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Smarter, greener, more inclusive?

Indicators to support the Europe 2020 strategy



2015 edition

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Indicators to support the Europe 2020 strategy

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Foreword of Vice-President Katainen



The Europe 2020 strategy was launched in 2010 as the basis for sustainable growth in the EU. Since then, the Union has faced great challenges due to a deep economic crisis but we have also seen real progress and bold reforms to lay the foundations for a solid recovery. The Europe 2020 strategy has always provided the long-term perspective in this battle for jobs and growth.

At the half way point today in 2015, the key principles of the Europe 2020 strategy remain as valid as ever. The Commission's ambition is to use our policy, legal and financial instruments to give fresh impetus to delivering jobs and growth for our citizens. We must step up our efforts, learning from the lessons of the past years, to reverse the negative trends amplified by the crisis, especially unemployment and exposure to poverty and social exclusion. Europe 2020 will remain the overarching framework. To achieve these objectives, this Commission will focus on the implementation of the Investment Plan for Europe, accelerating structural reforms in Member States to boost competitiveness and pursuing responsible growth friendly fiscal consolidation.

Good policy-making requires a solid evidence base. This publication by Eurostat provides up-to-date data in the areas covered by the Europe 2020 strategy. It helps to monitor progress towards the objectives of the strategy and is part of the review which the Commission is currently undertaking. The outcome of this review will inform future priorities in the delivery of the Europe 2020 strategy.



Jyrki Katainen
Vice-President
European Commission

Foreword of Eurostat's Director-General



Eurostat — the statistical office of the EU — has the role of informing the public about important developments in the EU and within important European policy frameworks. In this overall framework, Eurostat has introduced a new type of annual flagship publication that provides statistical analyses related to important European Commission policy frameworks or important economic, social or environmental phenomena.

Our publication *Smarter, greener, more inclusive? — Indicators to support the Europe 2020 strategy* from 2013 was the first of these new flagship publications. It focused on statistics related to the Europe 2020 strategy, showing the longer-term trends as described by the headline indicators of the strategy together with other relevant statistical data which enable an understanding of the driving forces behind the headline indicators.

The new 2015 edition of *Smarter, greener, more inclusive?* builds on and updates the previous flagship publication. It aims at providing the Commission with the most recent analyses related to the Europe 2020 headline indicators to support the review of the Europe 2020 strategy. The publication is based on data produced by the European Statistical System (ESS) and disseminated by Eurostat, thus ensuring that the quality standards of official European statistics are met.

Impartial and objective statistical information is essential for evidence-based political decision-making and forms the basis of Eurostat's role in the context of the Europe 2020 strategy. This role is to provide statistical and methodological support in the process of developing and choosing the relevant indicators to support the strategy, to produce and supply statistical data, and ensure its high quality standards.

Walter Radermacher
Director-General, Eurostat
Chief Statistician of the European Union

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

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

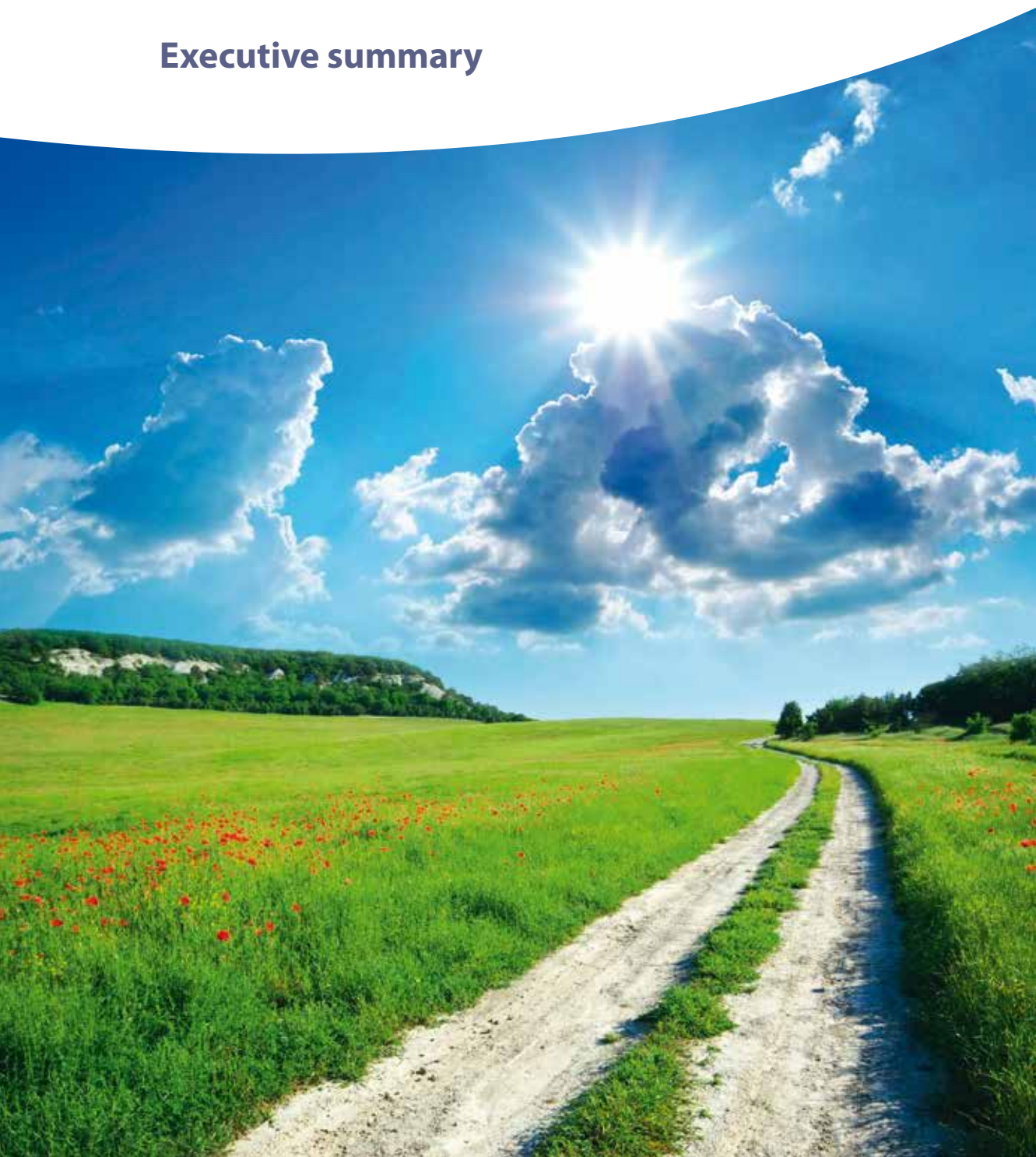
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Executive summary





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 five ambitious headline 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 (relating to the multiple dimensions of poverty and social exclusion) give an overview of how far or close 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 with regards to others, with the crisis having a sizeable impact.

