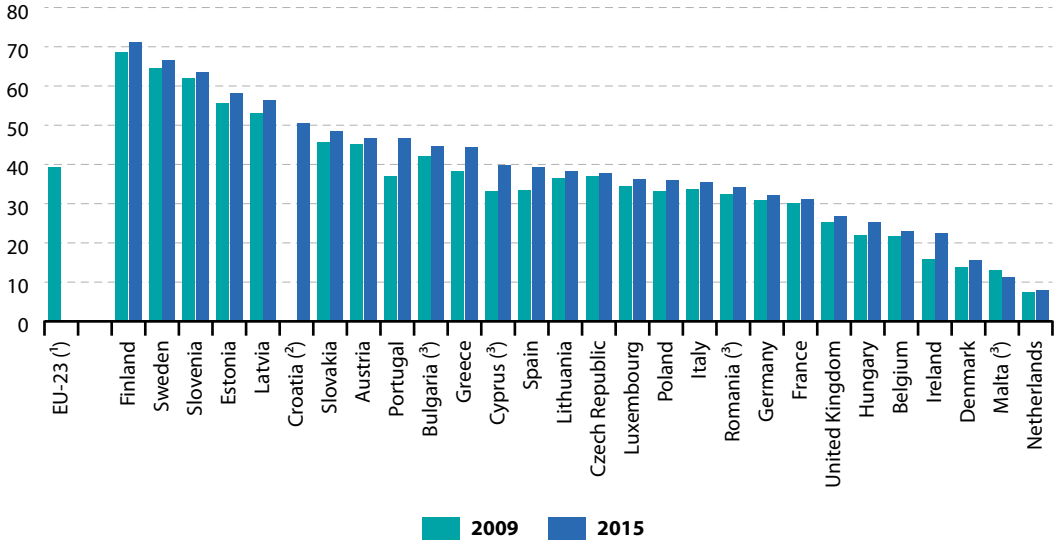
([34]) EEA (2015), *SOER 2015*.
([35]) EEA (2015), *Forests Briefing*.
([36]) See *Eurostat, LUCAS — Land use and land cover survey*.

habitats are home to diverse tree species, many of which are varieties of broadleaved and coniferous tree species. However, only 26 % of forest species and 15 % of forest habitats of European interest are considered to be in favourable conservation status under the Habitats Directive ([37]).

In 2015, forest area represented 42 % of the EU's ([38]) total land area, making it the most dominant ecosystem type in the EU. Forests have shown a slight growth pattern since 2009, with their share of total land area increasing slightly by 1.5 percentage points until 2012 and again by 1.3 percentage points until 2015. These results have shown growth in the short term, though at a decreasing rate. However, it should be noted that forest area only provides a clear and realistic picture when determined over the long term because of the long-term management cycles of forestry. FAO forest data, dating back to 1990, supports the LUCAS findings that forest area has constantly been increasing in the EU ([39]).

The trend shown in Figure 15.1 is only indicative for EU-23 countries and does not include forested areas of Bulgaria, Romania, Cyprus and Malta. When these countries are included, total forested area ([40]) in 2012 amounted to 1 737 700 square kilometres (km2) or 40.3 % of the EU's total area. This represents a slightly lower share compared to the EU-23 because the forested areas in Romania, Cyprus and Malta were slightly below the EU average. In 2015, with the addition of Croatia's forested areas, the figure for forested area reaches 1 823 300 km^2, or 41.7 % of the EU's ([41]) total land area. As such, Europe's trend for forest area as a proportion of its total land area has remained relatively stable between 2009 and 2015.

Figure 15.2: Share of forest area, by country, 2009 and 2015
(% of total land area)



(1) Not including Bulgaria, Cyprus, Croatia, Malta and Romania.
(2) No data for 2009.
(3) 2012 data (instead of 2009).

Source: Eurostat (online data code: sdg_15_10)

(37) EEA (2016), *European forest ecosystems — State and trends.*
(38) Data refers to EU-23.
(39) Based on long-term forest estimations based on FAO data, [for area].
(40) Data refers to EU-27.
(41) Data refers to EU-28.

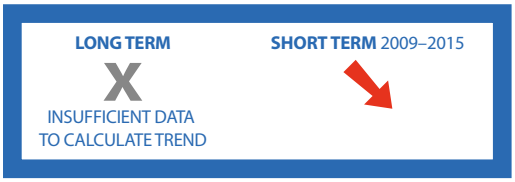
Forests in the EU are covered under the EU Forest Strategy ([42]), which stresses the importance and multiple socio-economic and environmental benefits of sustainable forest management. This strategy builds on the objectives stated under the EU Biodiversity Strategy to 2020 ([43]) with its target on forest preservation and management. Forests are also covered in the Habitats Directive ([44]) as habitats of EU interest and under the Europe 2020 strategy ([45]) for their relevance to reducing CO_2 emissions and combating climate change.

The share of land covered by forests and other wooded land varied strongly across the EU, from more than 70 % to less than 10 % in 2015. From 2009 to 2015, the proportion of forested area to total land area grew in all but one country, Malta.

Because healthy forests provide multiple socio-economic and environmental benefits, ensuring that forests can continue to offer these benefits remains high on the EU agenda. Though some EU countries do not have high percentages of forested areas, this does not mean they are not taking steps to conserve their forests. Each Member State has unique habitats and ecosystems specific to its region, which may include more grassland, peatland and steppes, for example, which have little forested land. These differences should be considered when assessing individual countries.

Artificial land cover per capita

Artificial surfaces per capita have increased by 6 % since 2009, but this rate of increase slowed between 2012 and 2015.

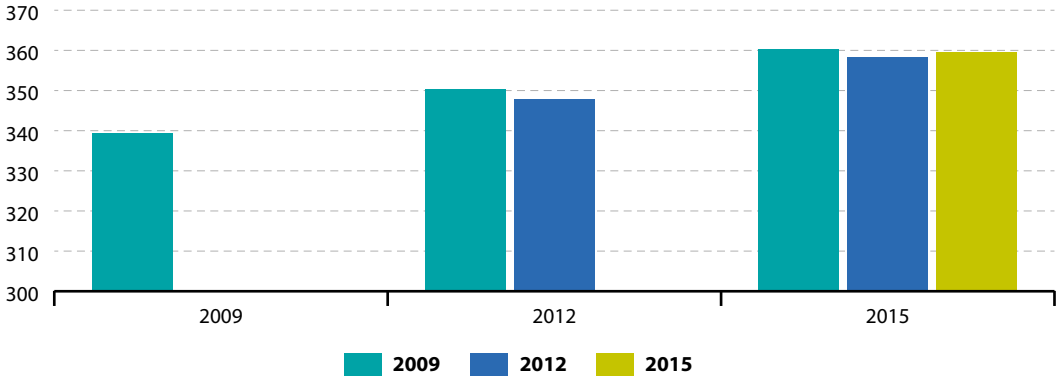


Data on artificial land cover stem from the land use/cover area survey (LUCAS) statistics (see methodological information provided in the previous section on 'share of forest area as % of total land area') ([46]). Artificial land is defined as the total of roofed built-up areas (including buildings and greenhouses), artificial non built-up areas (including sealed area features, such as yards, farmyards, cemeteries and car parking areas, and linear features, such as streets, roads, railways, runways and bridges) and other artificial areas (including bridges and viaducts, mobile homes, solar panels, power plants, electrical substations, pipelines, water sewage plants and open dump sites). For 2009, the EU aggregate provided includes only 23 countries (Bulgaria, Croatia, Cyprus, Malta and Romania are missing). For 2012, Croatia is missing, because it joined the EU in 2013 and did not take part in the 2012 survey.

Artificial land cover per capita in the EU-23 has been steadily increasing from 339 square metre (m^2) per person in 2009 to 350 m^2 per person in 2012, and 360 m^2 per person in 2015, representing an overall increase of 6 % between 2009 and 2015. For the EU-27, the trend is similar, rising from 348 m^2 per person in 2012 to 358 m^2 per person in 2015. Per capita use of artificial surfaces gives an indication of both the intensity and efficiency of land use and

([42]) European Commission, *A new EU Forest Strategy: for forests and the forest-based sector {SWD(2013) 342 final} {SWD(2013) 343 final}*, COM(2013) 659 final, Brussels.
([43]) European Commission, *Our life insurance, our natural capital: an EU biodiversity strategy to 2020 {SEC(2011) 540 final} {SEC(2011) 541 final}*, COM(2011) 244 final.
([44]) Council Directive 92 /43 /EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, No L 206 / 7.
([45]) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.
([46]) In the future reporting the statistical analysis will be complemented by the Copernicus High Resolution Layers on Imperviousness (2012, 2015).

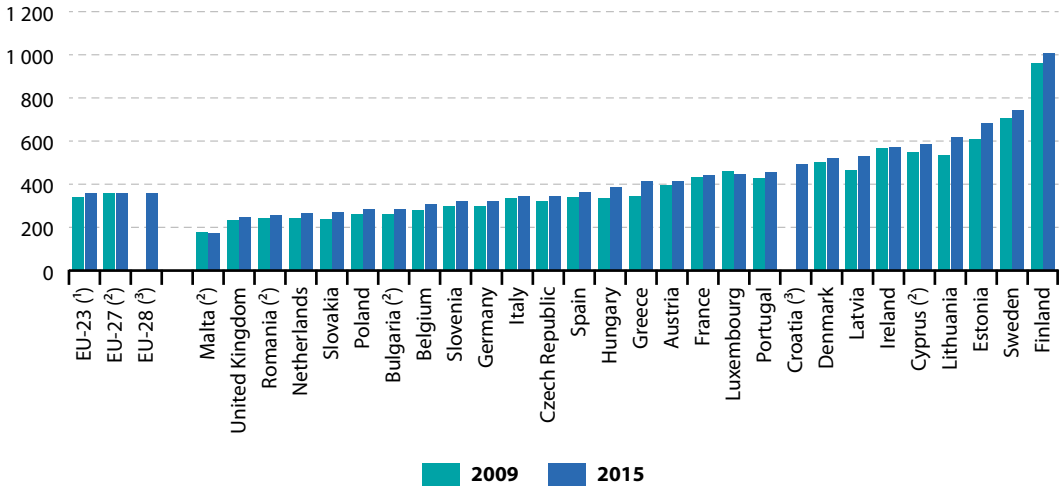
Figure 15.3: Artificial land cover per capita, EU, 2009, 2012 and 2015
(m^2)



Note: EU-23 refers to EU-aggregate not including Bulgaria, Cyprus, Croatia, Malta and Romania.
Source: Eurostat (online data code: sdg_15_30)

In the context of the Soil Thematic Strategy ([47]) and to support the Roadmap to a Resource-Efficient Europe ([48]) goal of achieving an EU annual land take (the increase of artificial land) not exceeding 800 km^2 per year by 2020 and no net land take by 2050, the EU has released guidelines providing the best practices to limit, mitigate or compensate soil sealing.

Figure 15.4: Artificial land cover per capita, by country, 2009 and 2015
(m^2)



(1) Not including Bulgaria, Cyprus, Croatia, Malta and Romania.
(2) 2012 data (instead of 2009).
(3) No data for 2009.

Source: Eurostat (online data code: sdg_15_30)

([47]) European Commission, *Thematic Strategy for Soil Protection [SEC(2006)620] [SEC(2006)1165]*, COM(2006)231 final, Brussels.
([48]) European Commission, *Roadmap to a Resource Efficient Europe {SEC(2011) 1067 final} {SEC(2011) 1068 final}*, COM(2011) 571 final, Brussels.

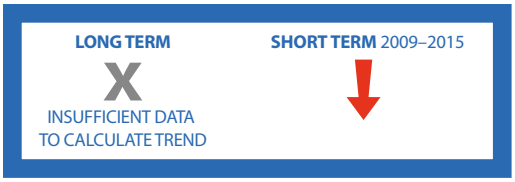
allows Member States to be compared on a more equal footing . An increase in artificial surfaces per capita expresses in general the growing demand for housing, roads and business locations in Europe ([49]). At the same time, increasing artificial land per capita can provide information on the demand for increased living space per person in the EU ([50]).

Population density, which is highly dependent on population and country size, has a strong influence on the patterns observed for artificial land cover per capita across the EU, as shown in Figure 15.4.

For example, it is not surprising that Malta, with an exceptionally high population density, shows the smallest artificial land cover per capita, while Finland, Sweden and the Baltic countries with characteristically low population densities show a relatively high rate of artificial land cover per area. The total area of predominantly rural areas in Member States might be another explanatory factor for the high levels of artificial land cover per capita, in particular in Finland, Sweden, Estonia and Ireland, as the average size of dwellings tends to be higher in towns or suburbs than in cities ([51]).

Change in artificial land cover

Land take has accelerated in the EU: while artificial areas grew by 3.7 % between 2009 and 2012, the increase between 2012 and 2015 was higher, at 3.9 %.



The data refer to the land use/cover area survey (LUCAS), as described in the previous section on 'artificial land cover per capita'. The indicator shows the change in artificial land cover for the periods 2009 to 2012 and 2012 to 2015, presented as index 2009 = 100. Comparing growth in artificial surfaces between these two periods shows whether the rate of artificial land cover in the EU is accelerating or slowing down.

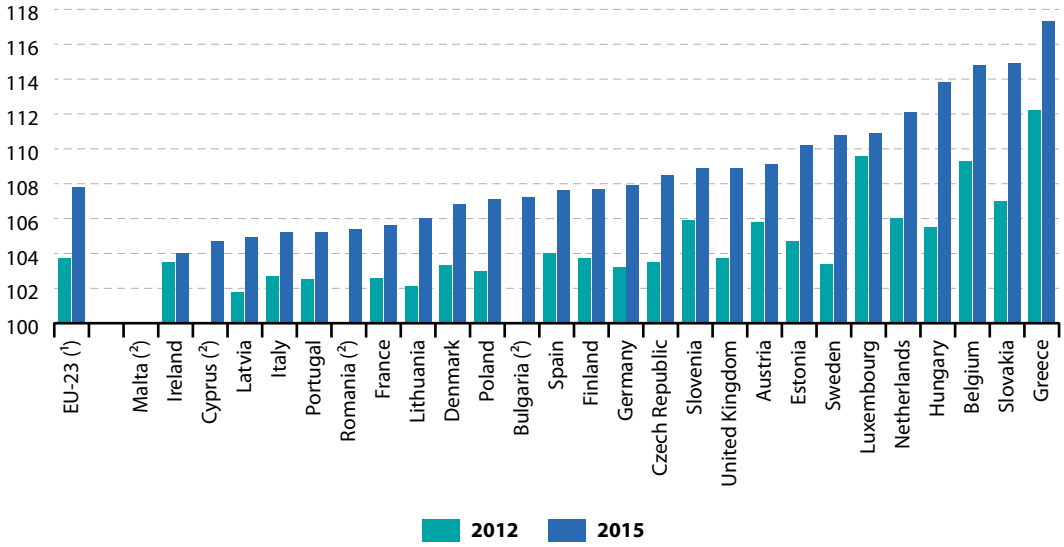
Europe is one of the most urbanised continents in the world ([52]). Artificial land cover leads to soil sealing, which is one of the main causes of soil degradation in Europe. In the EU, conversion of land into artificial areas has been accelerating over the years, with growth from 2012 to 2015 being about 6 % higher than from 2009 to 2012. It has been estimated that, if current trends continue, Europe will have artificially covered over an additional area the size of Hungary within a century ([53]).

It is difficult to analyse country patterns concerning the rate of land take and soil sealing using the usual factors influencing artificial land cover development, such as socio-economic positioning and comparing rapidly developing regions (that are 'catching-up') against established ones (which have already undergone this process in the decades prior to 1990) ([54]). Regardless,

([49]) Prokop et al. (2011), *Overview of best practices for limiting soil sealing or mitigating its effects in EU-27*, European Commission — Directorate-General for Environment. In ESPON & TECNALIA Research & Innovation, 2012. Chapter 1 Land Use Characterization In Europe IN EU-LUPA European Land Use Pattern, p.18.
([50]) Prokop et al. (2011), *Overview of best practices for limiting soil sealing or mitigating its effects in EU-27*, European Commission — Directorate-General for Environment. In ESPON & TECNALIA Research & Innovation, 2012. Chapter 1 Land Use Characterization In Europe IN EU-LUPA European Land Use Pattern, p. 64–65.
([51]) Eurostat, *Statistics Explained, People in the EU — statistics on housing conditions.*
([52]) European Commission (2012), *Guidelines on best practice to limit, mitigate or compensate soil sealing (SWD(2012) 101 final/2)*, p.5.
([53]) European Commission (2012), *New guidelines to reduce soil sealing.*
([54]) Prokop et al. (2011), *Overview of best practices for limiting soil sealing or mitigating its effects in EU-27*, European Commission — Directorate-General for Environment, In ESPON & TECNALIA Research & Innovation, 2012. Chapter 1 Land Use Characterization In Europe IN EU-LUPA European Land Use Pattern, p. 69.

Guidelines in the context of the Soil Thematic Strategy ([55]) provide best practices to limit, mitigate or compensate soil sealing. Some of these best practices to mitigate the negative impacts of artificial surfaces on the functioning of the environment include green infrastructure, the use of permeable materials and surfaces, and natural water harvesting systems.

Figure 15.5: Change in artificial land cover, by country, 2012 and 2015
(index 2009 = 100)



(1) Not including Bulgaria, Cyprus, Croatia, Malta and Romania.
(2) Data are indexed to 2012 = 100 (no data for 2009).
Source: Eurostat (online data code: sdg_15_40)

some Member States are aware of the negative consequences of change to artificial surfaces, and have established non-binding limits for annual change. Most notably, these Member States are all relatively developed, with existing built infrastructure and established economies. For example, in Austria and Germany, limits are defined in hectares per day for a target year, while Belgium (Flanders), Luxembourg and the Netherlands have limits based on inner urban development, where 60 % of new developments must be within defined inner urban boundaries. The United Kingdom's (England) limits are based on brownfield redevelopment, which limits new housing to already developed land ([56]).

([55]) European Commission, *Thematic Strategy for Soil Protection [SEC(2006)620] [SEC(2006)1165]*, COM(2006)231 final, Brussels.
([56]) Environment Agency Austria (2012), *Land Take and Soil Sealing: An overview of the EU situation*, Presentation at Soil remediation and soil sealing conference, Brussels, May 10 and 11 2012, p.13; European Commission (2012), *New guidelines to reduce soil sealing.*

Estimated soil erosion by water

The area affected by moderate to severe soil water erosion has reduced in the EU since 2000. This positive trend could be observed in most Member States.

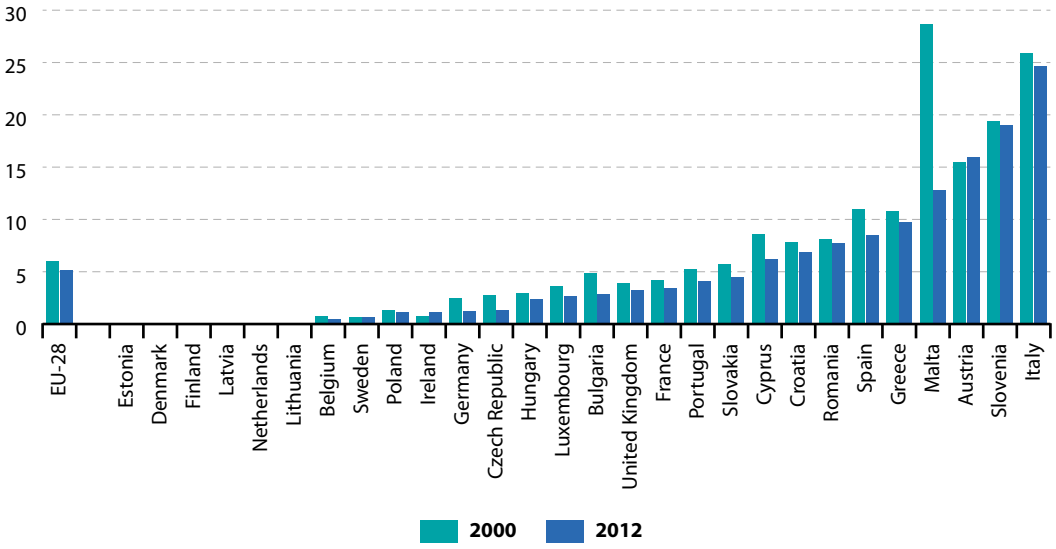
LONG TERM 2000–2012	SHORT TERM
↑	X INSUFFICIENT DATA TO CALCULATE TREND

The indicator assesses soil loss by water erosion processes (rainsplash, sheetwash and rills) and gives an indication of the area affected by a certain rate of soil erosion (severe, i.e. >10 tonnes/hectare/year, according to the OECD definition). It is important to note that these estimated figures are the result of soil erosion susceptibility models and should not be considered measured values ([57]).

