

Smarter, greener, more inclusive?

INDICATORS TO SUPPORT THE
EUROPE 2020 STRATEGY

2016 edition



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Smarter, greener, more inclusive?

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EUROPE 2020 STRATEGY

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Foreword of Vice-President Katainen and Commissioner Thyssen

The Europe 2020 strategy has been the European strategy for creating smart, sustainable and inclusive growth since 2010.

The Europe 2020 strategy is instrumental in preparing strategic choices for the European Commission's work. The strategy announced the creation of the European Semester, which has become a powerful instrument to provide guidance for the Member States in their structural reforms and sustainable fiscal policies.

The first years of the Europe 2020 strategy coincided with the financial and economic crisis, which had a significant impact on progress towards the strategy's targets. Progress was achieved on the energy and environmental targets and on the education targets. Recently we have seen progress regarding employment, with the situation improving in almost all Member States. The Commission will keep up its efforts to support these positive trends with all of its different policy initiatives and for that Europe 2020 will remain the overarching framework: from the smart use of EU budgetary resources to providing the right regulatory incentives. A forceful implementation also at national level will help achieve progress towards the targets.

To achieve the objectives in the Europe 2020 strategy, the Commission will also continue to focus on the implementation of the Investment Plan for Europe, on how to accelerate structural reforms in Member States to boost competitiveness and to pursue responsible, growth-friendly fiscal consolidation. Eurostat has important responsibilities in this respect. In particular, we are grateful for Eurostat's good co-operation with the other services of the Commission regarding the impact of the public accounting rules on the creation of public-private partnerships (PPPs) in different sectors.

This publication by Eurostat provides up-to-date data in the areas covered by the Europe 2020 strategy which is important for our policymaking and helps to monitor progress towards the strategy's objectives.



Jyrki Katainen
Vice-President
European Commission

Marianne Thyssen
Commissioner
European Commission



Foreword of Eurostat's Director-General

Eurostat — the statistical office of the European Union — has the role of informing the public about important developments in the EU, in particular with regards to key European policy initiatives. In this context, Eurostat produces annual flagship publications that provide statistical analyses related to those initiatives and to economic, social and environmental phenomena relevant for the EU.



Our flagship publication *Smarter, greener, more inclusive? — Indicators to support the Europe 2020 strategy* was first released in 2013 with the aim of providing statistical support for the implementation of the Europe 2020 strategy. I am pleased to present the 2016 edition of the publication, which builds on and updates the previous releases. The publication provides analyses based on the most recent statistics in the five thematic areas of employment, R&D and innovation, climate change and energy, education, and poverty and social exclusion.

The focus of the publication is on showing progress of the EU and its Member States towards the goals and targets defined in the Europe 2020 strategy. The analysis of long-term trends, as described by the strategy's headline indicators, is accompanied by additional contextual information, which improves our understanding of the driving forces behind the developments that these indicators show.

Most of the data presented in the publication are produced by the European Statistical System (ESS). Impartial and objective statistical information is essential for evidence-based political decision-making. Eurostat's role is to support the Europe 2020 strategy, and to produce and supply high quality statistical data.

Walter Radermacher

Director-General, Eurostat
Chief Statistician of the European Union

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

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

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Executive summary



Overview of trends in the Europe 2020 headline indicators

A set of nine headline indicators and additional sub-indicators has been developed to back up the monitoring of the Europe 2020 strategy's objectives. An analysis of the developments in these indicators since 2008 shows a diverse picture.

The Europe 2020 strategy

Europe 2020 is the EU's growth and jobs strategy for the current decade, striving to pave the way to a smart, sustainable and inclusive future. The strategy envisages measures to overcome the economic crisis and move beyond it by addressing the structural weaknesses in the European economic model. The final objective is to deliver high levels of employment, productivity and social cohesion in the Member States, while reducing the impact on the natural environment.

To reach its objective, the EU has adopted eight ambitious targets in the areas of employment, research and development (R&D), climate change and energy, education and poverty reduction, to be reached by 2020. These have been translated into national targets to reflect the situation and possibilities of each Member State to contribute to the common goal. A set of nine headline indicators and additional sub-indicators gives an overview of how far the EU is from reaching its overall targets.

In 2014, the European Commission published a communication taking stock of the Europe 2020 strategy. It reflects on the challenges and possibilities for meeting the targets adopted four years earlier, in view of adjusting the strategy for the period 2015 to 2020. According to the Commission's communication, the EU is on track to reach some of its headline targets for 2020 but has fallen behind on others, with the crisis having a sizeable impact.

Since 2008, substantial progress has been made in the area of climate change and energy through reduced greenhouse gas emissions and the

increased use of renewable energy sources. Positive developments are also visible in the area of education, where the EU is within reaching distance of both headline targets. Larger efforts will be required to get back on track with R&D investment, while meeting the employment and poverty targets will remain challenging.

The analysis in this 2016 edition of *Smarter, greener, more inclusive* aims to shed light on the trends in the headline indicators over the past seven years, from 2008 up to 2014 or 2015 (depending on data availability).

Employment rate

In 2008, employment in the EU for the age group 20 to 64 peaked at 70.3%, after a period of steady increase. In the following years, employment trends reversed as a result of the unfavourable effect of the economic crisis on the European labour market. By 2013, the indicator had fallen to 68.4%. In 2014, the employment rate started increasing again and by 2015 reached 70.1% — close to the 2008 level. As a result, in 2015 the distance to the EU 2020 employment target of 75% had narrowed to 4.9 percentage points.

The continuous fall in employment rates between 2009 and 2013 mostly affected young people, people with low educational attainment and non-EU nationals. Older people (aged 55 to 64 years) were another vulnerable group, as their employment rates grew continuously over the past decade but still remained lower compared with younger age groups. The gender employment gap has narrowed for all age groups since 2002. In 2015, the largest gap was observed for the age group 30 to 34 (14 percentage points).

Additionally, long-term changes in the demographic structure of the EU population add to the need to increase employment rates. Despite a growing population, low fertility rates and increasing life expectancy could result in a shrinking EU labour force and an increasing

**Table 0.1:** Europe 2020 headline indicators, EU-28, 2008 and 2011–2015

Topic	Headline indicator	2008	2011	2012	2013	2014	2015	Target
Employment	Employment rate age group 20–64, total (% of population)	70.3	68.6	68.4	68.4	69.2	70.1	75.0
	• Employment rate age group 20–64, females (% of population)	62.8	62.2	62.4	62.6	63.5	64.3	:
	• Employment rate age group 20–64, males (% of the population)	77.8	75.0	74.6	74.3	75.0	75.9	:
R&D	Gross domestic expenditure on R&D ⁽¹⁾ (% of GDP)	1.85	1.97	2.01	2.03	2.03	:	3.00
Climate change and energy	Greenhouse gas emissions ⁽²⁾ (Index 1990 = 100)	90.3	83.0	81.8	80.2	77.1	:	80.0
	Share of renewable energy in gross final energy consumption (%)	11.0	13.1	14.3	15.0	16.0	:	20.0
	Primary energy consumption (Million tonnes of oil equivalent)	1,693	1,593	1,584	1,569	1,507	:	1 483
	Final energy consumption (Million tonnes of oil equivalent)	1,180	1,105	1,105	1,106	1,061	:	1 086
Education	Early leavers from education and training, total ⁽³⁾ (% of population aged 18–24)	14.7	13.4	12.7	11.9	11.2	11.0	< 10,0
	• Early leavers from education and training, females ⁽³⁾ (% of population aged 18–24)	12.7	11.5	10.9	10.2	9.6	9.5	:
	• Early leavers from education and training, males ⁽³⁾ (% of population aged 18–24)	16.6	15.3	14.5	13.6	12.8	12.4	:
	Tertiary educational attainment, total ⁽³⁾ (% of population aged 30–34)	31.1	34.8	36.0	37.1	37.9	38.7	≥ 40,0
	• Tertiary educational attainment, females ⁽³⁾ (% of population aged 30–34)	34.3	38.6	40.2	41.4	42.3	43.4	:
	• Tertiary educational attainment, males ⁽³⁾ (% of population aged 30–34)	28.0	31.0	31.8	32.8	33.6	34.0	:
Poverty and social exclusion	People at risk of poverty or social exclusion, EU-27 ⁽⁴⁾ (Million people)	116.2	119.6	122.5	121.6	120.9	:	96.2 ⁽⁵⁾
	People at risk of poverty or social exclusion, EU-28 ⁽⁴⁾ (Million people)	:	121.0	123.8	122.9	122.2	:	:
	People at risk of poverty or social exclusion, EU-28 ⁽⁴⁾⁽⁶⁾ (% of population)	23.7	24.3	24.7	24.6	24.4	:	:
	• People living in households with very low work intensity, EU-28 ⁽⁶⁾ (% of population aged 0–59)	9.2	10.4	10.5	10.9	11.2	:	:
	• People at risk of poverty after social transfers, EU-28 ⁽⁶⁾ (% of population)	16.5	16.8	16.8	16.7	17.2	:	:
	• Severely materially deprived people, EU-28 ⁽⁶⁾⁽⁷⁾ (% of population)	8.5	8.9	9.9	9.6	8.9	:	:

(1) Data for 2014 are provisional.

(2) Total emissions, including international aviation and indirect CO₂, but excluding emissions from land use, land use change and forestry (LULUCF).

(3) Break in time series in 2014.

(4) The indicator 'people at risk of poverty or social exclusion' corresponds to the sum of persons who are: at risk of poverty after social transfers, severely materially deprived or living in households with very low work intensity. Persons are only counted once even if they are present in several sub-indicators.

(5) The overall EU target is to lift at least 20 million people out of the risk of poverty and exclusion by 2020. Due to data availability issues, the target is evaluated only for the EU-27.

(6) EU-27 data for 2008.

(7) 2015 data are estimates.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

share of economically inactive persons. A higher employment rate, especially for women, older workers and young people, is therefore needed to compensate for the expected decline of the working-age population (aged 20 to 64) by 4.3 million people by 2020.

Gross domestic expenditure on research and development (R&D)

Gross domestic expenditure on R&D as a percentage of GDP has increased slightly since 2008. In 2014, the indicator was at 2.03%, compared with 1.85% in 2008. The increase during the economic crisis of 2008 to 2009 reflects a wider EU effort to stimulate economic growth by boosting public expenditure on R&D, in combination with decreasing GDP. In 2014, the EU was still 0.97 percentage points below its target for 2020, which calls for increasing combined public and private R&D expenditure to 3% of gross domestic product (GDP).

Investment in R&D is crucial for transforming the EU into a successful and competitive knowledge-based economy. Progress in this regard has been reinforced by a 25.5% increase in the number of tertiary graduates in science and technology between 2008 and 2014. Despite the growth of female tertiary graduates in science over the past few years, women still engage in different fields of study than men and remain under-represented in science and technology fields.

Broadband access and digital skills are essential for the diffusion of knowledge across all sectors of our society. Internet access across the EU has increased substantially, reaching 95% of enterprises and 80% of households in 2015. Nevertheless, there is still considerable scope for increasing digital literacy, with almost half of the EU population being insufficiently equipped with digital skills.

In terms of overall R&D expenditure, the EU is still lagging behind its Asian and American competitors. However, European high-tech exports to outside markets increased between 2009 and 2014, mainly driven by growth in the aerospace and pharmaceutical sectors. The EU's international position in terms of human capital

has also improved, surpassing Japan and the United States in the share of tertiary graduates.

Greenhouse gas emissions, share of renewable energy in gross final energy consumption, and energy efficiency

By 2014, emissions of greenhouse gases (GHG) across the EU had fallen by 23.0% compared with 1990 levels. The EU is thus expected to exceed its Europe 2020 target of reducing GHG emissions by 20% by 2020. By far the strongest single-year drop in GHG emissions since the early 1990s was recorded between 2008 and 2009, when emissions fell by 7.2%. This swift decline in GHG emissions has mainly been attributed to the economic crisis and the depressed economic activity in many parts of Europe. Progress has been uneven across sectors, with the largest reductions recorded in the manufacturing and construction, as well as the energy industries, while in domestic transport and international aviation and shipping emissions have increased.

The share of renewable energy in gross final energy production — the Europe 2020 strategy's second climate change and energy target — increased from 11.0% in 2008 to 16.0% in 2014. The largest contributors have been solid biofuels and renewable waste, amounting to half of the gross inland consumption of renewable energy in 2014. Hydropower has also remained a large contributor, but its share has declined since 2000. In contrast, the shares of wind and solar energy have increased substantially thanks to effective support schemes and dramatic cost reductions. In 2014, the share of renewable energy in gross final energy consumption was four percentage points below the Europe 2020 target of 20%.

The EU has made substantial progress towards its energy efficiency objective as well. Between 2008 and 2014, primary energy consumption in the EU fell by 11.0% to 1 507 million tonnes of oil equivalent — a lower level than in 1990. It would need to fall by a further 1.6% by 2020 to meet the Europe 2020 goal of moving towards a 20% increase in energy efficiency, which is determined with reference to a business-as-usual projection for 2020. The trend in final energy consumption



has closely followed the trend in primary energy consumption but at a lower level, falling from 1 180 Mtoe in 2008 to 1 061 Mtoe in 2014. Energy efficiency policies have helped achieve substantial reductions in primary energy consumption. Despite the increase in economic activity in recent years, energy consumption has continued to fall, also supported by warmer-than-average temperatures.

Early leavers from education and training and tertiary educational attainment

The share of early leavers from education and training, defined as the share of 18 to 24 year olds with at most lower secondary education and not in further education and training, has consistently decreased since 2008, for both men and women. In 2015, the indicator was at 11.0%, compared with 14.7 % in 2008. Thus, Europe is steadily approaching its headline target for 2020, which envisages reducing the rate of early leavers from education and training to less than 10%.

Young men are more likely to leave education and training early compared with women, even though their rate has decreased by a larger amount between 2008 and 2015, from 16.6% to 12.4%. Figures for women are already below the overall EU target, standing at 9.5% in 2015. Foreign-born residents are more likely to leave formal education early compared with natives. In the EU, the share of early leavers among migrants in 2015 was almost twice as high as for natives (19.0% compared with 11.0%).

Improvements can also be observed in the share of 30 to 34 year olds who have attained tertiary education. The share increased continuously between 2008 and 2015, from 31.1 % to 38.7%. Provided that this positive trend continues, the EU seems to be on track to meeting its target of increasing the share of the population aged 30 to 34 having completed tertiary education to at least 40% by 2020.

Disaggregated by gender, the data reveal that growth in the share of tertiary graduates has been considerably faster for women, who had already met the Europe 2020 target in 2012 and by 2015 had reached 43.4%. Progress has been slower for

men: by 2015, only 34.0% of 30 to 34 year old men had attained tertiary education.

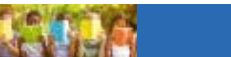
People at risk of poverty or social exclusion

Between 2008 and 2012, the number of people living at risk of poverty or social exclusion in the EU-27 increased by about 6 million before dropping to 121 million in 2014. In the EU-28, the indicator followed a similar path — the number of people affected increased from 118 million in 2010 to a peak value of 124 million in 2012, before decreasing to about 122 million in 2014. The increase has been largely attributed to the economic crisis of 2008 and the following recessions in most Member States. Despite the cushioning role of automatic stabilisers and other discretionary policies, almost every fourth person in the EU remained at risk of poverty or social exclusion over the period 2010 to 2014.

The most widespread form of poverty in the EU is monetary poverty. In 2014, about 86 million people, representing 17% of the total EU population, were at risk of poverty after social transfers. The second most frequent form of poverty was severe material deprivation, affecting almost 45 million people or 9% of all EU citizens. The third dimension was very low work intensity, with almost 42 million people falling into this category in 2014. This equalled 11% of the total population aged 0 to 59 in the EU. People may be simultaneously affected by two or more forms of poverty, but are nevertheless only counted once for the headline indicator.

The three dimensions of poverty and social exclusion covered by the headline indicator have developed unevenly since 2010. The number of severely materially deprived people increased in the period 2010 to 2012, before falling again gradually until 2014. The number of people at risk of poverty after social transfers increased until 2012. It declined slightly in 2013 before rising again in 2014. The number of people living in households with very low work intensity grew over the entire period from 2010 to 2014.

Across all three dimensions of poverty, the most vulnerable groups appear to be the same, namely



young people, the unemployed and inactive, single parents, households consisting of only one person, people with low educational attainment, foreign citizens born outside the EU-28, and those residing in rural areas. Of all the groups examined, single parents with one or more dependent children faced the highest risk of poverty.

The European Commission aims to reduce the number of people at risk of poverty or social exclusion by 20 million by 2020, as compared with the 2008 level ⁽¹⁾. In 2014, the gap to the EU-27 target was about 25 million people. Further efforts would be necessary to initiate a positive trend in the indicator for poverty and social exclusion and to meet the Europe 2020 goal.

(1) Due to the structure of the survey on which most of the key social data is based (European Union 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 data for the EU-27 as the most recent data available. This is why monitoring of progress towards Europe 2020 headline targets takes EU-27 data from 2008 as a baseline year (see European Commission, Social Europe — Current challenges and the way forward. Annual Report of the Social Protection Committee (2012), Luxembourg, Publications Office of the European Union, 2013, p. 12).

Introduction



About this publication

In 2013 Eurostat introduced a new type of ‘flagship publication’ with the aim of providing statistical analyses related to important [European Commission](#) policy frameworks and relevant economic, social and environmental phenomena. The annual ‘flagship publication’ entitled *Smarter, greener, more inclusive? — Indicators to support the Europe 2020 strategy* provides statistical support for the Europe 2020 strategy and monitors progress towards its headline targets.

The 2016 edition of *‘Smarter, greener, more inclusive?’* builds on and updates the previous editions. It presents official statistics produced by the [European Statistical System \(ESS\)](#) and disseminated by Eurostat. Impartial and objective statistical information is essential for evidence-based political decision-making and defines Eurostat’s role in the context of the [Europe 2020 strategy](#) ⁽¹⁾. It involves the development of relevant indicators to support the strategy, the production and supply of statistical data, and the assurance of high-quality standards.

The analysis in the publication is based on the Europe 2020 headline indicators developed to monitor the strategy’s targets. Other indicators focusing on specific subgroups of society or on related issues that show underlying trends are also used to deepen the analysis and present a broader picture. The data used mainly come from official ESS sources such as the [EU Labour Force Survey \(EU LFS\)](#) or the [EU Statistics on Income and Living Conditions \(EU SILC\)](#), as well as from administrative sources.

Data on [EU-28](#) aggregates and individual Member States are presented and, where available, comparisons are made with the members of the European Free Trade Association ([EFTA](#)) and [candidate countries](#), as well as the United States and Japan. Additionally, maps presenting the headline indicator performances of Europe’s regions and their progress towards the national Europe 2020 targets are included where feasible.

The 2016 edition of *‘Smarter, greener, more inclusive?’* analyses past trends, generally since 2002 or 2008, up to the most recent year for which data are available (2014 or 2015). Its purpose is not to predict whether the Europe 2020 targets will be reached, but to document and analyse the development of the headline indicators, while also painting a broader picture of the context using supplementary indicators. The publication includes references to analyses published by the European Commission on the future efforts required to meet the targets.

The publication is structured around the five thematic areas of Europe 2020, which are employment, education, poverty and social exclusion, climate change and energy, and research and development. Each area is analysed in a dedicated chapter. An [executive summary](#) outlines the main statistical trends observed in the indicators. Additional [country profiles](#) describe the progress of each Member State towards its national Europe 2020 targets.

The most recent data on the headline indicators and information on the Europe 2020 strategy are available on a dedicated section of Eurostat’s website: [Europe 2020 headline indicators](#).

⁽¹⁾ European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels, 2010.



The Europe 2020 strategy

The Europe 2020 strategy, adopted by the [European Council on 17 June 2010](#) ⁽²⁾ as the successor to the [Lisbon strategy](#), is the EU's agenda for growth and jobs for the current decade. It emphasises smart, sustainable and inclusive growth as a way to overcome the structural weaknesses in Europe's economy, improve its competitiveness and productivity and underpin a sustainable social market economy.

Three key priorities and eight targets

The Europe 2020 strategy puts forward three mutually reinforcing priorities to make Europe a smarter, more sustainable and more inclusive place to live:

- Smart growth, through the development of an economy based on knowledge, research and innovation.

- Sustainable growth, through the promotion of resource-efficient, green and competitive markets.
- Inclusive growth, through policies aimed at fostering job creation and poverty reduction.

In a rapidly changing world, these priorities are deemed essential for making the European economy fit for the future and for delivering higher employment, productivity and social cohesion ⁽³⁾. Under the three key priorities, the EU adopted eight targets, as shown in Table 0.1:

- The smart growth objective is covered by targets on innovation (gross domestic expenditure on R&D) and education (early leavers from education and training and tertiary educational attainment).
- The sustainable growth objective is covered by three targets on climate change and energy (greenhouse gas emissions, share of renewable

Table 0.1: The Europe 2020 strategy's key priorities, headline targets and flagship initiatives

	Targets	Flagship initiatives
Smart growth	<ul style="list-style-type: none"> • Increasing combined public and private investment in R&D to 3 % of GDP • Reducing school drop-out rates to less than 10 % • Increasing the share of the population aged 30–34 having completed tertiary education to at least 40 % 	<ul style="list-style-type: none"> • Innovation Union • Youth on the move (ended in December 2014) • A digital agenda for Europe
Sustainable growth	<ul style="list-style-type: none"> • Reducing greenhouse gas emissions by at least 20 % compared to 1990 levels • Increasing the share of renewable energy in final energy consumption to 20 % • Moving towards a 20% increase in energy efficiency 	<ul style="list-style-type: none"> • Resource efficient Europe • An industrial policy for the globalisation era
Inclusive growth	<ul style="list-style-type: none"> • Increasing the employment rate of the population aged 20–64 to at least 75 % • Lifting at least 20 million people out of the risk of poverty and social exclusion 	<ul style="list-style-type: none"> • An agenda for new skills and jobs • European platform against poverty and social exclusion

⁽²⁾ European Council conclusions, 17 June 2010, EUCO 13/10, Brussels, 2010.

⁽³⁾ European Commission, Europe 2020 — A strategy for smart, sustainable and inclusive growth, COM (2010)2020 final, Brussels, 2010.



energy in gross final energy consumption and primary energy consumption).

- The inclusive growth objective is covered by targets on employment (employment rate) and on poverty and social exclusion (people at risk of poverty or social exclusion, combining the dimensions on monetary poverty, material deprivation and living in a household with very low work intensity).

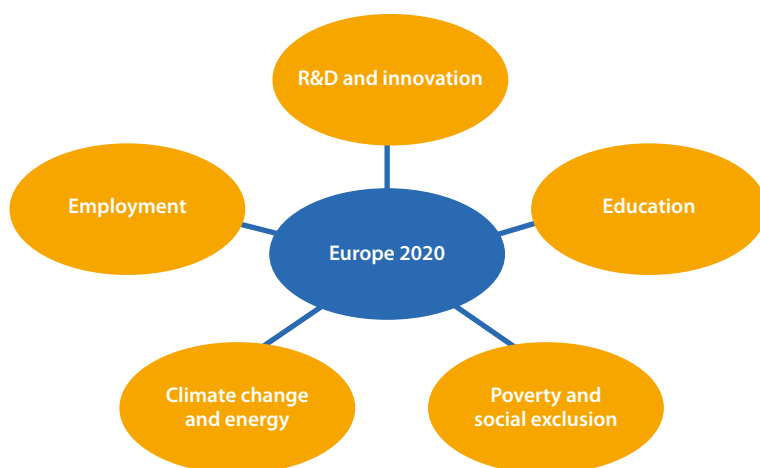
The targets are monitored using a set of nine headline indicators and additional sub-indicators related to various dimensions of the data (such as the multidimensional concept of poverty and social exclusion). For a detailed overview of the indicators, see Table 0.1 in the [Executive summary](#). The strategy's objectives and targets are further supported by thematic flagship initiatives, as shown in Table 0.1.

The eight targets belong to five thematic areas: employment, education, poverty and social exclusion, climate change and energy and research and development, as shown in Figure 0.1. These five areas are strongly interlinked. For example, higher educational levels are associated with better employability which in turn increases employment rates and helps to reduce poverty.

A greater capacity for research and development as well as innovation across all sectors of the economy, combined with increased resource efficiency, would improve competitiveness and foster job creation. Investing in cleaner, low-carbon technologies would help the environment, contribute to the fight against climate change and create new business and employment opportunities ⁽⁴⁾.

Each of the EU targets have been translated into national targets. These reflect each Member State's situation and the level of ambition they are able to reach as part of the EU-wide effort for implementing the Europe 2020 strategy. However, in a few cases Member States have not set up national targets or cumulatively the national targets are not ambitious enough to reach the EU-level goal. For example, the fulfilment of all national targets in the area of employment would bring the overall EU-28 employment rate up to 74 %, which would still be one percentage point below the Europe 2020 target of 75 %. Similarly, even if all Member States met their national targets on R&D expenditure, the EU would still fall short of its target of 3 % R&D expenditure as a share of GDP, reaching only 2.6 % by 2020 ⁽⁵⁾.

Figure 0.1: Europe 2020 strategy thematic areas



⁽⁴⁾ European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels, 2010 (p. 11).

⁽⁵⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, Brussels (p. 12–16).



Seven flagship initiatives

To ensure progress towards the Europe 2020 goals, a broad range of EU policies and instruments are used, including the single market, the EU budget and external policy tools. The ten priorities of the European Commission (see section 'Ten priorities for the EU' later in this chapter) guide the EU policies and help ensure progress towards smart, sustainable and inclusive growth. The strategy itself identifies seven policy areas where growth and jobs are put forward through the following seven flagship initiatives ⁽⁶⁾: 'Innovation Union', 'Youth on the move' ⁽⁷⁾, 'A digital agenda for Europe', 'Resource efficient Europe' ⁽⁸⁾, 'An industrial policy for the globalisation era', 'An agenda for new skills and jobs' and 'European platform against poverty and social exclusion'.

The targets and the flagship initiatives mentioned above are described in more detail in the [thematic chapters](#) of this publication.

Taking stock of Europe 2020 — how to pursue smart, sustainable and inclusive growth?

In March 2014, the Commission published its communication 'Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth' ⁽⁹⁾. It showed that the experience with the targets and flagship initiatives has been mixed: 'The EU is on course to meet or come close to its targets on education, climate change and energy but not on employment, research and development and poverty reduction'. The Commission concluded that while the targets have helped focus on longer-term, underlying features crucial to the future of the EU's society and economy, their translation to the national level has highlighted several uncomfortable trends. These include a growing gap between the

best and the least well performing Member States, a widening gap between regions within and across Member States, and growing inequalities in the distribution of wealth and income ⁽¹⁰⁾.

According to the Commission's stocktaking, some long-term trends affecting growth would have to be addressed ⁽¹¹⁾. These involve the societal change (in particular related to the ageing of European populations), the globalisation and trade (and the implications for the competitiveness of EU companies and access to new markets), the productivity developments and use of information and communication technologies (ICT) as catalysts of growth, and the pressure on resources and environmental concerns.

In March 2015, the Commission published the [results of a public consultation](#) ⁽¹²⁾ on the first years of the strategy. The main messages were:

- Europe 2020 is seen as a relevant overarching framework to promote jobs and growth at EU and national level. Its objectives and priorities are meaningful in the light of current and future challenges.
- The five headline targets represent key catalysts for jobs and growth and help to keep the strategy focused.
- Most of the flagship initiatives have served their purpose, yet their visibility has remained weak.
- There is scope and a need to improve the delivery of the strategy through enhanced ownership and involvement on the ground.

In the [2016 Annual Growth Survey](#) ⁽¹³⁾, published in November 2015, the Commission said it will make the best use of the Europe 2020 strategy and its tools by improving its implementation

⁽⁶⁾ For more information on the flagship initiatives see the Europe 2020 website: http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/flagship-initiatives/index_en.htm

⁽⁷⁾ The 'Youth on the move' flagship initiative ended in December 2014.

⁽⁸⁾ The Resource Efficiency Scoreboard, comprising about 30 indicators, is disseminated via a [dedicated section on Eurostat's website](#).

⁽⁹⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, Brussels.

⁽¹⁰⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, Brussels (p. 21).

⁽¹¹⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, Brussels (p. 8–1).

⁽¹²⁾ *Results of the public consultation on the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2015) 100 final, Brussels, 2015.

⁽¹³⁾ European Commission, *Annual Growth Survey 2016: Strengthening the recovery and fostering convergence*, COM(2015) 690 final, Brussels, 2015.



and monitoring in the context of the European Semester.

The European Semester: annual cycle of policy coordination

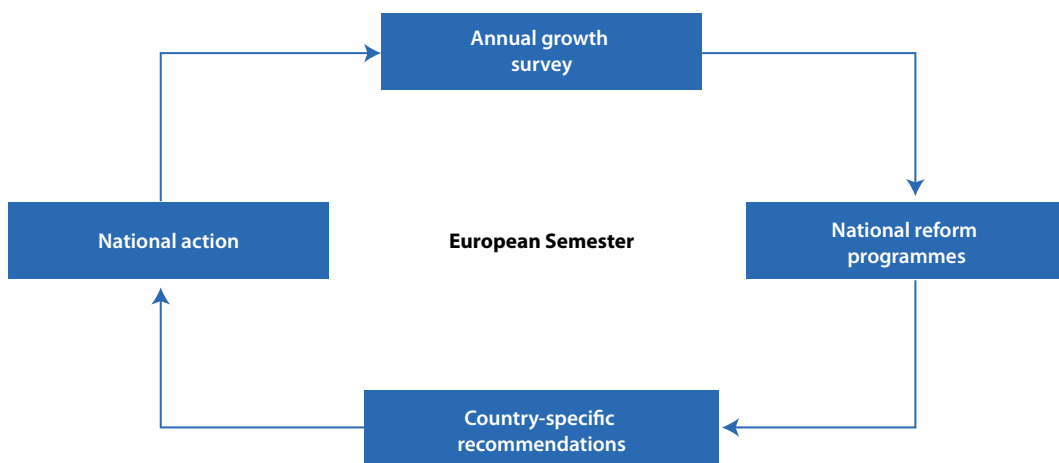
The success of the Europe 2020 strategy crucially depends on Member States co-ordinating their efforts. To ensure this, the European Commission has set up an annual cycle of EU-level policy co-ordination known as the European Semester. Its main purpose is to strengthen economic policy co-ordination and ensure the coherence of the budgetary and economic policies of Member States with the [Stability and Growth Pact \(SGP\)](#) and the Europe 2020 strategy.

The [Annual Growth Survey \(AGS\)](#), normally adopted by the Commission towards the end of the year, marks the start of the European Semester. It sets out overall economic, budgetary and social priorities at EU and national level, which are to guide Member States. Based on the AGS, each Member State has to submit its economic and budgetary plans annually in the National Reform Programmes (NRPs) and Stability and Convergence Programmes (SCPs). In the NRPs,

Member States present concrete reforms and measures towards implementing the Europe 2020 strategy. This period of integrated country surveillance starts before the first half of each year, when national economic and budgetary policies have still not been finalised. The aim is to detect inconsistencies and emerging imbalances and issue early warnings and recommendations in due course (see [European Union Explained](#)) ⁽¹⁴⁾. The NRPs and SCPs are submitted to the European Commission for assessment in April. At the end of June or in early July, country-specific recommendations are formally endorsed by the Council. These recommendations address the implementation of the Europe 2020 strategy and other economic challenges on the national level and provide a timeframe for Member States to respond accordingly and implement the policy advice in their annual economic policy and budgetary cycle.

To ensure progress towards the Europe 2020 targets, a broad range of existing EU policies and instruments are used, including the single market, the EU budget and external policy tools. Central to tackling the weaknesses revealed by the economic crisis and to achieving the Europe 2020

Figure 0.2: The European Semester ⁽¹⁾



(1) A more detailed illustration of the European Semester is available on the European Commission's 'Europe 2020' website.

(14) European Commission, *The European Union Explained: Europe 2020: Europe's Growth Strategy*, 2012.



objectives of growth and competitiveness is the promotion of enhanced economic governance. The two important elements in this respect are the Macroeconomic Imbalance Procedure (MIP) ⁽¹⁵⁾ and the Excessive Deficit Procedure (EDP) based on the Stability and Growth Pact.

In June 2015, the President of the European Commission presented a report titled '[Completing Europe's Economic and Monetary Union](#)' ⁽¹⁶⁾, also known as the Five Presidents' Report ⁽¹⁷⁾. It proposed a roadmap for strengthening the Economic and Monetary Union (EMU) by taking actions on four fronts — economic, financial, fiscal and political. As laid out in the roadmap, a number of immediate steps should be taken by mid-2017. The roadmap supports the implementation of the

Europe 2020 strategy by proposing concrete steps towards 'job creation, growth and prosperity for all citizens'.

As a follow-up to the Five Presidents' report, the European Commission issued a [communication](#) 'On steps towards completing the Economic and Monetary Union' ⁽¹⁸⁾. It laid out a plan for strengthening the European Semester by better integrating European and national dimensions, placing stronger focus on employment and social performance, promoting convergence by benchmarking and pursuing best practices, as well as by supporting structural reforms through the provision of EU funds and technical assistance.

Europe 2020 in a broader policy perspective

Ten priorities for the EU

Prior to his election as president of the European Commission in July 2014, Jean-Claude Juncker presented his political agenda, highlighting ten priority areas, in a document entitled '[A New Start for Europe: My Agenda for Jobs, Growth Fairness and Democratic Change](#)' ⁽¹⁹⁾ (see Box 0.1). These are referred to as 'political guidelines' for the European Commission and address some of the key challenges facing the European economy and society. Emphasis is placed on achieving concrete results in the identified priority areas whereas other policy areas are left to Member States that are considered better equipped to form effective policy responses at national, regional and local level.

In September 2015, the Commission released a report on [Progress on the European Commission's 10 Priorities](#). As outlined in the document, the investment plan for jobs and growth has been launched and has started to

show results — the ambition is to mobilise at least EUR 315 billion for investment over a three-year period.

During its first year in office, the European Commission also started work on the Energy Union, the Digital Single Market and a Capital Markets Union, among others. A roadmap for deepening the Economic and Monetary Union was presented in the Five Presidents' Report. The trade negotiations with the US are under way and the Commission has taken measures to make the process more transparent. The Commission has also worked towards a co-ordinated European response to the challenges of increased movement of migrants and refugees.

The international agenda for sustainable development

The 2030 Agenda for Sustainable Development was formally adopted by world leaders at the United Nations Sustainable Development

⁽¹⁵⁾ An [MIP scoreboard](#) of 14 indicators provides information for the identification of external and internal macroeconomic imbalances.

⁽¹⁶⁾ European Commission, *The Five Presidents' Report: Completing Europe's Economic and Monetary Union*, 22 June 2015.

⁽¹⁷⁾ The report was prepared by the president of the European Commission, in close co-operation with the presidents of the Euro Summit, the Eurogroup, the European Central Bank and the European Parliament.

⁽¹⁸⁾ European Commission, *Communication from the Commission to the European Parliament, the Council and the European Central Bank On steps towards Completing Economic and Monetary Union*, COM(2015) 600 final, Brussels, 2015.

⁽¹⁹⁾ Jean-Claude Juncker (2014), *A New Start for Europe: My Agenda for Jobs, Growth Fairness and Democratic Change*, Strassbourg, 15 July 2015.



Box 0.1: The ten European Commission priorities

1. A new boost for **Jobs, Growth and Investment** ⁽²⁰⁾
2. A connected **Digital Single Market** ⁽²¹⁾
3. A resilient **Energy Union** with a forward-looking climate change policy ⁽²²⁾
4. A deeper and fairer **internal market** with a strengthened industrial base ⁽²³⁾
5. A deeper and fairer **Economic and Monetary Union (EMU)** ⁽²⁴⁾
6. A reasonable and **balanced free trade agreement with the United States** ⁽²⁵⁾
7. An area of **Justice and Fundamental Rights** based on mutual trust ⁽²⁶⁾
8. Towards a new policy on **migration** ⁽²⁷⁾
9. Europe as a **stronger global actor** ⁽²⁸⁾
10. A Union of **Democratic Change** ⁽²⁹⁾

Summit in September 2015. The document, titled ‘**Transforming our world: the 2030 agenda for sustainable development**’ ⁽³⁰⁾, consists of a declaration, a set of 17 Sustainable Development Goals (SDGs; see Box 0.2 for a full list) and 169 related targets, a section on the means of implementation and on the follow-up and review of the 2030 Agenda.

The 2030 Agenda is the result of an inclusive process, which engaged a broad range of stakeholders. Talks on the new agenda were initiated at the United Nations Conference on Sustainable Development, which was held in 2012 in Rio de Janeiro and became known as Rio+20 ⁽³¹⁾. As a main outcome of the Rio+20 conference, world leaders decided to launch a process for the development of a post-2015 development agenda

to replace the Millennium Development Goals after their target date of 2015.

A first **proposal for sustainable development goals and targets** ⁽³²⁾ was prepared by an Open Working Group of the UN General Assembly, established in January 2013. It became the basis for a round of intergovernmental negotiations between UN Member States, which culminated in the adoption of the 2030 Agenda in September 2015 ⁽³³⁾.

In its 2013 communication, ‘**A decent life for all: ending poverty and giving the world a sustainable future**’ ⁽³⁴⁾, the European Commission showed its commitment to actively engage in the post-2015 processes and work towards the implementation of the objectives of the 2030 Agenda. The document proposes principles for an overarching framework that provides a coherent and comprehensive

⁽²⁰⁾ For more information on the Investment Plan for Europe see: http://ec.europa.eu/priorities/jobs-growth-and-investment_en

⁽²¹⁾ For more information on the Digital Single Market see: https://ec.europa.eu/priorities/digital-single-market_en

⁽²²⁾ For more information on the Energy Union see: http://ec.europa.eu/priorities/energy-union-and-climate_en

⁽²³⁾ For more information on the internal market see: http://ec.europa.eu/priorities/internal-market_en

⁽²⁴⁾ For more information on the Economic and Monetary Union see: https://ec.europa.eu/priorities/deeper-and-fairer-economic-and-monetary-union_en

⁽²⁵⁾ For more information on the EU-US free trade agreement see: http://ec.europa.eu/priorities/balanced-eu-us-free-trade-agreement_en

⁽²⁶⁾ For more information on justice and fundamental rights see: http://ec.europa.eu/priorities/justice-and-fundamental-rights_en

⁽²⁷⁾ For more information on migration policy see: http://ec.europa.eu/priorities/migration_en

⁽²⁸⁾ For more information on the EU as a stronger global actor see: https://ec.europa.eu/priorities/stronger-global-actor_en

⁽²⁹⁾ For more information on making the EU more democratic see: https://ec.europa.eu/priorities/democratic-change_en

⁽³⁰⁾ United Nations (2015) *Transforming our World: the 2030 agenda for sustainable development*, A/RES/70/1, 25 September 2015.

⁽³¹⁾ In 1992 the United Nations Conference on Environment and Development took place also in Rio de Janeiro and became known as the Rio Conference.

⁽³²⁾ Open Working Group of the General Assembly on Sustainable Development Goals (2014), *Open Working Group proposal for Sustainable Development Goals*, A/68/970.

⁽³³⁾ See Resolution adopted by the General Assembly on 25 September 2015: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

⁽³⁴⁾ European Commission, *A decent life for all: ending poverty and giving the world a sustainable future*, COM(2013) 92 final, Brussels, 2013.



response to the universal challenges of poverty eradication and sustainable development in its three dimensions, with the ultimate goal of ensuring a decent life for all by 2030.

In June 2014, the Commission published a follow-up to its communication, entitled 'A decent Life for all: from vision to collective action' ⁽³⁵⁾. Building on the existing EU position concerning the development of the SDGs, this new communication further elaborated key principles and set out possible priority areas

and potential target topics for the 'post-2015 framework'. 'Statistics' was one of the areas listed in the communication for which actions have been taken that contribute to the implementation of Rio+20.

The EU support was further conveyed in [European Council conclusions on a transformative post-2015 agenda](#), released in December 2014 ⁽³⁶⁾, which state that the implementation of the post-2015 agenda would require a global partnership based on the principles of 'universality, shared

Box 0.2: The Sustainable Development Goals

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*

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

*Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.

⁽³⁵⁾ European Commission, *A decent Life for all: from vision to collective action*, COM(2014) 335 final.

⁽³⁶⁾ See: *Council conclusions on a transformative post-2015 agenda*, Brussels, 16 December 2014.



responsibility, mutual accountability, consideration of respective capabilities, and the adoption of a multi-stakeholder approach'. The European Council further elaborated on the need to set up a [new global partnership for poverty eradication and sustainable development after 2015](#) in Council conclusions of May 2015 ⁽³⁷⁾.

The development of an indicator framework for monitoring progress towards the SDGs has been guided by the United Nations Statistical Commission (UNSC), the leading statistical body of the UN. For this purpose, the UNSC established an Inter-Agency and Expert Group on SDG indicators (IAEG-SDGs)⁽³⁸⁾. In December 2015, [a report of the IAEG-SDGs](#) ⁽³⁹⁾ was submitted to the Statistical Commissions, including an Annex (updated in February 2016) with a list of 241 indicators ⁽⁴⁰⁾ to measure progress towards the 169 targets of the

SDGs. The Statistical Commission agreed on the indicator list at its 47th meeting in March 2016, 'as a practical starting point [...] subject to future technical refinement'. Further work is envisaged in terms of improving the indicator list and the availability of data.

As mentioned above, the indicator framework developed by the IAEG-SDGs will monitor progress towards the SDGs at the global level. It is expected that the framework of global indicators will form the core of indicator sets for regional, national and thematic monitoring. Additional and in some cases different indicators might be used at different levels of monitoring. Member States will have to develop their own indicator sets, while indicators for thematic monitoring are already considered in a number of areas ⁽⁴¹⁾.

⁽³⁷⁾ See: *A New Global Partnership for Poverty Eradication and Sustainable Development after 2015*, Council Conclusions, 26 May 2015.

⁽³⁸⁾ The IAEG-SDGs was established by the UNSC with the aim of developing a proposal for a global monitoring framework. It consists of technical experts from national statistical offices and, as observers, representatives from regional and international organisations and agencies.

⁽³⁹⁾ *Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators*, March 2016.

⁽⁴⁰⁾ See Annex III of the *Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators*, March 2016.

⁽⁴¹⁾ See for example: International Trade Centre (ITC), *The State of Sustainable Markets: Statistics and Emerging Trends 2015*, Geneva, 2015.

1

Employment



Employment — why does it matter?

Employment and other labour market-related issues are at the heart of the social and political debate in the EU. Paid employment is crucial to ensuring sufficient living standards and provides the necessary base for people to achieve their personal goals and aspirations. Moreover, employment contributes to economic performance, quality of life and social inclusion, making it one of the cornerstones of socioeconomic development and well-being.

The EU's workforce is shrinking as a result of demographic changes. A smaller number of workers are therefore supporting a growing number of dependent people. This is putting at risk the sustainability of Europe's social model, welfare systems, economic growth and public finances. In addition, steady gains in economic growth and job creation over the past decade have been wiped out by the recent economic crisis, exposing structural weaknesses in the EU's economy. At the same time, global challenges

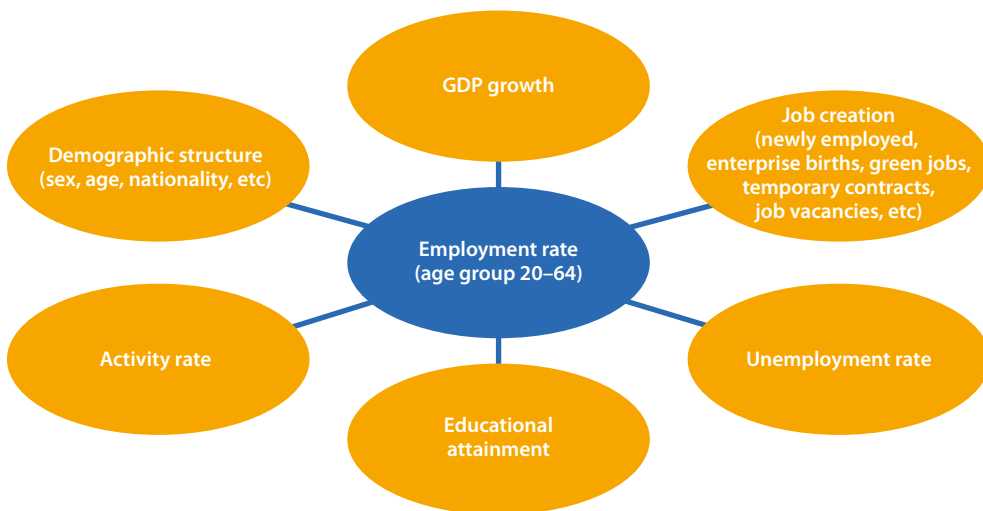
Europe 2020 strategy target on employment

The Europe 2020 strategy sets out a target of 'increasing the employment rate of the population aged 20 to 64 to at least 75 %' by 2020 ⁽¹⁾.

are intensifying and competition from developed and emerging economies such as China or India is increasing ⁽²⁾.

To face the challenges of an ageing population and rising global competition, the EU needs to make full use of its labour potential. The Europe 2020 strategy, through its 'inclusive growth' priority, has placed a strong emphasis on job creation. One of its five headline targets addresses employment, with the aim of raising the employment rate of 20 to 64 year olds to 75 %

Figure 1.1: Indicators presented in this chapter



⁽¹⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, 2014.

⁽²⁾ European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels, 2010 (p. 5, 7, 17), European Commission, *An Agenda for new skills and jobs: A European contribution towards full employment*, COM(2010) 682 final, Strasbourg, 2010 (p.2).



by 2020. This goal is supported by the so-called ‘Employment Package’ ⁽³⁾, which seeks to create more and better jobs throughout the EU.

The analysis in this chapter is based on the headline indicator ‘Employment rate — age group 20 to 64’, which monitors the strategy’s employment target. Contextual indicators are used to present a broader picture, looking into the drivers behind changes in the headline indicator. These include indicators on the characteristics of the labour force and those depicting short-term employment and unemployment trends. First, the analysis looks into the structure of the EU’s labour force and its long-term influence on employment in relation to the strategy’s main target groups such as young, older, low-skilled workers, women and migrants.

The analysis then shifts to short-term factors related to the economy’s cyclical development (expressed through GDP growth) such as availability of jobs, employment growth of different economic sectors and how these influence job creation, temporary employment and short-term and long-term unemployment. The changes in labour market flows are also analysed to provide a better overview of the underlying dynamics of the labour market.

The EU’s employment target is closely interlinked with the other strategy goals on research and development (R&D), education and poverty and social exclusion. Higher educational levels increase employability and better employment rates can in turn contribute to economic performance and poverty alleviation, thus addressing the strategy’s inclusive growth objective. Moreover, boosting R&D capacity and innovation could improve competitiveness and thus contribute to job creation.

What is meant by ‘activity’, ‘employment’, ‘unemployment’ and ‘labour force’?

People are classified as employed, unemployed and economically inactive according to the definitions of the [International Labour Organisation \(ILO\)](#) ⁽⁴⁾. At the EU level, the two main sources for this data are the EU Labour Force Survey (EU LFS) ⁽⁵⁾ and National Accounts (including GDP) ⁽⁶⁾.

The EU LFS is a large sample survey of private households, excluding the population living in institutional households (such as workers’ homes or prisons). Respondents are classified as employed, unemployed or economically inactive based on information collected through the survey questionnaire, relating mainly to their activity during a reference week. The EU LFS data refer to the resident population, so the results relate to the country of residence of people in employment, rather than to their country of work. This difference may be significant in countries with large cross-border flows.

Key employment terms include:

- The **economically active** population is the sum of employed and unemployed persons.
- **Inactive persons** are those who, during the reference week, were neither employed nor unemployed.
- The **activity rate** is the share of the population that is economically active. Economic activity is measured for people aged 15 years or older, which is the earliest that a person can leave full-time compulsory education in the EU ⁽⁷⁾. In many EU Member States the minimum employment age is 15 ⁽⁸⁾.

Persons in employment are those who, during the reference week, did any work for pay or profit, or were not working but had a job from which

⁽³⁾ European Commission, *Towards a job-rich recovery*, COM(2012) 173 final, 2012.

⁽⁴⁾ For more information see the ILO website: <http://www.ilo.org/global/lang--en/index.htm>

⁽⁵⁾ For more information on the EU LFS, see: <http://ec.europa.eu/eurostat/web/microdata/european-union-labour-force-survey>

⁽⁶⁾ For more information see: <http://ec.europa.eu/eurostat/web/national-accounts>

⁽⁷⁾ João Medeiros & Paul Minty, *Analytical support in the setting of EU employment rate targets for 2020*, Working Paper 1/2012, European Commission (Directorate-General for Employment, Social Affairs & Inclusion), Brussels, 2012 (p. 58).

⁽⁸⁾ European Commission (Directorate-General for Justice), *Age and Employment*, Publications Office of the European Union, Luxembourg, 2011 (p. 50).



they were temporarily absent. 'Work' means any work for pay or profit, even for as little as one hour. Pay includes cash payments or payment in kind (payment in goods or services rather than money), regardless of whether or not payment was received in the week the work was done. Anyone who receives a wage for on-the-job training that involves the production of goods or services is counted as being in employment. Self-employed and family workers are also included.

Employment rates represent employed persons, as a percentage of the same age population. Employment rates represent employed persons, as a percentage of the same age population and are typically published for the age group 15 to 64 years. For the Europe 2020 strategy's employment target, the lower age limit has been raised to 20 years. The reason was to ensure compatibility with the strategy's headline targets on education (see the chapter on Education, page 109), in particular the one for raising the tertiary educational attainment of 30–34 years old to at least 40% ⁽⁹⁾. The upper age limit for the employment rate is usually set to 64 years, taking into account statutory retirement ages across Europe ⁽¹⁰⁾.

Unemployed persons comprise people aged 15 to 74 who were:

1. without work during the reference week, meaning they neither had a job nor were at work (for one hour or more) in paid employment or self-employment;
2. available to start work, meaning they were available for paid employment or self-employment before the end of the two weeks following the reference week;
3. actively seeking work, meaning they had taken concrete steps in the four-week period ending with the reference week to seek paid employment or self-employment or who found a job to start within a period of at most three months.

To take into account people that would like to (or have to) work after the age of 64 but are unable to find a job, the upper age limit for the unemployment rate is usually set to 74. As a result, the observed age group for unemployed persons is 15 to 74 years.

Key unemployment terms include:

- The **unemployment rate** is the number of unemployed persons as a percentage of the labour force representing the total number of people employed and unemployed.
- The **youth unemployment rate** is the unemployment rate of people aged 15 to 24; for the purpose of this publication the analysis is extended to 15 to 29 year olds, which is the age group addressed by the EU Youth Strategy.
- The **long-term unemployment rate** is the number of people unemployed for 12 months or longer as a percentage of the labour force.

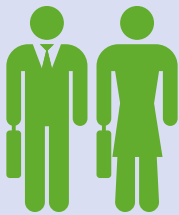
The term '**labour force**' refers to the economically active population, which is the total number of employed and unemployed people.

⁽⁹⁾ João Medeiros & Paul Minty, *Analytical support in the setting of EU employment rate targets for 2020*, Working Paper 1/2012, European Commission (Directorate-General for Employment, Social Affairs & Inclusion), Brussels, 2012 (p. 12).

⁽¹⁰⁾ European Commission (Directorate-General for Economic and Financial Affairs), *The 2012 Ageing Report: Economic and budgetary projections for the EU27 Member States (2010–2060)*, 2012 (p. 99).



EU employment on the rise again — signs of gradual recovery



Before the economic crisis hit the EU, the employment rate for the age group 20 to 64 had been rising continuously, increasing from 66.8 % in 2002 to a peak of 70.3 % in 2008. Growth

in employment stalled in 2009 and the EU labour market entered a period of prolonged stagnation.

Recovery started in 2014, and by 2015 the employment rate had almost returned to 2008 levels (70.1 %). As a result, the distance to the Europe 2020 employment target of 75 % narrowed to 4.9 percentage points.

In 2015, four Member States — Germany, Sweden, Estonia and Lithuania — had

already met their national employment targets.

Employment rates across the EU tend to show a north-south divide on a country as well as regional level. Some of the best performing countries also record high regional employment rates (Germany, Sweden, the United Kingdom, the Netherlands and Austria).

Young people aged 15 to 29, non-EU citizens and people with low educational attainment are some of the most disadvantaged groups on the labour market, exhibiting low employment rates.

Women, especially those aged 55 to 64 years, and older people in general still have considerably lower employment rates than men and younger groups, respectively.

The headline indicator 'Employment rate — age group 20 to 64' shows the share of employed 20 to 64 year olds in the total EU population ⁽¹⁾.

As shown in Figure 1.2, the EU's employment rate grew more or less steadily during the decade before the economic crisis, peaking at 70.3 % in 2008. However, in 2009 the crisis hit the labour market, knocking the employment rate back to its 2006 level.

Employment continued to fall to 68.6 % in 2010, before stalling at 68.4 % in 2012 and 2013. After the prolonged stagnation, in 2014 the employment rate started increasing again and in 2015 it reached 70.1 % — close to the 2008 level. As a result, in 2015 the distance to the EU 2020 employment target of 75 % had narrowed to 4.9 percentage points.

North-south divide in employment rates across the EU at Member State level...

Employment rates among Member States ranged from 54.9 % to 80.5 % in 2015 (see Figure 1.3). Northern and central Europe had the highest rates, in particular Sweden, Germany, the United Kingdom, Denmark, Estonia and the Netherlands. All of these countries exceeded the 75 % EU target. Countries at the lower end of the scale, with employment rates below 65 %, were Spain, Croatia, Italy and Greece. Employment rates in the [European Free Trade Association \(EFTA\)](#) countries of Iceland and Switzerland were higher than in any other EU Member State.

Over the past seven years, employment has fallen in a majority of the EU countries. In 2015, employment rates in 16 Member States were

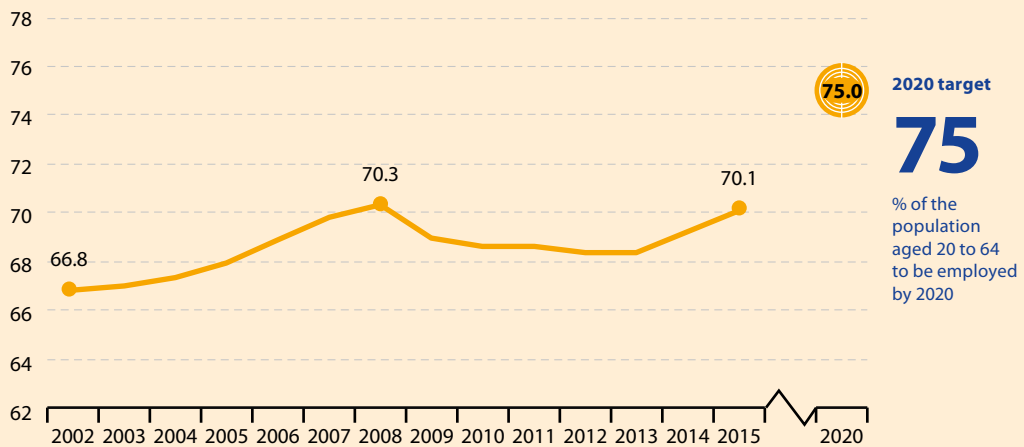
⁽¹⁾ The reason for choosing this age group over the 'usual' working-age population 15 to 64 years old is explained in the section 'What is meant by 'labour force', 'activity', 'employment' and 'unemployment'?', p. 25.



Europe 2020 headline indicator

Figure 1.2: Employment rate age-group 20 to 64, EU-28, 2002–2015

(%)



Source: Eurostat (online data code: t2020_10)

below 2008 levels. This shows that labour markets in these countries have still not fully recovered from the impacts of the crisis. The strongest falls were recorded in Greece (– 11.4 percentage points), Cyprus (– 8.5 percentage points) and Spain (– 6.5 percentage points). The remaining 12 countries were back on a ‘growth path’ by 2015, surpassing pre-crisis levels. Since 2008, employment rates have grown most significantly in Malta (8.6 percentage points), Hungary (7.4 percentage points) and Germany (4.0 percentage points).

To reflect different national circumstances, the common EU target has been translated into national targets ⁽¹²⁾. These range from 62.9 % for Croatia to 80.0 % for Denmark, the Netherlands and Sweden. In 2015, four Member States had already met their national employment targets. Germany surpassed its national target by one percentage point, with an employment rate of 78.0 %. Sweden, Estonia and Lithuania also recorded employment rates above their national targets — 80.5 %, 76.5 % and 73.4 %, respectively.

Of the remaining Member States, the Czech Republic and Ireland were closest to their national targets at just 0.2 percentage points below, followed by Latvia, which was 0.5 percentage points away from its 73 % target. Greece and Spain were the most distant, at 15.1 and 12.0 percentage points below their national targets respectively.

... as well as at regional level

The differences in the employment rate across EU Member States, shown in Figure 1.3, are also presented in the maps of cross-country regional distribution of employment rates (at NUTS 2 level). Map 1.1 shows that the highest regional employment rates were mainly recorded in north-western and central Europe, particularly in Germany, Sweden, the United Kingdom, the Netherlands, Austria and the Czech Republic. In 2015, the Finnish region Åland had the highest employment rate in the EU, at 86.7 %, followed by Stockholm (Sweden) and Småland med öarna (Sweden), with 82.5 % and 82.4 %, respectively. At the other end of the scale, the lowest rates were

⁽¹²⁾ See http://ec.europa.eu/eurostat/documents/4411192/4411431/Europe_2020_Targets.pdf



observed around the Mediterranean, in particular in southern Italy and Spain, and in Greece, as well as in the French overseas regions and the outlying Spanish autonomous cities (Ceuta and Melilla). In 2015, the Italian regions of Campania, Calabria and Sicilia had the lowest employment rates in the EU of less than 44 %.

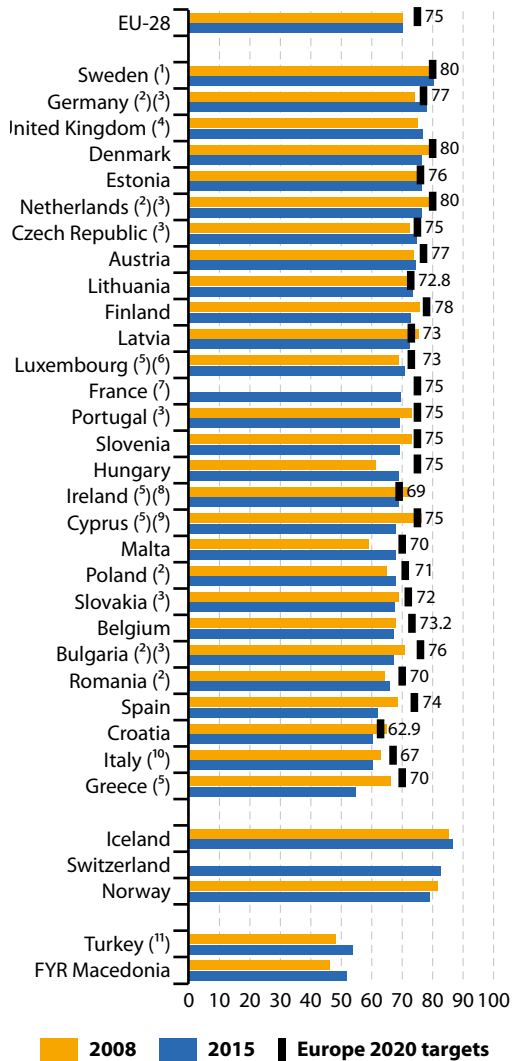
Map 1.2 shows the change in regional employment rates since 2008. Almost half (47 %) of the 268 NUTS 2 regions for which data are available have experienced a fall in their employment rates since the economic crisis began. Among the hardest hit were several regions in Greece and Spain, with reductions of 8 percentage points or more. Despite the economic crisis, employment rates increased in 130 regions from 2008 to 2015, in two regions from 2010 and 2015 and in six regions from 2012 to 2015. Growth rates of more than 4 percentage points were observed in 32 of these regions, 15 of which were regions in Germany. The highest increases were recorded in Hungary (Észak-Magyarország, Dél-Dunántúl, Észak-Alföld, Dél-Alföld), Malta, Germany (in particular in Chemnitz, Berlin, Sachsen-Anhalt, Lüneburg, Dresden and Leipzig), Romania (Nord-Est and Nord-Vest) and the United Kingdom (Cornwall and Isles of Scilly).

Higher employment rate in urban areas for Baltic, southern and eastern EU Member States

Employment rates vary not only between regions, but also by degree of urbanisation. This reflects differences in economic performance, industrial structure and skill composition of the local population. In 2015, the EU-28 employment was almost equally distributed among more and less densely populated areas, with cities recording an employment rate of 70.0 %, towns and suburbs 70.2 % and rural areas 69.8 % (for age group 20 to 64) ⁽¹³⁾. However, in most Scandinavian (Sweden, Norway and Denmark) and western European countries (Belgium, Germany, France, the United Kingdom, the Netherlands, Austria, Switzerland) employment rates tend to be higher in rural areas. In contrast, most Baltic (Estonia, Latvia, Lithuania),

⁽¹³⁾ Source: Eurostat (online data code: [lfst_r_ergau](#)).

Figure 1.3: Employment rate age-group 20–64, by country, 2008 and 2015 (%)



- ⁽¹⁾ Target: more than 80 %.
- ⁽²⁾ Break in time series in 2010.
- ⁽³⁾ Break in time series in 2011.
- ⁽⁴⁾ No target in National Reform Programme.
- ⁽⁵⁾ Break in time series in 2009.
- ⁽⁶⁾ Break in time series in 2015.
- ⁽⁷⁾ No data for 2008.
- ⁽⁸⁾ Target: 69–71 %.
- ⁽⁹⁾ Target: 75–77 %.
- ⁽¹⁰⁾ Target: 67–69 %.
- ⁽¹¹⁾ Break in time series in 2014.

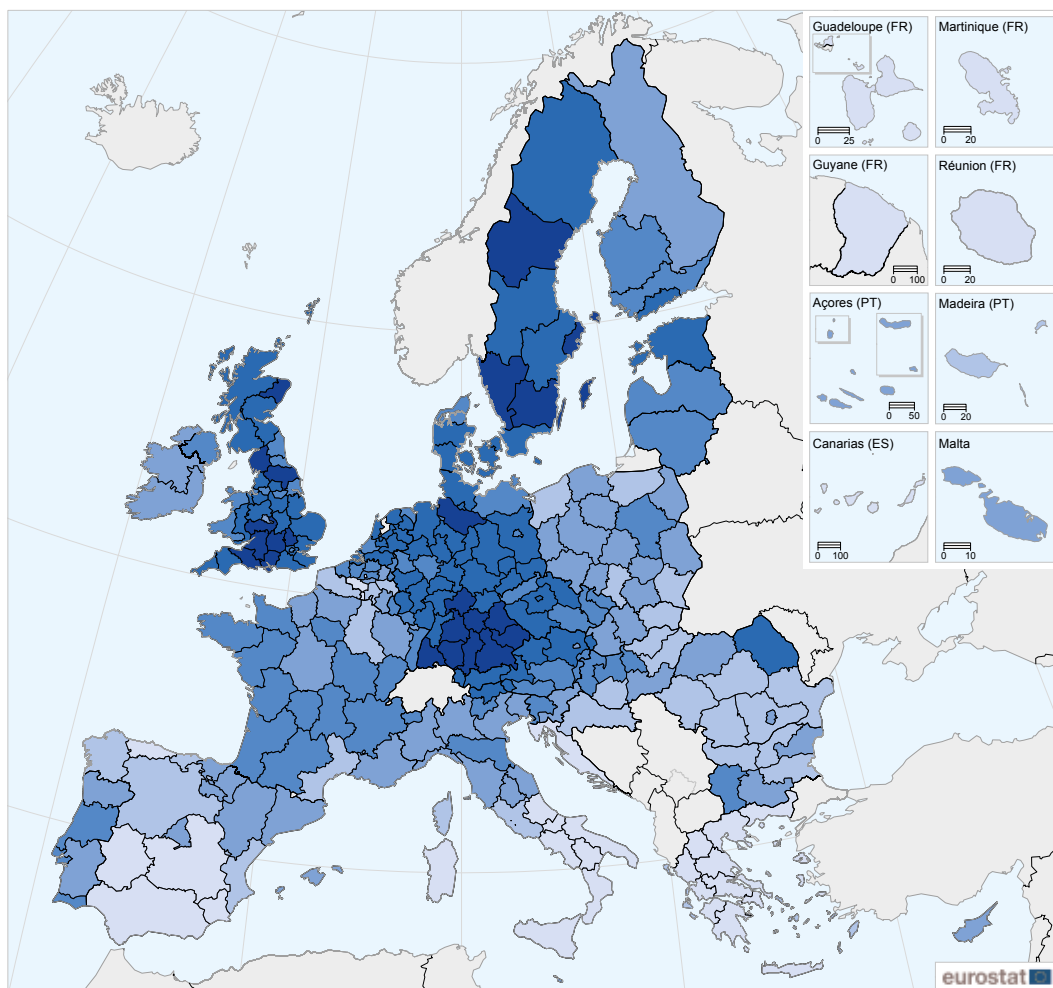
Source: Eurostat (online data code: [t2020_10](#))



1

Employment

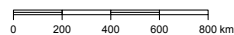
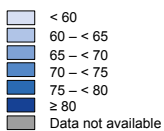
Map 1.1: Employment rate age-group 20 to 64, by NUTS 2 regions, 2015
(% of population aged 20–64)



(% of the population aged 20-64)

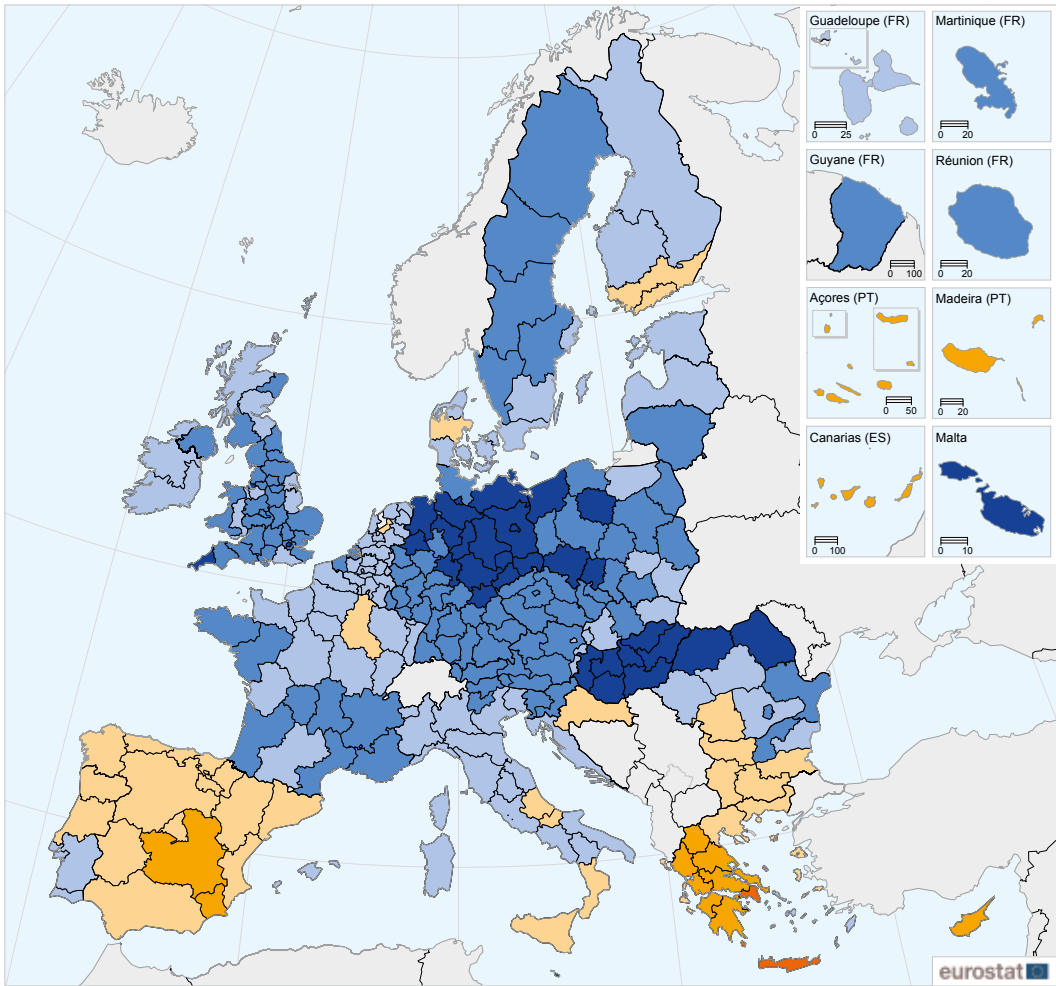
Administrative boundaries: © EuroGeographics © UN-FAO
Cartography: Eurostat — GISCO, 06/2016

EU-28 = 70.1



Source: Eurostat (online data code: [lfst_r_lfe2emprr](#))

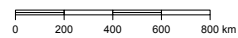
Map 1.2: Change in employment rate age-group 20 to 64, by NUTS 2 regions, 2008–2015⁽¹⁾
 (percentage points difference between 2014 and 2008, population aged 20 to 64)



(percentage points difference between 2015 and 2008, population aged 20-64)

Administrative boundaries: © EuroGeographics © UN-FAO
 Cartography: Eurostat — GISCO, 06/2016

EU-28 = -0.2



⁽¹⁾ Breaks in time series in 2010 and 2011 for several regions (too numerous to list); change 2010–2014 for several regions in Greece and France.

Source: Eurostat (online data code: [lfst_r_lfe2emprt](#))



southern (Spain, Italy, Cyprus, Malta) and central or eastern Member States (Bulgaria, the Czech Republic, Hungary, Poland, Slovakia, Romania, Croatia) exhibit higher employment rates in cities. The exceptions are Greece, which records higher employment rates in rural areas (58.6%) than in cities (53%), and Portugal, which seems to have similar employment rates in both areas.

Younger and older people have lower employment rates

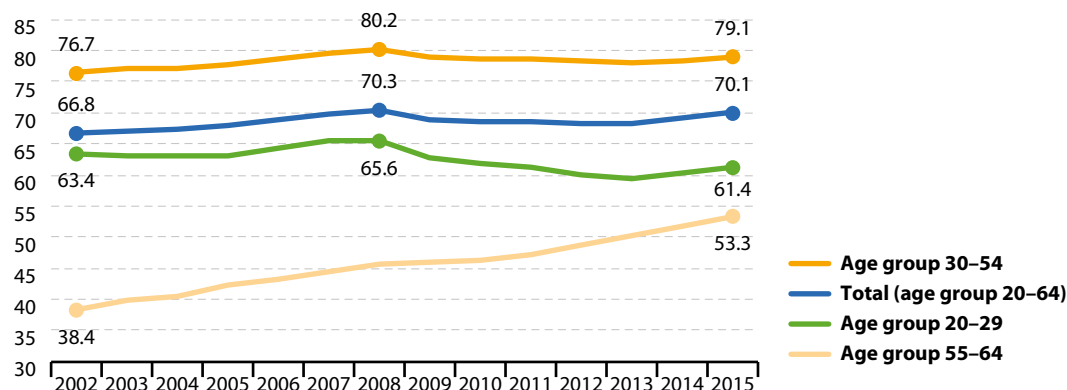
Employment rates of people aged 30 to 54 are 9 percentage points higher than the overall working-age population (see Figure 1.4). Young people aged 20 to 29 have even lower employment rates of 8.7 percentage points below the overall working-age population. Furthermore, the employment gap between the young cohort (age group 20 to 29) and those aged 30 to 54 years has widened since the crisis began. Recessions tend to hit younger workers especially hard. Since the onset of the crisis in 2008, the employment rate of young people aged 20 to 29 has dropped by 4.2 percentage points, from 65.6% in 2008 to 61.4% in 2015. This reflects their generally weaker attachment

to the labour market. They are more likely to be in non-permanent contracts (see the following analysis on 'temporary contracts') and are more vulnerable to 'last-in, first-out' redundancy policies⁽¹⁴⁾.

The group aged 55 to 64 years has by far the lowest employment rate among the working-age population. Employment in this group has risen more or less continuously over the past decade, increasing by 14.9 percentage points between 2002 and 2015. Growth was even more pronounced for older women at 17.8 percentage points compared with 11.9 percentage points for men. This age group was also the only one to experience employment growth since the onset of the crisis, rising by 7.8 percentage points between 2008 and 2015. These increases over the past decade could be linked to structural factors such as cohorts with higher educational attainment moving up the age pyramid⁽¹⁵⁾.

Increasing employment levels among older workers has also been influenced by recent pension reforms, such as increasing the pensionable age, the age for early retirement and length of contribution. This has led to longer working lives for both women and men⁽¹⁶⁾.

Figure 1.4: Employment rate, by age group, EU-28, 2002–2015
(%)



Source: Eurostat (online data codes: [lfsa_pganws](#), [t2020_10](#), [tsdde100](#))

⁽¹⁴⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2011*, Luxembourg, Publications Office of the European Union, 2012 (p. 48).

⁽¹⁵⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Luxembourg, Publications Office of the European Union, 2016.

⁽¹⁶⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Luxembourg, Publications Office of the European Union, 2016.

The duration of working life is measured as the number of years a person aged 15 is expected to be active in the labour market. Over the past decade, this has risen by 2.4 years in the EU, from 32.9 years in 2002 to 35.3 years in 2014. The rise was higher for women (+ 3.2 years) than for men (+ 1.6 years). However, in 2014 men could still expect to stay in work much longer (37.8 years) than women (32.7 years) ⁽¹⁷⁾. Other factors that have improved the duration of working life include flexible working time and work organisation, access to training by older workers and long-term care and childcare provision ⁽¹⁸⁾.