Since 2008 substantial progress has been made in the area of climate change and energy through the reduction in greenhouse gas emissions and the increase in the 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 2015 edition of *Smarter, greener, more inclusive* aims to shed light on the trends in the headline indicators over the past five years, from 2008 up to 2012 or 2013 (depending on data availability).

Employment rate

In 2008, employment in the EU for the age group 20 to 64 peaked at 70.3 %, following 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. In 2009, the employment rate fell down to 69.0 % and since 2010 has remained consistently low. By 2013, the indicator had fallen to 68.4 %, marking a deviation of 6.6 percentage points from the Europe 2020 target of increasing the employment rate of the population aged 20 to 64 to at least 75 %.

A breakdown of the employment figures by gender reveals that between 2008 and 2013 the employment rate of men deteriorated sharply by 3.5 percentage points, while no significant change was recorded in the rate for women. This has resulted in a narrowing of the gender employment gap.

The continuous fall in employment rates since 2009 has mostly affected young people, low-skilled workers and non-EU nationals. Other vulnerable groups include older people, whose employment rates are considerably lower compared with other groups in the labour force.



Table 0.1: Europe 2020 headline indicators, EU-28, 2008–13

Topic	Headline indicator	2008	2009	2010	2011	2012	2013	Target
Employment	Employment rate age group 20–64, total (% of population)	70.3	69.0	68.5	68.5	68.4	68.4	75.0
	• Employment rate age group 20–64, females (% of population)	62.8	62.3	62.0	62.2	62.4	62.6	:
	• Employment rate age group 20–64, males (% of population)	77.8	75.7	75.0	74.9	74.5	74.3	:
R&D	Gross domestic expenditure on R&D (1) (% of GDP)	1.85	1.94	1.93	1.97	2.01	2.02	3.00
Climate change and energy	Greenhouse gas emissions (2) (Index 1990 = 100)	90.4	83.8	85.7	83.2	82.1	:	80.0
	Share of renewable energy in gross final energy consumption (%)	10.5	11.9	12.5	12.9	14.1	:	20.0
	Primary energy consumption (Million tonnes of oil equivalent)	1 689	1 595	1 654	1 596	1 584	:	1 483
	Final energy consumption (Million tonnes of oil equivalent)	1 175	1 108	1 160	1 107	1 103	:	1 086
Education	Early leavers from education and training, total (% of population aged 18–24)	14.7	14.2	13.9	13.4	12.7	12.0	< 10.0
	• Early leavers from education and training, females (% of population aged 18–24)	12.6	12.3	11.9	11.5	10.9	10.2	:
	• Early leavers from education and training, males (% of population aged 18–24)	16.6	16.1	15.8	15.3	14.4	13.6	:
	Tertiary educational attainment, total (% of population aged 30–34)	31.2	32.3	33.6	34.7	35.9	36.9	≥ 40.0
	• Tertiary educational attainment, females (% of population aged 30–34)	34.4	35.7	37.2	38.6	40.2	41.2	:
	• Tertiary educational attainment, males (% of population aged 30–34)	28.0	28.9	30.0	30.8	31.7	32.7	:
Poverty and social exclusion	People at risk of poverty or social exclusion (3)(4) (million people)	116.6	114.5	117.0	120.4	123.1	121.4	96.6 (6)
	People at risk of poverty or social exclusion (3)(4) (% of population)	23.8	23.3	23.7	24.3	24.8	24.4	:
	• People living in households with very low work intensity (4) (% of population)	9.1	9.1	10.1	10.4	10.4	10.6	:
	• People at risk of poverty after social transfers (4) (% of population)	16.6	16.4	16.5	16.9	16.9	16.6	:
	• Severely materially deprived people (4)(5) (% of population)	8.5	8.2	8.4	8.8	9.9	9.6	:

(1) Data for 2013 are estimates.
(2) Total emissions, including international aviation, but excluding emissions from land use, land use change and forestry (LULUCF).
(3) The indicator 'People at risk of poverty or social exclusion' corresponds to the sum of people who are: at risk of poverty or severely materially deprived or living in households with very low work intensity. People are only counted once even if they are present in several sub-indicators.
(4) All data are EU-27 aggregates because for 2008 and 2009 there are no data available for Croatia. Data for 2013 are estimates.
(5) 2009 data are estimates.
(6) The overall EU target is to lift at least 20 million people out of the risk of poverty and exclusion by 2020. Due to the structure of the survey on which most of the key social data is based (the 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 data for the EU-27 as the most recent data available. This is why monitoring of progress towards the Europe 2020 strategy's poverty target takes EU-27 data from 2008 as a baseline year.

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



Corresponding to the abrupt fall in employment rates, unemployment levels have climbed since the onset of the crisis until 2013. The unemployment rate of young people aged 15 to 29 has been particularly high in the EU over the same time period, reaching 18.7 % in 2013. Unemployment rates of low-skilled people have also soared, with lowly educated young people being the worst off in 2013, having unemployment rates of 30.0 %.

Additionally, long-term changes in the demographic structure of the EU population add to the necessity of increasing employment rates. Despite a growing population, low fertility rates combined with a continuous rise in life expectancy are likely to result in a shrinking EU labour force. Increases in the employment rate are, therefore, necessary to compensate for the expected decline in the working-age population by 3.5 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 recorded a slight increase since 2008. In 2013 the indicator stood at 2.02 %, compared with 1.85 % in 2008. The increase amid the economic crisis between 2008 and 2009 reflected a wider EU effort to stimulate economic growth by boosting public expenditure on R&D. In 2013, the EU was still 0.98 percentage points below its target for 2020, which envisages increasing combined public and private R&D expenditure to 3 % of GDP.

Investment in R&D is crucial for transforming the EU in a successful and competitive knowledge-based economy. The progress in this regard has been strengthened by an increase in the output of tertiary graduates in science and technology, by 17.9 % between 2008 and 2012. An increase in the share of female graduates has additionally contributed to closing the gender employment gap. Overall, digital literacy has increased among the EU population. Recent measures to strengthen human capital have also involved an increase in the stock and mobility of researchers.