This area is expressed in km^2 and as a percentage of the total non-artificial area in the country. Member States receive a zero value when they do not have any land that is considered to lose more than 10 tonnes per hectare of soil through erosion by water. This does not mean that such Member State lacks soil erosion by water, but that the rate is less than 10 tonnes per hectare. Data presented in this section are provided by the Joint Research Centre (JRC).

Soil erosion by water is a natural process and part of the geological cycle; however, accelerated erosion can be attributed to human activities and degrades soil quality. Activities such as inappropriate agricultural practices, overgrazing, deforestation and forest fires, as well as construction all contribute to the erodibility of soil. Water erosion accounts for the greatest loss of soil in Europe in comparison to other erosion

Figure 15.6: Estimated soil erosion by water, by country, 2000 and 2012
(% of total non-artificial erosive area)



Note: It is important to note that the soil erosion indicator is an output of modelling exercises and is therefore an estimate rather than a measured value ([58]).

Source: Joint Research Centre (Eurostat online data code: sdg_15_50)

([57]) Eurostat, *Statistics Explained, Agri-environmental indicator — soil erosion.*
([58]) Ibid.

The Soil Thematic Strategy ([59]) recognises erosion as a threat to soil in the EU. The Roadmap to a Resource-Efficient Europe ([60]) sets out a milestone to reduce soil erosion and requires Member States to implement the actions needed for reducing erosion. Targets for soil erosion include a reduction for land subject to severe erosion of at least 25 % by 2020. Europe's Common Agricultural Policy sets requirements to protect utilised agricultural areas against erosion and establishes a framework of standards that aim, among others, to contribute to preventing soil erosion.

processes such as wind and gully erosion). In particular, runoff is the biggest direct cause of severe soil erosion, making landscape features and weather important factors in an area's susceptibility to erosion. Because soil can be considered a non-renewable resource, soil erosion above 1.4 tonnes per hectare per year may be irreversible in a time span of 50-100 years, while rates above 10 tonnes per hectare per year are considered severe.

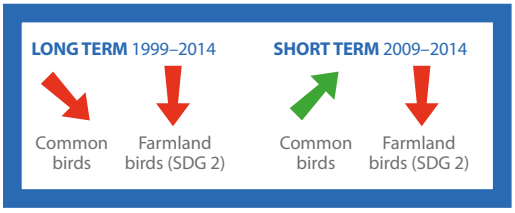
The EU, which accounts for 2.9 % of the global land area, contributes 1.3 % of the total global annual soil loss ([61]). In the EU, the total land area susceptible to severe erosion by water shrank by 14 %, from 234 834 km2 in 2000 to 201 885 km2 in 2012. The main reason for the decline can be attributed to the policy implementation of the Common Agricultural Policy (CAP). As a prerequisite for receiving CAP payments, farmers were encouraged to change their management of soil resources. This conclusion is based on the findings of a JRC study ([62]) but must be taken with care because the RUSLE model only incorporated CAP measures against erosion when it was modified in 2015, whereas those measures had been introduced into the CAP before 2015. Another reason for the decline in soil erosion can be attributed to an expansion in the area of forest land, which naturally tend not to erode, at the expense of arable land.

The main factors affecting soil erosion include soil type, precipitation, topography, land use and land management practices. This is partially reflected in Figure 15.6, which shows that the Member States with the greatest area of severe soil erosion by water were mostly mountainous countries, such as Italy, Slovenia, Austria and Greece. The area susceptible to soil erosion in Malta decreased strongly after the implementation of cross-compliance, although the proportion of land affected by soil erosion remains high.

([59]) European Commission, *Thematic Strategy for Soil Protection [SEC(2006)620] [SEC(2006)1165]*, COM(2006)231 final, Brussels.
([60]) European Commission, *Roadmap to a Resource Efficient Europe {SEC(2011) 1067 final} {SEC(2011) 1068 final}*, COM(2011) 571 final, Brussels.
([61]) Panagos et al. (2015), *The new assessment of soil loss by water erosion in Europe*, Environmental Science & Policy Journal (54), p 438–447.
([62]) Ibid.

Common bird index

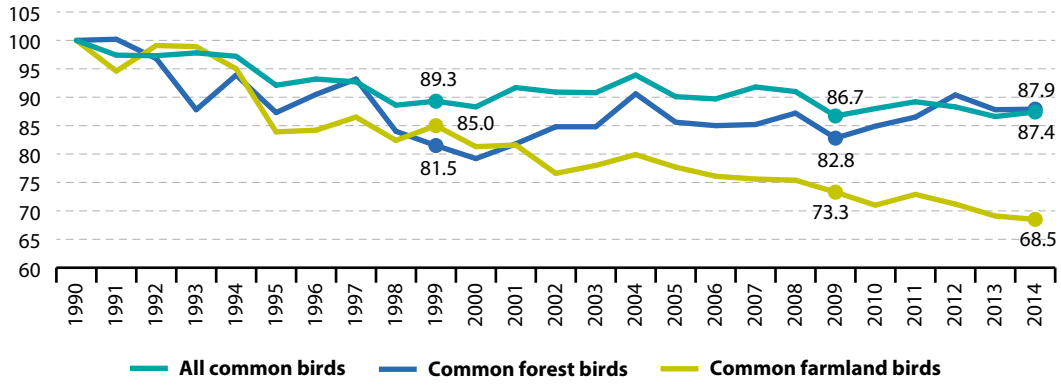
Common bird species have been declining in the EU since 1999, although the index signals a slight recovery in the past five years. The overall index, however, marks a considerable deterioration in farmland bird numbers, that have been in almost continuous decline since 1990.



The common bird index integrates the abundance and the diversity of a selection of common bird species associated with specific habitats. Rare species are not included. Three groups of bird species are represented: common farmland species (39 species), common forest species (34 species) and all common bird species (167 species) which include the farmland species, the forest species and a further 94 common species (generalists, as opposed to the farmland and forest specialists) ([63]). An agreed European list of bird species is used for the EU aggregates, while national lists are used for the national farmland bird indices (except for Spain and Portugal). The indices should be judged only on their overall trend rather than on annual fluctuations because they are based on modelling. The time series are also re-calculated each time new data is added. Although this indicator has a narrow focus compared to EU policy objectives on biodiversity and ecosystem services, it is considered to be the best available dataset and also indicative of general environmental status ([64]). The indicator is produced by the European Bird Census Council (EBCC) and its Pan-European Common Bird Monitoring Scheme (PECBMS) programme.

There has been a general declining trend for all common bird species, common farmland birds and common forest birds in the EU ([65]) compared

Figure 15.7: Common bird index, EU, 1990–2014
(Index 1990 = 100)



Note: The EU aggregate changes depending on countries joining the Pan-European Common Birds Monitoring Scheme.

Source: European Bird Census Council (Eurostat online data code: sdg_15_60)

([63]) Eurostat, Statistics Explained, *Biodiversity Statistics*.
([64]) Ibid.
([65]) The EU aggregate is based on data from up to 26 Member States: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Republic of Ireland, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom, see EBCC/ PECBMS.

Birds and the habitats of endangered and migratory bird species are protected under the Birds Directive ([66]). Many habitats used by birds are also protected under the Habitats Directive ([67]). The EU Biodiversity Strategy to 2020 ([68]) specifically states that these nature directives should be fully implemented in an effort to halt and reverse the trends of biodiversity loss. Funding through the LIFE+ programme has been made available to encourage nature conservation in Member States.

to 1990 levels. This negative trend is particularly relevant for farmland birds, which have seen a drop of 31.5 % since 1990, highlighting the stress these species are exposed to in agricultural ecosystems. Many of the losses in populations of common farmland bird species can be attributed to changes in land use and agricultural practices, including the intensification of crop rotation patterns, making fallow land a rare occurrence, as well as the efficiency of pesticides in eradicating insects ([69]). For common forest birds, the small increase between 2009 and 2012 may be related to an expansion of forested areas in the EU. However, the forest bird indicator is currently under development, with countries still selecting relevant species (also see the previous analysis on 'forest area as proportion of total land area'). Overall, these trends do not put the EU on track to meeting its targets for halting biodiversity loss.

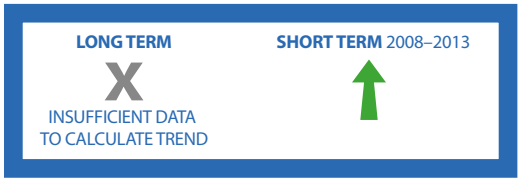
Across EU Member States, Latvia, Lithuania and Ireland are the only countries where national farmland bird species have increased. All other countries have shown more or less continuous declines over the periods for which data are available. Cyprus, in particular, has the worst annual rate of change with a loss of farmland bird species of – 6.8 % between 2006 and 2014. Illegal hunting of wild birds in Cyprus has been identified as to be the main cause of the nation's avian biodiversity loss, in addition to intensification of agricultural practices ([70]).

Common farmland birds are protected under the Birds Directive ([71]), as are all birds, although they are not specifically listed in its annex, which covers only threatened and huntable species. The EU Biodiversity Strategy to 2020 ([72]) aims to halt biodiversity loss within the EU and funds are made available to farmers under the European Agricultural Fund for Rural Development ([73]) to implement farming practices aimed at addressing biodiversity loss.

([66]) Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds, L 20/7.
([67]) Council Directive 92 /43 /EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, No L 206 / 7.
([68]) European Commission (2011), *Our life insurance, our natural capital: an EU biodiversity strategy to 2020*, COM(2011) 244 final, Brussels.
([69]) Eurostat, Common Bird Index (tsdnr100), Indicator Profile.
([70]) Bird Life Cyprus (2017), *The Future of Birds at the Cyprus Parliament: Sounding the alarm for possible referral of Cyprus to the EU court*, 6 June 2017.
([71]) Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds, L 20/7.
([72]) European Commission (2011), *Our life insurance, our natural capital: an EU biodiversity strategy to 2020*, COM(2011) 244 final, Brussels.
([73]) Regulation (EU) No 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) and repealing Council Regulation (EC) No 1698/2005, L 347/487.

Sufficiency of terrestrial sites designated under the EU Habitats Directive

The completeness of the designation of terrestrial protected areas for habitats and species listed in the Habitats Directive reached 92 % in 2013. Coverage has remained high, despite the addition of new habitats and species in the Annex of the Directive in 2012.

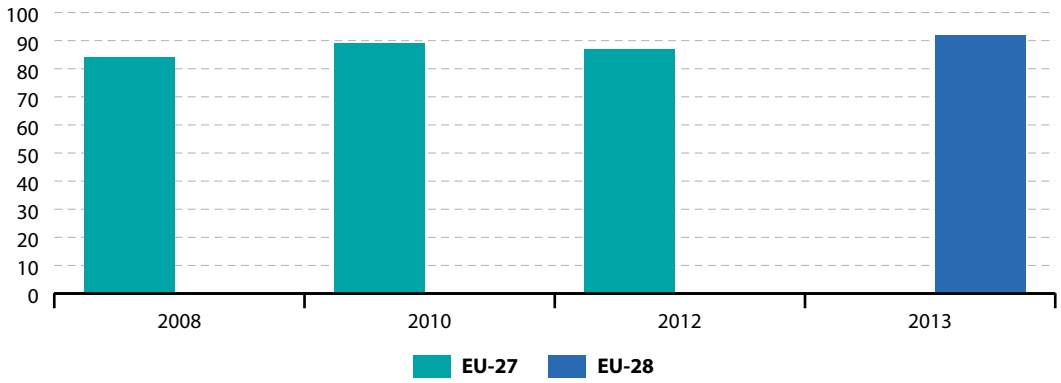


The EU Habitats Directive requires Member States to designate and manage Sites of Community Importance (SCIs) to maintain or restore favourable conservation status of natural habitat types and species of EU interest. For each Member State, the terrestrial sufficiency index expresses the share of species and habitats listed in the Directive for which the European Commission considers the national network of terrestrial SCIs to be sufficient in terms of number, extent, distribution and representativeness. The indicator therefore measures the degree to which the EU Habitats Directive has been implemented in terms of areas covered and numbers of species under protection. It is important to note that the European Commission has reviewed the calculation method of the sufficiency index at least twice. Some breaks in the time series and changes in the index can be attributed to the addition of new types of habitats and new species when new countries joined the EU. Data presented in this section are provided by the Member States to the Commission and are consolidated at least yearly by the European Environment Agency and the European Topic Centre on Biological Diversity (EEA ETC/BD).

Overall, the EU's index has generally increased since 2008, reaching 92 % in 2013. As such, the EU's coverage of terrestrial habitats and species listed in the Habitats Directive can be considered high.

The slight dip between 2010 and 2012 can be explained by the addition of more habitats and species to the Habitats Directive reference lists. This meant Members States had more habitats and species to designate and manage as SCIs, which

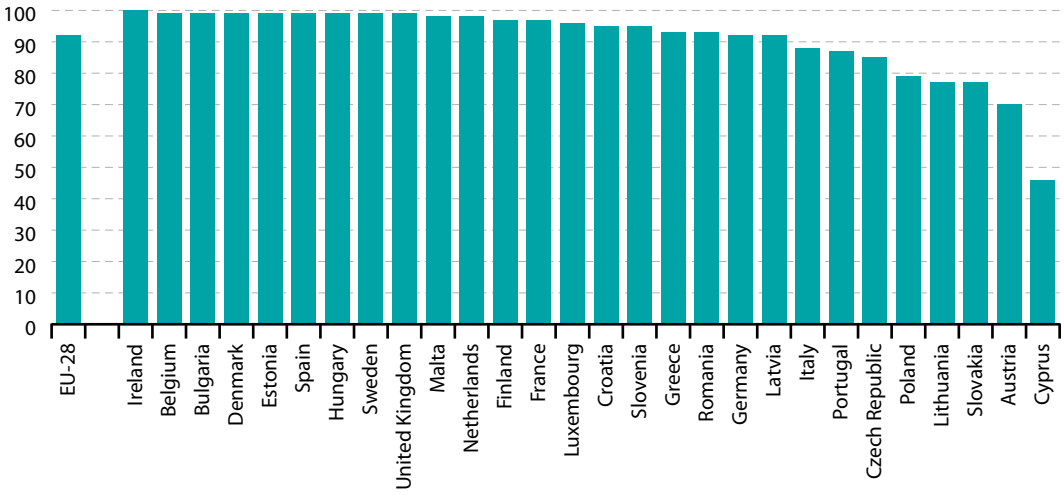
Figure 15.8: Sufficiency of terrestrial sites designated under the EU Habitats Directive, EU-27 and EU-28, 2008–2013
(sufficiency index (%))



Note: no data for 2009 and 2011; breaks in time series in 2012 and 2013.

Source: European Environment Agency (EEA), European Commission services (Eurostat online data code: sdg_15_20)

Figure 15.9: Sufficiency of terrestrial sites designated under the EU Habitats Directive, by country, 2013
(sufficiency index (%))



Source: European Environment Agency (EEA), European Commission services (Eurostat online data code: sdg_15_20)

The Habitats Directive ([74]), Birds Directive ([75]) and targets of the EU Biodiversity Strategy to 2020 ([76]) all highlight the importance of preservation, conservation and restoration of terrestrial habitats in the EU.

caused a slight decrease in the EU's score from 89 % in 2010 to 87 % in 2012. In 2013, Croatia joined the EU, with a sufficiency index of 95 %.

In general, most EU countries have relatively high sufficiency indices under the EU Habitats Directive. With the notable exception of Cyprus and Austria, all countries had sufficiency scores of over 75 % in 2013. Only eight countries had scores below the EU average of 92 %. Ireland was the only country to have a complete network of designated sites of terrestrial habitats and species listed in the annexes of the Habitats Directive. Poland reported the greatest increase in its sufficiency index between 2006 and 2013, from 17 % to 79 %.

([74]) Council Directive 92 /43 /EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, No L 206 / 7.
([75]) Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds, L 20/7.
([76]) European Commission, *Our life insurance, our natural capital: an EU biodiversity strategy to 2020 {SEC(2011) 540 final} {SEC(2011) 541 final}*, COM(2011) 244 final, Brussels.

Further reading on life on land

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Panagos, P., Borelli, P., Poesen, J., Ballabio, C., Lugato, E., Meusburger, K., Montanarella, L., and Alewell, C. (2015), *The new assessment of soil loss by water erosion in Europe*, Environmental Science & Policy Journal (54), p 438–447.

Panagos, P., Borrelli, P., Robinson, D.A. (2015), *Common Agricultural Policy: Tackling soil loss across Europe*, Nature (526), 195.

RECARE project (2017), *Soil Threats*, Preventing and Remediating Degradation of Soils in Europe through Land Care (RECARE).

16 Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

The global perspective on SDG 16

Peace, justice and effective, accountable and inclusive institutions are at the core of sustainable development. While several regions have enjoyed increased and sustained levels of peace and security in recent decades, many countries still face protracted armed conflict and violence. Furthermore, far too many people struggle as a result of weak institutions and the lack of access to justice, information and other fundamental freedoms. SDG 16 calls for peaceful and inclusive societies based on respect for human rights, protection of the most vulnerable, the rule of law and good governance at all levels. It also envisions transparent, effective and accountable institutions, which promote non-discriminatory laws and policies, combat corruption, bribery and organised crime and prevent violence, terrorism and crime. SDG 16 also stipulates responsive, inclusive, participatory and representative decision-making, with an enhanced role of developing countries in institutions of global governance ([1]).

eurostat supports the SDGs

Monitoring SDG 16 'peace, justice and strong institutions' in an EU context focuses on three sub-themes. 'Peace and personal security' refers to the incidence of homicide, crime and physical and sexual violence to women. 'Access to justice' looks at the financing of courts and the perceived independence of the justice system and 'trust in institutions' covers the perceived corruption of the public sector and confidence in EU institutions. As shown in Table 16.1, the EU's progress in these areas has been rather ambiguous. Trends for a number of indicators cannot be calculated due to limited data availability.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets 'Why it matters' and World Bank Group, (2017), Atlas of Sustainable Development Goals 2017 from World Development Indicators.

Table 16.1: Indicators measuring progress in SDG 16, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Peace and personal security			
Death rate due to homicide	↑ (1)	↑	p. 320
Population reporting occurrence of crime, violence or vandalism in their area	:	↑	p. 322
Physical and sexual violence to women experienced within 12 months prior to the interview (*)	:	:	SDG 5, p. 112
Access to justice			
General governmental total expenditure on law courts	:	↑	p. 324
Perceived independence of the justice system	:	:	p. 326
Trust in institutions			
Corruption Perceptions Index	:	:	p. 328
Population with confidence in EU institutions	↓	↗	p. 330

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.

(*) Multi-purpose indicator: for a detailed presentation of this indicator see the specified chapter.
(1) Past 12-year period.

Peace, justice and strong institutions in the EU: overview and key trends

The European Union is one of the most successful peace projects in the world. Under the guidance of the Treaty of Rome ([2]), signed in 1957, the Union can look back on 60 years of peace, democracy and solidarity. In 2012, the EU received the Nobel Peace Prize for advancing the causes of peace, reconciliation, democracy and human rights in Europe. Today, EU policies and legislation are in place with many of the underlying principles anchored into the Treaty on European Union and the EU Charter on Fundamental Rights and going beyond the ambition set out in SDG 16 ([3]).

With 'an area of justice and fundamental rights based on mutual trust' being one of the ten political priorities of the current European Commission, the EU aims at continued efforts in the area of justice and gender equality. Effective justice systems play a crucial role in upholding the rule of law and the Union's fundamental values. Nevertheless, crime is a threat to European citizens, businesses, state institutions as well as the economy as a whole. In particular, corruption remains one of the biggest challenges for all societies, including European societies. Since the Lisbon Treaty entered in to force in 2009, the EU has had the opportunity to establish measures to promote and support Member States' actions in the field of crime prevention matters. The European Commission has also been given a political mandate to monitor efforts in the fight against corruption and to develop a comprehensive EU anti-corruption policy.

Peace and personal security

Safety is a crucial aspect in people's lives. Insecurity of any kind is a source of fear and worry, which negatively affect quality of life. Physical insecurity includes all the external factors that could potentially put the individual's physical integrity in danger. Criminal actions are one of the most obvious causes of insecurity. Analyses of physical insecurity usually combine both subjective and objective aspects — the subjective perception of insecurity and the objective lack of safety as measured by crime statistics.