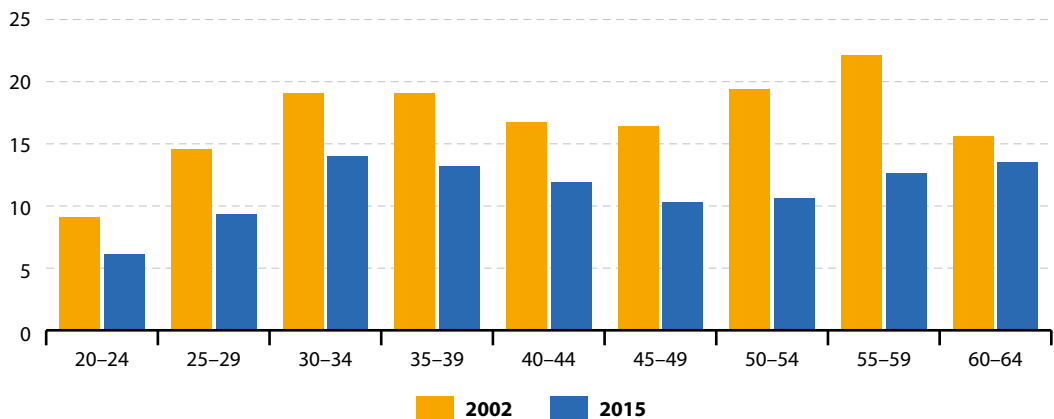
These trends reaffirm the Europe 2020 strategy's aim to boost the overall employment rate by focusing on 55 to 64 year old men and women: 'A longer working life will both support the sustainability and the adequacy of pensions, as well as bring growth and general welfare gains for an economy. Higher employment rates among older people are also a precondition for the EU's ability to reach the 2020 target, just as adequate pension systems

are a precondition for the achievement of the poverty reduction target' ⁽¹⁹⁾ (see also the chapter on 'Poverty and social exclusion', page 137). Interestingly, for a majority of Member States (19 countries in total), and most notably for Italy, Spain, Ireland and the Netherlands, the increase in the employment rate for older people between 2006 and 2015 was associated with a decrease of the employment rate for younger people ⁽²⁰⁾. In this context, raising the employment rate of older age groups is likely to contribute to increases in the overall employment rate under the condition that it is not counterbalanced by bigger increases in youth unemployment.

Women still have lower employment rates but the gender employment gap is decreasing

For all age groups, the **gender employment gap** — the difference in employment rates between men and women — has been decreasing. Between 2002 and 2015, the older age

Figure 1.5: Gender employment gap, by age group, EU-28, 2002 and 2015 ⁽¹⁾
(Difference between employment rates of men and women, in percentage points)



⁽¹⁾ Break in series in 2005

Source: Eurostat (online data code: [lfsa_organ](#))

⁽¹⁷⁾ Source: Eurostat (online data code: [tsdde420](#)).

⁽¹⁸⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Luxembourg, Publications Office of the European Union, 2016.

⁽¹⁹⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2012*, Luxembourg, Publications Office of the European Union, 2012 (p. 57).

⁽²⁰⁾ Source: Eurostat (online data code: [lfsa_organ](#))



Box 1.1: Employment policies targeting women

One of the priorities of the flagship initiative ‘An Agenda for new skills and jobs’ is to create new momentum for flexicurity policies aimed at modernising labour markets and promoting work through new forms of flexibility and security. Under the flexibility component, ‘Flexible and reliable contractual arrangements’, the flagship initiative calls for ‘putting greater weight on internal flexibility in times of economic downturn’. According to the [2010 European Commission Communication ‘An Agenda for new skills and jobs: A European contribution towards full employment’](#) ⁽²¹⁾, ‘Flexibility also allows men and women to combine work and care commitments, enhancing in particular the contribution of

women to the formal economy and to growth, through paid work outside the home.’

The security component is addressed by the EU employment package ‘Towards a job-rich recovery’ under its objective of restoring the dynamics of labour markets. As laid down in the [2012 European Commission Communication ‘Towards a job-rich recovery’](#) ⁽²²⁾, this calls for ‘security in employment transitions’, such as the transition from maternity leave to employment: ‘the integration of women in the labour market deserves particular attention, by providing equal pay, adequate childcare, eliminating all discrimination and tax-benefit disincentives that discourage female participation, and optimising the duration of maternity and parental leave.’

groups experienced the greatest narrowing of the gender employment gap — 6.1 percentage points for the 45 to 49 age group, 8.8 percentage points for the 50 to 54 age group and 9.5 percentage points for the 55 to 59 age group.

A number of structural factors influencing the labour market participation of women may account for the observed ‘catching up’ of female employment rates. These include changes in social values and attitudes, policies enabling women to reconcile paid work with household responsibilities such as child care provision, flexible working hours, reduction in financial disincentives and pension reforms ⁽²³⁾. European employment policies promoting new forms of flexibility and security are addressing the specific situation of women to help raise their employment rates in line with the headline target (see Box 1.1).

However, despite an increasing share of women in the EU workforce, their numbers are still fewer

than men. In 2015, the gender employment gap was highest for women aged 30 to 34 years at 14 percentage points (see Figure 1.5). Women are at more of a disadvantage to men at this age because of motherhood and childcare responsibilities. Time out of the workforce for these reasons might also affect employment in later years as finding a job becomes more difficult the longer a person is not employed. This might partially explain why gender differences in employment rates in 2015 were smaller for younger cohorts (20 to 24 and 25 to 29) but wider for older age groups (in particular for the age group 30 to 34 and 35 to 39).

Gender gaps in the older age cohorts (55 to 59 and 60 to 64) are also particularly high, which may be a result of a cohort effect (women not participating in the labour force when they were young moving up the age pyramid) or reflect the lack of care facilities for grandchildren or dependent parents. Women are more likely than

⁽²¹⁾ European Commission, *An Agenda for new skills and jobs: A European contribution towards full employment*, COM(2010) 682 final, 2010 (p. 5).

⁽²²⁾ European Commission, *Towards a job-rich recovery*, COM(2012) 173 final, 2012 (p. 10).

⁽²³⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Publications Office of the European Union, 2016 (p. 22).



men to take on care responsibilities for elderly or dependent family members with long-term care needs and are therefore more likely to reduce their working hours or exit the labour market. In addition to care responsibilities, early retirement options and difficulties in finding a job after prolonged unemployment can further affect the employment rate of older female cohorts ⁽²⁴⁾. All of the age groups between 30 and 49 have experienced a slight increase in the gender employment gap over the past one or two years ⁽²⁵⁾.

Higher education levels increase employability

Educational attainment levels are another reason for the variation in employment rates between different labour groups.

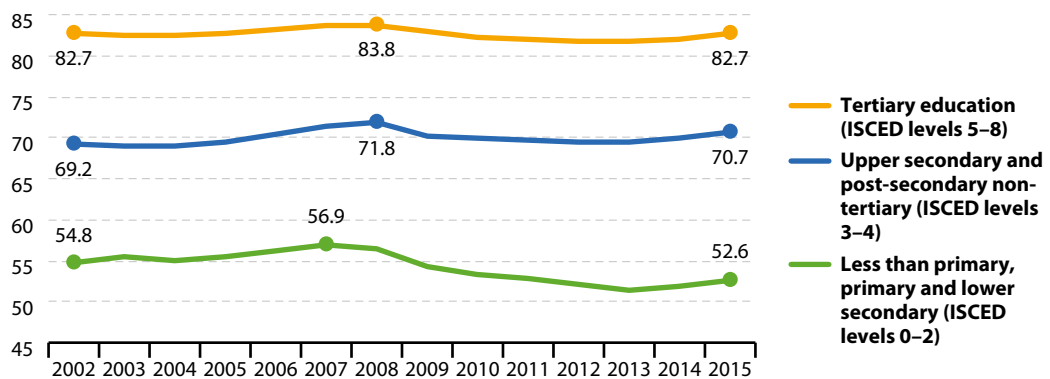
Figure 1.6 shows that employment rates are generally higher for more educated people. In 2015, the employment rate among tertiary education graduates (82.7 %) was much higher than the EU average (70.1 %). In contrast, just

Box 1.2: Employment policies and education

Investing in skills is also a priority of the EU employment package ‘Towards a job-rich recovery’. Under its objective of restoring the dynamics of labour markets, the European Commission calls for better monitoring of skill needs and ‘a close cooperation between the worlds of education and work’.

It also addresses youth employment, calling for ‘security in employment transitions’, such as the transition of young people from education to work. It also reaffirms the EU’s commitment to tackle the dramatic levels of youth unemployment, ‘by mobilising available EU funding’ and by supporting the transition to work ‘through youth guarantees, activation measures targeting young people, the quality of traineeships, and youth mobility’ ⁽²⁶⁾.

Figure 1.6: Employment rate age group 20 to 64, by educational attainment level, 2002–2015 ⁽¹⁾ (%)



⁽¹⁾ Breaks in time series in 2005 and 2014 (switch from ISCED 1997 to ISCED 2011).

Source: Eurostat (online data code: tsdec430)

⁽²⁴⁾ European Commission, *Labour market participation of women*, European Semester Thematical Fiche, 2015.

⁽²⁵⁾ Source: Eurostat (online data code: lfsa_ergan).

⁽²⁶⁾ European Commission, *Towards a job-rich recovery*, COM(2012) 173 final, 2012 (p. 10).



slightly more than half (52.6 %) of those with at most primary or lower secondary education were employed. The employment rate for people with upper secondary or post-secondary non-tertiary education was in between these levels, at 70.7 % and slightly above the overall EU average employment rate. People with the lowest education levels not only had the lowest employment rate but were also hit hardest by the crisis, experiencing a 4.3 percentage point fall in their employment rate between 2007 and 2015.

These findings underline the importance of education for employability. Increasing educational attainment and equipping people with skills for the knowledge society are therefore a major focus of European employment policies addressing the Europe 2020 headline targets on employment and education (see the chapter on 'Education', page 109).

Migration as a way to balance the ageing population

Economic migration is becoming increasingly important to the EU's ability to deal with a shrinking labour force and expected skills shortages. According to European Commission estimates, without net migration the working-age population will shrink by 12 % in 2030 and by 33 % in 2060 compared with 2009 levels ⁽²⁷⁾.

Country of origin can impact the labour market performance of individuals. 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 (see Figure 1.7) ⁽²⁸⁾. Migrants were also particularly affected by the economic crisis, being among the first to lose their jobs. In 2015, the employment rate of non-EU nationals aged 20 to 64 was 13.3 percentage points below the

Box 1.3: Employment policies addressing migration

'In the longer term, and especially in view of the EU's demographic development, economic immigration by third-country nationals is a key consideration for the EU labour market' ⁽²⁹⁾. The EU employment package 'Towards a job-rich recovery' specifically addresses the relevance of migration for tackling expected skills shortages: 'With labour needs in the most dynamic economic sectors set to rise significantly between now and 2020, while those in low-skills activities are set to decline further, there is a strong likelihood of deficits occurring in qualified job-specific skills'.

total employment rate and 13.9 percentage points below that of EU nationals. This is a significant widening of the gap since the onset of the crisis in 2008, when the difference in the employment rates between non-EU citizens and the total population was only 7.8 percentage points.

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 ⁽³⁰⁾.

⁽²⁷⁾ European Commission, *An Agenda for new skills and jobs: A European contribution towards full employment*, COM(2010) 682 final, 2010 (p. 9).

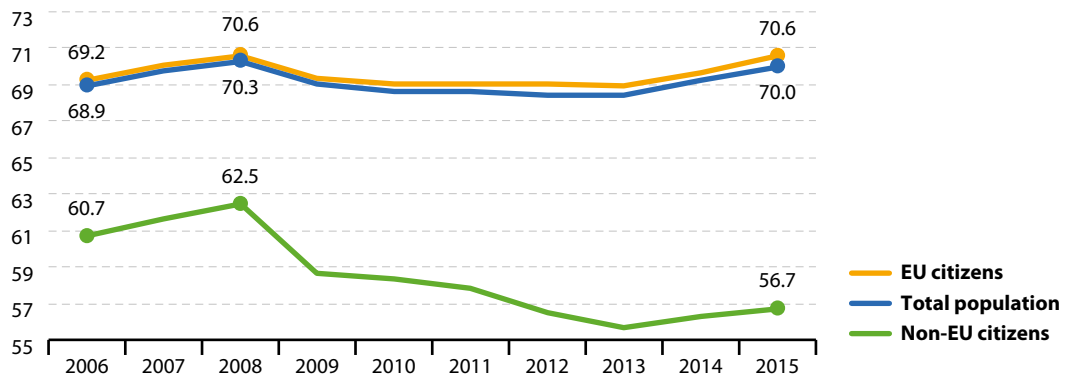
⁽²⁸⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Luxembourg, Publications Office of the European Union, 2016 (p. 177).

⁽²⁹⁾ European Commission, *Towards a job-rich recovery*, COM(2012) 173 final, 2012 (p. 18).

⁽³⁰⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Luxembourg, Publications Office of the European Union, 2016 (p. 14).



Figure 1.7: Employment rate age group 20–64, by citizenship, EU-28, 2006–2015 (%)



Source: Eurostat (online data code: lfsa_ergan)

Characteristics of the labour force: demographic and educational factors



Long-term changes in the demographic structure of the EU population add to the need to increase the EU's employment rate. Despite a growing population, the consequences of low fertility

rates and rising life expectancy are a shrinking EU labour force and an increasing old-dependency ratio.

Increases in the employment rate, especially for women, older workers and young people, are therefore needed to

compensate for the expected decline of the working-age population (aged 20 to 64) by 4.3 million people by 2020.

Improving qualification levels is also essential to meet the growing demand for a highly skilled workforce in the EU.

Recent projections show that the EU is relatively well on track to match educational achievement to labour market needs, with labour supply exceeding the demand for all qualifications types. However, potential skill mismatches such as over-qualification gaps could be expected in the future.

Employment rates result from the interplay between the supply of and demand for workers on the labour market. Workers supply labour to businesses and businesses demand labour from workers, both in exchange for wages. Consumers play an important role in businesses' labour needs through their demand for products and services, which in turn is influenced by the economy's cyclical

development. Labour supply is characterised by the number of working-age people available to the labour market (determined by demographic structure) and the skills they offer (approximated by education and training). However, the demographic structure of the economically active population, and its education levels, are two important factors that are hard to influence in the short term.



EU's labour force is shrinking because of an ageing population

The EU is confronted with a growing, but ageing population, driven by low **fertility rates** and a continuous rise in **life expectancy**. This ageing, already apparent in many Member States, will lead to a higher share of older people and a lower share of people aged 20 to 64 in the total population in the coming decades (see Figure 1.8). According to the **European Commission Demography report 2010** ⁽²¹⁾, this means that despite a growing population, the EU labour force is shrinking. This will increase the burden on the employed population to provide for the social expenditure caused by an ageing population.

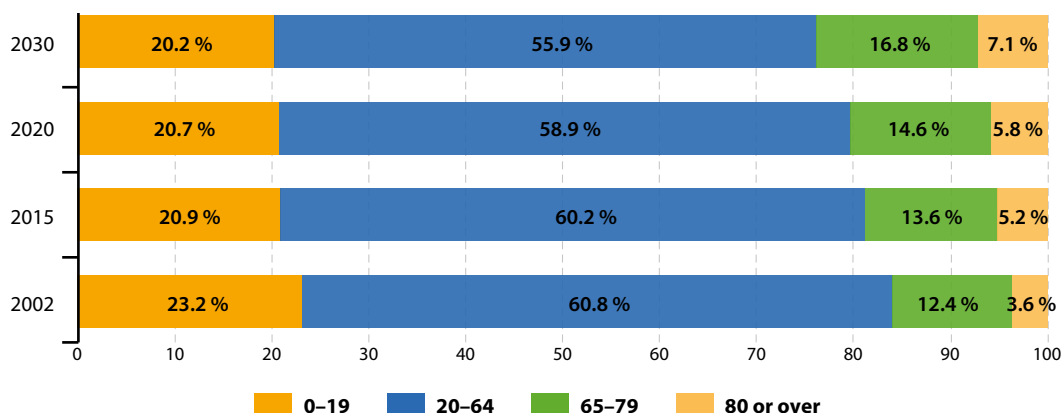
Over the past two decades the total EU population has grown from 475 million in 1990 to almost 509 million in 2015 ⁽²²⁾. Between 2002 and 2015 the number of older people aged 65 and above increased by 22.3 %. There was a particularly steep rise of 50.3 % for the group aged 80 or over. The population aged 20 to 64 years grew only slightly,

by 2.9 % over the same period. In contrast, the number of 0 to 19 year olds fell by 6.1 %.

While the most recent projections ⁽²³⁾ predict rapid growth in the number of older people, particularly in the group aged 80 years or over, the population aged 20 to 64 years is expected to start shrinking in the next few years as more baby boomers born between 1946 and 1964 enter their 60s and retire. As a result, the share of 20 to 64 year olds is expected to gradually decline from 60.2 % in 2015 to 58.9 % in 2020. This equals a reduction of 4.3 million people. At the same time, the number of older people aged 65 or over will grow by about 8.6 million, reaching 20.4 % of the total population in 2020. As indicated in Figure 1.8, these trends will continue at an even faster rate in the following decade. The population aged 20 to 64 is expected to shrink to 55.9 % and those aged 65 or over to climb to 23.9 %, making up almost a quarter of the total population in 2030.

Figure 1.9 shows how the baby boomer generation has moved up the age pyramid since

Figure 1.8: Population age structure, by major age groups, EU-28, 2002, 2015, 2020, 2030 ⁽¹⁾ (%)



⁽¹⁾ 2002–2015: observed populations; 2020–2030: projections based on EUROPOP2013 main scenario.

Source: Eurostat (online data codes: [demo_pjan](#), [proj_13npms](#))

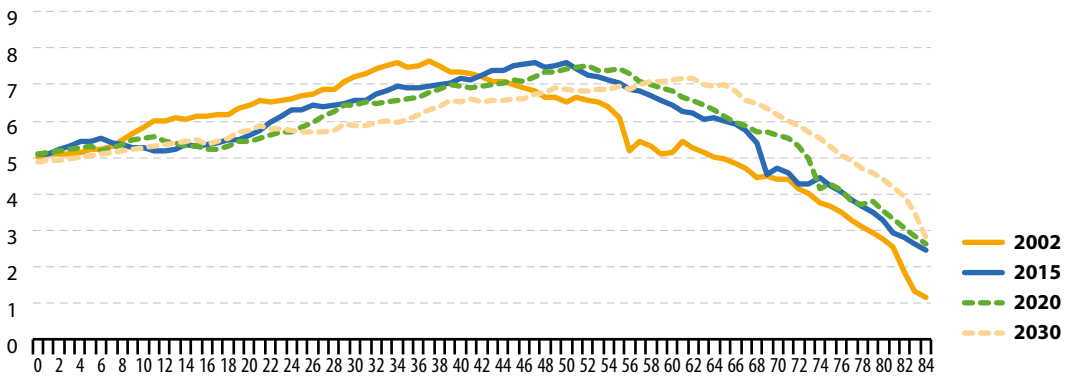
⁽²¹⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion & Eurostat), *Demography Report 2010 — Older, more numerous and diverse Europeans*, Luxembourg, Publications Office of the European Union, 2011 (p. 59).

⁽²²⁾ Note that the total population figures presented here differ from the population concept used in the EU LFS, which only covers resident persons living in private households, excluding the population living in institutional households (such as workers' homes or prisons). The data are based on Eurostat data tables ([demo_pjan](#)) and ([proj_13npms](#)).

⁽²³⁾ EUROPOP2013 main scenario; see <http://ec.europa.eu/eurostat/web/population-demography-migration-projections/population-projections-data>



Figure 1.9: Demographic profile of EU-28 population, 2002, 2015, 2020, and 2030 ⁽¹⁾
(million persons)



(¹) 2002–2015: observed populations; 2020–2030: projections based on EUROPOP2013 main scenario; age group '85 or over' not shown.

Source: Eurostat (online data codes: [demo_pjan](#), [proj_13npms](#))

2002. This generation is the result of high fertility rates in several European countries over a 20- to 30-year period to the mid-1960s. Baby boomers continue to comprise a significant part of the working population, however, the first of this large group are now reaching retirement age. As a result of these demographic changes the old-age dependency ratio has increased from 26.4% in 2002 to 31.3% in 2015. This ratio shows the share of the population aged 65 and above compared with the population of 20 to 64 year olds. This means that while there were 3.8 people of working age for every dependent person over 65 in the EU in 2002, this number had fallen to 3.2 people by 2015. By 2020, the old-age dependency ratio is projected to reach 34.6%, meaning there will be fewer than three people of working age for every dependent person over 65.

These trends underline the importance of making the most of the EU's labour potential by raising the employment rate for men and women over the coming years. To meet labour market needs in a sustainable way, efforts are needed to help people stay in work for longer. Particular attention needs to be given to women, older workers and young people. With regard to young people, it is

important to help them find work as soon as they leave education and ensure they remain employed.

Women as well as younger and older people are less economically active...

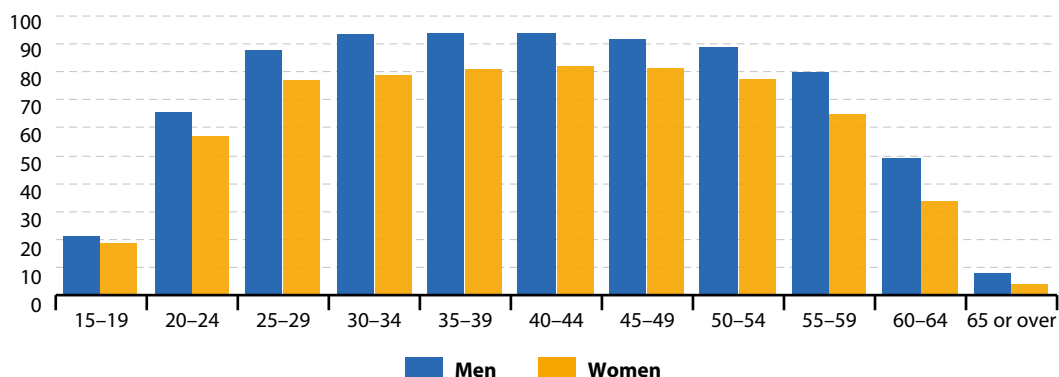
Not all people are economically active, as shown in Figure 1.10 which reflects the differences in activity rates between men and women and across age groups. Activity rates in the EU are consistently higher for men than for women and are generally highest for people aged 30 to 49. The main reason why men and women around 20 years of age do not seek employment is because they are participating in education or training. In 2015, this was the case for about 89% of the inactive population aged 15 to 24 ⁽²⁴⁾. On the other hand, people aged 50 or over slowly start dropping out of the labour market because of poor health or retirement. The low activity rates of 15 to 19 year olds due to education or training support the decision to raise the lower age limit for the strategy's employment target from 15 to 20 years of age.

Parenthood is one of the main factors underlying the gender gap in activity rates. Because women are more often involved in childcare, parenthood is more likely to have an impact on their activity

⁽²⁴⁾ Source: Eurostat (online data code: [lfsa_igar](#)).

**Figure 1.10: Activity rates, by five-year age group, EU-28, 2015**

(%)

Source: Eurostat (online data code: [lfsa_pganws](#))

rates than on those for men, especially when care services are lacking or are too expensive. Indeed, the lower activity rates for women aged 25 to 49 years compared with men are a result of women taking care of children or incapacitated adults (38.8% in 2015) and other family or personal circumstances such as marriage, pregnancy or long vacation (14.8% in 2015) ⁽³⁵⁾. In contrast, the main reasons why 25 to 49 year old men did not seek employment were illness or disability (36.5% in 2015) and participation in education or training (20.5% in 2015) ⁽³⁶⁾.

Changes in labour force skills outpacing changes in employment trends

A well-functioning labour market depends largely on matching the labour force's skills and qualifications to those requested by employers. Although some skills mismatch is inevitable, high and persistent mismatches can be costly for employers, workers and society at large ⁽³⁷⁾. Matching educational outcomes and labour market needs is a key component of the Europe 2020 strategy. 'Equipping people with the right skills for employment' has been identified as

one of four priorities of the flagship initiative 'An Agenda for new skills and jobs'. In particular the impact of the economic crisis and persistently high unemployment have increased the need to better understand where future skills shortages are likely to lie in the EU ⁽³⁸⁾.

According to estimates from the European Centre for the Development of Vocational Training (Cedefop) ⁽³⁹⁾, in 2015 the distribution of skills in the labour force largely matched the qualification requirements of the labour market. However, labour supply exceeded demand for all qualification types, with the difference being particularly high for the low- and medium-level qualifications. The demand for a skilled workforce is likely to continue — the most recent forecasts from Cedefop indicate that between 2015 and 2025 some 16 million jobs requiring high educational attainment will be created, while low-qualified jobs will decline by more than 7 million (see Figure 1.11).

Overall, the Cedefop forecasts show a parallel rise in skills from both the demand and the supply side until 2025. Changes in skills levels are expected to occur faster for the labour force

⁽³⁵⁾ Source: Eurostat (online data code: [lfsa_igar](#))⁽³⁶⁾ Source: Eurostat (online data code: [lfsa_igar](#))⁽³⁷⁾ European Commission, *Education and Training Monitor 2015*, Brussels, 2015 (p.14)⁽³⁸⁾ European Commission, *An Agenda for new skills and jobs: A European contribution towards full employment*, COM(2010) 682 final, Strasbourg, 2010 (p.8).⁽³⁹⁾ The Cedefop skills forecasts are available at <http://www.cedefop.europa.eu/en/events-and-projects/events/MaxSkillsJobs2015>

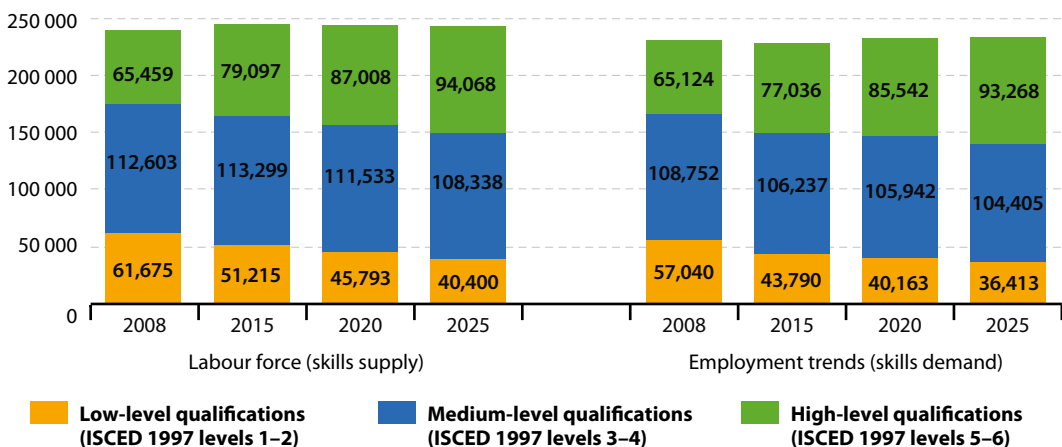
than on the job market. For instance, the share of the labour force holding only primary or lower secondary education is expected to decrease from 21 % in 2015 to 17 % in 2025, whereas the positions for people with low-level qualifications are projected to fall from 19 % to 16 % from all available jobs. However, this parallel rise does not prevent potential skills mismatches, such as over-qualification gaps. Results from Cedefop’s most recent survey show that skill mismatches do not affect only those unable to find a job because of high unemployment, but most of the workforce. As a result of weak employment demand, intensified by the economic crisis, people are increasingly taking jobs below their qualification or skills level. According to the Cedefop survey results, in 2014 about 25 % of highly qualified first job entrants were overqualified for their position ⁽⁴⁰⁾. These figures challenge the labour market relevance of skills and qualifications ⁽⁴¹⁾. Furthermore, concerns have been raised that the intensified skill mismatch might undermine the long-term potential of the EU skilled workforce ⁽⁴²⁾.

Box 1.4: Matching skills and labour market needs

Improving the matching process between labour supply and demand by adapting educational and training systems to produce the skills required on the labour market is a key priority of the Europe 2020 strategy’s flagship initiative ‘An Agenda for new skills and jobs’. It proposes a bundle of measures aimed at strengthening the EU’s capacity to anticipate and match labour market and skill needs. These include labour market observatories bringing together labour market actors and education and training providers, measures enhancing geographical mobility throughout the EU, and actions towards better integration of migrants and better recognition of their skills and qualifications ⁽⁴³⁾.

Figure 1.11: Labour force and employment trends by qualification, EU-28, 2008, 2015, 2020 and 2025

(1 000 persons)



Source: Cedefop 2015 skills forecast

⁽⁴⁰⁾ Cedefop, *Matching skills and jobs in Europe, Insights from Cedefop’s European skills and jobs survey*, 2015 (p. 2).

⁽⁴¹⁾ European Commission, *Education and Training Monitor 2015*, Brussels, 2015 (p. 14).

⁽⁴²⁾ Cedefop, *Matching skills and jobs in Europe, Insights from Cedefop’s European skills and jobs survey*, 2015 (p. 2).

⁽⁴³⁾ European Commission, *Towards a job-rich recovery*, COM(2012) 173 final, 2012 (p. 18).

Short-term employment and unemployment trends



Between 2008 and 2015, the number of employed persons in the age group 20–64 grew fastest in the professional, scientific and technical sector and the administrative sector,

but declined the most in the construction and agricultural sectors.

In the past few years increases in part-time work and the share of fixed-term contracts have been observed. Young people have been the most affected, with 32.5 % of 15 to 29 year olds employed on time-limited contracts in 2015, while 16.2 % of young people aged 15 to 24 were involuntary working on a temporary contract.

Data on job vacancies point to a possible deterioration in the job-matching process from 2010 to 2014. Unemployment rose while job vacancies remained stable or increased. However, between 2014 and 2015 the labour market expanded, showing falling unemployment rates and increasing vacancy rates.

In 2015, the total EU-28 unemployment rate fell to 9.4 % (age group 15 to 74), showing the first sign of improvement after a long labour market stagnation following the economic crisis.

With an unemployment rate of 20.4 % in 2015, young people aged 15 to 29 were clearly at a disadvantage compared with the overall population. Similarly, unemployment levels of people with low educational attainment were high at 17.4 %, compared with 5.6 % for people aged 15 to 74 with a tertiary education. Non-EU citizens were also among the worst off and the hardest hit by the economic crisis, with their unemployment rate 5.7 percentage points above the EU-28 total in 2015.

Overall, in western and Scandinavian Member States, cities were more affected by unemployment than rural areas, whereas in the Baltic and eastern Member States the opposite trends were observed.

The economic crisis has left a lasting mark on the EU labour market, with long-term unemployment rising from 2.6 % in 2008 to 4.5 % in 2015.

Data for the third and the fourth quarter of 2015 for 26 Member States shows that the flow of unemployed people towards inactivity exceeded the one towards employment in absolute numbers and as a percentage of the initial status. Inflows into unemployment were the largest during 2011 to 2012 and started falling afterwards.

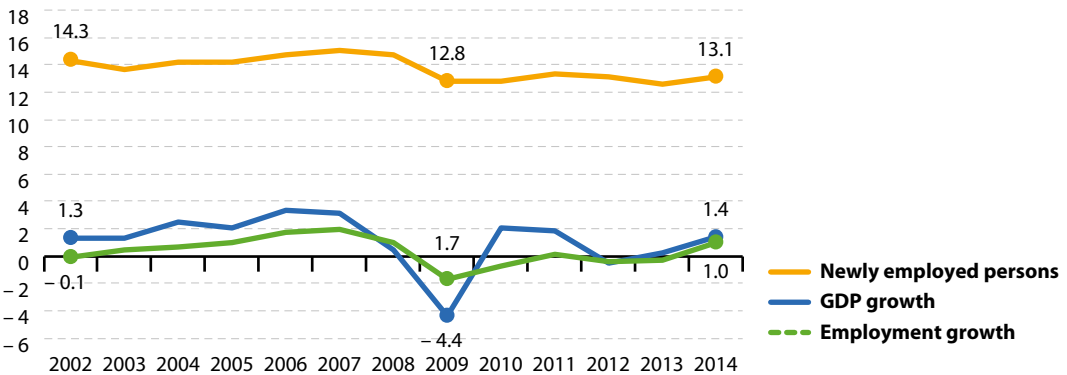
Employment (and unemployment) rates are closely linked to the business cycle. Usually this is expressed in terms of GDP growth, which can be seen as a measure of an economy's dynamism and capacity to create jobs. Figure 1.12 illustrates this relationship, showing similar patterns for GDP growth, employment growth and the share of newly employed people in total employment

(people who started their job within the past 12 months).

Following the double-dip recessions in 2009 and 2012, the EU experienced a pronounced decline in employment. In 2010 and 2011, GDP growth picked up again while employment recovery remained at a standstill. This pattern of 'jobless growth' stems from the fact that GDP grew mostly



Figure 1.12: GDP growth, employment growth and newly employed persons, EU-28, 2002–2014⁽¹⁾
 (GDP growth and employment growth: percentage change over previous period; newly employed persons: share of persons aged 20–64 whose job started within the last 12 months in total employment)



⁽¹⁾ Newly employed persons: break in time series in 2005.

Source: Eurostat (online data codes: [nama_10_gdp](#), [lfsi_grt_a](#), [lfsa_ewnasn](#))

because of an increase in productivity and hours worked, leaving little room for employment growth⁽⁴⁴⁾. As a result of another GDP contraction, following the slight recovery in 2010 and 2011, the number of employed people fell again in 2012 and 2013. GDP growth in 2014 brought about a job-rich recovery with employment picking up by 1%.

The link between GDP growth and employment growth is also reflected in the share of newly employed people as a share of total employment. This dropped considerably in 2009, following the contractions in GDP and employment in the same year. It rose slightly in the following years, only to drop again to the lowest level of the decade in 2013. In 2014, following the slight recovery in GDP and employment growth, the share of newly employed people returned again to its 2012 level.

Professional, administrative, and scientific and technical sectors show strongest signs of jobs recovery

Growth in jobs is unequally distributed across economic sectors and is strongly dependent on general economic conditions as well as developments in these sectors. Overall,

employment in all EU economic sectors⁽⁴⁵⁾ recorded a marginal reduction between 2008 and 2015 (see Figure 1.13). Over the same time, employment levels among high-end occupations related to professional, scientific and technical activities grew the fastest, by about 15%. Improvement in employment was observed also in traditional service sectors. Over the period 2008 to 2015 employment in the administrative and support service sector grew by 14%, followed by the health and social work sector (12%), the accommodation and food service sector (11%) and the education sector (8%).

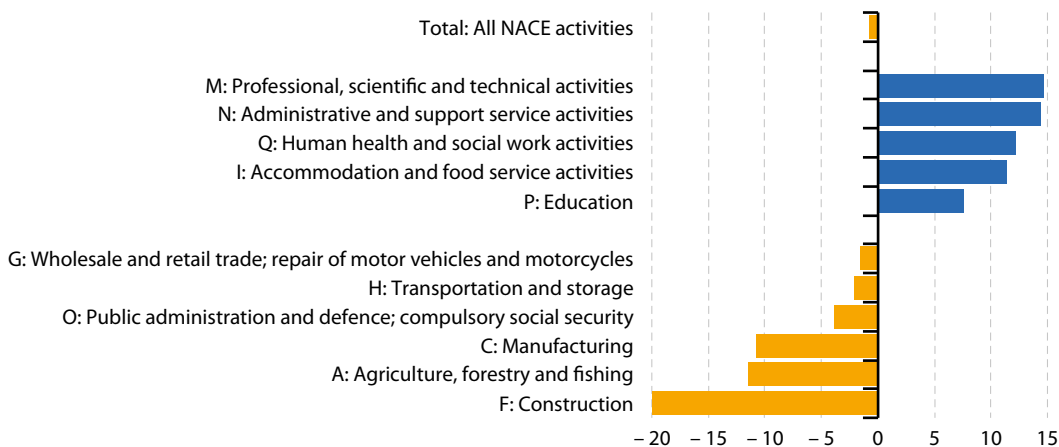
The construction, agriculture and manufacturing sectors were most affected by the economic crisis. Between 2008 and 2015 construction sector employment contracted by about 20%. The agriculture and manufacturing sectors also experienced relatively strong declines, with employment falling by about 12% and 11%, respectively. Stagnation was also observed in the public administration, transport and wholesale and retail trade sectors, where employment fell between 4% and 2%. Since the crisis had a bigger impact on employment in male-dominated sectors, such as construction and manufacturing,

⁽⁴⁴⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2012*, Luxembourg, Publications Office of the European Union, 2012 (p. 57).

⁽⁴⁵⁾ See *Statistical classification of economic activities in the European Community (NACE)*.



Figure 1.13: Employment growth by economic sector, EU-28, 2008–2015
(%)



Source: Eurostat (online data code: [lfsa_egan2](#))

it is not surprising that men accounted for more than 80% of the decline in employment between 2008 and 2010 in the EU ⁽⁴⁶⁾.

Temporary contracts most widespread among young people

Although temporary contracts were the first to decline from mid-2008 as a result of activity contraction, since 2012 the proportion of EU employees aged 20 to 64 and working on a fixed-term contract has increased slightly, from 12.8% in 2012 to 13.3% in 2015 ⁽⁴⁷⁾. Temporary employment in the EU was most widespread among young people, with 32.5% of 15 to 29 year olds working on a time-limited contract in 2015. Temporary employment was much lower among 20 to 64 year olds at 13.3% and for older people aged 55 to 64 at 6.5% in the same year ⁽⁴⁸⁾. The significant over-representation of young people in temporary work reflects not only changes in labour market demand, but also structural features of education systems

as well cultural norms. In many Member States, for instance, young people prefer temporary work because of participation in education and training or because of public policies promoting autonomy from an early age (for example, monthly support allowance, availability of affordable housing and free education) ⁽⁴⁹⁾.

However, for many people working on a fixed-term contract basis rather than a permanent one is not a personal choice. In this respect, involuntary temporary employment provides a better insight into the overexploitation of fixed-term contracts. In 2015, 8.8% of employed 20 to 64 year olds were involuntarily working on temporary contracts (see Figure 1.14). The share was much higher for young people aged 15 to 24, at 16.2%. Despite some fluctuations, the overall trend since 2006 indicates growing use of involuntary fixed-term contracts. Although fixed-term contracts could act as a stepping stone for young graduates to permanent jobs, there is also the risk that young people stay trapped in a series of temporary contracts ⁽⁵⁰⁾.

⁽⁴⁶⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2011*, Luxembourg, Publications Office of the European Union, 2012 (p. 47).

⁽⁴⁷⁾ Source: Eurostat ([lfsa_etpgan](#)).

⁽⁴⁸⁾ Source: Eurostat ([lfsa_etpgan](#)).

⁽⁴⁹⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2011*, Luxembourg, Publications Office of the European Union, 2012 (p. 33).

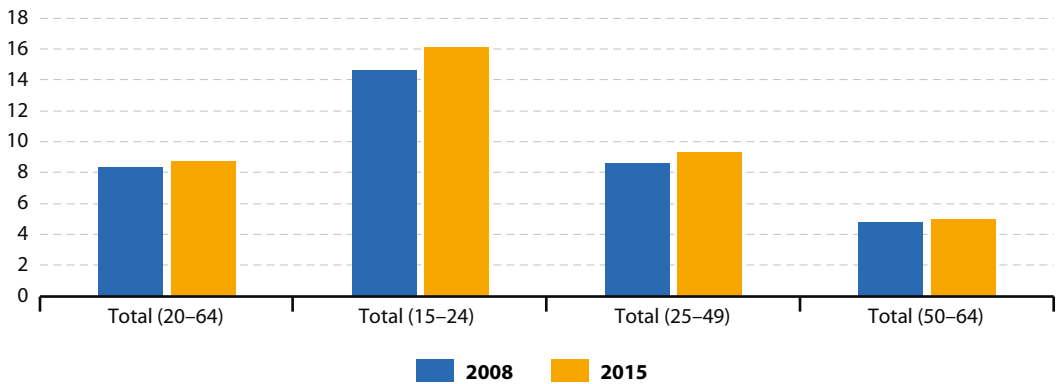
⁽⁵⁰⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2011*, Luxembourg, Publications Office of the European Union, 2012 (p. 91).

Involuntary part-time work has also increased substantially since the onset of the economic crisis. The share of the population aged 20 to 64 that were in involuntary part-time employment rose from 4.4% in 2008 to 5.7% in 2015. This trend affected young people the most with 9% of those aged 15 to 24 working involuntarily in part-time positions (see Figure 1.15). The share was almost twice as small for the age groups 25 to 49 (5.5%) and 50 to 64 (5.1%). For all age groups the share

of women employed part-time involuntarily exceeded that of men, with the gender gap particularly high for older groups.

The expansion of involuntary part-time work in recent years indicates that an increasing number of people undertake part-time employment not by choice, for example, because they want more flexible arrangements that allow better reconciliation between work and private life ⁽⁵¹⁾.

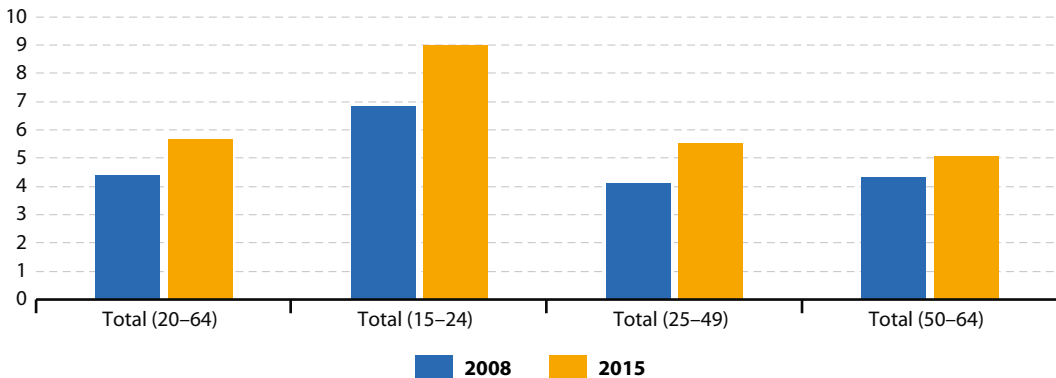
Figure 1.14: Involuntary temporary employees, by age group, EU-28, 2008 and 2015 ⁽¹⁾
(% of total employees)



(1) Data have low reliability.

Source: Eurostat (online data codes: [lfsa_etgar](#), [lfsa_etgaed](#), [lfsa_eegaed](#))

Figure 1.15: Involuntary part-time employment, by age group, EU-28, 2008 and 2015 ⁽¹⁾
(% of total employment)



(1) Data for 2008 have low reliability.

Source: Eurostat (online data codes: [lfsa_epgar](#), [lfsa_epgaed](#))

⁽⁵¹⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Luxembourg, Publications Office of the European Union, 2016 (p. 90).

Involuntary part-time employment is another sign of labour market segmentation, which could have important implications for income and potentially increase the risk of poverty and social exclusion ⁽⁵²⁾.

Signs of economic expansion with increasing job vacancies and decreasing unemployment

Job vacancy statistics provide an insight into the demand side of the labour market, in particular unmet labour demand. A job vacancy is defined as a paid post that is newly created, unoccupied or about to become vacant. The employer must be taking active steps and be prepared to take further steps to find a suitable candidate from outside the enterprise. The employer must also intend to fill the position either immediately or within a specific period of time. A vacant post that is only open to internal candidates is not treated as a 'job vacancy'.

Quarterly job vacancy statistics are used for business cycle analysis and for assessing mismatches in labour markets. Of particular interest is the relationship between vacancies and unemployment — the so-called Beveridge

curve (see Figure 1.16). The curve reflects the negative relationship between vacancies and unemployment. During economic contractions there are few vacancies and high unemployment, while during expansions there are more vacancies and the unemployment rate is low.

Structural changes in the economy can cause the Beveridge curve to shift. During times of uneven growth across regions or industries — when labour supply and demand are not matched efficiently — the vacancy and unemployment rates can rise at the same time. Conversely, they can both decrease when the matching-efficiency of the labour market improves. This could be, for example, due to a better flow of job vacancy information thanks to the internet. Empirical analysis of the curve can be challenging because both movements along the curve and shifts can take place at the same time with different intensities.

Data for the period 2008 to 2009 show a movement along the Beveridge curve, mirroring the impacts of the economic crisis on job vacancies and unemployment. Since 2010, however, movements of the Beveridge curve itself point to a possible substantial deterioration in the matching process: unemployment has been growing, while the job vacancy rate has remained

Figure 1.16: Beveridge curve, EU-28, 2006–2015 ⁽¹⁾
(%)



⁽¹⁾ Data for 2006–2010 refer to EU-27; data points with years (as caption) refer to the first quarter of the year; data have been smoothed (i.e. calculated as four quarters cumulated sums); all job vacancy data are provisional.

Source: Eurostat (online data codes: [jvs_q_nace2](#), [une_rt_q](#))

⁽⁵²⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Luxembourg, Publications Office of the European Union, 2016 (p. 90).



stable or has also been increasing. This was the case in the fourth quarter of 2013 and the first quarter of 2014. This indicates unemployment has become more structural⁽⁶³⁾. This poorer matching at the European level may reflect disparities across Member States: most of the job vacancies have been created in countries with comparatively low unemployment. In the period 2014 to 2015 an upward movement along the Beveridge curve can be seen, illustrating an expansionary phase with falling unemployment rates and increasing vacancy rates. EU policies that address job vacancies aim to improve the functioning of the labour market by trying to match supply and demand more closely.

Urban-rural divide in unemployment across Member States

Unemployment rates also tend to vary by degree of urbanisation. In 2015, unemployment rates were relatively similar across both more and less densely populated areas for the EU-28 as a whole⁽⁶⁴⁾. Overall, the population aged 15 to 74 who are residing in cities recorded a slightly higher unemployment rate (10.0%) compared with those living in towns and suburbs and rural areas (9.0 % and 9.1 %, respectively)⁽⁶⁵⁾.

Higher unemployment rates were concentrated in densely populated areas for 12 Member States — mostly countries in Western Europe and Scandinavian countries, but also Greece, Italy and Portugal. Greek city residents had the highest unemployment rate across the whole EU at 26.9%, which was six percentage points higher than for Greek rural inhabitants.

In six Member States, towns and suburbs recorded the highest unemployment rates, whereas in ten EU-28 countries rural unemployment was the highest. It was mostly rural areas in the Baltic countries and southern and eastern European

countries that exhibited the highest levels of unemployment, with thinly populated areas in Spain being particularly affected (24.4% of unemployment). The biggest difference in unemployment rates between cities and rural areas was recorded in Bulgaria (8.5 percentage points), followed by Lithuania (6.5 percentage points) and Slovakia (5.2 percentage points).

Younger people are at higher risk of unemployment

The EU total unemployment rate (age group 15 to 74) started increasing continuously after the onset of the economic crisis — from 7% in 2008 to 10.8% in 2013. The gradual economic recovery and labour market upturn reversed this trend in the following two years, with unemployment levels falling to 9.4% in 2015. Job seekers tend to become discouraged as an economic crisis drags on and some stop looking for work. These people drop out of the labour market and are thus no longer included in the unemployed population. However, they still represent an additional pool of the workforce that could be available to the labour market if the economic situation improves. In the EU, the number of people who are available and would like to work but are not seeking employment has risen by 0.5 percentage points since the onset of the economic crisis, from 2.0% of the population aged 15 to 74⁽⁶⁶⁾ in 2008 to 2.5% in 2015⁽⁶⁷⁾.

Young people aged 15 to 24 generally face a higher risk of being unemployed. In 2015, their unemployment rate was 20.4 % and thus 11 percentage points above the EU average of 9.4% (for the entire age group 15 to 74). This higher risk is particularly a problem for low-educated young people who have completed only lower secondary education (early leavers from education and training; see the chapter on [Education](#), page 109).

⁽⁶³⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2011*, Luxembourg, Publications Office of the European Union, 2012 (p. 29).

⁽⁶⁴⁾ Source: Eurostat (online data code: [lfst_r_urgau](#)).

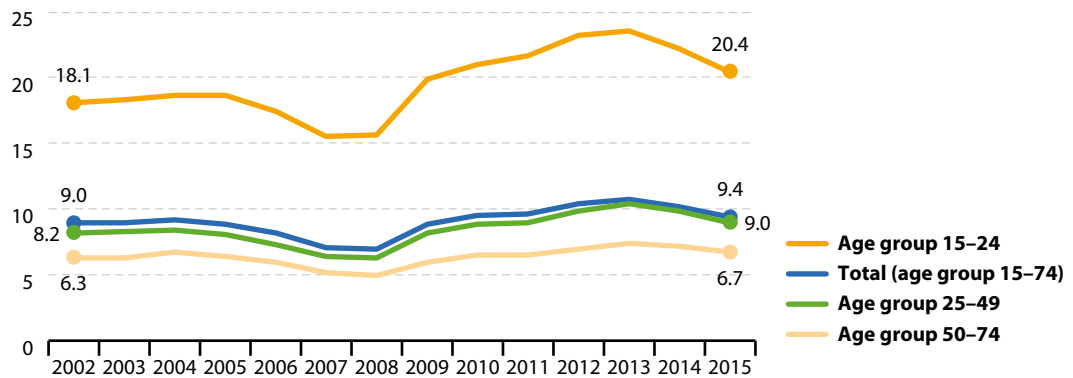
⁽⁶⁵⁾ Source: Eurostat (online data code: [lfst_r_urgau](#)).

⁽⁶⁶⁾ The target population of the EU LFS are resident persons living in private households, excluding the population living in institutional households (such as workers' homes or prisons).

⁽⁶⁷⁾ Source: Eurostat (online data code: [lfsi_sup_a](#)).

Figure 1.17: Unemployment rate by age group, EU-28, 2002–2015⁽¹⁾

(%)

⁽¹⁾ Break in time series in 2005.

Source: Eurostat (online data code: lfsa_urgaed)

Box 1.5: Policies tackling youth unemployment

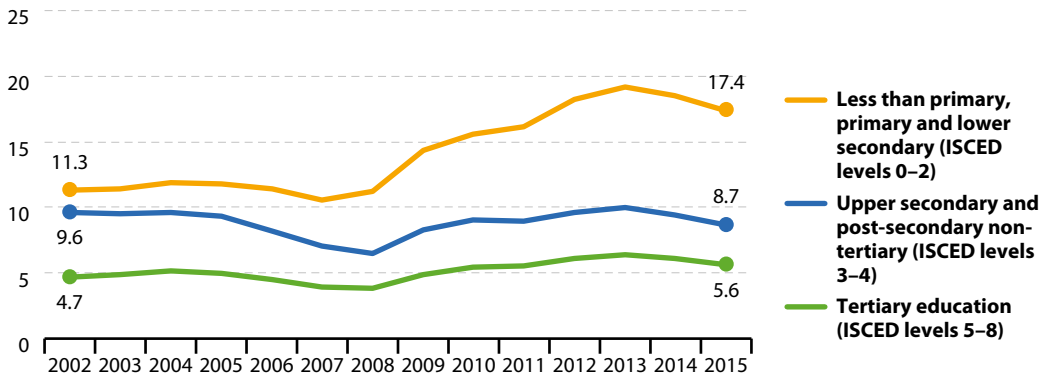
The Europe 2020 flagship initiative ‘Youth on the Move’ emphasises that ‘youth unemployment is unacceptably high’ in the EU, and that ‘to reach the 75 % employment target for the population aged 20 to 64 years, the transition of young people to the labour market needs to be radically improved’. To this end, the flagship initiative focuses on four main lines of action as laid down in the 2010 European Commission Communication [Youth on the Move: An initiative to unleash the potential of young people to achieve smart, sustainable and inclusive growth in the European Union](#) ⁽⁵⁸⁾:

- Lifelong learning to develop key competences and quality learning outcomes, in line with labour market needs. This also means tackling the high level of early school leaving.
- Raise the percentage of young people participating in higher education or equivalent to keep up with competitors in the knowledge-based economy and to foster innovation.
- Improve learning mobility programmes and initiatives, to support the aspiration that by 2020 all young people in Europe should have the possibility of spending a part of their education abroad, including via workplace-based training.
- Urgently improve the employment situation of young people, by presenting a framework of policy priorities for action at national and EU level to reduce youth unemployment by facilitating the transition from school to work and reducing labour market segmentation.

⁽⁵⁸⁾ European Commission, *Youth on the Move: An initiative to unleash the potential of young people to achieve smart, sustainable and inclusive growth in the European Union*, COM(2010) 477 final, 2010 (p. 3).



Figure 1.18: Unemployment rate by educational attainment, EU-28, 2002–2015 (%)⁽¹⁾



⁽¹⁾ Breaks in time series in 2005 and 2014 (switch from ISCED 1997 to ISCED 2011).

Source: Eurostat (online data code: [lfsa_urgaed](#))

In the context of the Europe 2020 strategy, it is important that young people maximise their professional working lives by engaging in employment as soon as possible and staying employed. This is specifically addressed through the flagship initiative ‘[Youth on the Move](#)’.

Education reduces the risk of being unemployed, in particular for young people

As with employment, a clear link exists between unemployment and education: unemployment rates are generally lower for people with better education levels. In 2015, unemployment among those aged 15 to 74 with tertiary education was 5.6% (see Figure 1.18). This was significantly lower than the EU unemployment rate of 9.4%. In contrast, unemployment was considerably higher for those with at most lower secondary education, at 17.4%.

Unemployment rates tend to be higher for non-EU citizens

Foreign-born workers were among the hardest hit by the economic downturn. This may be because they face a number of disadvantages

in the labour market. For example, a large share of third-country migrants work in low-skilled occupations and are more likely to work under temporary employment contracts compared with the native population⁽⁵⁹⁾. Between 2007 and 2013 the unemployment rate of non-EU citizens increased by almost six percentage points, from 11.9% in 2007 to 18% in 2013⁽⁶⁰⁾. Despite a decrease of almost three percentage points between 2013 and 2015, their unemployment rate remains 5.7 percentage points higher than the EU-28 total (9.4%).

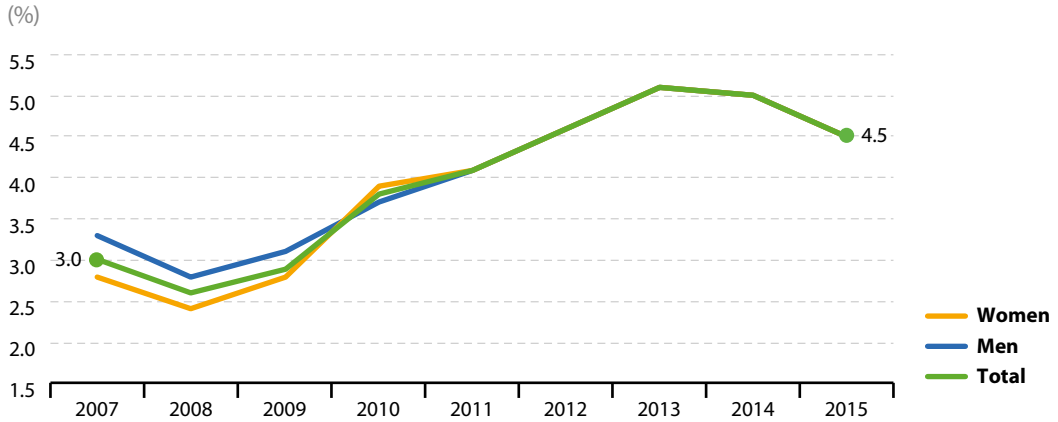
Gradual increase in long-term unemployment after the economic crisis

The prolonged and deep crisis, followed by a modest recovery, has led to high levels of long-term unemployment. Among the EU-28, long-term unemployment increased from 2.6% in 2008 to 4.5% in 2015, with the gender gap for this indicator closing completely in the after-crisis period (see Figure 1.19).

Long-term unemployment poses a serious challenge to the EU because of its negative social and financial implications for individuals and society as a whole. On an individual level,

⁽⁵⁹⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Luxembourg, Publications Office of the European Union, 2016 (p. 14).

⁽⁶⁰⁾ Source: Eurostat (online data code: [lfsa_urgan](#)).

Figure 1.19: Long-term unemployment rate, by sex, EU-28, 2007–2015

Source: Eurostat (online data code: [tsdsc330](#))

in the absence of an adequate and well-functioning social protection system, long-term unemployment can reduce income, increase the risk of poverty and social exclusion and affect health. It can also lead to a deterioration of skills and human capital, hindering future employability, productivity and earnings ⁽⁶¹⁾. At the societal level, prolonged unemployment harms economic growth and social cohesion. High rates of long-term unemployment could have further and long-lasting consequences for the EU labour market and economy given that probability of moving from unemployment to inactivity increases with the time spent unemployed ⁽⁶²⁾.

Labour market flows

Although employment and unemployment indicators provide important information on both the structural and short-term labour market developments, they are to some extent limited because of time lag. Labour market flow statistics are valuable in this respect as they help improve our understanding of the dynamics between these two important indicators.

The matrix in Table 1.1 provides an overview of the transitions between the different labour market statuses from the third to the fourth quarter of 2015 for 26 Member States ⁽⁶³⁾. The

Table 1.1: Transitions in labour market status in the EU, Q3–Q4 2015 ⁽¹⁾

(% of initial status; population aged 15–74)

From	To		
	Employment Q4 2015	Unemployment Q4 2015	Inactivity Q4 2015
	%	%	%
Employment Q3 2015	95.8	1.7	2.5
Unemployment Q3 2015	17.7	64.0	18.4
Inactivity Q3 2015	3.0	3.8	93.3

⁽¹⁾ EU-28 excluding Belgium and Germany.

Source: Eurostat (online data code: [lfsi_long_q](#))

⁽⁶¹⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Luxembourg, Publications Office of the European Union, 2016 (p. 26).

⁽⁶²⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Luxembourg, Publications Office of the European Union, 2016 (p. 26).

⁽⁶³⁾ Data not available for Belgium and Germany.

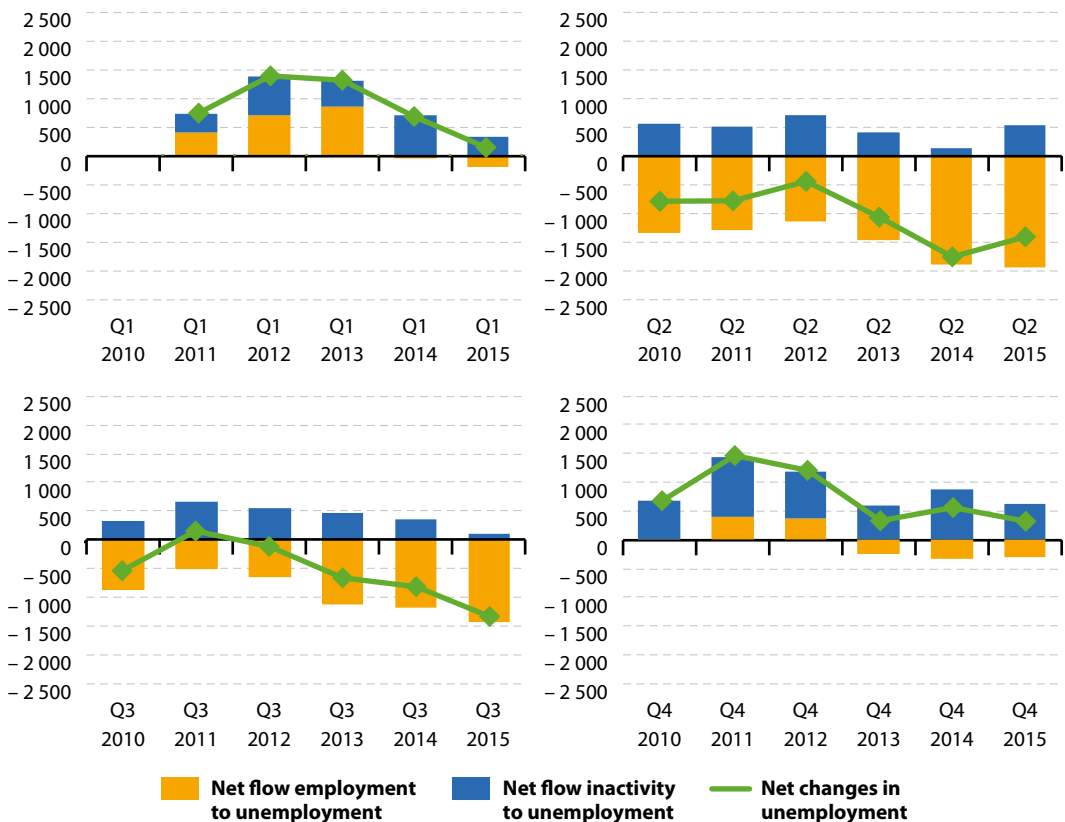
data flows are expressed as a percentage of the initial status. Of all the people in the EU who were unemployed in the third quarter of 2015, 64.0% (12.5 million) remained unemployed in the fourth quarter of 2015, while 17.7% (3.5 million) moved into employment and 18.4% (3.6 million) moved towards economic inactivity. The flow of unemployed people towards inactivity exceeded the one towards employment, indicating that either more people have become discouraged and decided to stop looking for a job (discouraged workers) or have become unavailable for work.

Looking at all those initially employed in the third quarter of 2015, 95.8% remained in employment, while 1.7% were recorded as unemployed in the

fourth quarter and 2.5% became economically inactive. It should be noted that the quarterly flows between employment, unemployment and inactivity tend to be highly seasonal, meaning they depend not only on general economic conditions but also on seasonal factors that are repeated in a similar fashion each year.

Figure 1.20 shows the data separately for each set of corresponding quarters, which allows observing development over time. The orange bars show the net flow between employment and unemployment, while the blue bars show the net flows between inactivity and unemployment. Negative values indicate net flows out of unemployment, which means unemployment

Figure 1.20: Net changes in unemployment by quarter, EU-28 excluding Belgium and Germany (¹)
(thousand persons)



(¹) The yellow bars illustrate the net flow between employment and unemployment; the blue bars illustrate the net flows between inactivity and unemployment. The green line traces the net change in unemployment levels resulting from the combined net flows.
Source: Eurostat (online data code: [lfsi_long_q](#))



falls. On the other hand, positive values show net flows into unemployment, corresponding to rising unemployment. Consequently, an orange bar with a negative value indicates a net flow from unemployment into employment while a positive value indicates a net flow from employment into unemployment. The same holds for the interpretation of the flow from inactivity indicated by the blue bars. The green line traces the net change in unemployment levels resulting from the combined net flows. For net flows between two quarters, if both the blue and orange bars are positive, then the corresponding green dot represents the sum of both bars. If one bar is positive (inflow into unemployment) and the other is negative (outflow from unemployment), then the green line indicates the net effect of these two flows.

Outlook towards 2020

Overall, in 2015 the EU was 4.9 percentage points below its employment target value of 75 %, to be met by 2020. Based on recent trends, the European Commission expects the EU employment rate to only reach about 72 % in 2020. According to the 2014 European Commission Communication *'Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth'*, even if all countries were to meet their national Europe 2020 targets, the overall EU employment rate would only grow to 74 %, just below the 2020 target ⁽⁶⁴⁾. Ageing of the working population and the associated rise in economic dependency adds a sense of urgency to the need to improve the functioning of the labour market. The EU risks undermining its growth potential and future prosperity unless it is 'able to put more people to work and ensure that they work more productively and for a longer time, in line with

The line, which traces net changes in unemployment levels, peaks in 2011 and 2012 for each quarter (see Figure 1.20). This comes to show that the inflows into unemployment were largest (or outflows from unemployment were smallest) during that period. From 2012 onwards, the line starts to gradually decrease, which indicates a decreasing inflow into unemployment or an increasing outflow from unemployment. From the four figures below it becomes visible that in the second and third quarters most of the declines in unemployment resulted from net flows from unemployment into employment (negative yellow bars), whereas for the first and fourth quarters falls in were mainly driven by net flows from unemployment towards inactivity.

the increase in life expectancy and healthy life years' ⁽⁶⁵⁾. While a large share of young and well-educated people will be available to work (see also the chapter on *'Education'*, page 109), achieving the Europe 2020 employment target will require greater use of the potential labour force, including women, older people and so far inactive adults such as migrants ⁽⁶⁶⁾.

The EU youth unemployment rate is more than double the overall unemployment rate (20% compared with 9%) and in most Member States it remains close to historical highs. Bringing young people into the labour market is crucial to avoid erosion of competence or insufficient skill acquisition ⁽⁶⁷⁾. Increasing the relevance of education and supporting a secure transition from education to employment — as emphasised in the flagship initiatives *'An Agenda for new skills and jobs'* ⁽⁶⁸⁾ and *'Youth on the Move'* ⁽⁶⁹⁾,

⁽⁶⁴⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM (2014) 130 final, 2014 (p. 12).

⁽⁶⁵⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, 2014 (p. 9).

⁽⁶⁶⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM (2014) 130 final, 2014 (p. 12).

⁽⁶⁷⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Luxembourg, Publications Office of the European Union, 2016 (p. 28).

⁽⁶⁸⁾ European Commission, *An Agenda for new skills and jobs: A European contribution towards full employment*, COM(2010) 682 final, 2010 (p. 8).

⁽⁶⁹⁾ European Commission, *Youth on the Move: An initiative to unleash the potential of young people to achieve smart, sustainable and inclusive growth in the European Union*, COM(2010) 477 final, 2010 (p. 3).



and the EU employment package ‘Towards a job-rich recovery’⁽⁷⁰⁾ — are key policy steps towards improving the employment prospects of young people. The ‘Youth Employment Package’ proposes specific recommendations on how to fight youth unemployment and enable young people to gain access to jobs, traineeships or apprenticeships, including the implementation of a Youth Guarantee scheme with EU funding support. The ‘Youth Employment Initiative’ reinforces and accelerates measures outlined in the Youth Employment Package, particularly focusing on young people not in education, employment or training in regions with a youth unemployment rate above 25%.

Increasing the labour force participation of women would require comprehensive family policies, which improve the compatibility of child-rearing and employment. Universal access to high-quality childcare services for children, availability of part-time work and access to parental leave are proven to be particularly effective in this

respect⁽⁷¹⁾. Highly relevant EU actions in this direction include the promotion of new forms of flexibility and security on the labour market as outlined in the flagship initiative ‘An Agenda for new skills and jobs: A European contribution towards full employment’⁽⁷²⁾ and addressed by the EU employment package ‘Towards a job-rich recovery’⁽⁷³⁾.

Integrating older people and migrants into the labour market might be challenging as a large portion tend to have low levels of education⁽⁷⁴⁾. Against future projections for increased demand for high-skilled labour, these groups are therefore more likely to join the less skilled part of the workforce. In this respect, it would be imperative for Member States to design and put in place active labour market policies combined with targeted policy measures for lifelong learning and comprehensive integration. Enabling mobile people to better capitalise on their formal qualifications would also enhance their employability and improve growth prospects.

⁽⁷⁰⁾ European Commission, *Towards a job-rich recovery*, COM(2012) 173 final, 2012 (p. 10).

⁽⁷¹⁾ European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2015*, Luxembourg, Publications Office of the European Union, 2016 (p. 16).

⁽⁷²⁾ European Commission, *An Agenda for new skills and jobs: A European contribution towards full employment*, COM(2010) 682 final, 2010 (p. 5).

⁽⁷³⁾ European Commission, *Towards a job-rich recovery*, COM(2012) 173 final, 2012 (p. 10).

⁽⁷⁴⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, 2014 (p. 12).

2

R&D and innovation



R&D and innovation – why do they matter?

Research and development (R&D) and innovation are key policy components of the Europe 2020 strategy. Having more innovative products and services on the market addresses two objectives of the strategy's smart growth goal: job creation through increased industrial competitiveness, labour productivity and the efficient use of resources; and finding solutions to societal challenges such as climate change and clean energy, security, and active and healthy ageing.

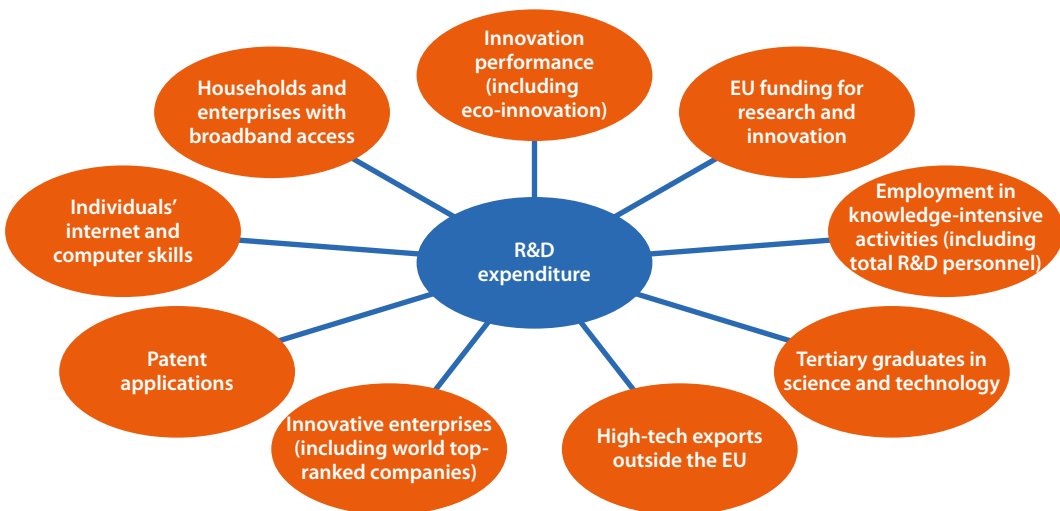
Addressing these challenges requires substantial resources, but also offers new market opportunities that could be exploited through innovation. A number of important EU policy strategies and initiatives address such win-win situations. In particular, the 'Innovation Union' flagship initiative is the European Union strategy that aims to create an innovation-friendly environment for EU researchers and entrepreneurs to make it easier for great ideas to be turned into products and services. The EU Action Plan for the Circular Economy, included in

Europe 2020 strategy target on R&D

The Europe 2020 strategy sets the target of 'improving the conditions for innovation, research and development' ⁽¹⁾, in particular with the aim of 'increasing combined public and private investment in R&D to 3 % of GDP' by 2020 ⁽²⁾.

the Circular Economy package, proposes actions that 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. Similarly, the 'Roadmap to a Resource Efficient Europe' ⁽³⁾ supports the shift towards a resource-efficient, low-carbon economy, while bringing new economic opportunities, sources of

Figure 2.1: Indicators presented in this chapter



⁽¹⁾ European Council conclusions 17 June 2010, EUCO 13/10, Brussels, 2010.

⁽²⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, Brussels, 2014 (p. 12).

⁽³⁾ European Commission, *Roadmap to a Resource Efficient Europe*, COM (2011) 571 final, (p. 4).

growth and jobs and increased competitiveness through improved efficiency.

The analysis in this chapter focuses on the headline indicator 'gross domestic expenditure on R&D', which monitors the strategy's research and development target. Fundamental enabling factors that drive innovation are also discussed. These are the first link in the innovation chain and include R&D investment by Member States and the way it is financed by the various public and private societal actors. The role of education, in particular tertiary education, in providing the necessary science and technology skills to the workforce is also highlighted. This is followed by a look at the EU's performance concerning business frontrunners, their innovative capacity, and the technological output at the end of the innovation chain in terms of commercialisation and the relevance to societal challenges.

The importance of R&D and innovation to fulfilling the ambitions of the Europe 2020 strategy is evident in the close interlinkages between them and the strategy's other objectives⁽⁴⁾. The Europe 2020 R&D target is closely related to the strategy's tertiary educational attainment and employment targets (see the chapters on 'Employment', page 23, and 'Education', page 109). Public investment in R&D generates the knowledge base and talent that

higher education and innovative companies need. Greater public investment in R&D also leverages private investment in research and innovation, providing new jobs in business and academia and ultimately increasing demand for scientists and researchers in the labour market.

The Europe 2020 target on R&D is also related to the strategy's climate change and energy targets (see the chapter on 'Climate change and energy', page 87). In particular, the transition to a green and low-carbon economy and climate change mitigation will require significant innovation, from small incremental changes to major technological breakthroughs. Technological advances in materials science and digitalisation, for example, are driving rapid progress in renewable energy and energy efficiency as well as other sectors important for sustainable development and climate change mitigation such as transport, construction, manufacturing, agriculture and consumer goods⁽⁵⁾.

However, development of new technologies alone will not be enough to solve many of the 'grand' societal challenges. Fundamental transformations in businesses and manufacturing processes, provision of services, the way society organises itself and other non-technological innovations will be equally important.

How much is the EU investing in R&D?

Between 2002 and 2007, the gross domestic expenditure on R&D as a percentage of GDP was relatively stable in the EU at 1.8%. Since then, it has grown marginally, reaching 2.03% in 2014. But the EU still has some way to go to meet its Europe 2020 target of 3%.



The headline indicator '**gross domestic expenditure on R&D**' shows the proportion of gross domestic product (GDP) dedicated to research and development⁽⁶⁾. It is also referred to as 'R&D intensity' and reflects the extent of research and innovation undertaken in a country in terms of resources input.

Figure 2.2 shows a prolonged stagnation of gross domestic expenditure on R&D at around 1.81% of GDP for the period 2002 to 2007. By 2009, at the onset of the economic crisis, R&D intensity had

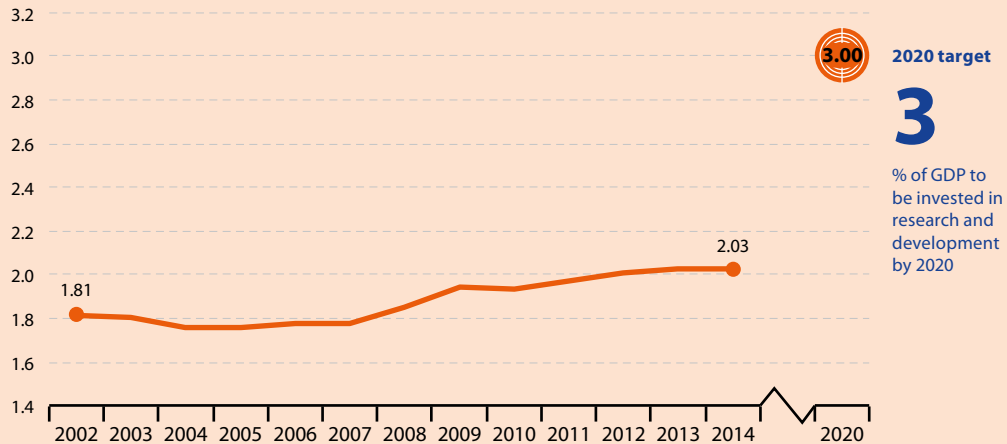
⁽⁴⁾ European Commission, *Roadmap to a resource efficient Europe*, COM (2011) 571 final, (p. 4).

⁽⁵⁾ The Global Commission on the Economy and Climate, *Better Growth Better Climate*, Chapter 7, 2014, Washington, (p. 3).

⁽⁶⁾ 'Research and experimental development (R&D) comprises creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications' (Frascati Manual, 2002 edition, p. 63).