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 have surged between 2009 and 2012, 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 in 2008 in the share of tertiary graduates.

Greenhouse gas emissions, share of renewable energy and energy efficiency

By 2012, emissions of greenhouse gases across the EU have fallen by 17.9 % compared with 1990 levels, marking a strong progress towards achieving the 2020 headline target of 20 % reduction. By far the strongest drop within one year since the early 1990s was recorded between 2008 and 2009, when emissions fell by 7.3 %. This swift decline in greenhouse gases has mainly been attributed to the economic crisis and the depressed economic activity in many parts of Europe and in sectors such as industry, transport and energy. The mild winter of 2010/11 further contributed to the reduction in energy demand and emissions. Between 2009 and 2012 levels have remained relatively stable. Progress has been uneven across sectors, with the largest reduction recorded in the manufacturing and energy industries, while in domestic transport and international aviation and maritime transport emissions have increased.

The share of renewable energy in gross final energy production in the EU has increased since 2008, from 10.5 % in 2008 to 14.1 % in 2012. The largest contributors have been solid biofuels, amounting to half of the gross inland consumption of renewable energy in 2012. Hydropower has also remained a large contributor, but its share has declined since 2000. In contrast, the share of wind and solar energy has increased substantially thanks to effective support schemes and dramatic cost reductions. In 2012, the share of renewable energy in gross final energy consumption was 5.9 percentage points below the Europe 2020 target of 20 %.

In 2012, primary energy consumption in the EU reached a decade low of 1 584 million tonnes of



oil equivalent. The figure is roughly equivalent to the primary energy consumed in the EU in 1990. Between 2008 and 2012 energy use fell by 6.2 %, and it will need to fall by further 6.4 % in the coming eight years in order to meet the Europe 2020 goal of moving towards a 20 % increase in energy efficiency. The trend in final energy consumption has closely followed the trend in primary energy consumption but at a lower level, falling from 1 175 Mtoe in 2008 to 1 103 Mtoe in 2012. Although the EU currently seems to be on track to achieving its targets, recent reductions in primary and final energy consumption have been mostly attributed to the slowdown in economic activity following the crisis, rather than structural shifts in energy consumption.

Early leavers from education and training and tertiary educational attainment

The EU indicator for early leavers from education and training, measured as the share of 18 to 24 year olds with at most lower secondary education and not in further education and training, has consistently declined since 2008, for both men and women. In 2013, the indicator stood at 12.0 %, 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 than women, even though their rate has declined faster between 2008 and 2013, from 16.6 % to 13.6 %. Figures for women are within reaching distance of the overall EU target, standing at 10.2 % in 2013, due to their lower initial rate.

Improvements can also be observed in the Europe 2020 headline indicator for tertiary education. The share of 30 to 34 year olds who have attained tertiary education has continuously increased since 2008, from 31.2 % in 2008 to 36.9 % in 2013. Disaggregated by gender, the data reveal that growth in the share of tertiary graduates has been considerably faster for women, who have already met the Europe 2020 target eight years in advance and continue to show improvements. Progress has been slower for men: by 2013, only 32.7 % of 30 to 34 year old men had attained tertiary education. Provided that these positives trends continue, 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.

The importance of fostering higher education is illustrated in forecasts by the European Centre for the Development of Vocational Training (Cedefop) concerning the skills required by the labour market until 2025. Between 2013 and 2025, some 20 million jobs requiring medium or high qualification are estimated to be created, whereas positions only requiring low qualifications are expected to decline by nearly 12 million.

People at risk of poverty or social exclusion

Over the period 2005 to 2008, the number of people at risk of poverty or social exclusion in the EU-27 decreased steadily, from 124 million to 117 million people. The indicator reached its lowest level in 2009 with about 114 million people living at risk of poverty or social exclusion. This positive trend was reversed in the following years.

The increase has been largely attributed to the economic crisis of 2008 and the following recessions in the majority of Member States. Despite the cushioning role of automatic stabilisers and other discretionary policies, in 2012 the number of people at risk of poverty or social exclusion in the EU-27 peaked at more than 123 million, before falling back by almost two million in 2013. The figures reveal that almost every fourth person in the EU-27 was at risk of poverty or social exclusion over the period 2011 to 2013.

The most widespread form of poverty in the EU is monetary poverty. In 2013, 82.6 million people, representing 16.6 % of the total EU-27 population, were at risk of poverty after social transfers. The second most frequent form of poverty was severe material deprivation, affecting 47.6 million people or 9.6 % of all EU-27 citizens. The third dimension



is very low work intensity, with 39.7 million people falling into this category in 2013. This equalled 10.6 % of the total population aged 0 to 59 in the EU-27.

The three dimensions of poverty and social exclusion covered by the headline indicator have developed unevenly since 2005. 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 2008/09; however, both poverty dimensions have been on the rise again since then.

Across all three dimensions of poverty, the most vulnerable groups appear to be the same, namely children, young people, single parents, families with three or more dependent children, people with low educational attainment, and migrants. More than 30 % of young people aged 18 to 24 and 27.6 % of children aged less than 18 were at risk of poverty or social exclusion in 2013. Moreover, one out of five children and young people aged 18 to 24 were subject to monetary poverty. Of all 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, compared with the 2008 level ([1]). In 2013, the gap to the EU-27 target was 25 million people. Further efforts would be needed to maintain a downward trend in the indicator for poverty and social exclusion to meet the Europe 2020 goal.

Notes

([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 the reason 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), Publications Office of the European Union, Luxembourg, 2013, p. 12).

Introduction





About this publication

In late 2013, Eurostat introduced a new type of 'flagship publication' with the aim of providing statistical analyses related to important European Commission policy frameworks or important economic, social or environmental phenomena. The purpose of the first of these flagship publications, entitled *Smarter, greener, more inclusive? — Indicators to support the Europe 2020 strategy*, was to provide statistical support for the Europe 2020 strategy and to back-up the monitoring of its headline targets.

One year later, a new European Commission has been appointed, which will review the Europe 2020 strategy for the period 2015 to 2020. To this end, the Commission in March 2014 has published a stocktaking of the progress made up to the year 2014 ([1]). Additionally, the Commission has run a public consultation to gather the views of stakeholders to help develop the strategy further. Eurostat is supporting this process by publishing an update of last year's flagship publication, providing the latest statistical analyses of the Europe 2020 headline indicators ([2]).