Homicides are one of the most serious crimes. Deaths due to homicide have fallen steadily in the EU since 2002, reaching a rate of 0.7 deaths per 100 000 people in 2014. Death rates due to homicide, however, remain about twice as high for men as for women. The reduction in homicides — the objective indicator — goes hand in hand with improvements in the perception of crime, violence or vandalism, the subjective counterpart in this sub-theme. Since 2010, the share of people reporting occurrence of such problems in their area has generally fallen in the EU. People living in cities are much more affected by these issues than those living in more sparsely populated areas, with about one fifth of people living in cities feeling affected in 2015. Reporting rates of these problems are also higher among poor people.

Personal security can also be threatened in one's own home. Gender-based violence is a brutal form of discrimination, related to inequalities between women and men. Physical and sexual violence against women by a partner or a non-partner does not only affect their health and well-being, it can also hamper their access to employment with negative effects on the financial independence and the economy overall. Thus, eliminating all forms of violence against women and girls in the public and private spheres is crucial. In 2012, every third woman reported to have experienced some form of physical or sexual violence since the age of 15, and 8 % had experienced such violence in the 12 months prior to the survey.

([2]) Signed in Rome in 1957 as the Treaty establishing the European Economic Community, it is now known as Treaty on the Functioning of the European Union.
([3]) European Commission (2016), *Next steps for a sustainable European future: European action for sustainability*, COM(2016) 739 final, Brussels.

Access to justice

Well-functioning justice systems are an important structural condition on which EU Member States base their sustainable growth and social stability policies. Whatever the model of the national justice system or the legal tradition in which it is anchored, quality, independence and efficiency are some of the essential parameters of an 'effective justice system'. As there is no single agreed way of measuring the quality of justice systems, the budget actually spent on courts is used here as a proxy for the quality of the legal system. In the EU, the financial resources dedicated to the legal system have grown over the past few years, reaching almost EUR 50 billion in 2015. In relation to total government expenditure, spending on law courts has, however, remained stable at 0.7 %, indicating that the growth in absolute spending only reflects the overall increase in total government spending.

In addition to sufficient financial resources, judges in law courts need to be able to make decisions without interference or pressure from policy or other economic actors, to ensure that individuals and businesses can fully enjoy their rights. Respect for the rule of law is a prerequisite for the protection of all fundamental values listed in the EU Treaties, including democracy and fundamental rights. In 2017 more than half of the EU inhabitants rated the independence of the courts and judges in their country as good ('very good' or 'fairly good'). The status and position of judges sufficiently guaranteeing their independence was the most common reason for a good rating, while political interference or economic pressure were the most likely reasons for a bad rating. Perceived independence has increased from 2016 to 2017.

Trust in institutions

Effective justice systems are a prerequisite for the fight against corruption. Corruption generally comprises illegal activities, which are deliberately hidden and only come to light through scandals, investigations or prosecutions. Corruption inflicts financial damage by lowering investment levels, hampering the fair operation of the internal market and reducing public finances. It also causes social harm as organised crime groups use corruption to commit other serious crimes, such as trafficking in drugs and human beings. Corruption is estimated to cost the EU economy EUR 120 billion per year, equivalent to about 1 % of the EU's GDP ([4]). As there is no meaningful way to assess absolute levels of corruption in countries or territories on the basis of hard empirical data, capturing perceptions of corruption of those in a position to offer assessments of public sector corruption is so far the most reliable method of comparing relative corruption levels across countries. According to Transparency International's Corruption Perceptions Index, EU countries continue to rank among the least corrupt countries in the world in 2016, with Member States making up half of the global top 20 countries in terms of least corruption. Within the EU, corruption perception is lowest in northern Europe.

Corruption can also undermine trust in democratic institutions and weaken the accountability of political leadership. Confidence in political institutions is important for effective democracies. On the one hand, citizens' confidence increases the probability that they vote in democratic elections. On the other hand, it provides politicians and political parties with the necessary mandate to take decisions that are accepted in society. Over the past decade the EU has seen a considerable decline in levels of trust in its main institutions. The shorter term trend since 2011 is less clear, showing stagnation of citizens' confidence at rather low levels. In 2016, only 42 % of Europeans expressed confidence in the European Parliament, and trust levels for the European Commission and the European Central Bank were below 40 %. A limited knowledge about the role and powers of EU institutions, and the financial crisis affecting the common currency, the euro, may have contributed to this development.

([4]) European Commission (2014), *EU anti-corruption report*, COM(2014) 38 final, p. 3.

Peace, justice and strong institutions in the EU

Peace and personal security

Homicide rate in 2014
0.7 per 100 000 inhabitants
- 0.2 per 100 000 inhabitants since 2009

Reported occurrence of crime in 2015
13.6 % of population
- 0.7 pp since 2010

Physical and sexual violence in 2012
8 % of women

Access to justice

Expenditure on law courts in 2015
49 980 million EUR
+ 5.2 % since 2010

Perceived independence of judiciary in 2017
55 % of population perceived it very good or fairly good

Trust in institutions

Corruption Perceptions Index in 2016
Member States' perceptions range from 41 to 90
Score from 0 (highly corrupt) to 100 (very clean)

Citizens' confidence in EU institutions in 2016

European Parliament
42 % of population
+ 1 pp since 2011

European Comission
38 % of population
+ 2 pp since 2011

European Central Bank
34 % of population
- 2 pp since 2011

Source: Eurostat (online data codes: sdg_16_10, sdg_16_20, sdg_05_10, sdg_16_30, sdg_16_40, sdg_16_50 and sdg_16_60)

Death rate due to homicide

Deaths due to homicides have fallen continuously in the EU since 2002. Death rates for men are about twice as high as for women.

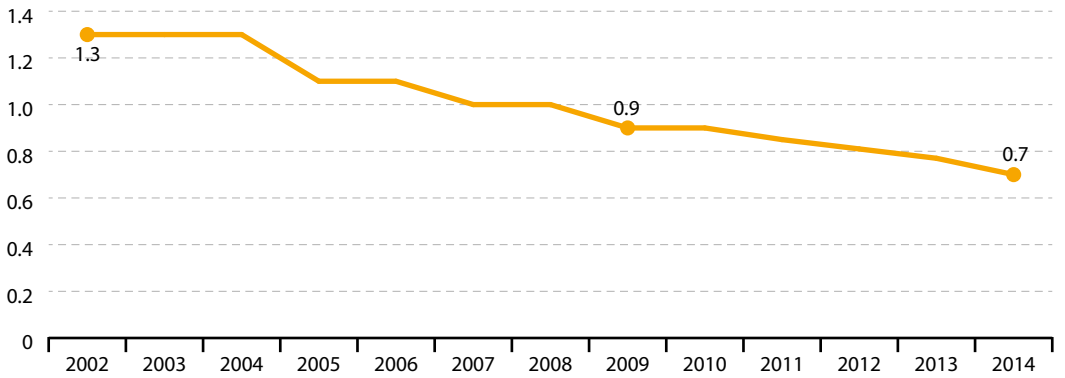
The indicator tracks deaths due to homicide and injuries inflicted by another person with the intent to injure or kill by any means, including 'late effects' from assault (International Classification of Diseases (ICD) codes X85 to Y09 and Y87.1). It does not include deaths due to legal interventions or war (ICD codes Y35 and Y36). The data are presented as standardised death rates, meaning they are adjusted to a standard age distribution in order to measure death rates independently of different age structures of populations. The standardised death rates used here are calculated on the basis of a standard European population.

The steady decline in deaths due to homicide in the EU shown in Figure 16.1 is consistent with the trend in police-recorded intentional homicide offences, which consistently decreased from 2008 to 2014. The total number of intentional homicides recorded across the EU (data available for 29 jurisdictions ([5])) in 2014 was 4 340, about 23 % less than the number of offences in 2008 (5 634) ([6]).

The trend at the EU level since 2002 reflects reductions in death rates due to homicide for both men and women. Deaths due to homicide, however, remain about twice as high for men (0.92 deaths per 100 000 people in 2014) as for women (0.48 deaths per 100 000 people).

With less than one death per 100 000 inhabitants due to homicide per year, the EU is among the least violent places on earth. Globally, the highest homicide rates are reported by countries in Latin America and the Caribbean as well as in Sub-Saharan Africa. Honduras reported the highest rates, with 70 homicides per 100 000 people

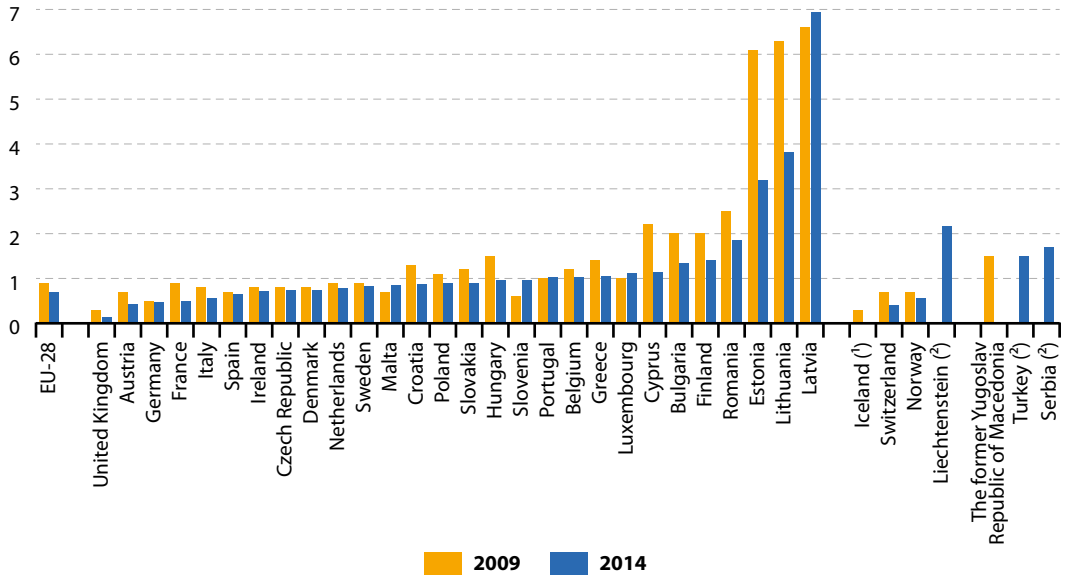
Figure 16.1: Death rate due to homicide, EU-28, 2002–2014
(number by 100 000 persons)



Source: Eurostat (online data code: sdg_16_10)

([5]) There is one jurisdiction in each of the EU-28 Member States except in the United Kingdom where there are three: England and Wales; Scotland; and Northern Ireland. As such, in total there are 30 jurisdictions within the EU-28. The 2014 data reported here exclude the Netherlands.
([6]) Eurostat, *Statistics Explained, Crime and criminal justice statistics*, (accessed on 17 October 2017).

Figure 16.2: Death rate due to homicide, assault, by country, 2009 and 2014
(number by 100 000 persons)



(1) No data for 2014.

(2) No data for 2009.

Source: Eurostat (online data code: sdg_16_10)

The European Agenda on security (7) sets out the main actions envisaged to ensure an effective EU response to terrorism and security threats in the European Union over the period 2015 to 2020. The Agenda identified three priorities: tackling terrorism and preventing radicalisation, disrupting organised crime, and fighting cybercrime. Other areas of EU intervention include the fight against trafficking in human beings and firearms, the fight against corruption, financial crime and counterfeiting crime.

in 2014 (8). On the global level the gender gap is much wider than for the EU, with 79 % of all homicide victims being male in 2013, and the global average homicide rate being almost four times higher for men than for women (9).

Across the EU, the Baltic countries Latvia, Lithuania and Estonia reported by far higher death rates due to homicide than all other Member States. In 2009, all three countries had reported rates of more than 6 deaths per 100 000 inhabitants due to homicide. However, while remarkable reductions were achieved in Estonia and Lithuania until 2014, the rate increased even further in Latvia to almost 7 deaths per 100 000 inhabitants. However, taking into account the rather small population sizes, variations in the assault rate in these countries may partly be due to random variations and not due to systematic developments. Overall, eastern European countries have seen the strongest reductions in deaths due to homicides since 2009. The improvement in socioeconomic conditions in these countries is likely to have contributed to this decrease (10).

(7) European Commission, *The European Agenda on Security*, COM(2015) 185 final, Strasbourg.
(8) World Bank (2017), *Atlas of Sustainable Development Goals 2017*, Washington, p. 92f.
(9) UNODC (2014), *Global study on homicide 2013*, Vienna: United Nations Office on Drugs and Crime, p. 28.
(10) Id., p. 34.

Population reporting occurrence of crime, violence or vandalism in their area

The perceived occurrence of crime, violence or vandalism in EU neighbourhoods has slightly fallen between 2010 and 2015. People living in cities are much more affected by these problems than those living in more sparsely populated areas.

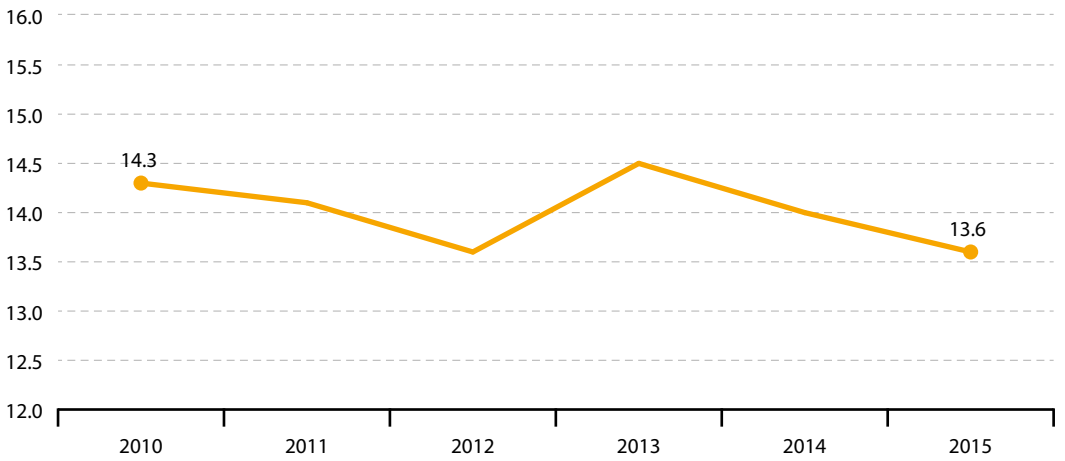
LONG TERM	SHORT TERM 2010–2015
X INSUFFICIENT DATA TO CALCULATE TREND	↑

Data for this indicator are collected through the EU Statistics on Income and Living Conditions (EU SILC). They show the share of the population who reported that they face the problem of crime, violence or vandalism in their local area. This describes the situation where the respondent feels crime, violence or vandalism in the area to be a problem for the household, although this perception is not necessarily based on personal experience.

Reporting of problems with crime, violence or vandalism in the neighbourhood has generally fallen in the EU over the past few years, but the trend has not been continuous. Perception rates of these problems differ considerably when distinguishing between urban and rural areas. In 2015, almost one fifth of people living in EU cities (19.8 %) reported occurrence of crime, violence or vandalism in their area. People living in more sparsely populated areas were much less affected, with reporting rates of 11.5 % in towns and suburbs and 7.0 % in rural areas. Similarly, poor people with an income below 60 % of the median equivalised income (therefore below the poverty threshold) reported these problems more often (16.6 % in 2015) than richer people (13.0 %).

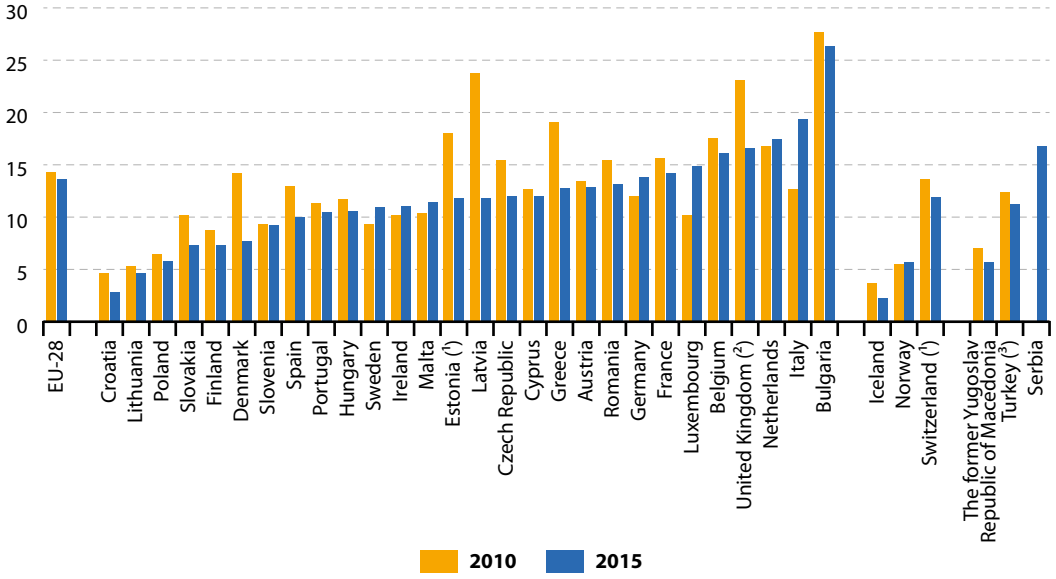
In 2015, perceived exposure to crime, violence or vandalism was nine times higher in the most affected country than in the least affected country. However, country differences in this subjective measurement need to be treated with caution, as the indicator mainly provides information on the extent to which people

Figure 16.3: Population reporting occurrence of crime, violence or vandalism in their area, EU-28, 2010–2015
(% of population)



Source: Eurostat (online data code: sdg_16_20)

Figure 16.4: Population reporting occurrence of crime, violence or vandalism in their area, by country, 2010 and 2015
(% of population)



(1) Break in time series in 2014.
(2) Break in time series in 2012.
(3) 2009 data (instead of 2010).

Source: Eurostat (online data code: sdg_16_20)

perceive crime, violence or vandalism in their neighbourhood as a problem, but not on the extent to which these problems actually occur. Previous research suggests that crime rates from police registers and the subjective exposure to crime may differ, as population groups with low victimisation rates are particularly afraid of crime (the so-called fear of victimisation paradox) ([11]). This is for instance visible in the United Kingdom, which had the lowest death rate due to homicide across the EU (see analysis on 'Death rates due to homicide, assault' above), but one of the highest shares of people reporting crime or other problems in their area. In contrast, death rates due to homicide were among the highest in Lithuania, but the country had one of the lowest shares of people reporting crime, violence or vandalism in their neighbourhood. However, it needs to be acknowledged that this comparison may not capture the full picture, as other forms of crime than homicide exist, which may also contribute to perceived insecurity.

([11]) See for example Schwind, H.-D. (2009), *Kriminologie — eine praxisorientierte Einführung mit Beispielen*, Heidelberg: Kriminalistik Verlag or Herbst, S. (2011), *Untersuchungen zum Viktimisierungs-Furcht-Paradoxon*, Baden-Baden: Nomos.

General governmental total expenditure on law courts

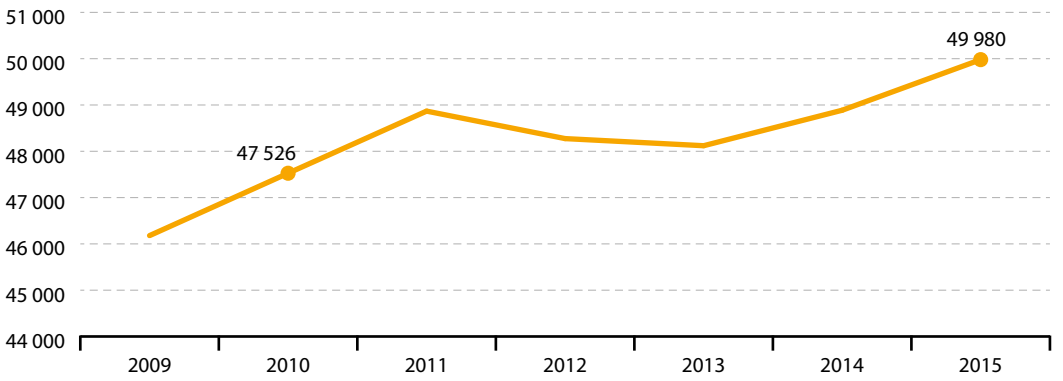
The budget spent on EU law courts has increased since 2010, reaching almost EUR 50 billion in 2015. However, this increase only reflects an overall increase in total government spending.