Europe 2020 headline indicator

Figure 2.2: Gross domestic expenditure on R&D, EU-28, 2002–2014⁽¹⁾
(% of GDP)



⁽¹⁾ Data for 2002–2003 are estimates; 2014 data are provisional.

Source: Eurostat (online data code: t2020_20)

increased to 1.94%. Since 2011 it has continued to grow marginally, stabilising at 2.03% in 2013 and 2014. One of the reasons for the increase between 2007 and 2009 include GDP falling more rapidly than overall R&D expenditure⁽⁷⁾. Between 2007 and 2009 GDP fell by 5.1%⁽⁸⁾ in the EU-28, whereas R&D expenditure declined by only 3.4%⁽⁹⁾.

Actions taken by individual Member States to step up public R&D investment in times of weak GDP growth have also helped increase R&D intensity in that period. In 2009, many Member States sustained nominal growth in public R&D expenditure to counter the impacts of the crisis on private investment⁽¹⁰⁾.

Despite the increases in public and private R&D expenditure over the 2007 to 2014 period, the EU has moved off-track to reaching its 3% R&D target. Estimates show that for the 2020 R&D target to be met, EU R&D intensity would need to grow by

more than three times the annual rate reported for the 2007 to 2014 period — 6.7% versus 1.9%⁽¹¹⁾.

At the global level the EU is still lagging behind other players, such as the United States, Japan and South Korea, in terms of R&D expenditure, with only the best performing Member States surpassing the United States (see Figure 2.3).

MEMBER STATES STEPPING UP R&D SPENDING

Figure 2.3 shows a rather varied picture of R&D intensity across EU Member States, ranging from 0.38% to 3.17% in 2014. Northern European Member States such as Finland and Sweden not only share a pattern of high expenditure, they have also adopted the most ambitious national targets. In 2014, Denmark achieved its national R&D target of 3% and the Czech Republic reached

⁽⁷⁾ European Commission, *Innovation Union Competitiveness Report 2011*, Brussels, 2011 (p.64).

⁽⁸⁾ Source: Eurostat, online data code: nama_10_gdp.

⁽⁹⁾ Source: Eurostat, online data code: rd_e_gerdtot.

⁽¹⁰⁾ European Commission, *Innovation Union Competitiveness Report 2013*, Brussels 2013 (p.38).

⁽¹¹⁾ European Commission, *Science, Research and Innovation Performance of the EU*, Brussels 2016 (p.30).

2% of government R&D intensity, twice the national target of 1%. Cyprus and Germany came very close to meeting their national targets of 0.5% and 3%, respectively. Lower R&D intensity levels, below 1%, were mostly recorded in eastern and southern Member States, for instance in Romania, Cyprus, Greece and Malta. The large variance in R&D spending might be explained to some extent by structural factors such as the varying share of R&D intensive sectors in the Member States.

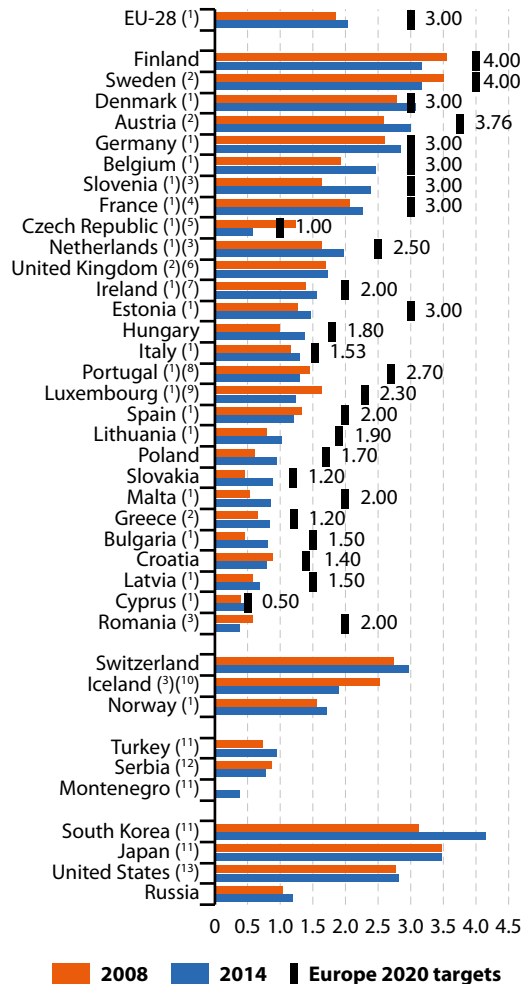
The financial crisis and its adverse impact on GDP growth in the following years, along with a rise in nominal government spending on R&D, led to an increase in R&D intensity in most Member States between 2008 and 2014. The exceptions were Romania, Luxembourg, Portugal, Finland, Croatia, Sweden and Spain. Growth in R&D expenditure over the same period has been most pronounced among countries with generally low R&D spending such as Slovakia, Bulgaria, Malta and the Czech Republic. The observed trends show that most Member States have put R&D investment high on the policy agenda for combating the effects of the crisis. However, despite these increases most Member States would require significant acceleration of R&D intensity growth to meet their respective national targets⁽¹²⁾.

THE BUSINESS SECTOR REMAINS THE LARGEST SOURCE OF R&D INVESTMENT

R&D activities in the EU are carried out by four main institutional sectors: business enterprise, government, higher education and private non-profit (see Box 2.1). Figure 2.4 shows the distribution of R&D expenditure between these sectors in 2014. The two biggest spenders were business enterprise, making up 63.9% (EUR 180.7 billion), and higher education, making up 23.2% (EUR 65.6 billion) of total R&D expenditure.

Although it has a more modest share of 12.2% (EUR 34.4 billion), the government sector also plays an important role, especially in terms of the long-term stability of R&D expenditure. The size of the private

Figure 2.3: Gross domestic expenditure on R&D, by country, 2008 and 2014 (% of GDP)



(1) 2014 data are provisional and/or estimates.

(2) Data are provisional and/or estimates.

(3) Break in time series for 2011.

(4) Break in time series for 2010.

(5) Target refers to public sector only.

(6) No national target.

(7) Target about 2.5% of GNP (approximately 2% of GDP).

(8) Target 2.7–3.3%.

(9) Target 2.3–2.6%.

(10) Break in time series in 2013.

(11) 2013 data (instead of 2014).

(12) 2009 data (instead of 2008).

(13) 2012 data (instead of 2014).

Source: Eurostat (online data code: t2020_20)

(12) European Commission, *Science, Research and Innovation Performance of the EU*, Brussels 2016 (p. 36).

Box 2.1: The four R&D sectors

R&D activities are carried out by four main institutional sectors: business enterprise, government, higher education and private non-profit.

The business enterprise sector comprises all firms, organisations and institutions whose primary activity is the market production of goods or services (other than higher education) for sale to the general public at an economically significant price. It also includes the private non-profit institutions that mainly serve them (while excluding those serving households).

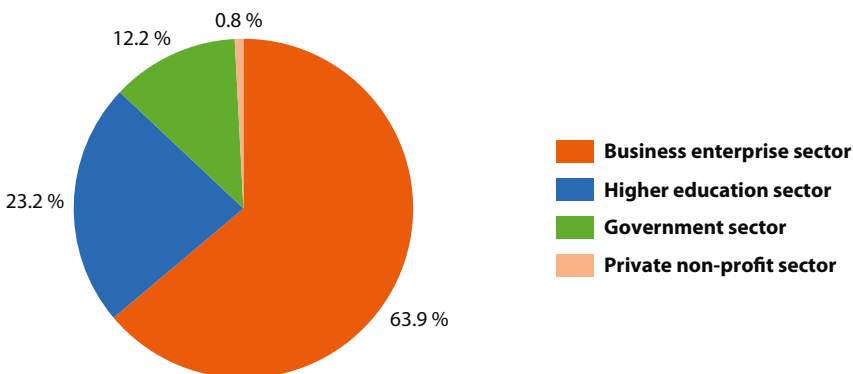
The government sector includes all departments, offices and other bodies that furnish, but normally do not sell to the community those common services, other than higher education, that cannot otherwise be conveniently and economically provided. They also administer the

state and the economic and social policy of the community. It also includes non-profit institutes controlled and mainly financed by government. Public enterprises are included in the business enterprise sector.

The higher education sector encompasses all universities, colleges of technology and other institutes of post-secondary education, whatever their source of finance or legal status. It also includes all research institutes, experimental stations and clinics operating under the direct control of or administered by or associated with higher education establishments.

The private non-profit sector includes private individuals, households and non-market, private non-profit institutions serving households (the general public) ⁽¹³⁾.

Figure 2.4: R&D expenditure, by sectors of performance, EU-28, 2014 ⁽¹⁾
(%)

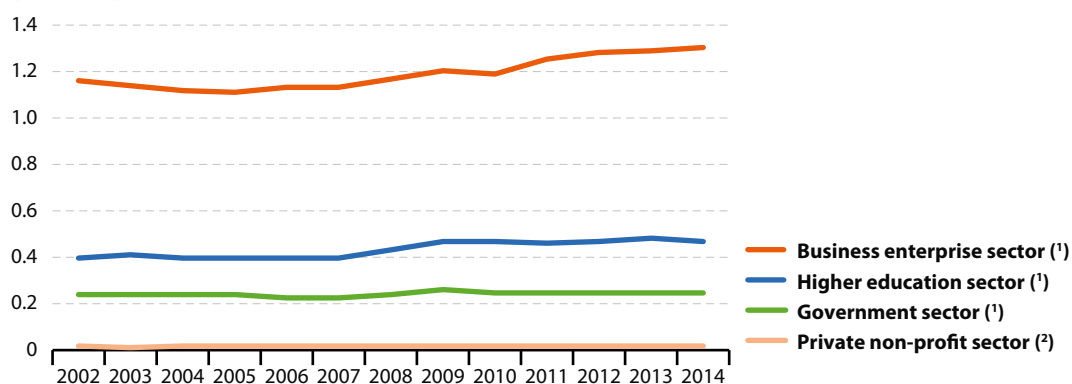


⁽¹⁾ Provisional data.

Source: Eurostat (online data code: [rd_e_gerdtot](#))

⁽¹³⁾ For some countries, the private non-profit sector is considered together with the government sector.

Figure 2.5: Gross domestic expenditure on R&D, by sectors of performance, EU-28, 2002–2014
(% of GDP)



(¹) Data for 2002–2003 and 2008–2010 are estimates, 2014 data are provisional.

(²) Data are estimates and/or provisional (whole time series).

Source: Eurostat (online data code: [rd_e_gerdtot](#))

Table 2.1: Gross domestic expenditure on R&D, by sector of performance, EU-28, 2006–2014 (¹)
(% change over previous year) (²)

	2006	2007	2008	2009	2010	2011	2012	2013	2014
All sectors	5.2	3.8	4.8	-0.2	1.8	3.9	1.7	0.7	1.8
Business enterprise sector	6.2	4.1	4.1	-2.6	2.0	6.2	2.3	0.7	2.4
Government sector	1.8	1.1	4.0	3.1	-0.4	0.8	0.1	0.4	1.2
Higher education sector	4.2	4.6	7.2	4.4	2.5	0.6	1.0	1.0	0.4
Private non-profit sector	16.5	0.6	2.4	3.7	5.5	-10.9	-0.9	-8.8	2.3

(¹) 2014 data are provisional (all sectors), 2008–2010 data are estimates (all sectors), data for 'private non-profit sector' are estimates (whole time series).

(²) Calculation based on million purchasing power standards (PPS) at 2005 prices.

Source: Eurostat (online data code: [rd_e_gerdtot](#))

non-profit sector is almost negligible, accounting for less than 1 % of the total (EUR 2.3 billion).

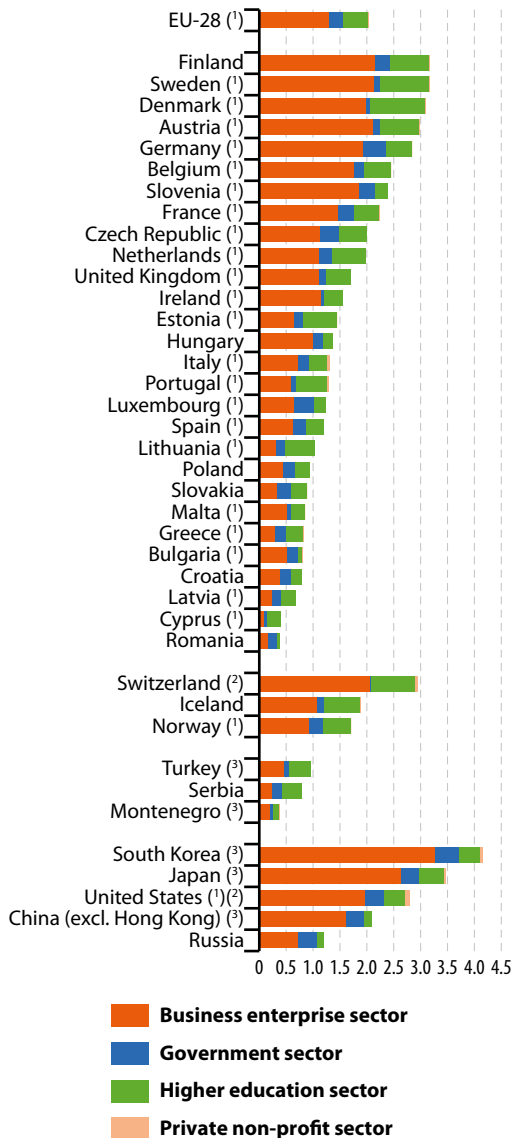
Between 2002 and 2014, R&D expenditure as a percentage of GDP in the EU grew across all sectors, apart from the private non-profit sector (see Figure 2.5). Despite certain deviations, the share of business spending in GDP increased the most, by 0.14 percentage points. The higher education sector displayed the second largest increase, of 0.07 percentage points, followed by the government sector with a 0.01 percentage point increase.

When the financial and economic crisis hit the EU in 2008, some Member States such as Malta,

Luxembourg, Estonia, the Czech Republic, Denmark, Germany, Austria, Croatia, Slovenia and Poland (¹⁴) maintained or increased their public R&D expenditure. The aim was to stimulate economic growth and encourage private R&D investment, which remains the largest source of R&D expenditure. Overall, in the EU government sector R&D expenditure as a share of GDP grew by about 0.02 percentage points or 3.1 % between 2008 and 2009 (see Figure 2.5 and Table 2.1) and remained constant at 0.25 % in the following years despite the crisis. The same applied for higher-education expenditure, which grew by 0.04 percentage points or 4.4 % between 2008 and

(¹⁴) European Commission, *Innovation Union Competitiveness Report 2013*, Brussels 2013 (p. 41).

Figure 2.6: Gross domestic expenditure on R&D, by sectors of performance, by country, 2014
(% of GDP)



(1) Data are estimates and/or provisional.

(2) 2012 data instead of 2014.

(3) 2013 data instead of 2014.

Source: Eurostat (online data code: rd_e_gerdtot)

2009 and remained relatively stable after the onset of the crisis.

In comparison, the business sector's R&D expenditure fell by 2.6% between 2008 and 2009 (see Table 2.1). Businesses usually decrease the amount they spend on R&D during an economic crisis as a cost-reduction strategy in time of economic pressure and tight credit constraints (15). However, in relative terms between 2008 and 2010 the EU business sector maintained its R&D expenditure at about 1.2% of GDP. Expenditure started to rise again gradually after 2010, reaching 1.3% of GDP in 2014.

In some countries, such as Cyprus, Slovakia, Greece, Latvia, Lithuania, Poland, Romania and Croatia, R&D efforts rely predominantly on the public sector — higher education and government (see Figure 2.6). This indicates that conditions for business R&D investment are still insufficiently attractive in those countries (16). Although the public R&D system is of prime importance for generating the knowledge and talents needed by innovative companies, it is only through business investment that the full impacts of R&D could be realised. These include, for example, production of innovative and greener products, processes and services that enable higher labour productivity, industrial competitiveness, resource efficiency and reduced environmental impacts. Therefore, apart from strengthening public R&D expenditure, efforts to improve the broader innovation system and put in place the right framework conditions for business R&D are an essential part of public policies (17).

THE ROLE OF COUNTER-CYCLICAL PUBLIC R&D INVESTMENT POLICY

While private investment — including R&D expenditure — typically follows cyclical patterns in relation to GDP growth, public or government-financed R&D investment tends to follow a counter-cyclical trend. The aim is to both stimulate economic growth and to encourage private R&D investment.

(15) Cincera, M., et. al, *Doing R&D or not (in a crisis), that is the question...*, European Planning Studies 20(9), 2012, (p. 4–6).

(16) European Commission, *Innovation Union Competitiveness Report 2013*, Brussels 2013 (p. 38).

(17) European Commission, *Science, Research and Innovation Performance of the EU*, Brussels 2016 (p. 27).

Box 2.2: Horizon 2020 — the biggest EU research and innovation programme ever

Horizon 2020 is the EU's current research and innovation programme. It follows up on the previous EU research framework programmes, which were implemented in 1984 and provided a total of almost EUR 120 billion of funding for wide-ranging research projects up to 2013 ⁽¹⁸⁾.

With EUR 74.8 billion ⁽¹⁹⁾⁽²⁰⁾ of funding available for the seven years between 2014 and 2020, Horizon 2020 is the financial instrument implementing the 'Innovation Union' in the EU. According to a [Regulation of the European Parliament and of the Council of 11 December 2013](#) it focuses on three priorities:

- Generating excellent science to strengthen the Union's world-class excellence in science.
- Fostering industrial leadership to support business, including micro, small and medium-sized enterprises (SMEs) and innovation.
- Tackling societal challenges, to respond directly to the challenges identified in the Europe 2020 strategy by supporting activities covering the entire spectrum from research to market.

Horizon 2020 aims to achieve the Europe 2020 ambition for smart, sustainable and inclusive growth and jobs. The goal is to ensure that the EU produces world-class science, removes barriers to innovation and makes it easier for the public and private sectors to work together to deliver innovation.

The biggest part of the Horizon 2020 budget (37.5 %) representing EUR 28.6 billion, is devoted to tackling societal challenges in the field of environment (including climate change), energy, transport, security, and health and demographic changes. Almost one third (31.7 %) of the budget is allocated to bringing about excellence in science, namely through the European Research Council. Another 21.5 % is devoted to increasing industrial leadership, in particular in enabling and industrial technologies such as information and communication technology (ICT), nanotechnologies and space. The European Institute of Innovation and Technology (EIT) and non-nuclear direct actions of the Joint Research Centre (JRC) receive 3.1 % and 2.1 % of the funding respectively.

Figure: Horizon 2020 budget breakdown, EU, 2014–2020

(%)



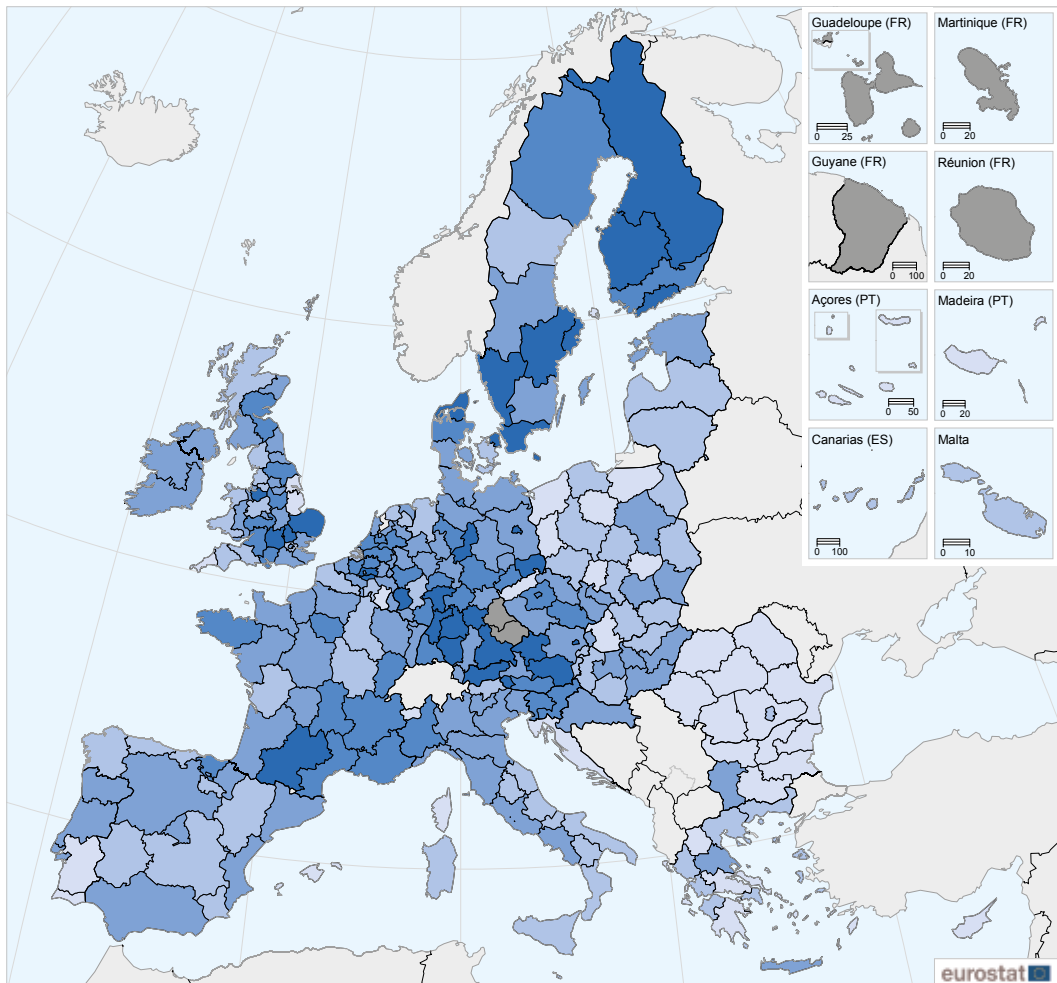
Source: Regulation of the European Parliament and of the Council of 25 June 2015.

⁽¹⁸⁾ European Commission, DG RTD; http://ec.europa.eu/research/fp7/index_en.cfm?pg=budget

⁽¹⁹⁾ Set in current prices.

⁽²⁰⁾ Regulation (EU) 2015/1017 of the European Parliament and of the Council of 25 June 2015 on the European Fund for Strategic Investments, the European Investment Advisory Hub and the European Investment Project Portal and amending Regulations (EU) No 1291/2013 and (EU) No 1316/2013 — the European Fund for Strategic Investments.

Map 2.1: Gross domestic expenditure on R&D, by NUTS 2 regions, 2013 ⁽¹⁾
 (% of GDP)



(% of GDP)

EU-28 = 2.03

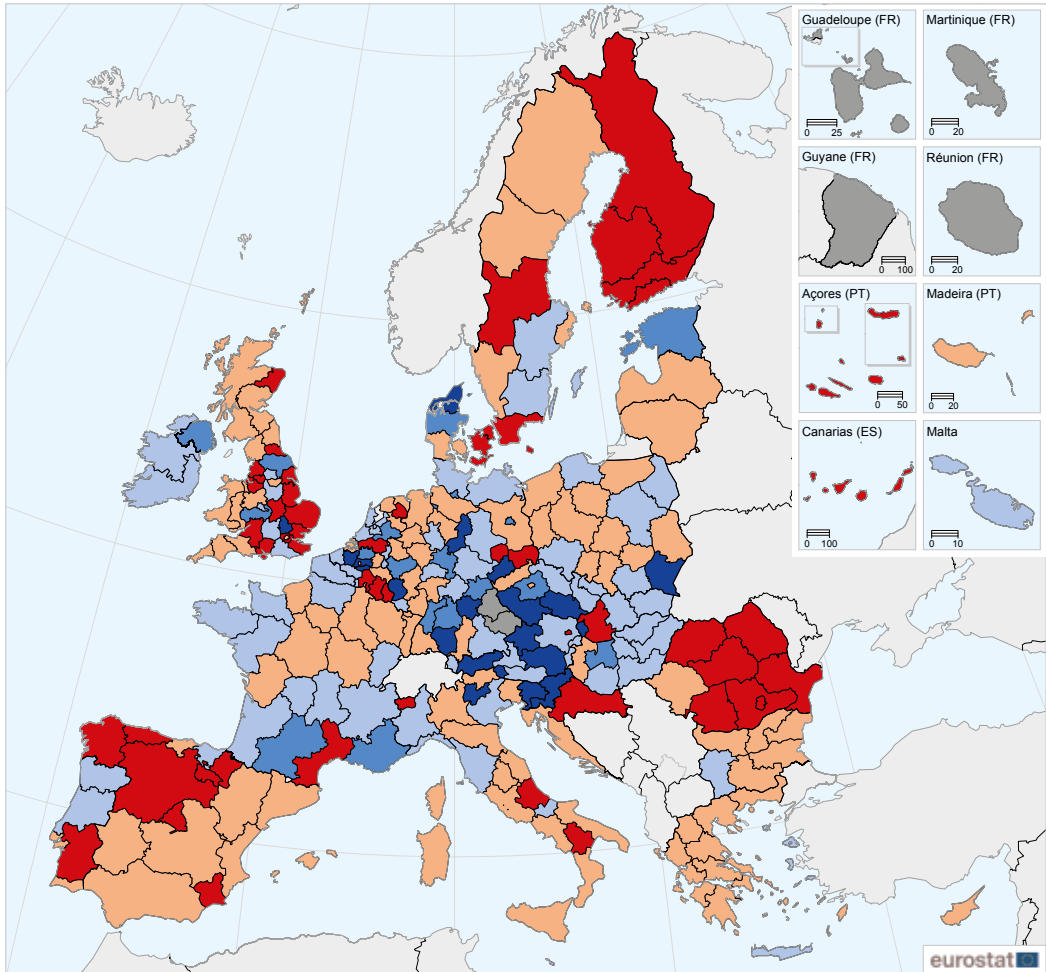
- < 0.5
- 0.5 – < 1.0
- 1.0 – < 2.0
- 2.0 – < 3.0
- ≥ 3.0
- Data not available

⁽¹⁾ Data for the United Kingdom are estimates.

Source: Eurostat (online data code: [rd_e_gerdreg](#))



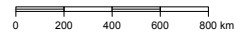
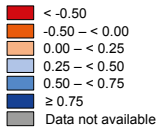
Map 2.2: Change in gross domestic expenditure on R&D, by NUTS 2 regions, 2007–2013 ⁽¹⁾
(percentage points difference between 2013 and 2007, % of GDP)



(percentage points difference between 2013 and 2007, % of GDP)

Administrative boundaries: © EuroGeographics © UN-FAO
Cartography: Eurostat — GISCO, 04/2016

EU-28 = 0.20



⁽¹⁾ Change 2008–2013 for Croatia; change 2009–2013 for Germany (regions Brandenburg, Chemnitz and Leipzig), Finland (regions Helsinki-Uusimaa and Etelä-Suomi) and the United Kingdom (regions Cheshire and Merseyside); change 2011–2013 for Greece (all 13 regions); estimated data for the Netherlands and Luxembourg (2007) and the UK (all years); breaks in time series for Austria (2013), Portugal (2008) and Slovenia (2011).

Source: Eurostat (online data code: [rd_e_gerdreg](#))

During the economic crisis of 2008 to 2009, the European Commission and some Member States took coordinated action to increase public R&D expenditure. Despite severe budgetary constraints, government R&D funding grew faster (or decreased less) than GDP during the crisis in half of the Member States: Malta, Luxembourg, Estonia, the Czech Republic, Denmark, Germany, Austria, Croatia, Slovenia, Poland, Cyprus, Finland, Sweden and Portugal ⁽²¹⁾. As a result of efforts both at Member State and EU level, the EU's public R&D sector has emerged slightly stronger from the crisis.

In a significant number of Member States, direct government R&D funding is complemented by tax incentives to provide indirect support for business R&D ⁽²²⁾. Overall, in half of the Member States, R&D tax incentives play either an important or a dominant role in addition to direct funding of business R&D and their use was increased during the crisis years ⁽²³⁾.

Beyond increases in public funding for R&D and more widespread use of tax incentives, European funds have provided important support for R&D financing, in particular through the EU Framework Programme and the EU Structural Funds. According to recent estimates, 69% of the rise in public R&D expenditure between 2007 and 2012 was the result of increased national public spending, whereas 20% could be attributed to 'funding from abroad', mainly from the EU budget ⁽²⁴⁾. Although most EU funds from Research Programmes flow to large, old, research-intensive Member States, their contribution to public funding has been substantial in several small new Member States with low R&D capacity ⁽²⁵⁾. Concerning Structural Funds, there has been an important shift in their use, with a growing share being channelled into R&D spending ⁽²⁶⁾.

On average Member States have managed to maintain the same budgetary share for R&D in total government expenditure, therefore achieving smart fiscal consolidation, without sacrificing the

R&D budget to other government expenditure. However, substantial differences between Member States remain, with Estonia, Slovakia, Luxembourg, Portugal and Germany recording the largest increase in the share of R&D in government expenditure since 2007 ⁽²⁷⁾.

R&D INTENSITY CONCENTRATED IN REGIONS IN GERMANY, THE UNITED KINGDOM, NORDIC COUNTRIES, AUSTRIA, BELGIUM AND SLOVENIA

When analysing R&D intensity by region (see Map 2.1), a high level of R&D spending can be seen in 30 of the **NUTS 2** regions in Germany (10 regions), the United Kingdom (four), Sweden (four), Austria (four) and Finland (three), followed by regions in Denmark and Belgium (two regions each) and Slovenia (one region). Some research-intensive 'clusters' also become apparent: in particular there is a band of research-intensive regions running from Finland through southern Sweden into Denmark; another band runs from the United Kingdom, through Belgium into southern Germany; and a final band goes from Slovenia, through Austria and Switzerland into southern France and northern Spain.

Geographical concentration of R&D activities is a common phenomenon. R&D clusters often develop around academic institutions or specific high-technology industrial activities and knowledge-based services, where they could benefit from a favourable environment and spillover of knowledge. Because of these clusters many regions attract new start-up businesses and highly qualified personnel, and develop a competitive advantage in specialised activities.

Three EU regions have a particularly pronounced R&D intensity. In 2013, Germany's Stuttgart and Braunschweig regions reached an R&D intensity of 6% and 7.3%, respectively. Even higher was the

⁽²¹⁾ European Commission, *Innovation Union Competitiveness Report 2013*, Brussels 2013 (p. 38).

⁽²²⁾ European Commission, *Science, Research and Innovation Performance of the EU*, Brussels 2016 (p. 143).

⁽²³⁾ European Commission, *Science, Research and Innovation Performance of the EU*, Brussels 2016 (p. 143).

⁽²⁴⁾ European Commission, *Science, Research and Innovation Performance of the EU*, Brussels 2016 (p. 28).

⁽²⁵⁾ European Commission, *Science, Research and Innovation Performance of the EU*, Brussels 2016 (p. 145).

⁽²⁶⁾ European Commission, *Science, Research and Innovation Performance of the EU*, Brussels 2016 (p. 160).

⁽²⁷⁾ European Commission, *Innovation Union Competitiveness Report 2013*, Brussels 2013 (p. 41).

share in Belgian's Brabant Wallon province, where R&D intensity peaked at 11.4% in 2013, more than five times the EU average. It should be noted that this high share is partly explained by the high number of commuters from Brabant Wallon to the Brussels regions, who contribute to the GDP of Brussels and lower the GDP of Brabant Wallon. At the other end of the scale, the 42 regions with R&D intensity below 0.5% mainly belong to southern or central Member States: Romania, Bulgaria, Greece and Poland (six regions each), Bulgaria (five regions), Portugal (four regions) and Spain (three regions).

The capital region recorded the highest levels of R&D intensity in 11 multi-regional Member States. In addition, in 20 countries, the capital regions' R&D intensity exceeded the national average but was not necessarily the highest in the country. Only the United Kingdom, Belgium and the Netherlands clearly went against this trend, with national averages exceeding their capital regions' R&D intensity. Regional disparities in R&D intensity within countries were largest in the United Kingdom, Belgium and Spain and smallest in Slovenia, Hungary, Croatia and the Netherlands.

Changes in R&D intensity over time are highlighted in Map 2.2. Of the 266 regions for which data is available, 59 experienced a decline in R&D intensity between 2007 and 2013. This decline was below one percentage point in all regions except for four regions in the United Kingdom, namely Essex, Lancashire, Cheshire and Kent. In one region in Romania, Sud-Vest Oltenia, the decline was marginal, at just 0.01 percentage points and in six regions R&D intensity remained unchanged: Düsseldorf in Germany, Castilla-La Mancha in Spain, Champagne-Ardenne in France, Umbria in Italy, Vest in Romania and West Wales and the Valley in the United Kingdom. In the remaining 201 regions, R&D intensity increased by between 0.01 percentage points and 4.63 percentage points (Belgian Brabant Wallon).

While EU funding seeks to target all regions, an innovation divide remains. A regional innovation paradox appears to exist, whereby those regions characterised by established innovative activity maintain their position as innovative leaders (such as the Nordic countries), while those that trail behind fail to catch up, despite targeted funding and policy prescriptions (see Box 2.2) ⁽²⁸⁾.

How the EU strengthens its human capital and knowledge base



The EU increased its output of tertiary graduates in science and technology by 17.9% between 2008 and 2012.

Employment in knowledge-intensive activities increased in almost all Member States, however, the United States and Japan are still outperforming the EU in this respect.

Between 2007 and 2015 broadband internet access increased substantially in the EU, reaching 80% of households and 95% of businesses. However, the level of digital skills of the EU population seems insufficient. In 2015, 55% of the EU population reported at least basic overall digital skills and 74% at least basic digital communication skills.

⁽²⁸⁾ European Commission, *Research and innovation statistics at regional level*, Statistics Explained, Luxembourg, 2014.

Current skill mismatches are a threat to the EU's innovation capacity at a time when the need for new technology is increasing (also see the 'Employment' and 'Education' chapters, see pages 23 and 109). The demand for highly qualified people in the EU is predicted to rise by almost 16 million in the period up to 2020, according to the *Researchers' Report 2014* ⁽²⁹⁾. In particular, as emphasised by the *European Commission* ⁽³⁰⁾, more human resources such as scientists, researchers and engineers are needed. To try to improve this situation, *Horizon 2020*, the *European Research Area (ERA)* and other policy initiatives aim to support researchers' careers and mobility, attract young people to science, enhance the quality and efficiency of doctoral training and encourage partnerships between academia and industry ⁽³¹⁾.

Knowledge and skills are crucial for gaining new scientific and technological expertise and for

building the economy's capacity to absorb and use this knowledge (see Box 2.3). R&D expenditure covers a substantial part of expenditure on skills and education and, therefore, constitutes a vital enabling factor for human capital. In this regard, the EU will need to train and employ at least one million new researchers compared with 2008 levels if it is to reach the R&D target of 3% ⁽³³⁾.

Businesses and higher education institutions can work together to share knowledge. In particular, close and effective links between education and research and innovation stimulate the development of entrepreneurial, creative and innovative skills in all disciplines. They promote innovation in higher education through more interactive learning environments and increased knowledge exchange. Thus, close collaboration between the three ultimately contributes to the realisation of the ERA and EU's competitiveness, growth and job creation. Being the three key and interdependent drivers of the knowledge-based society, research, education and innovation are together referred to as the 'knowledge triangle' ⁽³⁴⁾ (see Box 2.3).

Box 2.3: The knowledge triangle: education facilitates research and innovation

Education is the ultimate way of building up human capital and is strongly linked to research and innovation. These three concepts, which are central drivers of a knowledge-based society, form the so-called knowledge triangle ⁽³²⁾. This concept couples education, academic research and knowledge production, and innovation, and highlights the mutual benefits from strong interlinkages among the three. To realise a cohesive *European Research Area (ERA)*, education, research and innovation need to develop strong links with each other.

THE NUMBER OF SCIENCE GRADUATES IN THE EU IS INCREASING

In line with the EU's declared intention to become the world's most competitive science-based economy, a well-functioning research and innovation system is expected to promote excellence in education and skills development and ensure a sufficient supply of (post)graduates in science, technology, engineering and mathematics. Increasing the number of science graduates and jobs in knowledge-intensive activities would help to create a solid base for the EU knowledge economy and contribute to Europe

⁽²⁹⁾ European Commission, *Researchers' report — Final report 2014*, Brussels, 2014 (p. 17).

⁽³⁰⁾ European Commission, *Commission staff working document — A rationale for action accompanying the Europe 2020 Flagship Initiative Innovation Union*, SEC (2010) 1161 final, Brussels, 2010 (p. 34).

⁽³¹⁾ European Commission, *State of the Innovation Union 2015*, Brussels, 2015 (p. 3 and 4).

⁽³²⁾ European Institute of Innovation and Technology, *Catalysing innovation in the knowledge triangle: practices from the EIT knowledge and innovation communities*, 2012 (p. 8).

⁽³³⁾ European Commission, *Researchers' report — Final report 2014*, Brussels, 2014 (p. 54).

⁽³⁴⁾ See Knowledge Triangle and Innovation at http://ec.europa.eu/education/policy/higher-education/knowledge-innovation-triangle_en.htm

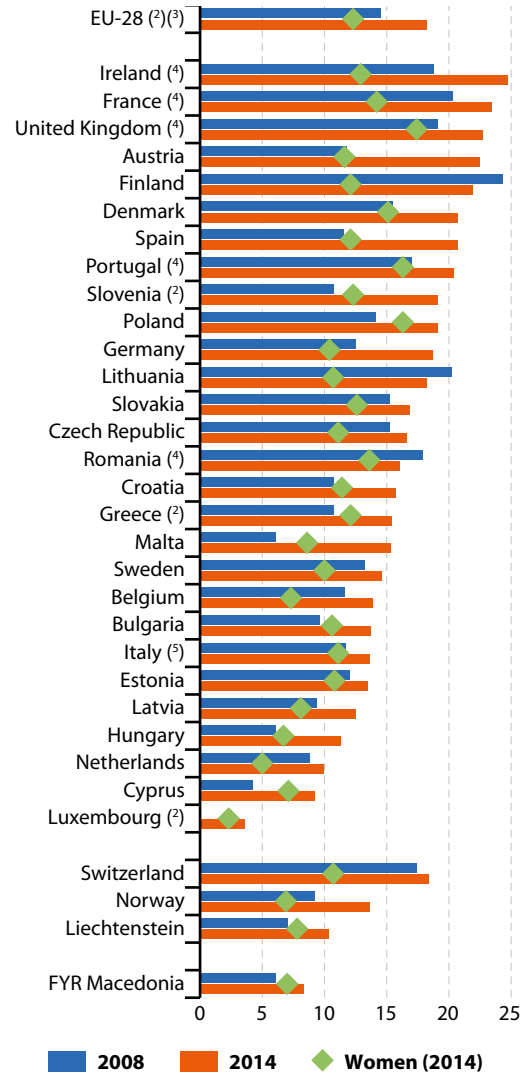
2020's objectives by fostering the EU's innovation capacity, economic strength and employment.

Despite some challenges regarding science education — in particular disparities in basic science literacy and quality of science education, as well as gender imbalances in science education across countries and regions — the EU has a good basic education system ⁽³⁵⁾. A growing number of EU students **graduate from tertiary education in science and technology**.

Figure 2.7 shows how this trend has developed over the past years. Between 2008 and 2014 the number of tertiary graduates in science and technology grew by 25.5 %, from 14.5 graduates per 1 000 population aged 20 to 29 in 2008 to 18.2 graduates per 1 000 population in the same age group in 2014. The EU's international position has also improved constantly since 2003 and it is now outperforming Japan and the United States. However, the EU's progress in tertiary education needs to be interpreted with caution because the growth in the number of science and technology graduates might be somewhat overstated by the Bologna effect. This effect results from students who first complete a bachelor and then a master degree being counted twice as tertiary graduates. Furthermore, concerning the EU's global position, it should also be noted that the cohort size in the EU has developed less dynamically compared with the US. Therefore, the EU has seen a relatively less positive trend in the absolute number of graduates.

At Member State level the trend varies considerably (see Figure 2.7). In 2014, the number of science and technology graduates ranged from about 24.7 per 1 000 inhabitants in Ireland to 3.5 per 1 000 inhabitants in Luxembourg and 9.2 per 1 000 inhabitants in Cyprus. The very low ratio of science graduates in Luxembourg and Cyprus might be explained to a large extent by the number of students who pursue their studies abroad. This is because foreign graduates who return home following their studies tend to push up the ratio in the country where they studied and pull it down in their country of origin.

Figure 2.7: Tertiary graduates in science and technology, by country, 2008 and 2014 ⁽¹⁾
(Graduates per 1 000 population aged 20 to 29 years)



⁽¹⁾ 2008 data based on ISCED97; 2014 data based on ISCED 2011. Full title of the 2014 indicator 'Graduates in tertiary education, in science, math, computing, engineering, manufacturing, construction'.

⁽²⁾ 2013 data (instead of 2014).

⁽³⁾ Definition differs (2013).

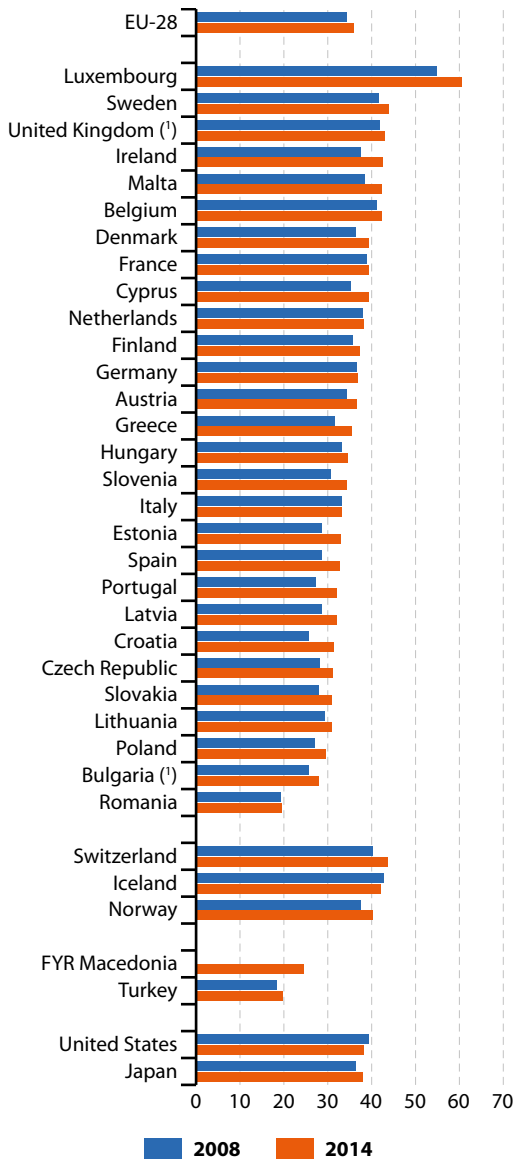
⁽⁴⁾ 2014 data are provisional and/or estimates.

⁽⁵⁾ Definition differs (2008).

Source: Eurostat (online data codes: tps00188 and educ_uoe_grad04)

⁽³⁵⁾ European Commission, *Europe 2020 Flagship Initiative Innovation Union*, SEC (2010) 1161, Brussels, 2011 (p. 11 and 36).

Figure 2.8: Employment rate in knowledge-intensive activities, by country, 2008 and 2014
(% of total employment)



(¹) Break in time series in 2008.

Source: Eurostat (online data code: [htec_kia_emp2](#))

(²) OECD, *Report on the Gender Initiative: Gender Equality in Education, Employment and Entrepreneurship*, Meeting of the OECD Council at Ministerial Level Paris, 25–26 May 2011 (p. 25).

(³) ISCED 1997 classifications used.

(⁴) Source: Eurostat, online data code: [rd_p_persocc](#).

(⁵) European Commission, *She Figures 2015. Gender in Research and Innovation. Statistics and Indicators. Preliminary results*, (p. 2).

All Member States, except Finland, Lithuania and Romania, have increased their science and technology graduation rates since 2008. Between 2008 and 2014, Malta and Cyprus more than doubled their rates, while the rate grew by more than 50 % in Austria, Slovenia, Spain and Hungary.

Empowering women in tertiary education and enhancing their employment opportunities in the R&D sector is also an essential part of the EU's research and innovation policy. Ensuring gender equality in any planned action and activities at all levels of research is one of the European Commission's main five priorities set out in the 2012 Communication 'A Reinforced European Research Area Partnership for Excellence and Growth' and is a key element of the Horizon 2020 programme. Improving gender equality in science education could promote research, innovation and ultimately long-term growth by increasing the number of scientists and engineers. It is also important for reducing occupational segmentation in the labour force and improving gender equity in the labour market ^(⁶).

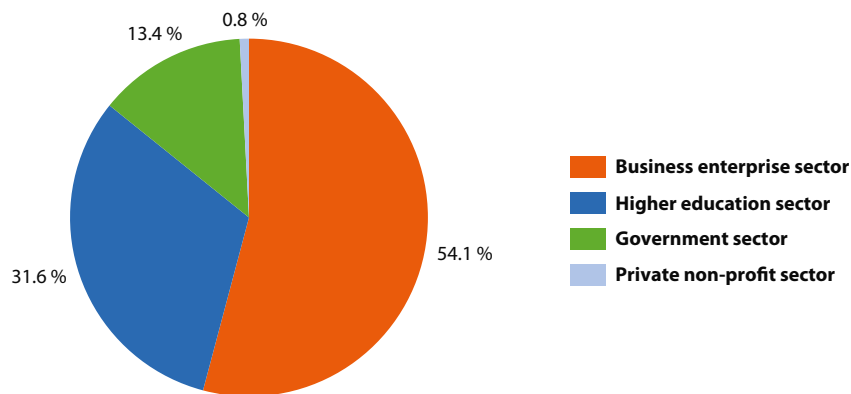
Despite the growth of female tertiary graduates in science over the past few years, women still engage in different fields of study than men and remain under-represented in science and technology fields in all Member States (see Figure 2.7). At the postgraduate level, the share of women in these fields declines further and yet again in the transition to the workplace. In 2012 women accounted for 47 % of top-level graduates (ISCED 6: post-graduate programmes above master's level ^(⁷)) and in 2013 they held only 35.5 % of total research positions ^{(⁸)(⁹)}.

HOW IS THE EU PERFORMING WITH REGARD TO EMPLOYMENT IN KNOWLEDGE-INTENSIVE ACTIVITIES?

The EU has been improving its academic tertiary education output. This has been complemented,

Figure 2.9: R&D personnel, by sectors of performance, EU-28, 2014 ⁽¹⁾

(%)

⁽¹⁾ Provisional data.Source: Eurostat (online data code: [rd_p_persocc](#))

to a varying extent, with national measures intended to attract a larger and more highly qualified workforce, including women, to science and research ⁽⁴⁰⁾. In the EU, **the number of people employed in knowledge-intensive activities** as a share of total employment increased slightly from 34.2% in 2008 to 35.9% in 2014. However, the United States and Japan, with rates of about 38%, are still outperforming the EU in this area.

As shown in Figure 2.8, progress in the EU has been uneven and substantial differences between Member States persist. While in 2014 Romania (19.5%), Bulgaria (27.8%) and Poland (29.6%) recorded relatively low employment rates in knowledge-intensive activities, Luxembourg (60.4%), Sweden (43.9%) and the United Kingdom (43%) had a share considerably above the EU average. Ireland, Belgium and Malta recorded almost the same rate, at about 42%.

As a general trend, between 2008 and 2014 the share of people employed in knowledge-intensive activities increased in all Member States (except for Italy, which maintained the same level). Countries where the share increased substantially

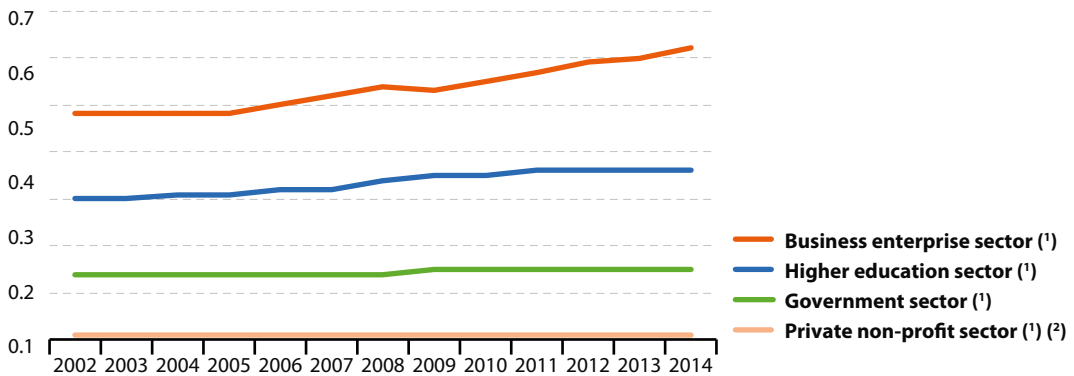
were Luxembourg and Croatia (5.7 percentage points each), followed by Ireland, Portugal, Estonia, Spain, Cyprus, Malta, Greece, Slovenia, Latvia, Denmark and the Czech Republic. All of these experienced a period of continuous relative growth of 3.0 to 5.0 percentage points.

However, it should be noted that a growing share of employment in knowledge-intensive activities might not necessarily indicate that a country is moving toward a more knowledge-based economy. It could also be a result of total employment decreasing faster than employment in knowledge-intensive activities. In fact, this is the case with countries such as Bulgaria, Greece, Spain, Italy, Lithuania, Latvia, the Netherlands, Romania and Finland, which in real terms experienced reductions in both total employment and in employment in knowledge-intensive activities between 2008 and 2014 ⁽⁴¹⁾.

Regarding gender, the female employment rate in total knowledge-intensive activities was 44% in 2014, exceeding the men's share in all countries ⁽⁴²⁾. However, only 13.3% of women were employed in EU knowledge-intensive business

⁽⁴⁰⁾ European Commission, *European Research Area, Facts and Figures for 2014*, Luxembourg, 2014 (p. 22).⁽⁴¹⁾ Source: Eurostat, online data codes: [lfsi_emp_a](#) and [htec_kia_emp2](#).⁽⁴²⁾ Source: Eurostat, online data code: [htec_kia_emp2](#).

Figure 2.10: Total R&D personnel by sectors of performance, EU-28, 2002–2014
(Full-time equivalents, % of the labour force)



(1) Data for 2002–2004 and 2008–2010 are estimates; 2014 data are provisional.

(2) Data for 2002–2013 are estimates.

Source: Eurostat (online data code: rd_p_perslf)

enterprises, compared with 14.5% of men, showing that more effort is needed to create an even gender balance.

At the EU level, **R&D personnel** — including researchers and other staff employed directly in R&D — constituted 1.27% of total employment in 2014. More than a half of R&D personnel (54.1%) were employed in the business enterprise sector (see Figure 2.9). The higher education sector was the second largest employer of R&D personnel (31.6%).

The EU is also committed to creating an attractive and open labour market for researchers. It has launched a series of policy initiatives for this purpose, including the [EURAXESS network](#), the ‘[Scientific Visa Directive](#)’, a [Human Resources Strategy for Researchers](#) based on the Charter and Code, the [Principles of Innovative Doctoral Training](#) and support for a [new pan-European supplementary pension fund for researchers](#) ⁽⁴³⁾.

Between 2002 and 2014 the share of R&D personnel in the labour force increased by 0.22 percentage points, from 0.92% to 1.14%. As shown in Figure 2.10, this trend was supported by growth in the share of R&D personnel in

three of the four institutional sectors. However, growth rates varied. In the business enterprise sector the share of R&D personnel grew by 0.14 percentage points over the same period, followed by the higher education sector in which the share grew by 0.06 percentage points. The share in the government sector increased by only 0.01 percentage points. In the private non-profit sector the share remained stable at 0.01%.

ICT CONNECTIVITY AND DIGITAL SKILLS ARE CENTRAL TO A KNOWLEDGE-BASED ECONOMY

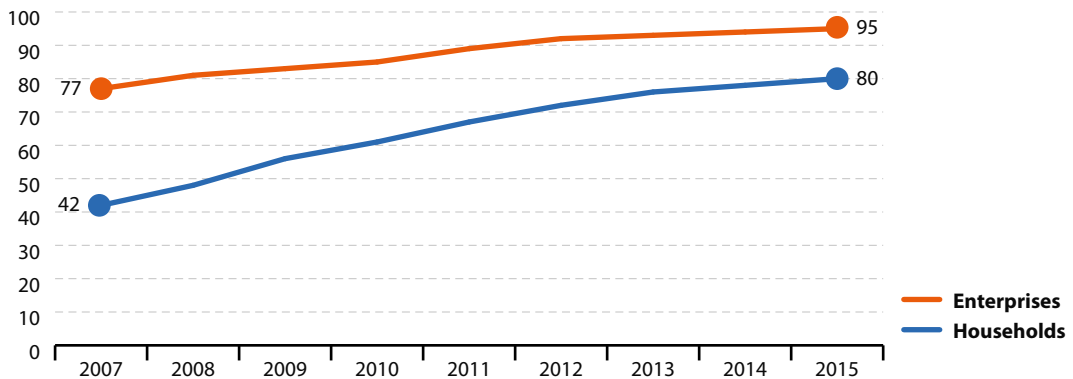
Information and communications technology (ICT) ⁽⁴⁴⁾ skills and knowledge are essential for developing an effective research and innovation system. In that sense, they are an important part of the skills base needed in today’s interactive and connected world.

Furthermore, ICT development and usage skills are an important driver of employment and R&D in the EU. The value added of the ICT sector, including information industries, accounted for around 4% of GDP in 2012 (see [Monitoring the Digital Economy](#)

⁽⁴³⁾ European Commission, [Researchers’ Report 2014](#), (p. 6).

⁽⁴⁴⁾ Information and communication technology (ICT) covers all technical means used to handle information and aid communication. This includes both computer and network hardware, as well as their software.

Figure 2.11: Households and enterprises with broadband internet access, EU-28, 2007–2015⁽¹⁾
(% of households and % of enterprises)



⁽¹⁾ Households with broadband access refers to households with at least one member aged 16 to 74; Enterprises with broadband access refers to enterprises with at least 10 people employed in the given NACE sectors.

Source: Eurostat (online data codes: tin00089 and tin00090)

and Society 2016–2021⁽⁴⁵⁾). In addition, in the same year the sector represented 2.8% of total EU employment and accounted for 19% of total R&D personnel in the labour force⁽⁴⁶⁾. In 2012, R&D intensity in the ICT sector amounted to 5.6%⁽⁴⁷⁾.

A series of high-level Europe 2020 initiatives address the issue of investment in digital technologies, in particular to increase the connectivity and ICT skills of businesses and citizens, and the free movement of knowledge between science and business.

Connectivity is addressed by the flagship initiative ‘Digital Agenda for Europe’⁽⁴⁸⁾⁽⁴⁹⁾, which contributes to the smart growth priority to boost citizens and businesses’ access to broadband. ICT skills are targeted by another flagship initiative, the ‘Agenda for new skills and jobs’⁽⁵⁰⁾. This facilitates the inclusive growth priority, supporting the improvement of e-skill levels in the labour force and the creation of jobs in the ICT sector overall. The flagship initiative ‘Innovation Union’⁽⁵¹⁾ called for the completion of the ERA by 2014, which

should optimise the circulation, access to and transfer of scientific knowledge including via digital ERA⁽⁵²⁾.

A large part of the EU population, however, still has poor digital literacy skills. This is holding back the large multiplier effect that ICT take-up has on innovations and productivity growth. These skills not only improve employability, they enhance societal learning, creativity, emancipation and empowerment.

BROADBAND INTERNET CONNECTIONS HAVE INCREASED SUBSTANTIALLY

Infrastructure availability is vital to diffusing the digital and knowledge-based economy into the very corners of society. Increasing [broadband internet access](#) for private and business use is an important enabling factor in this process.

The **share of households and businesses in the EU with broadband internet access** rose

⁽⁴⁵⁾ European Commission, *Monitoring the Digital Economy & Society*.

⁽⁴⁶⁾ European Commission, *Trends in European Research & Development in the EU 2015*, (p. 5 and p. 9).

⁽⁴⁷⁾ European Commission, *Trends in European Research & Development in the EU 2015*, (p. 7).

⁽⁴⁸⁾ European Commission, *A Digital Agenda for Europe*, COM(2010)245 final, Brussels, 2010.

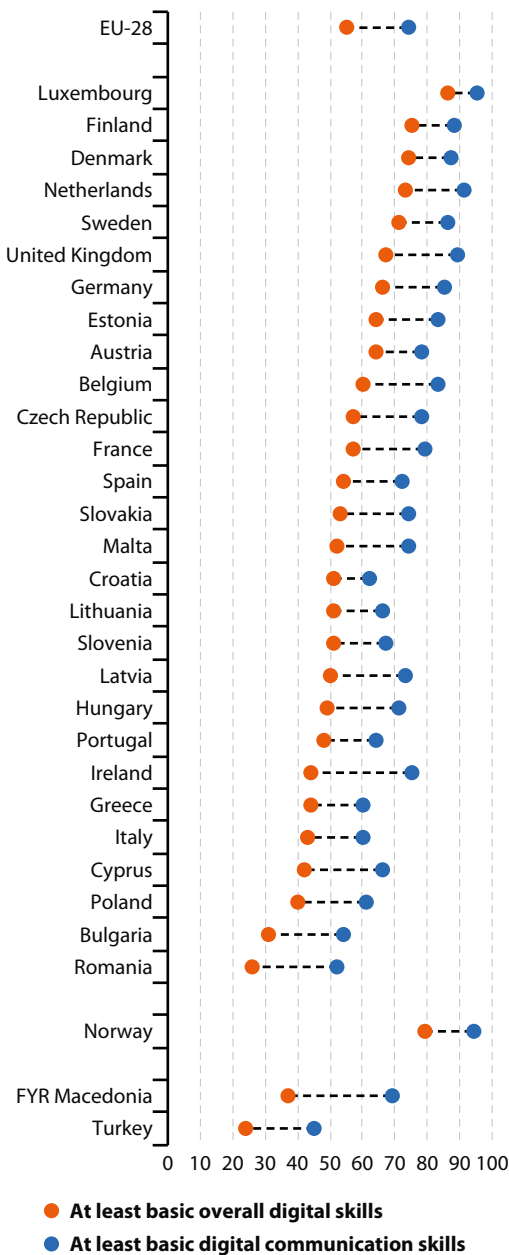
⁽⁴⁹⁾ See also: *Digital 'to-do' list: new digital priorities for 2013–2014*.

⁽⁵⁰⁾ European Commission, *An agenda for new skills and jobs*, COM (2010)682 final, Brussels, 2010.

⁽⁵¹⁾ European Commission, *Innovation Union, COM (2010) 546 final*, Brussels, 2010.

⁽⁵²⁾ European Commission, *European Research Area, Facts and Figures for 2013*, Luxembourg, 2013 (p. 23).

Figure 2.12: Individuals with at least basic overall digital skills and digital communication skills, by country, 2015
(% of individuals)



considerably between 2007 and 2015, helped by technological advances, wider network coverage and increased affordability. The share of enterprises with access to broadband internet connections increased by 18 percentage points over the same period, from 77 % to 95 %. At the same time, the share of households enjoying broadband access increased by 38 percentage points, from 42 % to 80 % (see Figure 2.11).

At the national level, the share of both households and enterprises with broadband internet access increased in all countries between 2007 and 2015. In 2015, the share of household connectivity exceeded the EU average in 12 Member States, with rates ranging from 81 % in Austria to 95 % in Luxembourg⁽⁵³⁾. The other 17 countries had lower access rates, from 59 % in Bulgaria to 79 % in Belgium. In general, the highest simple growth rates between 2007 and 2015 were mainly in eastern and southern Member States. Some of these, such as Greece and Romania, had access rates in 2015 that were more than nine and eight times higher than in 2007, respectively. In 2015, the share of enterprises with broadband access varied from 100 % in Lithuania, the Netherlands and Finland and 99 % in Denmark and Slovenia to 76 % in Bulgaria.

DIGITAL COMPETENCE IS STILL NOT WIDESPREAD IN THE EU

ICT has spread throughout different spheres of life, from education, workplace, leisure/entertainment, to communication, social interaction and health. People need at least a basic level of digital skills to be fully functional in the digital and knowledge-based society in terms of personal fulfilment and development, active citizenship, social inclusion and employment. However, Figure 2.12 shows that almost half of the EU population (45 %) could be considered to be insufficiently equipped with these skills.

The level of overall digital skills between Member States is still very dispersed, with the share of individuals with at least basic overall digital skills ranging between 86 % in Luxembourg and 26 %

Source: Eurostat (online data code: [isoc_sk_dskl_i](#))

⁽⁵³⁾ Source: Eurostat, online data codes: [tin00089](#) and [tin00090](#).

in Romania (see Figure 2.12). Nordic countries have some of the most digitally literate citizens, but a number of other countries exceed the EU average for basic digital skill levels, including Luxembourg, the Netherlands, the United Kingdom, Germany, Estonia, Austria, Belgium, France, the Czech Republic and France. At the other end of the spectrum, a relatively large share of the population in eastern and southern Member States shows limited digital skills. In 10 Member States only 50 % or less of the population report that they have basic digital skills. In Romania and Bulgaria, 74 % and 69 % of the population, respectively, report to have no or limited digital competence.

Digital communication skills are equally important for being able to thrive in a technological, global environment. As Figure 2.12 shows, in 2015 the **share of individuals with at least a basic level of digital communication skills** in the EU surpassed that of individuals with at least basic overall digital skills — 74 % versus 55 %. In all Member States digital communication skills

were more prevalent among the population compared with overall digital skills. Not surprisingly, countries that rank high on overall digital competence also lead the ranking of basic digital communication skills. Almost the whole population of Luxembourg (95 %) reports basic digital communication skills, followed by the Netherlands (91 %) and the United Kingdom (89 %). Basic digital communication competence in Nordic countries is again above the EU average as it is in Germany, Estonia, Austria, Belgium, the Czech Republic and France. Although southern and eastern Member States again report lower levels of digital communication skills, the shares of people with digital communication literacy in all countries are above 50 %. An interesting case in point is Ireland, in which the share of individuals with basic digital communication skills is slightly above the EU average, but the overall level of basic digital skills is below the average. In Romania, the share of people with digital communication skills (52 %) is twice that of individuals with basic digital skills (26 %).

How are businesses bringing innovation and good ideas to the market?

The EU has become more innovative, with almost half of companies having reported innovation activity in 2012. Sweden, Denmark, Finland and Germany ranked as 'innovation leaders' in 2014.



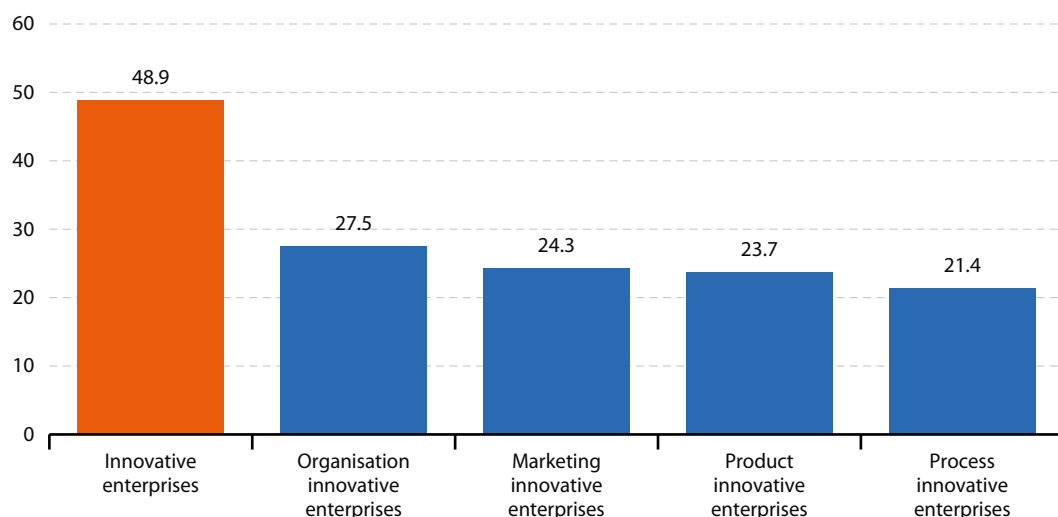
The number of patent applications in the EU increased between 2002 and 2007 but growth was interrupted by the economic turmoil in 2008.

Exports of high-tech products to outside the EU have recovered since the global economic crisis, increasing by more than 40 % between 2009 and 2014.

A dynamic business environment is essential for the promotion and diffusion of innovations. The challenge is to make use of R&D through entrepreneurship and creativity to trigger innovation and economic competitiveness. Therefore, measures targeting knowledge diffusion and absorption of ideas and innovations, for example, through the creation of technology markets and licensing schemes, are just as important as investment in knowledge generation (see Box 2.5, page 81). The higher the uptake and use of ideas from R&D, the more likely those innovative players are to invest in future knowledge generation through increased private R&D expenditure. Innovators also help to create a more dynamic system. In many cases they contribute to the structural and technological changes needed to adapt to new circumstances and challenges. An example is the depletion of

Figure 2.13: Enterprises by type of innovation, EU-28, 2012

(% of the total number of enterprises)



Source: Eurostat (online data code: inn_cis8_type)

Box 2.4: Types of innovation

Innovation is a broad concept that encompasses the capacity of a company, economy or society to adapt to changing environments and circumstances. As outlined in the Community Innovation Survey 2012⁽⁵⁴⁾ and the [Oslo Manual](#)⁽⁵⁵⁾ it comprises a variety of aspects:

- **Product innovation:** introduction of new or significantly improved goods or services.
 - **Process innovation:** significant changes in production and delivery methods.
 - **Organisational innovation:** changes in the way business or manufacturing practices are organised.
 - **Marketing innovation:** the introduction of new marketing methods (concept or strategy).
- Other innovation types, elaborated in a [Commission staff working document](#)⁽⁵⁶⁾, may include:
- **User-driven innovation:** innovation that draws heavily on knowledge inputs from customers and markets.
 - **Open innovation:** changes in the way companies and other organisations access and exploit knowledge to innovate.
 - **Social innovation:** innovations in the way society organises itself, especially the different ways that the public sector serves the needs of society.

⁽⁵⁴⁾ See the results of the Community Innovation Survey 2012 in the Eurostat database, online data code: inn_cis8_type.

⁽⁵⁵⁾ OECD and Eurostat, *Oslo Manual. Guidelines for Collecting and Interpreting Innovation Data*, Third Edition, Paris, 2005 (p. 1 onwards).

⁽⁵⁶⁾ European Commission, *Commission staff working document — A rationale for action accompanying the Europe 2020 Flagship Initiative Innovation Union*, SEC (2010) 1161 final, Brussels, 2010 (p. 6).

fossil fuels and the resulting transition towards more renewable energy sources.

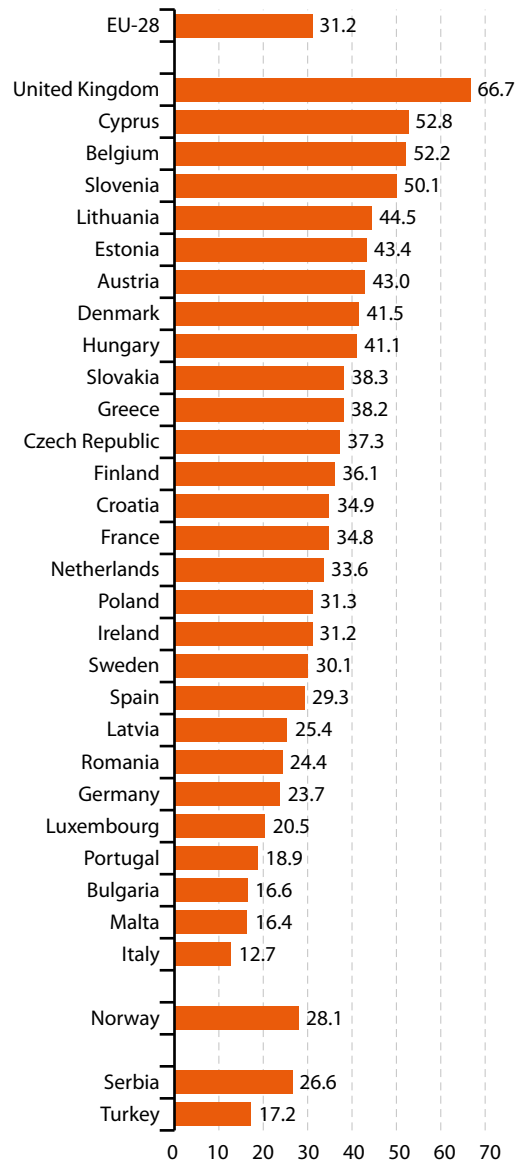
Significant progress in achieving knowledge diffusion and absorption is measured through growth in the number of innovative firms, the amount of venture capital investment, the export of high-tech products and the number of patent applications, especially those related to high-tech products and societal challenges such as [climate change](#).

ALMOST HALF OF EU ENTERPRISES CONTRIBUTE TO INNOVATION ACTIVITY

An analysis of business innovativeness reveals that almost half of the EU's enterprises reported innovation activity in 2012 (see Figure 2.13). At country level, Germany (66.9%) and Luxembourg (66.1%) rank first in this respect, both having a **share of innovative enterprises** substantially above the EU average of 48.9%. These are followed by Sweden (55.9%), Ireland (58.7%), Italy (56.1%) and Belgium (55.6%) ⁽⁶⁷⁾. Innovative companies can be distinguished by the type of innovation they pursue. Figure 2.13 shows how different business strategies lead to different innovation types such as product and/or process as well as organisational and/or marketing innovation (see Box 2.4).

Innovation co-operation is an important determinant of enterprises' innovation activity, productivity and growth. It measures the level of active participation with other enterprises or institutions on innovation activities, where both partners do not need to commercially benefit. Nearly a third (31.2%) of EU enterprises that have developed and introduced product and process innovations were engaged in innovation co-operation in 2012. As Figure 2.14 shows, the highest share of co-operative enterprises were recorded in the United Kingdom (66.7%), Cyprus (52.8%) and Belgium (52.2%) and the lowest in Italy (12.7%), Malta (16.4%) and Bulgaria (16.6%).

Figure 2.14: Innovative enterprises engaged in any type of co-operation, by country, 2012
(% of product and/or process innovative enterprises)



Source: Eurostat (online data code: [inn_cis8_coop](#))

⁽⁶⁷⁾ Eurostat. Online data code: [inn_cis8_type](#).

INNOVATION PERFORMANCE HAS IMPROVED IN MOST MEMBER STATES

According to the Innovation Union Scoreboard, which provides a comparative assessment of the research and innovation performance of Member States using a composite indicator, the EU has become more innovative in recent years. The EU-28 **innovation index** has increased from 0.519 in 2007 to 0.555 in 2014 ⁽⁵⁸⁾. As a result the EU has decreased its innovation gap with two global innovation leaders — the United States and Japan — although the gap with the top innovator, South Korea, has been widening ⁽⁵⁹⁾.

In 2014, the improvement in innovation performance for the EU at large had stalled compared with the previous year. This was mainly due to a decrease in innovation activities as measured by the Community Innovation Survey ⁽⁶⁰⁾. A delayed negative effect of the economic crisis on business activities may also help explain this decline in innovation performance.

While innovation performance improved for most Member States between 2007 and 2014, differences are still high and are diminishing only slowly. Some convergence was observed in 2011, 2013 and in particular 2014 ⁽⁶¹⁾.

The measurement framework of the Innovation Union Scoreboard provides a holistic picture of Member States' innovation performance by distinguishing between three main types of indicators: innovation performance drivers external to the firm (enablers), innovation efforts at the level of the firm (firms' activities) and the effects of firms' innovation activities (outputs). These are composed of eight innovation dimensions, capturing in total 25 different indicators. Based on the average innovation performance, countries are classified into four distinct groups: innovation leaders, innovation

followers, moderate innovators and modest innovators.

The overall ranking within the EU remains relatively stable. With performance well above the EU average, Sweden, Denmark, Finland and Germany are classified as the four 'innovation leaders'. These countries show excellent performance on all dimensions of the composite innovation index: from research and innovation inputs, through business innovation activities up to innovation outputs and economic effects, reflecting a balanced national research and innovation system ⁽⁶²⁾.

At the other end of the scale, in the group of 'modest innovators', with performance well below the EU average, are three eastern Member States: Bulgaria, Latvia and Romania. In between are two large groups of 13 'moderate innovators' with performance below the EU average and eight 'innovation followers' with performance above or close to the EU average (see Figure 2.15).

The fastest growth in innovation performance since 2007 has been observed among innovation followers, moderate and modest innovators. In particular, Latvia, Bulgaria and Malta have shown the most improvement over the past few years. However, innovation performance has not improved in a few Member States. Innovation leader Finland, innovation follower Luxembourg and moderate innovator Greece just managed to maintain positive annual average growth rates, while average annual growth rates in Cyprus, Spain and Romania were negative.

Most progress in innovation performance made by EU countries between 2007 and 2014 is the result of an increase in the openness and attractiveness of the EU research system, the improvement in human resources and the growth in intellectual assets. However, according to the [Innovation Union Scoreboard 2015](#) ⁽⁶³⁾ the growth

⁽⁵⁸⁾ European Commission, *Innovation Union Scoreboard 2015*, 2015 Brussels (p. 92).

⁽⁵⁹⁾ European Commission, *Innovation Union Scoreboard 2015*, Brussels, 2015 (p. 6).

⁽⁶⁰⁾ The CIS is a survey of innovation activity in enterprises. The harmonised survey is designed to provide information on the innovativeness of sectors by type of enterprises, on the different types of innovation and on various aspects of the development of an innovation, such as the objectives, the sources of information, the public funding and the innovation expenditures.