The 2015 edition of *Smarter, greener, more inclusive?* consequently builds on and updates last year's Eurostat flagship publication. 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. This role is to provide statistical and methodological support in the process of developing and choosing the relevant indicators to support the strategy, to produce and supply statistical data and ensure its high quality standards.

The analysis in the publication is based on the Europe 2020 headline indicators chosen 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 stem mainly 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.

The analysis in the 2015 edition of *Smarter, greener, more inclusive?* looks into past trends, generally since 2002 or 2008, up to the most recent year for which data are available (2012 or 2013). Its purpose is not to predict whether the Europe 2020 targets will be reached, but to investigate the reasons behind the changes observed in the headline indicators. The publication includes references to analyses published by the European Commission on the future efforts required to meet the targets.

Data on EU-28 aggregates, individual Member States and, where available, the European Free Trade Association (EFTA) and candidate countries, as well as the United States and Japan are presented. As described in the next section, the EU-wide targets have been translated into national targets by most Member States. In a few cases, maps presenting the different performances of Europe's regions and their progress towards the national Europe 2020 targets are included, even though the targets only apply on a national level.

The publication is structured around the five Europe 2020 targets. Each is analysed in a dedicated thematic chapter. Data on the headline indicators and information on the Europe 2020 strategy are available on a dedicated section of Eurostat's website: Europe 2020 indicators.

This introductory section presents the Europe 2020 strategy and the economic context in which it is embedded. An executive summary outlines the main statistical trends observed in the indicators. The five thematic chapters are followed by a 'country profiles' section. This describes how each Member State is progressing in relation to its national Europe 2020 targets.



The Europe 2020 strategy

The Europe 2020 strategy, adopted by the European Council on 17 June 2010 ([3]), 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.

The Europe 2020 strategy is the successor to the Lisbon strategy. The latter was launched in March 2000 in response to the mounting economic and demographic challenges for Europe at the dawn of the twenty-first century. The Lisbon strategy emerged as a commitment to increasing European competitiveness through a knowledge-based society, technological capacity and innovation.

Three key priorities

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

- It envisions the transition to smart growth through the development of an economy based on knowledge, research and innovation.
- The sustainable growth objective relates to the promotion of more resource-efficient, greener and competitive markets.
- The inclusive growth priority encompasses 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 ([4]).

Under the three priority areas the EU adopted five headline targets on employment, research and development (R&D), climate change and energy, education, and poverty and social exclusion. The targets are monitored using a set of nine headline indicators (including three sub-indicators relating to the multidimensional concept of poverty and social exclusion).

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

	Targets	Flagship initiatives
Smart growth	— Increasing combined public and private investment in R&D to 3 % of GDP — Reducing school drop out rates to less than 10 % and increasing the share of the population aged 30 to 34 having completed tertiary education to at least 40 %	— Innovation Union — Youth on the move — A digital agenda for Europe
Sustainable growth	— 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	— Resource efficient Europe — An industrial policy for the globalisation era
Inclusive growth	— Increasing the employment rate of the population aged 20 to 64 to at least 75 % — Lifting at least 20 million people out of the risk of poverty and social exclusion	— An agenda for new skills and jobs — European platform against poverty and social exclusion

Each indicator falls within one of the three thematic priorities, as shown in Figure 0.1:

- The smart growth objective is covered by the indicators on innovation (gross domestic expenditure on R&D) and education (early leavers from education and training and tertiary educational attainment).
- The sustainable growth pillar is monitored by three indicators on climate change and energy (greenhouse gas emissions, share of renewable energy in gross final energy consumption and primary energy consumption).
- Inclusive growth is measured against the poverty or social exclusion headline indicator (combining three sub-indicators on monetary poverty, material deprivation and living in a household with very low work intensity) and employment rate.

For a detailed overview of the indicators see Table 0.1 in the executive summary. The strategy objectives and targets are further supported by thematic flagship initiatives, as shown in Figure 0.1.

Five headline targets

The headline targets related to the strategy's key objectives at the EU level are:

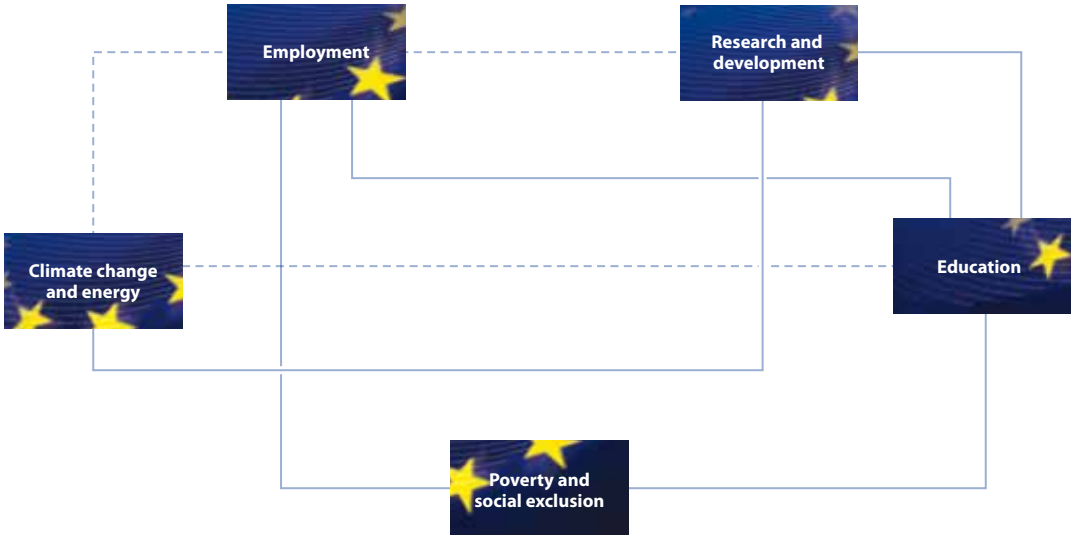
- Increasing the employment rate of the population aged 20 to 64 to at least 75 %.
- Increasing combined public and private investment in R&D to 3 % of GDP.
- Climate change and energy targets:
  - » Reducing greenhouse gas emissions by at least 20 % compared to 1990 levels.
  - » Increasing the share of renewable energy in final energy consumption to 20 %.
  - » Moving towards a 20 % increase in energy efficiency.
- Reducing school drop-out rates to less than 10 % and increasing the share of the population aged 30–34 having completed tertiary education to at least 40 %.
- Lifting at least 20 million people out of the risk of poverty or social exclusion.