LONG TERM	SHORT TERM 2010–2015
X INSUFFICIENT DATA TO CALCULATE TREND	↑

Data refer to general government total expenditure on administration, operation or support of administrative, civil and criminal law courts and the judicial system, including enforcement of fines and legal settlements imposed by the courts and operation of parole probation systems, and parts of legal aid (legal representation and advice on behalf of government or on behalf of others provided by government in cash or in services), excluding prison administrations.

Effective justice systems do not only require timely but also high-quality decisions. Quality is a driver for citizens' and businesses' trust in the justice system. Because there is no single agreed way of measuring the quality of justice systems ([12]), the budget actually spent on courts is used as a proxy for the quality of the legal system in the EU. As shown in Figure 16.5, the financial resources dedicated to law courts in the EU have increased over the past few years. When expressed as a share of GDP, however, the trend is less clear. Government expenditure on law courts accounted for 0.4 % of GDP for the period 2009 to 2013, and has fallen to 0.3 % since 2014. When expressed as a share of total government expenditure, spending on law courts has remained stable at 0.7 % over the whole period. The growth in absolute spending since 2009 consequently does not reflect a stronger focus on the financing of law courts but merely mirrors an increase in total government spending, which was outperformed by growth in nominal GDP.

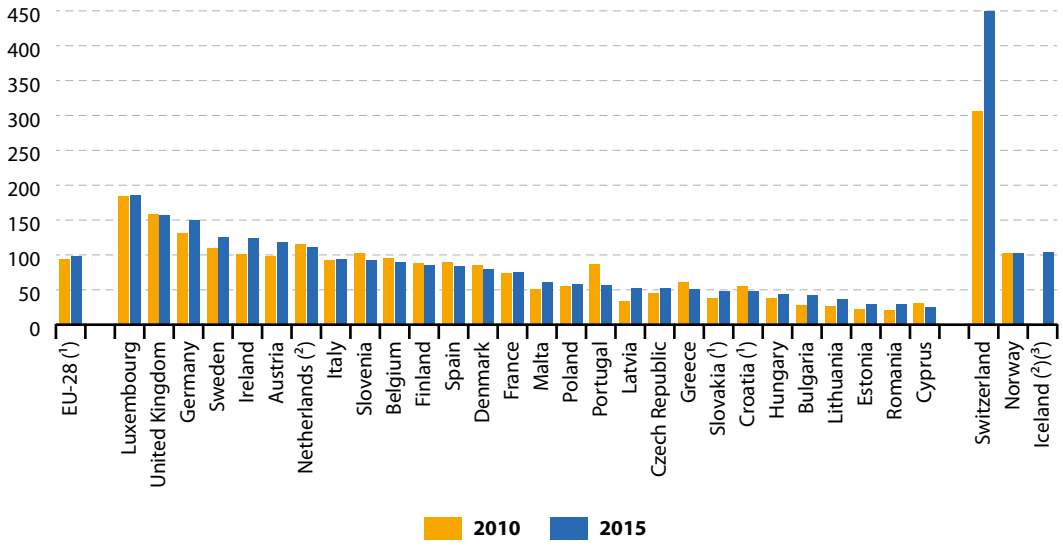
Figure 16.5: General government total expenditure on law courts, EU-28, 2009–2015
(EUR million, in current prices)



Note: Provisional data.
Source: Eurostat (online data code: sdg_16_30)

([12]) European Commission (2017), *The 2017 EU Justice Scoreboard*, COM(2017) 167 final, p. 18.

Figure 16.6: General government total expenditure on law courts, by country, 2010 and 2015
(EUR per capita, in current prices)



(1) Provisional data.
(2) 2015 data are provisional.
(3) No data for 2010.

Source: Eurostat (online data code: sdg_16_30)

Improvement of the effectiveness of justice systems in Member States has been identified as a key component for structural reforms in the European Semester, the annual cycle for the coordination of economic policies at EU level. With the help of the Justice Scoreboard, the EU monitors the efficiency, quality and independence of the justice systems of the Member States.

Across the EU, per capita government spending on law courts ranged from EUR 186.4 per person to EUR 25.0 per person in 2015. Figures for Switzerland by far exceeded all other countries, with a spending of almost EUR 450 per person in 2015. Country differences need to be interpreted with caution because the majority of total expenditure on law courts is in the form of compensation of employees, which comprises wages and salaries as well as employers' social contributions. The evolution of total expenditure in this area is therefore strongly influenced by general labour costs.

Perceived independence of the justice system

More than half of the EU inhabitants rate the independence of the courts and judges in their country as good. The perceived independence has increased from 2016 to 2017.

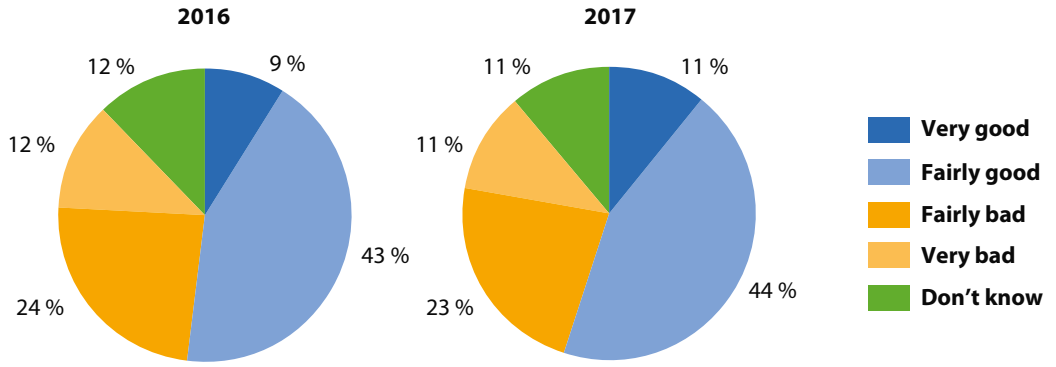
X INSUFFICIENT DATA TO CALCULATE TREND

Data on the perceived independence of the justice system stem from Flash Eurobarometer surveys carried out in 2016 and 2017 on behalf of the European Commission's Directorate-General for Justice and Consumers. It was designed to explore respondents' perceptions about the independence of the judiciary across Member States, looking specifically at the perceived independence of the courts and judges in a country and the reasons for these perceptions. The surveys were carried out in February 2016 and January 2017, covering about 26 500 respondents each ([13]) from different social and demographic groups who were interviewed by telephone.

Across the EU, the majority of respondents perceived the independence of the courts and judges in their country to be good. The share of respondents with 'very good' or 'fairly good' perception increased by three percentage points from 2016 to 2017, while the perception of 'very bad' or 'fairly bad' fell by two percentage points. The most common reason for respondents rating the independence of their justice system as good was the status and position of judges sufficiently guaranteeing their independence. In contrast, interference or pressure from economic or other specific interests as well as interference or pressure from government and politicians were the most likely reasons for a bad rating.

While there are no significant gender differences, age seems to have a notable effect on the perception of the independence of the justice system. The share of respondents' rating their justice system as good decreases with older age: while almost two-thirds (64 %) of 15 to 24 year old respondents gave a good rating, only 52 % of respondents aged 55 or over had the same perception. Even more distinct differences were

Figure 16.7: Perceived independence of the justice system, EU-28, 2016 and 2017
(% of population)



Source: European Commission services, Eurobarometer (Eurostat online data code: sdg_16_40)

([13]) About 1 000 respondents per country, except for Luxembourg, Cyprus and Malta where about 500 respondents were interviewed each.

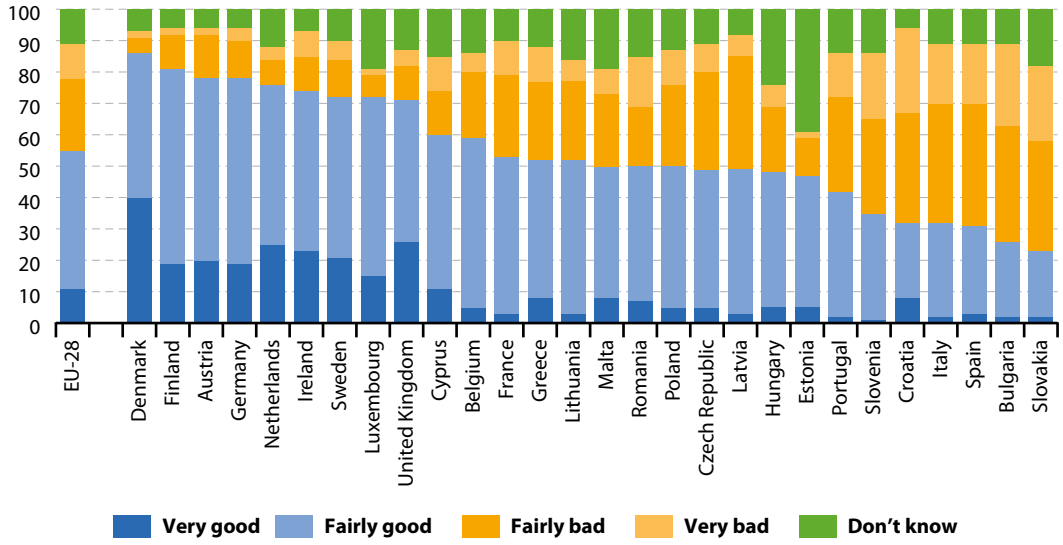
visible in terms of the length of time respondents had been in education. Those who had finished school at the age of 15 were more likely to have a negative perception of the independence of the justice system (42 %). In contrast, respondents studying until the age of 20 or longer had a much more positive perception (60 % good). In terms of respondents' occupation, employees (61 %) and self-employed (57 %) were most likely to give a good rating.

Notably, respondents who had been involved in a dispute that had gone to court were evenly split between those who rated their system as good (48 %) and bad (48 %). In contrast, the majority of those who had not been to court said the independence was good (56 %).

In 17 Member States, at least half of all respondents rated the independence of courts and judges as good in 2017. Particularly high perceptions of independence were reported in some northern and central European countries. Conversely, in six countries from southern and eastern Europe, the majority of respondents rated the independence of their justice system as bad. It is worth noting that the share of respondents answering the question of perceived independence with 'don't know' was particularly high in Estonia and Hungary.

Compared to 2016, the most notable improvements in the perceived independence could be observed in Portugal (10 percentage points higher share of good ratings), Germany (+ 9 percentage points) and Latvia and Italy (+ 7 percentage points each). In contrast, the share of people with a good perception fell the most in Estonia (– 15 percentage points), mainly due to an increase in the proportion of those who did not know.

Figure 16.8: Perceived independence of the justice system, by country, 2017
(% of population)



Source: European Commission services, Eurobarometer (Eurostat online data code: sdg_16_40)

Corruption Perceptions Index

EU Member States continued to rank among the least corrupt countries in the world in 2016. Perceived corruption was lowest in northern European countries.

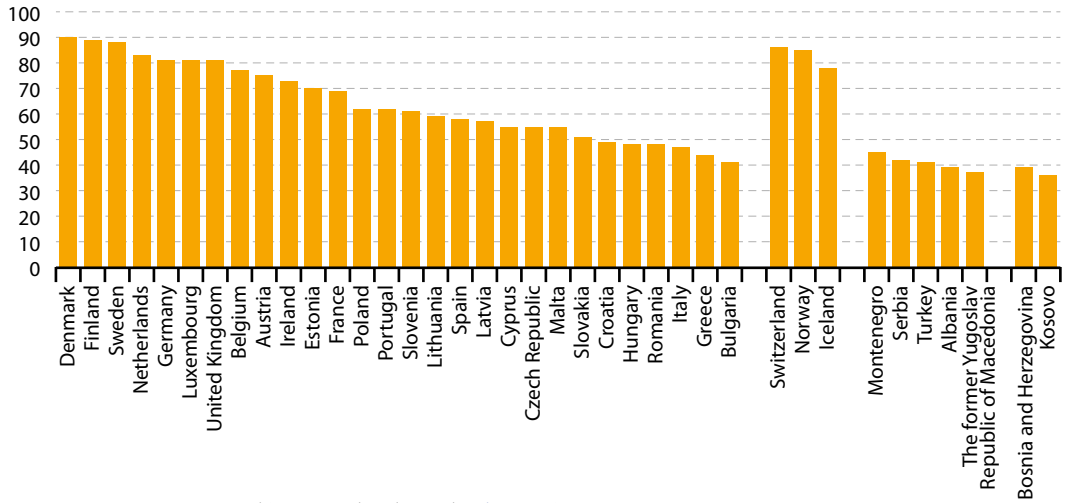
X INSUFFICIENT DATA TO CALCULATE TREND

The Corruption Perceptions Index (CPI) is published by Transparency International and scores and ranks countries based on how corrupt a country's public sector is perceived to be. It is a composite index based on a combination of surveys and assessments of corruption from 13 different sources ([14]). The sources of information used for the 2016 CPI are based on data gathered in the 24 months preceding the publication of the index. The CPI includes only sources that provide a score for a set of countries/territories and that measure perceptions of corruption in the public sector. For a country or territory to be included in the ranking, it must be included in a minimum of three of the CPI's data sources. The 2016 CPI includes 176 countries and territories. A country or territory's score indicates the perceived level of public sector corruption on a scale of 0 to 100, where 0 means a country is perceived as highly corrupt and a 100 means a country is perceived as very clean.

European countries showed rather low levels of perceived corruption in 2016. Northern European countries achieved the best scores across the EU, with Denmark on the first place (also at the global level). Half of the global top 20 countries in 2016 were Member States. Across the EU, perceived corruption was highest in Bulgaria and Greece. On the global list (comprising 176 countries in total), these two countries were ranked at position 75 and 69, respectively.

According to the EU anti-corruption report ([15]), the country ranking in the CPI corresponds to answers collected in Eurobarometer surveys on the same topic. In economic terms, corruption is estimated to cost the EU economy EUR 120 billion per year, an equivalent of about 1 % of the EU's GDP ([16]).

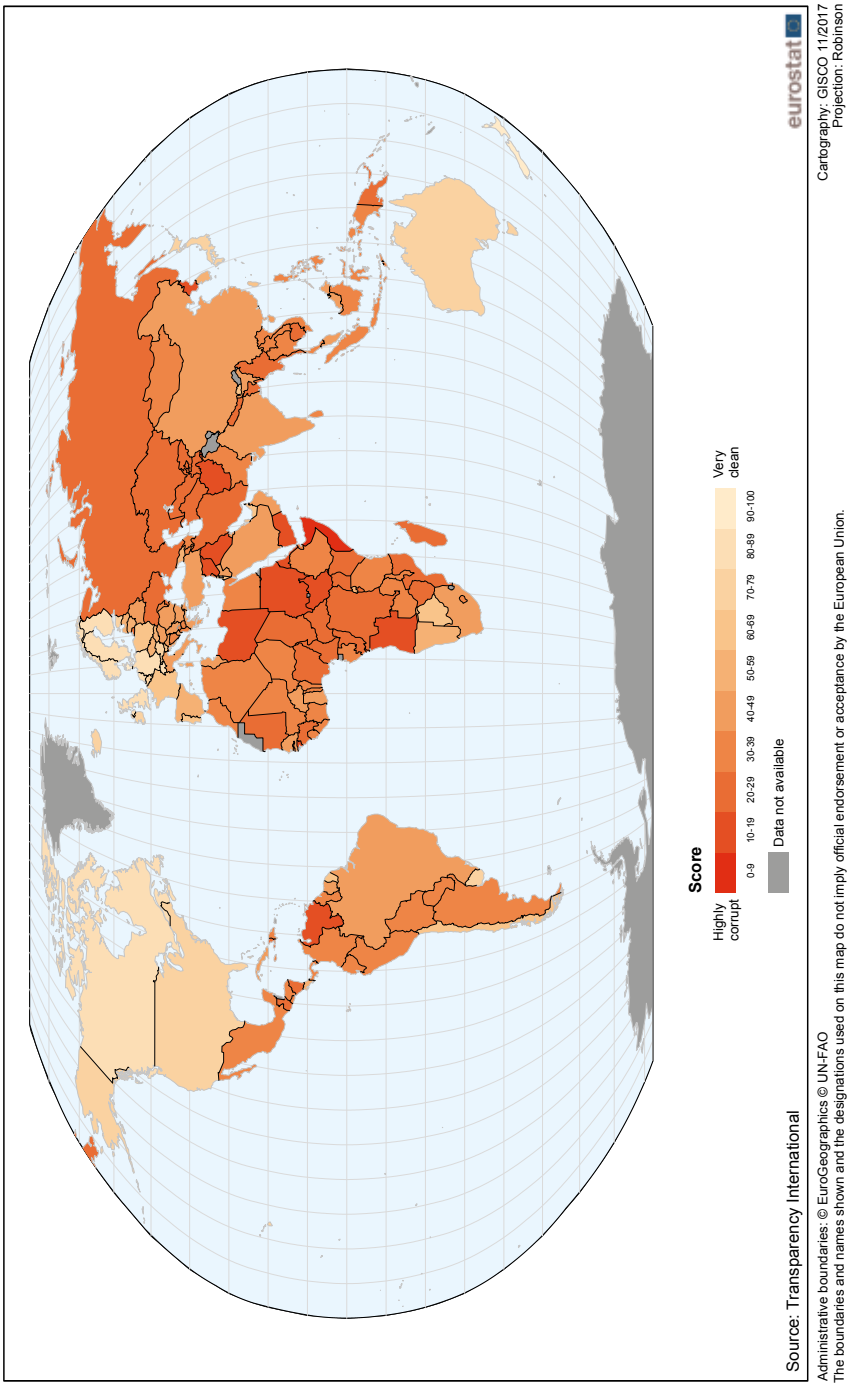
Figure 16.9: Corruption Perceptions Index, by country, 2016
(score scale from 0 (highly corrupt) to 100 (very clean))



Source: Transparency International (Eurostat online data code: sdg_16_50)

([14]) See Transparency International (2016), Corruption Perceptions Index 2016: Full Source Description.
([15]) European Commission (2014), *EU anti-corruption report*, COM(2014) 38 final.
([16]) European Commission (2011), *Fighting corruption in the EU*, COM(2011) 308 final.

Map 16.1: Corruption Perceptions Index, 2016
(score scale of 0 (highly corrupt) to 100 (very clean))



Source: Transparency International (Eurostat online data code: sdg_16_50)

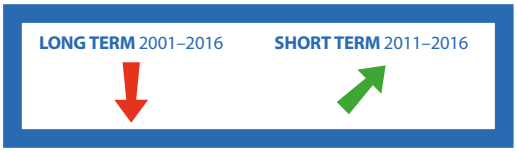
Compared to previous editions of the CPI, no drastic changes are visible in Europe. According to Transparency International, this 'stagnation does not indicate that the fight against corruption has improved, but quite the opposite' ([17]).

There exists a notable relationship between the CPI and the perceived independence of the justice system (analysed in the previous section). Countries with a high share of the population rating the independence of the justice system as 'good', such as Denmark, Finland or the Netherlands, also score high in the CPI. Vice versa, countries with less optimistic ratings of the justice system's independence also tend to have lower CPI scores, for example Bulgaria, Italy or Croatia. As both indicators are based on people's perceptions, however, a causal relationship between the effectiveness of the justice system and the occurrence of corruption cannot be implied based on these data. Effective justice systems are nevertheless considered as a prerequisite for fighting corruption ([18]).

Globally, out of the 176 countries included in the CPI 2016, over 120 countries scored below 50 on the scale from 0 (highly corrupt) to 100 (very clean). This means less than a third were even above the midpoint. Looking at regional aggregates, the EU and western Europe were perceived to be the most clean in 2016 (average score of 66), followed by the Americas and the Asia-pacific region (average score of 44 each). Countries in Sub-Saharan Africa were considered the most corrupt (average score of 31). Together with Denmark, New Zealand was considered to be the least corrupt country in 2016, with a score of 90 out of the maximum 100. In contrast, the most corrupt countries according to the CPI were North Korea, South Sudan und Somalia, with scores of 12, 11 and 10, respectively.

Population with confidence in EU institutions

Citizens' confidence in EU institutions has deteriorated since 2001. In the short-term period since 2011, trust levels have experienced ups and downs, but overall stagnated at low levels.