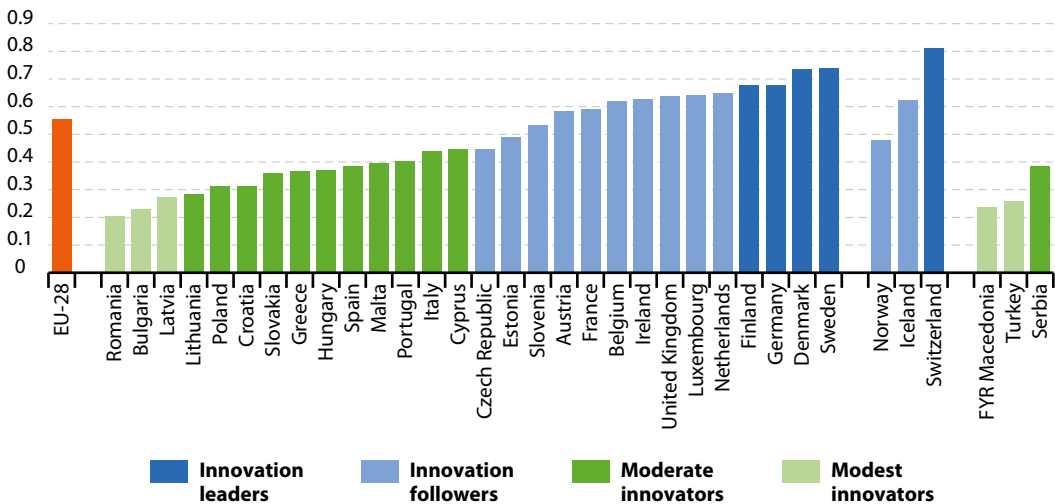
⁽⁶¹⁾ European Commission, *Innovation Union Scoreboard 2015*, 2015 Brussels (p. 18).

⁽⁶²⁾ European Commission, *Innovation Union Scoreboard 2015*, 2015 Brussels (p. 4).

⁽⁶³⁾ European Commission, *Innovation Union Scoreboard 2015*, Brussels, 2015 (p. 30).

Figure 2.15: Innovation performance, by country, 2014 ⁽¹⁾

(Index)



⁽¹⁾ The Innovation Union Scoreboard analyses the innovation system of EU Member States through a set of 25 indicators broken down into eight dimensions looking at human resources, research systems, finance and support, firm investments, linkages and entrepreneurship, intellectual assets, innovators and economic effects. In the resulting summary innovation index Member States are classified into four groups, based on their average innovation performances: 'innovation leaders' have an innovation performance well above the EU average, 'innovation followers' comprises countries whose performance is above or close to the EU average, 'moderate innovators' perform below the EU average, and 'modest innovators' perform well below the EU average.

Source: European Commission, *Innovation Union Scoreboard 2015*, Brussels, 2015

of public R&D expenditure over the past few years has been offset by a continuous fall in venture capital investment and a declining share of SMEs that introduced product or process innovations, or marketing or organisational innovations (see also indicators on R&D expenditure, venture capital investment and patent applications).

NORTHERN EUROPEAN MEMBER STATES ARE LEADERS IN ECO-INNOVATION

Eco-innovation, as all other types of innovation brings a new (radical innovation) or significantly improved (incremental innovation) product, which can be a good or service, to the market or implements a new solution in the production or organisational processes of a company ⁽⁶⁴⁾. Eco-innovation reduces the use of natural resources

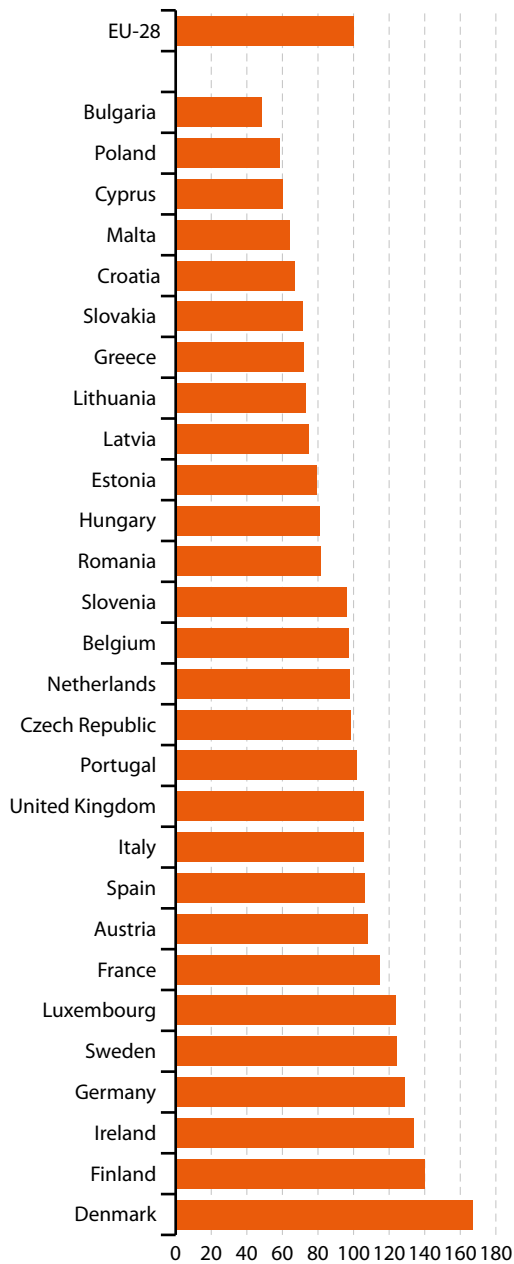
and decreases the release of harmful substances across the whole life cycle, bringing economic, social and environmental benefits. Environmental benefits include improved resource productivity, in particular better material and energy efficiency, lower greenhouse gas (GHG) emissions and reduced waste generation, which is beneficial for companies and end users. Measuring eco-innovation performance helps to assess whether the EU and its Member States are moving towards smart and sustainable growth, as requested by the Europe 2020 strategy.

The **Eco-Innovation Scoreboard (Eco-IS)** ⁽⁶⁵⁾ assesses and illustrates eco-innovation performance across the 28 Member States. The Eco-IS shows how well individual countries perform in different dimensions of eco-innovation compared with the EU average. It is based on 16 indicators grouped into five thematic areas:

⁽⁶⁴⁾ Eco-innovation Observatory, *Introducing eco-innovation: from incremental changes to systemic transformations*, 2011.

⁽⁶⁵⁾ Eco-Innovation Scoreboard on the Eco-Innovation Observatory website: http://www.eco-innovation.eu/index.php?option=com_content&view=article&id=2&Itemid=34

Figure 2.16: Eco-innovation index, by country, 2015
(Index EU-28=100)



Source: European Commission, Eco-Innovation observatory
(online data code: t2020_rt200)

(66) Detailed data is available in the database at: <http://ec.europa.eu/environment/eco-innovation/>

eco-innovation inputs, eco-innovation activities, eco-innovation outputs, resource efficiency and socio-economic outcomes. The index ranks Member States in relation to the EU average of 100.

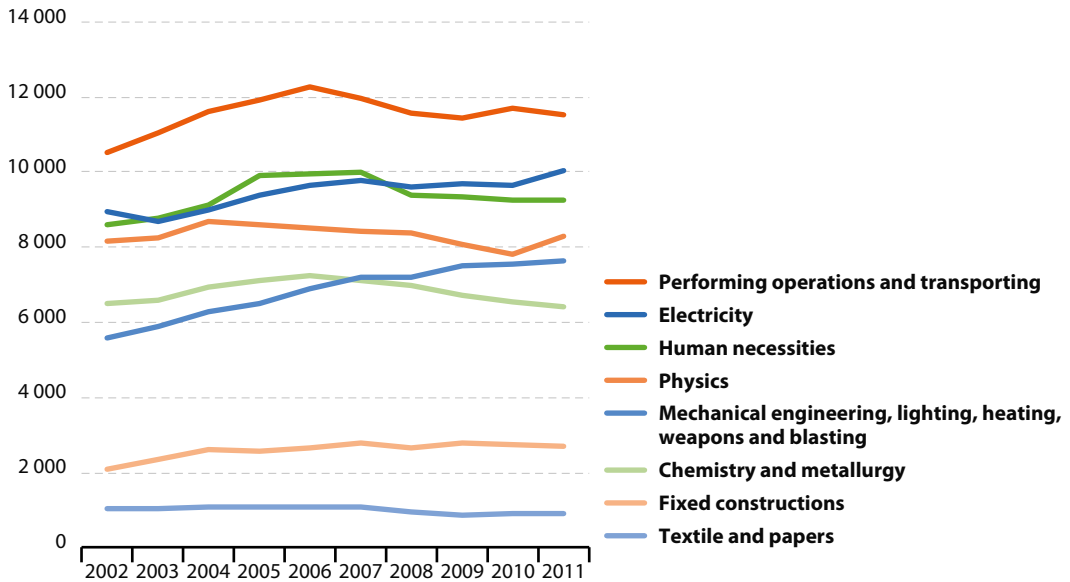
According to the eco-innovation index, in 2015 the overall performance of EU countries ranged from around 50 in Bulgaria to almost 130 or more in Denmark, Finland, Ireland and Germany. The latter countries, with the exception of Ireland, also belonged to the innovation leaders in the Innovation Union Scoreboard in 2014 (see Figure 2.16). The majority of EU-15 countries can be found at the top, particularly Scandinavian countries, but also Ireland, Germany, Luxembourg, France, Austria, Spain, Italy, the United Kingdom and Portugal. Most of these countries have persistently shown an index value above the EU average over the six-year period for which the data is available (2010 to 2015). Less well performing in terms of the eco-innovation index are Member States in eastern and southern Europe.

A few Member States have improved their ranking since 2014 — the Czech Republic, Finland, Lithuania, Malta and Romania gained two places while Austria, Denmark, Estonia, Germany, Italy, Latvia, Slovakia and Sweden gained one place each. However, the ranking was less favourable for Croatia, which lost seven places, and Luxembourg, which fell five places in one year ⁽⁶⁶⁾.

HOW ARE EU SECTORS PERFORMING WITH REGARD TO NEW PATENT APPLICATIONS?

The more cutting-edge knowledge that is produced, the more likely it will spill over into new products and private R&D activities. In this regard, patents provide a valuable measure of the exploitation of research results and of the inventiveness of countries, regions and companies. Patent development has a strategic role in supporting Europe 2020. Bringing innovative ideas on to the market through patenting helps improve EU's competitiveness and productivity — which underlie economic

Figure 2.17: Patent applications to the European Patent Office (EPO) by priority year by international patent classification (IPC) sections and classes, EU-28, 2002–2011 (number)



Source: Eurostat (online data code: pat_ep_nipc)

Box 2.5: Relationships between R&D, innovation and patents

Patents are legal instruments that encourage companies to innovate by conferring some exclusive rights to inventors or assignees in return for the disclosure of an invention.

According to literature ⁽⁶⁷⁾, a company's propensity to file patents is influenced by three factors: R&D efforts, strategic considerations and the competitive environment. One of the trade-offs for filing a patent application is that it excludes other parties from using the invention, unless permitted by the patent holder, and therefore limits its diffusion into society ⁽⁶⁸⁾.

Since the 1990s, a trend of increased propensity to patent without a corresponding growth in R&D expenditure has been experienced in the EU and the United States. This trend reflects an increase in R&D productivity.

Next to patent development, the extent to which patents are actually used for economic and societal purposes remains of major importance. Licensing has largely been used to alleviate the risk that innovations are not used and are patented for reasons other than increasing productivity and further innovation (for example, guaranteeing protection from rivals) ⁽⁶⁹⁾.

⁽⁶⁷⁾ Harhoff, D., Hall, B.H., von Graevenitz, G., Hoisl, K., Wagner, S., Gambardella, A. and Giuri, P., *The strategic use of patents and its implications for enterprise and competition policies*, Final Report to DG Enterprise, July 8, 2007 (p. 7).

⁽⁶⁸⁾ Gambardella, A., Giuri, P. and Mariani, M., *Study on evaluating the knowledge economy: what are patents actually worth? The value of patents for today's economy and society*, Project ETD/2004/IM/E3/77 for DG Internal Market, 2006 (p. 28 and 31).

⁽⁶⁹⁾ Gambardella, A., Giuri, P. and Mariani, M., *Study on evaluating the knowledge economy: what are patents actually worth? The value of patents for today's economy and society*, Project ETD/2004/IM/E3/77 for DG Internal Market, 2006 (p. 28 and 31).

growth and employment —and brings long-term benefits to the economy at large through the wide diffusion of knowledge.

Between 2002 and 2007, **total patent applications** in the EU increased almost continuously until the global economic and financial crisis started to emerge in 2008. After peaking in 2007, EU patent applications fell by 4% between 2007 and 2010.

The trend with total patent filings at the EU level is to a large extent reflected by development in the individual sectors as outlined in Figure 2.17. Of the eight main patent sub-sectors, the smallest — the textile and papers sector — has been hit the hardest, with patent applications dropping by almost 20% between 2007 and 2010. A similar trend can be observed in the chemistry and metallurgy sector (–8%). The human necessities, performing operations, transporting and fixed constructions and physics and electricity sectors have been affected to a lesser degree (varying between –7% and –1%). In 2011, patent applications stabilised or started

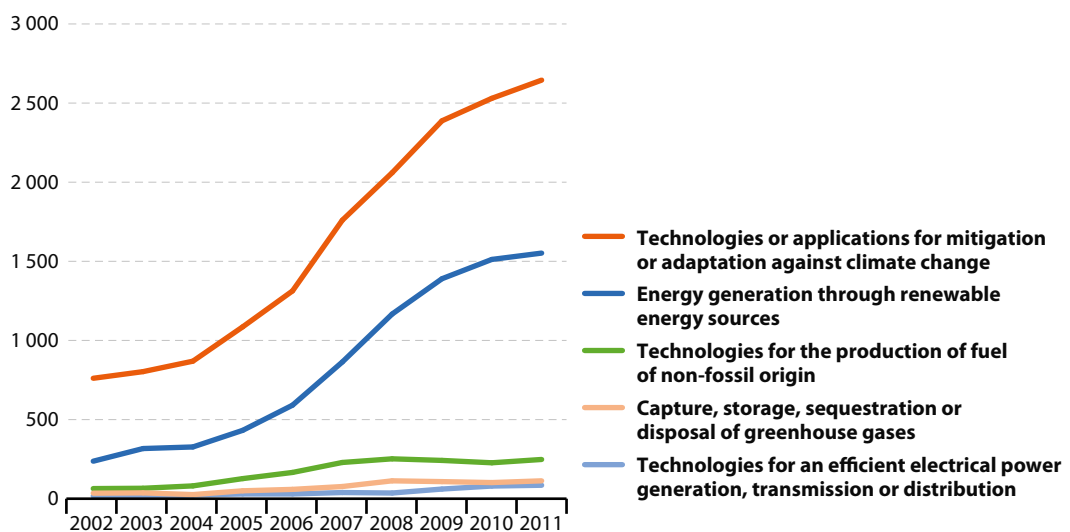
increasing gradually in almost all sectors apart from performing operations and transporting, chemistry and metallurgy, and fixed constructions, where they decreased slightly. However, in the next year all sectors experienced a strong reduction, varying between 15% in physics and 24% in chemistry and metallurgy. This was also reflected in the 19% drop in total patent filings in that time period.

CLIMATE CHANGE PATENTS HAVE BEEN EQUALLY HIT BY THE CRISIS

The EU focuses its investment strategies towards innovation-oriented sectors that help address some of society's most pressing challenges. To this end, the EU plays a leading role in developing climate change mitigation and adaptation technologies, accounting for 40% of all world patent applications in this field ⁽⁷⁰⁾.

Figure 2.18 shows EU **patent applications in the field of climate change mitigation and adaptation**. Similar to total patent applications, this sector did not escape the financial and

Figure 2.18: Patent applications of technologies or applications for mitigation or adaptation against climate change, EU-28, 2002–2011 (number)



Source: Eurostat (online data code: [pat_ep_nrg](#))

⁽⁷⁰⁾ European Commission, 2011, *Innovation Union Competitiveness Report 2011*, Brussels (p. 416).

economic crisis. The EU's patent sector for climate change mitigation and adaptation grew rapidly between 2002 and 2009, at an annual average rate of 17.7%. Over the next two years, patent applications continued to rise but much more slowly (5.4%). This slowdown might be due to companies reducing R&D expenditure, which would indirectly affect patentable inventions, organisations postponing some applications because of cost-saving or risk aversion ⁽¹⁾, or it might be a result of a saturation effect.

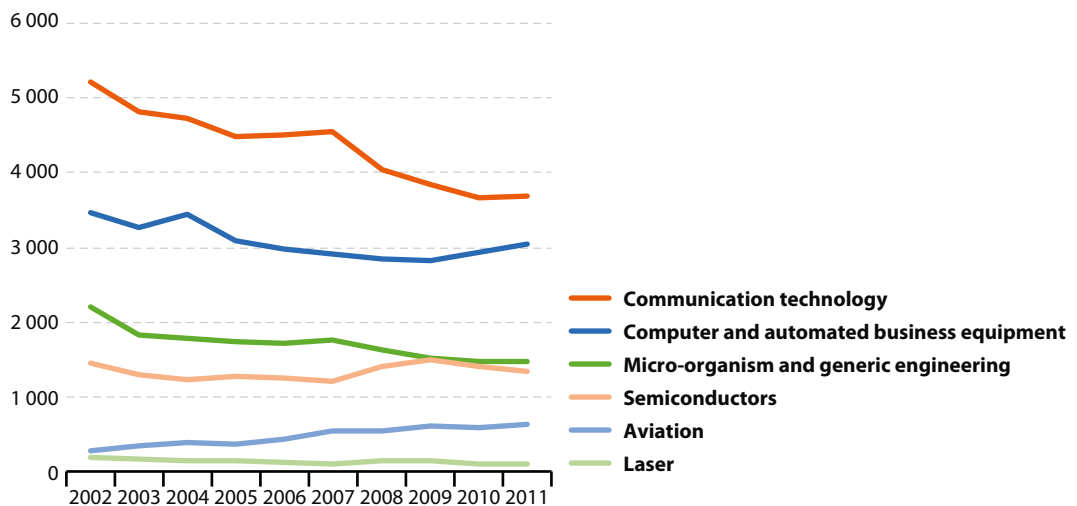
The 'capture, storage, sequestration or disposal of greenhouse gases' and the 'production of fuel of non-fossil origin' sectors, which account for only 4% and 9% of total climate change mitigation and adaptation patents, respectively, experienced a reduction. Patent applications in both sectors dropped by nearly 9% between 2008 and 2010 before rising again in 2011. The 'electrical power generation, transmission or distribution' sector was also affected, with the number of patent filings falling by 8% in 2008 before rising sharply in the following three years.

THE NUMBER OF HIGH-TECH PATENT APPLICATIONS HAS FALLEN IN MOST SECTORS

Increased specialisation of countries in the production of medium and high-tech products is an important characteristic of a knowledge-based economy, which reflects the economic effect of innovation. High-tech production is a key driver of economic growth, productivity and welfare, and is generally a source of high value added and well-paid jobs. For this reason it is important for many of the priority areas of Europe 2020 strategy.

As shown on Figure 2.19, within the high-tech sector, communication technologies hold the highest share of patent filings (38% in 2011), followed by computer and automated business equipment (31%). This is not surprising as ICT is a key enabler for the development of most other economic sectors. The **number of high-tech patents** in the EU has been falling almost continuously, by an annual average rate of 2%, since 2002. The number of patents in the laser sub-sector, which is the smallest sub-sector within

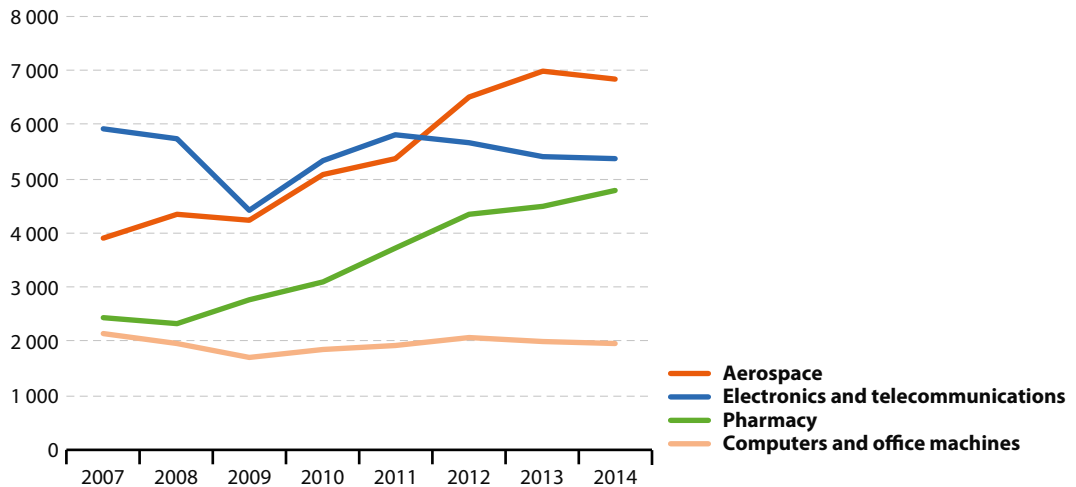
Figure 2.19: High-tech patent applications to the European Patent Office (EPO) by priority year, EU-28, 2002–2011 (number)



Source: Eurostat (online data code: pat_ep_ntec)

⁽¹⁾ Fraunhofer, *Patent Applications — Structures, Trends and Recent Developments 2013*, Berlin, 2014. (p. 2).

Figure 2.20: Exports of high-tech products by product group, EU-28, 2007–2014
(EUR million)



Source: Eurostat (online data code: [htec_trd_group4](#))

the high-tech sector of the international patent classification (IPC), fell the most, by almost 50 % between 2002 and 2011. Among all high-tech patents in the IPC, only the number of patents for aviation increased during this period, more than doubling in number over the course of one decade.

HIGH-TECH EXPORTS HAVE RECOVERED ON THE INTERNATIONAL MARKET

Beyond turning research results into tangible applications, innovative businesses compete globally to sell their high-tech products on the world market. By bringing good ideas to the market, businesses contribute to innovation-related trade, for example, in high-tech goods, for the benefit of an economy's balance of trade. Since **high-tech trade** is associated with high value added for the economy and knowledge-intensive and well paid jobs, it contributes to

Europe 2020's priorities for smart and inclusive growth. Even though only 13 % of the EU's small and medium enterprises (SMEs) were active in markets outside the EU in 2009, these exporters showed greater employment growth and innovation than non-exporters, according to a [European Commission Staff working document](#) ⁽⁷²⁾.

During 2008 and 2009 total EU high-tech exports to outside the EU fell. However, after the sharp drop in 2009 they quickly recovered and by 2014 had increased continuously by more than 42.5 %. Similar trends can be observed at sector level. The economic crises led to reductions in all high-export sectors between 2008 and 2009, with the exception of pharmacy which grew by 19 %. Since the recovery from the economic crisis, the aerospace and pharmacy sectors have been the main drivers behind the EU's high-tech exports, growing by more than 60 % between 2009 and 2014 (see Figure 2.20).

⁽⁷²⁾ European Commission, *Commission staff working document — A rationale for action accompanying the Europe 2020 Flagship Initiative Innovation Union*, SEC(2010) 1161 final, Brussels, 2010 (p. 73).



Outlook towards 2020

The Europe 2020 strategy tries to overcome the economic crisis and its impacts by addressing the shortcomings of the EU's growth model. It also attempts to create the conditions for 'smarter' growth through more effective investment in education, research and innovation. However, R&D intensity is expected to remain below the 3% objective that the EU has set itself for 2020. In 2014 it was at 2.03% and had shown only limited progress over time. According to the latest projections, and if current reforms and financial efforts continue, investment in R&D is forecast to rise to 2.2% by 2020 ⁽⁷³⁾. More rapid progress towards the 3% target would require a faster structural shift to more knowledge-based economic activities. This share could reach 2.6% if Member States meet their national targets. However, progress towards these is uneven, with targets ranging from 0.5% to 4.0% of GDP. In 2014, Denmark and the Czech Republic ⁽⁷⁴⁾ had already met their respective national targets, while Cyprus and Germany came very close, with a gap of 0.05 and 0.16 percentage points, respectively, to be closed by 2020.

Besides context-specific factors that influence R&D investment, the distance to the EU target can be ascribed to various challenges that have not been fully overcome by the actions and instruments put in place. These instruments aim to foster private investment in R&D and to maintain and promote public funding of R&D despite the crisis.

The 'Innovation Union' flagship initiative is one of the most prominent EU policy instruments. It places renewed emphasis on public sector intervention to stimulate the private sector and remove bottlenecks to enable EU's scientific expertise to be converted into marketable goods and services. More specifically the flagship

initiative puts emphasis on the challenges facing our society, such as climate change.

Delivery of the actions set out in 'Innovation Union' is on track, but with various levels of implementation. In particular, the initiative has not succeeded in closing the innovation performance gaps between EU countries. However, it has reduced the gap between the EU and its main competitors ⁽⁷⁵⁾.

Between 2014 and 2020, the 'Innovation Union' will be implemented through financial support provided by Horizon 2020 (see Box 2.2) — the EU's current framework programme for research and innovation.

With EUR 74.8 billion of funding available for the next seven years, Horizon 2020 will namely finance the further development of the ERA which is at the heart of Europe 2020 and 'Innovation Union'. The ERA has been designed to create attractive conditions for carrying out research and investing in R&D-intensive sectors.

Another policy instrument is the 'Digital agenda for Europe' flagship initiative which aims to unleash the digital potential and diffuse the digital culture widely across the EU through a set of more than 100 actions. 90% of these had been completed or were on track in January 2014. The flagship initiative has increased political focus on the digital economy while also strengthening the use of the internet, development of e-commerce, availability of e-government services and accessibility of basic broadband internet connections in most of the EU ⁽⁷⁶⁾.

Complementing these initiatives, in 2015 the European Commission adopted an ambitious strategy to complete the Digital Single Market by addressing existing regulatory and market

⁽⁷³⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, Brussels, 2014 (p. 12).

⁽⁷⁴⁾ The R&D target for the Czech Republic refers to government R&D expenditure only.

⁽⁷⁵⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM (2014) 130 final — Annexes 1 to 3, Brussels, 2014 (p. 32).

⁽⁷⁶⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM (2014) 130 final — Annexes 1 to 3, Brussels, 2014 (p. 33).



barriers ⁽⁷⁷⁾. The Digital Single Market is defined as a market ‘in which the free movement of goods, persons, services and capital is ensured and where individuals and businesses can seamlessly access and exercise online activities under conditions of fair competition, and a high level of consumer and personal data protection, irrespective of their nationality or place of residence’.

The Digital Single Market Strategy is built on three pillars: better access for consumers and businesses to online goods and services across the EU; creating the right conditions for digital networks and services to flourish, and maximising

the growth potential of our European Digital Economy. Some of the main objectives envisioned by the strategy are to conclude negotiations on common EU data protection rules; give more ambition to the ongoing reform of telecoms rules; modify copyright rules to reflect new technologies, and to make them simpler and clearer; simplify consumer rules for online purchases; and make it easier for innovators to start their own business. It is expected that a fully functional Digital Single Market would promote innovation, contribute EUR 415 billion per year to the EU economy and create many new jobs ⁽⁷⁸⁾.

⁽⁷⁷⁾ European Commission, *A Digital Single Market Strategy for Europe*, COM (2015) 192 final, Brussels, 2015.

⁽⁷⁸⁾ European Commission, *A Digital Single Market Strategy for Europe*, COM (2015) 192 final, Brussels, 2015 (p.3).

3

Climate change and energy



Climate change and energy — why do they matter?

By changing weather patterns, redrawing coastlines and degrading natural ecosystems, unchecked climate change threatens to erode the foundations on which modern society is built.

To avoid dangerous levels of warming, the international community, including the EU, committed to limiting the mean global temperature rise to well below 2°C above pre-industrial levels and to drive efforts to limit the increase even further to 1.5°C. This agreement was signed at the UNFCCC 21st Conference of the Parties (COP 21) in 2015 in Paris ⁽¹⁾. A target of 2°C had already been agreed on in 2009 at COP 15 in Copenhagen ⁽²⁾.

Europe 2020 strategy targets on climate change and energy

The Europe 2020 strategy sets three objectives for climate and energy policy, to be reached by 2020 ⁽³⁾:

- Reducing GHG emissions by at least 20% compared with 1990 levels;
- Increasing the share of renewable energy in final energy consumption to 20%; and
- Moving towards a 20% increase in energy efficiency.

These targets are also known as the '20-20-20' targets. The Europe 2020 strategy's three climate and energy targets are interrelated and mutually support one another.

To contribute to this global goal, the EU has pledged to continually reduce the amount of greenhouse gases (GHGs) it emits. Towards this objective it has committed to reduce GHG emissions by 80–90% by 2050 compared with 1990 levels.

Focusing on the most important GHG, carbon dioxide (CO₂), the Europe 2020 strategy aims to turn the EU into a so-called 'low carbon economy' based on renewable energy sources and energy efficiency. CO₂ is the most prevalent GHG, accounting for 82% of the EU's total GHG emissions in 2013 (not including emissions from land use, land use change and forestry (LULUCF)) ⁽⁴⁾. Other GHGs include nitrous oxide, methane and fluorinated gases. The aggregate of GHGs is often measured in CO₂ equivalents to make the data comparable. In addition to mitigating climate change, climate and energy policies also have further environmental and health benefits, by helping to reduce air pollution and the health risks it poses. This lowers health costs and increases well-being, particularly in cities.

The transition towards a low-carbon economy is not only a strategy to prevent catastrophic climate change. Climate and energy policies contribute to the core objective of the Europe 2020 strategy ⁽⁵⁾ of enabling sustainable growth. A push for renewable energy and energy efficiency — two key levers for reducing emissions — can spur innovation and create jobs. Therefore, the EU's '20-20-20' targets are also interlinked with other Europe 2020 goals, in particular those for research and development (R&D) and employment.

The EU can become a lead market in fields with high global demand. Creating demand for ever-better green products while boosting innovation and export strength in the growing global market

⁽¹⁾ United Nations Framework Convention on Climate Change, *Paris Agreement*, Paris, United Nations, 2015.

⁽²⁾ United Nations Framework Convention on Climate Change, *Copenhagen Accord*, Copenhagen, United Nations, 2009.

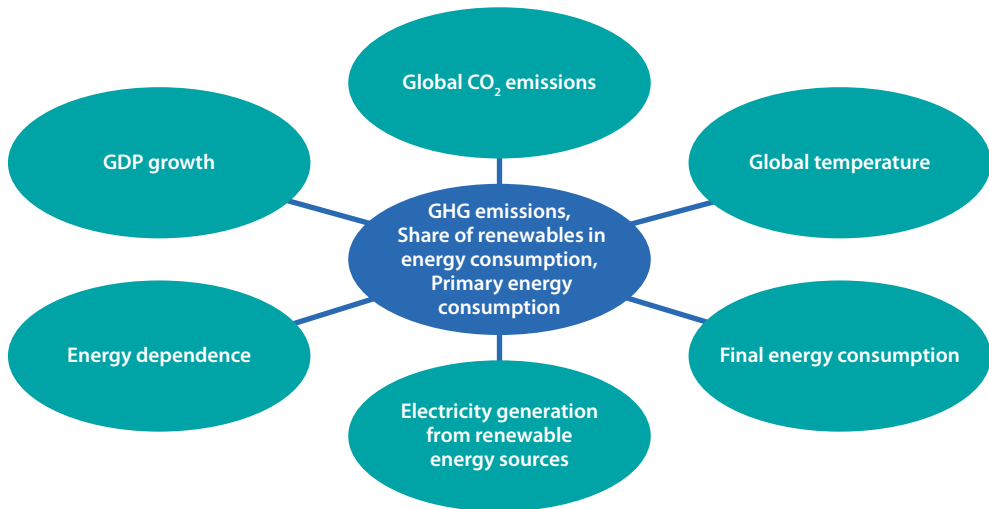
⁽³⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, Brussels, 2014.

⁽⁴⁾ EEA, *Annual European Union greenhouse gas inventory 1990–2013 and inventory report 2015*, Technical report No 19/2015, Copenhagen 2015.

⁽⁵⁾ European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels, 2010.



Figure 3.1: Headline and contextual indicators presented in this chapter



will be key to mastering new technologies such as smart grids, energy storage or electric vehicles. At the same time, more efficient energy use will improve the competitiveness of EU businesses by lowering production costs.

Furthermore, more renewables and improved energy efficiency can reduce energy dependence and save the EU between EUR 175 and 320 billion in energy import costs per year over the next 40 years ⁽⁶⁾. As recognised in the flagship initiative [Innovation Union](#), a push for technological and policy innovation will be crucial for accomplishing this transformation.

The EU's [Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy](#) ⁽⁷⁾, introduced in 2015, complements the existing climate change and energy governance up to 2020 and will guide the development until 2030. It aims to ensure a secure, affordable and climate-friendly energy supply by focusing on five related and mutually supportive dimensions: 1) energy supply security of the EU; 2) the EU-internal energy market; 3) energy efficiency

improvements; 4) GHG emission reduction; and 5) research and innovation.

The analysis in this chapter is based on the four headline indicators that have been chosen to monitor each of the climate and energy targets: 'GHG emissions', 'share of renewable energy in gross final energy consumption', 'primary energy consumption' and 'final energy consumption'.

Contextual indicators are used to present a broader picture, looking into the drivers behind changes in the headline indicators. Changes in EU GHG emissions are analysed in relation to underlying sectoral trends. EU trends are then compared with information on the global trend in GHG emissions and its impact on global mean temperature and the climate system. The analysis then turns to the two most important measures for cutting EU emissions, namely energy supplied from renewable sources and energy efficiency. For both fields, progress at the EU and Member State levels is assessed with a special focus on the wider socioeconomic effects of the emerging green economy.

⁽⁶⁾ European Commission, *Climate Action: Benefits of climate action*, 2016, Accessed 1 June 2016.

⁽⁷⁾ European Commission, *A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy*, COM(2015) 80 final, Brussels, 2015.

The EU's GHG emission reductions are approaching the 2020 target

In 2014, EU greenhouse gas emissions, including emissions from international aviation and indirect CO₂ emissions, were down by 23.0% compared with 1990 levels. The EU is thus expected to exceed its Europe 2020



target of reducing GHG emissions by 20% by 2020.

All sectors, except for fuel combustion in transport and international aviation, contributed to the reductions between 1990 and 2014. However, the average global surface temperature continues to rise, with 2015 being the warmest year on record.

Reducing GHG emissions is a central objective of the Europe 2020 strategy. As a result, the EU as a whole aims to reduce these emissions by 20% compared with 1990 levels (including international aviation and indirect CO₂ emissions). The main policy instruments to achieve this target are the [EU Emissions Trading System \(EU ETS\)](#) ⁽⁸⁾ and the [Effort Sharing Decision \(ESD\)](#) ⁽⁹⁾.

The EU ETS sets a single EU-wide cap for more than 11 000 power stations and industrial plants, as well as the aviation industry. It allows these economic actors to trade emission allowances among themselves. The cap shrinks each year with the aim of reducing emissions by 21% compared with 2005 by 2020.

The Effort Sharing Decision sets binding annual GHG emissions targets for Member States for sectors not included in the EU ETS. Member States' targets for the non-EU ETS sectors (such as transport, buildings, agriculture and waste) vary between a 20% reduction to a 20% increase in emissions by 2020, reflecting differences in starting points and wealth ⁽¹⁰⁾. Less wealthy economies are allowed to increase their emissions to accommodate higher economic growth. Their targets still limit emissions compared with business-as-usual scenarios; hence all Member

States are committed to reduction efforts. By 2020, meeting the national targets would collectively deliver a reduction of around 10% in total EU emissions from the non-EU ETS sectors compared with 2005 levels.

Together, the EU ETS and the Effort Sharing Decision aim to reduce overall emissions to around 14% below 2005 levels by 2020 ⁽¹¹⁾. This would equal a 20% cut below 1990 levels. In addition to these overarching instruments, the EU has set an array of policy tools to address emissions from certain sectors and activities. Box 3.1 lists the most important tools.

By 2014, the EU as a whole had cut man-made GHG emissions by 22.9% compared with their 1990 levels (see Figure 3.2). A large portion of this reduction occurred during the 1990s. Between 1990 and 1994 a large drop of 6.8% occurred, mostly due to structural changes (such as a shift from heavy manufacturing industries to more service-based economies), modernisation in industries and a change from coal to gas. Emissions began to rise again in 1995, but this trend reversed in 1997. Between 1998 and 2007 emissions stabilised at around 92–94% of 1990 levels. This was mainly a result of growth in the use of lower carbon fuels, particularly renewable

⁽⁸⁾ See: http://ec.europa.eu/clima/policies/ets/index_en.htm

⁽⁹⁾ [Council Decision 406/2009/EC](#) on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020.

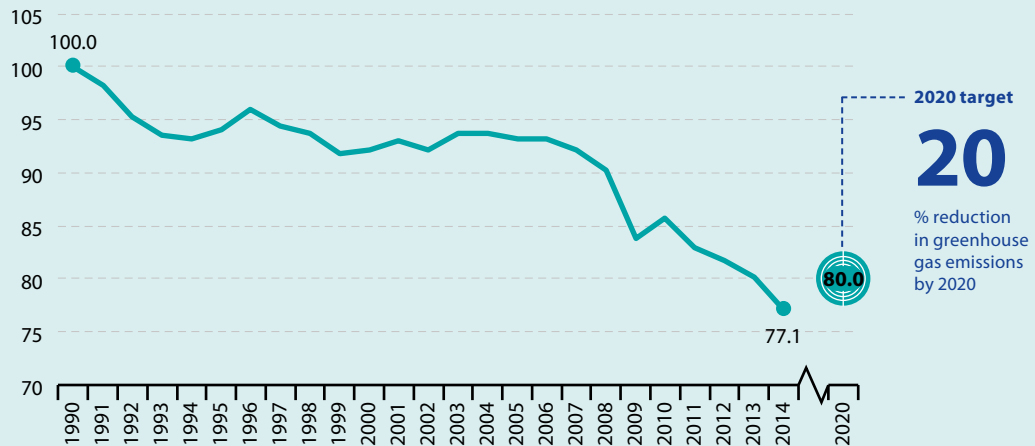
⁽¹⁰⁾ See http://ec.europa.eu/eurostat/documents/4411192/4411431/Europe_2020_Targets.pdf

⁽¹¹⁾ Based on Eurostat data on [greenhouse gas emissions, base year 1990](#) (accessed 6 July 2016).



Europe 2020 headline indicator

Figure 3.2: Greenhouse gas emissions, EU-28, 1990–2014⁽¹⁾
(Index 1990 = 100)



⁽¹⁾ Total emissions, including international aviation and indirect CO₂, but excluding emissions from land use, land use change and forestry (LULUCF)

Source: European Environment Agency, Eurostat (online data code: [t2020_30](#))

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energy sources, offsetting increases in primary energy consumption. However, significant cuts were also made in the waste sector through the use of treatment processes with lower carbon footprints and in agriculture due to a decline in livestock numbers and nitrogenous fertiliser use ⁽¹²⁾.

By far the sharpest single-year decline in energy consumption and GHG emissions since the early 1990s occurred between 2008 and 2009 (–7.2%). During this time, the economic crisis had reduced industrial production, transport volumes and energy demand. The following years saw only a slow recovery in many parts of Europe. The decline in CO₂ emissions observed between 2009 and 2012 can mainly be attributed to three factors: improvement in the energy intensity of the EU economy, development of renewable

energy sources and the economic slowdown. This slowdown, however, accounts for less than half of the total emission reductions achieved during this period ⁽¹³⁾.

From 2012 to 2013, GHG emissions fell by 1.9%, while GDP picked up again slightly with a growth of 0.2% ⁽¹⁴⁾. The largest share of emission reductions during this year was achieved in the energy sector, with more than 80% of cuts occurring because of lower emissions from electricity generation in thermal power stations ⁽¹⁵⁾. Between 2013 and 2014, GHG emissions fell by a further 4.0%, despite 1.4% growth in real GDP ⁽¹⁶⁾. This decrease was the result of additional emission reductions in the energy sector, particularly in electricity and heat production. Furthermore, warmer temperatures in Europe in 2014, as well as an increase in non-

⁽¹²⁾ Viktoria Bolla and Velina Pendolovska, *Driving forces behind EU-27 greenhouse gas emissions over the decade 1999–2008*, Statistics in Focus 10/2011, Luxembourg, Eurostat, 2011, (p. 2).

⁽¹³⁾ EEA, *Why did GHG emissions decrease in the EU between 1990 and 2012, 2014*.

⁽¹⁴⁾ Based on Eurostat data on real GDP growth rate — volume (accessed 23 June 2016).

⁽¹⁵⁾ EEA, *Annual European Union greenhouse gas inventory 1990–2013 and inventory report 2015*. Technical report No 19/2015, Copenhagen 2015.

⁽¹⁶⁾ Based on Eurostat data on real GDP growth rate — volume (accessed 23 June 2016).

Box 3.1: Key policy instruments to reduce GHG emissions

The EU has adopted a number of instruments to complement the [EU Emissions Trading System](#) (EU ETS) and the [Effort Sharing Decision](#) (ESD). The most relevant, given the energy sector's importance as a major source of emissions, are those underlying the renewable energy and energy efficiency targets.

The Renewable Energy Directive ⁽¹⁷⁾ (RED) sets a framework for promoting energy from renewable sources. It establishes mandatory national targets, detailed planning and regular monitoring requirements, and rules on simplifying administrative procedures. Within this framework, Member States have leeway to develop their own support schemes for renewable technologies.

The Energy Efficiency Directive ⁽¹⁸⁾ (EED) creates an overarching framework for improving

efficiency in Member States to ensure the EU's energy efficiency target is met. It is complemented by sector-specific instruments such as the Energy Performance of Buildings Directive ⁽¹⁹⁾, which sets standards on insulation in newly built buildings, the Ecodesign Directive ⁽²⁰⁾ defining performance standards for energy-using products and the Energy Taxation Directive ⁽²¹⁾, which sets minimum rates for energy products.

To increase energy efficiency in the transport sector, the EU has set mandatory emissions reduction targets for new passenger cars ⁽²²⁾. Fleets must emit no more than an average of 95 grams of CO₂ per kilometre by 2020. Similarly, the Vans Regulation ⁽²³⁾ limits CO₂ emissions from new vans to a fleet average of 175 grams of CO₂ per kilometre by 2017.

combustible renewables used for electricity generation, led to emission reductions in the residential and commercial sectors ⁽²⁴⁾.

Dividing emissions figures by population provides a way of comparing countries' GHG emissions on a more equal footing. Figure 3.3 shows Member States' overall per capita GHG emissions for the years 2005 and 2014. Luxembourg emitted the most GHG per capita in the EU in 2014. This can partly be attributed to a considerable number of commuters from neighbouring countries, fuelling their cars on Luxembourgish territory, as well as road freight transit and fuel tourism ⁽²⁵⁾.

Luxembourg was followed by Estonia, Ireland, the Czech Republic and the Netherlands. In contrast, Romania had the lowest per capita emissions.

Between 2005 and 2014, Luxembourg showed the highest reduction in per capita emissions. Ireland, Belgium, the United Kingdom, Denmark and Cyprus also showed large falls. However, emissions rose in the eastern Member States of Estonia and Latvia between 2005 and 2014.

Looking towards 2020, the projection of GHG emissions based on Member States' existing policy measures shows the EU is on track to reach the 2020 target. However, it can also be seen that

⁽¹⁷⁾ Directive 2009/28/EC of the European Parliament and the European Council on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, 2009.

⁽¹⁸⁾ European Commission, 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. European Commission, Brussels, 2012, Art. 3.

⁽¹⁹⁾ Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings.

⁽²⁰⁾ Directive 2009/125 of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products.

⁽²¹⁾ Directive 2003/96 of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity.

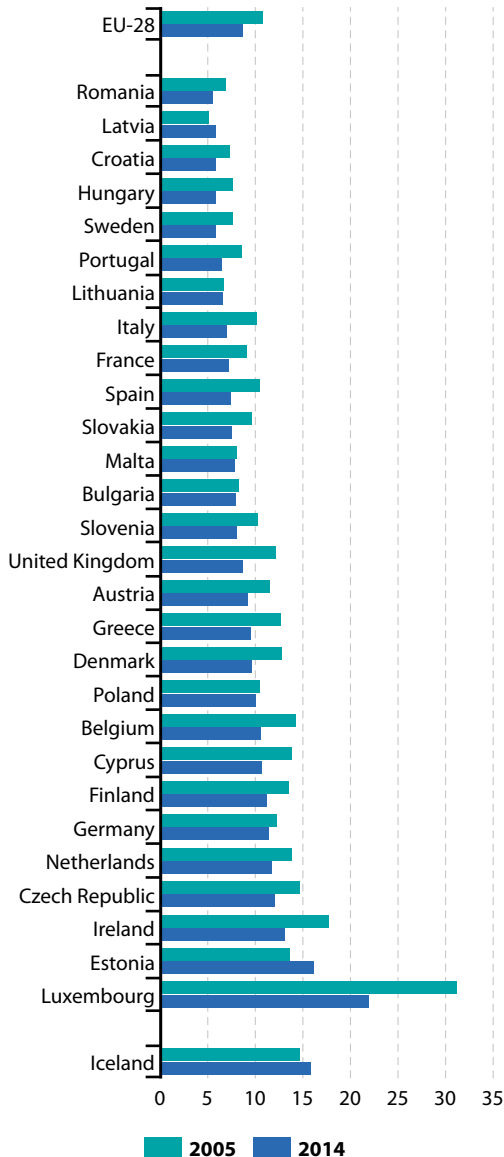
⁽²²⁾ Regulation 443/2009 of 23 April 2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO₂ emissions from light-duty vehicles.

⁽²³⁾ Regulation (EU) No 510/2011 of the European Parliament and of the Council of 11 May 2011 setting emission performance standards for new light commercial vehicles as part of the Union's integrated approach to reduce CO₂ emissions from light-duty vehicles.

⁽²⁴⁾ EEA, *Total greenhouse gas emissions trends and projections*, Website accessed 23 June 2016.

⁽²⁵⁾ Eurostat, *Using official statistics to calculate greenhouse gas emissions*, Luxembourg 2010 (p. 28).

Figure 3.3: Greenhouse gas emissions per capita, by country, 2005 and 2014 (¹)
(Tonnes of CO₂ equivalent)



(¹) Total emissions, including international aviation and indirect CO₂, but excluding emissions from land use, land use change and forestry (LULUCF)

Source: European Environment Agency, Eurostat (online data code: t2020_rd300)

(²⁶) European Commission, *A Roadmap for moving to a competitive low carbon economy in 2050*, Brussels, 2011.

(²⁷) European Commission, *European Council Conclusions 23 and 24 October 2014*, Brussels 2014.

Box 3.2: The 2030 climate and energy framework

The **2030 climate and energy framework** was adopted by EU leaders in October 2014 and builds on the 2020 climate and energy package. The strategy sets 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
- At least 27% improvement in energy efficiency

The 2030 framework is also in line with the long-term perspective of the **Roadmap for moving to a competitive low carbon economy in 2050** (²⁶), which sets out the pathway towards the EU's objective of reducing emissions by 80–95 % by 2050 compared with 1990 levels.

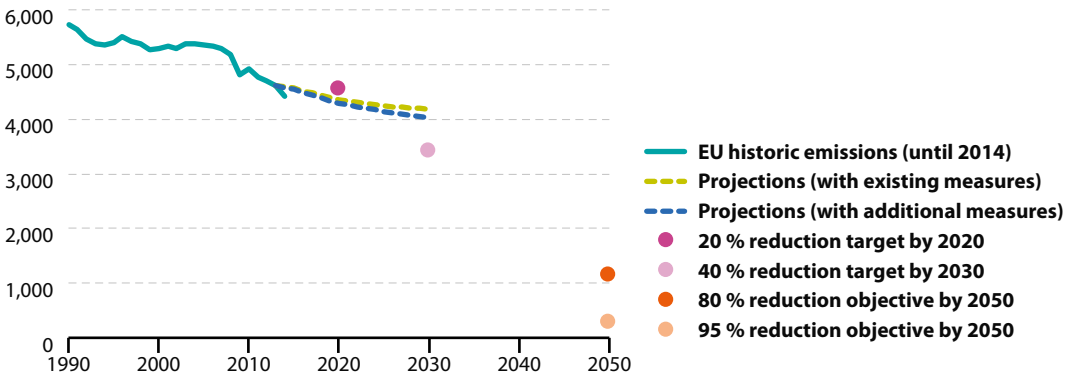
existing and planned measures are not enough to put the EU on track to meet the 40% GHG reduction target until 2030 (²⁷). Thus, further efforts will be needed.

All sectors except transport have lowered emissions since 1990

Figure 3.5 shows how each sector has contributed to the EU's total GHG emissions. All sectors, except fuel combustion in transport and international aviation, contributed to the overall GHG emission reductions from 1990 to 2014.

In absolute terms, the energy industries contributed the largest emission reductions between 1990 and 2014 with 413 million tonnes of CO₂ equivalent. Nevertheless, it is still the sector responsible for the largest share of total emissions (28.2% in 2014). The second largest reduction of 372 million tonnes of CO₂ equivalent was achieved in the manufacturing industries and construction.

Figure 3.4: Greenhouse gas emissions and projections, 1990–2050 (1)
(Million tonnes of CO₂ equivalent)



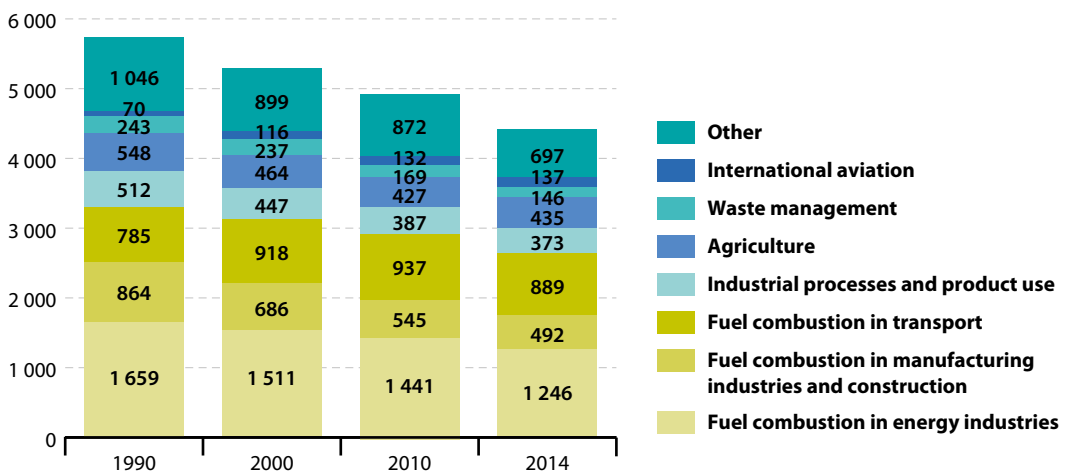
(1) Total EU GHG emissions include those from international aviation and exclude those from land-use, land-use change and forestry (LULUCF).

Source: European Environment Agency

By contrast, transport emissions were 13.3% higher in 2014 than in 1990. Fuel combustion in transport accounted for 20.1% of total EU emissions in 2014, making it the second largest source after the energy industries. However, transport emissions were even higher in 2007, peaking at 987 million tonnes of CO₂ equivalent, before falling by 10.0% by 2014.

Fuel price increases, along with the economic recession appear to have reduced freight transport demand. Moreover, the share of less carbon-intensive fuels such as liquefied petroleum gas (LPG) and liquid biofuel blends increased (28). However, improving energy efficiency and increasing the share of alternative fuels remain crucial to reducing the transport sector's GHG

Figure 3.5: Greenhouse gas emissions by sector, EU-28, 1990, 2000, 2010 and 2014
(Million tonnes of CO₂ equivalent)



Source: European Environment Agency, Eurostat (online data code: tsdcc210)

(28) EEA, *Why did GHG emissions decrease in the EU between 1990 and 2012, 2014.*

emissions, particularly when economic growth picks up again.

Emissions from international aviation nearly doubled between 1990 and 2014, increasing from 70 to 137 million tonnes of CO₂ equivalent.

Overall positive developments in non-ETS emissions since 2005

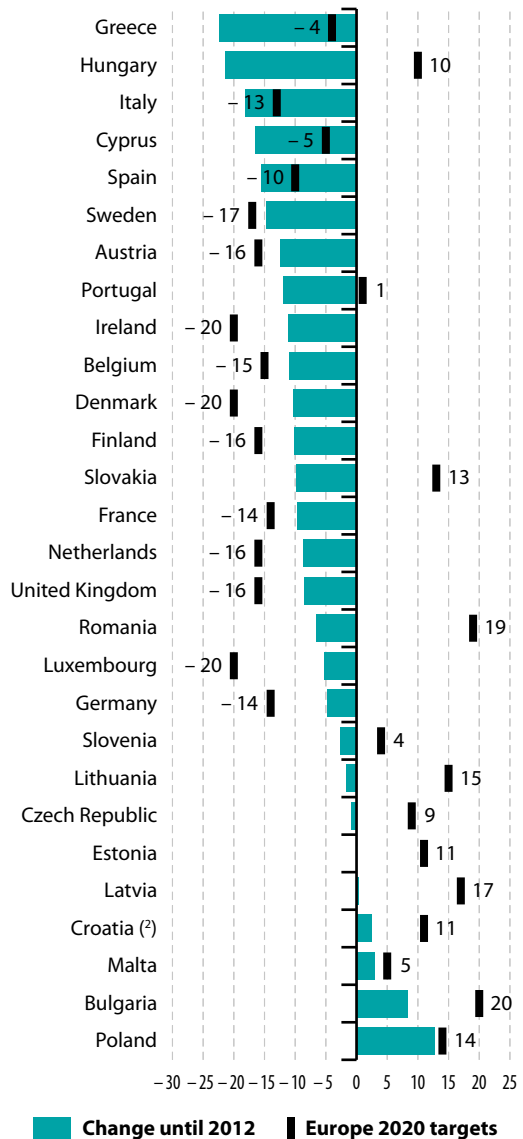
Figure 3.6 shows Member States' non-ETS emissions between the ESD base year⁽²⁹⁾ and 2012, as well as their 2020 non-ETS targets. Twelve countries reduced their emissions and have already fulfilled their national targets. Emissions increased in five countries, but remained within national targets. Eleven Member States are still above their national reduction targets, although all of them had reduced emissions up to 2012. Luxembourg was the furthest from its target, followed by Denmark, Germany and Ireland.

The overall positive trend for non-ETS emissions in the EU can be linked mainly to the building sector as a result of energy efficiency improvements and a less carbon-intensive fuel mix for space heating⁽³⁰⁾. However, mild winter temperatures are also partly responsible for the fall in energy demand. The reductions in transport emissions since 2007 also contributed to the decrease.

Global CO₂ emissions and mean temperature continue to rise

Despite reductions in the EU, global CO₂ emissions from fuel combustion rose by 56.1 % between 1990 and 2013, as shown in Figure 3.7. Most of the increase took place in emerging economies. Emissions growth, both in relative and absolute terms, was strongest in China. Between 1990 and 2013, its annual CO₂ emissions more than quadrupled and the country overtook the United States to become the world's biggest emitter. At the same time, its per capita emissions from fuel combustion reached 6.60 tonnes of CO₂, outpacing the EU level of 6.57 tonnes⁽³¹⁾.

Figure 3.6: Greenhouse gas emissions in non-ETS sectors, by country, 2012⁽¹⁾
(% changes since ESD base year)



(1) Total emissions, excluding emissions covered by the Emissions Trading Scheme.

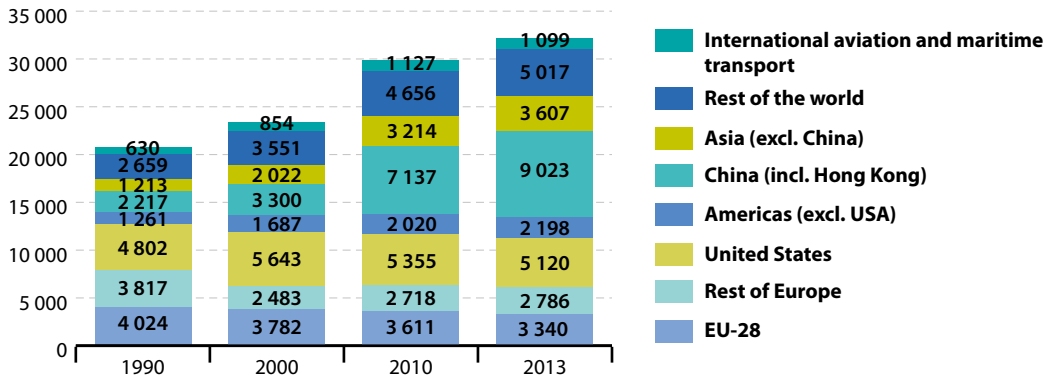
Source: European Environment Agency, Eurostat (online data code: t2020_35)

⁽²⁹⁾ The *Effort Sharing Decision* (406/2009/EC) originally defined 2005 as base year for Member States' GHG emissions reductions. However, due to recent recalculations with improved methodologies used at national level to measure the estimated emissions, 2005 values of countries are not necessarily equal to the value of the ESD base year.

⁽³⁰⁾ EEA, *Annual European Union greenhouse gas inventory 1990–2013 and inventory report 2015*, Technical report No 19/2015, Copenhagen 2015.

⁽³¹⁾ IEA, *CO₂ Emissions from Fuel Combustion*, 2015.

Figure 3.7: Global CO₂ emissions from fuel combustion, 1990, 2000, 2010 and 2013
(Million tonnes of CO₂ equivalent)



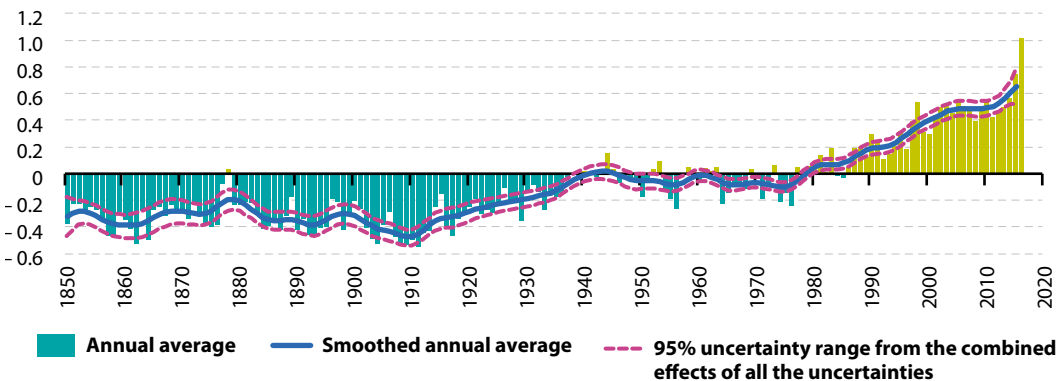
Source: International Energy Agency (IEA)

Although less important in absolute terms, emissions in the rest of Asia and the rest of the world also grew significantly in relative terms between 1990 and 2013 (197.4% and 88.7% respectively). As a result of these trends, the EU's share of global CO₂ emissions has been shrinking, from almost a fifth in 1990 to 10.4% in 2013.

Rising emissions have dramatically increased CO₂ levels in the atmosphere. Although there is a time lag between CO₂ being emitted and the corresponding increase in average global surface

temperature, recordings already show a clear upward trend (see Figure 3.8). Between 2001 and 2010, the global surface temperature was 0.89°C higher than during the first decade of the 20th century. The year 2015 was the warmest year since records began in 1850. Current projections estimate that global mean temperatures could rise by as much as 2.6°C to 4.8°C compared with the reference period (1986–2005) by the late 21st century (2081–2100) if CO₂ emissions remain at current levels⁽²⁾.

Figure 3.8: Global annual mean temperature deviations, 1850–2016⁽¹⁾
(Temperature deviation in °C, compared with 1961–1990 average)



⁽¹⁾ 2016 data refer to the first quarter of the year (until March 2016).

Source: Climatic Research Unit, University of East Anglia and the UK Met Office Hadley Centre

⁽²⁾ EEA, *SOER 2015 — The European environment: Increasingly severe consequences of climate change (GMT 9)*, 2015.



Box 3.3: The consequence of climate change

In Europe and globally, temperature rises have already led to observable changes in natural systems and society. For example, the resulting warming of lakes and rivers have led to more frequent algal blooms and forced some species to move northwards⁽³³⁾. Damage costs from natural disasters have increased and are likely to rise substantially in the future.

A European Environment Agency (EEA) assessment shows that the negative impacts of climate change will not affect European regions equally. It can increase existing vulnerabilities such as exposure to flood risk in coastal areas or

drought in the Mediterranean region. Coastal erosion and flooding due to sea-level rise, as well as more extreme weather events such as storms and heat waves, are the most important threats to humans and infrastructure. In southern Europe, problems of water availability and more frequent droughts threaten to lower crop productivity even with a temperature rise of 1–2°C, putting the region's agricultural sector at risk⁽³⁴⁾.

By hitting marginalised regions and poor people the hardest, climate change might deepen socioeconomic imbalances in Europe.

Despite the EU's shrinking share of global CO₂ emissions, recent findings on the potentially catastrophic impacts of climate change confirm the ongoing importance of its climate and energy goals. EU emission cuts alone cannot halt climate change, but if it can show that a low-carbon economy is feasible, and can even increase

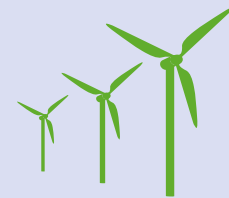
innovation and employment, it will serve as a role model to other regions. Continuous investment in advanced low-carbon technologies can also help the EU uphold technological leadership and secure export markets. A successful transformation of the energy sector, discussed in the next section, is pivotal in this respect.

More renewable energy means lower EU emissions

Renewable energy is on the rise: in 2014, it provided 16.0% of gross final energy consumption in the EU, up from 8.5% in 2004. Over the same period, gross electricity generated from renewable sources reached 27.5%, up from 14.4%.

Thanks to cost reductions and effective support schemes, the share of wind and solar energy has increased particularly quickly. Their levelised cost of electricity (the average total cost to build and operate

solar or wind projects divided by their total energy output), is increasingly competitive with fossil fuel-based power generation.



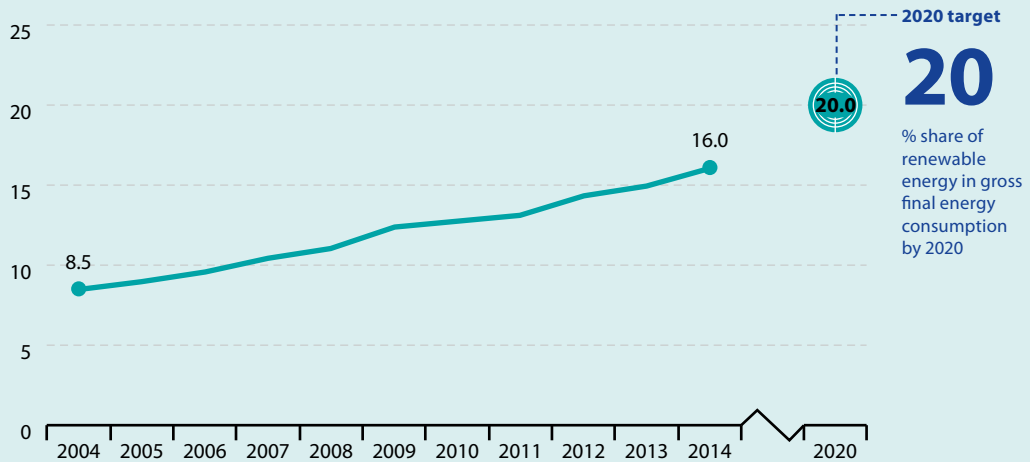
For transport, renewable energy provided 5.9% of all energy used in 2014, up from 1.0% in 2004.

⁽³³⁾ EEA, *Climate change, impacts and vulnerability in Europe 2012*, Copenhagen, 2013.

⁽³⁴⁾ EEA, *Climate change, impacts and vulnerability in Europe 2012*, Copenhagen, 2013.

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Figure 3.9: Share of renewable energy in gross final energy consumption, EU-28, 2004–2014 (%)



Source: European Eurostat (online data code: [t2020_31](#))

Renewable energy has been growing steadily since 2004

The Europe 2020 strategy's second climate change and energy target is to increase the **share of renewable energy in gross final energy consumption** to 20% by 2020. Final energy consumption comprises the energy supplied to the final consumers for all energy uses.

Between 2004 and 2014, the share of renewable energy almost doubled, reaching 16.0% of gross final energy consumption in 2014 (see Figure 3.9). Support schemes for renewable energy technology and falling renewable energy system costs were the two main drivers of this increase. Policies such as feed-in tariffs, grants, tax credits and quota systems have led to steady growth in installed capacity for renewable electricity and heat generation as well as the use of renewable transport fuels over the past decade.

The scaling up of global production volumes and technological advances have allowed producers to substantially cut costs per unit. Prices of crystalline silicon photovoltaic modules experienced the biggest plunge, falling by 61% between 2009 and 2015. Onshore wind turbines became 14% cheaper during the same period ⁽³⁵⁾.

These price falls led some Member States, such as Germany and Italy, to restrict support for new renewable energy projects, which reduced profitability for investors. In combination with a weak economic climate, this resulted in fewer projects being planned and realised and thus slower growth in capacity. The addition of new renewable capacity peaked in 2011 at 35.8 GW and has been declining ever since. Only 19.9 GW were installed in 2014 ⁽³⁶⁾.

The renewable energy industry has also become a key sector for research and innovation in Europe,

⁽³⁵⁾ McCrone, Angus et al, *Global Trends in Renewable Energy Investment 2016*, Frankfurt School of Finance and Management, commissioned by UNEP's Division of Technology, Industry and Economics (DTIE) in co-operation with Frankfurt School-UNEP Collaborating Centre for Climate & Sustainable Energy Finance and produced in collaboration with Bloomberg New Energy Finance, 2016.

⁽³⁶⁾ Eurostat (online data code: [nrg_113a](#))

generating a rapidly increasing number of patents (see the chapter on [R&D and innovation](#), page 55).

In 2014, the share of renewable energy in gross final energy consumption in Member States ranged from 52.6% in Sweden to 4.5% in Luxembourg (see Figure 3.10). Differences stem from variations in natural resources, such as the potential for building hydropower plants and the availability of biomass, but also from the success of national climate and energy policies. All EU countries increased their renewable energy share between 2005 and 2014. Twelve have more than doubled their share, albeit from a low base. Nine have already met their 2020 targets.

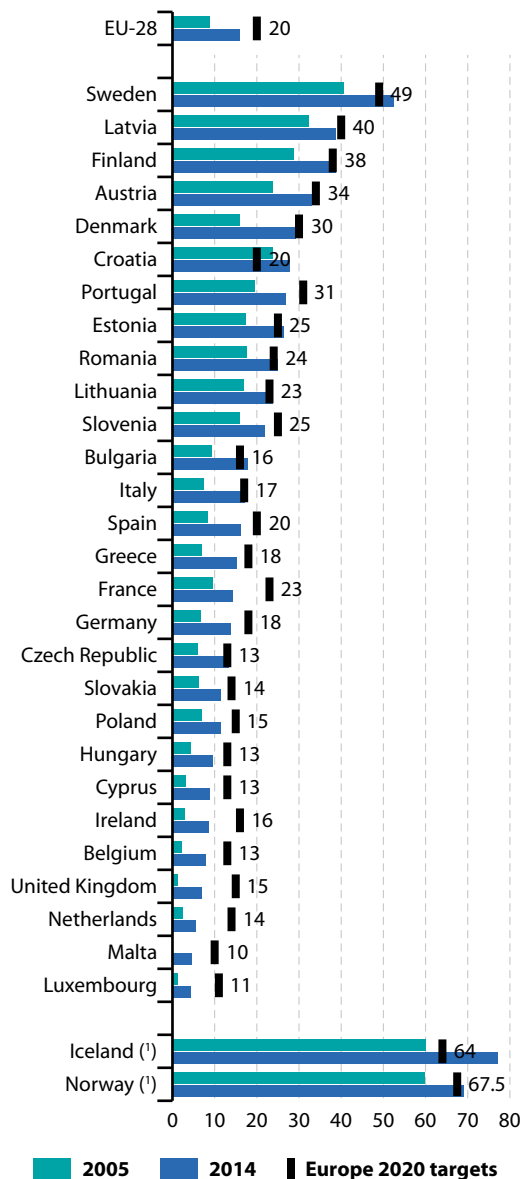
Box 3.4: Implementing the EU renewable energy target in the Member States

The EU's renewable energy target has been broken down into national targets that reflect differences in resource base and wealth.

To ensure the renewable energy targets are met, the [Renewable Energy Directive](#) ⁽³⁷⁾ allows Member States to put in place support schemes and requires them to remove administrative barriers to the authorisation, certification and licensing of renewable energy plants.

All Member States have developed [national renewable energy action plans](#) (NREAPs). These outline how they plan to achieve their target and include interim targets and trajectories per sector and technology. Progress on these plans is reported to the European Commission every two years. In addition, Member States report on their national renewable energy policies in the [National Reform Programme](#) under the Europe 2020 strategy.

Figure 3.10: Share of renewable energy in gross final energy consumption, by country, 2005 and 2014⁽¹⁾
(%)

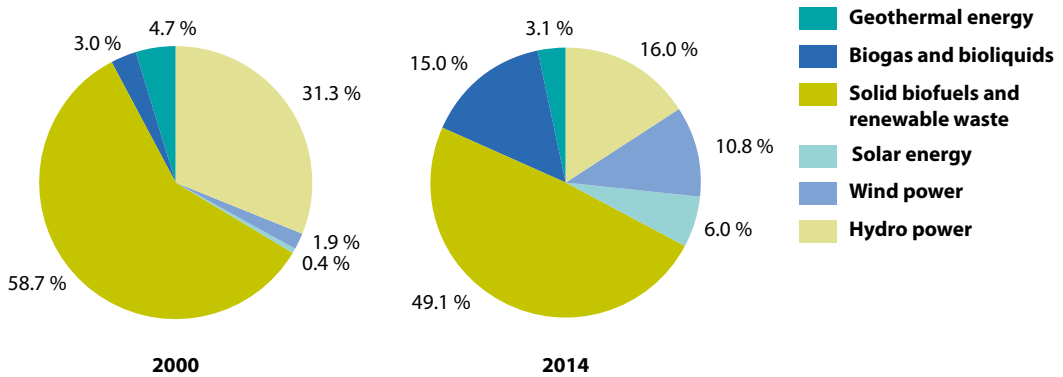


⁽¹⁾ Iceland and Norway have adopted mandatory targets under Directive 2009/28/EC (see EEA Agreement, Annex IV).

Source: Eurostat (online data code: t2020_31)

⁽³⁷⁾ Directive 2009/28/EC of the European Parliament and the European Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, 2009.

Figure 3.11: Gross inland consumption of renewable energy, by source, EU-28, 2000 and 2014 (%)



Source: Eurostat (online data code: nrg_107a)

In 2014, France, the Netherlands, the United Kingdom and Ireland were the furthest from their national targets.

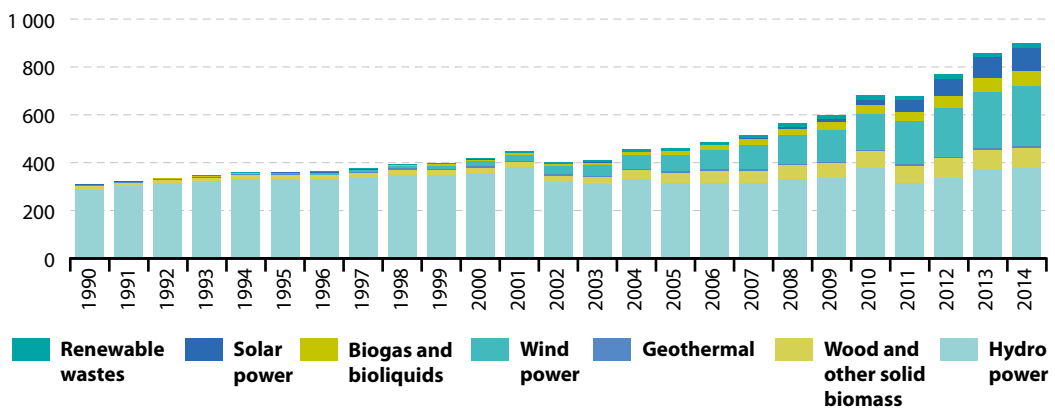
Biofuels dominate renewable energy but wind and solar are expanding fast

Renewable energy can be generated from a range of sources, including hydro, wind, solar and geothermal power. Biofuel remains by far the most important renewable energy source in the EU because it contributes to all energy use sectors (electricity generation, transport and heating and

cooling). In 2014, solid biofuels, renewable waste, biogas and bioliquids provided 64.1% of the total gross inland consumption of renewable energy (see Figure 3.11). At the same time, wind and solar energy have been growing the fastest. In 2014, the EU generated 21.8 million tonnes of oil equivalent (Mtoe) from wind energy, a more than eleven-fold increase compared with 2000. In the same year, solar energy contributed 12.0 Mtoe, more than 27 times as much as in 2000.

After a rapid expansion over the past decade, renewables contributed 27.5% of total gross

Figure 3.12: Gross electricity generation from renewable energy sources, EU-28, 1990–2014 (Gigawatt hours)



Source: Eurostat (online data code: nrg_105a)



electricity generation in 2014, compared with 14.4% in 2004 ⁽³⁸⁾. Hydropower remained the largest source, but has been declining in relative weight as wind, solar and biogas were developing rapidly (see Figure 3.12).

Moreover, renewable energy provided 17.7% of Europe's energy for heating and cooling in 2014, up from 10.2% in 2004 ⁽³⁹⁾. Solid biofuels delivered the largest share of total renewables, followed by minor contributions from biogas, solar thermal, and ambient heat captured by heat pumps.

Share of renewable energy in transport increasing slowly

Between 2011 and 2014, the share of renewables in transport energy use increased from 3.4% to 5.9%. Figure 3.13 shows an almost continuous increase since 2004, with a break in 2011 when the accounting methodology changed.