These targets were initially defined in the Commission communication 'Europe 2020 — A strategy for smart, sustainable and inclusive growth' published on 3 March 2010 ([3]) and adopted on 17 June 2010 by a European Council decision ([5]). The recent Commission communication 'Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth' published on 5 March 2014 ([1]) introduced a slight rewording to the exact formulation of the targets. The formulation used in the 2015 edition of *Smarter, greener, more inclusive?* follows this most recent communication.

The five headline targets are strongly interlinked, as shown in Figure 0.2. For example, higher educational levels help employability and progress in increasing the employment rate 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, will improve competitiveness and foster job creation. Investing in cleaner, low-carbon technologies will help the environment, contribute to the fight against climate change and create new business and employment opportunities ([6]).

The EU headline 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 some cases the national targets are not sufficiently ambitious to cumulatively reach the EU-level ambition. Fulfilment of all national targets in the area of employment, for instance, would bring the overall EU-28 employment rate up to 74 %, which is still one percentage point below the Europe 2020 target of 75 %. Similarly, even if all Member States met their national R&D expenditure targets, the EU would still fall short of its 3 % R&D intensity target, reaching only 2.6 % by 2020 ([7]).

Figure 0.2: Europe 2020 strategy headline targets and their interlinkages



Seven flagship initiatives

To ensure progress towards the Europe 2020 goals, a broad range of existing EU policies and instruments are being harnessed, including the single market, the EU budget and external policy tools. In addition, the strategy has identified seven policy areas that serve as engines for growth and jobs and hence catalyse the procedure under each priority theme. These are put forward through the following seven flagship initiatives:

- '**Innovation Union**' aims to create a more conducive environment for innovation by improving conditions and access to finance for research and development. Facilitating the transformation of innovative ideas into products and services is seen as the key to creating more jobs, building a greener economy, improving quality of life and maintaining the EU's competitiveness on the global market.
- '**Youth on the move**' is concerned with improving the performance and international attractiveness of Europe's higher education institutions; raising the overall quality of the education and training in the EU and assisting the integration of young people into the labour market. This aim is to be achieved through EU-funded study, learning and training programmes as well as through the development of platforms to assist young people in their search for employment across the EU.
- '**A digital agenda for Europe**' aims to advance high-speed broadband coverage and internet structure, as well as the uptake of information and communication technologies across the EU.
- '**A resource efficient Europe**' aims to facilitate the transition to a resource-efficient and low-carbon economy. This is to be achieved through support for increased use of renewable energy, development of green technologies, promotion of energy efficiency, modernisation of the transport, industrial and agricultural systems, preservation of biodiversity and regional development. The Resource Efficiency Scoreboard, comprising about 30 indicators, is disseminated via a dedicated section on Eurostat's website ([8]).
- '**An industrial policy for the globalisation era**' supports the development of a strong, diversified

and resource-efficient industrial base, which is able to boost growth and jobs in Europe and successfully compete on the global market. It also sets out a strategy for promoting a favourable business environment by facilitating access to credit and internationalisation of small- and medium-sized enterprises (SMEs).

- '**An agenda for new skills and jobs**' aims to advance reforms, which would improve flexibility and security in the labour market ('flexicurity'); create conditions for modernising labour markets and enhance job quality and working conditions. Furthermore, it endorses policies aimed at empowering people, through the acquisition of new skills, through the promotion of better labour supply and demand matching and raising labour productivity.
- '**European platform against poverty and social exclusion**' sets out actions for combating poverty and social exclusion by improving access to work, basic services, education and social support for the marginalised part of the population.

The headline targets and the flagship initiatives briefly defined 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' ([1]). 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 and energy but not on employment, research and development and poverty reduction'. The Commission concludes 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 ([9]).

Looking at the aspects that will shape the strategy for the period 2015 to 2020, the Commission points out that 'seeking to return to the growth "model" of the previous decade [before the crisis] would be both illusory and harmful'.

Instead, a revised Europe 2020 strategy will have to address a number of long-term trends affecting growth. According to the Commission's stocktaking, these include ([10]):

- **Societal change**: the two most prominent trends to be addressed are the ageing of the European population, leading to an ever-increasing economic dependency ([11]), and the long-standing issue of effectiveness and fairness of the wealth produced and distributed through growth.
- **Globalisation and trade**: as the world's largest trader in goods and services, and having in mind that in the next 10 to 15 years 90 % of the world's growth will come from outside the EU, the EU needs to make sure its companies remain competitive and can access new markets.
- **Productivity developments and use of information and communication technologies (ICT)**: weak productivity growth is seen as one of the major reasons for economic growth in Europe lagging behind that of other advanced economies over the past 30 years. The EU thus needs to boost productivity, both as a source of growth and to address its shrinking working age population due to population ageing. In this regard, information and communication technologies (ICT) are considered crucial levers of growth and productivity in the EU.
- **Pressure on resources and environmental concerns**: during the twentieth century, the world's fossil fuel use increased by a factor of 12, while extraction of material resources grew 34 times. Apart from the environmental impacts caused by this growing demand for resources, businesses are facing increasing costs for essential raw materials, energy and minerals, while the absence of security of supply and price volatility has a damaging effect on the economy as a whole.



As a result, the EU needs to use its resources more efficiently. This would not only improve competitiveness and profitability but could also boost employment and economic growth.

The analyses presented in the 2015 edition of *Smarter, greener, more inclusive?* take up many of the above mentioned challenges in the form of contextual indicators presented alongside the Europe 2020 headline indicators in the five thematic chapters dedicated to 'Employment', 'R&D and innovation', 'Climate change and energy', 'Education' and 'Poverty'.