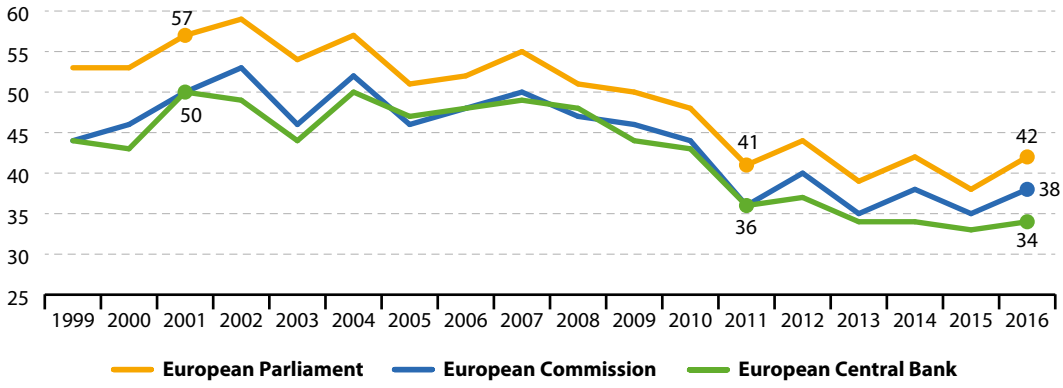
The indicator measures expressions of institutional 'trust' among EU citizens in main EU institutions: European Parliament, European Commission and the European Central Bank. It is expressed as the share of positive opinions (people who declare that they tend to trust) about the institutions. The indicator is based on Eurobarometer surveys and shows the results of the autumn survey. Citizens are asked to express their confidence levels by choosing the following alternatives: 'tend to trust', 'tend not to trust' and 'don't know' or 'no answer'. As 'trust' is not further specified, there is clearly room for individual interpretations on part of the interviewees.

In the EU, levels of trust in all three institutions have declined sharply in the long term, especially up to 2011. Since then, levels of citizens' confidence have fluctuated at rather low levels, without a clear trend being discernible. The European Parliament has remained the most trusted among the surveyed EU institutions; however, with trust levels of only 42 % in 2016. Citizen's confidence in the European Commission and the European Central Bank were even lower, as shown in Figure 16.10.

The economic crisis may have played a role in the strong decline in trust levels of EU institutions observable between 2007 and 2011. One the one hand, a financial crisis affecting the euro can be seen as test of the EU's governance mechanisms. On the other hand, citizens tend to be much less

([17]) See http://www.transparency.org/news/feature/europe_and_central_asia_an_overall_stagnation.
([18]) European Commission (2016), *European Semester Thematic Fiche on Effective Justice Systems*, accessed 19 May 2017.

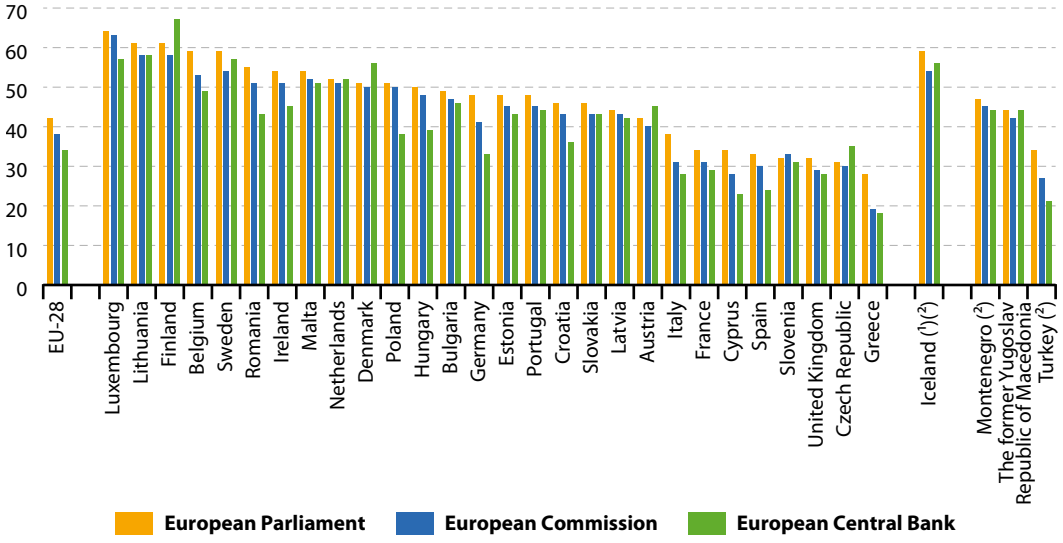
Figure 16.10: Population with confidence in EU institutions by institution, EU, 1999–2016
(% of population)



Note: Data refer to the EU composition of the reference period.

Source: European Commission services, Eurobarometer (Eurostat online data code: sdg_16_60)

Figure 16.11: Population with confidence in EU institutions by institution, by country, 2016
(% of population)



(1) 2014 data for European Parliament and European Commission.
(2) 2013 data for European Central Bank.

Source: European Commission services, Eurobarometer (Eurostat online data code: sdg_16_60)

acquainted with EU institutions compared with their own national or regional governments, making confidence in the EU much more dependent on extrinsic factors, such as context information, than on actual governance ([19]).

Across the EU, trust in EU institutions in 2016 ranged from more than 60 % (for the Parliament and the Commission) in Luxembourg and almost 70 % (for the Central Bank) in Finland to less than 30 % (for the Parliament) and less than 20 % (for the Commission and the Central Bank) in Greece.

Citizens expressed strongest confidence in the European Parliament in all countries except for Slovenia, where the European Commission received slightly higher trust levels, and except for Austria, the Czech Republic, Denmark and Finland, where the European Central Bank was the most trusted of the three EU institutions monitored here. Notably, Iceland — being a former EU candidate country — showed rather high levels of trust in EU institutions. Trust levels in the other candidate countries, with the exception of Turkey, were slightly higher than the EU average.

Further reading on peace, justice and strong institutions

Eurobarometer reports on *'Perceived independence of the national justice systems in the EU'* from 2016 and 2017.

European Commission (2014), *EU anti-corruption report*, COM(2014) 38 final, Brussels.

European Commission (2017), *The 2017 EU Justice Scoreboard*, COM(2017) 167 final, Brussels.

European Research Centre for Anti-Corruption and State-Building (ERCAS) & Hertie School of Governance (2015), *Public integrity and trust in Europe*, Berlin.

UNODC (2014), *Global study on homicide 2013*, Vienna: United Nations Office on Drugs and Crime.

([19]) European Research Centre for Anti-Corruption and State-Building (ERCAS) & Hertie School of Governance (2015), *Public integrity and trust in Europe*, Berlin, p. 19.

17 Strengthen the means of implementation and revitalise the global partnership for sustainable development

The global perspective on SDG 17

The achievement of the 2030 Agenda requires a revitalised and enhanced global partnership that mobilises all available resources from governments, civil society, the private sector and other actors. Partners need to combine their policy efforts to promote conducive policy frameworks and ensure policy coherence for sustainable development. Official Development Assistance and other financial resources, whether public or private, domestic or international will be needed. Increasing support for successful integration of developing countries in the global economy is critical to ensuring progress toward the SDGs. SDG 17 calls for a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under WTO and the implementation of duty-free and quota-free market access, and specifically targets least developed countries. It also highlights the importance of global macroeconomic stability and support to developing countries in attaining long-term debt sustainability. Additionally capacity building and exchange in science, technology and innovation will be critical for developing countries to be able to participate in the global knowledge economy. Enhanced support to developing countries to increase the availability of quality statistical data and develop measures of progress on the SDGs is also seen essential for delivering on the sustainable development objectives ([1]).

eurostat supports the SDGs

Monitoring SDG 17 'partnership for the goals' in an EU context focuses on global partnerships, which relates to the EU's actions in relations to developing countries, and on financial governance within the EU to support the internal implementation of the 2030 Agenda for Sustainable Development. As shown in Table 17.1, the EU's progress in these areas has been rather mixed.

([1]) Source: United Nations, http://www.un.org/sustainabledevelopment/sustainable-development-goals/; United Nations Development Programme, http://www.undp.org/content/undp/en/home/sustainable-development-goals.html; UN Factsheets '*Why it matters*' and World Bank Group, (2017), *Atlas of Sustainable Development Goals 2017 from World Development Indicators*.

Table 17.1: Indicators measuring progress in SDG 17, EU-28

Indicator	Long-term trend (past 15-year period)	Short-term trend (past 5-year period)	Page number/ Where to find out more?
Global partnership			
Official development assistance as share of gross national income	↗ (1)(2)	↑ (1)	p. 338
EU financing to developing countries	↑	↑	p. 342
EU imports from developing countries	↑ (3)	↗	p. 344
Financial governance within the EU			
General government gross debt	↓ (3)	↘	p. 347
Share of environmental and labour taxes in total tax revenues	↘ (4)(5)	↘ (5)	p. 348

Note: The approach applied in this report and the meaning of the symbols is explained in the Introduction.
(1) Trend in relation to the target of raising the share of official development assistance (ODA) to 0.7 % of gross national income (GNI) by 2030.
(2) Past 11-year period.
(3) Past 14-year period.
(4) Calculation of trend based on shares of environmental taxes in total tax revenues only.
(5) Past 12-year period.

Partnership for the goals in the EU: overview and key trends

We live in an interconnected world where social, economic and environmental challenges are global in nature and problems in one country or region resonate in different ways in other parts of the world. In this context, relationships can no longer be limited to north-south or state-to-state connections. To achieve the ambitions of the 2030 Agenda, cooperative and strong partnerships are necessary at all levels and between different governments, the private sector and civil society. While this chapter focuses on financial resources, the implementation of the 2030 Agenda requires the mobilisation and effective use of all resources: financial and non-financial ([2]), public and private, domestic and international. Advanced economies such as the EU can support developing countries to shift to sustainable — and country-led — development paths in various ways. This includes providing official development assistance (ODA), including using it to mobilise other financial resources such as domestic taxes or foreign investment, thus unlocking trade and private financing. These resources can in turn allow developing countries to invest in social services, clean energy, sustainable infrastructure, transport and information and communications technologies and thus potentially leapfrog some of the unsustainable modes of production and consumption that were, and still are, observed in industrialised countries.

To deliver on all of the sustainable development objectives, all countries need to mobilise and make effective use of all the necessary means of implementation. In this context, sound public policies and finances, as well as incentive structures are important to attract investment and reinforce sustainable development. Environmental taxes, for instance, not only potentially influence the behaviour of producers or consumers, but also the revenue they generate could potentially be used to promote sustainable development.

Global partnership

In the past, international relationships between states were all too often seen through the lens of donors and recipients, of 'developing' and 'developed' states, and of 'world powers' and 'failing states'. At the International Conference on Financing for Development in Monterrey in 2002, these relationships were questioned and it was commonly agreed to work towards a global partnership. From Monterrey in 2002, via other international agreements such as the Paris Declaration on Aid Effectiveness in 2005, the Accra Agenda for Action in 2008, the EU Agenda for Change in 2011, the Busan Partnership for Effective Development Cooperation in 2012 and through to the Addis Ababa conference in 2015, a new form of partnership was realised. The EU now promotes partnerships with developing countries based more on shared-values cooperation. This includes moving beyond traditional forms of support for developing countries (for example, development assistance) towards a more equitable global partnership (such as through trade and economic cooperation).

In the Addis Ababa Action Agenda, all countries, including EU Member States, recognised that international public finance plays an important role in complementing the efforts of countries to mobilise public resources domestically, especially in the poorest and most vulnerable countries with limited domestic resources. This includes ODA. Recent positive trends, if maintained, would be consistent with the long-standing target of dedicating 0.7% of gross national income (GNI) to ODA. Still, in 2016, only five EU Member States met their national target of dedicating 0.7% of their GNI to ODA.

Building on the EU Council Conclusions from 2015 ([3]), the new European Consensus on

([2]) Non-financial resources include domestic policy frameworks, effective institutions and support for good governance, democracy, rule of law, human rights, transparency and accountability; see also the Addis Ababa Action Agenda (AAAA).
([3]) Council of the European Union, *A New Global Partnership for Poverty Eradication and Sustainable Development after 2015' — Council conclusions*, 9241/15, Brussels.

Development signed in June 2017 confirms the EU commitments on ODA. The EU is collectively committed to providing 0.7 % of its gross national income (GNI) as ODA within the timeframe of the 2030 Agenda. To target resources to where they are most needed, especially least developed countries (LDCs) and countries in states of fragility and conflict, the EU also undertakes to meet its target to collectively provide 0.15–0.20 % of ODA/GNI to least developed countries in the short term, and to reach the 0.20 % upper target within the timeframe of the 2030 Agenda. However, between 2000 and 2015, out of all countries that were listed on the Development Assistance Committee's (DAC) lists of ODA recipients, growth in assistance was slowest for LDCs. The Consensus takes a comprehensive approach to implementation, combining aid with other resources, with sound policies and a strengthened approach to Policy Coherence for Development. It puts emphasis on better-tailored partnerships with a broader range of stakeholders and partner countries.

But ODA is only part of the story, with other official flows (OOFs), private flows, such as foreign direct investment (FDI), and grants by NGOs making up **different types of financial flows** from the EU to developing countries. The EU aims to contribute to a global partnership by promoting such flows to developing countries, for instance by encouraging foreign direct investment. A positive trend regarding the total volume of financial flows from the EU to developing countries could be observed over the past two decades, reaching a new height in 2015.

The EU pursues a coherent and supportive approach to development, where all financial flows to developing countries, including aid, investment and trade, work together with domestic resource mobilisation and good policies to help build capacity and support self-reliance in these countries. To attract additional financing for important investment in developing countries, innovative instruments have been developed such as blending grants with loans or equity from public and private financiers to reduce risks. Resources can also come from development countries' national tax systems and the EU is supporting them to improve the mobilisation of domestic resources (such as tax revenues).

The EU has also led the way towards a more equal global partnership with developing countries by taking a responsible approach to **trade** and investment policy, for instance through the 'Trade for All' strategy (2015) which aims to help developing countries participate more fully in the global market. Regarding EU trade flows, the volume of EU imports from developing countries has been growing since 2002. Although this is mainly due to growing imports from China, it is still a positive development.

Financial governance within the EU

To help others to advance their economies, it is pivotal to keep the EU's own economies on a sustainable development path. Macroeconomic management that aims to ensure **financial stability in the EU** is therefore one pillar of the EU's contribution to implementing the SDGs. Government debt should consequently be limited to a manageable level and not exceed 60 % of GDP, as laid down in the Treaty on the Functioning of the European Union. However, since the economic crisis in 2008, the debts of many EU Member States have remained very high. The year 2015 was the first since the economic crisis in which governments' debts fell slightly compared with the previous year.

In addition to financial stability, the EU seeks to transform its economy to become greener, for example through its Europe 2020 strategy for smart, sustainable and inclusive growth. In a global context, where consumption patterns in one region can severely impact production patterns elsewhere in the world, it is particularly important that prices reflect the real costs of consumption and production. They should, therefore, also include the payments for the damages activities cause to human health and the environment. EU policies such as Europe 2020 consequently call for **shifting the tax burden from labour to environmental taxes**, meaning that revenues from environmental taxes should increase relative to labour taxes. Since 2010, the shares of labour taxes in total tax revenues have fallen slightly more than the shares of environmental taxes, indicating a small relative shift of taxation in line with EU policy objectives.

Partnership for the goals in the EU

Global partnership

Official development assistance in 2016
0.51 % of GNI
+ 0.09 pp since 2011

Financing to developing countries in 2015
178 billion EUR
+ 39.8 % since 2010

Imports from developing countries in 2016
861 billion EUR
+ 2.3 % since 2011

Financial governance within the EU

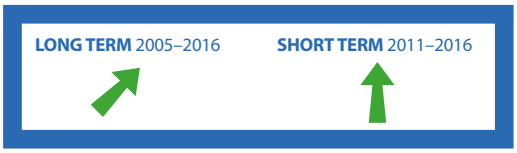
General government gross debt in 2016
83.5 % of GDP
+ 2.4 pp since 2011

Environmental taxes in 2015
6.3 % of total tax revenues
- 0.1 pp since 2010

Source: Eurostat (online data codes: sdg_17_10, sdg_17_20, sdg_17_30, sdg_17_40 and sdg_17_50)

Official development assistance as share of gross national income

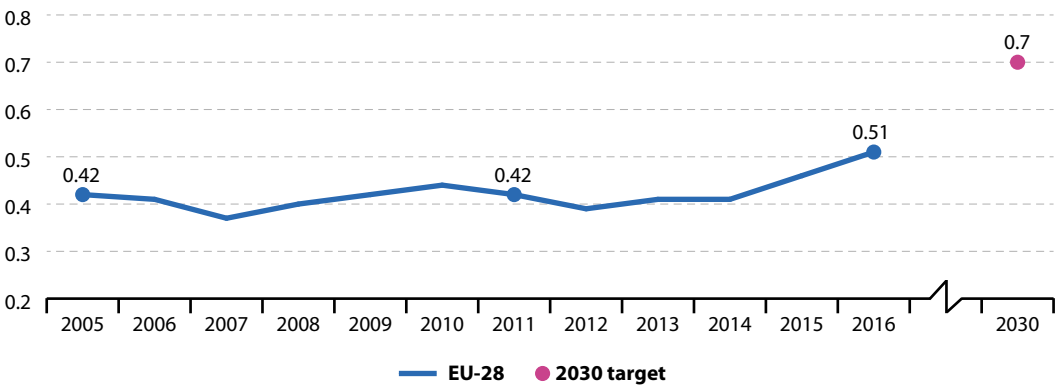
Due to considerable increases since 2014, the EU is progressing towards its commitment of dedicating 0.7 % of GNI to ODA by 2030.



Official development assistance (ODA) consists of grants or loans provided by official agencies, including state and local governments or their executive agencies, to countries and territories on the Organisation for Economic Development and Cooperation's (OECD) Development Assistance Committee (DAC) list of ODA recipients and to multilateral development institutions. The main objective of ODA is to promote the economic development and welfare of developing countries. It must convey a grant element of at least 25 % (calculated at a rate of discount of 10 %) and be concessional in character. Only those countries recorded on the OECD DAC list of ODA recipients are eligible. ODA is reported by donors to the OECD, including information on the purpose of each payment.

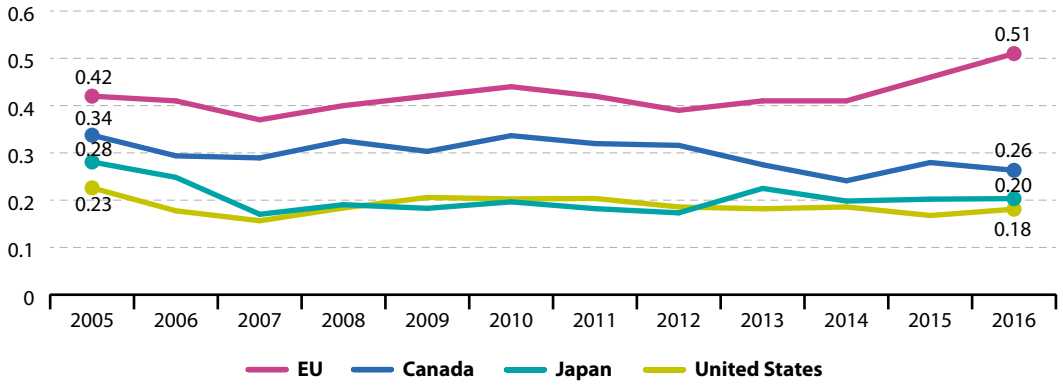
ODA as a share of gross national income (GNI) is, like many indicators related to global partnership, linked to the EU's economic situation. This is particularly visible since the indicator shows that overall flows fell during the economic downturn in 2008 and its aftermath, but the ODA to GNI share did not suffer significantly. Nevertheless, the long-term trend for meeting ODA targets has not been particularly promising. The EU previously missed its former collective interim target of dedicating 0.56 % of its GNI to ODA by 2010 as well as its target of dedicating 0.7 % of its GNI to ODA by 2015. Moreover, several developments expected in the years ahead (for example, the withdrawal of the United Kingdom from the EU) may have a negative influence on progress. Thus, additional efforts are needed from a majority of Member States to meet the renewed collective commitment to dedicate 0.7 % of GNI to official development assistance by 2030.

Figure 17.1: Official development assistance as share of gross national income, EU (Member States and Institutions), 2005–2016
(% of GNI (at current prices))



Note: data for 2016 are preliminary.
Source: OECD (Eurostat online data code: sdg_17_10)

Figure 17.2: Official development assistance as share of gross national income, by donor, 2005-2016
(% of GNI (at current prices))



Note: data for 2016 are preliminary.
Source: OECD (Eurostat online data code: sdg_17_10)

The short-term trend is more promising. After a decade of stagnation, the EU has recently increased its share of GNI spent on ODA by 0.1 percentage points between 2014 and 2016. This current upward EU trend, if maintained beyond the short term, would put the EU on track to meeting the UN target of dedicating 0.7 % of GNI to ODA, which has been reaffirmed for 2030.