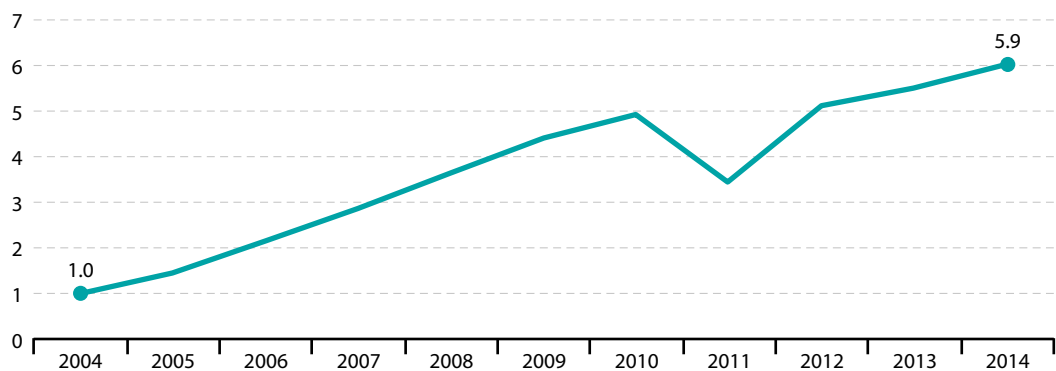
The [Renewable Energy Directive](#) ⁽⁴⁰⁾ (Directive 2009/28/EC) sets sustainability criteria for the production of liquid biofuels, which make up the

lion's share of renewables in transport ⁽⁴¹⁾. From 2011, only those biofuels certified as sustainable according to the Directive are counted towards the share of renewables in transport and are therefore included in the indicator. Some Member States transposed the sustainability standards into national law earlier than others. The change explains the drop in the share of renewables in transport from 2010 to 2011.

The consumption of bioliquids in transport has been growing steadily, but also slowly. In 2014, the overall share of renewable energy in transport was at 5.9% in the EU. Half of the Member States achieved a share of at least 5%.

Political uncertainty surrounding the future development of biofuels is one reason for the slow growth. There has been an increasing awareness that certain biofuel production pathways can lead to higher overall greenhouse gas emissions due to indirect land use change. Furthermore, alternative, second-generation biofuels are still not widely available on the market ⁽⁴²⁾ ⁽⁴³⁾. A 2015 [amendment to the Fuel](#)

Figure 3.13: Share of renewable energy in fuel consumption of transport, EU-28, 2004–2014 ⁽¹⁾ (%)



⁽¹⁾ Break in series in 2011; since 2011 only compliant (sustainable) biofuels according to Directive 2009/28/EC are included in the data.

Source: Eurostat (online data code: tsdcc340)

⁽³⁸⁾ Eurostat (online data code: tsdcc330)

⁽³⁹⁾ Eurostat (online data code: nrg_ind_335a)

⁽⁴⁰⁾ Directive 2009/28/EC of the European Parliament and the European Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, 2009.

⁽⁴¹⁾ Eurostat: *Shares 2014 — Short assessment of renewable energy sources*. Last update: 10 February 2016.

⁽⁴²⁾ European Commission, *Renewable energy progress report*, (SWD(2015) 117 final), Brussels, 2015.

⁽⁴³⁾ European Commission, *Technical assessment of the EU biofuel sustainability and feasibility of 10% renewable energy target in transport*, Accompanying the document report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions — Renewable energy progress report, SWD(2015) 117 final, Brussels, 2015.

Quality Directive and the Renewable Energy Directive ⁽⁴⁴⁾ put greater emphasis on production of advanced biofuels (biofuels stemming from the residual non-food parts of crops, as well as crops that are not used for food purposes). Furthermore, it introduced a 7 % cap on the contribution of liquid biofuels produced from

crops grown on agricultural land towards the 2020 renewable energy transport target. Member States must transpose the Directive into national legislation by 2017. The data in Figure 3.13 does not take into account the accounting rules enacted by this amendment; instead the previous accounting rules are used.

The EU needs to further pursue energy efficiency improvements



The EU has made substantial progress towards its energy efficiency objective. In 2014, the EU consumed 12.0 % less primary energy than in 2005.

Compared with the hypothetical projection for the EU primary energy consumption underlying the 2020 target, the EU had saved 15.7 % of primary energy up to 2014.

Although energy efficiency policies have helped drive reductions in primary energy consumption, some of the reductions can

be attributed to lower economic output and warmer than average years, such as 2013 and 2014.

To achieve the target of improving energy efficiency by 20 %, the EU must reduce primary energy consumption by a further 1.6 % over the six years from 2014 to 2020.

The EU still relies heavily on energy imports from non-EU countries, which provided 53.5 % of all energy consumed in 2014. The main supplier of energy to the EU in 2014 was Russia. It supplied 29.9 % of total gas imports, 25.6 % of imports of petroleum products and 25.9 % of imports of solid fuels.

Delivering the same service or product by using less energy is one of the most cost-effective options for reducing GHG emissions. Building refurbishment, followed by the transport and industry sectors, offer the biggest potential for improvement (see the Energy Efficiency Plan 2011 ⁽⁴⁵⁾).

The target is to move towards a 20 % increase in energy efficiency. In absolute terms this means that by 2020, EU energy consumption should not exceed 1 483 Mtoe of primary energy or 1 086 Mtoe of final energy ⁽⁴⁶⁾.

Primary energy consumption (PEC) includes all gross inland energy consumption except energy carriers employed for non-energy purposes, for example, petroleum or gas not used for combustion but for producing plastics. By contrast, final energy consumption only comprises the energy supplied to the final consumer's door for all energy uses. The difference between primary and final energy consumption is equivalent to the energy losses occurring during energy transformation (particularly electricity generation), transmission and distribution.

⁽⁴⁴⁾ Directive (EU) 2015/1513 of the European Parliament and of the Council of 9 September 2015 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources.

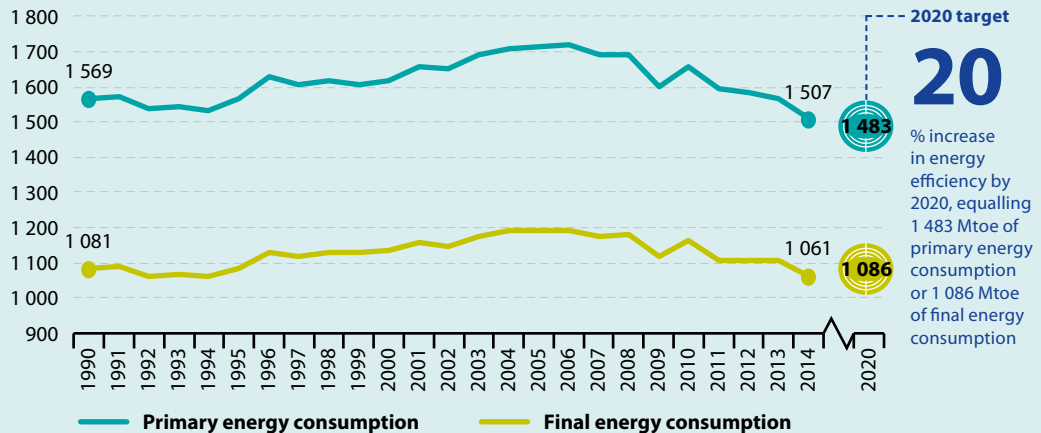
⁽⁴⁵⁾ European Commission, *Energy Efficiency Plan 2011*, COM(2011) 109 final, Brussels, 2011.

⁽⁴⁶⁾ European Commission, *Directive 2012/27/EU* of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125 and 2010/30 and repealing Directives 2004/8 and 2006/32. European Commission, Brussels, 2012, Art. 3



Europe 2020 headline indicator

Figure 3.14: Primary energy consumption and final energy consumption, EU-28, 1990–2014
(Million tonnes of oil equivalent)



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Energy consumption is on a downward path

As shown in Figure 3.14, PEC was relatively stable in the EU between 1990 and 1995. In 1996 it increased by about 60 Mtoe (almost 4%), compared with the previous year. It remained almost unchanged throughout the period from 1997 to 2000, but rose again between 2001 and 2004. In 2006 PEC peaked at an annual consumption of 1 722 Mtoe. Following the economic crisis, it fell sharply by 123 Mtoe until 2009, dropping below the 1997 level. After rebounding in 2010, PEC fell again in the following years to 1 507 Mtoe in 2014. In 2014, the EU thus consumed 4.0% less primary energy than it did in 1990 and 12.0% less than in 2005. To achieve its 2020 target, the EU needs to reduce PEC by an additional 1.6% in the six years between 2014 and 2020.

Much of the decrease between 2008 and 2009 may be attributed to reduced economic

activity as a result of the financial and economic crisis, rather than to a structural shift in energy consumption patterns. In 2010, an especially cold winter caused a sharp increase in heating demand. The most recent reductions from 2011 onwards can again be partly attributed to reduced economic output expressed by a 0.5% contraction in real GDP in 2012. However, primary energy consumption continued to decrease thereafter, despite a real GDP growth of 1.4% in 2014⁽⁴⁷⁾. Warmer years in 2013 and 2014, and improvements in energy efficiency due to introduced policies, are considered to have contributed to this fall⁽⁴⁸⁾.

The analysis underlines the need to further pursue energy-efficiency measures. Continuous effort can ensure PEC will remain on a downward path even when economic growth accelerates. The trend in final energy consumption has closely followed the trend in primary energy consumption, reaching 1 061 Mtoe in 2014.

⁽⁴⁷⁾ Based on Eurostat data on real GDP growth rate — volume (accessed 13 April 2016).

⁽⁴⁸⁾ EEA, *Trends and Projections in Europe 2015 — Tracking progress towards Europe's climate and energy targets*, European Environment Agency, Copenhagen, 2015.

Measuring progress towards the EU energy efficiency target

According to the [Energy Efficiency Directive \(EED\)](#) ⁽⁴⁹⁾, the EU efficiency target is measured as a 20% saving compared with a hypothetical projection for EU primary energy consumption. Starting with the 2005 base year, this business-as-usual projection (carried out in 2007) estimated a primary energy consumption of 1853 Mtoe in 2020. It assumed continuous economic growth and no additional energy-efficiency policies above and beyond those in place in 2005. The envisaged 20% saving amounts to an absolute saving of 370 Mtoe, resulting in a target value of no more than 1483 Mtoe PEC for 2020 ⁽⁵⁰⁾. Compared with the actual level of PEC in 2005, this is equivalent to a 13.4% reduction.

Table 3.1 shows the PEC savings compared with the hypothetical projection from 2005 to 2014. It is important to note that the difference between the

projection's underlying assumptions and reality has a certain influence on target achievement. Next to real improvements in energy efficiency (producing products and services with less energy input per unit compared with the projection), other factors can contribute. For example, economic growth in the EU since 2008 has been lower than the projections underlying the energy-efficiency target assume, thus resulting in lower absolute production levels and energy consumption than in the projection. Additional factors could be structural changes in the EU economy or lower-than-expected consumption of fuels for space heating due to unexpectedly warm years.

Breaking down the energy efficiency target to Member State level

Figure 3.15 shows the change in PEC from 2005 to 2014 in all Member States. Looking at the 2014

Table 3.1: Savings in primary energy consumption compared with the PEC projection for 2020, EU-28, 2005–2014
(% of savings)

2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Target
0.0	0.0	2.1	2.6	8.2	5.6	9.5	10.5	11.8	15.7	20.0

Source: Eurostat (online data code: t2020_33)

Box 3.5: National energy efficiency targets

The [Energy Efficiency Directive \(EED\)](#) ⁽⁵¹⁾ requires Member States to set indicative national energy efficiency targets for 2020. These can be based on different indicators (primary or final energy consumption, or primary or final energy savings, or energy intensity). To make these targets comparable, the Directive also requires each Member State to 'translate' its target into

levels of primary and final energy consumption in 2020. In addition, Member States need to explain how this has been calculated. Taken collectively, the national indicative targets result in a 3% higher PEC than the absolute 2020 target set at EU level, which means Member States overall are not aiming for sufficient energy use reductions ⁽⁵²⁾.

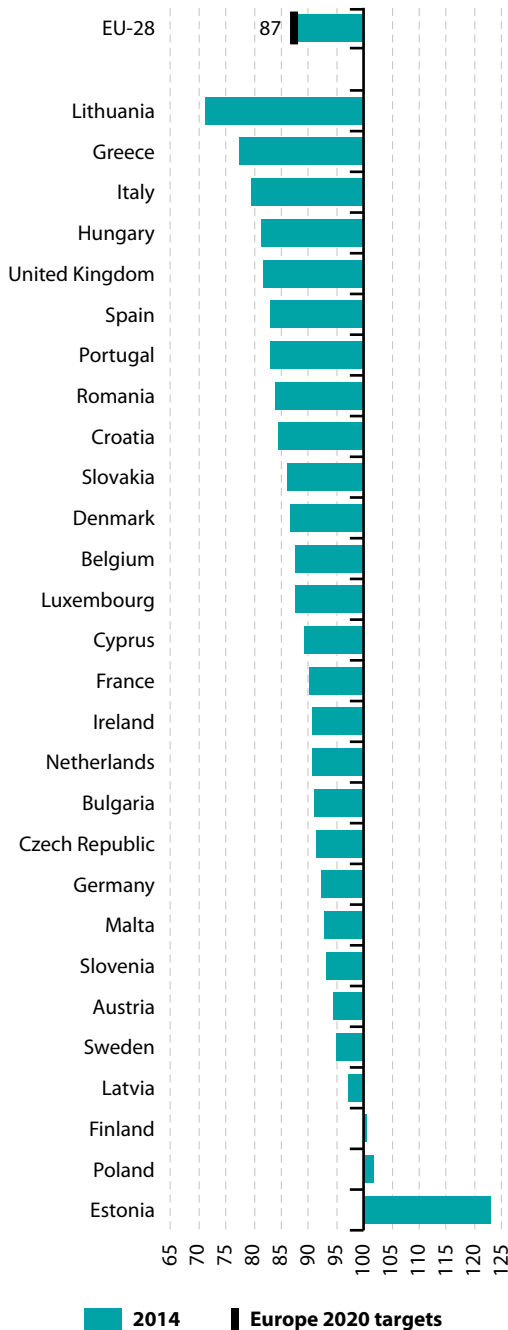
⁽⁴⁹⁾ European Commission, [Directive 2012/27/EU](#) of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending [Directives 2009/125](#) and [2010/30](#) and repealing [Directives 2004/8](#) and [2006/32](#), European Commission, Brussels, 2012, Art. 3.

⁽⁵⁰⁾ Council Directive 2013/12/EU 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 (accessed 20 April 2016).

⁽⁵¹⁾ European Commission, [Directive 2012/27/EU](#) of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending [Directives 2009/125](#) and [2010/30](#) and repealing [Directives 2004/8](#) and [2006/32](#), European Commission, Brussels, 2012, Art. 3.

⁽⁵²⁾ EEA, [Trends and Projections in Europe 2015 — Tracking progress towards Europe's climate and energy targets](#). European Environment Agency, Copenhagen, 2015.

Figure 3.15: Change in primary energy consumption, by country, 2014
(Index 2005 = 100)



Source: Eurostat (online data code: t2020_33)

data, 25 Member States reduced primary energy consumption between 2005 and 2014 by values ranging from 3.0% to 28.9%. Small increases were observed in Finland and Poland, while PEC has increased by 22.9% in Estonia since 2005.

Between 1990 and 2014, the economic sectors followed different final energy consumption trends (see Figure 3.16). Agriculture and forestry, as well as industry, reduced final energy consumption by 25.4% each, while the residential sector's consumption remained fairly stable with a reduction of 4.0%. By contrast, energy consumption in the services and transport sectors went up by 29.6% and 24.2% respectively over the same time period.

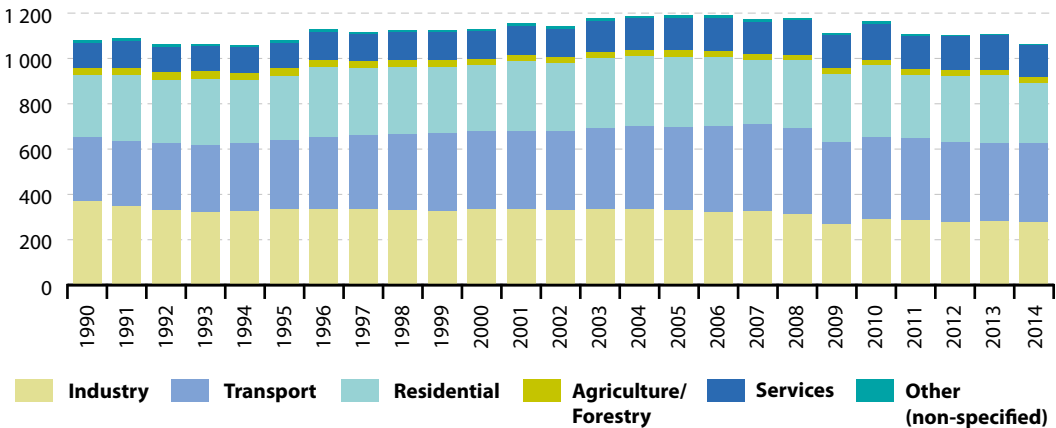
While these changes reflect sector-specific levels of energy-efficiency improvement, they also relate to structural changes in the EU economy, particularly a shift away from an energy-intensive industry to a service-based economy. In the case of transport, a large share of efficiency gains have been outweighed by rising volumes of transport over the past few decades. In 2014, the majority of final energy was used in transport (33.2%), followed by industry (25.9%) and the residential sector (24.8%). The services sector was responsible for 13.3% and agriculture for 2.2% of final energy consumption.

Despite recent reductions in energy consumption, substantial potential for cost-efficient improvements in energy efficiency remain untapped. This includes in particular the transport sector, the refurbishment of buildings, industrial processes and savings along the energy supply chain.

Renewable energy and energy efficiency improvements reduce the EU's dependence on energy imports

Energy-efficiency improvements can strengthen the EU's competitiveness and lower its dependence on fossil fuel imports. The EU's energy dependence — the share of total energy needs met by imports from non-EU countries — has increased significantly over the past decade, reaching 53.5% in 2014 (see Figure 3.17). Imports of fossil energy carriers such as petroleum, natural

Figure 3.16: Final energy consumption, by sector, EU-28, 1990–2014
(Million tonnes of oil equivalent)



Source: Eurostat (online data code: [tsdpc320](#))

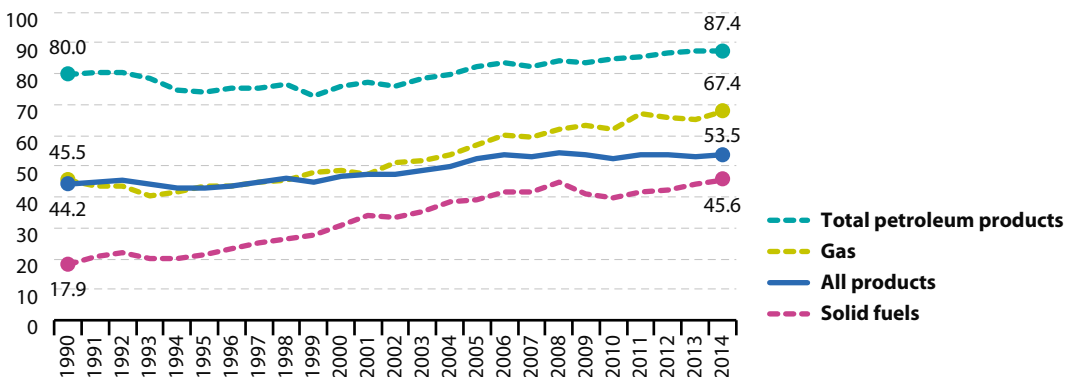
gas and hard coal are mostly responsible for this increase. In contrast, most renewable energy can be sourced domestically.

Dependence on energy imports exposes the European economy to significant costs and the risk of supply shortages, for example due to geopolitical conflicts. The expansion of renewable energy sources and the improvement of energy efficiency reduce these risks and

contribute to the Europe 2020 strategy's employment objective (see the chapter on [Employment](#), page 23) by creating jobs and value added within EU borders.

Figure 3.18 shows where EU imports of energy carriers come from. The main supplier of energy to the EU in 2014 was Russia. It supplied 37.9% of gas imports, 34.0% of imports of petroleum products and 29.0% of imports of solid fuels from

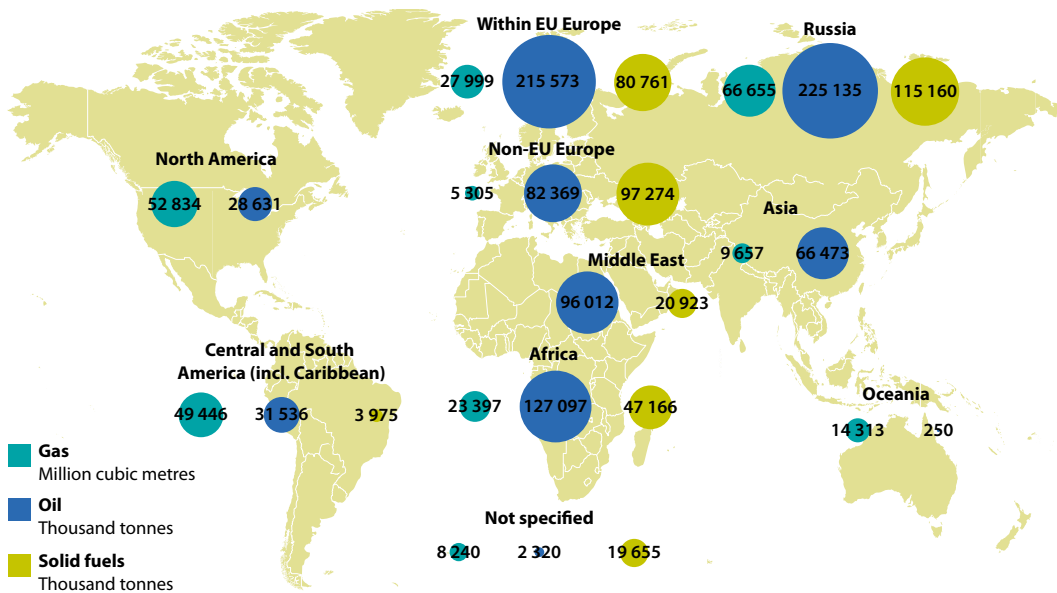
Figure 3.17: Energy dependence, EU-28, 1990–2014⁽¹⁾
(% of imports in total energy consumption)



⁽¹⁾ 'All products' is not the average of the other three fuel categories shown. It includes other energy sources, such as renewable energy or nuclear energy, which are treated as domestic sources.

Source: Eurostat (online data code: [tsdcc310](#))

Figure 3.18: EU imports of energy carriers by type of energy carrier
(Thousand tonnes and million cubic metres)



Source: Eurostat (online data code: [nrg_122a](#), [nrg_123a](#), [nrg_124a](#))

non-EU suppliers. The second largest source of natural gas is other non-EU European countries, mainly Norway, with 32.0%. Also 12.4% of oil imports come from this region. The second largest source supplying oil to the EU after Russia is Africa,

followed by the Middle East with 19.2% and 14.5% respectively. Regarding solid fuels, North America is the second largest source after Russia with 23.0%, followed by Central and South America with 21.5%.

Outlook towards 2020

According to the [2015 Climate action progress report](#) ⁽⁵³⁾, the EU is expected to exceed its 2020 GHG emission target. Also at the Member State level, regarding their achievement of individual non-ETS targets (manifested in the Effort-Sharing Decision), 24 countries are on track to meet their GHG targets (except Austria, Belgium, Ireland and Luxembourg) ⁽⁵⁴⁾. However, projections show that

further efforts will be necessary to bring the EU on track towards the 2030 target.

With respect to renewable energy, the EU is currently on track to meet its 2020 target ⁽⁵⁵⁾. However, the European Commission's [2015 Renewable energy progress report](#) ⁽⁵⁶⁾ emphasises that non-economic barriers, such as spatial planning, and administrative and authorisation

⁽⁵³⁾ European Commission, *Climate action progress report, including the report on the functioning of the European carbon market and the report on the review of Directive 2009/31/EC on the geological storage of carbon dioxide*, SWD(2015) 246 final.

⁽⁵⁴⁾ EEA, *Trends and Projections in Europe 2015 — Tracking progress towards Europe's climate and energy targets*, European Environment Agency, Copenhagen, 2015.

⁽⁵⁵⁾ EEA, *Trends and Projections in Europe 2015 — Tracking progress towards Europe's climate and energy targets*, European Environment Agency, Copenhagen, 2015.

⁽⁵⁶⁾ European Commission, *Renewable energy progress report*. (SWD(2015) 117 final), Brussels, 2015.

procedures, need to be removed by many Member States to ensure progress continues. Further challenges include recent changes in national support schemes ⁽⁵⁷⁾, which can raise uncertainty and risk for investors.

The 2020 target for energy efficiency is within reach. Nevertheless, continuous efforts are needed

to ensure primary energy consumption continues to fall, even when the economic situation in the EU improves. The [2015 Energy efficiency progress report](#) ⁽⁵⁸⁾ concludes that additional efforts are needed in the buildings, transport and generation sectors.

⁽⁵⁷⁾ EEA, *Trends and Projections in Europe 2015 — Tracking progress towards Europe's climate and energy targets*, European Environment Agency, Copenhagen, 2015.

⁽⁵⁸⁾ European Commission, *Assessment of the progress made by Member States towards the national energy efficiency targets for 2020 and towards the implementation of the Energy Efficiency Directive 2012/27/EU as required by Article 24 (3) of Energy Efficiency Directive 2012/27/EU*, (SWD (2015) 245 final), Brussels, 2015.

4

Education



Education and training — why do they matter?

Education and training lie at the heart of the Europe 2020 strategy and are seen as key drivers for growth and jobs. The recent economic crisis along with an ageing population, through their impact on economies, labour markets and society, are two important challenges that are changing the context in which education systems operate ⁽¹⁾. At the same time education and training help boost productivity, innovation and competitiveness.

Nowadays upper secondary education is considered the minimum desirable educational attainment level for EU citizens. Young people who leave education and training prematurely lack crucial skills and run the risk of facing serious, persistent problems in the labour market and experiencing poverty and social exclusion. Early leavers from education and training who do enter the labour market are more likely to be in precarious and low-paid jobs and to draw on welfare and other social programmes. They are

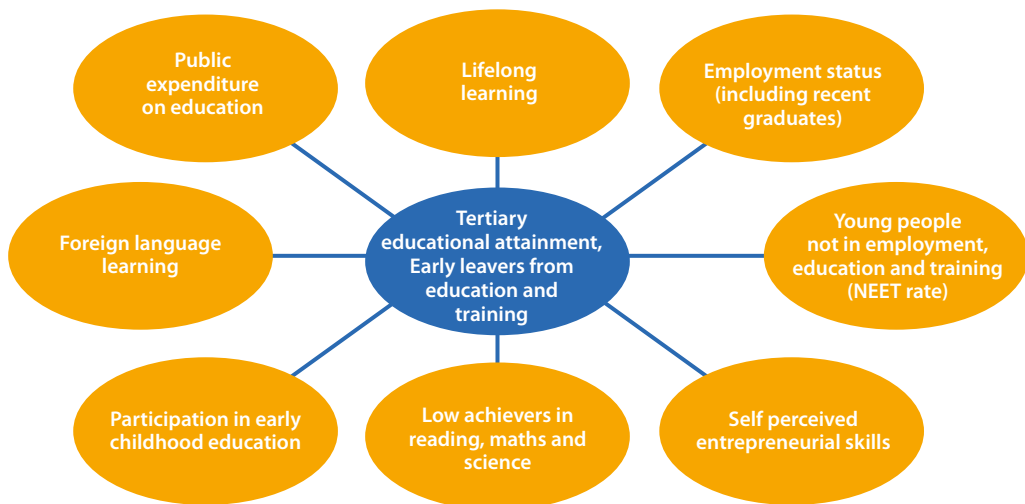
Europe 2020 strategy target on education

The Europe 2020 strategy sets out a target of 'reducing the share of early leavers of education and training to less than 10 % and increasing the share of the population aged 30 to 34 having completed tertiary or equivalent education to at least 40 %' by 2020 ⁽²⁾.

also less likely to be 'active citizens' or engage in lifelong learning ⁽³⁾.

In addition, tertiary education, with its links to research and innovation, provides highly skilled human capital (see the chapter on [R&D and innovation](#), page 55). A lack of these skills presents a severe obstacle to economic growth and employment in an era of rapid technological

Figure 4.1: Indicators presented in this chapter



⁽¹⁾ For further information on the impact of demographic ageing on the labour force see the chapter on Employment on page 23.

⁽²⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, Brussels, 2014.

⁽³⁾ European Commission, *Early School Leaving* (accessed 4 May 2016).



progress, intense global competition and labour market demand for ever-increasing levels of skill. The Europe 2020 strategy, through its 'smart growth' priority, therefore aims to tackle early school leaving and to raise tertiary education levels ⁽⁴⁾.

The analysis in this chapter builds on the headline indicators chosen to monitor the strategy's education targets: 'Early leavers from education and training' and 'Tertiary educational attainment'. Contextual indicators are used to provide a broader picture and insight into drivers behind changes in the headline indicators. Some are also used to monitor progress towards additional benchmarks set under the EU's *Strategic Framework for Education and Training 2020 (ET 2020)*. These indicators include early childhood education, basic reading, maths and science skills, and adult participation in lifelong learning. The benchmarks are listed in Box 4.1.

The analysis follows the typical educational pathway, starting with early childhood education, followed by the acquisition of basic skills (reading, maths and science) and foreign languages, leading to tertiary education and lifelong learning in adulthood. It then switches to the 'outcome' side, looking at educational attainment in the EU labour force and the impacts of low levels of attainment. The input in the form of public expenditure on education is investigated as well.

The EU's education targets are interlinked with the other Europe 2020 goals: higher educational attainment improves employability, which in turn reduces poverty. The tertiary education target is furthermore interrelated with the research and development (R&D) and innovation target — investments in the R&D sector is likely to raise the demand for highly skilled workers.

Box 4.1: ET 2020 — the EU's Strategic Framework for Education and Training 2020

The two Europe 2020 education targets also feature as EU benchmarks under the *Strategic Framework for Education and Training 2020 (ET 2020)* ⁽⁵⁾. ET 2020 aims to foster European co-operation in education and training, providing common strategic objectives for the EU and its Member States for the period up to 2020. ET 2020 covers the areas of lifelong learning and mobility; quality and efficiency of education and training; equity, social cohesion and active citizenship; and creativity, innovation and entrepreneurship at all levels of education and training. To support the achievement of these objectives ET 2020 sets EU-wide benchmarks. In addition to the two Europe 2020 targets for education, there are another five benchmarks:

- An average of at least 15 % of adults should participate in lifelong learning.
- The share of low-achieving 15 year olds in reading, mathematics and science should be less than 15 %.
- At least 95 % of children between the age of four years and the age for starting compulsory primary education should participate in early childhood education.
- An EU average of at least 20 % of higher education graduates and of at least 6 % of 18 to 34 year olds with an initial vocational qualification should have had some time studying or training abroad ⁽⁶⁾.
- The share of employed graduates (20 to 34 year olds) having left education and training no more than three years before the reference year should be at least 82 %.

⁽⁴⁾ European Commission, *Tertiary Education* (accessed 4 May 2016).

⁽⁵⁾ Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training ('ET 2020') (2009/C 119/02), Official Journal of the European Union, 28.5.2009.

⁽⁶⁾ For further information, see: <http://ec.europa.eu/programmes/erasmus-plus/>

Early leaving from education and training is declining



Early leaving from education and training has been falling continuously in the EU since 2002, for both men and women. The fall from

17.0% in 2002 to 11.0% in 2015 represents steady progress towards the Europe 2020 target of less than 10% of early leavers.

Young men, foreign-born residents and ethnic minorities are more likely to leave education and training with at most lower secondary education.

Participation in early childhood education and care (ECEC) has grown more or less continuously in the EU since 2002. In 2014, 94.3% of children between the age of four and the starting age of compulsory education participated in ECEC, compared with 87.7% in 2002. This is a considerable move towards the ET 2020 benchmark of at least 95%.

In 2012 about one fifth of 15 year olds showed insufficient abilities in reading, maths and science. This means the number of people with poor abilities needs to fall by almost a quarter to reach the ET 2020 benchmark.

The headline indicator ‘**Early leavers from education and training**’ measures the share of the population aged 18 to 24 with at most lower secondary education and who were not involved in further education or training during the four weeks preceding the survey. Figure 4.2 shows that the share of early leavers has fallen continuously from 17.0% in 2002 to 11.0% in 2015. This trend mirrors reductions in almost all EU Member States for both men and women.

Young men, foreign-born and ethnic minorities are more likely to leave education and training earlier

Overall, men were more likely to leave education and training earlier than women in the EU. This gap has been narrowing since 2010, reaching 2.9 percentage points in 2015. This was the first time it had fallen below three percentage points. The share for women is already below the headline target, at 9.5%.

At the country-level, Bulgaria was the only Member State in 2015 where men were more likely to stay in education and training longer. A similar situation could be observed in the [candidate countries](#) Turkey and FYR Macedonia (?). Gender differences were particularly strong in Spain, Latvia, Malta, Portugal and Italy.

Young foreign-born residents in the EU also have a higher tendency to abandon formal education prematurely. In the EU, the share of early leavers among migrants in 2015 was almost twice as high as for natives (19.0% compared with 10.1%) (?). Language difficulties, leading to underachievement and lack of motivation, are one possible reason. Increased risk of social exclusion due to lower socioeconomic status is another. Educational systems may also exacerbate these circumstances if they are not set up to respond to the special needs of pupils from vulnerable groups (?).

(?) The Former Yugoslav Republic of Macedonia.

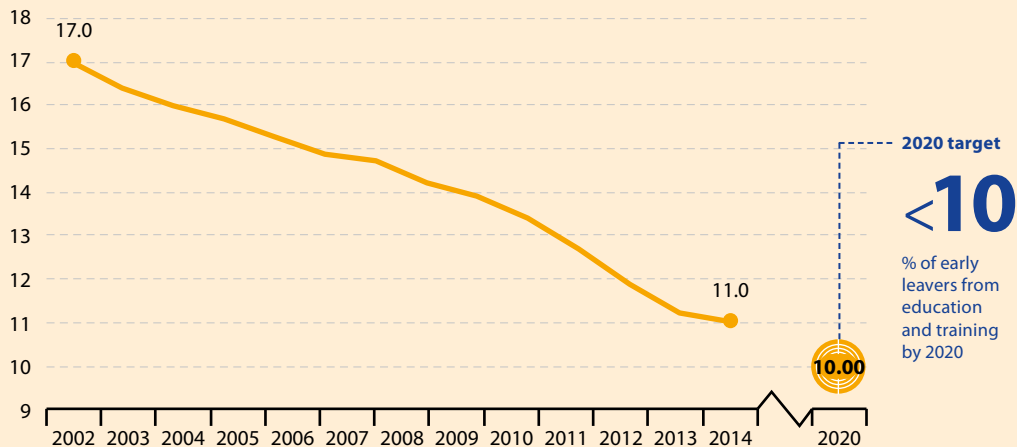
(?) According to the *Education and Training Monitor 2015*, Data for foreign-born individuals have to be interpreted with some caution, as they are only available for a number of Member States, with many of them yielding sample sizes too small to be fully reliable.

(?) Dale et al., *Early School leaving: Lessons from Research for Policy Makers*, European Commission, 2010 (p.30).



Europe 2020 headline indicator

Figure 4.2: Early leavers from education and training, EU-28, 2002–2015 ⁽¹⁾
(% of the population aged 18–24 with at most lower secondary education and not in further education or training)



⁽¹⁾ Breaks in time series in 2003, 2006 and 2014.

Source: Eurostat (online data code: t2020_40)

In a number of Member States, the proportion of early leavers is especially high among ethnic minority groups, such as Roma. The report *'The situation of Roma in 11 EU Member States'* ⁽¹⁰⁾, states that in 2011 the share of early leavers among young Roma aged 18 to 24 years ranged from 72 % in the Czech Republic to 82–85 % in Bulgaria, Hungary, Italy, Poland and Slovakia. In France, Greece, Portugal, Romania and Spain more than 93 % of Roma aged 18 to 24 have not completed upper secondary education.

Ethnic minorities are likely to be excluded from education due to a combination of factors including parental choices, poverty, discriminatory practices, residential segregation and language barriers. In response to persistent marginalisation and social exclusion of Roma minorities, in 2011 the European Commission adopted the *'EU Framework for National Roma Integration*

Strategies up to 2020' ⁽¹¹⁾. The framework reflects the EU's commitment to ensuring Roma inclusion in four key areas, including access to education.

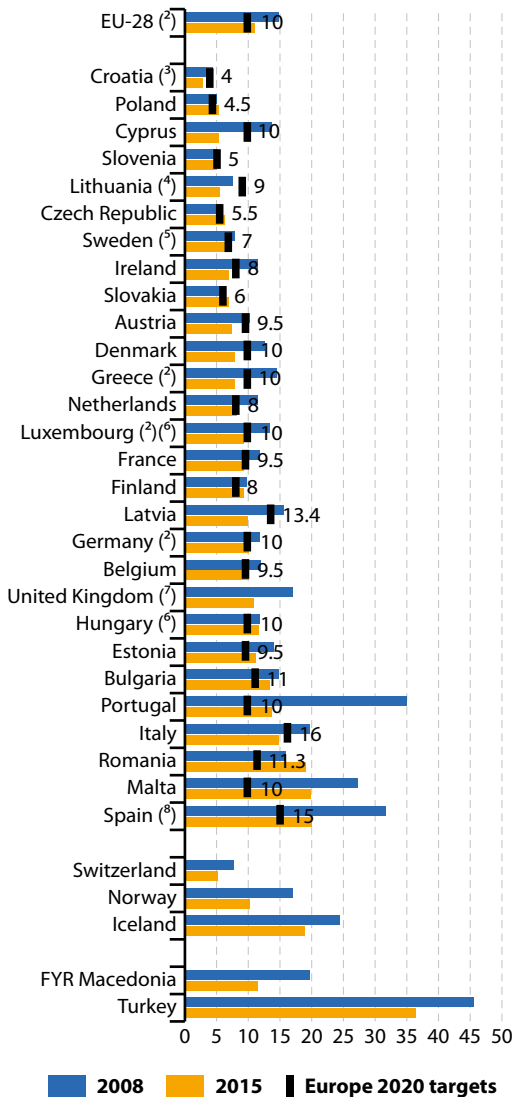
Southern European countries showed strongest reductions in early leaving from education and training

Reflecting different national circumstances, the common EU target for early leavers from education and training has been transposed into *national targets* by all Member States except the United Kingdom. National targets range from 4 % for Croatia to 16 % for Italy. In 2015, 13 countries had already achieved their targets: Austria, Croatia, Cyprus, Denmark, France, Greece, Ireland, Italy, Lithuania, Luxembourg, Latvia, Slovenia and Sweden. The Czech Republic had achieved its target in 2013 but dropped out again in 2015. At

⁽¹⁰⁾ European Union Agency for Fundamental Rights, *Poverty and Employment: The Situation of Roma in 11 EU Member States*, 2014 (p. 18).

⁽¹¹⁾ European Commission, *EU Framework for National Roma Integration Strategies up to 2020*, COM(2011) 173 final, Brussels, 2011.

Figure 4.3: Early leavers from education and training, by country, 2008 and 2015 ⁽¹⁾
 (% of the population aged 18–24 with at most lower secondary education and not in further education or training)



⁽¹⁾ All countries: break in time series in 2014 (switch from ISCED 1997 to ISCED 2011).
⁽²⁾ Target: less than 10 %.
⁽³⁾ 2015 data with low reliability.
⁽⁴⁾ Target: less than 9 %.
⁽⁵⁾ Target: less than 7 %.
⁽⁶⁾ Break in time series in 2015.
⁽⁷⁾ No target in National Reform Programme.
⁽⁸⁾ Target defined for school drop-out rate.

Source: Eurostat (online data code: t2020_40)

the other end of the scale, Malta was the furthest away by some 10 percentage points.

In 2015, rates of early leaving varied by a factor of six across Member States. The lowest proportion of early leavers was in Croatia, Cyprus, Lithuania, Poland and Slovenia with less than 6%. The share was highest in Spain, Malta and Romania with 19% or more.

At the same time, southern European countries experienced strong falls in early leaving from education and training between 2008 and 2015, especially Portugal (from 34.9% to 13.7%), Spain (from 31.7% to 20.0%), Malta (from 27.2% to 19.8%), Greece (from 14.4% to 7.9%) and Cyprus (from 13.7% to 5.3%). In 2015, 17 Member States were already below the overall EU target of 10%.

Looking at the [European Free Trade Association \(EFTA\)](#) and [candidate countries](#), Switzerland was on a level with the best performing EU Member States. However, the share of early leavers was slightly lower than the EU average in Norway and above the EU average in Iceland. The highest share of early leavers — three times as high as in the EU — was in Turkey.

Variations in early leaving from education and training across Member States are also mirrored in the indicator's regional dispersion (see Map 4.1). The predominance of regions with a very low share of early leavers (below 8%) in some central and eastern European countries, such as Poland, the Czech Republic, Slovenia, Slovakia and Croatia, corresponds to the overall low proportion of early leavers in these countries.

In contrast, regions in Spain, Portugal, Italy and Romania stand out with above average rates of early leavers from education and training. In 2015, 20 [NUTS 2](#) regions had a share of early leavers higher than 20%. Half of these regions were in Spain (10 regions), while there were three in Romania, two in each of Italy, France and Portugal, and one in Belgium. The highest proportions of 18 to 24 year olds who were classified as early leavers in 2015 were found in French Guyane (36.1%) and the Spanish Ciudad Autónoma de Ceuta (29.8%). According to the [Education and Training Monitor](#)

2015 ⁽¹²⁾ the share of early leavers is often relatively high in peripheral and remote areas, where students may be forced to leave home if they wish to follow a particular specialisation, while those who remain may be presented with few opportunities for higher education.

The two Member States with the largest internal dispersion of early leaving rates in 2015, by a factor of five or higher, were the Czech Republic and France. This means the worst performing regions in these countries had early leaving rates that were about five times higher than in the best performing regions. In 2015, the French region Picardie had early leaving rates six times higher than Bretagne, the best performing region in France. In contrast, Slovenia, Denmark, Finland and Sweden were the most 'equal' countries, showing almost no difference in rates across their regions.

Map 4.2 shows the change in regional rates of early leaving from education and training since 2008. The share of early leavers in the EU-28 fell by 3.7 percentage points between 2008 and 2015. Nearly four fifths (78.5%) of the 265 NUTS 2 regions for which data are available have experienced a fall in their share of early leavers aged 18 to 24 over the six years from 2008 to 2015.

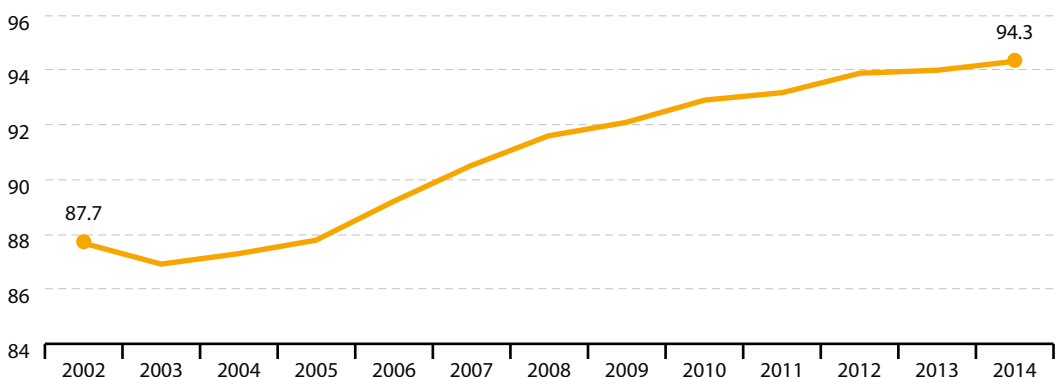
The biggest regional reductions were recorded in Portuguese and Spanish. The largest falls were in the Norte region and the Região Autónoma dos Açores in Portugal, where the proportion of early leavers fell by around 25 percentage points. Four other Portuguese regions as well as four Spanish regions recorded declines of at least 15 percentage points.

In contrast, early leaving rates increased in 57 regions over the period from 2008 to 2015. Five regions had increases of more than five percentage points; three of which were in Romania (Nord-Est, Sud-Est and Centru), one was in Bulgaria (Severozapaden) and one was in the United Kingdom (Cumbria).

EARLY CHILDHOOD EDUCATION AND CARE IS IMPROVING

Early childhood education and care (ECEC) can bring wide-ranging social and economic benefits for individuals and for society as a whole. Quality ECEC provides an essential foundation for effective lifelong learning and future educational achievements. It also helps personal development and social integration. The EU therefore aims to

Figure 4.4: Participation in early childhood education, EU-28, 2002–2014 ⁽¹⁾
(% of the age group between four years old and the starting age of compulsory education)

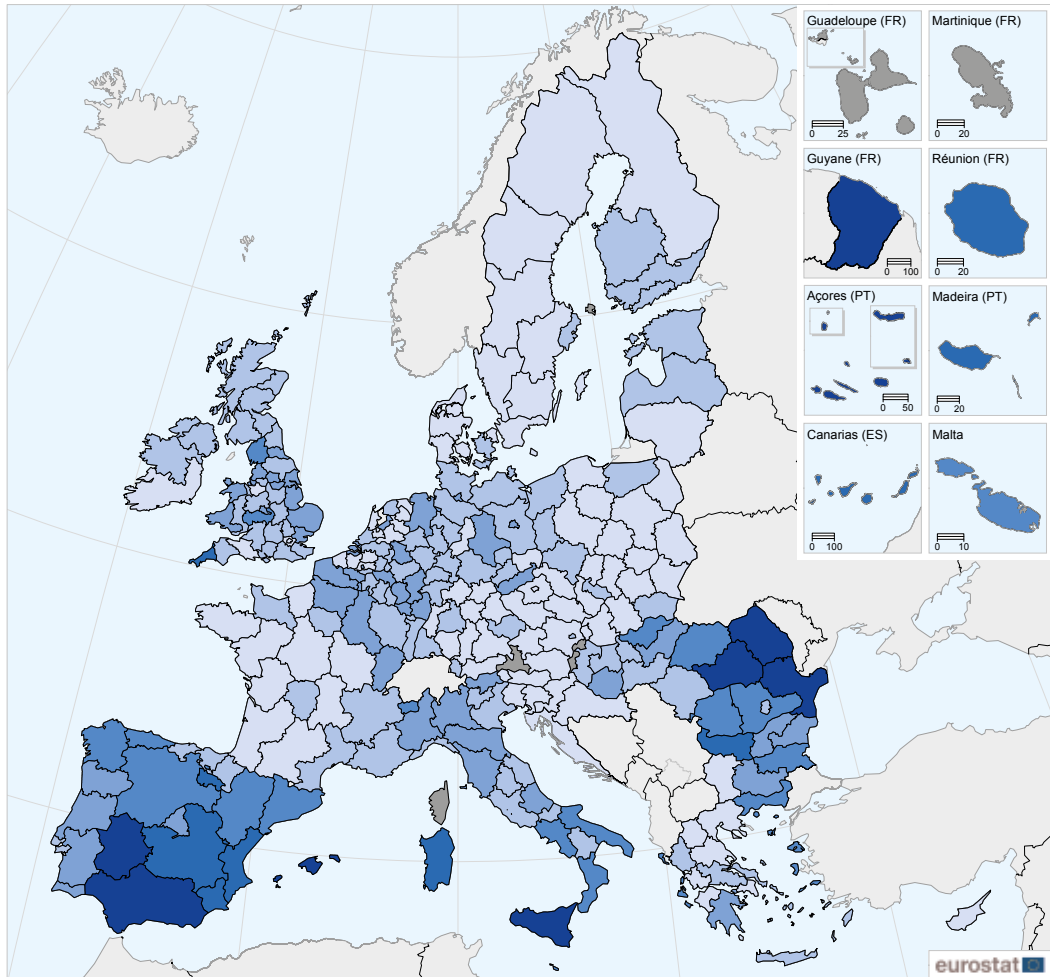


⁽¹⁾ Break in time series in 2013 (switch from ISCED 1997 to ISCED 2011). ET 2020 benchmark for the EU: at least 95%.

Source: Eurostat (online data codes: [tps00179](#) and [educ_uoe_enra10](#))

⁽¹²⁾ European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2015*, Publications Office of the European Union, Luxembourg, 2015 (p.61).

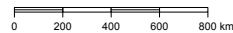
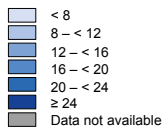
Map 4.1: Early leavers from education and training, by NUTS 2 regions, 2015 ⁽¹⁾
 (% of the population aged 18–24 with at most lower secondary education and not in further education or training)



(% of the population aged 18-24)

Administrative boundaries: © EuroGeographics © UN-FAO
 Cartography: Eurostat — GISCO, 06/2016

EU-28 = 11.0

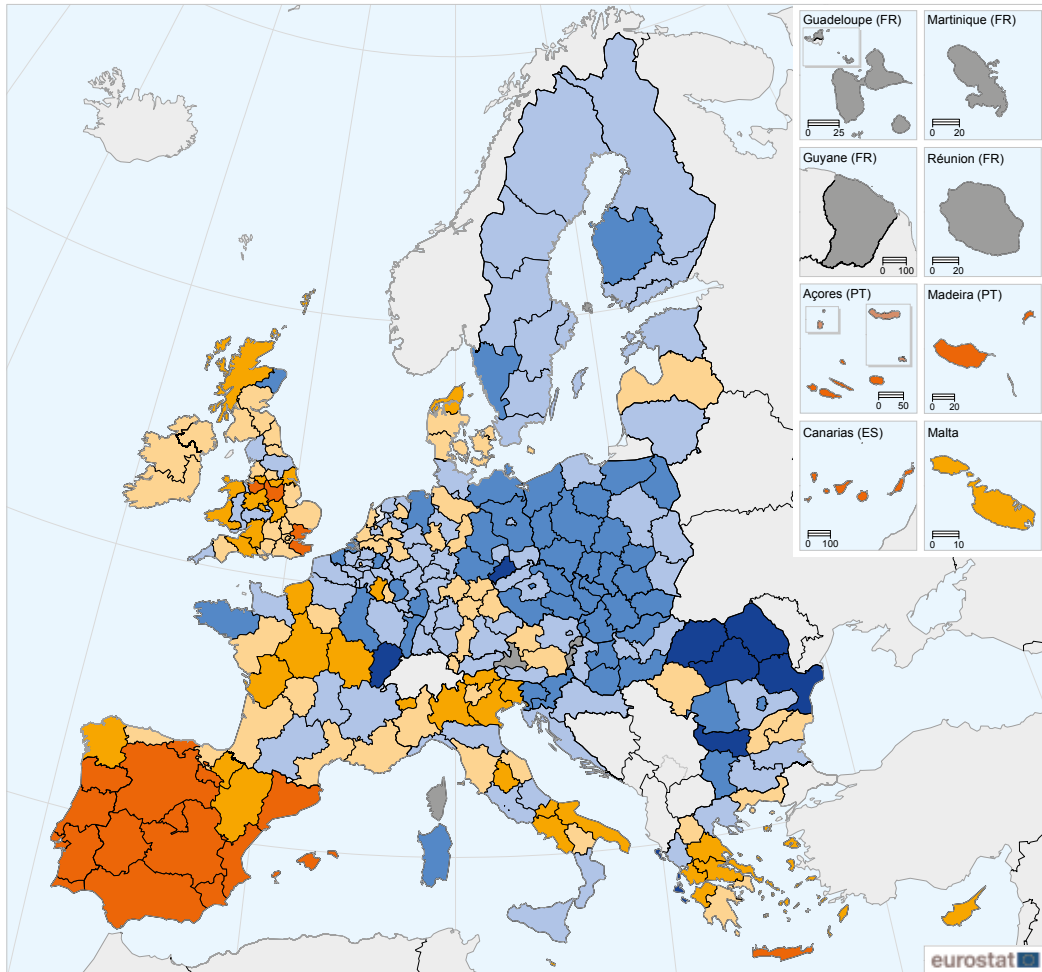


⁽¹⁾ 2011 data for Podlaskie and Opolskie (Poland); 2012 data for Trier (Germany), Kärnten and Vorarlberg (Austria), Swietokrzyskie (Poland) and Cornwall and Isles of Scilly (United Kingdom); 2013 data for Oberpfalz (Germany), Ipeiros (Greece) and Valle d'Aosta/Vallée d'Aoste (Italy); 2014 data for Prov. Brabant Wallon (Belgium), Ionia Nisia (Greece) and Limousin (France); low data reliability for several regions (too numerous to list).

Source: Eurostat (online data code: [edat_lfse_16](#))



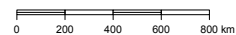
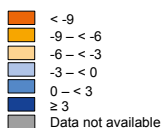
Map 4.2: Change in early leavers from education and training, by NUTS 2 regions, 2008–2015⁽¹⁾
(percentage points difference between 2015 and 2008, population aged 18 to 24 with at most lower secondary education and not in further education or training)



(percentage points difference between 2015 and 2008, population aged 18-24)

Administrative boundaries: © EuroGeographics © UN-FAO
Cartography: Eurostat — GISCO, 06/2016

EU-28 = -3.7



⁽¹⁾ Break in time series in 2014 (switch from ISCED 1997 to ISCED 2011); change 2008–2011 for Podlaskie and Opolskie (Poland); change 2008–2012 for Trier (Germany), Kärnten and Vorarlberg (Austria), Swietokrzyskie (Poland) and Cornwall and Isles of Scilly (United Kingdom); change 2008–2013 for Oberpfalz (Germany) and Valle d'Aosta/Vallée d'Aoste (Italy); change 2008–2014 for Prov. Brabant Wallon (Belgium); change 2009–2015 for North Eastern Scotland (United Kingdom); change 2010–2013 for Ipeiros (Greece); change 2010–2014 for Ionia Nisia (Greece); change 2010–2015 for Anatoliki Makedonia, Thraki, Kentriki Makedonia, Dytiki Makedonia, Thessalia, Dytiki Ellada, Sterea Ellada and Peloponnisos (Greece), Mellersta Norrland (Sweden), and Highlands and Islands (United Kingdom); change 2012–2014 for Limousin (France); change 2012–2015 for Slovenia and London (United Kingdom); low data reliability for several regions (too numerous to list).

Source: Eurostat (online data code: [edat_lfse_16](#))

ensure that all young children can access and benefit from high-quality education and care ⁽¹³⁾.

Participation in ECEC is considered a crucial factor for socialising children into formal education. This is especially important for children from disadvantaged backgrounds. The aim is to reduce the incidence of early school leaving, addressing one of the Europe 2020 headline targets on education. Investment in [pre-primary education](#) also offers higher medium- and long-term returns and is more likely to help children from low socioeconomic status than investment at later educational stages.

ET 2020 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. As Figure 4.4 shows, participation has been rising more or less continuously in the EU since 2002. Several countries had already exceeded the ET 2020 benchmark in 2014, implying almost universal pre-school attendance. France had already achieved a 100% pre-school attendance, while in Luxembourg, the United Kingdom, Denmark and Belgium participation rates were above 98%. At the opposite end of the spectrum, the lowest pre-school attendances were observed in Croatia (72.4%) and Slovakia (77.4%).

Integrating foreign-born population and ethnic minorities into early childhood education remains a challenge

Gender differences in early childhood education are negligible across the EU. However, children with a migrant background or from ethnic minorities are in a very disadvantaged position. For example, [a recent study of 11 Member States](#) ⁽¹⁴⁾ revealed a large gap between Roma and non-Roma children attending pre-school and kindergarten in nine of the countries. The

EU has since identified accessibility to early childhood education and care for children from ethnic minorities as a priority area within the [ECEC participation framework](#) ⁽¹⁵⁾. This reflects the growing consensus at policy level that early pre-schooling has an important role to play in addressing disadvantages and reducing the risk of poverty and social exclusion.

ACQUIRING SKILLS FOR THE KNOWLEDGE SOCIETY

A key objective of all educational systems is to equip people with a wide range of skills and competences. This encompasses not only basic skills such as reading and mathematics, but also more transversal ones such as [information and communication technology \(ICT\)](#) and entrepreneurship.

Basic skills: poor reading, maths and science affect one fifth of EU pupils

Basic skills, whether reading simple text or performing easy calculations, provide the foundations for learning, gaining specialised skills and personal development. The ET 2020 framework acknowledges the increasing importance of individual skills in the era of the knowledge-based economy. In response, it has set a target to reduce the share of 15 year olds achieving at most low levels of reading, mathematics and science to less than 15% by 2020.

In 2012, about one sixth to almost one quarter of 15 year old EU citizens showed insufficient abilities in reading, mathematics and science as measured by the OECD's PISA study ⁽¹⁶⁾. The test results were best for science, with a 16.5% share of low achievers, followed by reading with 17.8% and maths with 22.0%. Figure 4.5 shows how the overall performance in reading, mathematics and science varied significantly across countries. The share of pupils failing to acquire competences

⁽¹³⁾ European Commission, *Key Data on Early Childhood Education and Care in Europe: 2014*.

⁽¹⁴⁾ European Union Agency for Fundamental Rights, *Poverty and Employment: The Situation of Roma in 11 EU Member States*, 2014 (p. 13).

⁽¹⁵⁾ European Commission, *Early Childhood Education and Care: Providing All our Children with the Best Start for the World of Tomorrow*, COM(2011) 66 final, Brussels, 2011 (p. 4).

⁽¹⁶⁾ 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/>



in the key subjects surpassed 36% in Bulgaria and Romania. However, Estonia, Finland, Poland and the Netherlands had the lowest share of low achievers in reading, mathematics and science with levels below 15%.

Compared with international competitors, the EU's overall share of low achievers in reading, maths and science was similar to that of the United States. However, it was higher than for Japan and Korea, where the shares of low-achieving pupils in 2012 were below 12% and 10% respectively.

Achievement in science has shown the strongest progress at the EU level since 2000, while improvement in mathematical competences has been the slowest. For the EU as a whole, the ET 2020 benchmark implies that the share of low achievers needs to be reduced by a tenth (for science) to almost a third (for maths) compared with 2012 levels.

A large gender gap in reading performance can be seen. In 2012, the share of low achieving OECD pupils was about twice as high among boys (23.6%) than among girls (11.7%). This means girls have already reached the ET 2020 framework's 15% reading benchmark and that effort needs to be focused on boys to balance performance levels. Gender differences are considerably smaller in the other key subject areas. Boys slightly outperform girls in maths and girls slightly outperform boys in science.

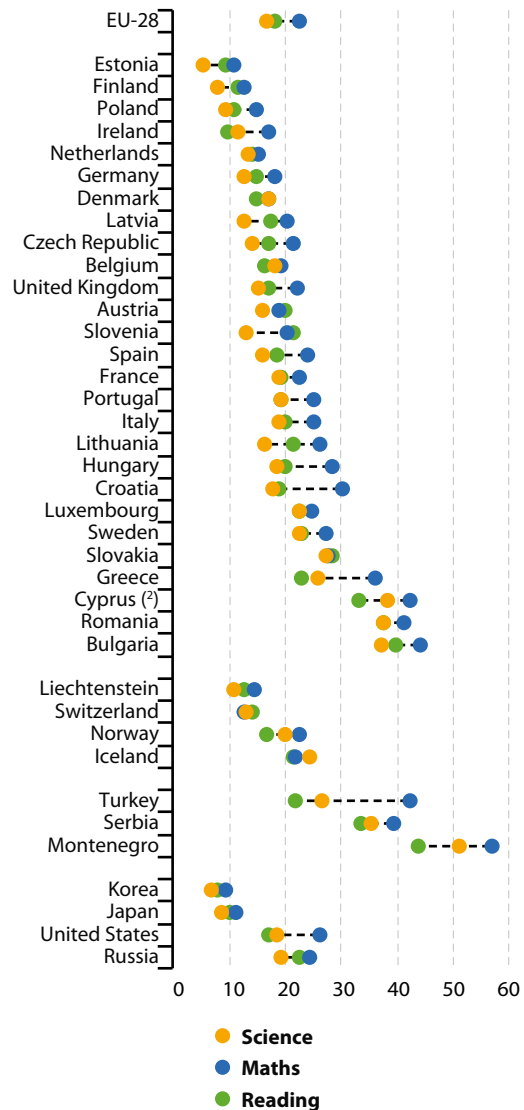
Wide variations in foreign language learning across Member States

The ability of citizens to communicate in at least two languages besides their mother tongue has been identified as a key priority in the EU's ET 2020 framework. The European Commission has proposed monitoring student proficiency in the first foreign language and the uptake of a second foreign language at lower secondary level. Member States must ensure the quantity and quality of foreign language education is scrutinised and that teaching and learning are geared towards practical, real-life application ⁽¹⁷⁾.

⁽¹⁷⁾ The Member States play an important role in the development of national assessments of language learning. See in particular the May 2014 Council *Conclusions on Multilingualism and the development of language competence*.

Figure 4.5: Low achievers in reading, maths and science, by country, 2012 ⁽¹⁾

(Share of 15-year-old pupils who are below proficiency level 2 on the PISA scales for reading, maths and science)

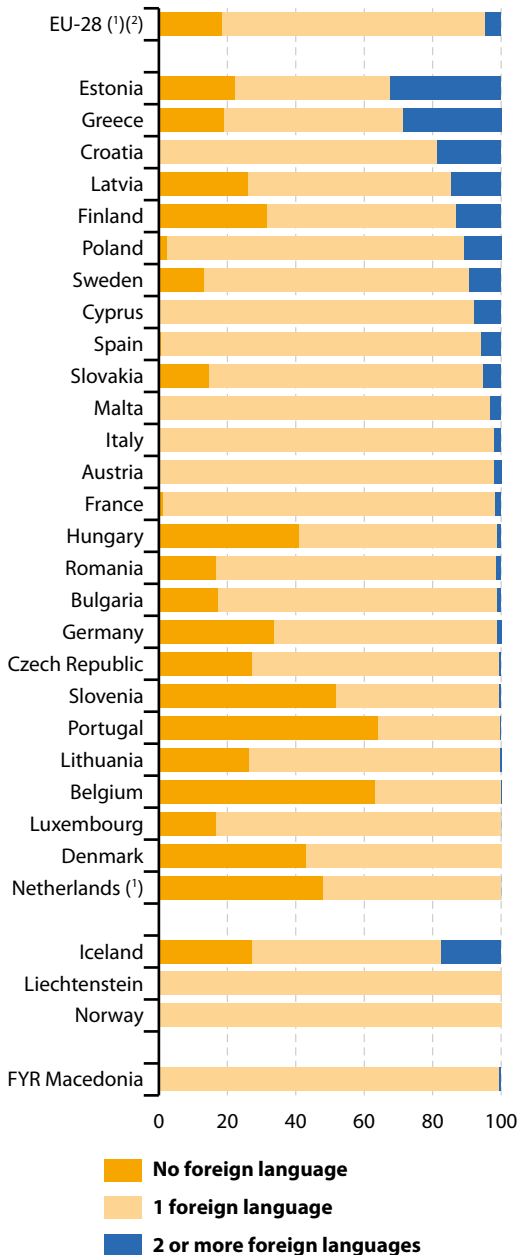


⁽¹⁾ EU-28 data are estimates.

⁽²⁾ Data relate to the area under the effective control of the Government of the Republic of Cyprus.

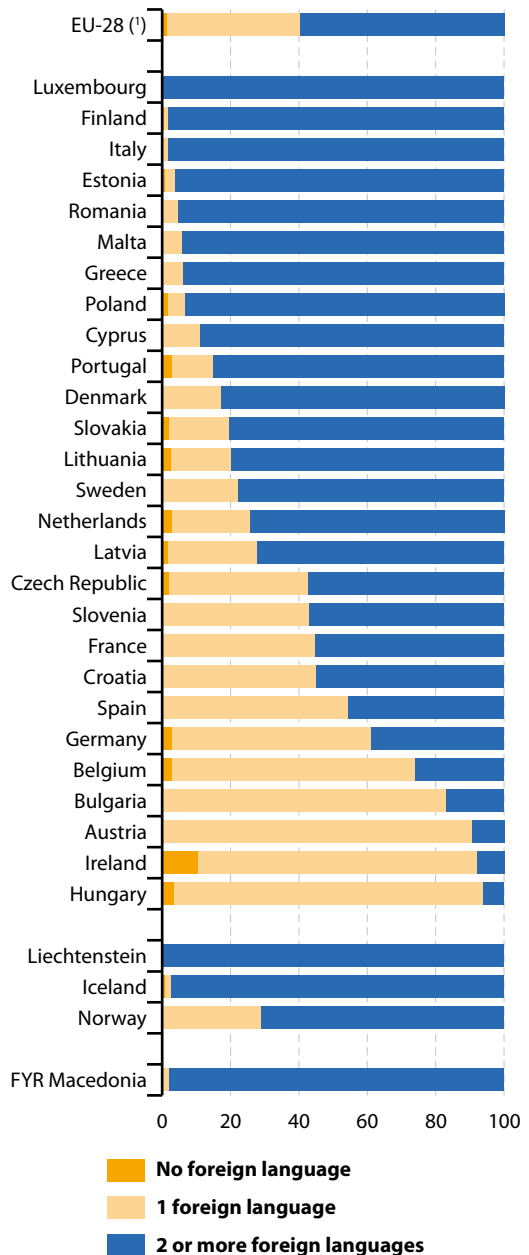
Source: OECD/PISA (online data code: tsdsc450)

Figure 4.6: Pupils in primary education, by number of modern foreign languages studied, 2014
(% of pupils at ISCED level 1)



(¹) 2013 data.
(²) Excluding Ireland and the United Kingdom.
Source: Eurostat (online data code: [educ_uoe_lang02](#))

Figure 4.7: Pupils in lower secondary education, by number of modern foreign languages studied, 2014
(% of pupils at ISCED level 2)



(¹) Excluding the United Kingdom.
Source: Eurostat (online data code: [educ_uoe_lang02](#))



Foreign language skills should be taken into account in the effort to equip young people with the competences needed to meet labour market demands.

Schools teach foreign languages in all Member States, making language learning a central element in every child's school experience across Europe. Figure 4.6 shows the number of modern foreign languages studied in primary education (ISCED level 1) in 2014. In Austria, Croatia, Cyprus, Italy and Malta the study of a second language was almost universal at this level. Nonetheless, on average, 18% of pupils across the EU were not engaged in language learning at this level in 2013. This number was higher in 2010 with 23.1%.

Figure 4.7 shows that the share of students learning no foreign language dropped below 2% in lower secondary education (ISCED level 2) across the EU. On the other hand, students learning two or more foreign languages reached almost 60%. In Luxembourg, all of the students learned two languages, followed by Finland and Italy with shares of 98%.

English was the most studied foreign language across the EU, with 97.3% of students learning it in 2014 (at ISCED level 2). This represents a substantial increase in its popularity, compared with 75.4% a decade earlier. French, German and especially Spanish have also been steadily gaining popularity over that time.

ICT skills: enhancing digital competences

Enhancing digital competences to exploit the potential of information and communication technologies (ICT) is a key priority under the Europe 2020 strategy. Its flagship initiative 'Digital Agenda for Europe'⁽¹⁸⁾ aims to help achieve this goal. The lack of digital literacy and skills is seen as 'excluding many citizens from the digital society and economy. It is also holding back the large multiplier effect of ICT take-up on productivity growth'.

ICT skills are also relevant to the Europe 2020 strategy's headline indicator on R&D expenditure. An analysis of European citizens' computer and internet skills is provided in the chapter on 'R&D and innovation', page 55.

Tertiary education and lifelong learning on the rise in the EU



Between 2002 and 2015, the share of 30 to 34 year olds having completed tertiary education grew continuously from 23.6% to 38.7%.

Growth was considerably faster for women, who in 2015 were already clearly above the Europe 2020 target at 43.4%. In contrast, among 30 to 34 year old men the share was 34.0% in 2015.

In 2013, 7.5% of all EU students were studying in a country other than the one where they had completed their secondary education. Most of the mobility took place at doctorate level.

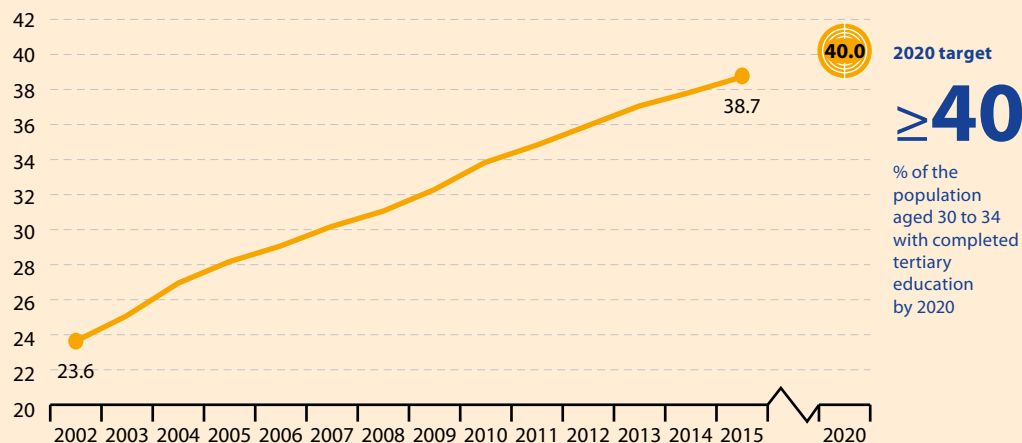
The share of adults participating in lifelong learning does not seem to be increasing fast enough to meet the ET 2020 benchmark of raising participation to at least 15% by 2020. In 2014, the share reached a high of 10.8%, before falling slightly to 10.7% in 2015.

⁽¹⁸⁾ European Commission, *A Digital Agenda for Europe*, COM(2010) 245 final, Brussels, 2010 (p.6).



Europe 2020 headline indicator

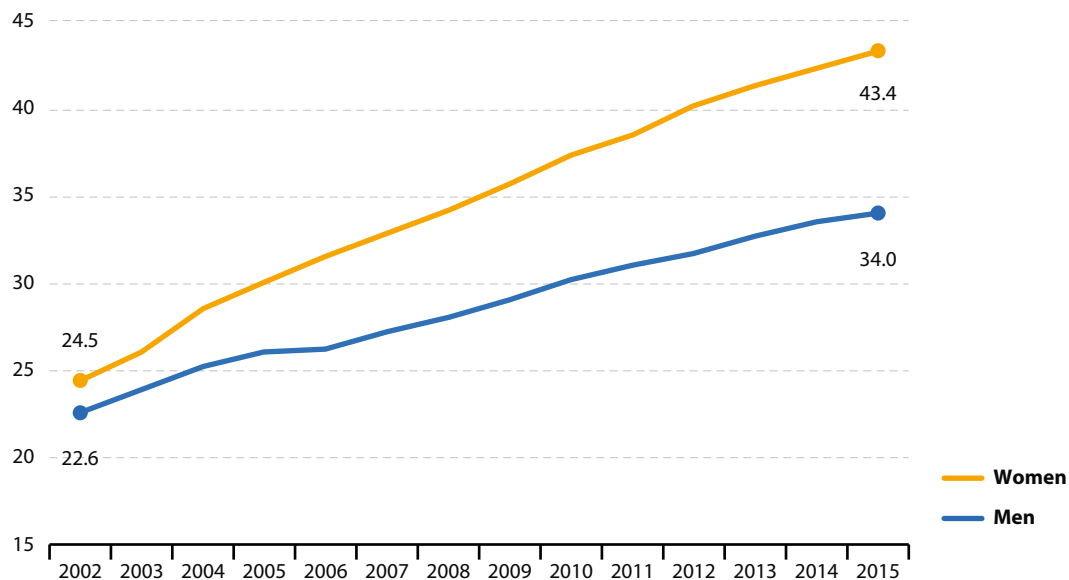
Figure 4.8: Tertiary educational attainment, EU-28, 2002–2015⁽¹⁾
 (% of the population aged 30–34 with completed tertiary education)



⁽¹⁾ Break in time series in 2014 (switch from ISCED 1997 to ISCED 2011); Europe 2020 target: at least 40%.

Source: Eurostat (online data code: t2020_41)

Figure 4.9: Tertiary educational attainment, by sex, EU-28, 2002–2015⁽¹⁾
 (% of the population aged 30–34 with completed tertiary education)



⁽¹⁾ Break in time series in 2014 (switch from ISCED 1997 to ISCED 2011).

Source: Eurostat (online data code: t2020_41)



The proportion of tertiary graduates is growing rapidly

Raising the share of the population aged 30 to 34 that have completed tertiary or equivalent education to at least 40% is the second of the two Europe 2020 education targets. It is monitored with the headline indicator that follows **tertiary educational attainment** of the same age group ⁽¹⁹⁾.

Figure 4.8 shows steady and considerable growth in the share of 30 to 34 year olds who have completed university or other tertiary-level education since 2002. The share of 38.7% in 2015 implied a growth of 15.1 percentage points since 2002.

Women significantly outnumber men in tertiary educational attainment

Figure 4.9 shows a significantly widening gender gap among tertiary education graduates across the EU. While in 2002 the share was similar for both sexes, the increase up to 2015 was almost twice as fast for women. In 2015, women outnumbered men significantly in terms of tertiary educational attainment in almost all Member States. In fact, 21 countries showed a gender gap of more than 10 percentage points in 2015. In Estonia, Latvia, Lithuania and Slovenia the differences were more than 20 percentage points. Germany was the most 'equal' country with a gender gap of only 0.2 percentage points.

Gender differences can also be seen in the fields studied. A much higher proportion of men graduate in STEM fields (science, technology, engineering, mathematics), while women tend to dominate social sciences, humanities and teaching ⁽²⁰⁾.

Northern and central Europe show the highest tertiary educational attainment

The trend in the EU as a whole mirrors increases in tertiary educational attainment levels across

all Member States. This to some extent reflects Member States' increased 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 ⁽²¹⁾ process reforms in some countries.

National targets for tertiary education range from 26% for Italy to 66% for Luxembourg. Germany's target is slightly different from the overall EU target because it includes post-secondary, non-tertiary attainment (ISCED level 4). For France the target definition refers to the age group of 17 to 33 year olds while for Finland the target excludes former tertiary vocational education and training (VET).

Figure 4.10 shows that in 2015, 13 countries had already achieved their national targets: Austria, Cyprus, Denmark, Estonia, Finland, Germany ⁽²²⁾, Greece, Hungary, Latvia, Lithuania, the Netherlands, Slovenia and Sweden. Italy, Poland and Romania were less than two percentage points away from their national targets. Luxembourg and Slovakia were the most distant, at some 10 percentage points or more below their targets.

In 2015, levels of tertiary educational attainment varied by a factor of about 2.3 across Europe. Northern and central Europe had the highest percentage of tertiary graduates, with 18 countries exceeding the overall EU target of 40%. The lowest levels could be observed in Italy and Romania, which were both around 25%.

At the same time, some eastern European countries experienced the strongest increases over the period 2008 to 2015. Changes were most pronounced in Lithuania, Austria, Latvia, Greece and the Czech Republic where the shares almost doubled.