The European Semester: annual cycle of policy coordination

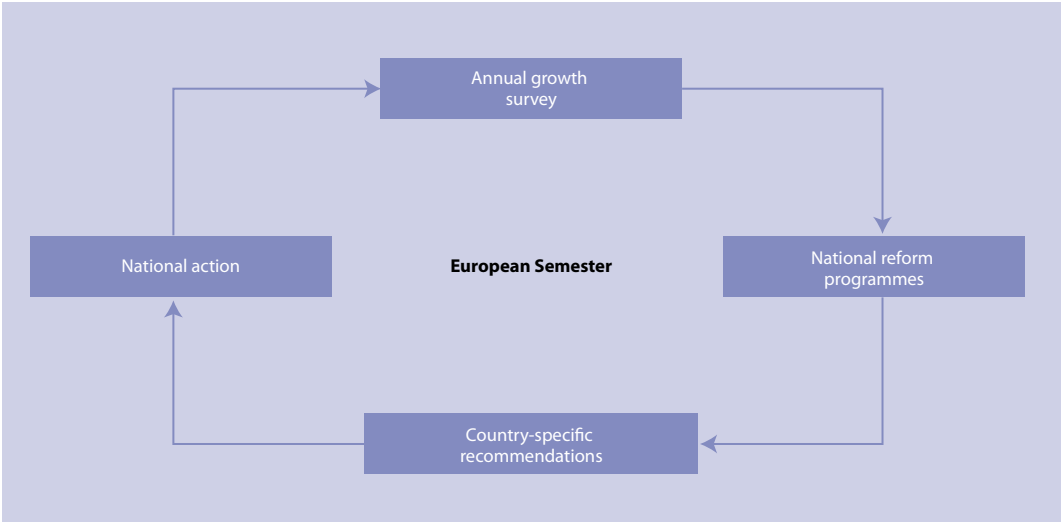
The success of the Europe 2020 strategy crucially depends on Member States coordinating their efforts. To ensure this, the European Commission has set up an annual cycle of EU-level policy coordination known as the European Semester. Its main purpose is to strengthen economic policy coordination and 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 develop plans for National Reform Programmes (NRPs) and Stability Convergence Programmes (SCPs).

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 ([12]). The NRPs and SCPs are submitted to the European Commission for assessment in April. At the end of June/July, country-specific recommendations are formally endorsed by the Council. These recommendations provide a timeframe for Member States to respond accordingly and implement the policy advice.

To ensure progress towards the Europe 2020 goals a broad range of existing EU policies and instruments are being harnessed, including the single

Figure 0.3 The European Semester (*)



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

market, the EU budget and external policy tools. Central to tackling the weaknesses revealed by the crisis and to achieving the Europe 2020 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) and the Excessive Deficit Procedure (EDP) based on the Stability and Growth Pact.

The MIP is intended to monitor the build-up of persistent macroeconomic imbalances and serve as an early warning system. A MIP scoreboard of 11 indicators provides information for the identification of external and internal macroeconomic imbalances. Internal imbalances refer to public sector indebtedness, financial and asset market developments and other general trends such as private sector credit flows and unemployment. External imbalances are related to current account developments and trends in real effective exchange rates, share of world exports and nominal unit labour costs ([13]).

The EDP is a part of the corrective arm of the SGP. Its main purpose is to enforce compliance with budgetary discipline and ensure Member States take corrective actions in a timely and durable manner. The EDP operationalises limits on the budget deficit and public debt on the basis of the following thresholds enshrined in the Treaty: government deficit within 3 % of GDP and gross debt not exceeding 60 % of GDP without diminishing at a satisfactory pace.

The procedure under the EDP starts when a Member State has either breached or is at risk of breaching one of the two thresholds, with special consideration sometimes also given to other factors. Within a period of six months (or three for serious breaches), countries placed in EDP need to take actions and implement recommendations to correct their excessive deficit levels. Member States that fail to do so within the predefined timeframe or deliver insufficient progress, become subject to certain sanctions and receive revised recommendations with an extended timeline.

Europe 2020 in a broader policy perspective

Policy framework for sustainable development

Sustainable development is a fundamental and overarching objective of the European Union, enshrined in its treaties since 1997. The concept aims to continuously improve the quality of life and well-being for present and future generations by linking economic development, protection of the environment and social justice. The renewed EU Sustainable Development Strategy from 2006 ([14]) describes how the EU will more effectively meet the challenges of sustainable development. The overall aim is to continually improve citizens' quality of life by creating sustainable communities that manage and use resources efficiently and tap the ecological and social innovation potential of the economy, thus ensuring prosperity, environmental protection and social cohesion.

Unsustainable patterns of economic development, currently prevailing in society, have significant impacts on our lives. These include both socioeconomic and natural phenomena such as economic crises, intensified inequalities, climate change, depletion of natural resources and environmental degradation. The recent economic crisis has wiped out years of economic and social progress and exposed structural weaknesses in Europe's economy. Meanwhile, in a fast-moving world, long-term challenges — such as globalisation, pressure on resources and an ageing population — are intensifying.

The Europe 2020 strategy has been adopted as the EU's answer to these challenges, building on the EU Sustainable Development Strategy, by focusing on the practical implementation of the EU's overarching policy agenda for sustainable development. Due to their complexity and global scope,



the above-mentioned challenges require a coherent and comprehensive response from the international community. In this respect, the United Nations Conference on Sustainable Development held in Rio de Janeiro in June 2012 (also known as 'Rio+20') has played an important role in shaping a common global vision of an 'economically, socially and environmentally sustainable future for the planet and for present and future generations' ([15]). The conference was a 20-year follow-up of the 1992 United Nations Conference on Environment and Development (the Earth Summit), which promoted the concept of sustainable development. Rio+20 recognised the transition to sustainable patterns of consumption and production, the protection of the natural resource base and poverty eradication as key requirements for achieving sustainable development.

Rio+20 also started a process for establishing universal sustainable development goals (SDGs) and agreed on a set of actions for mainstreaming the development and later realisation of these objectives. In its 2013 communication 'A decent life for all: ending poverty and giving the world a sustainable future' ([16]), the EU showed commitment to actively engage in the processes and work towards the implementation of the objectives agreed. The document proposes principles for an overarching framework that provides a coherent and comprehensive 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 ([17]).

In June 2014 the Commission published a follow-up of its 'decent life' communication from 2013, entitled 'A decent Life for all: from vision to collective action' ([18]). 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' is one of the areas listed in the communication for which actions are taken that contribute to the implementation of Rio+20. This highlights the importance of official statistics for evidence-based political decision-making. As such, the communication calls for the further development of indicators on GDP and beyond in the EU (see next section), as well as further improve measurement of progress and ensure comparability on an international level.

Going beyond GDP

For many years, GDP — originally designed as a measure of macro-economic performance and market activity — has been used to assess a society's overall well-being. The political consensus for using GDP as the only measure for societal progress has been declining over the past few years.

Most prominently, new approaches to measuring progress have been proposed in the report of the Stiglitz-Sen-Fitoussi Commission ([19]), in the European Commission's communication 'GDP and beyond' ([20]) and in the report of the ESS's Sponsorship Group 'Measuring Progress, Well-being and Sustainable Development' ([21]).