It has to be noted that donor countries are allowed to count certain expenses for refugees for the first year after their arrival as ODA. Thus, on the one hand, the extent of the recent refugee crisis is one reason why ODA saw such an increase in 2015 and 2016. However, on the other hand, collective EU ODA increased by 10 % in 2016 even when in-donor refugee costs are excluded ([4]).

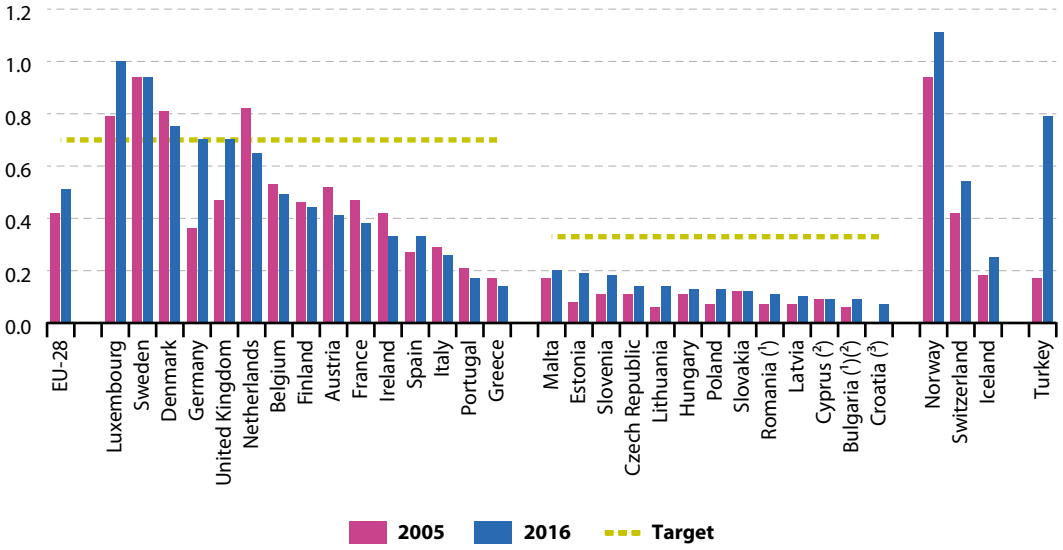
In 2016, the EU maintained its position as the biggest ODA donor globally, providing EUR 75.5 billion, more than half of the total ODA made available by countries of the Development Assistance Committee (DAC) of the OECD ([5]). This figure refers to the combined ODA provided by all EU Member States and the non-imputed spending by the EU institutions.

The overall EU ODA/GNI ratio in 2016 was 0.51%, significantly higher than for most other OECD donors such as Canada, Japan or the United States (see Figure 17.3). At the same time, aid from emerging donors is increasing. For example, the United Arab Emirates spent 1.12 % of its GNI on ODA, which was the highest ratio for a country reporting to the DAC in 2016 ([6]).

In addition to the collective EU commitment to dedicate 0.7 % of GNI to ODA by 2030, Member States have committed themselves to individual targets. For the EU-15, these refer to the overall target of 0.7 % of GNI to ODA. In 2016, five Member States achieved their individual commitments (Luxembourg, Sweden, Denmark, Germany and the United Kingdom). Member States that joined the EU after 2002 have a lower individual target of increasing ODA to 0.33 % of GNI by 2015 ([7]). Across the EU, the share of ODA ranged from 0.14 % of GNI to 1 % of GNI among

([4]) European Commission — Press release, *EU Official Development Assistance reaches highest level ever Brussels*, 11 April 2017.
([5]) Table 1: Net Official Development Assistance from DAC and other Donors in 2016, preliminary 2016 data.
([6]) Ibid.
([7]) European Commission (2016), *Proposal for a new European Consensus on Development Our World, our Dignity, our Future and A New Global Partnership for Poverty Eradication*, COM(2016) 740 final, Strasbourg: European Commission, § 83, p. 24; Council of the European Union (2015), *Sustainable Development after 2015 — Council Conclusions*, Council of the European Union, 26 May 2015 (9241/15), § 32 and 33, p. 11f.

Figure 17.3: Official development assistance as share of gross national income, by country, 2005 and 2016
(% of GNI (at current prices))



Note: Data for 2016 are preliminary.
(1) 2007 data (instead of 2005).
(2) 2015 data (instead of 2016).
(3) No data for 2005.
Source: OECD (Eurostat online data code: sdg_17_10)

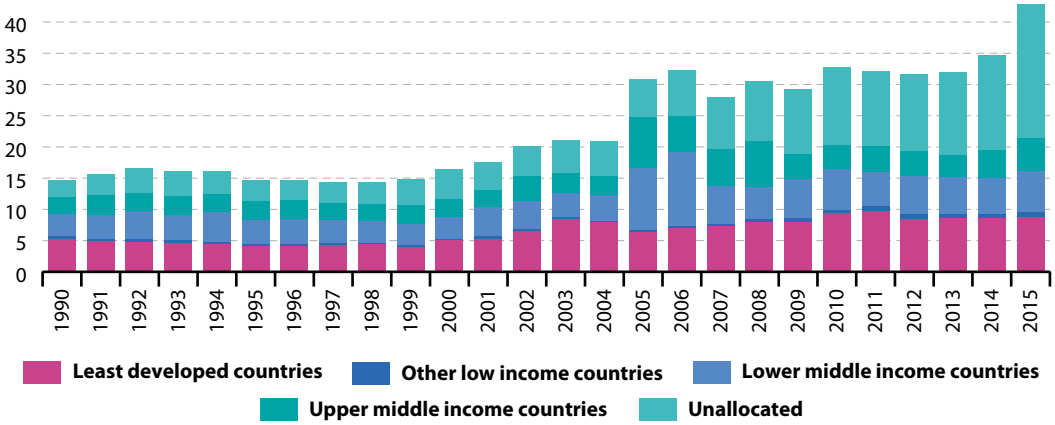
The new European Consensus on Development ([8]) signed in June 2017 confirms the need to dedicate a high proportion of official development assistance to least developed countries and other low-income countries (OLICs). Hence, 0.15 % of gross national income in the short term, rising to 0.2 % by 2030, should be allocated to least developed countries. This commitment is also set-out in EU Council Conclusions from 2015 ([9]).

the Member States with the 0.7 % target and from 0.07 % to 0.20 % of GNI among the Member States with the 0.33 % target.

In addition to analysing how much ODA is disbursed, it is also interesting to look at ODA recipients. ODA by income group refers to the countries on the DAC list of ODA beneficiaries; these countries are mainly referred to as 'developing countries' in this section. The next indicator is broken down by income groups of countries following the World Bank definition which classifies developing countries as low income, lower middle income or upper middle income, based on their GNI per capita ([10]). In addition, countries are classified by the UN as 'least developed' on the basis of their three-year average estimate of gross national income per capita, Human Assets Index, and the

([8]) Joint statement by the Council and the representatives of the governments of the Member States meeting within the Council, the European Parliament and the European Commission: The New European Consensus on Development 'Our World, Our Dignity, Our Future'.
([9]) Council of the European Union, *A New Global Partnership for Poverty Eradication and Sustainable Development after 2015' — Council conclusions*, 9241/15, Brussels.
([10]) Low-income economies are defined as those with a GNI per capita of USD 1 025 or less in 2015; lower middle-income economies are those with a GNI per capita between USD 1 026 and USD 4 035; upper middle-income economies are those with a GNI per capita between USD 4 036 and USD 12 475. This classification is valid for the fiscal year 2017, see The World Bank (2017), *World Bank Country and Lending Groups*.

Figure 17.4: Official development assistance, by recipient income group, EU-28, 1990–2015
(EUR billion (at current prices))



Source: OECD

The new European Consensus has confirmed the commitment to direct at least 20 % of EU aid to social inclusion and human development.

Economic Vulnerability Index ([11]). The list of ODA beneficiaries published by the OECD-DAC in 2014 has been used throughout the time series.

In 2000, 30.1 % of ODA was allocated to least developed countries, 20.9 % to lower middle income countries, 17.1 % to upper middle income countries and 1.8 % to other low-income countries. About one-third (29.0 %) was unallocated. Since then ODA to LDCs has increased. However, the proportion of ODA marked as 'unallocated' has also increased, making it more difficult to identify recipient groups. In 2015, 20.3 % of ODA was allocated to least developed countries, 15.3 % to lower middle income countries, 12.1 % to upper middle income countries and 1.8 % to other low-income countries, while slightly more than half (50.5 %) was unallocated.

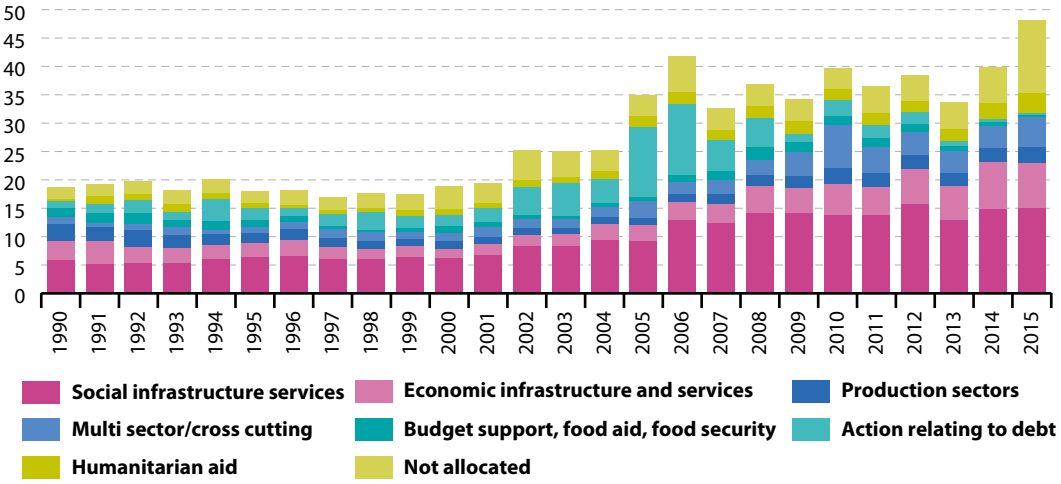
Furthermore, since least developed countries and other low-income countries are the two poorest groups of countries, the EU agreed on specific targets for them. In 2010, EU DAC members provided 0.14 % of their GNI to these countries, with the proportion falling to 0.13 % in 2011 and 0.11 % in 2012 ([12]), where it has remained ([13]). Addressing this stagnation has been identified as a priority for the EU. Recognising the vulnerabilities of these countries, and the need to improve collective EU performance in these areas, Member States have renewed their ODA to LDC pledges but with a revised timeline of providing 0.15-0.20 % of GNI in the short term, and 0.20 % by 2030.

SDG 17 ultimately (also) aims to build capacity in developing countries. Consequently, it is not only interesting to know how much ODA is paid but also what it is used for. The indicator 'bilateral ODA' provides a breakdown of aid destination based on aid categories that offer different opportunities for poverty alleviation and welfare development.

The fastest growing category for bilateral official development assistance (ODA) between 2000 and 2015 was 'economic infrastructure and services',

([11]) United Nations (2017), UN recognition of least developed countries (LDCs).
([12]) European Commission (2014), *EU Accountability Report 2014 on Financing for Development. Review of progress by the EU and its Member States*, SWD(2014) 235 final.
([13]) European Commission (2017), *Publication of figures on 2016 Official Development Assistance (Annex to Memo)*.

Figure 17.5: Bilateral official development assistance, by category, EU-28, 1990–2015
(EUR billion (at current prices))

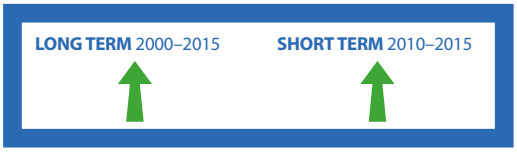


Source: OECD

with an annual growth rate as high as 11.7 %. In contrast, bilateral ODA for 'action related to debt' decreased by 11.4 % annually during the same time period, making up only 0.7 % of total ODA in 2015, largely because of reduced need in developing countries given decreasing debt burdens. ODA related to 'social infrastructure and services' made up the largest share of bilateral ODA throughout the years, accounting for almost one-third (31.2 %) in 2015.

EU financing to developing countries

Total official and private flows from the EU have risen considerably over recent decades, reaching a new record height in 2015.

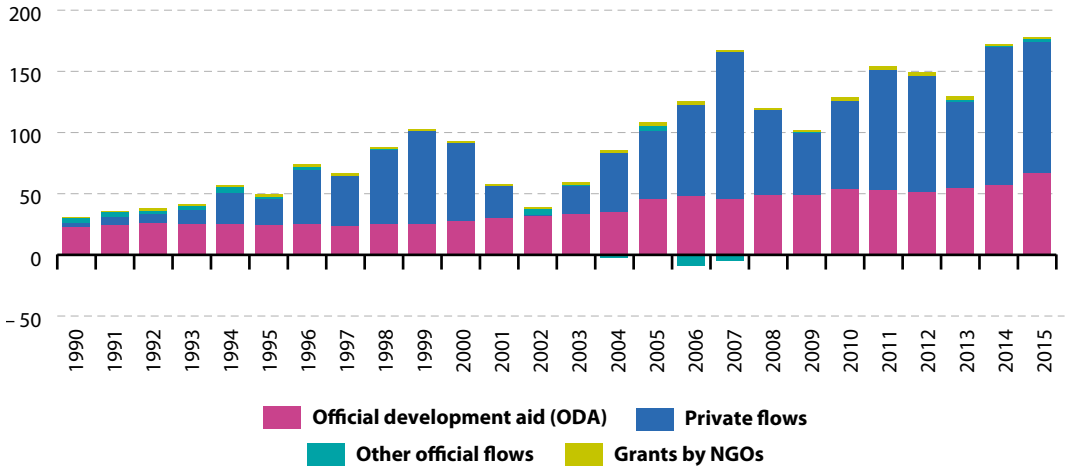


According to the OECD definition, total official and private flows comprises net disbursements of ODA, other official flows (OOFs), private flows (mainly foreign direct investment, FDI) and grants by private agencies and NGOs. ODA consists of grants or concessional loans undertaken by the official sector with the promotion of economic development and welfare in the recipient countries as the main objective.

Private flows include direct investment, bonds, export credits and multilateral private flows. OOFs are transactions which do not meet the conditions for eligibility as ODA, either because they are not primarily aimed at development, or because they have a grant element of less than 25 %. Grants by national NGOs consists of funds for development assistance and relief, together with any additional contributions in kind, including, for instance proceeds from charity Christmas card sales or special appeals (for example, for disaster relief).

The OECD estimates that total EU financing to developing countries, comprising flows from the public and private sector, amounted to EUR 178 billion in 2015. This corresponds to an annual average increase of 4.4 % between 2000 and 2015. Growth was even stronger in the past five years,

Figure 17.6: Financing to developing countries, by type, EU-28, 1990–2015
(billion EUR (at current prices))



Source: OECD (Eurostat online data code: sdg_17_20)

The EU places an emphasis on coherence between all financial flows to developing countries, trying to bring together aid, investment, trade, domestic resource mobilisation and good policies. For instance, with the EU's flagship Domestic Resource Mobilisation support programme, the EU uses its blending facilities to strengthen private sector investments in developing countries, at the same time keeping 'duty free and quota free' market access to LDCs as reflected in the Addis Ababa Action Agenda (AAAA) ([14]).

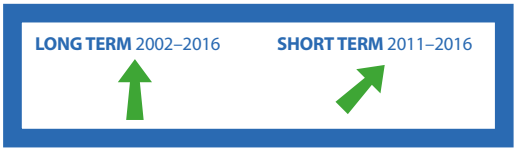
at 6.9 % per year. As a result, financial flows to developing countries reached a new record height in 2015.

While OOFs and grants by NGOs remained at a rather marginal level, ODA and private flows accounted for by far the biggest share of financial flows to developing countries. Since 2006, these two categories have accounted for a share of over 95 % in total financing for development. Private flows, however, have experienced a huge variation over the years, ranging from 73.0 % of total financing in 2007 to only 1.8 % in 2002. Hence, although the ODA targets have not been reached in the past, ODA constituted a much more steady flow to developing countries than foreign direct investment.

([14]) United Nations (2015), *Addis Ababa Action Agenda of the Third International Conference on Financing for Development, Outcome Document*, endorsed by the General Assembly in its resolution 69/313 of 27 July 2015, §85, p. 40.

EU imports from developing countries

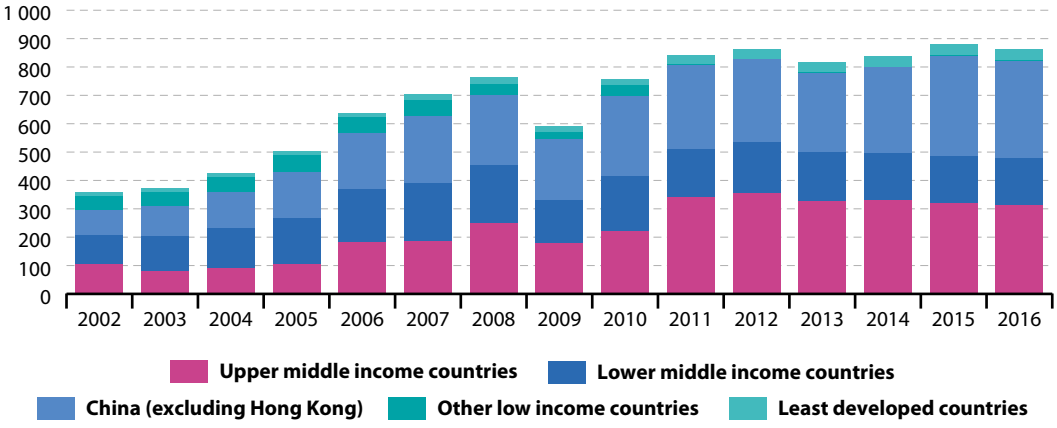
EU imports from developing countries have grown considerably since 2002, mainly due to growing imports from China. In the short-term since 2011, imports from developing countries have stagnated.



This indicator is defined as the value (at current prices) of EU imports from the countries on the DAC list of ODA beneficiaries. These countries are mainly referred to as 'developing countries' in this section. EU import statistics indicate to what extent developing countries can access the EU market and with which products they do so. However, no measure of the use of environmentally and socially sustainable modes of production in developing countries or the overall effects of trade on sustainable development in

The potential contribution of trade to sustainable development has long been acknowledged. The EU facilitates imports from developing countries by granting tariff reductions under its Generalised Scheme of Preferences ([15]) and by providing 'Aid for Trade' ([16]) targeted at supporting trade-related infrastructure, trade-related assistance and private sector development. Furthermore, the Cotonou Agreement ([17]) regulates the EU's relationship with 79 countries from Africa, the Caribbean and the Pacific (ACP), focusing on development cooperation, political cooperation as well as economic and trade cooperation.

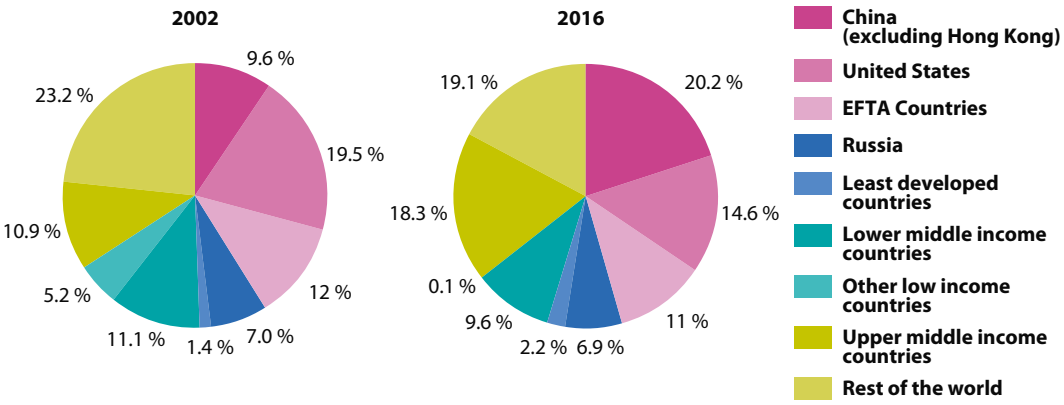
Figure 17.7: EU Imports from developing countries by income group, EU-28, 2002–2016
(billion EUR (at current prices))



Source: Eurostat (online data code: sdg_17_30)

([15]) Council regulation (EC) No 980/2005 of 27 June 2005 applying a scheme of generalised tariff preferences.
([16]) Council of the European Union, *EU Strategy on Aid for Trade: Enhancing EU support for trade-related needs in developing countries — Conclusions of the Council and of the Representatives of the Governments of the Member States meeting within the Council*, 14470/07, Brussels.
([17]) European Commission Directorate General Development and Cooperation — EuropeAid (2014), *Cotonou Agreement and multiannual financial framework 2014–20*, Luxembourg: Publications office of the European Union.