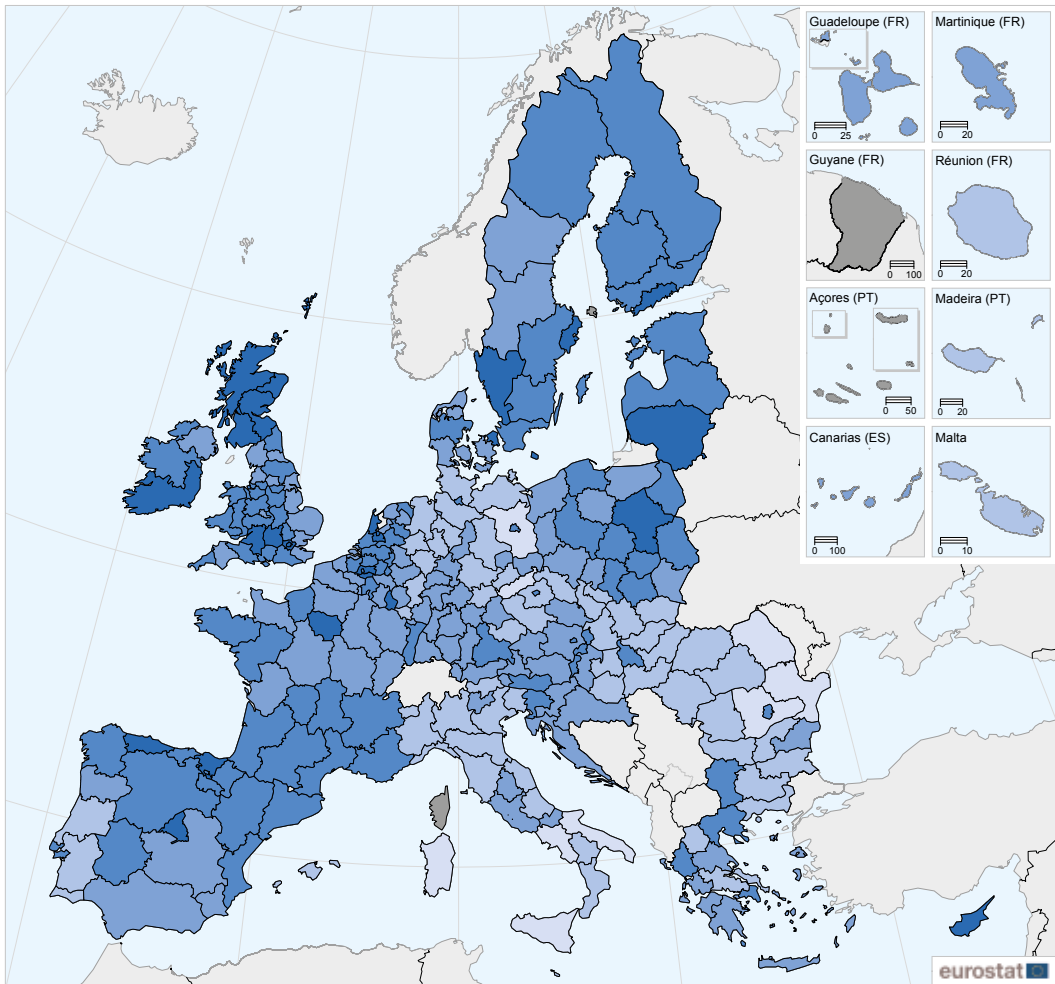
⁽¹⁹⁾ Educational attainment is defined according to the International Standard Classification of Education (ISCED). Tertiary educational attainment refers to ISCED 2011 level 5–8 (for data as from 2014) and to ISCED 1997 level 5–6 (for data up to 2013).

⁽²⁰⁾ For more information, see *the education and training monitor 2015*, p. 44.

⁽²¹⁾ 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: *Education and training statistics introduced* (accessed 25 April 2016)).

⁽²²⁾ Germany: Target and data including ISCED level 4.

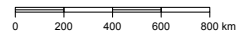
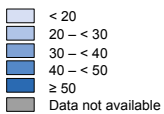
Map 4.3: Tertiary educational attainment, by NUTS 2 regions, 2015 ⁽¹⁾
 (% of the population aged 30–34 with completed tertiary education)



(% of the population aged 30-34)

Administrative boundaries: © EuroGeographics © UN-FAO
 Cartography: Eurostat — GISCO, 06/2016

EU-28 = 38.7

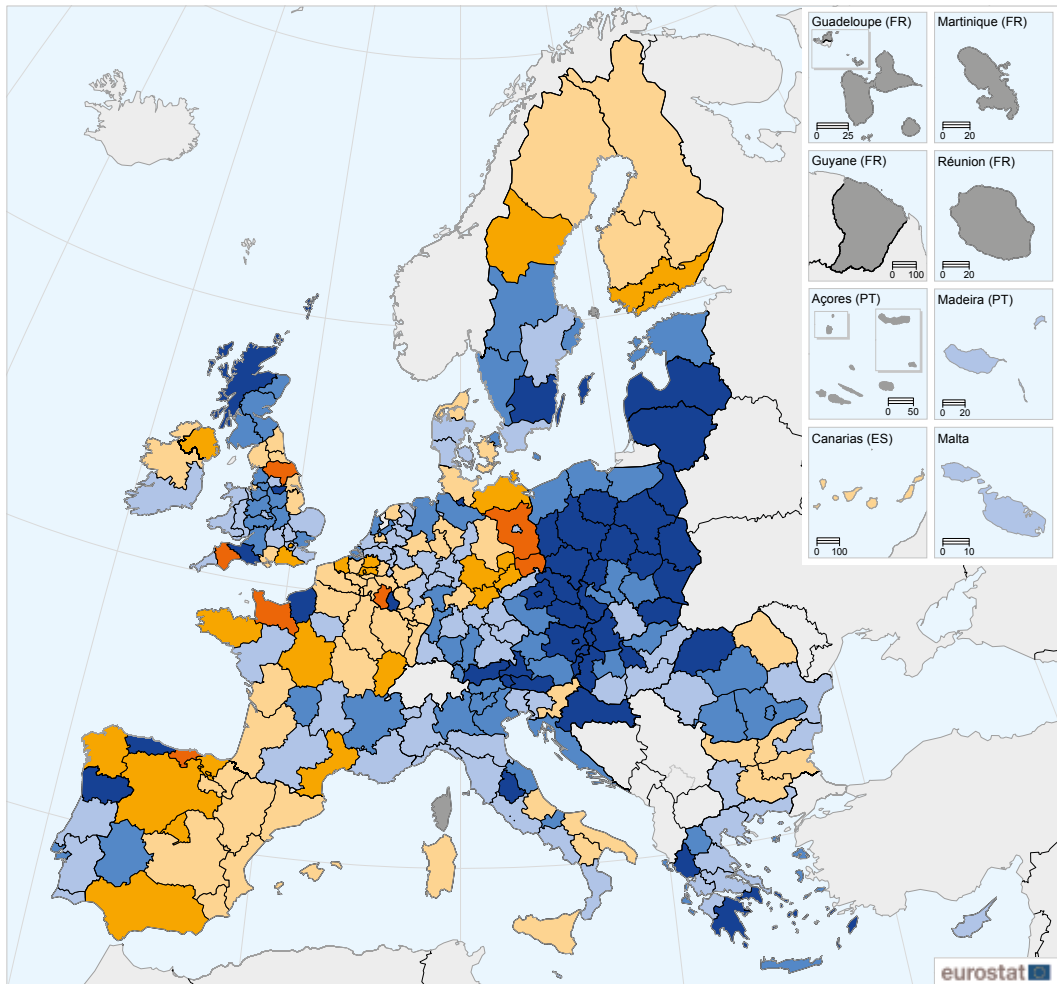


⁽¹⁾ 2013 data for Região Autónoma da Madeira (PT); low data reliability for several regions (too numerous to list).

Source: Eurostat (online data code: [edat_lfse_12](#))



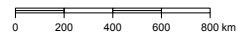
Map 4.4: Change in tertiary educational attainment, by NUTS 2 regions, 2008–2015⁽¹⁾
(percentage points difference between 2015 and 2008, population aged 30–34 with completed tertiary education)



(percentage points difference between 2015 and 2008, population aged 30–34)

Administrative boundaries: © EuroGeographics © UN-FAO
Cartography: Eurostat — GISCO, 06/2016

EU-28 = 7.6

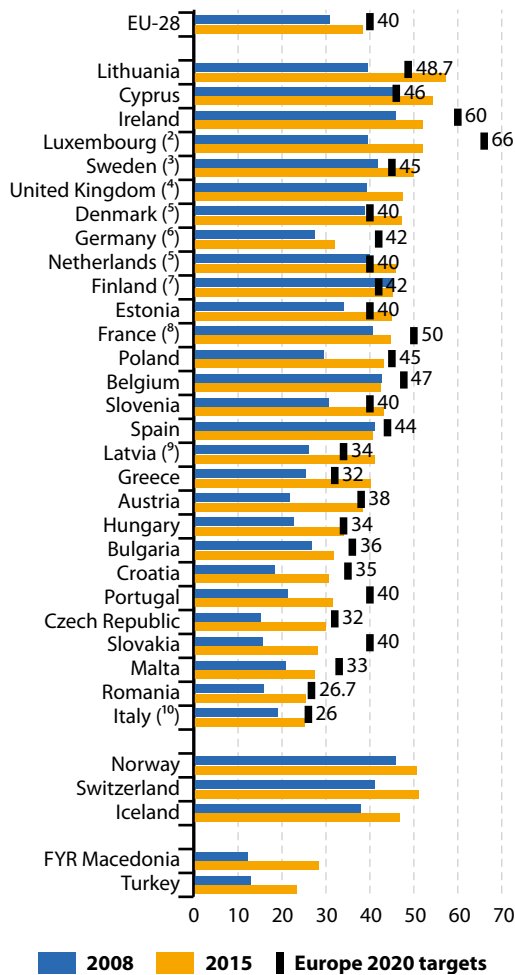


⁽¹⁾ Break in time series in 2014 (switch from ISCED 1997 to ISCED 2011); change 2009–2014 for Burgenland (Austria), change 2009–2013 for Região Autónoma da Madeira (Portugal), change 2010–2015 for several regions in Greece, change 2011–2015 for Slovenia and London (United Kingdom); low data reliability for several regions (too numerous to list).

Source: Eurostat (online data code: [edat_lfse_12](#))

Figure 4.10: Tertiary educational attainment, by country, 2008 and 2015 ⁽¹⁾

(% of the population aged 30–34 with completed tertiary education)



⁽¹⁾ Break in time series in 2014 (switch from ISCED 1997 to ISCED 2011).

⁽²⁾ Break in time series in 2015.

⁽³⁾ National target: 45–50 %.

⁽⁴⁾ No target in National Reform Programme.

⁽⁵⁾ National target: more than 40 %.

⁽⁶⁾ Target and data refer to ISCED 2011 levels 4–8.

⁽⁷⁾ Target: excluding former tertiary Vocational Education and Training (VET).

⁽⁸⁾ Target refers to 17–33 year-olds.

⁽⁹⁾ National target: 34–36 %.

⁽¹⁰⁾ National target: 26–27 %.

Source: Eurostat (online data code: t2020_41)

Looking at non-EU Europe, the EFTA countries Norway, Switzerland and Iceland were at the level of the best performing Member States in 2015. However, the candidate countries FYR Macedonia and Turkey showed tertiary educational attainment levels similar to southern and eastern European Member States.

The regional differences in tertiary educational attainment across Europe shown in Map 4.3 are to a large extent in line with general country differences (see Figure 4.10). In 2015, many regions in Belgium, Finland, France, the Netherlands, Poland, Sweden and the United Kingdom had above average rates. On the other hand, most regions in the Czech Republic, Italy, Hungary, Romania and Slovakia showed a small proportion of tertiary graduates.

Romania and the Czech Republic had the biggest internal dispersion of tertiary educational attainment rates: their worst performing regions had a rate that was three times lower than in the best performing regions. In the Czech Republic, the region of Praha had a share three times as low as the region with the highest rate — Severozápad. In contrast, Austria, Finland and Italy were more 'equal' countries, with relatively small disparities in tertiary educational attainment rates across their regions. Only the differences in Croatia and Slovenia were smaller. One possible explanation could be the small number of regions in these countries.

Map 4.4 shows the change in regional tertiary educational attainment rates since 2008. Of the 269 NUTS 2 regions for which data are available, 86.6% (or 233 regions) experienced an increase between 2008 and 2015. Among the regions with the highest increases were Peloponnisos ⁽²³⁾ and Notio Aigaio (Greece) and Niederösterreich and Burgenland (Austria) ⁽²⁴⁾.

In contrast, tertiary educational attainment rates fell in 33 regions over the period from 2008 to 2015. Eight had falls of more than five percentage points. Three of these were in Spain (Ciudad Autónoma de Ceuta, Ciudad Autónoma

⁽²³⁾ Increase between 2010 and 2015.

⁽²⁴⁾ The rise in Austria was mainly influenced by a methodological change. Increase for Burgenland between 2009 and 2015.



de Melilla and Cantabria), two of these were in Germany (Brandenburg and Dresden) and the remaining three in the United Kingdom (Devon), France (Basse-Normandie) and Belgium (Prov. Luxembourg).

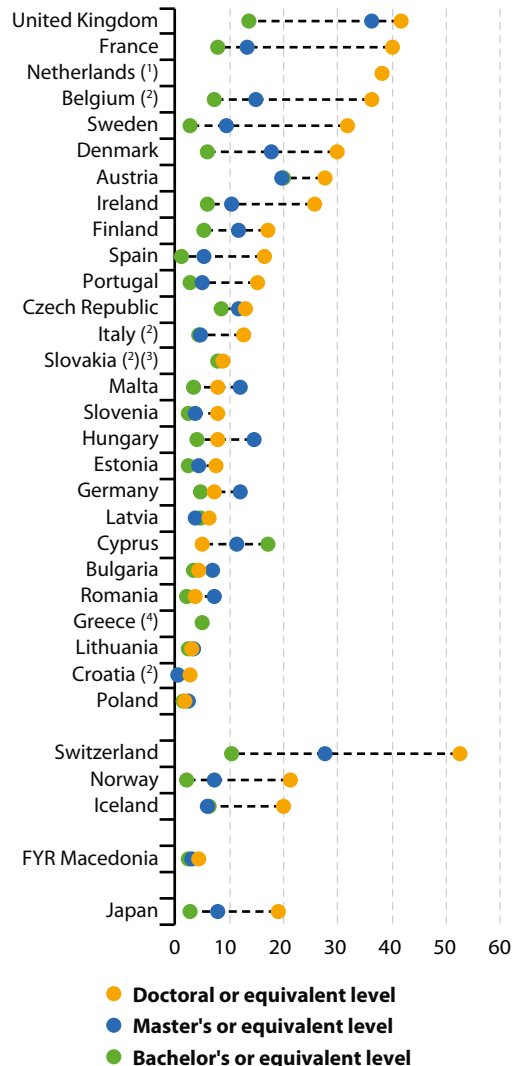
LOW LEVELS OF STUDENT MOBILITY IN HIGHER EDUCATION

Apart from providing valuable academic and cultural benefits, educational mobility is increasingly important for improving young people's employability and labour market access. Increased mobility in higher education — of students, researchers and staff — is a key priority of the *Bologna Process* ⁽²⁵⁾. In 2009, European ministers responsible for higher education met to take stock of the achievements of the Bologna Process. They agreed on the benchmark that 'in 2020 at least 20% of those graduating in the European Higher Education Area should have had a study or training period abroad' ⁽²⁶⁾. The benchmark refers to two main forms of mobility: degree mobility (undertaking a full degree programme in another country) and credit mobility (taking part of a study programme in a university abroad). Direct assessment of Member States' progress towards the EU mobility benchmark cannot be made because the current data on students going abroad do not provide information on graduates' degree and credit mobility. Nevertheless, statistics on student enrolment in higher education provide a useful indication of general mobility trends.

In 2013, around 1.4 million people undertaking tertiary level studies in Member States were from abroad. This corresponded to 7.5% of all EU students in 2013. These students were studying in a country other than the one where they had completed their secondary education, regardless of whether this was another Member State or a non-member country. Mobility particularly takes place at the doctorate level, where students specialise at a high level in a specific topic (see

Figure 4.11: Students from abroad in tertiary education, by education level and country, 2013

(Share of mobile students from all over the world except for the reporting country)



⁽¹⁾ No data for bachelor and master degrees.

⁽²⁾ Definition differs.

⁽³⁾ No data for master degrees.

⁽⁴⁾ No data for master and doctoral degrees.

Source: Eurostat (online data code: educ_uoe_mobs03)

⁽²⁵⁾ Eurydice (Education, Audiovisual and Culture Executive Agency), *The European Higher Education Area in 2012: Bologna Process Implementation Report*, 2012 (p. 153).

⁽²⁶⁾ Communiqué of the Conference of European Ministers Responsible for Higher Education, *The Bologna Process 2020 — The European Higher Education Area in the new decade*, Leuven and Louvain-la-Neuve, 28–29 April 2009.

Figure 4.11). Rates are lower at master's and bachelor's level.

Most countries in central and eastern Europe host relatively few students from abroad. By contrast, the United Kingdom, France, Austria and the Scandinavian countries show higher shares of mobile students. The range was especially high at doctorate level with student mobility at around 40% in France, the Netherlands and the United Kingdom and less than 3% in Croatia, Lithuania and Poland.

Inbound mobility can generally be seen as a sign of the attractiveness of a country's higher education and its financial and institutional capacity for enrolling foreign students. Outward mobility, on the other hand, might be a result of policies encouraging students to spend part of their studies abroad (credit mobility in particular).

PARTICIPATION IN LIFELONG LEARNING REMAINS AT A DISTANCE TO THE ET 2020 BENCHMARK

In addition to tertiary educational attainment, **lifelong learning** is also crucial for providing Europe with a highly qualified labour force. Adult education and training covers the longest time span in the process of learning throughout a person's life. After an initial phase of education and training, continuous, lifelong learning is crucial for improving and developing skills, adapting to technical developments, advancing careers or returning to the labour market (see the chapter on **Employment**, page 23). In recognition of this, lifelong learning plays a crucial role in the Europe 2020 flagship initiative 'An Agenda for new skills and jobs' and played an important role in the concluded initiative 'Youth on the move'. In addition, the European Council in 2011 adopted

Box 4.2: EU initiatives promoting mobility in higher education

For the period 2014 to 2020, the activities of the **Lifelong Learning Programme** ⁽²⁷⁾ continue under the new **Erasmus+ programme** ⁽²⁸⁾, which integrates seven earlier programmes in the fields of education, youth and culture. The programme has received 40% higher budget compared with the previous programming period.

As part of the Europe 2020 strategy, the flagship initiative 'Youth on the move' ⁽²⁹⁾ also aimed to extend opportunities for learning mobility to all young people in Europe, mainly through financial support and dissemination of information. The programme ended in December 2014.

Erasmus was part of the EU's lifelong learning programme. Erasmus mobility, with its core focus on skills development, is a central element of the European Commission's strategy to combat youth unemployment, featuring prominently in the Europe 2020 strategy for growth and jobs.

During the academic year 2012 to 2013 nearly 270 000 students from 33 European countries spent time abroad with an Erasmus grant. Since the programme began in 1987 to 1988, it has provided more than three million European students with the opportunity to go abroad and study at a higher education institution or train in a company.

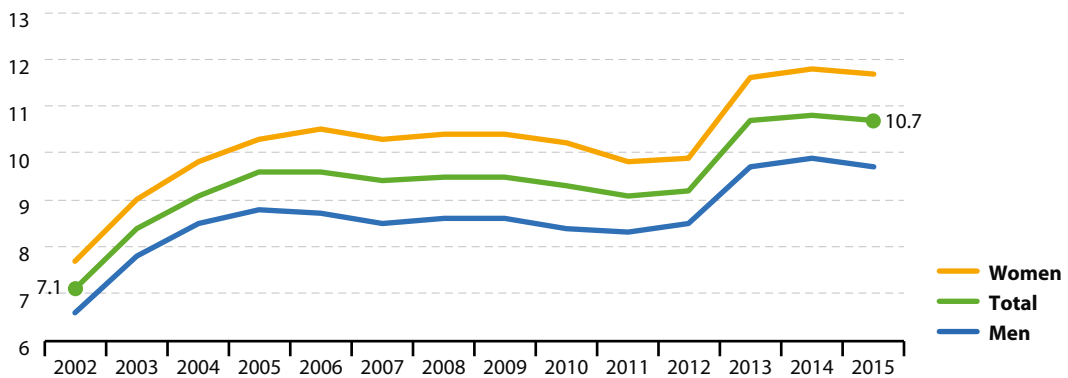
⁽²⁷⁾ See http://ec.europa.eu/education/tools/llp_en.htm

⁽²⁸⁾ See <http://ec.europa.eu/programmes/erasmus-plus/>

⁽²⁹⁾ European Commission, *Regulation Youth on the Move: An initiative to unleash the potential of young people to achieve smart, sustainable and inclusive growth in the European Union*, COM(2010) 477 final, Brussels, 2010.



Figure 4.12: Participation in lifelong learning, EU-28, 2002–2015 ⁽¹⁾
(% of population aged 25 to 64) ⁽²⁾



⁽¹⁾ Breaks in time series in 2003 and 2013. ET 2020 benchmark for the EU: at least 15 %.

⁽²⁾ Lifelong learning refers to persons aged 25 to 64 who stated that they received education or 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 to the question 'participation in education and training'.

Source: Eurostat (online data code: [tsdsc440](#))

a [resolution on a renewed European agenda for adult learning](#) ⁽³⁰⁾. The EU's ET 2020 framework also includes a benchmark that aims to raise the share of adults participating in lifelong learning to at least 15 %. This benchmark refers to persons aged 25 to 64 who stated that they received education or training in the four weeks preceding the survey.

After growing between 2003 and 2005, the share of EU adults participating in lifelong learning fell slightly to 9.2 % in 2012. It increased to 10.7 % in the following year, but this rise was mainly influenced by a methodological change to the French Labour Force Survey ⁽³¹⁾. In 2014, the share reached its highest point of 10.8 %, before falling back to 10.7 % in 2015.

In most Member States, participation in lifelong learning stagnated or changed marginally from 2014 to 2015. The largest difference was observed in Hungary, where the rate increased from 3.3 % in 2014 to 7.1 % in 2015 ⁽³²⁾. Over the period 2002 to 2015, nine countries experienced a substantial

increase of more than five percentage points: Denmark, Sweden, Finland, Estonia, Portugal, Luxembourg, Spain, Austria and France. The largest increase of 15.9 percentage points was observed in France ⁽³³⁾. In contrast, the largest decrease of 5.6 percentage points was observed in the United Kingdom. In 2015, only seven countries (Denmark, Sweden, Finland, the Netherlands, France, Luxembourg and the United Kingdom) exceeded the ET 2020 benchmark. In 13 Member States, participation in lifelong learning was less than half the required level of 15 %. In 2015, participation rates in lifelong learning in Bulgaria (2.0 %), Romania (1.3 %), Slovakia and Croatia (both 3.1 %) were significantly lower than in Finland (25.4 %), Sweden (29.4 %) and Denmark (31.3 %).

Women participate in lifelong learning more often

Women are more likely to participate in lifelong learning than men. In 2015, the share of women engaged in lifelong learning was 2.0 percentage

⁽³⁰⁾ *Council Resolution on a renewed European agenda for adult learning* (2011/C 372/01), Official Journal of the European Union, 20.12.2011.

⁽³¹⁾ 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 impacts significantly the level of various French LFS-indicators. Detailed information on these methodological changes and their impact is available in INSEE's website <http://www.insee.fr/fr/themes/info-rapide.asp?id=14> Box 'Pour en savoir plus'.

⁽³²⁾ It has to be mentioned that the increase in Hungary may be partly due to a methodological change.

⁽³³⁾ This rise was mainly influenced by a methodological change to the French Labour Force Survey, see the previous footnote.

points higher than that of men (11.7% compared with 9.7%). Women recorded higher participation rates in all Member States except for Luxembourg and Germany, where a slightly higher share of men were engaged in lifelong learning. No difference between the sexes could be observed in Greece and Romania. The largest differences were observed in Sweden with 14.4 percentage points and in Denmark with 12.0 percentage points.

The foreign-born population also tends to be slightly more involved in lifelong learning (12.1% in 2015). This may reflect participation in targeted learning activities such as language courses. It may also be linked to higher [unemployment rates](#) among migrants in some countries, resulting in a

greater participation in labour market integration programmes (see the chapter on [Employment](#), page 23).

There is a clear correspondence of participation in lifelong learning and a person's educational attainment. In 2015, people with at most lower secondary education were less engaged in lifelong learning (4.3%) than those with upper secondary (8.8%) or tertiary education (18.8%).

In relation to labour status, employed people in general show a slightly higher participation rate in lifelong learning. Some 11.6% of employed 25 to 64 year olds took part in lifelong learning in 2015. Among unemployed people, the rate was slightly lower than the total participation rate, at 9.5%.

How do education levels affect labour market participation?

Educational attainment strongly influences successful participation in the labour market. In 2015, 58.2% of 18 to 24 year old early leavers from education and training were either unemployed or inactive. Of the total population of 18 to 24 year olds, 19.1% were neither in employment nor in any further education or training (NEET) and thus at risk of being excluded from the labour market.

Education and training plays an important role in improving employability. The employment rate of recent graduates (20 to 34 year olds having left education and training in the past three years) has dropped considerably due to the economic and financial crisis. It fell from 82.0% in 2008 to 75.4% in 2013. However, it has increased slightly since 2013, reaching 76.9% in 2015.



YOUNGER PEOPLE SHOW HIGHER EDUCATIONAL ATTAINMENT LEVELS

Educational attainment is the visible output of education systems. Achievement levels can have major implications for many issues touching a person's life. This is reflected in participation in lifelong learning as well as in other aspects presented in the chapters on [Employment](#) and [Poverty and social exclusion](#), pages 23 and 137.

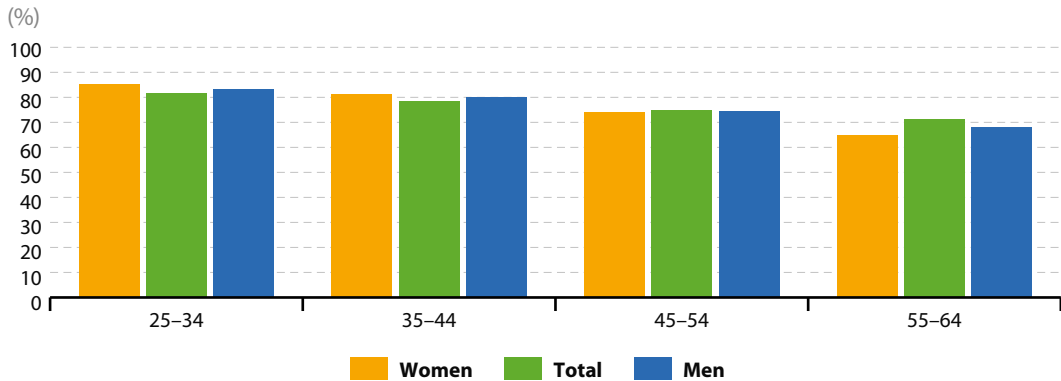
Upper secondary education is now considered the lowest desirable attainment level for European

citizens leaving the education and training system. This is reflected in the Europe 2020 headline indicator on [early leavers from education and training](#). Figure 4.13 shows the share of the population that has completed upper secondary or tertiary education, broken down by sex and age groups.

In 2015, 83.4% of 25 to 34 year olds had completed at least upper secondary education, while the share for the age group 55 to 64 was lower, at 68%. This difference reflects the growing demand for a more highly skilled workforce in most parts of Europe over the past few decades. A more skilled



Figure 4.13: Population with upper secondary or tertiary education, by age and sex, EU-28, 2015



Source: Eurostat (online data code: [edat_lfse_03](#))

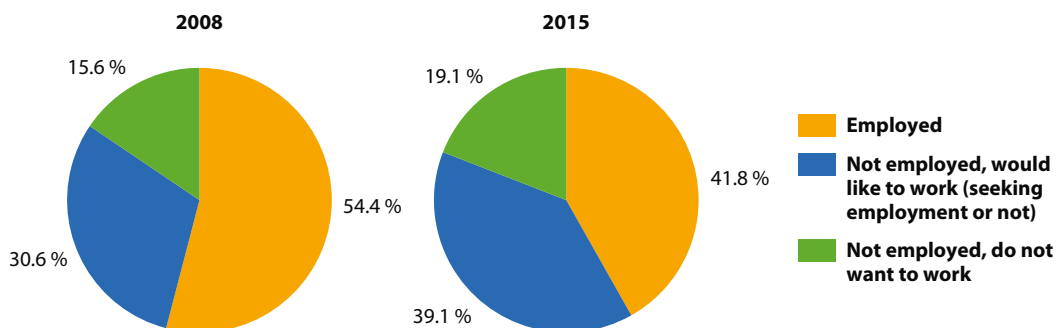
workforce is expected to emerge as older groups steadily leave the workforce and are replaced by a younger, more highly educated generation. If labour markets do not provide adequate jobs, this may result in certain levels of over-qualification and youth unemployment. For older workers aged 55 to 64, lower educational attainment levels, especially among women, highlight the importance of lifelong learning to increase their employability and help meet the Europe 2020 strategy's employment target (see the chapter on [Employment](#), page 23).

Educational attainment was highest in eastern European countries, such as Croatia, Slovakia, the

Czech Republic, Slovenia and Poland, where levels range from 93 % to 95 % for the age group 25 to 34. Southern European countries, in contrast, showed the lowest education levels. In 2015, between 61 % and 66 % of the population aged 25 to 34 living in Spain and Malta had completed more than lower secondary education. However, these countries have shown the strongest improvements over time, with education levels among 20 to 24 year olds being about twice as high as among those close to retirement.

Figure 4.13 also shows how women have overtaken men in educational attainment. While in the age group 45 to 64 years attainment was higher for men,

Figure 4.14: Early leavers from education and training, by labour status, EU-28, 2008 and 2015
(% of the population aged 18 to 24 with at most lower secondary education and not in further education or training) ⁽¹⁾



⁽¹⁾ For 2008, the percentages do not add up to 100% due to rounding of numbers.

Source: Eurostat (online data code: [edat_lfse_14](#))

the situation was turned around in the population aged 44 and younger. This trend illustrates the gender differences observed for a number of the indicators analysed in this chapter, such as early leavers from education and training, tertiary education and participation in lifelong learning.

GROWING DIFFICULTIES IN FINDING A JOB FOR EARLY LEAVERS

Low educational attainment — at most lower secondary education — is usually negatively linked with other socioeconomic variables. The most important of these are employment and the risk of poverty or social exclusion. Some of these relationships are also analysed in detail in the respective chapters (see the chapters on [Employment](#) and [Poverty and social exclusion](#), pages 23 and 137).

Early leavers from education and training and poorly educated young people face particularly severe problems in the labour market. As shown in Figure 4.14, about 60% of 18 to 24 year olds with at most lower secondary education and who were not in further education or training were either unemployed or inactive in 2015. Of these, two thirds stated they would like to work. At the same time, the EU's overall youth unemployment, covering the age group 15 to 24 years, stood at 20.3%. This implies that unemployment levels among early leavers from

education and training are much higher than among the total population of the same age group. For a further analysis on youth unemployment see the chapter on [Employment](#), page 23.

Compared with the overall decline in early leaving from education and training, Figure 4.14 shows it is becoming more difficult for early school leavers to find work. Between 2008 and 2015, the share of 18 to 24 year old early leavers who were not employed but wanted to work grew from less than one-third to nearly 40%.

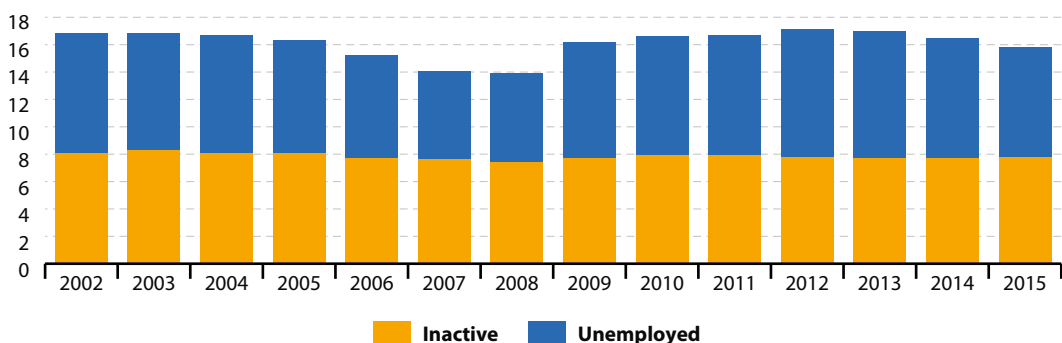
Young people neither in employment nor in education and training face a high risk of being excluded from the labour market

The indicator monitoring young people neither in employment nor in education and training (NEET) covers people aged 18 to 24 years. Low educational attainment is one of the key determinants of young people entering the NEET category. Other factors include having a disability or coming from a migrant background.

In 2015, 15.8% of 18 to 24 year olds were in the NEET status, putting them at risk of being excluded from the labour market and becoming dependent on benefits. This represents a decrease from 2012 when the NEET rate peaked at 17.2%, but it was still higher than in 2008, when the NEET rate stood at a low of 14.0%.

Figure 4.15: Young people not in employment and not in any education and training, EU-28, 2002–2015⁽¹⁾

(% of population aged 18 to 24)



⁽¹⁾ Breaks in time series in 2003 and 2006.

Source: Eurostat (online data code: [edat_lfse_20](#))



The EU's NEET rate has been largely influenced by changes in unemployment for 18 to 24 year olds (see Figure 4.15). In comparison, the share of inactive youths has remained stable at or slightly below 8%. The rate was slightly higher for women than for men, although the gender gap has closed slightly since the economic crisis began in 2008. In 2015, the NEET rate for 18 to 24 year old women was 16.3%, with 60.5% of them being economically inactive. At the same time, the NEET rate for men of the same age group was 15.4%, but 57.1% of them were unemployed.

Low educational attainment reduces quality of life

The negative impacts of low educational attainment described here and in the chapters on [Employment](#) and [Poverty and social exclusion](#) (see pages 23 and 137) also influence other aspects of a person's perceived quality of life. Across the EU, the perception of being in good or very good health in 2012 was highest among people who had completed tertiary education (81.6%). Only slightly more than half (55.1%) of those with at

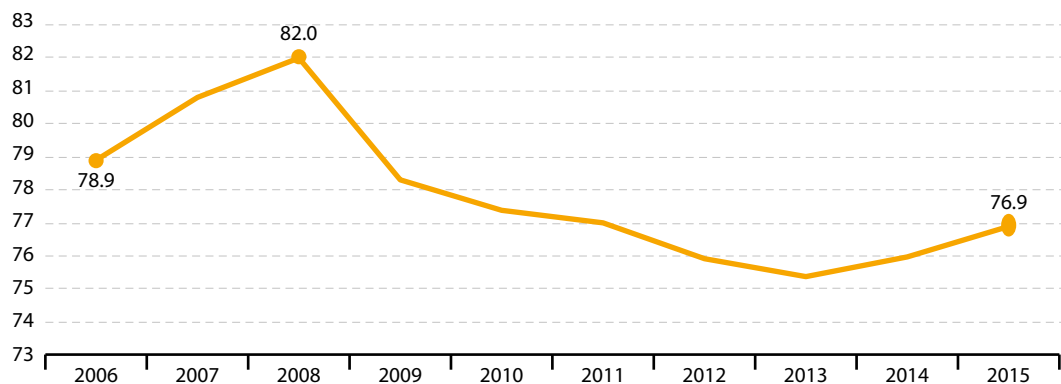
Box 4.3: Policies tackling the transition from education to employment

The EU employment package 'Towards a job-rich recovery' ⁽³⁴⁾, under its objective of restoring the dynamics of labour markets, calls for 'security in employment transitions', such as in the transition of young people from education to work. It states: 'There is evidence to show that apprenticeships and quality traineeships can be a good means of gaining entry into the world of work, but there are also recurring examples of traineeships being misused.'

The employment package also reaffirms the European Commission's commitment to tackling the dramatic levels of youth unemployment by supporting the transition to work 'through youth guarantees, activation measures targeting young people, the quality of traineeships and youth mobility'.

Figure 4.16: Employment rate of recent graduates, EU-28, 2006–2015 ⁽¹⁾

(Share of employed graduates (20–34 year olds) having left education and training in the past 1–3 years)



⁽¹⁾ 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). ET 2020 benchmark for the EU: at least 82%.

Source: Eurostat (online data code: [edat_lsfe_24](#))

⁽³⁴⁾ European Commission, *Towards a job-rich recovery*, COM(2012) 173 final, Strasbourg, 2012 (p. 10).

most lower secondary educational attainment shared this perception.

MATCHING SKILLS WITH LABOUR MARKET NEEDS

The EU's *ET 2020 framework* ⁽³⁵⁾ 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.

Figure 4.16 shows that recent graduates have been affected particularly strongly 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

decline in the overall employment rate for 20 to 64 year olds was 'only' 1.9 percentage points over the same period. However, 2013 seems to mark a turnaround in this trend, with the share of employed recent graduates increasing in the two following years, reaching 76.9% in 2015.

The data in Figure 4.16 refer to graduates having 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 stronger for the lower educated cohort (– 6.3 percentage points from 2008 to 2015) than for those with tertiary education (– 5.0 percentage points from 2008 to 2015). This is in line with overall employment rate trends (see the chapter on *Employment*, page 23) and underlines the importance of educational attainment for employability.

Investment in future generations: public expenditure on education

Public expenditure on education as a percentage of GDP is often considered to be an indicator of how committed a government is to developing skills and competences.

Figure 4.17 shows the total public expenditure on education as a share of GDP in 2013. Data for all four education levels are available for 23 Member States. Nonetheless, all 26 Member States for which data are at least partly available have been included in the following analysis ⁽³⁶⁾.

The highest share of public expenditure on education can be observed in Denmark (8.6 % of GDP), followed by Sweden (8.0 %) and Finland (7.5 %). The lowest proportions were observed in Romania (2.4 %), Latvia (3.4 %) and Hungary (3.4 %), however, in Romania and Hungary data

for one education level are missing, therefore the real proportions might be higher. Latvia was the country with the lowest share of 3.4 % with data for all four education levels. This share was more than half of the share observed in Sweden.

In all 26 Member States, where data were available for primary and lower secondary education (levels 1 and 2), most education funding went to primary and lower secondary education. As a share of GDP, this ratio ranged from 1.0 % in Romania to 3.5 % in Cyprus.

By contrast, in nearly all countries, the smallest share of public expenditure on education went to early childhood education ⁽³⁷⁾. This ratio ranged from 0.1 % in Ireland to 1.9 % in Sweden. In general, in nine of the 24 Member States, public

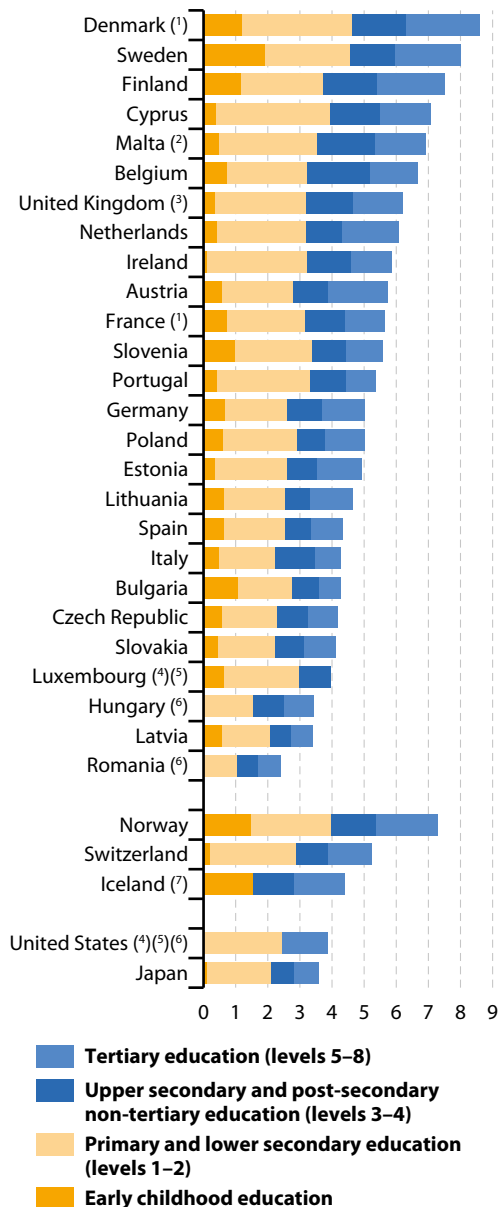
⁽³⁵⁾ *Council conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training* ('ET 2020') (2009/C 119/02), Official Journal of the European Union, 28.5.2009.

⁽³⁶⁾ There is no data available for Croatia and Greece.

⁽³⁷⁾ The analysis takes in consideration all ISCED0 (i.e. early childhood education development — ISCED01 and pre-primary — ISCED0.2). Early childhood education development is not obligatory by the EU Regulation, therefore not provided by all countries.



Figure 4.17: Total public expenditure on education by education level, by country, 2013
(% of GDP)



expenditure on this level of education was less than 0.5 % of GDP.

For the two remaining categories (upper secondary and post-secondary non-tertiary education (levels 3 and 4) and tertiary education (levels 5 to 8), the differences were not as high as for the two lower categories. For the upper secondary (including also post-secondary non-tertiary levels), public expenditure ranged from 0.6 % of GDP in Romania to 1.9 % of GDP in Belgium.

The proportion of financial resources devoted to the tertiary level varied between the 25 Member States for which data are available, ranging from 0.7 % in Latvia to 2.3 % in Denmark.

(1) 2012 data for ISCED levels 5–8.

(2) 2012 data for ISCED level 0.

(3) 2012 data for ISCED levels 1 and 2 (4) 2012 data.

(5) No data for ISCED levels 5–8.

(6) No data for ISCED level 0.

(7) No data for ISCED levels 1 and 2.

Source: Eurostat (online data code: [educ_uoe_fine06](#))

Outlook towards 2020

Knowledge of current student cohorts and demographic projections allow educational trends to be estimated up to 2020. This can help identify priority issues that may need particular political attention on the path to meeting the Europe 2020 targets. For example, students who are now in their mid-20s will fall within the scope of the Europe 2020 headline indicator on 'tertiary educational attainment' in 2020, which looks at education levels of the population aged 30 to 34 years.

The flagship initiative '[An Agenda for new skills and jobs](#)' addresses the challenge of early leaving from education and training. In 2011, the European Council published [recommendations on policies to reduce early leaving from education and training](#) ⁽³⁸⁾, giving guidance to Member States on

the implementation of strategies and measures tackling this problem. Vocational Education and Training (VET) systems are seen as important for improving the employability of young people and reducing early leaving from education and training, by offering an interesting alternative to general education.

Additionally, the [Europe 2020 strategy](#) ⁽³⁹⁾ puts particular effort into making sure that higher education programmes develop the skills relevant to the world of work, both for meeting future labour demand and for ensuring the long-term attractiveness of higher education. Moreover, the [European Council's Resolution](#) ⁽⁴⁰⁾ on a renewed European agenda for adult learning addresses the challenge of raising participation rates of adults in lifelong learning activities.

Box 4.4: Projections up to 2020 in relation to the Europe 2020 education targets

Based on the most recent data for early school leaving and tertiary education, the European Commission has published projections of the likelihood that Europe 2020's education targets will be met by 2020:

- The EU average early school leaving rate in 2010 was 13.9% and would need to be below 10% by 2020, ten years later. This means that the minimum annual progress required for the EU as a whole during this period is – 3.3%, whereas the observed annual progress for the EU between 2010 and 2015 has been – 4.3%. This means that overall the EU is on track to meeting the headline target if current progress is sustained.
- The EU average tertiary attainment rate in 2010 was 33.8% and it would need to reach

40% ten years later. The resulting minimum annual progress required for the EU as a whole is 1.8%, while the observed annual change between 2010 and 2015 has been considerably higher (3.8%). This means that the EU is well on track to reach its 40% target by 2020 if recent progress can be sustained.

Of the 12.4 million 30 to 34 year olds with a tertiary education qualification, 6.8 million are women. This highlights a significant gender difference in relation to obtaining a high-level education. Moreover, this difference has increased, up by 0.7 percentage since 2011. As a matter of fact, women had already exceeded the 40% benchmark in 2012 when evaluated separately, eight years ahead of the 2020 target date.

⁽³⁸⁾ Council recommendations of 28 June 2011 on policies to reduce early school leaving (2011/C 191/01), Official Journal of the European Union, 1.7.2011.

⁽³⁹⁾ European Commission, [Tertiary Education](#) (accessed 04 May 2016).

⁽⁴⁰⁾ European Commission, [Regulation Youth on the Move: An initiative to unleash the potential of young people to achieve smart, sustainable and inclusive growth in the European Union](#), COM(2010) 477 final, Brussels, 2010.

5

Poverty and social exclusion



Poverty and social exclusion — why do they matter?

Poverty and social exclusion harm individual lives and limit the opportunities for people to achieve their full potential by affecting their health and well-being and lowering educational outcomes. This, in turn, reduces opportunities to lead a successful life and further increases the risk of poverty. Without effective educational, health, social, tax benefit and employment systems, the risk of poverty is passed from one generation to the next. This causes poverty to persist and hence creates more inequality, which can lead to long-term loss of economic productivity from whole groups of society ⁽¹⁾ and hamper inclusive and sustainable economic growth.

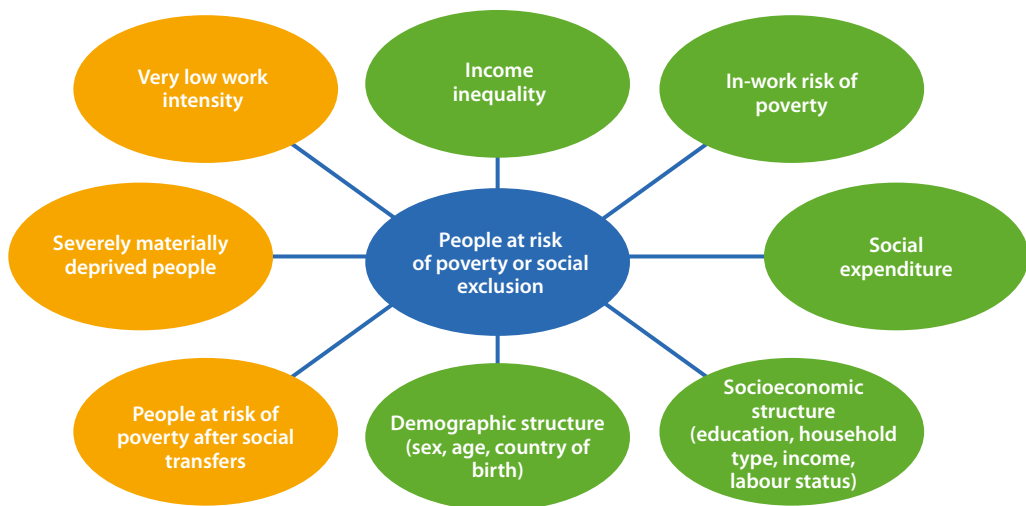
To prevent this downward spiral, the European Commission has made 'inclusive growth' one of the three priorities of the Europe 2020 strategy. It has set a target to lift at least 20 million people out of the risk of poverty and social exclusion by

Europe 2020 strategy target on the risk of poverty and social exclusion

The Europe 2020 strategy has set the target of 'lifting at least 20 million people out of the risk of poverty and social exclusion' by 2020 compared with the year 2008 ⁽²⁾.

2020. To underpin this objective, the Commission has launched two flagship initiatives under the 'inclusive growth' priority: the 'Agenda for new skills and jobs' and the 'European platform against poverty and social exclusion'. Furthermore, between 2010 and 2014 a package of policy initiatives 'Youth on the move' was developed to

Figure 5.1: Indicators presented in this chapter



⁽¹⁾ European Commission, *Social trends and dynamics of poverty*, ESDE conference, Brussels, 2013.

⁽²⁾ 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. With 116.2 million people having been at risk of poverty or social exclusion in the EU-27 in 2008, this translates into a target value of 96.2 million people in the EU-27 to be achieved by the year 2020.



enhance the performance of education systems and help young people find work.

The strategy's poverty target is monitored through the headline indicator 'people at risk of poverty or social exclusion', consisting of the three sub-indicators: monetary poverty, severe material deprivation and very low work intensity. Additional contextual indicators present a broader picture and show the drivers behind changes by providing a breakdown by sex, age, labour status, household type, educational level and parents' educational level, country of birth, and degree of urbanisation of residential municipality. This allows the most-at-risk groups to be identified. Additional factors also affect the at-risk-of-poverty rate, such as social transfers.

Due to the structure of the survey on which most of the key social data are based (EU Statistics on Income and Living Conditions (EU-SILC)), 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. For this reason, 2008 is used as the baseline year for monitoring progress. For the headline indicator, 'people at risk of poverty or social exclusion', the target value for 2020 continues to be based on EU-27 data from 2008 because EU-28 aggregated data are only available from 2010. This is why the analysis of the headline indicator and the three sub-indicators refers to EU-27 data (from 2005) and EU-28 data (from 2010).

By setting a poverty target, the EU has put social concerns on an equal footing with economic objectives. Achieving the target to reduce the number of people at risk of poverty and social exclusion will depend on successfully implementing other priorities of the Europe 2020 strategy, such as providing better opportunities for employment and education (see the chapters on Employment, page 23, and Education, page 109).

How do poverty and social exclusion affect Europe?

Almost every fourth person in the EU was still at risk of poverty or social exclusion in 2014.

More than 30% of young people aged 18 to 24 and 27.8 % of children aged less than 18 were at risk in 2014. At 17.8 %, the rate was considerably lower among the elderly aged 65 or over.

Of all groups examined, unemployed people faced the greatest risk of poverty or social exclusion, at 66.7 % in 2014.

Almost 50 % of all single parents were at risk in 2014. This was double the average and higher than for any other household type analysed.

35 % of adults with at most lower secondary educational attainment were at risk of

poverty or social exclusion in 2014. 63.8 % of children of parents with pre-primary and lower secondary education were at risk as well.



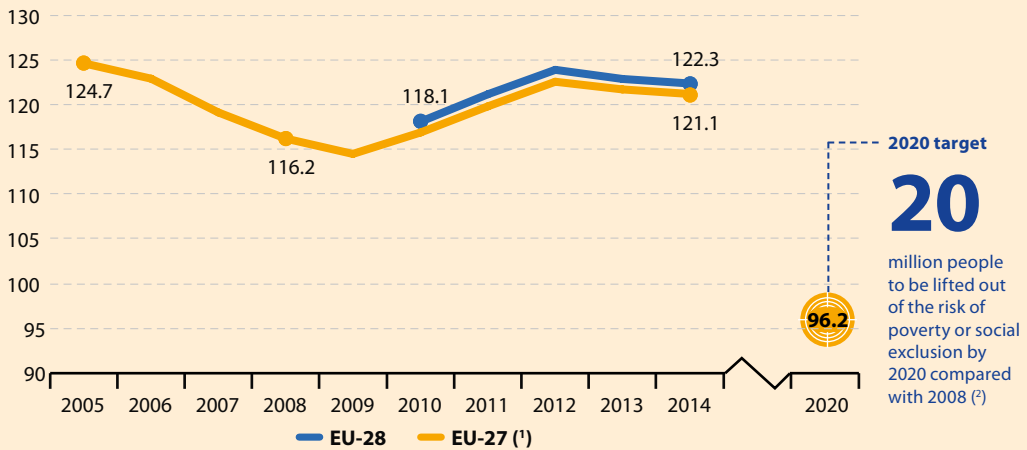
In 2014, 40.1 % of adults born in a country outside the EU-28 and 24.8 % of those born in a different EU-28 country than the reporting one were at risk of poverty or social exclusion. For native citizens, however, only 22.5 % of the population faced this risk.

EU-28 citizens in rural areas were on average more likely to live in poverty or social exclusion than those living in urban areas (27.2 % compared with 24.3 %) in 2014.



Europe 2020 headline indicator

Figure 5.2: People at risk of poverty or social exclusion, EU-27 and EU-28, 2005–2014
(million people)



(¹) Data for 2005 and 2006 are estimates.

(²) The Europe 2020 strategy has set the target of lifting at least 20 million people out of the risk of poverty or social exclusion by 2020.

Source: Eurostat (online data code: t2020_50)

The headline indicator ‘**people at risk of poverty or social exclusion**’ shows the number of people affected by at least one of three forms of poverty: monetary poverty, material deprivation and low work intensity. People can suffer from more than one dimension of poverty at a time. To calculate the headline indicator, people are counted only once, even if their current living conditions can be described by more than one sub-indicator.

As shown in Figure 5.2, the number of people at risk of poverty or social exclusion in the EU had been decreasing steadily before the start of the economic crisis. The indicator reached its lowest level in 2009, with about 114.5 million people at risk in the EU-27. However, this figure grew again in the following years. It reached its peak in 2012, with about 122.5 million people at risk in the EU-27 (123.9 million people in the EU-28). Between 2012 and 2014 this number decreased again slightly to

121.1 million people in the EU-27 and 122.3 million people in the EU-28, respectively.

The negative impact of the economic crisis on Member States’ financial and labour markets was the most likely cause of the rise in the amount of people at risk of poverty or social exclusion from 2009 to 2012 (³) (see also the chapter on ‘Employment’).

Automatic stabilisers and other discretionary measures were used to cushion the recession’s negative social effects. While discretionary measures constitute policy responses to crises, automatic stabilisers are elements of fiscal policy that reduce tax burdens and increase public spending without immediate government actions (⁴). Despite the slight reduction in poverty figures between 2012 and 2014, a little over 122 million people — 24.1 % of the EU population — were still at risk of poverty or social

(³) ECFIN Economic Brief, *Poverty developments in the EU after the crisis: a look at main drivers*, 2014.

(⁴) Dolls et al., 2012, *Automatic stabilization and discretionary fiscal policy in the financial crisis*, IZA Journal of Labor Policy 2012, 1:4.



Box 5.1: What is social exclusion?

In its report, *Employment and Social Developments in Europe 2011* ⁽⁵⁾, the European Commission stated that social exclusion can be defined as ‘a process whereby certain individuals are pushed to the edge of society and prevented from participating fully by virtue of their poverty, or lack of basic competencies and life-long learning opportunities, or as a result of discrimination. This distances them from job, income, education and training opportunities as well as social and community networks and activities. They have little access to power and decision-making bodies and so often feel powerless and unable to take control over the decisions affecting their day-to-day lives’.

exclusion in 2014. This means almost one in four people in the EU experienced at least one of the three forms of poverty or social exclusion.

Although the EU has entered its fourth year of economic recovery ⁽⁶⁾, the current economic situation remains a major challenge to policy-makers trying to fight poverty and ensure social inclusion. According to the *Annual Report of the Social Protection Committee* ⁽⁷⁾, the emphasis needs to shift from short-term measures to structural reforms to further spur economic growth, raise employment ⁽⁸⁾ and tackle in-work poverty, and guarantee adequate levels of social protection and access to quality services. Reaching the Europe 2020 strategy’s objective of

reducing the amount of people at risk of poverty or social exclusion by 20 million would thus need to be supported by appropriate economic, employment, tax and education policies.

The number of people at risk of poverty or social exclusion has increased in most Member States

To meet the overall EU target on risk of poverty and social exclusion, Member States have set their own national targets in their *National Reform Programmes*. As noted in the *European Council conclusions from 17 June 2010* ⁽⁹⁾, Member States are free to set their own targets based on the most appropriate indicators for their circumstances and priorities. In most countries the target is expressed as an absolute number of people to be lifted out of the risk of poverty or social exclusion compared with 2008 ⁽¹⁰⁾. This corresponds to the base year also used for the overall EU target.

In 17 of the EU Member States the number of people at risk of poverty or social exclusion has risen since 2008, increasing the distance to their national targets. Nineteen Member States use a target based on the indicator ‘people at risk of poverty or social exclusion’, and four (Bulgaria, Denmark, Estonia and Latvia) based their targets on one or more of its sub-indicators. The remaining countries (Germany, Ireland, the Netherlands, Sweden and the United Kingdom) defined their targets based on nationally developed indicators not available on the Eurostat database ⁽¹¹⁾.

Two countries using the ‘at risk of poverty or social exclusion’ indicator or one of its sub-indicators (Poland and Romania) had already reached their national poverty targets in 2014. The other

⁽⁵⁾ European Commission (Directorate-General for Economic, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2011*, Publications Office of the European Union, Luxembourg, 2012 (p. 144).

⁽⁶⁾ European Commission, *European Economic Forecast Winter 2016*, Institutional Paper 020, 2016.

⁽⁷⁾ European Commission, *Social Europe — Aiming for inclusive growth. Annual report of the Social Protection Committee on the social situation in the European Union (2014)*, Publications Office of the European Union, Luxembourg, 2015, p. 9.

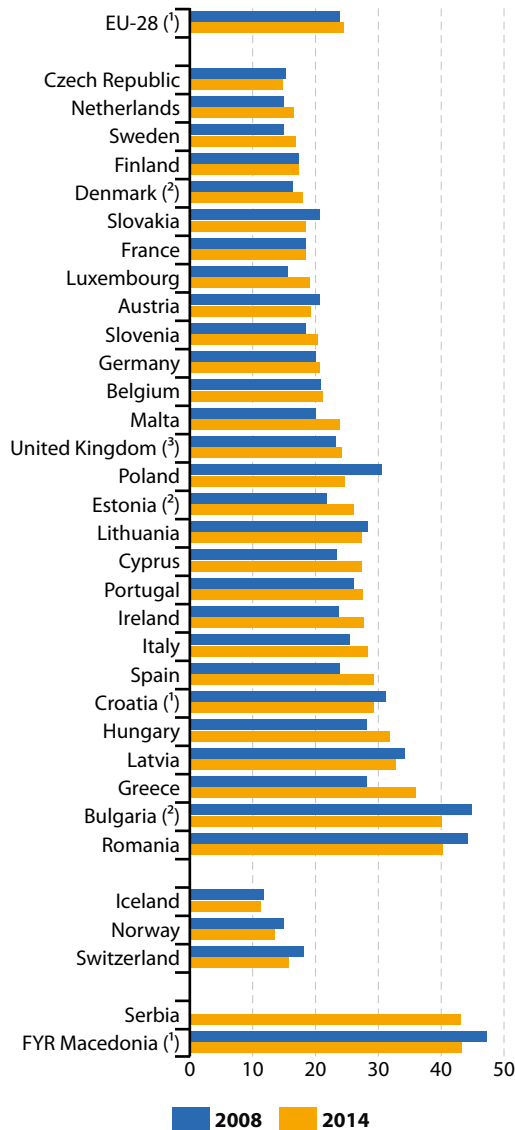
⁽⁸⁾ However, some research also shows that the positive employment development before the economic crisis did not strongly contribute to reducing poverty (see Taylor-Gooby, P., Gurny, J. and Otto, A. 2015, *Can ‘New Welfare’ address poverty through more and better jobs?*, *Journal of Social Policy* [Online] 44:83–104 and Cantillon, B., Luigjes, C. and Marchal, S. 2015, *Poverty reduction in Europe: Social Policy and Innovations*, Discussion Paper No. 15/18).

⁽⁹⁾ European Council, *Conclusion from 17 June 2010*, 2010.

⁽¹⁰⁾ European Commission, *Social Europe — Aiming for inclusive growth. Annual report of the Social Protection Committee on the social situation in the European Union (2014)*, Publications Office of the European Union, Luxembourg, 2015, p. 162–461.

⁽¹¹⁾ Germany and Sweden use targets based on different forms of unemployment, Ireland defined a combined poverty target, the Netherlands aims to reduce the amount of jobless households, Sweden’s target refers to different situations of long-term unemployment, and the United Kingdom based its numerical targets on a nationally launched Child Poverty Act.

Figure 5.3: People at risk of poverty or social exclusion, by country, 2008 and 2014
(% of population)



⁽¹⁾ 2010 data (instead of 2008).

⁽²⁾ Break in time series in 2014.

⁽³⁾ Break in time series in 2012.

Source: Eurostat (online data code: t2020_50)

Member States using this concept to define their national targets have yet to meet their goals. These range from reducing the amount of people at risk of poverty or social exclusion by 4.4 million people in Italy to about 25 000 people in Malta.

As seen in Figure 5.3, 24.1 % of the entire EU population were at risk of poverty or social exclusion in 2014. However, Member State-specific mechanisms underlying this figure vary strongly, both in the level and dynamics of this indicator. In Romania and Bulgaria, just over 40 % of the population fell into this category in 2014. In the Czech Republic (14.8 %), the Netherlands (16.5 %), and Sweden (16.9 %) the rate was less than half that.

In addition, significant differences can be seen between Member States between 2008 and 2014. Some countries made clear progress in integrating their most vulnerable members into society. Reductions in the number of people at risk of poverty or social exclusion ranged from 0.1 percentage points to 5.8 percentage points. Member States making the most progress in this area were Poland (reduced by 5.8 percentage points), Romania (reduced by 4.0 percentage points) and Slovakia (reduced by 2.2 percentage points)⁽¹²⁾. A number of countries experienced substantial increases in the number of people at risk of poverty or social exclusion. The countries with the highest increase were Greece, Spain and Estonia, where the number of people at risk increased by between four and eight percentage points.

One reason for the disparity in poverty rates across the EU is the uneven impact of the economic crisis on Member States. Although many factors have influenced overall economic performance, much of the current divergence results from the way labour markets and social systems reacted to the severe global downturn as well as the fiscal consolidation packages implemented in the majority of Member States⁽¹³⁾ (see also the chapter on [Employment](#), page 23).

⁽¹²⁾ Bulgaria also experienced a strong reduction by 4.7 percentage points in the number of people at risk of poverty or social exclusion. In 2014, however, there was a break in the time series, which limits the value of a direct comparison.

⁽¹³⁾ European Commission, *Social Europe — Aiming for inclusive growth. Annual report of the Social Protection Committee on the social situation in the European Union (2014)*, Publications Office of the European Union, Luxembourg, 2015, p. 9.



WHICH GROUPS ARE AT GREATER RISK OF POVERTY OR SOCIAL EXCLUSION?

Compared with the EU average, some groups of the population are at a higher risk of poverty and social exclusion. The most affected are women, children, young people, the unemployed, single-parent households and those living alone, people with lower educational attainment, people born in a different country than the one they reside in, people out of work, and in a majority of Member States those living in rural areas. EU policies aimed at reducing the number of people at risk therefore tend to focus on these groups. A [recommendation of the European Commission](#) ⁽¹⁴⁾ calls on Member States to define and implement measures to address their specific circumstances.

Women are more likely to live in poverty and social exclusion than men

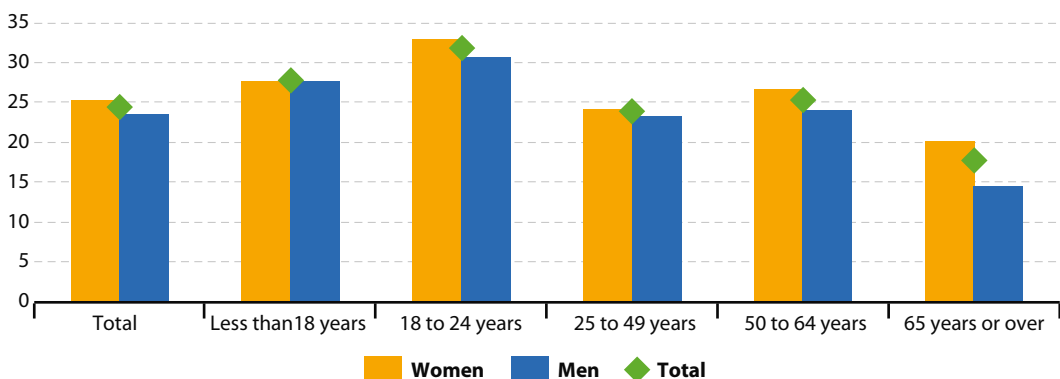
Up to 2012, the share of both men and women at risk of poverty or social exclusion followed a similar path as the overall trend depicted in Figure 5.2. This means an increase of about one percentage point between 2008 and 2012 for both sexes. Since

then, the overall rate for women has fallen, while the rate for men has remained more or less stable. Nevertheless, in 2014 women remained at a higher risk of poverty or social exclusion than men (25.3% compared with 23.6%). This put the EU-wide gender gap at 1.7 percentage points.

Women were worse off in all EU countries except Spain, where men were at higher risk of poverty or social exclusion, and Poland, where the risk was the same for women and men. In 2014, gender gaps were highest in the Baltic States, the Czech Republic and Austria (3.8 percentage points in Latvia, 3.3 percentage points in Lithuania, 3.0 percentage points in the Czech Republic and 2.8 percentage points in Estonia, Cyprus and Austria). Poland was the most egalitarian country in terms of poverty rates, with no gender gap, followed by Denmark with a 0.5 percentage point gap. The gap narrowed in most EU countries between 2008 and 2014, except for the Netherlands and Sweden, where it rose by 0.2 percentage points each.

The gender gap discussed above could be explained by higher poverty rates among single female households, particularly those with dependent children, compared with single male households ⁽¹⁵⁾. In a [workshop on the main causes](#)

Figure 5.4: People at risk of poverty or social exclusion, by sex and age group, EU-28, 2014
(% of population)



Source: Eurostat (online data code: [ilc_peps01](#))

⁽¹⁴⁾ European Commission Annex to the Recommendation for a Council Recommendation on broad guidelines for the economic policies of the Member States and of the Union, [COM\(2015\) 99 final](#), 2015.

⁽¹⁵⁾ The survey on which the data are based assumes that households with more than one member share their resources equally. Given that the data does not reveal systematic differences in the risk of poverty or social exclusion between single female and single male households without dependent children, the gender gap is expected to be caused by single households with dependent children.

of female poverty⁽¹⁶⁾ the Directorate General for Internal Policies pointed out that one of the reasons for the persistent gender gap is that single parents are much more likely to have very low work intensity compared with other households with children. These **single-parent households** are far more often headed by women (almost 10% of all European households in 2011) than by men (1.8%). A comparison of Member States' performance in the **European Semester Thematic Fiche**⁽¹⁷⁾, shows two policy measures that could ease this problem: child and family-support benefits as well as access to quality and affordable childcare.

Young people aged 18 to 24 are more at risk

For both men and women, young people aged 18 to 24 are the most likely to be at risk of poverty or social exclusion. Almost a third were at risk in 2014 (30.8% of men and 33.0% of women). People younger than 18 years formed the group with the second highest risk, at 27.8%. Moreover, the situation of young people aged 18 to 24 has not improved compared with 2010. Although their risk of poverty or social exclusion had been falling until 2009, it climbed back up in the following years (for more information on this group's employment situation see the chapter on 'Employment'). In contrast, older people aged 65 or over showed the lowest rate of 17.8% (14.6% for men and 20.3% for women) in 2014⁽¹⁸⁾. Rates for this group showed a steady decline over the period 2010 to 2014. As a result, the age gap has widened.

This widening of the gap between young people aged 18 to 24 and older people aged 65 or over can also be seen in most Member States. In almost all countries, except Germany, the gap

increased — in some cases substantially — between 2008 and 2014⁽¹⁹⁾.

Finally, the disparities between women and men become more distinct when looking at age groups. Among men, those aged 18 to 24 were most at risk (30.8%) in 2014, while those aged 65 or over were the least likely to be at risk (14.6%). Women were more likely to be at risk of poverty or social exclusion than men in all age groups except for those younger than 18 (see Figure 5.4). The largest difference between men and women could be seen for the last age group (65 or over), which displayed a gender gap of 5.7 percentage points in 2014. One explanation for the poverty gap between men and women among elderly EU citizens is that on average women receive a lower pension income than men. This is mainly due to childcare-related gaps in their employment history and patterns of employment with low pension coverage⁽²⁰⁾⁽²¹⁾.

Lack of work increases the risk of poverty or social exclusion

At 66.7%, exactly two thirds of unemployed people in the EU were at risk of poverty or social exclusion in 2014. Also, 43.4% of the other economically inactive people⁽²²⁾ were at risk in 2014. In comparison, the share of employed people at risk was 13.1% in the same year. This shows that the unemployed as a group are strongly threatened by poverty or social exclusion. The extent to which members of a household have the opportunity to work is thus a relevant factor determining poverty or social exclusion and is further analysed in the sub-indicator '**very low work intensity**' later in this chapter.

The risk of poverty or social exclusion increased for all groups between 2010 and 2014 except for retired people, where it decreased by

⁽¹⁶⁾ Directorate-General for Internal Policies, *Workshop on main causes of female poverty*, 2015, p. 22.

⁽¹⁷⁾ European Commission, *European Semester Thematic Fiche. Poverty and Social Exclusion*, 2015, p.10.

⁽¹⁸⁾ Reasons for this could include that many elderly people receive regular pensions, have accrued some wealth and have often paid off their housing situation.

⁽¹⁹⁾ Bulgaria, Estonia, Lithuania, Latvia, and Malta were in the opposite situation where poverty was higher among the older than the younger age groups.

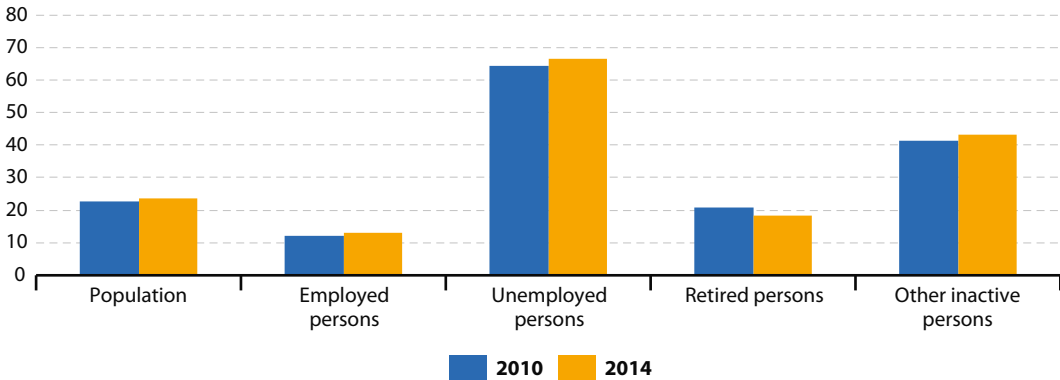
⁽²⁰⁾ European Centre, *Poverty Risks for Older People in EU Countries — An Update*, 2010.

⁽²¹⁾ European Commission, *Why older women are much more exposed to the risk of poverty than older men*, 2015.

⁽²²⁾ The main economically inactive groups are students, people looking after family and home, long-term sick and disabled, temporarily sick and disabled, retired people and discouraged workers (*UK Office for National Statistics (2012), A guide to labour market statistics*).



Figure 5.5: People at risk of poverty or social exclusion, by activity status, EU-28, 2010 and 2014
(% of population aged 18 and over)



Source: Eurostat (online data code: [ilc_peps02](#))

2.3 percentage points. Of the Member States in 2014, France had the lowest risk among the unemployed (52.9%), while Germany had the highest (84.4%).

It is interesting that the poverty rate was higher for men than for women in all groups (by between 0.7 percentage points among the employed to 9.1 percentage points among the unemployed), except for retired people. Among those, the share of women at risk of poverty or social exclusion was just over 4.1 percentage points higher than that of men. This highlights the fact that one of the drivers behind the feminisation of poverty and social exclusion discussed earlier is the amount of women at risk of poverty or social exclusion at retirement age.

Single parents face the highest risk of poverty or social exclusion

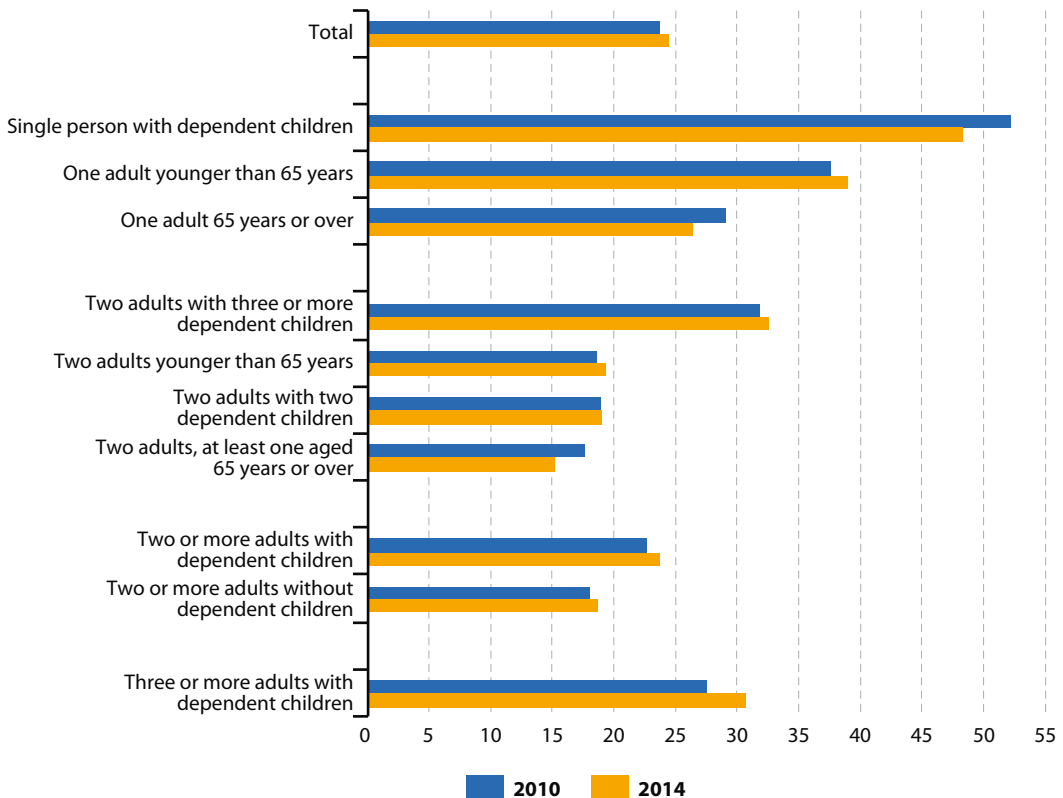
Of single people with one or more dependent children, 48.3% were at risk of poverty or social exclusion in 2014. This was almost twice the average and higher than for any other household type. This group experienced the largest fall in the number of people at risk of poverty or social exclusion between 2010 and 2014. This rate was at 52.1% in 2010 and well over twice the average.