In August 2009, the European Commission published the communication 'GDP and beyond — Measuring progress in a changing world' which aims to improve indicators to better reflect policy and societal concerns. It seeks to improve, adjust and complement GDP with indicators that monitor social and environmental progress and to report more accurately on distribution and inequalities. It

Box 0.1: 'GDP and beyond' key actions for the short to medium term

1. Complement GDP with environmental and social indicators (environmental index and quality of life and wellbeing).
2. Provide near real-time information for decision-making.
3. Report more accurately on distribution and inequalities.
4. Develop a European sustainable development scoreboard (including thresholds for environmental sustainability).
5. Extend national accounts to environmental and social issues.

identifies five key actions for the short to medium term (see Box 0.1).

In September 2009, the Stiglitz-Sen-Fitoussi commission published its report on the 'Measurement of Economic Performance and Social Progress' ([22]) with 12 recommendations on how to better measure economic performance, societal well-being and sustainability (see Box 0.2).

In November 2011 the ESS Committee adopted the report by the ESS Sponsorship Group on 'Measuring Progress, Well-being and Sustainable Development'. This report translates the recommendations from the Stiglitz-Sen-Fitoussi Commission report and the European Commission's communication 'GDP and beyond' into a plan for concrete actions for the ESS for better use of and improving existing statistics with a view to providing the most appropriate indicators.

The report identifies about 50 concrete actions for improving and developing European statistics over the coming years. The ESS Committee has decided to work further on the following priority areas:

1. Strengthening the household perspective and distributional aspects of income, consumption and wealth.
2. Multidimensional measures of quality of life.
3. Environmental sustainability.

Box 0.2: 12 recommendations from the Stiglitz-Sen-Fitoussi commission

1. When evaluating material well-being, look at income and consumption rather than production.
2. Emphasise the household perspective.
3. Consider income and consumption jointly with wealth.
4. Give more prominence to the distribution of income, consumption and wealth.
5. Broaden income measures to non-market activities.
6. Quality of life depends on people's objective conditions and capabilities. Steps should be taken to improve measures of people's health, education, personal activities and environmental conditions. In particular, substantial effort should be devoted to developing and implementing robust, reliable measures of social connections, political voice, and insecurity that can be shown to predict life satisfaction.
7. Quality-of-life indicators in all the dimensions covered should assess inequalities in a comprehensive way.
8. Surveys should be designed to assess the links between various quality-of-life domains for each person, and this information should be used when designing policies in various fields.
9. Statistical offices should provide the information needed to aggregate across quality-of-life dimensions, allowing the construction of different indexes.
10. Measures of both objective and subjective well-being provide key information about people's quality of life. Statistical offices should incorporate questions to capture people's life evaluations, hedonic experiences and priorities in their own survey.
11. Sustainability assessment requires a well-identified dashboard of indicators. The distinctive feature of the components of this dashboard should be that they are interpretable as variations of some underlying "stocks". A monetary index of sustainability has its place in such a dashboard but, under the current state of the art, it should remain essentially focused on economic aspects of sustainability.
12. The environmental aspects of sustainability deserve a separate follow-up based on a well-chosen set of physical indicators. In particular, there is a need for a clear indicator of our proximity to dangerous levels of environmental damage (such as associated with climate change or the depletion of fishing stocks).



The actions are an integral part of the European Statistical Programme ([23]) and they are gradually being implemented, resulting in new sets of indicators (for example 'quality of life' ([24])), in refining and specifying existing indicators (such as household adjusted disposable income per capita) and in extending national accounts to integrate environmental, social and economic accounting ([25]).

In August 2013, DG Environment published a Commission staff working document ([26]) summarising the results obtained in the context of the 'GDP and beyond' communication and its five key actions (see Box 0.1).

Notes

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

([2]) See http://ec.europa.eu/eurostat/web/europe-2020-indicators/headline-indicators.

([3]) European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels, 2010 and European Council conclusions, 17 June 2010, EUCO 13/10, Brussels, 2010.

([4]) European Commission, *Europe 2020 — A strategy for smart, sustainable and inclusive growth*, COM (2010)2020 final (p. 8).

([5]) European Council conclusions, 17 June 2010, EUCO 13/10, Brussels, 2010.

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

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

([8]) See http://ec.europa.eu/eurostat/web/environmental-data-centre-on-natural-resources/resource-efficiency-indicators/resource-efficiency-scoreboard.

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

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

([11]) Economic dependency is the ratio between the number of people not in employment and those who are; this ratio is expected to rise from 1.32 in 2010 to 1.47 in 2030.

([12]) European Commission, *The European Union Explained: Europe 2020: Europe's Growth Strategy*, 2012 (p. 6).

([13]) European Commission, Eurostat, *Macroeconomic Imbalances Procedure Scoreboard Headline Indicators*, 2012, (p. 2).

([14]) European Council, *Review of the EU Sustainable Development Strategy (EU SDS) — Renewed Strategy*, 10117/06, Brussels, 2006.

([15]) European Commission, *A decent life for all: ending poverty and giving the world a sustainable future*, COM(2013) 92 final, Brussels, 2013 (p. 6).

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

([17]) European Commission, *A decent life for all: ending poverty and giving the world a sustainable future*, COM(2013) 92 final, Brussels, 2013 (p. 2).

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

([19]) French president Nicolas Sarkozy in 2008 set up a high-level Commission on the Measurement of Economic Performance and Social Progress chaired by Joseph Stiglitz, Amartya Sen and Jean-Paul Fitoussi 'to identify the limits of GDP as an indicator of economic performance and social progress' and 'to consider additional information required for the production of a more relevant picture'.

([20]) European Commission, *GDP and beyond — Measuring progress in a changing world*, COM(2009) 433 final, Brussels, 2009.

([21]) Final report of the 'Sponsorship Group on Measuring Progress, Well-being and Sustainable Development' adopted by the European Statistical System Committee in November 2011.

([22]) Stiglitz, J.E., Sen, A., Fitoussi, J.-P., *Report by the Commission on the Measurement of Economic Performance and Social Progress*, 2009.

([23]) Regulation (EU) No 99/2013 of the European Parliament and of the Council of 15 January 2013 on the European Statistical Programme 2013–17, Official Journal of the European Union 2013.

([24]) See http://ec.europa.eu/eurostat/web/gdp-and-beyond/quality-of-life/data/overview.