Figure 17.8: Extra-EU-28 imports, by trading partner, EU-28, 2002 and 2016
(%)



Source: Eurostat (online data codes: sdg_17_30 and ext_lt_maineu)

The EU's 'Generalised Scheme of Preferences' (GSP) allows developing countries to pay less or no duties on their exports to the EU. In addition, the Everything But Arms initiative, which is part of the GSP, grants duty free and quota free access for all LDC products except arms and ammunition. Furthermore, the Cotonou Agreement regulates the EU's relationship with 79 countries from Africa, the Caribbean and the Pacific (ACP), focusing on development cooperation, political cooperation as well as economic and trade cooperation.

these countries is provided. Moreover, they do not allow inferences to be made about the EU's overall trade balance with developing countries, which would require EU exports to these countries to also be taken into account. Trade is particularly important for making use of the comparative advantages for value creation in a country. Through exports, developing countries can obtain foreign currency which can in turn be used for importing other goods, whether for consumption or production. Better integration of developing countries into world markets reduces the need for external public flows such as ODA.

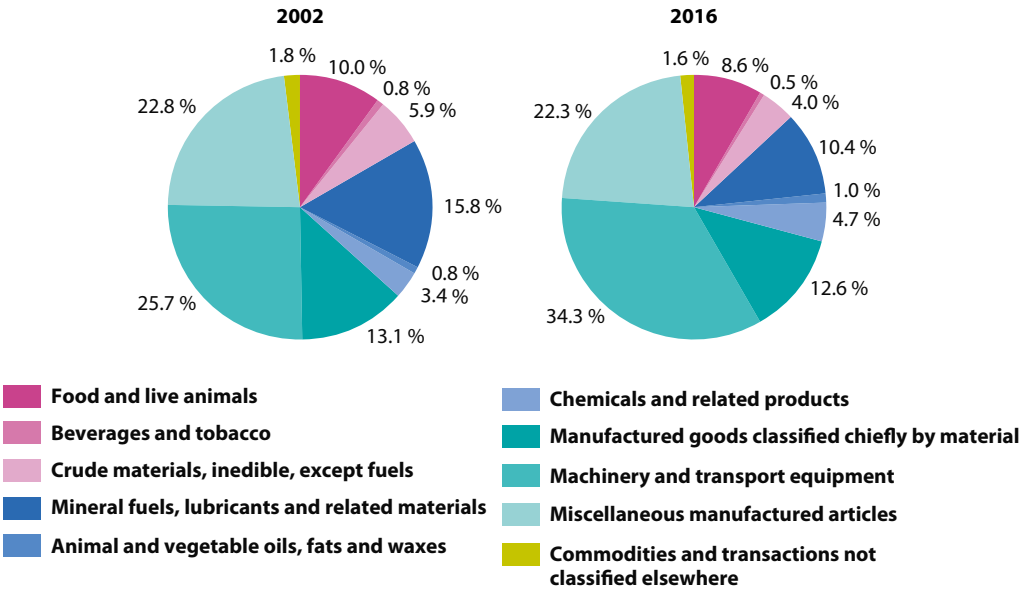
Furthermore, various international declarations emphasise the importance of a greater share in world trade for developing countries. The February 2015 Communication from the EU Commission ([18]) also refers to trade as a key factor for inclusive growth and sustainable development.

Since 2002, EU imports from developing countries more than doubled, from EUR 359 billion to EUR 861 billion in 2016. Growing imports from China have been a decisive factor behind the long-term growth in EU imports. The country's share in EU imports from developing countries increased from 25.2 % in 2002 to 40.1 % in 2016. In absolute terms, the value of imports from China in 2016 was about 3.8 times the 2002 level.

Looking at total imports from outside the EU, China was the largest supplier in 2016, followed by the US and EFTA countries. Among the ten biggest exporters to the EU were three middle income countries in addition to China in 2016. China was by far the largest exporter among the BASIC countries (Brazil, South Africa, India and China), exporting to the EU more ten times as much as India — the next largest EU import provider in this group. Between 2002 and 2016 the share of EU

([18]) European Commission (2015), *A Global Partnership for Poverty Eradication and Sustainable Development after 2015*, COM(2015) 44, p. 9f.

Figure 17.9: EU Imports from developing countries, by group of products, EU-28, 2002 and 2016
(%)



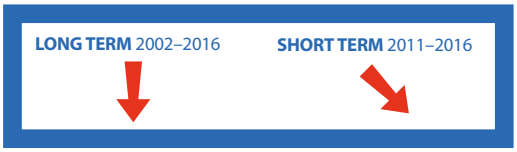
Source: Eurostat

imports from developing countries in EU imports from all countries outside the EU increased from 38.3 % in 2002 to 50.3 % in 2016. While imports from all non-EU countries to the EU on average grew by 4.4 % per year between 2002 and 2016, imports from developing countries grew even faster, at an average of 6.5 % per year, although the bulk of that growth came from China.

The EU imports a range of products from developing countries. Machinery and transport equipment as well as other manufactured products are by far the two largest product categories, accounting for 47.5 % of imports in 2002 and 56.3 % of imports from developing countries in 2016. In absolute terms, all product groups contributed to the overall increase in imports from developing countries, although to varying degrees. Imports of machinery and transport equipment, chemicals, and oils, fats and waxes more than tripled between 2002 and 2016. In contrast, imports of beverages and tobacco, materials and mineral fuels grew slowest, and the shares of these product groups in total imports thus fell considerably between 2002 and 2016.

General government gross debt

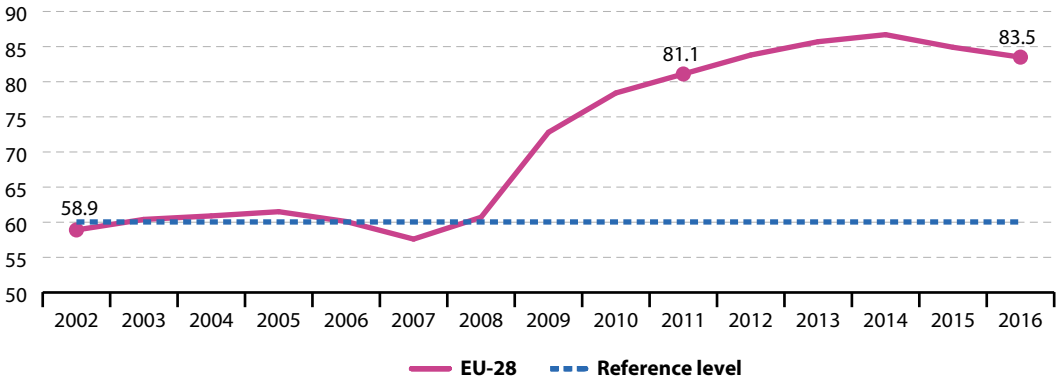
Government debt levels have risen considerably in the EU since the onset of the economic crisis. A declining trend, however, has been visible since 2014.



General government gross debt monitors the sustainability of public finances. It is one of the key parameters used for EU budgetary surveillance, which includes monitoring progress towards the EU reference value for government debt of 60 % of GDP. The indicator is defined (in the 2012 consolidated version of the Treaty on the Functioning of the European Union) ([19]) as the ratio of total gross debt at nominal value outstanding at the end of the year to GDP at current market prices. Gross debt refers to the stock of borrowing by the general government to support its financing requirements. The general government sector comprises the subsectors of central government, state government, local government and social security funds.

The Treaty on the Functioning of the European Union (TFEU) requires that the ratio of a Member State's planned or actual government deficit to gross domestic product at market prices should not exceed 3 % and that government debt as a ratio of gross domestic product at market prices should be limited to 60 %. The TFEU is complemented by Regulation 1176/2011 on the prevention and correction of macroeconomic imbalances ([20]) as well as Regulation 1174/2011 on enforcement action to correct excessive macroeconomic imbalances in the euro area ([21]). Both regulations aim to detect fiscal imbalances in the EU and allow, among other things, for sanctions enforcement. The Economic Reform Programmes, which were introduced in 2015, form an equivalent system for EU candidates and potential candidates.

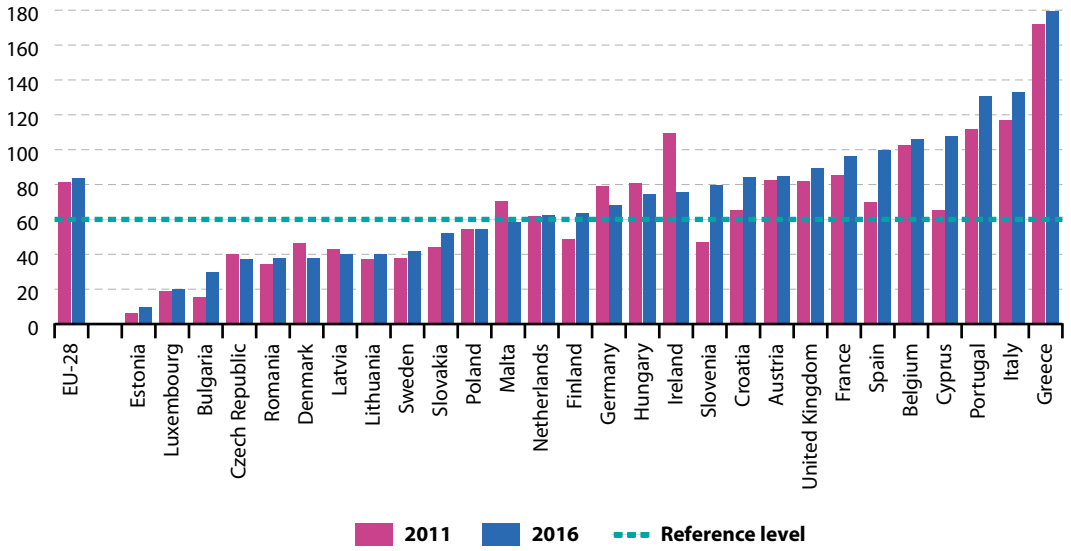
Figure 17.10: General government gross debt, EU-28, 2002–2016
(% of GDP)



Source: Eurostat (online data code: sdg_17_40)

([19]) Consolidated version of the Treaty on the Functioning of the European Union, 2012.
([20]) Regulation (EU) No 1176/2011 of the European Parliament and of the Council of 16 November 2011 on the prevention and correction of macroeconomic imbalances.
([21]) Regulation (EU) No 1174/2011 of the European Parliament and of the Council of 16 November 2011 on enforcement measures to correct excessive macroeconomic imbalances in the euro area.

Figure 17.11: General government gross debt, by country, 2011 and 2016
(% of GDP)



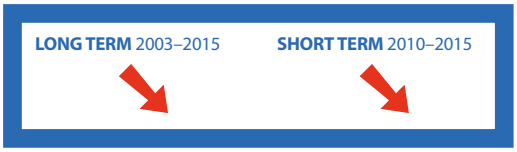
Source: Eurostat (online data code: sdg_17_40)

Government debt in the EU increased slightly between 2011 and 2016, from 81.1 % to 83.5 %. After peaking at 86.7 % in 2014, the debt-to-GDP ratio has fallen in the past two years.

Across the EU, debt-to-GDP ratios ranged from almost 180 % to less than 10 %. A total of 16 Member States reported a debt ratio above 60 % of GDP at the end of 2016. In the period between 2011 and 2016, seven countries managed to reduce their debt to GDP ratios. The more recent decline of debt levels in the EU since 2014 was a result of falling debt-to-GDP ratios in 20 Member States.

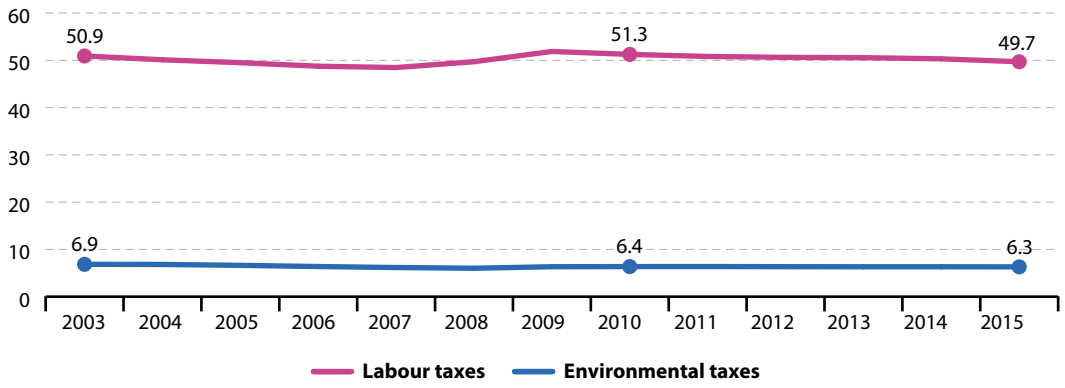
Share of environmental and labour taxes in total tax revenues

Both shares of environmental and labour taxes in total tax revenues have fallen slightly since 2003. Over the short term since 2010 a small shift from labour to environmental taxes has been observed, due to a stronger decline in labour tax shares.



This indicator compares the shares of both environmental and labour taxes in total revenues from taxes and social contributions. Environmental taxes are defined as taxes whose tax base is a physical unit (or proxy of it) of something that has a proven, specific negative impact on the environment. Environmental tax revenues stem from four types of taxes: energy taxes (which contribute around three-quarters of the total), transport taxes (about one-fifth of the total) and pollution and resource taxes (about 4 %). Taxes on labour are generally defined as all personal income

Figure 17.12: Shares of environmental and labour taxes in total tax revenues, EU-28, 2003–2015
(% of total taxes)



Source: European Commission services (Eurostat online data code: sdg_17_50)

The Europe 2020 strategy ([22]) calls for a shift from labour to energy and environmental taxes as part of a 'greening' of taxation systems. The European Semester monitors the progress towards the objectives laid down in the Europe 2020 strategy.

taxes, payroll taxes and social contributions of employees and employers that are levied on labour income (both employed and non-employed). On average, about 65 % of labour taxes consist of social contributions.

Economic instruments relate to the polluter pays principle as well as to the goals of the Europe 2020 strategy. One of the policy-guiding principles of the EU is to ensure prices reflect the real costs of consumption and production activities to society and that polluters pay for the damage they cause to human health and the environment. More specifically, the strategy encourages Member States to consider further steps to shift taxation from labour into resource and energy consumption and/or pollution.

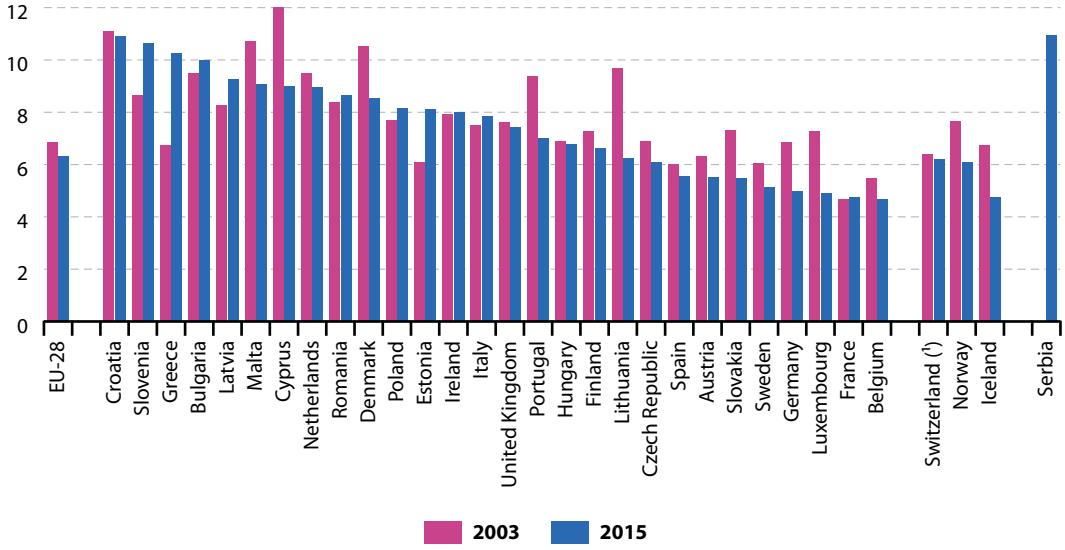
Revenues from environmental and labour taxes as a share of total tax revenues have both fallen slightly since 2003, as shown in Figure 17.12. Over the whole period, shares of labour tax revenues remained almost eight times higher than revenues from environmental taxes. In the short-term period since 2010, the decline in shares of labour tax revenues was slightly stronger than for environmental taxes, indicating a small increase in the relative importance of environmental taxes.

In 2015, shares of environmental taxes in total tax revenues ranged from 4.7 % to 10.9 % across Member States. At the same time, labour taxes accounted for 33.9 % to 57.6 % of total tax revenues in these countries.

The ratio of labour to environmental taxes shows how much higher the shares of labour tax revenues are compared with the shares of environmental taxes in a country. In 2015, this ratio ranged from 3.4 to 11.4 across Member States. The countries with rather high ratios such as Germany, Belgium and Sweden were all characterised by shares of labour taxes well above 50 % of total tax revenues, while environmental tax revenues only

([22]) European Commission (2010), *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels.

Figure 17.13: Share of environmental taxes in total tax revenues, by country, 2003 and 2015
(% of total taxes)



(1) 2013 data (instead of 2015).

Source: European Commission services (Eurostat online data code: sdg_17_50)

made up about 5 % of total tax revenues in these countries. In contrast, countries with lower ratios of labour to environmental taxes reported shares of labour taxes well below 40 %, while environmental taxes accounted for 9 % or more in total tax revenues.

In a majority of Member States, the ratio of labour to environmental taxes has increased since 2003, indicating an increase in the relative importance of labour tax revenues compared with environmental taxes.

Further reading on partnership for the goals

European Commission (2015), *EU Accountability Report 2015 on Financing for Development*, SWD(2015)128 final, Brussels.

European Commission (2016), *Proposal for a new European Consensus on Development. Our World, our Dignity, our Future*, COM(2016) 740 final.

European Environment Agency (2011), *Environmental tax reform in Europe: opportunities for eco-innovation*, Technical report No 17/2011, Copenhagen.

Eurostat (2015), *Taxation trends in the European Union: Data for the EU Member States, Iceland and Norway*, 2015 edition, Publications Office of the European Union, Luxembourg.

Global Partnership for Effective Development Co-operation (2016), *Nairobi Outcome Document: Global Partnership for Effective Development Co-Operation*.

Organisation for Economic Co-operation and Development High-Level Forum on Aid Effectiveness, *Paris Declaration on Aid Effectiveness (2005) and Accra Agenda for Action (2008)*, Paris.

Organisation for Economic Co-operation and Development High-Level Forum on Aid Effectiveness (2011), *Busan Partnership Agreement*, Busan.

United Nations (2002), *Monterrey Consensus on Financing for Development*, Monterrey.

United Nations (2008), *Doha Declaration on Financing for Development: outcome document of the follow-up international conference on financing for development to review the implementation of the Monterrey consensus*, Doha.

United Nations Department of Economic and Social Affairs (2015), *Addis Ababa Action Agenda of the Third International Conference on Financing for Development (Addis Ababa Action Agenda)*, UNGA Resolution 69/313 of 27 July 2015,

United Nations' Report of the Inter-agency Task Force on Financing for Development (2017), *Financing for Development: Progress and Prospects*.