Figure 5.6 shows that in general households with only one adult — both with children and without — and households with many children are at a higher risk of poverty or social exclusion. In households with only one adult, temporary shocks such as unemployment or sickness cannot be cushioned by a partner. Also, many households with only one adult are made up of young unemployed people or pensioners, often women, which are groups already identified as having a higher-than-average risk of poverty or social exclusion⁽²³⁾. In addition, single parents are faced with the challenges of being both the primary breadwinner and caregiver for the family. The group with the lowest poverty rate in 2014 was households with two adults where at least one person was aged 65 years or over.

At the Member State level, changes in the risk of poverty or social exclusion rate varied widely for single parent households between 2010 and 2014. Changes ranged from a rise of 12.7 percentage points in Cyprus to a fall of 13.7 percentage points in Germany. Other countries that also experienced large increases were Finland (7.3 percentage points) and Hungary (8.1 percentage points). The biggest falls, besides Germany, were in Malta (– 10.7 percentage points) and Lithuania (– 9.3 percentage points).

⁽²³⁾ European Centre, *Poverty Across Europe: The latest evidence using the EU-SILC Survey*, 2008.

Figure 5.6: People at risk of poverty or social exclusion, by household type, EU-28, 2010 and 2014
(% of population)



Source: Eurostat (online data code: [ilc_peps03](#))

In contrast, for households with two adults with at least one aged 65 or over, the at-risk-of-poverty or social-exclusion rate decreased in most countries. Hence, the absence of children seems to lower the risk of poverty or social exclusion.

People with low educational attainment are three times more likely to be at risk compared with those with the highest degrees

In 2014, 35.0% of people with at most lower secondary educational attainment were at risk of poverty or social exclusion (see Figure 5.7). In comparison, only 12.0% 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 (also see the chapter on 'Education'). This is also reflected in the data on employment: with increasing educational level the share of the employed also rises (see the chapter on 'Employment' for more information).

This situation is even more distinct in Member States such as the Czech Republic, Malta, Hungary, Poland, Romania and Slovenia. In these countries, people with the lowest educational attainment were over four (4.3 times in Slovenia) to six times (6.4 times in the Czech Republic) more likely to be at risk of poverty or social exclusion than those with the highest educational attainment. This ratio increased in 12 Member States between 2010 and 2014. However, a better education did not necessarily offer protection from the crisis.

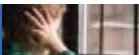
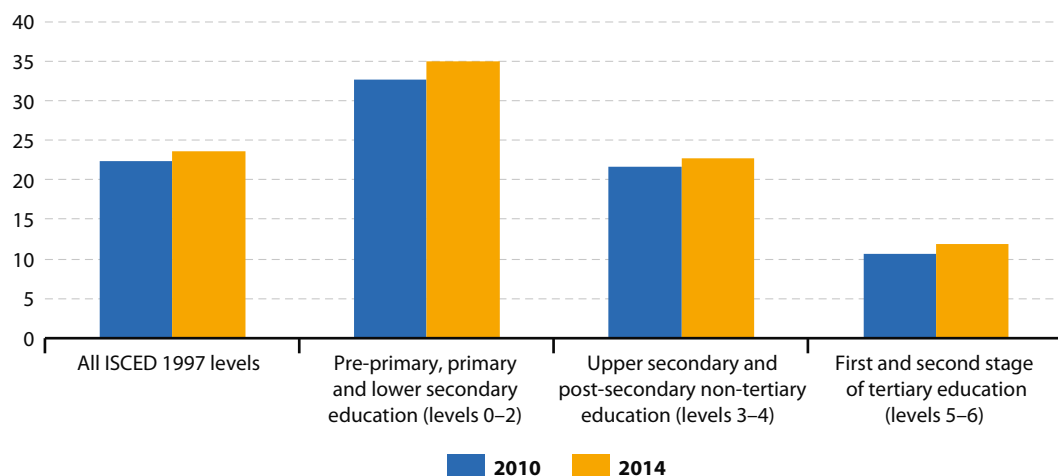


Figure 5.7: People at risk of poverty or social exclusion, by educational attainment level, EU-28, 2010 and 2014 ⁽¹⁾

(% of population aged 18 and over)



(¹) 2014 data are estimates.

Source: Eurostat (online data code: ilc_peps04)

Between 2010 and 2014, 15 Member States also experienced a rise in the at-risk rate among those with the highest educational degrees.

The risk of poverty or social exclusion due to low education is being passed on to the next generation

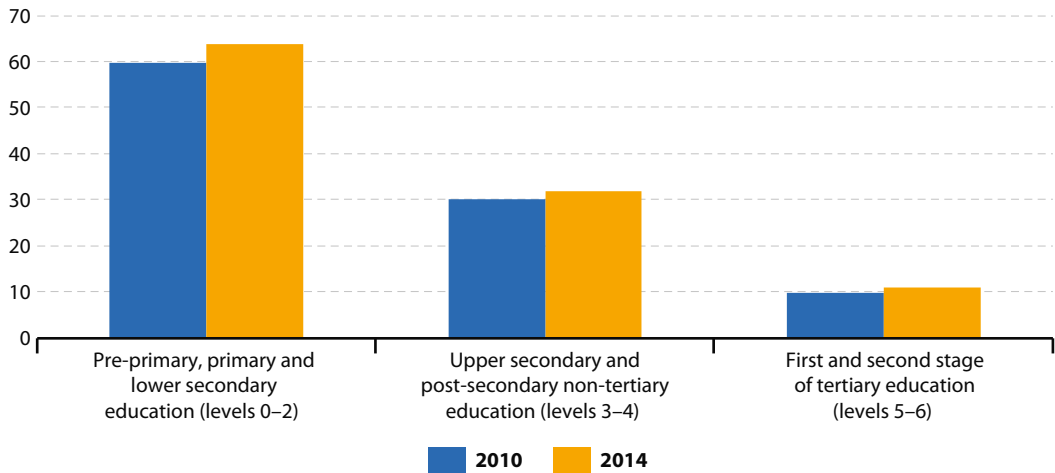
An important aspect to consider when analysing the overall number of people living in poverty or social exclusion is how factors leading to these situations are transmitted from one generation to the next.

In 2014, 63.8% of children of parents with at most pre-primary and lower secondary education were at risk of poverty or social exclusion. This was almost six times higher than for children of parents with first- or second-stage tertiary education. Although there was an increase in the risk of poverty or social exclusion for all children between 2010 and 2014, the highest increase was observed for children of parents with the lowest educational attainment. Thus, education, which is a strong determinant of poverty or social exclusion for adults, also influences whether children live in poverty or social exclusion

In 2014, children were at the highest risk of poverty or social exclusion if their parents had the lowest educational attainment in Slovakia (93.5%), Hungary (89.9%) and Bulgaria (89.2%). Conversely, in the Netherlands, Slovenia and Portugal the risk of poverty or social exclusion for children whose parents had the lowest educational attainment was the lowest in the EU with 42.8%, 45.7% and 48.1%, respectively. Moreover, the risk of poverty or social exclusion for children whose parents had the lowest educational attainment increased between 2010 and 2014 in about two thirds of Member States. The increase ranged from 18.2 percentage points in Malta to 0.7 percentage points in Romania. A third of the Member States made progress on this issue. For instance, in the United Kingdom and Poland this rate decreased by around 10 percentage points each.

Not only does the socio-economic environment in which children grow up and develop significantly affect a child's standard of living, there is also a close link between the socio-economic statuses of adults and the status of their parents during their childhood.

Figure 5.8: Children at risk of poverty or social exclusion by educational attainment level of their parents, EU-28, 2010 and 2014 ⁽¹⁾
(% of population aged less than 18 years)



⁽¹⁾ 2014 data are estimates.

Source: Eurostat (online data code: ilc_peps60)

For instance, the ad hoc module on [Intergenerational transmission of disadvantage statistics](#) ⁽²⁴⁾ carried out in the EU Statistics on Income and Living Conditions (EU-SILC) in 2011 showed that 34.2% of low-educated adults also had low-educated parents in their childhood. This can be explained by the parents' inability to financially support their children's studies and/or to pass on a perception of the importance of education to their children.

Education is not the only factor transmitted from generation to generation. In 2011, 68.9% of adults with a low ability to make ends meet grew up in a household in the same situation. Moreover, among adults 'not at work', 28.6% grew up in a household with at least one parent 'not at work' ⁽²⁵⁾.

In a [Commission Recommendation](#) ⁽²⁶⁾, the European Commission called its Member States

to take action to prevent disadvantages being transmitted across generations. Specifically it advised them to guarantee that children grow up with sufficient resources, as well as to assure their access to quality education, including childcare services and health services, and to enforce children's rights to access different pastime activities.

People from outside the EU-28 are generally worse off than people living in their home country

In 2014, people living in the EU but born in a non EU-28 country had a 40.1% risk of living in poverty or social exclusion. The risk was lower for people born in an EU-country other than the one they were living in, at 24.8%. Among the people whose country of residence corresponded to their country of birth, 22.5% were at risk of poverty or social

⁽²⁴⁾ Eurostat, Statistics in focus, [Intergenerational transmission of disadvantage statistics](#), Statistics Explained, 2013.

⁽²⁵⁾ Parents 'not at work' include unemployed, in retirement or in early retirement or had given up business, fulfilling domestic tasks and care responsibilities, other inactive person, and those answering 'don't know'.

⁽²⁶⁾ European Commission, Commission Recommendation of 20 February 2013, [Investing in children: breaking the cycle of disadvantage](#), Official Journal of the European Union, 2013.



exclusion. Thus people born outside the EU-28 Member States were almost twice as likely to be at risk of poverty or social exclusion compared with native citizens. On average, migration within the EU-28 does not bear much higher risk than remaining in one's country of birth.

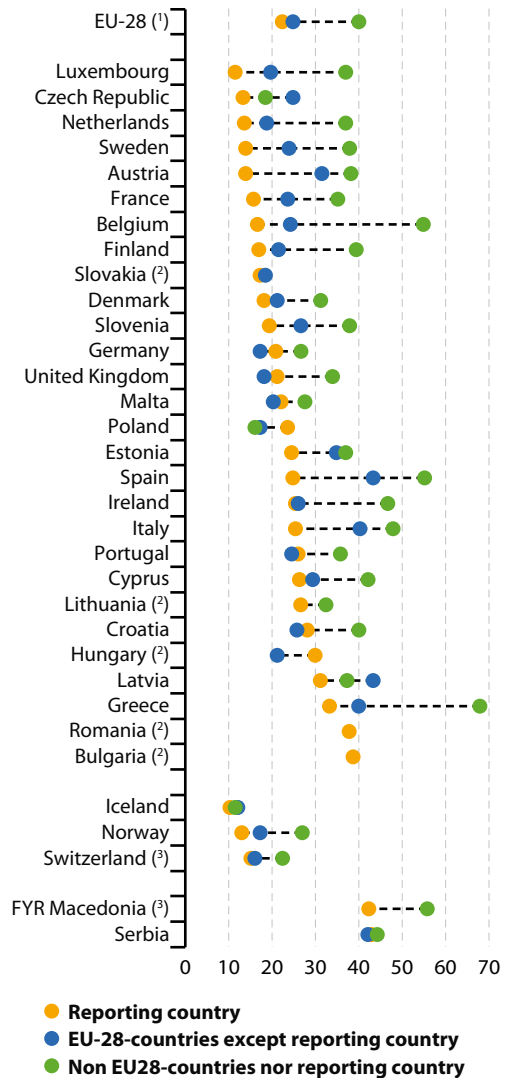
A cross-country comparison shows that this 'origin gap' differs strongly across EU Member States. The countries with the greatest difference in at-risk-of-poverty rate between people from non-EU-28 countries and those living in their home country are Belgium (37.9 percentage point gap), Greece (34.7 percentage point gap) and Spain (30.4 percentage point gap). Conversely, the Czech Republic, Malta and Germany showed the smallest differences between these two groups. In these countries, foreign citizens from a non-EU-28 country were between 5 and 6 percentage points more likely to be at risk of poverty or social exclusion compared with citizens living in their country of birth ⁽²⁷⁾.

In Poland the opposite pattern could be seen, where people from non-EU-28 countries had a 7.4 percentage point lower risk of poverty or social exclusion compared with native citizens in 2014 ⁽²⁸⁾. Finally, there are some Member States where foreign citizens from other EU-28 countries fare better in terms of poverty or social exclusion than native citizens. This is the case in Germany, the United Kingdom, Malta, Poland, Portugal and Croatia ⁽²⁹⁾. Country differences could be explained by a number of factors, such as the level of education and employment status of foreign citizens residing in a given Member State. Furthermore, the reasons for migrating to a specific country may differ between countries, a fact which is reflected in the differing origin gap.

Between 2010 and 2014 the risk of poverty or social exclusion rose for all three of the groups described. However, the increase was the largest for people born in non-EU-28 countries (3.2 percentage points), followed by those born in a different EU-28 country than the one they reside

Figure 5.9: People at risk of poverty or social exclusion by group of country of birth, by country, 2014

(% of population aged 18 and over)



⁽¹⁾ Estimated data for foreign country.

⁽²⁾ Missing data due to low reliability.

⁽³⁾ 2013 data (instead of 2014).

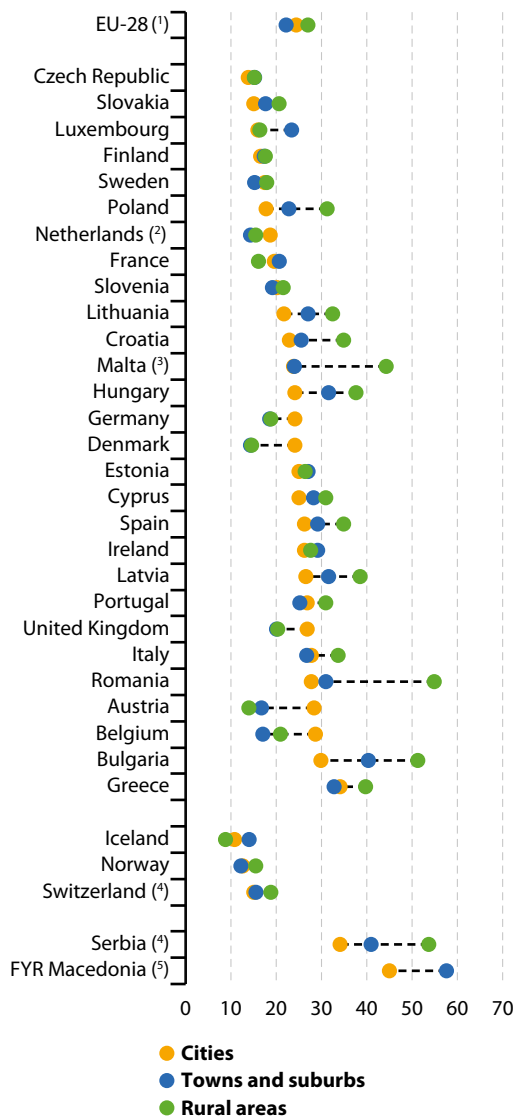
Source: Eurostat (online data code: ilc_peps06)

⁽²⁷⁾ This was also the case for Lithuania; however, the data is of low reliability.

⁽²⁸⁾ This could also be seen in Bulgaria and Hungary, but the data is considered unreliable.

⁽²⁹⁾ Foreign citizens also have a lower risk of poverty or social exclusion in Lithuania and Hungary, however, this is based on data with low reliability.

Figure 5.10: People at risk of poverty or social exclusion by degree of urbanisation, by country, 2014
(% of population)



⁽¹⁾ Estimated data for rural areas.

⁽²⁾ Provisional data.

⁽³⁾ Data for rural areas have low reliability.

⁽⁴⁾ 2013 data.

⁽⁵⁾ 2011 data; no data for 'rural areas'.

Source: Eurostat (online data code: ilc_peps13)

in (2.3 percentage points) and was the smallest among native citizens (0.5 percentage points).

The overall trend could be explained by the fact that people born in countries other than the one they reside in have suffered the most from rising unemployment in the EU, as shown in the migrant integration statistics.

In the majority of Member States, people in rural areas are more at risk of poverty or social exclusion

On average, EU-28 citizens in rural areas were more likely to live at risk of poverty or social exclusion than those in urban areas (27.2% in rural areas compared with 24.3% in urban areas) in 2014. Those living in towns or suburbs were the least likely to be at risk (22.3%). However, the figures vary greatly between Member States. In 17 countries, people living in rural areas were at the highest risk of being poor or socially excluded.

The countries with the highest poverty rates in rural areas compared with urban areas are Romania (27.1 percentage points higher), Bulgaria (21.4 percentage points higher) and Malta (20.6 percentage points higher). In other countries, such as Austria and Belgium, the opposite is true: a clearly larger share of urban residents live in poverty or social exclusion compared with residents in rural areas or towns. There are also countries, such as the Czech Republic, Finland and Slovenia, where the poverty rates in urban, rural or suburban areas differ only slightly.

In a [study report](#) ⁽³⁰⁾ the European Commission identified four main categories of problems that characterise rural areas in the EU and determine the risk of poverty or social exclusion: demography (for example, the exodus of residents and the ageing population in rural areas), remoteness (such as lack of infrastructure and basic services), education (for example, lack of preschools and difficulty in accessing primary and secondary schools) and labour markets (lower employment rates, persistent long-term unemployment and a greater number of seasonal workers).

⁽³⁰⁾ European Commission, *Poverty and social exclusion in rural areas. Final study report*, Luxembourg, Office for Official Publications of the European Communities, 2008.



The three dimensions of poverty



Monetary poverty was the most widespread form of poverty with 17.2 % of EU citizens affected in 2014. Next were severe material deprivation and very low work intensity, affecting 9 % and 11.2 % of EU citizens respectively.

Overall, 9.5 % of the working EU population was at risk of poverty in 2014.

Measuring poverty and social exclusion requires a multidimensional approach. Household income has a big impact on living standards, but other aspects preventing full participation in society such as access to labour markets and material deprivation also need to be considered. Therefore, the European Commission adopted a broad 'at-risk-of-poverty or social exclusion rate' indicator to serve the purposes of the Europe 2020 strategy. This indicator is an aggregate of three sub-indicators: (1) monetary poverty, (2) material deprivation and (3) low work intensity.

1. Monetary poverty is measured by the indicator 'people at risk of poverty after social transfers'. This measures the share of people with an equivalised disposable income below the at-risk-of-poverty threshold. This is set at 60% of the national median equivalised disposable income after monetary social transfers. Social transfers are benefits provided by national or local governments, including benefits relating to education, housing, pensions or unemployment. The 60% benchmark is conventionally used. However, as shown in the monetary poverty subsection, the amount of people considered to be at risk of poverty depends on where this threshold is set.
2. Material deprivation covers issues relating to economic strain, durables and housing and dwelling environment. Severely materially

deprived people are living in conditions greatly constrained by a lack of resources and cannot afford at least four of the following: to pay their rent or utility bills or hire purchase instalments or other loan payments; to keep their home warm; to pay unexpected expenses; to eat meat, fish or other protein-rich nutrition every second day; a week-long holiday away from home; to own a car, a washing machine, a colour TV or a telephone. Again, the threshold at which people are considered severely materially deprived is a result of convention. By changing the amount of items a person cannot afford in order to be viewed as severely materially deprived or materially deprived changes the amount of people considered to be facing this problem.

3. Very low work intensity describes the number of people aged 0 to 59 living in households where the adults worked no more than 20% of their potential during the past year.

Because there are intersections between these three dimensions, they cannot simply be added together to give the total number of people at risk of poverty or social exclusion. Some people are affected by two or even all three types of poverty. Taking the sum of each would lead to cases being double-counted. This becomes clear when looking at the current number of people at risk of poverty or social exclusion (see Figure 5.11).

Overall 122.3 million people were at risk of poverty or social exclusion in the 28 EU Member States in 2014. Often they were affected by one or more dimensions of poverty. As shown in Figure 5.11, monetary poverty was the most widespread form of poverty in 2014, with 86.2 million people **living at risk of poverty after social transfers**. This was followed by **severe material deprivation**, affecting 44.8 million people, and very low work intensity ⁽³¹⁾, affecting 41.8 million people.

⁽³¹⁾ The dimension 'very low work intensity' is only measured among working age respondents. 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 'monetary poverty' or 'severe material deprivation' are met.

More than a third affected by more than one dimension of poverty

About 40 million people, or almost one-third (33.2%) of all people at risk of poverty or social exclusion, were affected by more than one dimension of poverty in 2014. Of these, 12.9 million people suffered from monetary poverty and material deprivation, 3.4 million were both materially deprived and living in households with very low work intensity, and 14.5 million were affected by low work intensity and monetary poverty. Another 9.8 million people were affected by all three forms (see Figure 5.11).

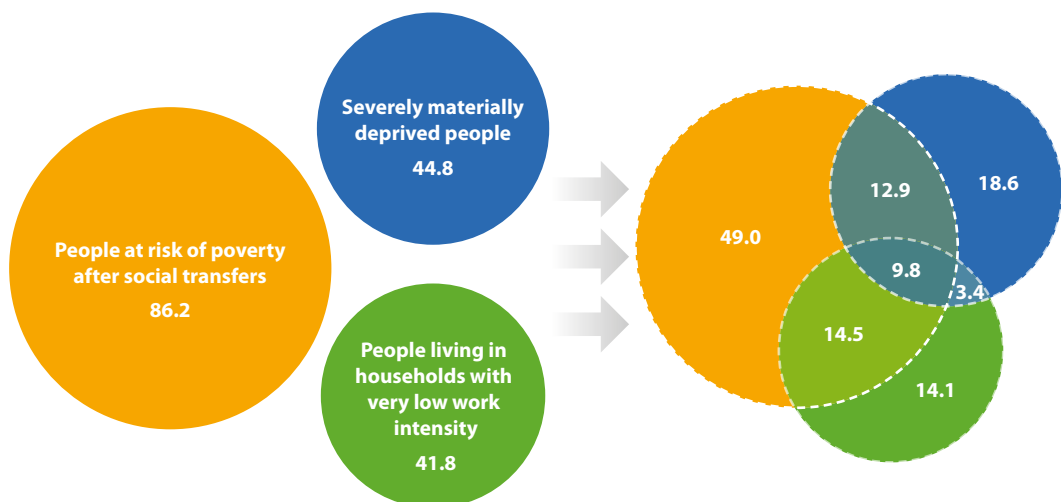
Divergent trends in the three forms of poverty

As shown in Figure 5.12, the three forms of poverty developed quite distinctly between 2005 and 2014. Monetary poverty has been the most prevalent form and has shown a slightly increasing

trend since 2005. In contrast, the number of people affected by severe material deprivation or very low work intensity fell considerably over the period 2005 to 2009. While the number of people with very low work intensity increased steadily between 2009 and 2014, the number who were severely materially deprived first increased sharply before declining again slightly. This shows that improvements in the headline indicator between 2005 and 2009 (see Figure 5.2) can mainly be attributed to the reduction in material deprivation and low work intensity.

One possible reason for the divergence in monetary poverty, on the one hand, and material deprivation and low work intensity, on the other, is the different structure of the indicators. While monetary poverty is measured in relative terms, material deprivation and low work intensity are absolute measures. The relativity of monetary poverty means the at-risk rate may remain stable or even increase even if a country's average

Figure 5.11: Aggregation of sub-indicators of 'People at risk of poverty or social exclusion', EU-28, 2014 (1)
(million people)

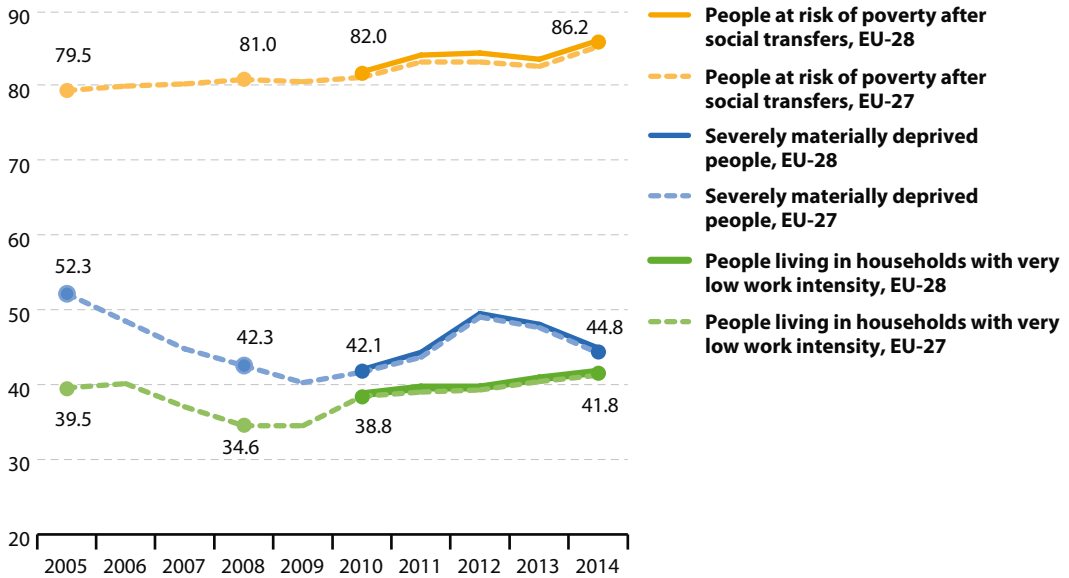


(1) Estimated data

Source: Eurostat (online data code: [ilc_pees01](#))



Figure 5.12: Sub-indicators on 'People at risk of poverty or social exclusion', EU-27 and EU-28, 2005–2014⁽¹⁾
(million people)



(¹) EU-27 data for 2005 and 2006 are estimates; EU-27 data for 2007 for 'risk of poverty after social transfers' are estimates; EU-27 data for 2009 for 'severe material deprivation' are estimates.

Source: Eurostat (online data codes: t2020_51, t2020_52 and t2020_53)

or **median equivalised disposable income** ⁽³²⁾ increases. This is due to the fact that the monetary poverty threshold is set at a specific percentage of the median disposable income. That means that if the median income increases, but the inequality of the income distribution remains unchanged or even increases, the number of people below the poverty line does not decrease. Absolute poverty measures reflecting the ability to afford basic goods, however, are likely to decrease during economic recoveries when people are generally better off financially.

The groups identified in the discussion of the headline indicator as being the most at risk of poverty or social exclusion largely correspond to the groups most exposed to being at risk of the three sub-indicators. As in the headline indicator,

in 2014 the groups most often affected by monetary poverty were women, young people, the unemployed and inactive, single-parent households and households consisting of only one person, people with the lowest educational attainment, foreign citizens born outside the EU-28 and those living in rural areas. For example, while on average 17.2% of the EU-28 population was affected by monetary poverty, the rate was 47.3% among the unemployed, 32.5% among single parent households and 30.5% among foreign citizens born in a country outside the EU-28.

Material deprivation was also more common among women, the young, the unemployed, households with single-parents, people with lower educational attainment, foreign citizens

(³²) The equivalised disposable income refers to the financial means a household has left for saving and spending. It is calculated by taking the entire income of a household and dividing it by the weighted household size, where each household member receives a weight depending on their age.

born outside the EU-28 and people living in rural areas compared with cities and suburbs. For example, while 9% of the overall EU-28 population suffered from severe material deprivation in 2014, the rate was 26.2% among the unemployed, 19.1% among single-parent households and 14.7% among foreign citizens born outside the EU-28.

Finally, while on average 11.2% of the working age population in the EU-28 was living in households with very low work intensity in 2014, the rate was at 17.0% among foreign citizens born outside the EU-28. Naturally, unemployed

people were more often living in households with very low work intensity (49.5% of the time). Also, single parents — faced with the double burden of being the sole caregiver and breadwinner — were, at 28.8%, far more likely to live in households with very low work intensity compared with the average.

The groups identified in the headline indicators as most vulnerable were not necessarily affected the most by very low work intensity. Unlike in the headline indicator, elderly people aged 55–59 were more likely to live in households with very low work intensity than the young, and people living in urban areas were more likely to live in such a household than those living in rural areas.

Box 5.2: Measuring poverty in absolute and relative terms

Absolute poverty refers to the deprivation of basic human necessities for survival, such as food, clean water, clothing, shelter, health care and education. This poverty line is considered the same for different countries, cultures and technological levels and it is often based on a given basket of goods and services. For example, absolute poverty can be measured as the number of people eating less food than needed to sustain the human body.

Relative poverty occurs when someone's standard of living and income are much worse than the general standard of the country or region they live in. They may struggle to live a normal life and to participate in ordinary economic, social and cultural activities. Relative poverty depends on the standard of living enjoyed by most of the country. For example, it can be measured by the number of people living below a country-specific poverty threshold. Relative poverty measures are often closely linked to inequality⁽³³⁾.

MONETARY POVERTY INCREASED IN MORE THAN TWO THIRDS OF THE MEMBER STATES

In 2014, 17.2% of the EU population earned less than 60% of their respective national median equivalised disposable income, the so-called 'poverty threshold'. This represents a slight increase compared with 2008, when 16.5% fell under the poverty threshold.

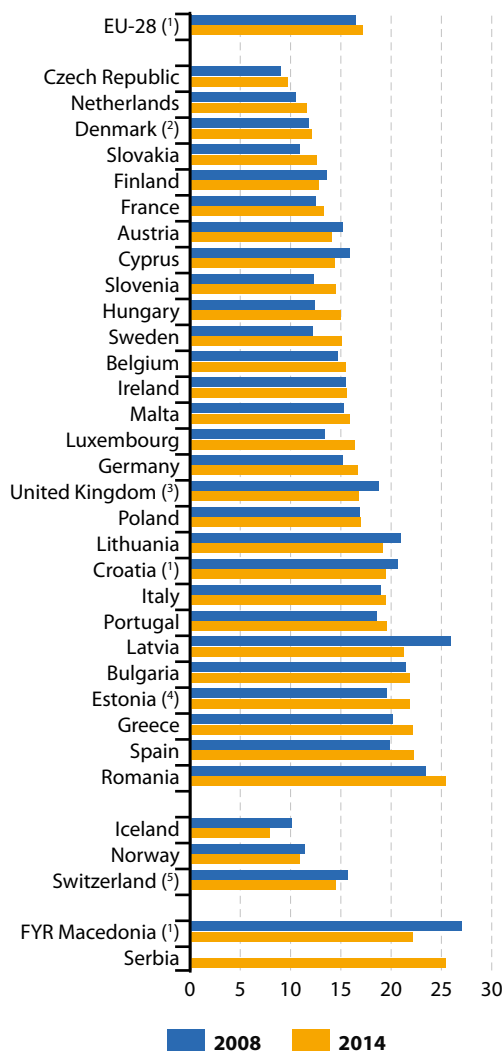
The increase did not take place in all countries (see Figure 5.13). Between 2008 and 2014 the share of people at risk of monetary poverty rose in 20 Member States and fell in the rest. The countries reporting the highest rates in 2014 were Romania (25.4%), Spain (22.2%) and Greece (22.1%). The best performing Member States in terms of monetary poverty were the Czech Republic (9.7%), the Netherlands (11.6%) and Denmark (12.1%).

The duration of monetary poverty and thus the extent of the situation can be measured with the indicator '**persistent at-risk-of-poverty rate**', defined as the share of people who are currently poor and had also been poor for two out of three years prior to the survey. Persistent poverty steadily increased in the EU-27 between 2008 and 2012

⁽³³⁾ European Anti-Poverty Network, *Poverty and inequality in the EU*, EAPN Explainer, 2014, p.13ff.



Figure 5.13: People at risk of poverty after social transfers, by country, 2008 and 2014
(% of population)



(1) 2010 data (instead of 2008).

(2) break in time series in 2013.

(3) break in time series in 2012.

(4) break in time series in 2014.

(5) 2013 data (instead of 2014).

Source: Eurostat (online data code: t2020_52)

before decreasing again slightly in 2013 (34). In 2013 the persistent risk of poverty rate was at 10.1 % in the EU-28 (35) (see also the data on 'persistent poverty' (36)).

Impact of the poverty threshold

Monetary poverty is related to disposable income after monetary social transfers. It is the case when disposable income falls below a certain threshold. Hence, the number of people considered monetarily poor depends on the level at which the poverty threshold is set (see Table 5.1).

If the poverty threshold were set at 70% of the national median disposable income, nearly one out of four people in the EU would have been at risk of monetary poverty in 2010 and 2014. If the threshold were set at 50% or 40%, then about 10% or 5% of the population would have been at risk, respectively. For all poverty thresholds, the number of people at risk of monetary poverty increased from 2010 to 2014.

To gain insights into how poor people below the poverty threshold are, the 'relative median at-risk-of-poverty gap' can be computed. This refers to the difference between the at-risk-of-poverty threshold (set at 60% of the national median equivalised disposable income after social transfers) and the median equivalised disposable income of people below the same at-risk-of-poverty threshold, expressed as a percentage of the at-risk-of-poverty threshold. In 2014, the relative at-risk-of-poverty gap was 24.6%. This means that the median person among all people who were below the at-risk-of-poverty threshold had about three quarters of the means of a person just at the poverty threshold.

Between 2010 and 2014, the at-risk-of-poverty gap increased by 1.8 percentage points, showing that the general situation for those below the poverty threshold has worsened.

(34) Aggregated data is only available for the EU-27 between 2008 and 2013 including estimates for the years 2008 and 2009. Aggregated data for the EU-28 is only available for the years 2011–2013 including estimates for 2011 and 2012.

(35) European Commission, *Poverty Dynamics in Europe: From What to Why*, 2015.

(36) Eurostat online data code: tessi020.

Table 5.1: People at risk of poverty after social transfers, by poverty threshold, EU-28, 2010 and 2014

Poverty threshold	2010		2014	
	% of population	1 000 persons	% of population	1 000 persons
40 %	5.6	27 670	6.3	31 525
50 %	10.0	49 760	10.8	53 944
60 %	16.5	82 003	17.2	86 199
70 %	24.2	120 438	24.9	124 541

Source: Eurostat (online data code: [ilc_li02](#))

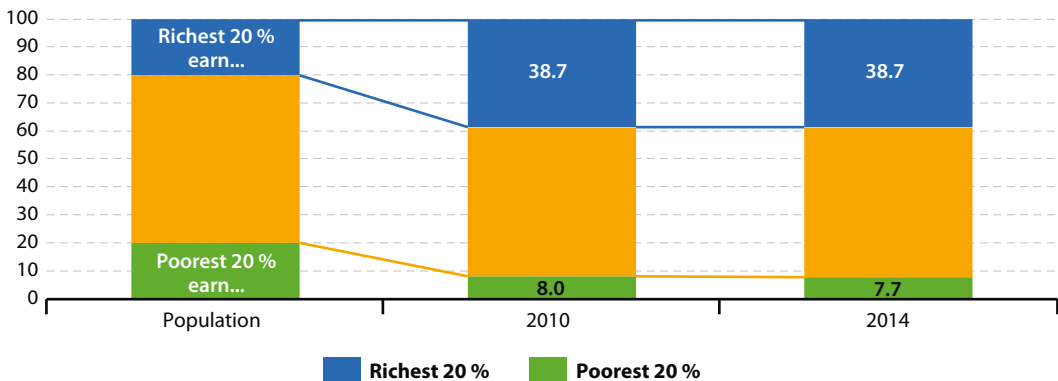
Inequality of income distribution remained stable

One way to measure income inequality is by looking at the income quintile share ratio. This is defined as the ratio between the income of the richest 20% of a population divided by the income of the poorest 20%.

Over the period from 2010 to 2014, the **distribution of income by quintiles** in the EU remained more or less stable, with the poorest 20% earning slightly less than in 2010 and the richest 20% earning marginally more. During this period, the richest 20% of the population earned

about five times more than the poorest 20% (see Figure 5.14).

There are considerable differences among Member States in the income quintile share ratio. In 2014 Romania, Bulgaria, Spain, Estonia and Latvia recorded the highest inequality in income distribution. In all of these Member States, the combined income of the richest 20% was almost seven times higher than the combined income of the poorest 20%. Conversely, the Czech Republic, Finland, Slovenia, the Netherlands and Belgium had income quintile share ratios equal to or below 3.8 (for further information see the data on [income quintile share ratios](#) ⁽²⁷⁾).

Figure 5.14: Inequality of income distribution, EU-28, 2010 and 2014
(% of national equivalised income)

Source: Eurostat (online data code: [ilc_di01](#))

⁽²⁷⁾ Eurostat online data code: [ilc_di11](#).



Social expenditure helped prevent more monetary poverty

To support people at risk of poverty, governments provide social security in the form of [social transfers](#). The effectiveness of monetary social provision can be evaluated by comparing the at-risk-of-poverty rate before and after social transfers (see Figure 5.15). On average, social transfers reduced the share of people at risk in the EU-28 by 8.9 percentage points in 2014, from 26.1 % to 17.2 %. However, the extent to which Member States were able to reduce this rate through social transfers varied. Reductions were largest in Ireland (– 21.6 percentage points), Denmark (– 14.8 percentage points) and Finland (– 14.8 percentage points) in 2014. Conversely, the smallest decreases were recorded by Romania (– 3.1 percentage points), Greece (– 3.9 percentage points) and Italy (– 5.3 percentage points).

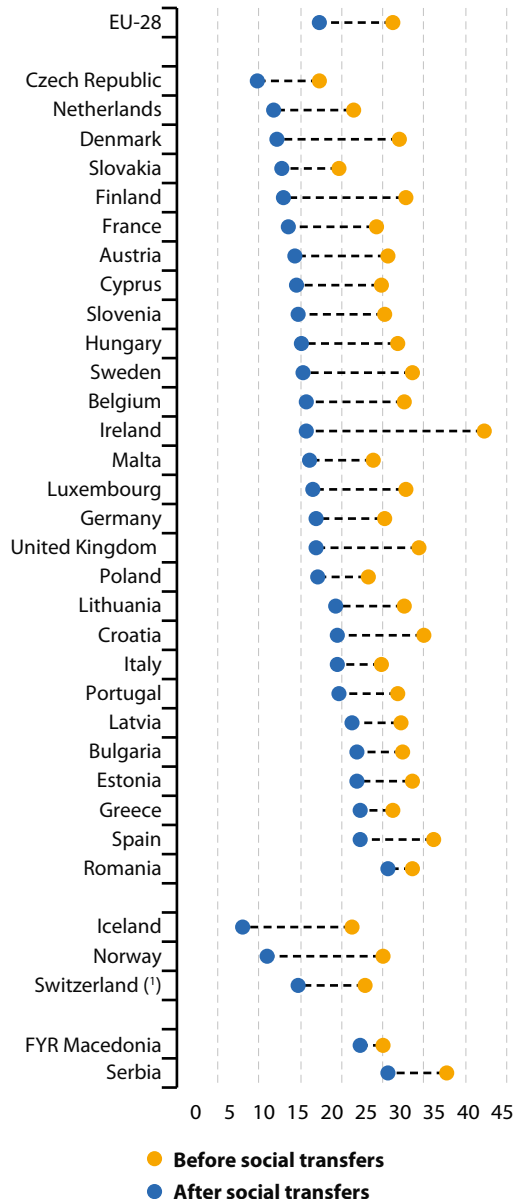
Over time, the at-risk-of-poverty rates before and after social transfers have moved in different directions. The rate before social transfers was relatively stable in the EU between 2010 and 2014, while the rate after social transfers increased slightly over the same time.

According to the [European Semester Thematic Fiche](#) ⁽³⁸⁾, differences in the effectiveness and the efficiency of social protection expenditures depend on different factors, such as the level of poverty and inequality before social transfers and differences in the size and design of these expenditures ⁽³⁹⁾.

MATERIAL DEPRIVATION IS THE SECOND MOST COMMON FORM OF POVERTY

[Material deprivation](#) covers issues relating to economic strain, durables and housing, and environment of the dwellings. Severely materially deprived people have living conditions greatly constrained by a lack of resources. This means they live in households unable to afford four or more items out of a list of nine considered by

Figure 5.15: At-risk-of-poverty rate before and after social transfers, by country, 2014
(% of population)



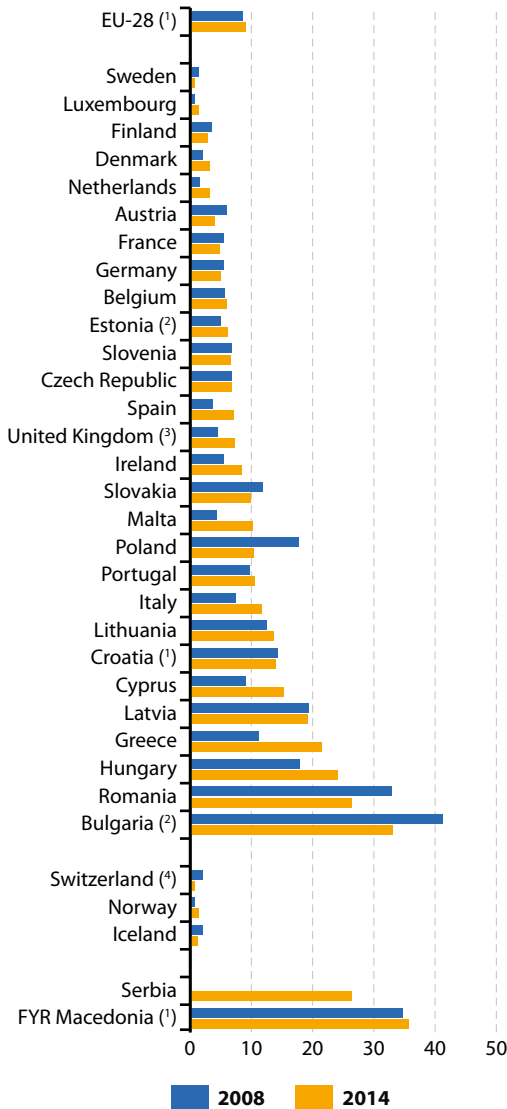
(1) 2013 data (instead of 2014).

Source: Eurostat (online data codes: t2020_52 and tesov250)

⁽³⁸⁾ European Commission, *European Semester Thematic Fiche. Poverty and Social Exclusion*.

⁽³⁹⁾ Earnings-related social benefits, for instance in old age, are often not aimed at reducing poverty but at maintaining the living standards of those facing the risk.

Figure 5.16: Severely materially deprived people, by country, 2008 and 2014
(% of population)



(1) 2010 data (instead of 2008).

(2) Break in time series in 2014.

(3) Break in time series in 2012.

(4) 2013 data (instead of 2014).

Source: Eurostat (online data code: t2020_53)

most people to be desirable or even necessary to lead an adequate life⁽⁴⁰⁾.

In 2014, 44.8 million people in the EU were living in conditions severely constrained by a lack of resources. This equalled 9.0% of the total EU population or almost every tenth person, making severe material deprivation the second most common form of poverty. The levels of severe material deprivation differed widely across the EU in 2014, from 33.1% in Bulgaria to as low as 1.4% in Luxembourg and 0.7% in Sweden (see Figure 5.16).

These persistent disparities between Member States are likely due to a combination of factors. Especially, differences in living standards and the effectiveness of social policies all play a part⁽⁴¹⁾.

In a few Member States, the share of people living in poor conditions is much higher than the share of people at risk of monetary poverty. This is because monetary poverty is a relative measure (the standard of living and income are much worse than the general standard in the country or region they live in) while material deprivation is absolute (referring to the deprivation of basic necessities for survival based on a given basket of goods; see also Box 5.2). For example, in Hungary and Bulgaria the proportion of people living in severely deprived conditions was about 1.5 times as high as the share living in monetary poverty. Contrarily, in a few countries with higher living standards such as Sweden and Luxembourg, the monetary poverty rate clearly exceeded the rate of people suffering from severe material deprivation.

Since 2008 the number of people living in severe material deprivation increased in a little over half of the EU-28 Member States. The rate decreased in nine countries and remained more or less stable in three. In general, these were countries with initially low rates, below or around 6%, such as Sweden, Finland, Austria, France and Germany. However, in Romania the rate decreased by 6.6 percentage points, from 32.9% in 2008. The most distinct improvements took place in Poland, where severe

(40) These items are the following: to pay their rent, mortgage or utility bills; to keep their home adequately warm; to face unexpected expenses; to eat meat or proteins regularly; to go on holiday; a television set; a washing machine; a car; a telephone.

(41) Social Protection Committee, *Social Europe — Current challenges and the way forward, Annual report of the Social Protection Committee on the social situation in the European Union (2012)*, 2013 P. 27.



material deprivation decreased by 7.3 percentage points from 17.7 % in 2008 ⁽⁴²⁾.

INABILITY TO FACE UNEXPECTED FINANCIAL EXPENSES OR TO MAKE ENDS MEET

Material deprivation can threaten a person's existence or make them fear that their existence is threatened. They may feel unable to face unexpected financial expenses or to 'make ends meet' (the ability to pay for their usual expenses).

In 2014, 38.9% of the EU population reported that their household was not able to face unexpected expenses and 11.5% declared they had great difficulties making ends meet.

There is a strong relationship between these concerns and material deprivation. In countries with fewer severely materially deprived people, more could afford unexpected or usual expenses. Countries with more materially deprived people were more likely to exhibit higher numbers of people unable to face unexpected expenses or make ends meet.

The number of households with low work intensity is increasing

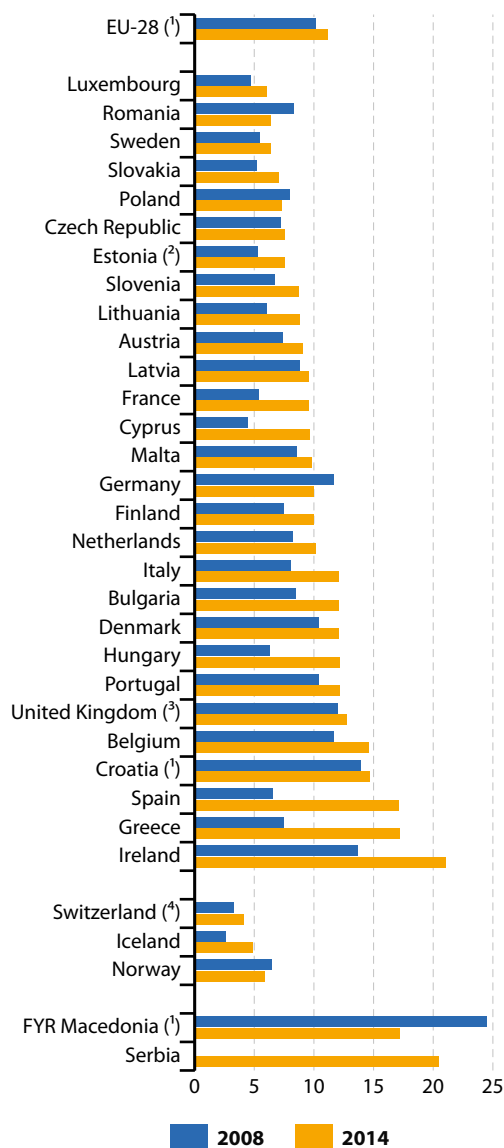
In 2014, 11.2% (or 41.8 million) of the EU population aged 0 to 59 were living in households with very low work intensity. This means the working-age members of the household worked no more than 20% of their potential during the previous year.

Across Europe, this figure ranged from 6.1% in Luxembourg and 6.4% in Romania to 21.1% in Ireland (see Figure 5.17). Low work intensity increased between 2005 and 2006 before declining between 2006 and 2008. It then remained stable for one year but started to increase again gradually in parallel with the rising unemployment levels as a result of the crisis.

Between 2008 and 2014, Spain, Greece and Ireland reported the highest increases in the amount of households with very low work

Figure 5.17: People living in households with very low work intensity, by country, 2008 and 2014

(% of population aged 0 to 59)



⁽¹⁾ 2010 data (instead of 2008).

⁽²⁾ Break in time series in 2014.

⁽³⁾ Break in time series in 2012.

⁽⁴⁾ 2013 data (instead of 2014).

Source: Eurostat (online data code: t2020_51)

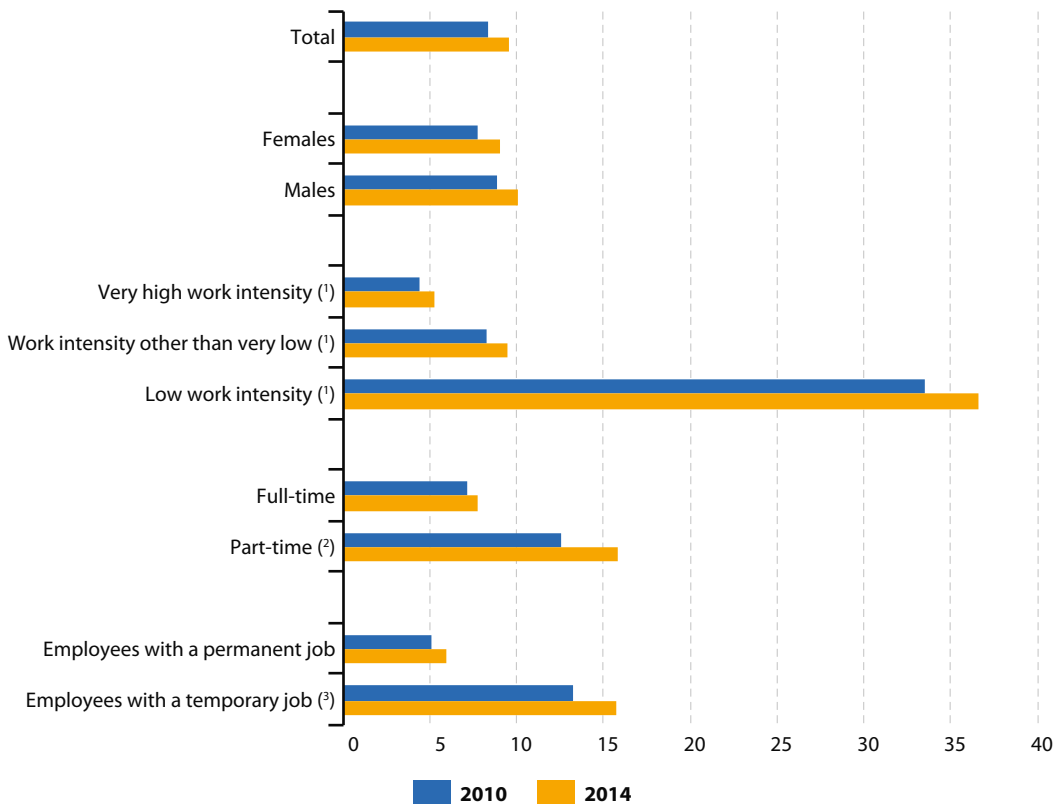
⁽⁴²⁾ A strong decrease can also be seen in Bulgaria, however, there was a break in the time series in 2014.

intensity by 10.5, 9.7 and 7.4 percentage points, respectively. Improvements were observed in Romania (– 1.9 percentage points), Germany (– 1.7 percentage points) and Poland (– 0.7 percentage points).

In some countries, the rate of lack of access to labour does not seem to correspond to the extent of the other forms of poverty or social exclusion: material deprivation and monetary

poverty. Belgium, for example, had a higher than average proportion of households with very low work intensity (14.6%) despite its risk of monetary poverty and severe material deprivation being below the EU average. In contrast, Romania had one of the highest proportions of its population living at risk of monetary poverty in 2014 and at the same time one of the lowest shares of households with very low work intensity (6.4%)⁽⁴³⁾.

Figure 5.18: In-work at-risk-of-poverty rate, by sex, work intensity of the household, type of contract, full-time and part-time work, EU-28, 2010 and 2014
(% of employed people aged 18 or over)



⁽¹⁾ Population aged 18–59 only.

⁽²⁾ 2010 data are estimates.

⁽³⁾ 2014 data are estimates.

Source: Eurostat (online data codes: *ilc_iw01*, *ilc_iw03*, *ilc_iw05* and *ilc_iw07*)

⁽⁴³⁾ 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.



PEOPLE IN WORK CAN ALSO BE AFFECTED BY POVERTY

Poverty and social exclusion do not only affect those who are economically inactive or unemployed (for more information on employment statistics indicators see the 'Employment' chapter, where the sub-indicator 'long-term unemployment' is also discussed in detail). Working conditions and terms of work contracts can influence the risk of being affected by poverty despite being in work. Figure 5.18 shows that overall 9.5% of the working EU population was at risk of poverty in 2014.

The work intensity of a household refers to the ratio of the total number of months that all working-age household members have worked during the income reference year and the total number of months the same household members theoretically could have worked during the same period.

It appears that the lower the work intensity, the higher the risk of poverty, despite partial employment. A reason for this could be that low work-intensity is associated with less stable working conditions. Also, people working part-time were more than twice as susceptible to being at risk of poverty as full-time workers in the EU (15.8% compared with 7.7%). Furthermore, those

workers with only a temporary contract had a clearly higher risk of poverty than those with a permanent contract (15.7% compared with 5.9%) in 2014. Thus, any situation reducing income such as low work intensity, working part-time or having a temporary contract increases the risk of poverty despite a person being in work.

In contrast to all other poverty indicators, men were more affected by in-work poverty than women (10.0% compared with 9.0% in 2014), although women more frequently hold part-time positions and often earn a lower salary. However, women are more often secondary earners, meaning the household income does not depend only on them⁽⁴⁴⁾. The situation was the opposite for young workers aged 18 to 24 years. In this case, women were more affected by in-work poverty than men in 2014 (14.0% compared with 11.6%).

For other groups of the population, the **in-work at-risk-of-poverty** situation matches that of the headline indicator. Of all age groups, young workers show the highest in-work at-risk-of-poverty rates. Also, multi-person adult households without dependent children are much less at risk of in-work poverty than households with dependent children and single-person households. Those most at risk are single parents; one out of five was affected in 2014.

Outlook towards 2020

As the most widespread form of poverty, monetary poverty poses one of the major challenges to achieving the Europe 2020 target. The proportion of people at risk of monetary poverty is closely linked to income inequality. As stated in the *Synthesis Report of the 2011 Peer Review in Social Protection and Social Inclusion*, this is not reduced by simply raising the average income. Therefore, action needs to be taken in the areas of social protection and improving the efficiency and effectiveness of income support.

To make progress towards the Europe 2020 poverty goal it will be particularly important to focus on groups that are at high risk of poverty and social exclusion. Actions to be taken for this purpose have been outlined in the EU flagship initiatives 'Youth on the move', 'Agenda for new skills and jobs' and 'European Platform against poverty'. These include EU funded study programmes, learning projects and training aimed at facilitating employment of young people, as well as reforms to improve the flexibility and

⁽⁴⁴⁾ For more information see: <https://epthinktank.eu/2014/08/13/in-work-poverty-in-the-eu/>

security in the labour market ('flexicurity'), to improve the quality of jobs, and to ensure better conditions for workers and for job creation (see the [Agenda for new skills and jobs](#)). Measures directly addressing poverty and social exclusion include the monitoring of Member States' economic and structural reforms through the European Semester and actions designed to help meet the poverty target at the European level.

In its [stocktaking of the Europe 2020 strategy](#) ⁽⁴⁵⁾, the European Commission acknowledges there

is no sign of a rapid improvement in the situation and expects that the number of people at risk of poverty might remain at about 100 million by 2020. The Commission expresses a concern that 'the situation is particularly aggravated in certain Member States, driven by increases in severe material deprivation and in the share of jobless households', reckoning that 'the crisis has demonstrated the need for effective social protection systems'.

⁽⁴⁵⁾ European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, Brussels, 2014, p. 14.

Country profiles



Country profiles

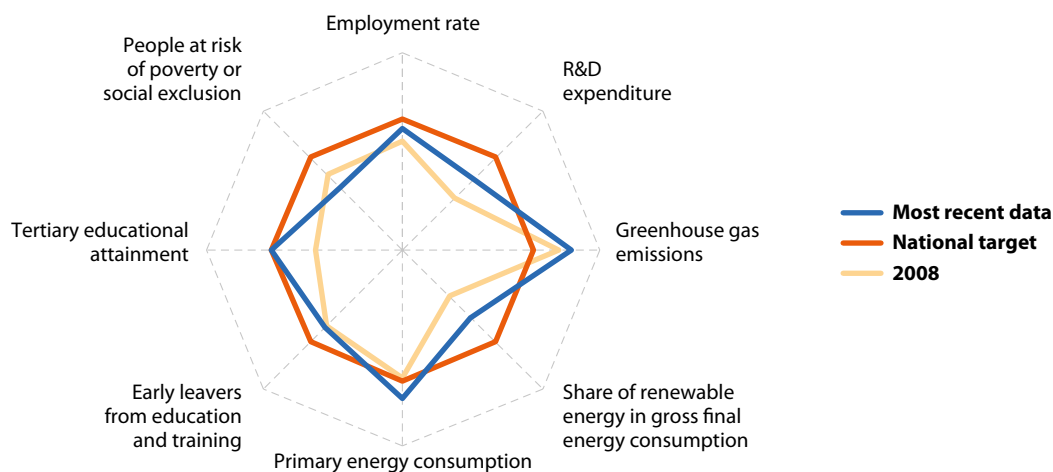
This section provides a detailed picture of the situation at national level in relation to the Europe 2020 headline indicators and national targets. The focus lies on summarising the state of play for each Member State in relation to its national targets.

As already mentioned in the introduction, Member States have defined their **national targets** in their **National Reform Programmes (NRPs)**, reflecting their current situation. The NRPs outline the actions and measures planned in each country to progress towards the national targets. They are supported with country-specific recommendations issued by the European Commission after the assessment of the national programmes. The complete NRPs and country-specific recommendations can be downloaded from the [European Commission's Europe 2020 website](#).

The presentation of each country is supported by an illustration in the form of a radar chart. The chart shows the distance of a country from its

national targets as a percentage of the targets through three elements: the national target (orange line), the country situation in 2008 (yellow line) and the most recent situation (blue line). The closer a country is to the centre of the radar chart for an indicator, the larger is the distance to its respective national target. In contrast, the closer a country is to the outer red line of the radar chart, the closer it is to the respective national target. Data points on or outside the outer red line mean that the country has met or exceeded this target. The comparison of the country's most recent performance with the yellow line reveals whether it has moved closer towards or further way from its targets since 2008 (1).

National targets that are not harmonised with the overall EU targets are not presented in the diagram. For example, this is the case with the poverty and social exclusion targets adopted by some countries. Regarding the indicator on energy efficiency, Member States have set indicative national targets based on different indicators (primary or final energy consumption, or primary



(1) Please note that in a few cases, some countries have changed their national targets since 2008, therefore comparisons with earlier editions of this publication may be misleading.



or final energy savings, or energy intensity) in line with the [Energy Efficiency Directive](#). These have been translated into absolute levels of primary energy consumption, expressed in million tonnes of oil equivalent (Mtoe).

Progress towards the national greenhouse gas (GHG) emissions targets is analysed based on emissions in sectors not covered by the EU Emissions Trading Scheme (EU ETS) and in relation with the base year defined in the Effort Sharing

Decision (ESD) ⁽²⁾. For further details on the EU ETS and the ESD see the chapter on Climate change and energy, page 87.

The national targets (as defined in the NRPs) and the latest available national data for the headline indicators are presented in a separate table. Data on Europe 2020 headline indicators, targets and related issues are disseminated by [Eurostat on a dedicated section of its website](#).

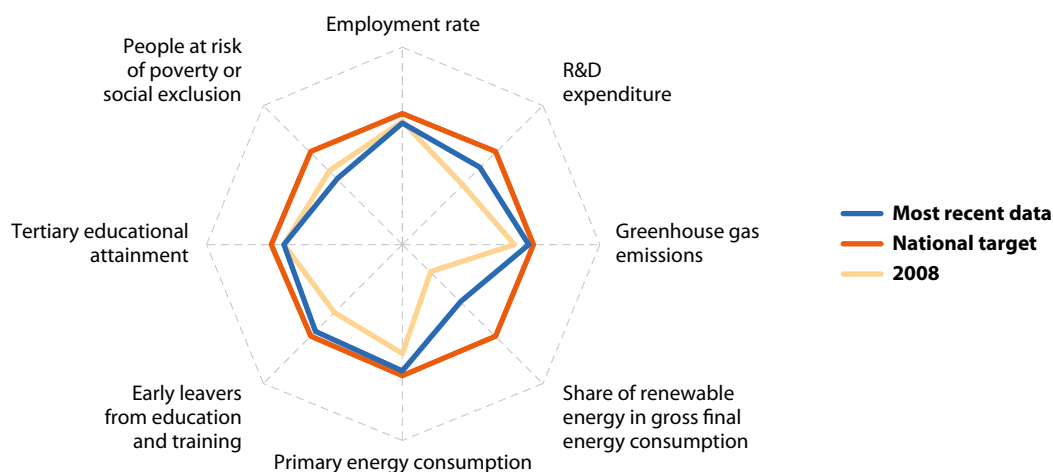
⁽²⁾ The Effort Sharing Decision (406/2009/EC) originally defined 2005 as base year for Member States' GHG emissions reductions. However, due to recent recalculations with improved methodologies used at national level to measure the estimated emissions, 2005 values of countries are not necessarily equal to the value of the ESD base year.

Belgium

In 2014, Belgium almost closed the distance to its energy efficiency target to reduce primary energy consumption to 43.7 Mtoe. Since 2008, Belgium has made progress towards its targets on early leavers from education and training, and in 2015 the gap to the national target was smaller than for the EU as a whole. The country has also increased expenditure on R&D as a share of GDP, but in 2014 it was still 0.5 percentage points from its national target of 3%. The share of renewable energy in gross final energy consumption doubled in the period from 2008 to 2014, however, the country

remains five percentage points below its national target of 13%. In contrast, the employment rate and the share of tertiary graduates have stagnated since 2008. Over the same period, the number of people at risk of poverty or social exclusion rose by about 7%, moving the country further from its national 2020 target. Although the country displayed a downward trend in GHG emissions in non-ETS sectors in the period from 2010 to 2012, the distance to the national target was larger than the distance of the EU as a whole from the EU target.

Figure 6.1: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.1: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	67.2	2015	73.2
Gross domestic expenditure on R&D (% of GDP)	2.46 (¹)	2014	3
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 11.0	2012	- 15
Share of renewable energy in gross final energy consumption (%)	8.0	2014	13
Primary energy consumption (million tonnes of oil equivalent)	45.0	2014	43.7
Early leavers from education and training (% of population aged 18–24)	10.1	2015	9.5
Tertiary educational attainment (% of population aged 30–34)	42.7	2015	47
People at risk of poverty or social exclusion (thousands)	2 339	2014	1 814

(¹) Estimate/provisional data.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

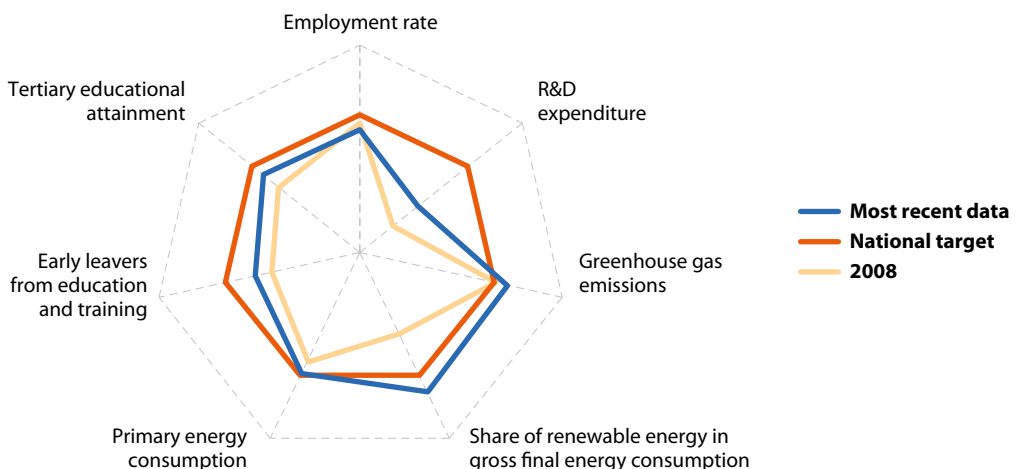


Bulgaria

Despite an increase in non-ETS GHG emissions by 8.4% since the ESD base year, Bulgaria has remained within its national target to limit the rise in non-ETS sector GHG emissions to 20% by 2020. In 2014, the country surpassed its 16% target on renewable energy and almost met its target on primary energy consumption. Although Bulgaria has moved closer to its national targets on early school leavers and tertiary education, for both indicators the distance to the national targets remained larger than the distance of the EU as a whole to the respective EU target in 2015. The employment rate in Bulgaria deteriorated

sharply between 2008 and 2011; the subsequent increase up to 2015 was not sufficient to bring the country closer to its 76% target. Despite a steady increase of R&D expenditure between 2008 and 2014, Bulgaria would need to double its level of expenditure in the coming years to reach its goal of 1.5% of GDP. Progress towards the country's poverty reduction target has been low since the start of the crisis; in 2014, the number of people at risk of poverty after social transfers — used as a national target in the area of poverty reduction — was 3.3% below its 2008 level and 15.0% above the national 2020 target.

Figure 6.2: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.2: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	67.1	2015	76
Gross domestic expenditure on R&D (% of GDP)	0.8	2014	1.5
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	8.4	2012	20
Share of renewable energy in gross final energy consumption (%)	18.0	2014	16
Primary energy consumption (million tonnes of oil equivalent)	17.2	2014	16.9
Early leavers from education and training (% of population aged 18–24)	13.4	2015	11
Tertiary educational attainment (% of population aged 30–34)	32.1	2015	36
People at risk of poverty after social transfers (thousands)	1 578	2014	1 372 (!)

(!) National target differs from the overall EU target on 'risk of poverty or social exclusion' as it refers to the sub-indicator 'people at risk of poverty after social transfers' only.

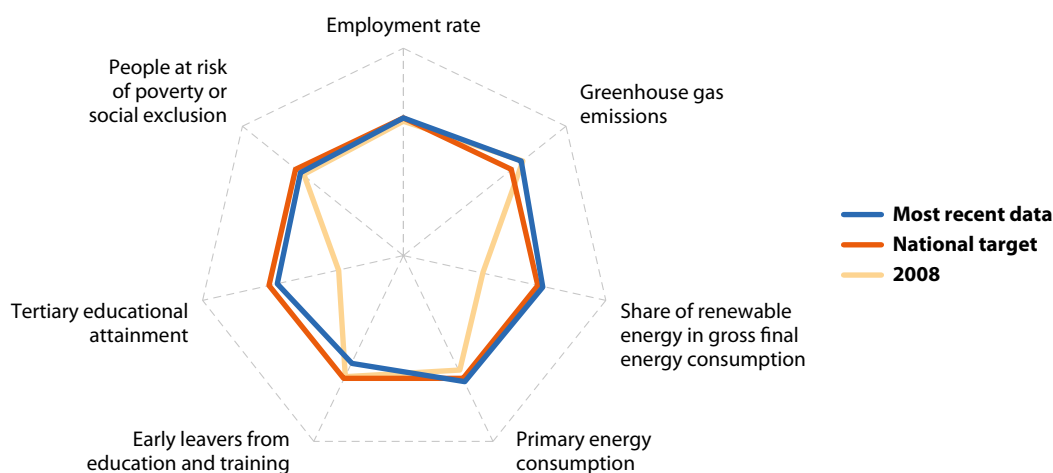
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Czech Republic

The Czech Republic had reduced its non-ETS GHG emissions by 0.9% since the ESD base year, thus remaining within the national GHG emissions target to limit increases to 9% by 2020. In 2014, the country had already met its national targets on renewable energy and primary energy consumption. The gradual rise in employment in the period from 2010 to 2015 brought the Czech Republic close to its 75% employment target. The share of 30 to 34 year olds with tertiary education increased by nearly 15 percentage points between

2008 and 2015, substantially narrowing the gap to the respective national target. Despite an increase in the share of early leavers from education and training in the same time period, the Czech Republic was closer to its national target than the EU as a whole was to the EU target in 2015. Progress towards the national poverty reduction target has been low since 2008 and some 66 000 people still need to be lifted out of the risk of poverty and social exclusion by 2020 in order to meet the target.

Figure 6.3: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.3: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	74.8	2015	75
Gross domestic expenditure on R&D (% of GDP)	2.0 ⁽¹⁾	2014	1 ⁽²⁾
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	-0.9	2012	9
Share of renewable energy in gross final energy consumption (%)	13.4	2014	13
Primary energy consumption (million tonnes of oil equivalent)	38.6	2014	39.6
Early leavers from education and training (% of population aged 18–24)	6.2	2015	5.5
Tertiary educational attainment (% of population aged 30–34)	30.1	2015	32
People at risk of poverty or social exclusion (thousands)	1 532	2014	1 466

⁽¹⁾ Provisional data.

⁽²⁾ National target refers to public sector expenditure only.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

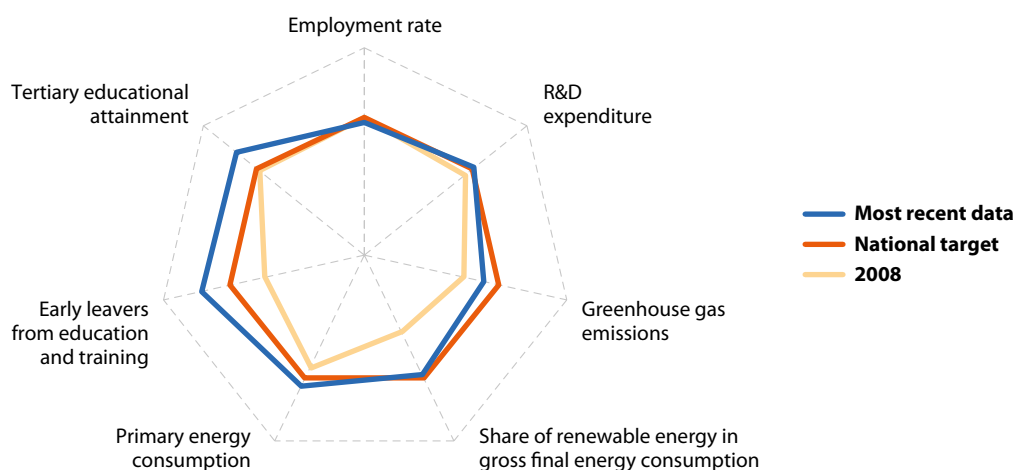


Denmark

In 2015, Denmark exceeded its national targets on early school leavers and tertiary educational attainment, by about 2 and 8 percentage points respectively. Denmark was the only EU Member State to exceed its national R&D expenditure target of 3 % of GDP. With a 14 % reduction in primary energy consumption between 2008 and 2014, Denmark also exceeded its energy efficiency target. In 2014, the country was closer to meeting its renewable energy objective than the EU as a whole was to meeting the EU

objective but lagged behind in terms of reducing its levels of GHG emissions in non-ETS sectors (2012 data). The employment rate in Denmark deteriorated slightly between 2008 and 2015, widening the distance to the national target of 80%. The number of people living in households with very low work intensity — used in Denmark as a national target in the area of poverty and social exclusion — rose by 35 % in the same time period, further increasing the distance to the national target.

Figure 6.4: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.4: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	76.5	2015	80
Gross domestic expenditure on R&D (% of GDP)	3.05 ⁽¹⁾	2014	3
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 10.4	2012	- 20
Share of renewable energy in gross final energy consumption (%)	29.2	2014	30
Primary energy consumption (million tonnes of oil equivalent)	16.7	2014	17.8
Early leavers from education and training (% of population aged 18–24)	7.8	2015	10
Tertiary educational attainment (% of population aged 30–34)	47.6	2015	40 ⁽²⁾
People living in households with very low work intensity (thousands)	495	2014	325 ⁽³⁾

⁽¹⁾ Estimated/provisional data.

⁽²⁾ National target: more than 40%.

⁽³⁾ National target differs from the overall EU target on 'risk of poverty or social exclusion' as it refers to the sub-indicator 'people living in households with very low work intensity' only.

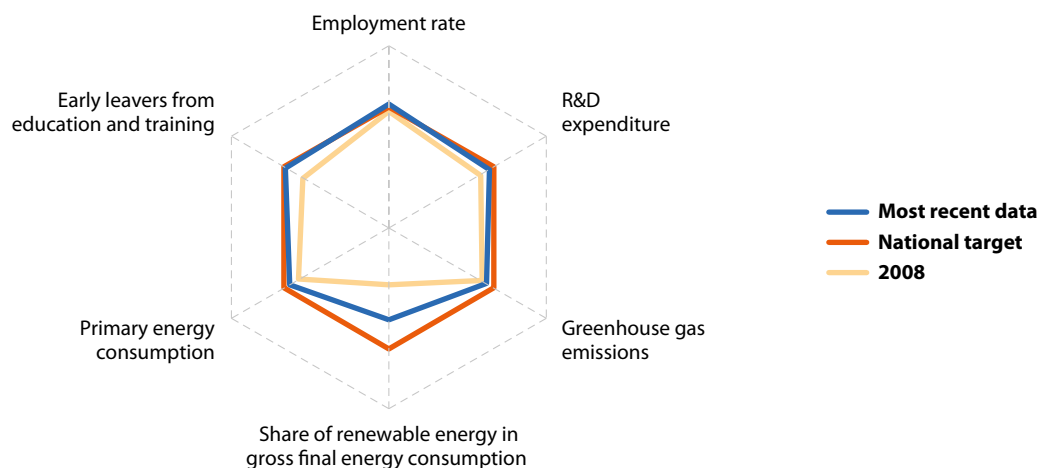
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Germany

Long-term unemployment, which is used in Germany as a national target in the area of poverty and social exclusion, was reduced by 43 % between 2008 and 2014. Thus, the country significantly exceeded its target of reducing long-term unemployment by 20 % by 2020. It met its employment target of 77 % in 2013 and continued to increase its employment rate until 2015. In 2015, Germany surpassed its national target on tertiary educational attainment by nearly five percentage points, with 46.8 % of 30 to 34 year olds having completed post-secondary level education or

equivalent. Germany's national target differs from those adopted by other Member States because it includes post-secondary non-tertiary education (ISCED level 4) in addition to ISCED levels 5 to 8. In addition, Germany almost closed the gap to its national targets on R&D expenditure and early leavers from education and training. Between 2008 and 2014, it halved the distance to its national targets on primary energy consumption and renewable energy. However, the gap to its target on GHG emissions in non-ETS sectors was significantly larger than for the EU as a whole in 2012.

Figure 6.5: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.5: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	78.0	2015	77
Gross domestic expenditure on R&D (% of GDP)	2.87 ⁽¹⁾	2014	3
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 4.8	2012	- 14
Share of renewable energy in gross final energy consumption (%)	13.8	2014	18
Primary energy consumption (million tonnes of oil equivalent)	291.8	2014	276.6
Early leavers from education and training (% of population aged 18–24)	10.1	2015	10 ⁽²⁾
Tertiary educational attainment (% of population aged 30–34)	46.8 ⁽³⁾	2015	42 ⁽³⁾
Long-term unemployment (thousands)	919	2014	1 306 ⁽⁴⁾

⁽¹⁾ Estimated/provisional data.

⁽²⁾ National target: less than 10%.

⁽³⁾ Indicator and target refer to ISCED levels 4–8.

⁽⁴⁾ National target differs from the overall EU target on 'risk of poverty or social exclusion' as it refers to long-term unemployed people.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#) and [lfsa_ugad](#)), DESTATIS

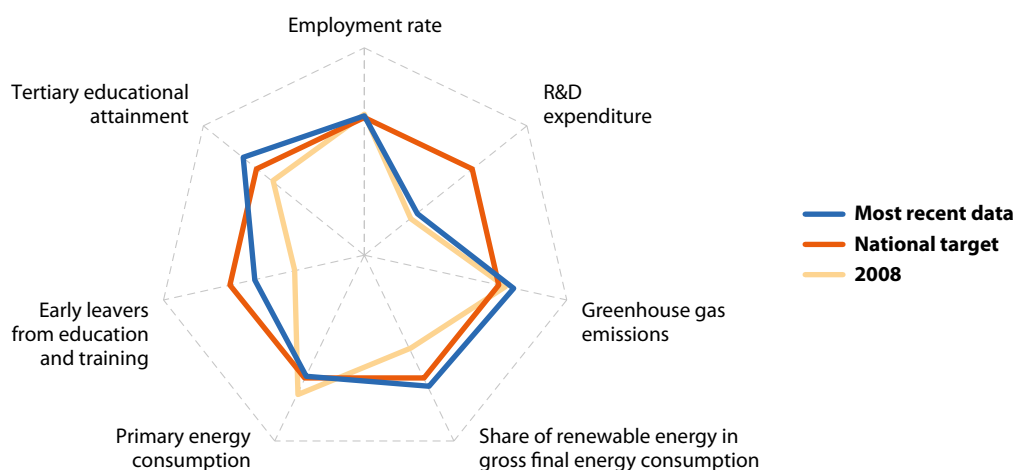


Estonia

By 2012 Estonia had decreased its GHG emissions by 0.1 % compared with the ESD base year, remaining well below its national target, which allows an increase of 11 % by 2020. In 2014, Estonia also surpassed its target on renewable energy but fell slightly short of its target on primary energy consumption. The country also exceeded its target on tertiary education by 5.3 percentage points and reached its employment target of 76%. Despite a sizeable reduction in the share of early

school leavers since 2008, Estonia was almost two percentage points below its national target in 2015. Public expenditure on R&D has been low since the start of the economic crisis in 2008 and in 2015 it was further from the national target than the EU as a whole was from the respective EU target. Since 2010 the country has experienced a gradual increase in the share of the population living at risk of poverty after social transfers, which has moved Estonia further away from its national target of 15%.

Figure 6.6: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.6: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	76.5	2015	76
Gross domestic expenditure on R&D (% of GDP)	1.44	2014	3
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	-0.1	2012	11
Share of renewable energy in gross final energy consumption (%)	26.5	2014	25
Primary energy consumption (million tonnes of oil equivalent)	6.6	2014	6.5
Early leavers from education and training (% of population aged 18–24)	11.2	2015	9.5
Tertiary educational attainment (% of population aged 30–34)	45.3	2015	40
People at risk of poverty after social transfers (% of population)	21.8	2014	15 (!)

(!) National target differs from the overall EU target on 'Risk of poverty or social exclusion' as it refers to the sub-indicator 'people at risk of poverty after social transfers' only.

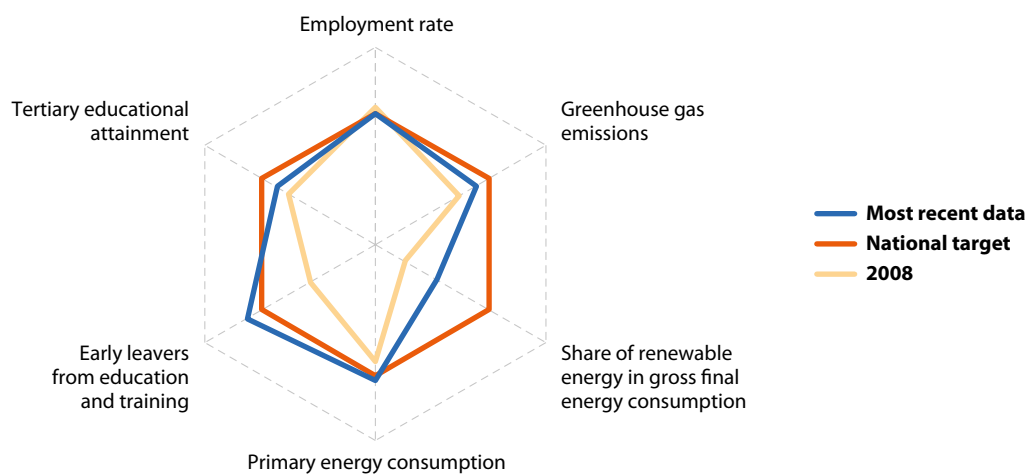
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Ireland

The employment rate in Ireland fell sharply during the economic recession of 2009; although the indicator has not risen to pre-crisis levels, in 2015 the country came close to reaching its employment target of 69%. Ireland met its target on primary energy consumption in 2011 and has remained within the limit of 13.9 Mtoe up to 2014. The country also surpassed its target on early leavers from education and training, achieving a 4.5 percentage point reduction from 2008 to 2015. Although the share of tertiary graduates

increased steadily in the same time period, Ireland remained at a distance from its 60% target. Ireland's R&D expenditure as a share of GDP has been more or less stable since 2009, maintaining a half percentage point gap to the national target of about 2% (2.5% of GNP). Between 2014 and 2020, Ireland would need to double its share of renewable energy in gross final energy consumption to meet its 16% target. In 2012, the country was further from its GHG emissions target than the EU as a whole was from the EU target.

Figure 6.7: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.7: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	68.8	2015	69 ⁽¹⁾
Gross domestic expenditure on R&D (% of GDP)	1.52 ⁽²⁾	2014	2 ⁽³⁾
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 11.2	2012	- 20
Share of renewable energy in gross final energy consumption (%)	8.6	2014	16
Primary energy consumption (million tonnes of oil equivalent)	13.4	2014	13.9
Early leavers from education and training (% of population aged 18–24)	6.9	2015	8
Tertiary educational attainment (% of population aged 30–34)	52.3	2015	60
People at risk of poverty or social exclusion (thousands)	1 274	2014	: ⁽⁴⁾

⁽¹⁾ National target: 69–71 %.

⁽²⁾ Estimated data.

⁽³⁾ National target: 2.5% of GNP (approximately 2% of GDP).

⁽⁴⁾ National target: Reduce by a minimum of 200 000 the population in combined poverty (either consistent poverty, at-risk-of-poverty or basic deprivation).

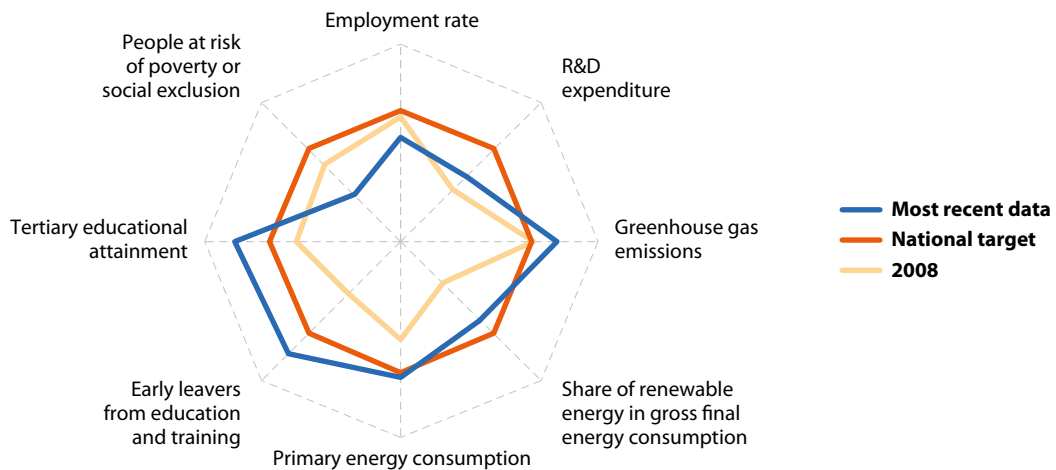
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Greece

Partly as a result of the economic downturn, by 2012 Greece had reduced its GHG emissions in non-ETS sectors by 22.4% compared with the ESD base year, significantly exceeding its national target to achieve a 4% reduction by 2020. In 2015, the country also surpassed the national targets on tertiary education and early leavers from education and training, by 8.4 and 2.1 percentage points respectively. Greece met its target on primary energy consumption in 2011 and has continued to improve its energy efficiency up until 2014. Between 2008 and 2014,

Greece almost doubled its share of renewable energy in gross final energy consumption and increased its expenditure on R&D as a share of GDP, thus narrowing the distance to the respective national targets. In contrast, Greece had both the lowest employment rate and the largest distance to its employment target in the EU in 2015. Moreover, the number of people living at risk of poverty or social exclusion increased by about 840 000 between 2008 and 2014, widening the gap to the national target to nearly 1.3 million people.

Figure 6.8: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.8: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	54.9	2015	70
Gross domestic expenditure on R&D (% of GDP)	0.84	2014	1.2
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 22.4	2012	- 4
Share of renewable energy in gross final energy consumption (%)	15.3	2014	18
Primary energy consumption (million tonnes of oil equivalent)	23.7	2014	24.7
Early leavers from education and training (% of population aged 18–24)	7.9	2015	10 (!)
Tertiary educational attainment (% of population aged 30–34)	40.4	2015	32
People at risk of poverty or social exclusion (thousands)	3 885	2014	2 596

(!) National target: less than 10%.

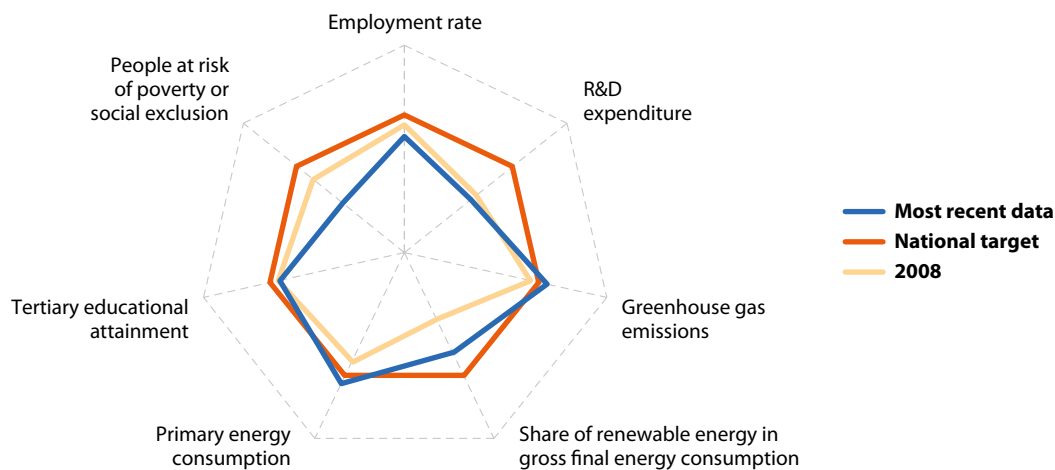
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Spain

In 2012, Spain exceeded its national target on GHG emissions in non-ETS sectors by 5.6 percentage points. The country also surpassed its target on primary energy consumption and narrowed the distance to its target on renewable energy to 3.8 percentage points in 2014. By reducing the number of early leavers from education and training by 11.7 percentage points between 2008 and 2015, Spain made substantial progress towards its 2020 target. In contrast, the share of 30 to 34 years olds with tertiary education fell slightly in 2015, increasing the distance to the national target

to 3 percentage points. Since 2008, the number of people at risk of poverty or social exclusion has deteriorated sharply. Spain would need to lift some 4 million people out of the risk of poverty or social exclusion in order to meet its 2020 objective. The country's employment rate also deteriorated in the first years of the crisis and in 2015 the gap to the national target was 12 percentage points — the second largest in the EU. R&D spending has also fallen, however, the distance to the national target was smaller than the distance of the EU as a whole to the EU target in 2014.

Figure 6.9: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.9: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	62.0	2015	74
Gross domestic expenditure on R&D (% of GDP)	1.23	2014	2
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 15.6	2012	- 10
Share of renewable energy in gross final energy consumption (%)	16.2	2014	20
Primary energy consumption (million tonnes of oil equivalent)	112.6	2014	119.8
Early leavers from education and training (% of population aged 18–24)	20.0	2015	15 ⁽¹⁾
Tertiary educational attainment (% of population aged 30–34)	40.9	2015	44
People at risk of poverty or social exclusion (thousands)	13 402	2014	9 386 ⁽²⁾

⁽¹⁾ National target refers to school drop-out rate.

⁽²⁾ National target: reduce the number of people at risk of poverty or social exclusion by 1 400 000 to 1 500 000 people (compared to 2008).

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

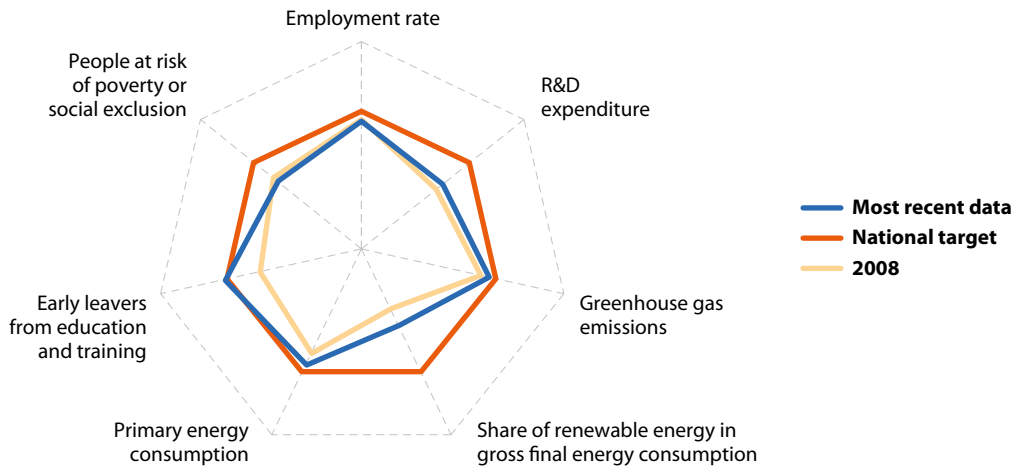


France

In 2015, France met its Europe 2020 target on early leavers from education and training for a second consecutive year. By 2014 the country had moved closer towards its target on primary energy consumption. Progress has also been achieved in the area of tertiary educational attainment, however, the indicator used at EU level cannot directly be compared to the French target value of 50%, which refers to the population aged 17 to 33. In terms of renewable energy, in 2014 France was the Member State that was furthest from its national target (8.7 percentage points). Despite

an overall reduction in GHG emissions in non-ETS sectors, by 2012 the country was further from its Europe 2020 goal than the EU as a whole was from the EU goal. In 2015, France was also further from its employment target than the EU as a whole was from the EU target but slightly closer to its target on R&D expenditure (2014 data). Between 2008 and 2014, the number of people at risk of poverty or social exclusion increased by about 390 000, moving the country further from its 2020 goal of a 1.9 million reduction.

Figure 6.10: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.10: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	69.5	2015	75
Gross domestic expenditure on R&D (% of GDP)	2.26 ⁽¹⁾	2014	3
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 9.7	2012	- 14
Share of renewable energy in gross final energy consumption (%)	14.3	2014	23
Primary energy consumption (million tonnes of oil equivalent)	234.5	2014	219.9
Early leavers from education and training (% of population aged 18–24)	9.3	2015	9.5
Tertiary educational attainment (% of population aged 30–34)	45.1	2015	50 ⁽²⁾
People at risk of poverty or social exclusion (thousands)	11 540	2014	9 482 ⁽²⁾

⁽¹⁾ Provisional data.

⁽²⁾ National target differs from the overall EU target on 'tertiary educational attainment' as it refers to 17–33 year olds.

⁽³⁾ National target: reduce by 1 900 000 the population living in poverty or social exclusion by 2020 (compared with 2007).

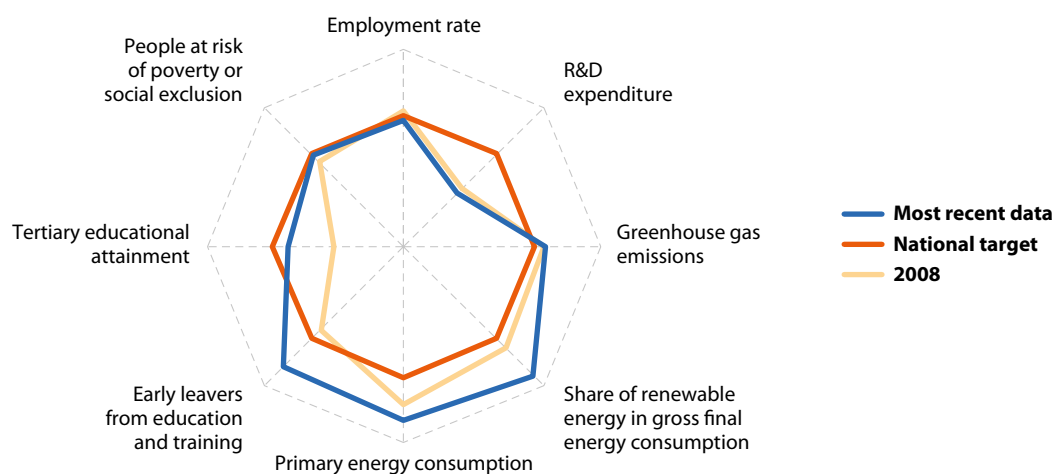
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Croatia

Croatia had by far the lowest rate of early leavers from education and training across the EU in 2015, exceeding its 2020 target. By 2010, the country had remained well within its target on GHG emissions in non-ETS sectors, which allows emissions to increase by up to 11 % by 2020 compared with the ESD base year. In 2014, Croatia also surpassed its national targets on renewable energy and primary energy consumption. The share of the population aged 30 to 34 with tertiary education increased

by 12.4 percentage points in the period between 2008 and 2015, substantially reducing the distance to the national 2020 target. In 2014, Croatia came close to meeting its commitments on poverty reduction, but slightly increased the gap to the national target on R&D expenditure. The employment rate in Croatia gradually declined in the first years of the economic crisis but by 2015 the country had shortened the distance to the national target of 62.9% to 2.4 percentage points.

Figure 6.11: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.11: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	60.5	2015	62.9
Gross domestic expenditure on R&D (% of GDP)	0.79	2014	1.4
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	2.6	2010	11
Share of renewable energy in gross final energy consumption (%)	27.9	2014	20
Primary energy consumption (million tonnes of oil equivalent)	7.7	2014	11.5
Early leavers from education and training (% of population aged 18–24)	2.8 (†)	2015	4
Tertiary educational attainment (% of population aged 30–34)	30.9	2015	35
People at risk of poverty or social exclusion (thousands)	1 243	2014	1 220

(†) Data with low reliability.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

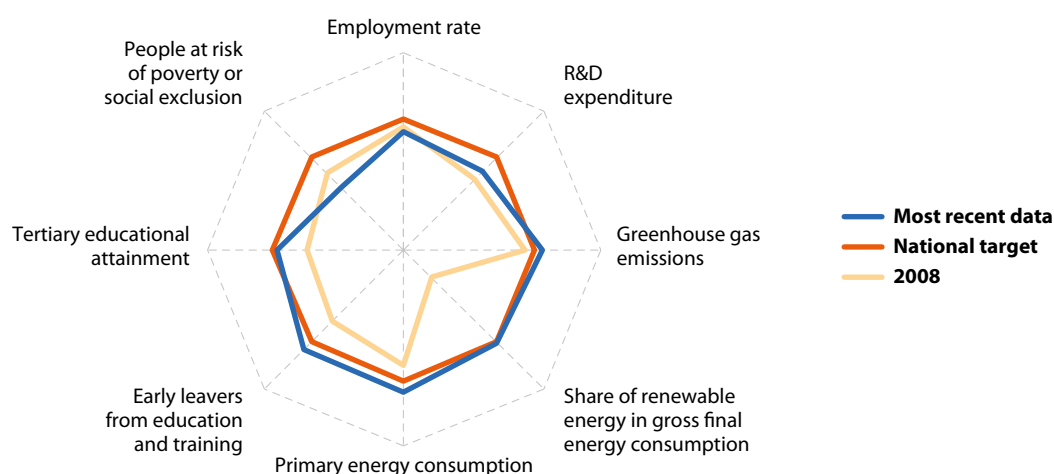


Italy

Since the ESD base year, Italy achieved a notable 68.1 % reduction in GHG emissions in non-ETS sectors, thus exceeding its national target by five percentage points. In 2014, the country also reached its national target on renewable energy and surpassed its goals on primary energy consumption for a third consecutive year. In the area of education, by 2015 Italy had met its goal on early leavers from education and training and came close to meeting its target

on tertiary education; nevertheless, the country had the lowest share of tertiary graduates in the EU in 2015 (25.3 % of 30 to 34 year olds). R&D expenditure has increased slightly since 2008 and in 2014 it was closer to its national target than the EU as a whole was to the EU target. In contrast, the distance to the national targets on employment and poverty reduction has increased since 2008 due to the negative effects of the economic crisis.

Figure 6.12: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.12: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	60.5	2015	67 (1)
Gross domestic expenditure on R&D (% of GDP)	1.29 (2)	2014	1.53
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	-18.1	2012	-13
Share of renewable energy in gross final energy consumption (%)	17.1	2014	17
Primary energy consumption (million tonnes of oil equivalent)	143.8	2014	158
Early leavers from education and training (% of population aged 18–24)	14.7	2015	16
Tertiary educational attainment (% of population aged 30–34)	25.3	2015	26 (3)
People at risk of poverty or social exclusion (thousands)	17 146	2014	12 882

(1) National target: 67–69%.

(2) Provisional data.

(3) National target: 26–27%.

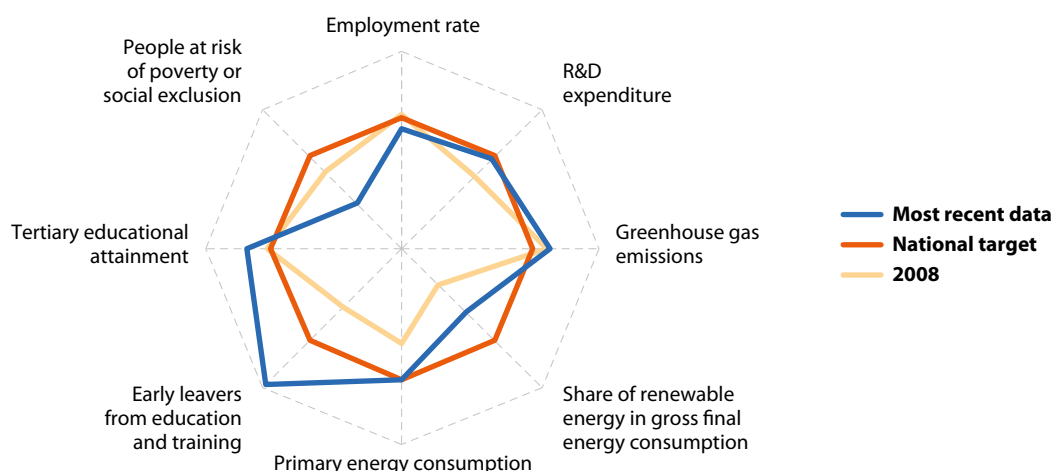
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Cyprus

Since 2011, Cyprus has exceeded its national target to achieve a tertiary educational attainment rate of 46%. The country had also surpassed its target on early leavers from education and training by 4.7 percentage points by 2015 and had met its goal on primary energy consumption by 2014. Additionally, by 2012 Cyprus had recorded a reduction in GHG emission three times larger than the one envisaged in its Europe 2020 commitment. By 2014, the country had almost closed the gap to its target

on R&D expenditure and reduced the distance to its renewable energy goal to 4 percentage points. Developments in the area of employment and poverty reduction have been much less favourable since the start of the economic crisis in 2008. In 2015, the employment rate in Cyprus was 8 percentage points below the national target of 75%. Additionally, the country would need to lift 80 000 people out of the risk of poverty and social exclusion by 2020 to meet its commitment.

Figure 6.13: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.13: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	68.0	2015	75 (1)
Gross domestic expenditure on R&D (% of GDP)	0.48 (2)	2014	0.5
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 16.5	2012	- 5
Share of renewable energy in gross final energy consumption (%)	9.0	2014	13
Primary energy consumption (million tonnes of oil equivalent)	2.2	2014	2.2
Early leavers from education and training (% of population aged 18–24)	5.3	2015	10
Tertiary educational attainment (% of population aged 30–34)	54.6	2015	46
People at risk of poverty or social exclusion (thousands)	234	2014	154

(1) National target: 75–77%.

(2) Provisional data.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

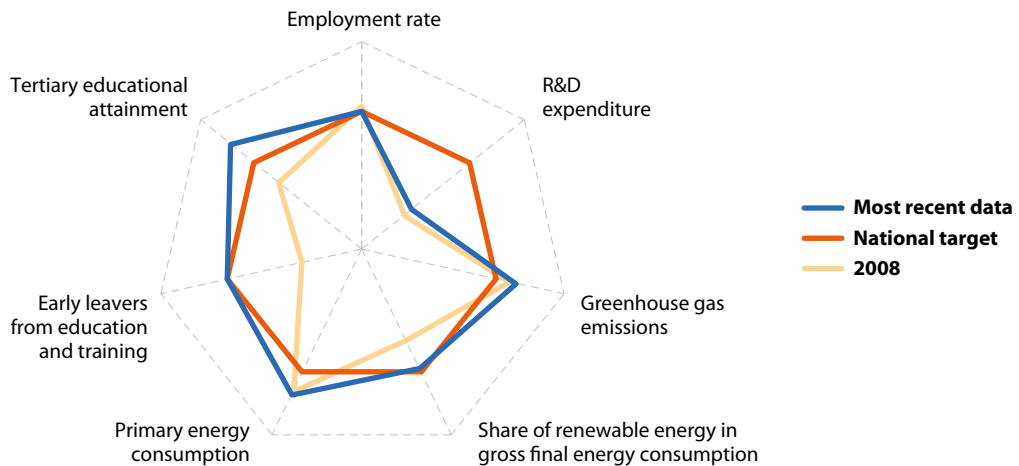


Latvia

Latvia has achieved notable progress in reducing the number of early leavers from education and training and increasing the share of tertiary graduates. The country reached its respective targets in 2013 and 2011 and continued to improve until 2015. Latvia's GHG emissions in non-ETS sectors have not risen notably since the ESD base year, thus remaining within the limits of the national target to increase emissions by no more than 17% by 2020. Since 2008, Latvia has fulfilled its commitment on primary energy consumption and has steadily moved towards its target of 40% renewable energy

in gross final energy consumption. In the same time period, the country also reduced the distance to its national poverty reduction target. This differs from the EU-level target because it refers to monetary poverty and very low work intensity only and does not take into account severe material deprivation. The country's employment rate has stabilised after a period of sharp decline between 2008 and 2010; in 2015, Latvia was only marginally below its 73% employment target. Progress on R&D intensity has been less favourable, with only a slight rise between 2008 and 2014.

Figure 6.14: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.14: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	72.5	2015	73
Gross domestic expenditure on R&D (% of GDP)	0.69 ⁽¹⁾	2014	1.5
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	0.3	2012	17
Share of renewable energy in gross final energy consumption (%)	38.7	2014	40
Primary energy consumption (million tonnes of oil equivalent)	4.4	2014	5.4
Early leavers from education and training (% of population aged 18–24)	9.9	2015	10
Tertiary educational attainment (% of population aged 30–34)	41.3	2015	34 ⁽²⁾
People at risk of poverty or social exclusion (thousands)	560 ⁽³⁾	2014	529 ⁽³⁾

⁽¹⁾ Provisional data.

⁽²⁾ National target: 34–36%.

⁽³⁾ Indicator and national target differ from the overall EU target on 'risk of poverty or social exclusion' as they refer to the two sub-indicators 'People living at risk of poverty after social transfers' and 'people living in households with very low work intensity' only.

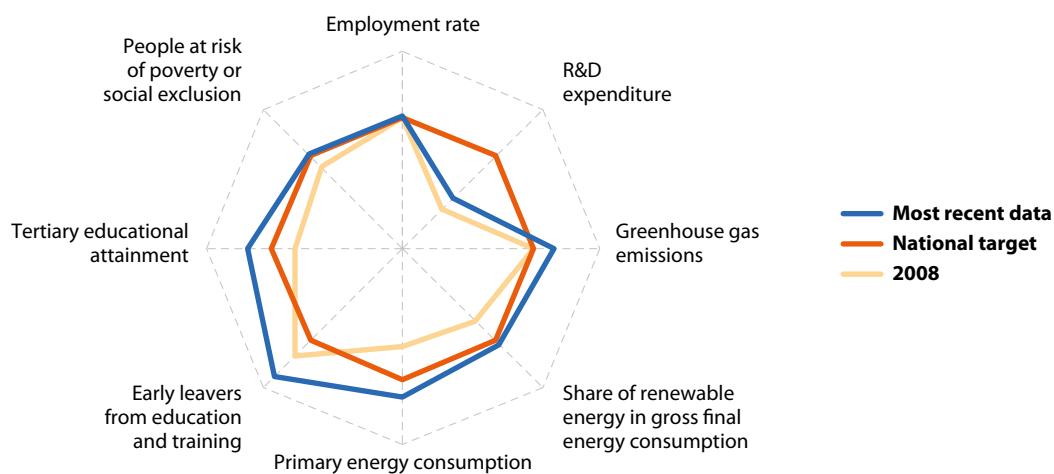
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Lithuania

In 2015, Lithuania had by far the highest share of 30 to 34 year olds with tertiary education in the EU (57.6%) and exceeded its national target by 8.9 percentage points. Additionally, the share of early leavers from education and training was half the EU total rate and well below the national target of 9%. Progress has been notable in the areas of climate change and energy as well. By reducing its GHG emissions by 1.8% since the ESD base year, Lithuania has remained well below its target to limit emission increases to 15%. The country had

also exceeded its targets on renewable energy and primary energy consumption by 2014. After a sharp drop in employment figures between 2008 and 2010, the employment rate climbed up again and in 2015 Lithuania reached its Europe 2020 goal. The country also met its poverty reduction target by lifting around 100 000 people out of the risk of poverty and social exclusion between 2008 and 2014. In terms of R&D expenditure, a gap of nearly one percentage point remains to be closed for the target of 1.9% of GDP to be reached.

Figure 6.15: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.15: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	73.4	2015	72.8
Gross domestic expenditure on R&D (% of GDP)	1.01 (1)	2014	1.9
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 1.8	2012	15
Share of renewable energy in gross final energy consumption (%)	23.9	2014	23
Primary energy consumption (million tonnes of oil equivalent)	5.6	2014	6.5
Early leavers from education and training (% of population aged 18–24)	5.5	2015	9 (2)
Tertiary educational attainment (% of population aged 30–34)	57.6	2015	48.7
People at risk of poverty or social exclusion (thousands)	804	2014	814

(1) Provisional data.

(2) National target: less than 9%.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

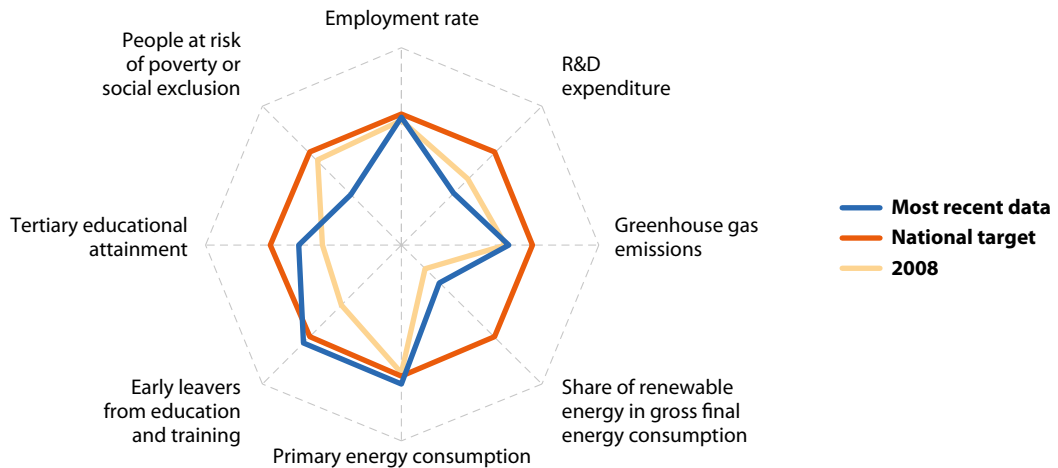


Luxembourg

Luxembourg has the most ambitious target on tertiary education across the EU, envisioning 66% of the population aged 30 to 34 to have attained tertiary education by 2020. Despite a notable increase of 12.5 percentage points between 2008 and 2015, Luxembourg still has the largest gap to its national target in the EU. In contrast, the country has exceeded its target on early leavers from education and training since 2009 and in 2015 was closer to reaching its employment target than the EU as a whole. In 2014, Luxembourg was below the EU as a whole in terms of R&D expenditure and

the gap to the national target has widened since 2009. The number of people at risk of poverty or social exclusion increased by one third between 2008 and 2014, pushing Luxembourg further from its national poverty alleviation target. In the area of climate change and energy, Luxembourg has remained within its target on primary energy consumption since 2011 but did not reach its national target and lagged behind the EU as a whole in the extension of renewable energy. In 2012, it also faced the largest gap to its non-ETS GHG emissions target across the EU.

Figure 6.16: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.16: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	70.9	2015	73
Gross domestic expenditure on R&D (% of GDP)	1.26 ⁽¹⁾	2014	2.3 ⁽²⁾
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 5.4	2012	- 20
Share of renewable energy in gross final energy consumption (%)	4.5	2014	11
Primary energy consumption (million tonnes of oil equivalent)	4.2	2014	4.5
Early leavers from education and training (% of population aged 18–24)	9.3	2015	10 ⁽³⁾
Tertiary educational attainment (% of population aged 30–34)	52.3	2015	66
People at risk of poverty or social exclusion (thousands)	96	2014	66

⁽¹⁾ Estimated/provisional data.

⁽²⁾ National target: 2.3–2.6%.

⁽³⁾ National target: less than 10%.

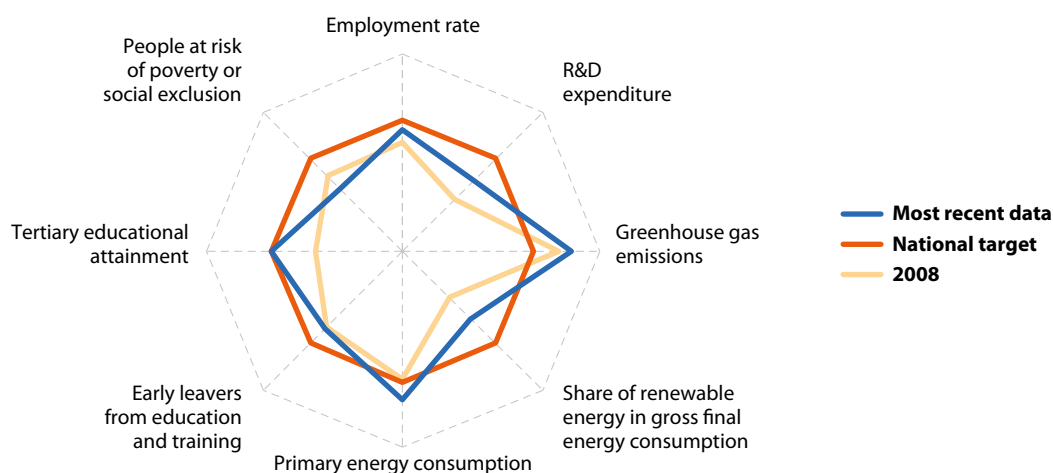
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Hungary

By reducing its GHG emissions in non-ETS sectors by 21.4% since the ESD base year, Hungary remained well below its target to limit emission increases to 10% by 2020. The country has also remained within its target on primary energy consumption. Progress towards the national education targets has been ambiguous since 2008. While Hungary met its national target on tertiary education in 2014, it has not reduced the share of early leavers from education and training. In terms of R&D expenditure, Hungary was 0.4 percentage points below its national target in 2014 and thus it was closer to the national target than

the EU as a whole was to the EU target. The share of renewables in gross final energy consumption rose by 3 percentage points between 2008 and 2014, thus the country moved closer to its national target than the EU as a whole did to the EU target. Poverty levels, however, have deteriorated in Hungary since the economic crisis, resulting in about 750 000 people still needing to be lifted out of the risk of poverty or social exclusion to meet the national 2020 target. Despite the rise in the employment rate from 2010 to 2015, the distance to the national target of 75% was larger than the distance of the EU as a whole to the EU target.

Figure 6.17: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.17: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	68.9	2015	75
Gross domestic expenditure on R&D (% of GDP)	1.37	2014	1.8
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	-21.4	2012	10
Share of renewable energy in gross final energy consumption (%)	9.5	2014	13
Primary energy consumption (million tonnes of oil equivalent)	20.7	2014	24.1
Early leavers from education and training (% of population aged 18–24)	11.6	2015	10
Tertiary educational attainment (% of population aged 30–34)	34.3	2015	34
People at risk of poverty or social exclusion (thousands)	3 097	2014	2 344

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

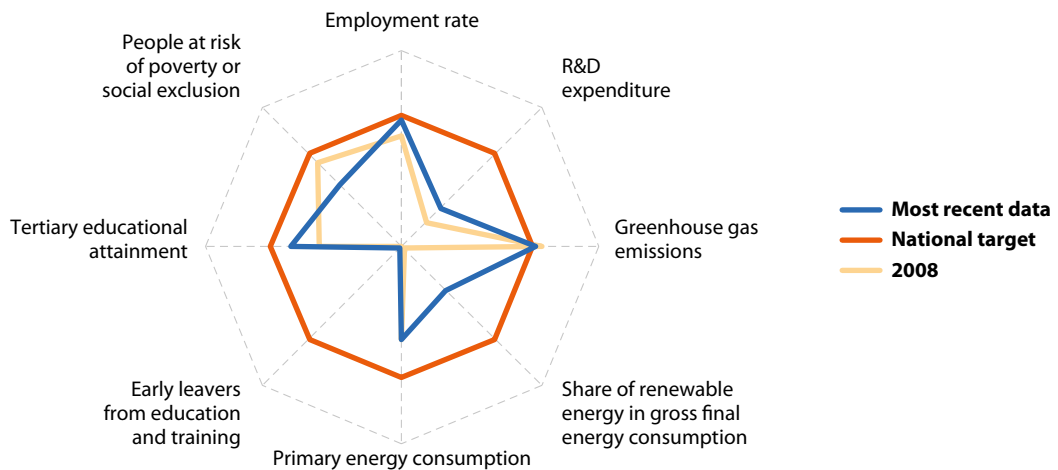


Malta

Since the ESD base year, Malta has increased its GHG emissions in non-ETS sectors by 3 %, thus remaining within its Europe 2020 target of increasing emissions by no more than 5 %. Despite the adverse economic situation, Malta's employment rate has more or less increased steadily since 2008, putting the country nearer to its national target than the EU as a whole was to the EU target in 2015. The share of 30 to 34 years old with tertiary education has increased continuously between 2008 and 2015, shortening the distance to the national target

to 5.2 percentage points. In contrast, Malta has lagged behind the EU as a whole in terms of renewable energy and R&D expenditure, and has maintained a gap of 0.2 Mtoe to its target on primary energy consumption since 2008. The number of people at risk of poverty and social exclusion rose continuously between 2008 and 2014, moving the country further from its Europe 2020 goal. Despite a significant drop in the share of early leavers from education and training since 2008, in 2015 Malta was the Member States with the largest distance to its national 2020 target.

Figure 6.18: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below. The 2008 value for early leavers from education and training exceeds the axis range.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.18: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	67.8	2015	70
Gross domestic expenditure on R&D (% of GDP)	0.83 (1)	2014	2
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	3.0	2012	5
Share of renewable energy in gross final energy consumption (%)	4.7	2014	10
Primary energy consumption (million tonnes of oil equivalent)	0.9	2014	0.7
Early leavers from education and training (% of population aged 18–24)	19.8	2015	10
Tertiary educational attainment (% of population aged 30–34)	27.8	2015	33
People at risk of poverty or social exclusion (thousands)	99	2014	74.44

(1) Provisional data.

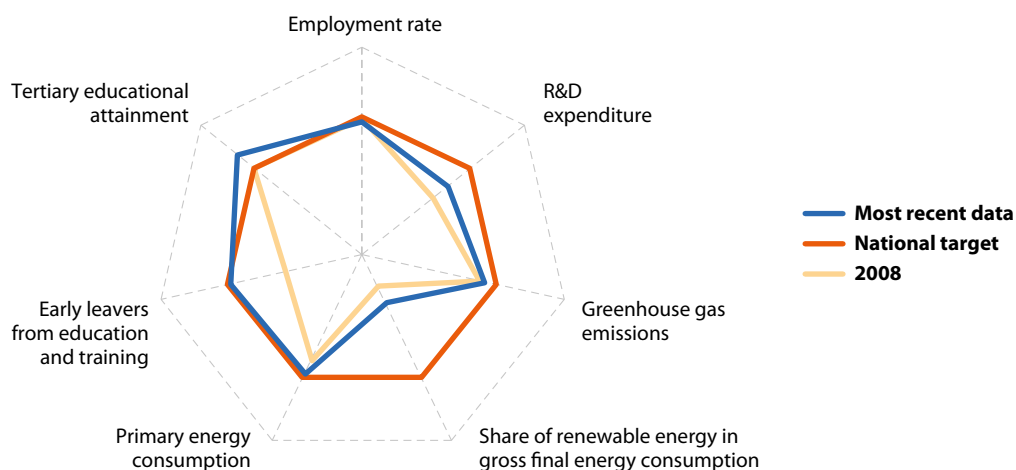
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Netherlands

The Netherlands had already exceeded its target on tertiary educational attainment in 2008 and the share of 30 to 34 year olds with tertiary educational attainment has continued to increase ever since. The country was also within reach of its national targets on early leavers from education and training and primary energy consumption. Despite the adverse impact of the economic crisis on employment, in 2015 the Netherlands was closer to its employment target than the EU as a whole was to the EU target. Since 2008, the country has

also moved closer to its target on R&D expenditure than the EU as a whole has moved towards the EU target. In contrast, the Netherlands was among the countries furthest from their renewable energy targets and was only halfway to meeting its target on GHG emissions in non-ETS sectors. The situation concerning the number of people at risk of poverty or social exclusion has deteriorated since 2008, however, a comparison with the national target, referring to people aged 0 to 64 living in a jobless household, is not possible.

Figure 6.19: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.19: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	76.4	2015	80
Gross domestic expenditure on R&D (% of GDP)	1.97 ⁽¹⁾	2014	2.5
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	– 8.8	2012	– 16
Share of renewable energy in gross final energy consumption (%)	5.5	2014	14
Primary energy consumption (million tonnes of oil equivalent)	62.7	2014	60.7
Early leavers from education and training (% of population aged 18–24)	8.2	2015	8
Tertiary educational attainment (% of population aged 30–34)	46.3	2015	40 ⁽²⁾
People at risk of poverty or social exclusion (thousands)	2 751	2014	: ⁽³⁾

⁽¹⁾ Provisional data.

⁽²⁾ National target: more than 40%.

⁽³⁾ National target: Reduce by 100 000 the number of people (aged 0–64) living in a jobless household (compared to 2008).

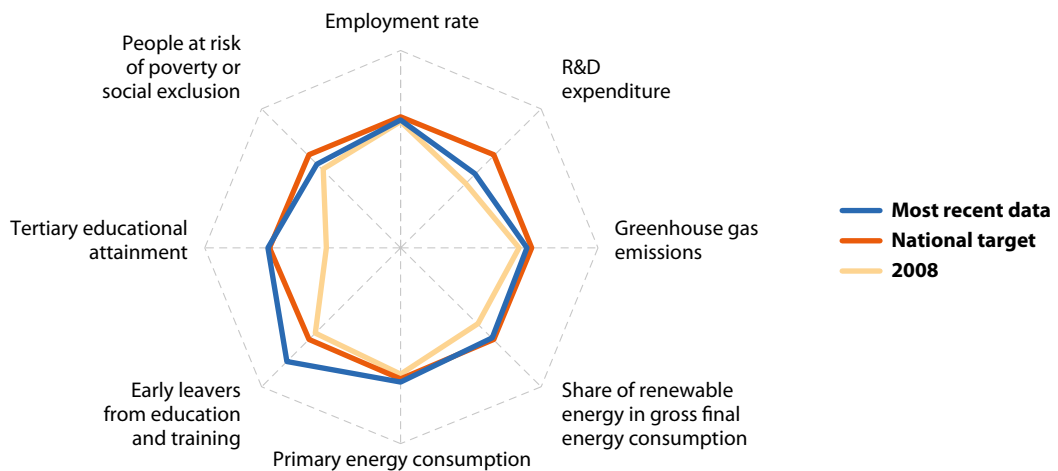
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Austria

In 2015, Austria continued to meet both of its education targets, with a 7.3% share of early school leavers and 38.7% of the 30 to 34 year olds having completed tertiary education. In 2014, Austria also met its target on primary energy consumption and was within reach of its target on renewable energy. With an employment rate of 74.3% in 2015, the country was closer to its national target of 77% than the EU as a whole was to the EU target of 75%. Despite having one of the highest R&D intensities (R&D expenditure as a share of GDP)

across the EU, Austria was at a similar distance from its respective target as the EU as a whole was to the EU target, due to the ambitious national target. Similarly, in spite of a 12.5% reduction in GHG emissions in non-ETS by 2012, the country remained slightly further from its national target than the EU as a whole was from the EU target. Progress in the area of poverty reduction has been slow since 2008; Austria would need to raise about 145 000 people out of the risk of poverty and social exclusion to meet its Europe 2020 commitment.

Figure 6.20: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.20: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	74.3	2015	77
Gross domestic expenditure on R&D (% of GDP)	2.99 (†)	2014	3.76
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 12.5	2012	- 16
Share of renewable energy in gross final energy consumption (%)	33.1	2014	34
Primary energy consumption (million tonnes of oil equivalent)	30.6	2014	31.5
Early leavers from education and training (% of population aged 18–24)	7.3	2015	9.5
Tertiary educational attainment (% of population aged 30–34)	38.7	2015	38
People at risk of poverty or social exclusion (thousands)	1 609	2014	1 464

(†) Estimated/provisional data.

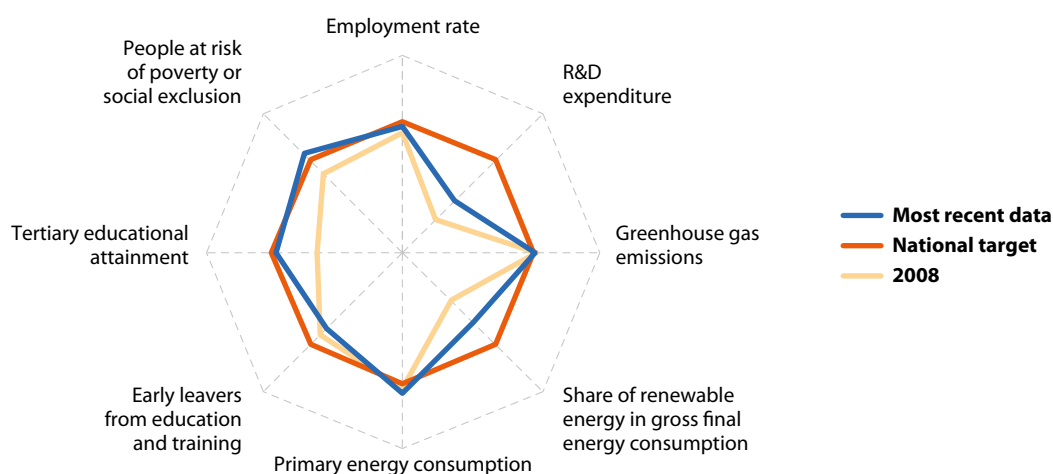
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Poland

Despite a 12.9% increase in GHG emissions in non-ETS sectors since the ESD base year, Poland remained within its target of limiting the increase in emissions to 14% by 2020. Against the backdrop of the crisis, Poland has continuously reduced the number of people living at risk of poverty or social exclusion since 2008 and in 2014 exceeded its target for the second year in a row. The country also reached its goal on primary energy consumption and came within

reaching distance of its tertiary education target, which foresees 45% of 30 to 34 years olds having a tertiary education by 2020. The country performed slightly better than the EU as a whole in terms of boosting employment, R&D expenditure and renewable energy. Although the share of early school leavers has risen slightly since 2008, Poland was closer to its national target than the EU as a whole was to the EU target in 2015.

Figure 6.21: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.21: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	67.8	2015	71
Gross domestic expenditure on R&D (% of GDP)	0.94	2014	1.7
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	12.9	2012	14
Share of renewable energy in gross final energy consumption (%)	11.4	2014	15
Primary energy consumption (million tonnes of oil equivalent)	89.1	2014	96.4
Early leavers from education and training (% of population aged 18–24)	5.3	2015	4.5
Tertiary educational attainment (% of population aged 30–34)	43.4	2015	45
People at risk of poverty or social exclusion (thousands)	9 337	2014	9 991

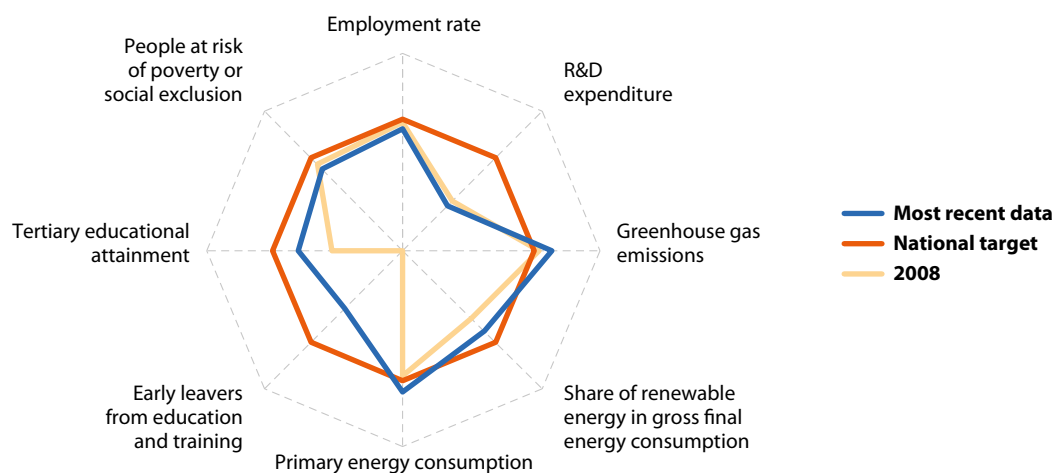
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Portugal

By 2012, Portugal had reduced its GHG emissions in non-ETS sectors by 12 % compared with the ESD base year, thus remaining well below its target of at most a 1 % increase by 2020. Since 2011, the country has continuously met its target on primary energy consumption and has reduced the distance to its target on renewable energy to 4 percentage points. Portugal has also achieved a notable reduction in the share of early leavers from education and training, narrowing the distance to its respective target by 21.2 percentage points between 2008 and 2015.

In contrast, the country was among the Member States furthest from their tertiary education targets, with a gap of 8.1 percentage points to be closed by 2020. Portugal's progress towards its national employment and poverty reduction targets was strongly affected by the economic crisis. Employment rates fell sharply in the period between 2008 and 2012, before rising slightly to 69.1 % by 2015. The number of people at risk of poverty or social exclusion would need to be reduced by 306 000 by 2020 to meet the national commitment, from nearly 2.9 million in 2014.

Figure 6.22: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below. The 2008 value for early leavers from education and training exceeds the axis range.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.22: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	69.1	2015	75
Gross domestic expenditure on R&D (% of GDP)	1.29 (¹)	2014	2.7 (²)
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 12.0	2012	1
Share of renewable energy in gross final energy consumption (%)	27.0	2014	31
Primary energy consumption (million tonnes of oil equivalent)	20.7	2014	22.5
Early leavers from education and training (% of population aged 18–24)	13.7	2015	10
Tertiary educational attainment (% of population aged 30–34)	31.9	2015	40
People at risk of poverty or social exclusion (thousands)	2 863	2014	2 557

(¹) Provisional data.

(²) National target: 2.7–3.3%.

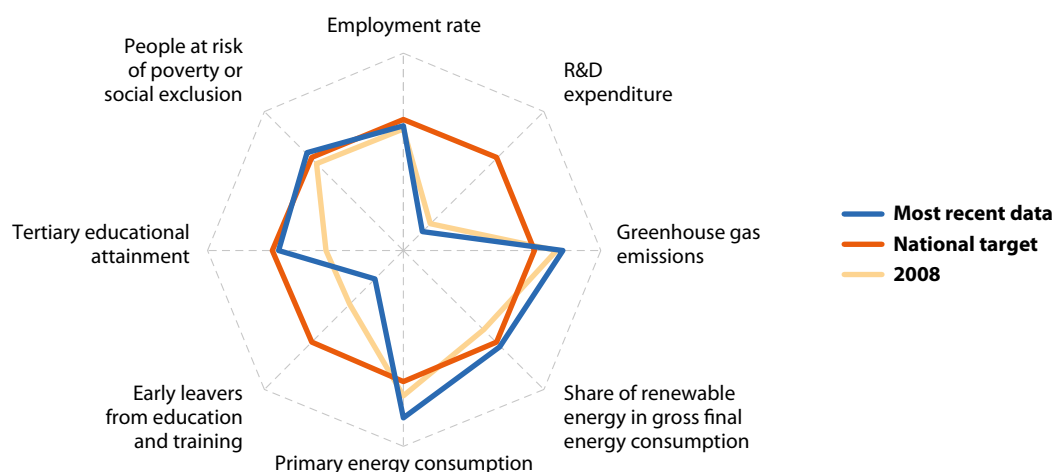
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Romania

By 2012, Romania had reduced its GHG emissions in non-ETS sectors by 6.5 % compared with the ESD base year, thus remaining well below its 2020 target of a maximum increase of 19 %. The country also recorded a significant reduction of 1 million in the number of people at risk of poverty or social exclusion between 2008 and 2014 and reached the national target in 2013. In 2014, Romania exceeded its commitment of a 24 % share of renewable energy in gross final energy consumption and remained well below its national target on primary energy consumption. Although it was 1.1 percentage points below its tertiary education

target in 2015, Romania made strong progress by raising the tertiary educational attainment rate by 9.6 percentage points between 2008 and 2015. In contrast, the share of early leavers from education and training rose to 19.1 % during the same period, increasing the distance to the national target to 7.8 percentage points. Progress towards the national target on employment has been somewhat limited since 2008, with a gap of 4 percentage points remaining by 2020. Romania's R&D intensity fell by 0.19 percentage points between 2008 and 2014, making it the Member State with the largest distance to its national target.

Figure 6.23: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.23: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	66.0	2015	70
Gross domestic expenditure on R&D (% of GDP)	0.38	2014	2
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	-6.5	2012	19
Share of renewable energy in gross final energy consumption (%)	24.9	2014	24
Primary energy consumption (million tonnes of oil equivalent)	30.8	2014	43.0
Early leavers from education and training (% of population aged 18–24)	19.1	2015	11.3
Tertiary educational attainment (% of population aged 30–34)	25.6	2015	26.7
People at risk of poverty or social exclusion (thousands)	8 397	2014	8 838

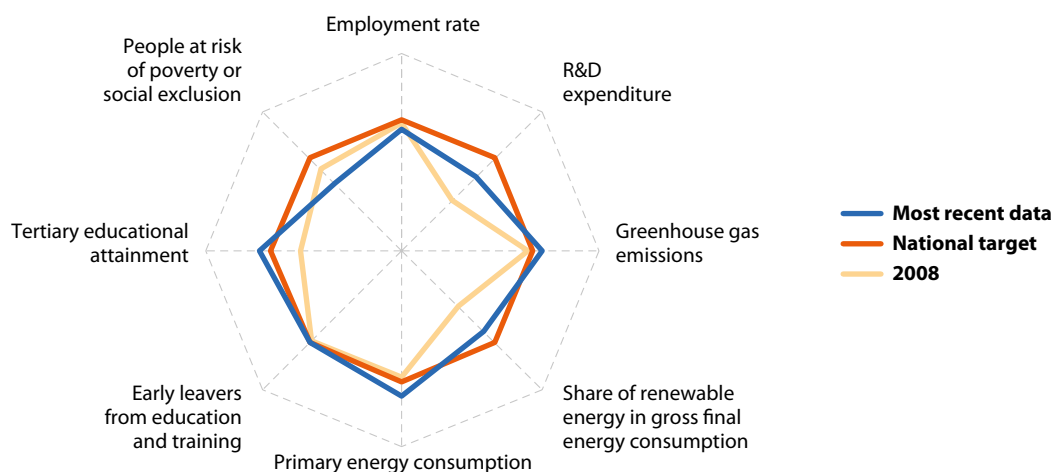
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Slovenia

By reducing its GHG emissions in non-ETS sectors by 2.7% since the ESD base year, Slovenia remained below its target of a maximum increase of 4% by 2020. The country has already met both of its education targets, with only 5% of the population aged 18 to 24 leaving school early and 43.4% of 30 to 34 year olds having tertiary educational attainment in 2015. Since 2009, it has continuously met its target on energy efficiency, which requires a primary energy consumption of 7.3 Mtoe or less. In 2014, Slovenia was closer to

meeting its commitments on R&D expenditure and renewable energy than the EU as a whole was to meeting its collective commitments. After a period of continuous deterioration between 2008 and 2013, the employment rate increased to 69.1% in 2015, thus reducing the distance to the national target to 5.9 percentage points. Between 2008 and 2014, the number of people at risk of poverty or social exclusion in Slovenia increased by 49 000, which translates into a gap of 89 000 people to the respective target.

Figure 6.24: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.24: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	69.1	2015	75
Gross domestic expenditure on R&D (% of GDP)	2.39	2014	3
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	-2.7	2012	4
Share of renewable energy in gross final energy consumption (%)	21.9	2014	25
Primary energy consumption (million tonnes of oil equivalent)	6.5	2014	7.3
Early leavers from education and training (% of population aged 18–24)	5.0	2015	5
Tertiary educational attainment (% of population aged 30–34)	43.4	2015	40
People at risk of poverty or social exclusion (thousands)	410	2014	321

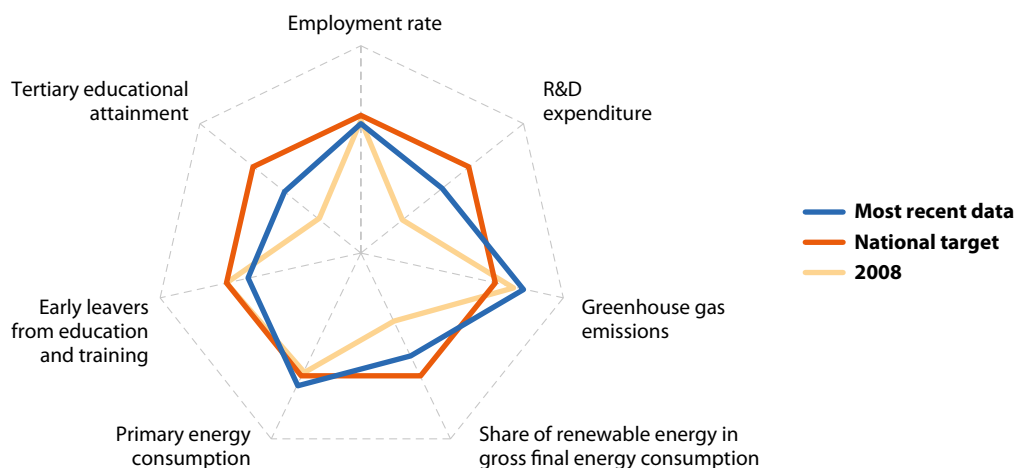
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Slovakia

By 2012, GHG emissions in non-ETS sectors in Slovakia had fallen by almost 10% compared with the ESD base year. The country thus remained well below its long-term commitment of limiting the increase in emissions to 13% by 2020. Although Slovakia had already met its target on early leavers from education and training in 2008, the indicator deteriorated in the following years and by 2015 the country was 0.9 percentage points above its respective target. The country has recorded a substantial increase in the share of 30 to 34 year olds with tertiary education since 2008, however, a gap of 11.6 percentage points remains to be

closed by 2020. The employment rate in Slovakia followed the EU trend and fell considerably during the first years of the economic crisis. After a period of stagnation at around 65%, in 2015 the indicator increased to 67.7%, thus reducing the gap to the national target to 4.3 percentage points. In contrast, the country was closer to its targets on renewable energy, primary energy consumption, and R&D expenditure than the EU as a whole was to the respective EU targets. Since 2008, Slovakia has made progress towards its target on poverty reduction, with a gap of 1.2 percentage points remaining to be closed by 2020.

Figure 6.25: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.25: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	67.7	2015	72
Gross domestic expenditure on R&D (% of GDP)	0.89	2014	1.2
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	-9.9	2012	13
Share of renewable energy in gross final energy consumption (%)	11.6	2014	14
Primary energy consumption (million tonnes of oil equivalent)	15.3	2014	16.4
Early leavers from education and training (% of population aged 18–24)	6.9	2015	6
Tertiary educational attainment (% of population aged 30–34)	28.4	2015	40
People at risk of poverty or social exclusion (% of population) (1)	18.4	2014	17.2

(1) The national target uses ' % of the population ' instead of ' number of people '.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

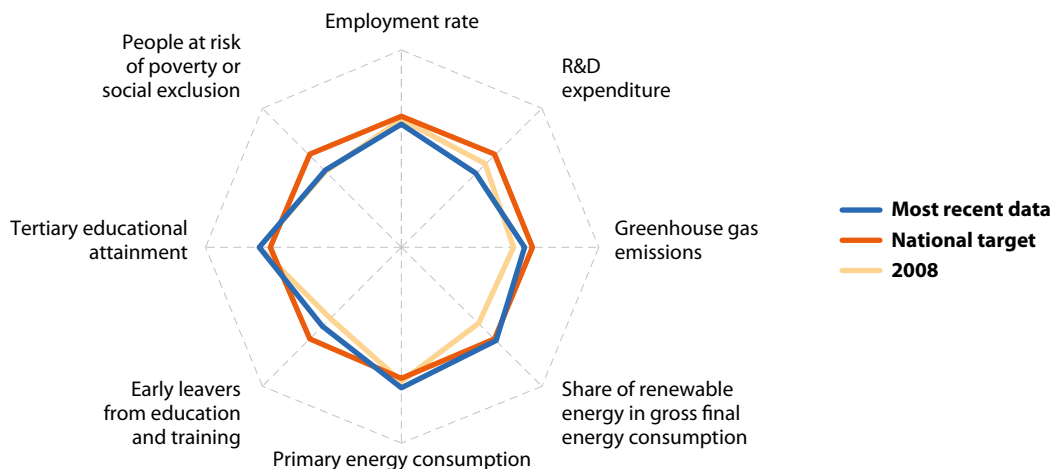


Finland

With 45.5 % of the population aged 30 to 34 having completed tertiary educational attainment in 2015, Finland continued to exceed its national target of 42 %. However, its target is defined more narrowly than the EU target as it excludes former tertiary vocational education and training (VET). With a share of renewable energy in final energy consumption of 38.7 %, Finland exceeded its national 2020 commitment by 0.7 percentage points in 2014. The primary energy consumption of the country amounted to 33.4 Mtoe in 2014, which was below the respective national target of 35.9 Mtoe. Despite having the highest R&D

intensity across the EU (3.17 % of GDP), in 2014 the country remained 0.83 percentage points from its very ambitious national target. Finland's employment rate fell from 75.8 % in 2008 to 72.9 % in 2015, thus moving away from the national target of 78 %. Progress towards the target on early leavers from education and training has been somewhat slow since 2008, with a gap of 1.2 percentage points remaining in 2015. Despite a notable 60 percentage point reduction in GHG emissions in non-ETS sectors since the ESD base year, the gap to the national target remained larger than in most other EU countries.

Figure 6.26: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.26: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	72.9	2015	78
Gross domestic expenditure on R&D (% of GDP)	3.17	2014	4
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	-10.2	2012	-16
Share of renewable energy in gross final energy consumption (%)	38.7	2014	38
Primary energy consumption (million tonnes of oil equivalent)	33.4	2014	35.9
Early leavers from education and training (% of population aged 18–24)	9.2	2015	8
Tertiary educational attainment (% of population aged 30–34)	45.5	2015	42 (¹)
People at risk of poverty or social exclusion (thousands)	904	2014	770

(¹) Narrower national definition.

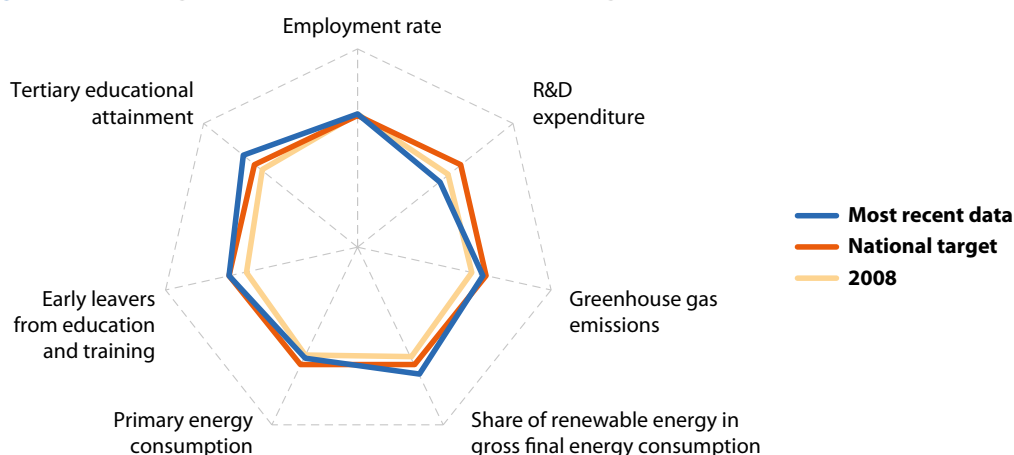
Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Sweden

With 50.2% of its population aged 30 to 34 years having attained tertiary education in 2015, Sweden exceeded its national 2020 target by 5.2 percentage points. The country also met its target on early leavers from education and training in 2015. Sweden also exceeded its employment target by 0.5 percentage points and had one of the highest employment rates in the EU in 2015. In 2014, it also surpassed its renewable energy target by increasing the share of renewables in gross final energy consumption to 52.6% — by far the best

performance in the EU. Sweden had reduced its primary energy consumption to 46.2 Mtoe by 2014, thus shortening the distance to its 2020 target. Despite having the second highest R&D intensity across the EU (after Finland), a 0.84 percentage point gap remains to be closed between 2014 and 2020 to meet the ambitious national target of spending 4% of GDP on R&D. Similarly, the country remained at a distance from its GHG emission target of a 17% reduction compared with the ESD base year, with a gap of 2.27 percentage points to be closed by 2020.

Figure 6.27: Change since 2008 in relation to national targets (*)



(*) Most recent year for which data are available; see table below.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Table 6.27: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	80.5	2015	80 ⁽¹⁾
Gross domestic expenditure on R&D (% of GDP)	3.16 ⁽²⁾	2014	4
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 14.7	2012	- 17
Share of renewable energy in gross final energy consumption (%)	52.6	2014	49
Primary energy consumption (million tonnes of oil equivalent)	46.2	2014	43.4
Early leavers from education and training (% of population aged 18–24)	7.0	2015	7 ⁽³⁾
Tertiary educational attainment (% of population aged 30–34)	50.2	2015	45 ⁽⁴⁾
People at risk of poverty or social exclusion (thousands)	1 636	2014	: ⁽⁵⁾

⁽¹⁾ National target: More than 80%.

⁽²⁾ Estimated data.

⁽³⁾ National target: less than 7%.

⁽⁴⁾ National target: 45–50%.

⁽⁵⁾ National target: Reduction in the percentage of women and men (aged 20–64) who are not in the labour force (except full-time students), the long-term unemployed or those on long-term sick leave to well under 14%.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))



United Kingdom

The United Kingdom has not adopted specific national Europe 2020 targets apart from the already existing climate change and renewable energy commitments (as a consequence, no radar chart can be shown for the United Kingdom). After the deterioration in employment rates during the economic crisis (2008 to 2011), the indicator increased again to 76.9% in 2015, exceeding the EU aggregate performance of 70.1%. In the period between 2008 and 2015, the United Kingdom managed to increase the tertiary educational attainment rate from 39.5% to 47.8%, against the backdrop of the adverse economic situation in the EU. The indicator on early school leavers recorded a 4.1 percentage point reduction over a four-year period, from 14.9% in 2011 to 10.8% in 2015. Although nearly 400 000 people were lifted

out of the risk of poverty between 2013 and 2014, the number of people at risk of poverty or social exclusion was still 1.1 million more compared with 2008. R&D expenditure increased to 1.7% of GDP in 2014, a value close to 2008 levels. Between the ESD base year and 2012, the country had recorded a reduction of GHG emissions in non-ETS sectors of 8.6%; further reductions of a similar magnitude would be required to meet the 16% reduction target by 2020. With a gap of 8 percentage points in 2014, the United Kingdom was the third furthest country from its renewable energy target, after France and the Netherlands. Between 2008 and 2014, the United Kingdom managed to reduce its primary energy consumption by 27.6 Mtoe, thus shortening the gap to its 2020 target of 177.6 Mtoe.

Table 6.28: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20-64 (%)	76.9	2015	: (¹)
Gross domestic expenditure on R&D (% of GDP)	1.7 (²)	2014	: (¹)
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	- 8.6	2012	- 16
Share of renewable energy in gross final energy consumption (%)	7.0	2014	15
Primary energy consumption (million tonnes of oil equivalent)	182.4	2014	177.6
Early leavers from education and training (% of population aged 18-24)	10.8	2015	: (¹)
Tertiary educational attainment (% of population aged 30-34)	47.8	2015	: (¹)
People at risk of poverty or social exclusion (thousands)	15 188	2014	: (³)

(¹) No target in the National Reform Programme.

(²) Estimated/provisional data.

(³) Existing numerical targets under the umbrella of the 2010 Child Poverty Act and the Child Poverty Strategy 2011-2014.

Source: Eurostat (see dedicated web section: [Europe 2020 headline indicators](#))

Abbreviations and acronyms

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)

Note that EU aggregates are back-calculated when enough information is available – for example, data relating to the EU-28 aggregate is presented when possible for periods before Croatia joined the EU in 2013 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-15).

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

(*) The name of the former Yugoslav Republic of Macedonia is shown in tables as 'FYR Macedonia'. This does not prejudice in any way the definitive nomenclature for this country, which is to be agreed following the conclusion of negotiations currently taking place on this subject at the United Nations.



POTENTIAL CANDIDATES

BA	Bosnia and Herzegovina
XK	Kosovo ^(?)

UNITS OF MEASUREMENT

%	Per cent
°C	Degree Celsius
EUR	Euro
GW	Gigawatt
GWh	Gigawatt hour
km	Kilometre
Mtoe	Million tonnes of oil equivalent

ABBREVIATIONS

AGS	Annual Growth Survey
CCS	Carbon capture and storage
Cedefop	European Centre for the Development of Vocational Training
CO ₂	Carbon dioxide
ECEC	Early childhood education and care
Eco-IS	Eco-Innovation Scoreboard
ECTS	European Credit Transfer and Accumulation System
EDP	Excessive Deficit Procedure
EEA	European Environment Agency
EED	Energy Efficiency Directive
EFTA	European Free Trade Association
EIT	European Institute of Innovation and Technology
EMU	Economic and Monetary Union
EPO	European Patent Office
ERA	European Research Area
ERDF	European Regional Development Fund
ESA	European System of Accounts
ESD	Effort Sharing Decision

^(?) This designation is without prejudice to position or status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.



ESS	European Statistical System
ET 2020	'Education and Training 2020' Framework
ETS	Emissions Trading System
EU	European Union
EU ETS	EU Emission Trading System
EU LFS	EU Labour Force Survey
EU SILC	EU Statistics on Income and Living Conditions
GDP	Gross domestic product
GHG	Greenhouse gas
GNP	Gross national product
HEIs	Higher education institutions
IAEG-SDGs	Inter-Agency and Expert Group on Sustainable Development Goals
ICT	Information and communications technology
IEA	International Energy Agency
ILO	International Labour Organisation
IPC	International Patent Classification
ISCED	International Standard Classification for Education
JRC	Joint Research Centre
LULUCF	Land use, land-use change and forestry
MIP	Macroeconomic Imbalance Procedure
NACE	Statistical Classification of Economic Activities in the European Community
NEET	Not in education, employment or training
NREAP	National renewable energy action plans
NRP	National Reform Programmes
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organization for Economic Co-operation and Development
PEC	Primary energy consumption
PISA	Program for International Student Assessment
PPS	Purchasing Power Standards
RED	Renewable Energy Directive
R&D	Research and development
R&I	Research and innovation



RTD	Research and technological development
SCP	Stability and Convergence Programme
SDGs	Sustainable Development Goals
SGP	Stability and Growth Pact
SMEs	Small and medium enterprises
STEM	Science, technology, engineering, mathematics
UN	United Nations
UNEP	United Nations Environment Programme
UNSC	United Nations Statistical Commission
US	United States
VAT	Value added tax
VET	Vocational education and training
WMO	World Meteorological Organization

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