Annexes

Annex I

Geographical aggregates and countries

EU-28	The 28 Member States of the European Union from 1 July 2013 (BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, UK)
EU-27	The 27 Member States of the European Union from 1 January 2007 to 30 June 2013 (BE, BG, CZ, DK, DE, EE, IE, EL, ES, FR, IT, CY, LV, LT, LU, HU, MT, NL, AT, PL, PT, RO, SI, SK, FI, SE, UK)
EU-15	The 15 Member States of the European Union from 1 January 1995 to 30 April 2004 (BE, DK, DE, IE, EL, ES, FR, IT, LU, NL, AT, PT, FI, SE, UK)
EEA	The member countries of the European Environment Agency (EEA) refer to the EU-28 plus IS, LI, NO, CH and TR
G20	Group of 20 (Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom, the United States and the European Union)

Note that EU aggregates are back-calculated when enough information is available — for example, data relating to the EU-27 aggregate is presented when possible for periods before Bulgaria and Romania joined the EU in 2007 and the accession of ten Member States in 2004, as if all 27 Member States had always been members of the EU. The abbreviation 'EU' is usually used in texts when referring to the EU-28. The label is changed (to EU-27 or EU-15) if the data refer to another aggregate.

European Union Member States

BE	Belgium
BG	Bulgaria
CZ	Czech Republic
DK	Denmark
DE	Germany
EE	Estonia
IE	Ireland
EL	Greece
ES	Spain
FR	France
HR	Croatia
IT	Italy
CY	Cyprus
LV	Latvia
LT	Lithuania
LU	Luxembourg
HU	Hungary
MT	Malta
NL	Netherlands
AT	Austria
PL	Poland
PT	Portugal
RO	Romania
SI	Slovenia
SK	Slovakia
FI	Finland
SE	Sweden
UK	United Kingdom

European Free Trade Association (EFTA)

IS	Iceland
LI	Liechtenstein
NO	Norway
CH	Switzerland

EU candidate countries

ME	Montenegro
MK	The former Yugoslav Republic of Macedonia
AL	Albania
RS	Serbia
TR	Turkey

Potential candidates

BA	Bosnia and Herzegovina
XK	Kosovo ([1])

Units of measurement

%	percent
°C	Degree Celsius
:	Data not available
µg	microgram
µm	micrometre
dB	decibel
bn	billion
EUR	euro
gr	gram
ha	hectare
kg	kilogram
kgoe	kilograms of oil equivalent
km	kilometre
km^2	square kilometre
L	litre
m2	square meter

([1]) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

m^3	cubic meter
mg	milligram
Mt	Million tonnes
Mtoe	Million tonnes of oil equivalent
pkm	passenger-kilometre
pp	percentage point
PPS	purchasing power standard
tkm	tonne-kilometre
USD	US dollar

Abbreviations

AAAA	Addis Ababa Action Agenda
ACP	Africa, the Caribbean and the Pacific
AEI	Average Exposure Indicator
AQGs	Air Quality Guidelines
AWU	Agricultural factor income per annual Work Unit
BMI	Body Mass Index
BMSY	Biomass that enables a fish stock to deliver the Maximum Sustainable Yield
BOD	Biochemical Oxygen Demand
BTRIGGER	Value of spawning stock biomass (SSB) that triggers a specific management action
CAGR	Compound Annual Growth Rate
CAP	Common Agricultural Policy
CARE	Community database on Accidents on the Roads in Europe
CEO	Chief Executive Officer
CERRE	Centre on Regulation in Europe
CFP	Common Fisheries Policy
CH_4	methane
CLP	Classification, Labelling and Packaging
CMEMS	Copernicus Marine Environment Monitoring Service
CMR	Carcinogenic, Mutagenic and Reprotoxic
CO_2	carbon dioxide
COD	Chemical Oxygen Demand

CoM	Covenant of Mayors
CPI	Corruption Perception Index
DAC	Development Assistance Committee
DG	Directorate General
DIC	Dissolved Inorganic Carbon
DMC	Domestic Material Consumption
EAGF	European Agricultural Guarantee Fund
EAFRD	European Agricultural Fund for Rural Development
EAP	Environmental Action Programme
EC	European Commission
ECOSOC	United Nations Economic and Social Council
ECEC	Early Childhood Education and Care
EEA	European Environment Agency
EFTA	European Free Trade Association
EHIS	European Health Interview Survey
EIB	European Investment Bank
EIGE	European Institute for Gender Equality
EPO	European Patent Office
ERCAS	European Research Centre for Anti-Corruption and State-Building
ESA	European System of Accounting
ESAC	European Statistical Advisory Committee
ESDN	European Sustainable Development Network
ESF	European Social Fund
ESS	European Statistical System
ET 2020	'Education and Training 2020' Framework
EXPH	Expert Panel on effective ways of investigating in Health
EU	European Union
EU SDS	EU Sustainable Development Strategy
EU SILC	EU Statistics on Income and Living Conditions
F	Fishing mortality
FDI	Foreign Direct Investment
FEAD	Fund for European Aid to the most Deprived
FfD	Financing for Development

F_{MSY}	Fishing mortality at Maximum Sustainable Yield
FRA	Fundamental Rights Agency
GDP	Gross domestic Product
GBOARD	Government Budget Appropriations or Outlays on R&D
GES	Good Environmental Status
GHG	Greenhouse Gas
GHS	Globally Harmonized System
GIC	Gross Inland Consumption
GNI	Gross National Income
GSP	Generalised Scheme of Preferences
GWP	Global Warming Potential
HLPF	High-level Political Forum
HOT	Hawaiian Ocean Timeseries
ICD	International Classification of Diseases
ICES	International Council for the Exploration of the Sea
ICJ	International Court of Justice
ICT	Information and Communications Technology
IEAG-SDG	Inter-Agency and Expert Group on SDG indicators
ILO	International Labour Organisation
IPCC	Intergovernmental Panel on Climate Change
ISCED	International Standard Classification for Education
ITS	Inter-modal Transport Systems
JRC	Joint Research Centre
LDCs	Least-Developed Countries
LRTAP	Long-Range Transboundary Air Pollution
LTAA	Long-Term Annual Average
LUCAS	Land Use/Cover Area frame Survey
LULUCF	Land Use, Land-Use Change and Forestry
MDGs	Millennium Development Goals
MMR	Monitoring Mechanism Regulation
MPA	Marine Protected Area
MPI	Multi-Purpose Indicators
MS	Member States

MSY	Maximum sustainable Yield
N2O	Nitrous Oxide
NABS	Nomenclature for the Analysis and comparison of scientific programmes and Budgets
NECD	National Emissions Ceilings Directive
NEET	Not in Education, Employment or Training
NF3	Nitrogen Triflouride
NGOs	Non-Governmental Organisations
NH3	Ammonia
NO3	Nitrate
NPISH	Non-Profit Institutions serving Households
NUTS	Nomenclature of Territorial Units for Statistics
O2	Oxygen
ODA	Official development assistance
OECD	Organisation for Economic Co-operation and Development
OLICs	Other Low-Income Countries
OOFs	Other Official Flows
PEC	Primary Energy Consumption
PIAAC	Programme for the International Assessment of Adult Competencies
PISA	Programme for International Student Assessment
PM	Particulate Matter
PO4	Phosphate
PPP	Purchasing Power Parity
R&D	Research and Development
REACH	Registration, Evaluation, Authorisation and restriction of Chemicals
RMC	Raw Material Consumption
SCI	Sites of Community Importance
SCP	Sustainable Consumption and Production
SD	Sustainable Development
SDGs	Sustainable Development Goals
SDIs	Sustainable Development Indicators
SDMX	Statistical Data and Metadata Exchange

SEAP	Sustainable Energy Action Plan
SECAP	Sustainable Energy and Climate Action Plans
SES	Structure of Earnings Survey
SF6	Sulphur hexafluoride
SIP	Sustainable Industrial Policy
SMD	Severe Material Deprivation
SOCAT	Surface Ocean Carbon Atlas
SSB	Spawning Stock Biomass
STECF	Scientific, Technical and Economic Committee for Fisheries
SWD	Staff Working Document
TAC	Total Allowable Catch
TFEU	Treaty on the Functioning of the European Union
UAA	Utilised Agricultural Area
UN	United Nations
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UN FAO	United Nations Food and Agriculture Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UNHCR	United Nations High Commissioner for Refugees
UNODC	United Nations Office on Drugs and Crime
UNSC	United Nations Statistical Commission
UNSCR	United Nations Security Council Resolutions
US	United States
WCED	World Commission on Environment and Development
WEI	Water Exploitation Index
WFD	Water Framework Directive
WHO	World Health Organization
WLTP	Worldwide harmonized Light vehicles Test Procedure
WTO	World Trade Organisation

Annex II

List of indicators included in this report

The tables below show the complete list of indicators included in the respective thematic chapters of the 2017 edition of 'Sustainable development in the European Union — monitoring report on progress towards the SDGs in an EU context'. Some 'multi-purpose' indicators are used in more than one theme; for these indicators the original theme from which they stem from is indicated in brackets.

Table II.1: Indicators for SDG 1 'no poverty', by sub-themes

Indicator
Multidimensional poverty
People at risk of poverty or social exclusion
People at risk of income poverty after social transfers
Severely materially deprived people
People living in households with very low work intensity
Basic needs
Housing cost overburden rate
Self-reported unmet need for medical care (SDG 3)
Population unable to keep home adequately warm (SDG 7)
Share of total population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor
Population having neither a bath, nor a shower, nor indoor flushing toilet in their household (SDG 6)
Overcrowding rate (SDG 11)

Table II.2: Indicators for SDG 2 'zero hunger', by sub-themes

Indicator
Malnutrition
Obesity rate
Sustainable agricultural production
Agricultural factor income per annual work unit (AWU)
Government support to agricultural research and development
Area under organic farming
Gross nitrogen balance on agricultural land
Adverse impacts of agricultural production
Ammonia emissions from agriculture
Nitrate in groundwater (SDG 6)
Farmland bird index (SDG 15)
Estimated soil erosion by water (SDG 15)

Table II.3: Indicators for SDG 3 'good health and well-being', by sub-themes

Indicator
Healthy lives
Life expectancy at birth
Self-perceived health
Health determinants
Obesity rate (SDG 2)
Smoking prevalence
Exposure to air pollution by particulate matter (SDG 11)
Population living in households considering that they suffer from noise (SDG 11)
Causes of death
Death rate due to chronic diseases
Suicide rate
People killed in accidents at work (SDG 8)
People killed in road accidents (SDG 11)
Access to healthcare
Self-reported unmet need for medical care

Table II.4: Indicators for SDG 4 'quality education', by sub-themes

Indicator
Basic education
Early leavers from education and training
Early childhood education
Underachievement in reading, maths and science
Young people neither in employment nor in education and training (SDG 8)
Tertiary education
Tertiary educational attainment
Employment rate of recent graduates
Adult education
Adult participation in learning

Table II.5: Indicators for SDG 5 'gender equality', by sub-themes

Indicator
Gender-based violence
Physical and sexual violence to women experienced within 12 months prior to the interview
Education
Gender gap for early leavers from education and training (SDG 4)
Gender gap for tertiary educational attainment (SDG 4)
Gender gap for employment rate of recent graduates (SDG 4)
Employment
Gender employment gap
Gender pay gap in unadjusted form
Inactive population due to caring responsibilities
Leadership positions
Seats held by women in national parliaments and governments
Positions held by women in senior management

Table II.6: Indicators for SDG 6 'clean water and sanitation', by sub-themes

Indicator
Sanitation
Population having neither a bath, nor a shower, nor indoor flushing toilet in their household
Population connected to at least secondary wastewater treatment
Water quality
Biochemical oxygen demand in rivers
Nitrate in groundwater
Phosphate in rivers
Bathing sites with excellent water quality (SDG 14)
Water use efficiency
Water exploitation index

Table II.7: Indicators for SDG 7 'affordable and clean energy', by sub-themes

Indicator
Energy consumption
Energy consumption
Final energy consumption in households per capita
Energy productivity
Greenhouse gas emissions intensity of energy consumption (SDG 13)
Energy supply
Share of renewable energy in gross final energy consumption
Energy dependence
Access to affordable energy
Population unable to keep home adequately warm

Table II.8: Indicators for SDG 8 'decent work and economic growth', by sub-themes

Indicator
Sustainable economic growth
Real GDP per capita
Resource productivity and domestic material consumption (DMC) (SDG 12)
Employment
Total employment rate
Young people neither in employment nor in education and training
Long-term unemployment rate
Inactive population due to caring responsibilities (SDG 5)
Decent work
Involuntary temporary employment
People killed in accidents at work

Table II.9: Indicators for SDG 9 'industry, innovation and infrastructure', by sub-themes

Indicator
R&D and innovation
Gross domestic expenditure on R&D
Employment in high- and medium-high technology manufacturing sectors and knowledge-intensive service sectors
R&D personnel
Patent applications to the European Patent Office (EPO)
Sustainable transport
Average CO_2 emissions per km from new passenger cars (SDG 12)
Share of collective transport modes in total passenger land transport
Share of rail and inland waterways activity in total freight transport

Table II.10: Indicators for changes in SDG 10 'reduced inequalities', by sub-themes

Indicator
Inequalities between countries
Disparities in GDP per capita in PPS
Disparities in adjusted gross disposable income of households per capita in PPS
EU financing to developing countries (SDG 17)
EU Imports from developing countries (SDG 17)
Inequalities within countries
People at risk of income poverty after social transfers (SDG 1)
Relative median at-risk-of-poverty gap
Gini coefficient of equivalised disposable income
Income growth of the bottom 40 % of the population
Migration and social inclusion
Asylum applications

Table II.11: Indicators for SDG 11 'sustainable cities and communities', by sub-themes

Indicator
Quality of life in cities and communities
Population living in a dwelling with a leaking roof, damp walls, floors or foundation or rot in window frames or floor (SDG 1)
Overcrowding rate
Population living in households considering that they suffer from noise
Population reporting occurrence of crime, violence or vandalism in their area (SDG 16)
Sustainable transport
Difficulty in accessing public transport
Share of collective transport modes in total passenger transport (SDG 9)
People killed in road accidents
Adverse environmental impacts
Population connected to at least secondary wastewater treatment (SDG 6)
Exposure to air pollution by particulate matter
Recycling rate of municipal waste
Artificial land cover per capita (SDG 15)
Change in artificial land cover (SDG 15)

Table II.12: Indicators for SDG 12 'responsible consumption and production', by sub-themes

Indicator
Decoupling environmental impacts from economic growth
Resource productivity and domestic material consumption (DMC)
Energy productivity (SDG 7)
Consumption of toxic chemicals
Volume of freight transport relative to gross domestic product (GDP)
Average CO_2 emissions per km from new passenger cars
Energy consumption
Energy consumption (SDG 7)
Share of renewable energy in gross final energy consumption (SDG 7)
Waste generation and management
Generation of waste excluding major mineral wastes
Recycling and landfill rate of waste excluding major mineral waste

Table II.13: Indicators for SDG 13 'climate action', by sub-themes

Indicator
Climate mitigation
Greenhouse gas emissions
Greenhouse gas emissions intensity of energy consumption
Share of renewable energy in gross final energy consumption (SDG 7)
Energy consumption (SDG 7)
Average CO_2 emissions per km from new passenger cars (SDG 12)
Climate impacts
Mean near surface temperature deviation
Climate-related economic losses
Mean ocean acidity (SDG 14)
Climate initiatives
Contribution to the international 100bn USD commitment on climate-related expending
Population covered by the Covenant of Mayors for Climate and Energy signatories

Table II.14: Indicators for SDG 14 'life below water', by sub-themes

Indicator
Marine conservation
Sufficiency of marine sites designated under the EU Habitats Directive
Sustainable fishery
Catches in major fishing areas
Assessed fish stocks exceeding fishing mortality at maximum sustainable yield (F_{MSY})
Ocean health
Bathing sites with excellent water quality
Mean ocean acidity

Table II.15: Indicators for SDG 15 'life on land', by sub-themes

Indicator
Ecosystem status
Biochemical oxygen demand in rivers (SDG 6)
Nitrate in groundwater (SDG 6)
Phosphate in rivers (SDG 6)
Share of forest area
Land degradation
Artificial land cover per capita
Change in artificial land cover
Estimated soil erosion by water
Biodiversity
Common bird index
Sufficiency of terrestrial sites designated under the EU Habitats Directive

Table II.16: Indicators for SDG 16 'peace, justice and strong institutions', by sub-themes

Indicator
Peace and personal security
Death rate due to homicide
Population reporting occurrence of crime, violence or vandalism in their area
Physical and sexual violence to women experienced within 12 months prior to the interview (SDG 5)
Access to justice
General governmental total expenditure on law courts
Perceived independence of the justice system
Trust in institutions
Corruption Perceptions Index
Population with confidence in EU institutions

Table II.17: Indicators for SDG 17 'partnership for the goals', by sub-themes

Indicator
Global partnership
Official development assistance as a share of gross national income
EU financing to developing countries
EU imports from developing countries
Financial governance within the EU
General government gross debt
Share of environmental and labour taxes in total tax revenues

Annex III

Description of method for calculating indicator trends

Method 1: Indicators without quantitative targets

The calculation of trends for indicators without quantitative targets, both for the long-term and short-term period, is based on the compound annual growth rate (CAGR), using the following formula:

(1) $$CAGR = \left(\frac{y_t}{y_{t_0}} \right)^{\frac{1}{t-t_0}} - 1$$

where: t0 = base year, t = most recent year, yt0 = indicator value in base year, yt = indicator value in most recent year

The table below shows the applied thresholds and the resulting symbols.

Table III.1: Thresholds for trends of indicators without quantitative targets

Growth rate (CAGR) in relation to desired direction	Symbol
≥ 1 %	↑
< 1 % and ≥ 0 %	↗
< 0 % and ≥ - 1 %	↘
< - 1 %	↓

Method 2: Indicators with quantitative targets

The calculation of trends for indicators with targets is based on the compound annual growth rate described above and also takes into account concrete targets set in relevant EU policies and strategies. The main point of reference for identifying relevant policy targets is the Commission Staff Working Document (SWD) 'Key European action supporting the 2030 Agenda and the Sustainable Development Goals' accompanying the Commission communication 'Next steps for a sustainable European future: European Union action for sustainability' from 22 November 2016. For this type of indicators, the actual (observed) growth rate is compared to the (theoretical) growth rate that would be required to meet the target in the target year. Independently of the year when the target was politically defined, the base years defined above for the long-term and short-term trends are

used for comparing the actual progress with the progress that should have been achieved by now to meet the target in the target year. This approach is based on the CAGR formula and includes the following three steps:

Actual (observed) growth rate:

$$(2a)\ CAGR_a = \left(\frac{y_t}{y_{t_0}} \right)^{\frac{1}{t-t_0}} - 1$$

where: t0 = base year, t = most recent year, yt0 = indicator value in base year, yt = indicator value in most recent year

Required (theoretical) growth rate to meet the target:

$$(2b)\ CAGR_r = \left(\frac{x_{t_1}}{y_{t_0}} \right)^{\frac{1}{t_1-t_0}} - 1$$

where: t0 = base year, t1 = target year, yt0 = indicator value in base year, xt1 = target value in target year

Ratio of actual and required growth rate:

$$(2c)\ R_{a/r} = \frac{CAGR_a}{CAGR_r}$$

The table below shows the thresholds applied for the Ra/r ratio and the resulting symbols.

Table III.2: Thresholds for trends of indicators with quantitative targets

Ratio of actual and required growth rate	Symbol
≥ 95 %	↑
< 95 % and ≥ 80 %	↗
< 80 % and ≥ 0 %	↘
< 0 %	↓

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Sustainable development in the European Union

MONITORING REPORT ON PROGRESS TOWARDS THE SDGS IN AN EU CONTEXT

Sustainable development is firmly anchored in the European Treaties and has been at the heart of European policy for a long time. The 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs), adopted by the UN General Assembly in September 2015, gives a new impetus to global efforts for achieving sustainable development. The EU is fully committed to playing an active role to maximise progress towards the Sustainable Development Goals.

This publication, titled 'Sustainable development in the European Union — Monitoring report on progress towards the SDGs in an EU context', marks the beginning of Eurostat's regular monitoring of progress towards the SDGs in an EU context. The analysis in this publication builds on the EU SDG indicator set, developed in cooperation with a large number of stakeholders. The indicator set comprises 100 indicators and is structured along the 17 SDGs. For each SDG, it focuses on aspects which are relevant from an EU perspective.

The monitoring report provides a statistical presentation of trends relating to the SDGs in the EU over the past five years ('short-term') and, when sufficient data are available, over the past 15 years ('long-term'). The indicator trends are described on the basis of a set of specific quantitative rules. Trends are visually represented by arrows: green upward arrows show progress towards the sustainable development goals while red downward arrows indicate movements away from them. The inclination of the arrows takes into account the speed of change.

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