([25]) See http://ec.europa.eu/eurostat/web/environment/overview.

([26]) European Commission, Commission staff working document *'Progress on 'GDP and beyond' actions'*, Volume 1 of 2, SWD(2013) 303 final, Brussels, 2013.

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 for ensuring adequate living standards and provides the base for people to achieve personal goals and aspirations. Moreover, employment contributes to economic performance, quality of life and social inclusion, making it a cornerstone of socio-economic development and well-being.

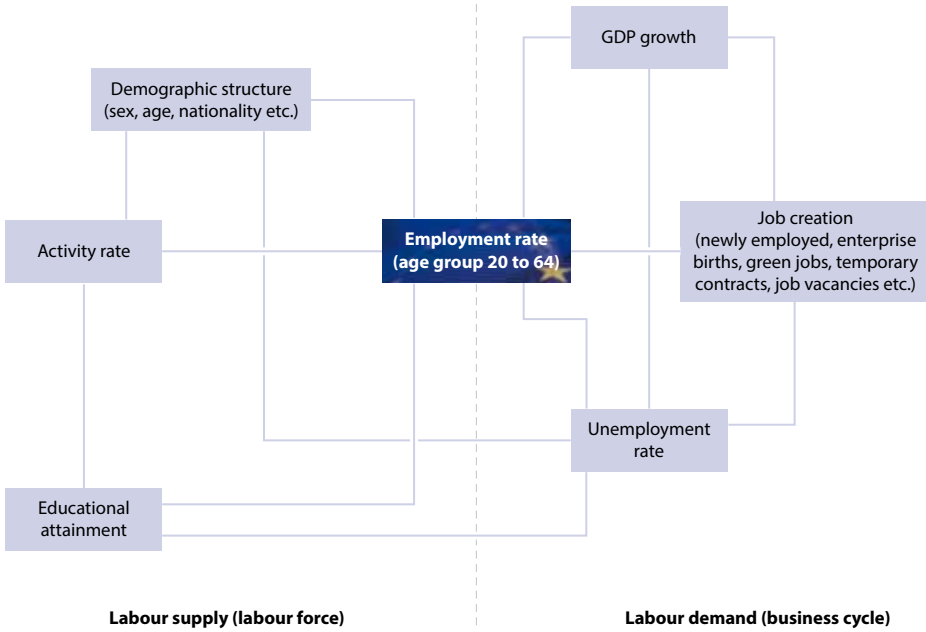
The EU's workforce is shrinking as a result of demographic changes. This means a smaller number of employed people are now supporting a growing number of dependent people. This is putting the sustainability of Europe's social model, welfare systems, economic growth and public finances at risk. In addition, the recent economic crisis has wiped out steady gains in economic growth and job creation made over the past decade, exposing structural weaknesses in the EU's economy. At the same time, global challenges are intensifying and competition from developed and emerging economies such as China and 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 has placed a strong emphasis on job

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]).

Figure 1.1: Indicators and concepts presented in the chapter and their links to the headline indicator on the employment target



creation. One of its five headline targets addresses employment, with the aim of raising the employment rate of 20 to 64 year olds to at least 75 % by 2020. This goal is supported by the so-called 'Employment Package' ([3]), which seeks to create more and better jobs throughout the EU.

This chapter analyses the headline indicator 'Employment rate — age group 20 to 64', chosen to monitor the strategy's employment target. Contextual indicators are used to present a broader picture, looking at the drivers behind the changes in the headline indicator. These include indicators from both the supply and demand side of the labour market, as shown in Figure 1.1.

Concerning labour supply, the analysis investigates the structure of the EU's labour force and its long-term influence on employment in relation to the strategy's main target groups: migrants, women and young, older and low-skilled people. These groups are important because of their low employment rates; reaching the Europe 2020 target consequently means tapping into the potential labour force that they represent ([4]).

The analysis then shifts to short-term, demand-oriented factors related to changes in the economic cycle expressed through GDP growth, such as the birth of new enterprises and job vacancies, and how this influences job creation, temporary employment and unemployment.

The EU's employment target is closely interlinked with the other strategy goals on research and development (R&D) (see p. 49), climate change and energy (see p. 81), education (see p. 103) and poverty and social exclusion (see p. 135). Progress towards one target therefore also depends on how other targets are addressed. Better educational levels help employability, and higher employment rates in turn help reduce poverty. Moreover, greater R&D capacity, together with better resource efficiency, will improve competitiveness and contribute to job creation. The same is true for investing in energy efficiency measures and boosting renewable energies ([5]).

Box 1.1: What is meant by 'labour force', 'activity', 'employment' and 'unemployment'?

The term '**labour force**' refers to the economically active population. This is the total number of employed and unemployed people. People are classified as employed, unemployed and economically inactive according to the definitions of the International Labour Organisation (ILO) ([6]). The two main EU-level sources for these data are the EU Labour Force Survey (EU LFS) ([7]) and National Accounts ([8]).

The EU LFS is a large sample survey of private households, excluding people 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, which mainly relates to their actual activity during a particular reference week. The EU LFS data refer to the country where employed people reside, rather than where they work. This difference may be significant in countries with large cross-border flows.

According to the definitions:

- 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 only for people aged 15 years or older, because this is the earliest that a person can leave full-time compulsory education in the EU ([9]). Many Member States have also made 15 the minimum employment age ([10]).
- **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 they were temporarily absent. 'Work' means any work for pay or profit during the reference week, even for as little as one hour. Pay includes cash payments or payment in kind (payment in goods or services rather than money), whether or not payment was received in the week the work was done. Anyone receiving a wage for on-the-job training involving the production of goods or services is considered to be in employment. Self-employed and family workers are also included.

» **Employment rates** represent employed persons, as a percentage of the population of the same age; they are often broken down by sex and age group.

» For employment rates, data most often refer to persons aged 15 to 64. But during the course of setting the Europe 2020 strategy's employment target, the lower age limit was raised to 20 years. One reason was to ensure compatibility with the strategy's headline targets on education (see chapter on 'Education' on p. 103), in particular for tertiary education ([11]). The upper age limit for the employment rate is usually set to 64 years, taking into account statutory retirement ages across Europe ([12]). However, the possibility of raising the upper age limit for the employment rate is being considered ([13]).

- **Unemployed persons** comprise persons aged 15 to 74 who were:

(1) Without work during the reference week — they neither had a job nor were at work (for one hour or more) in paid employment or self-employment.

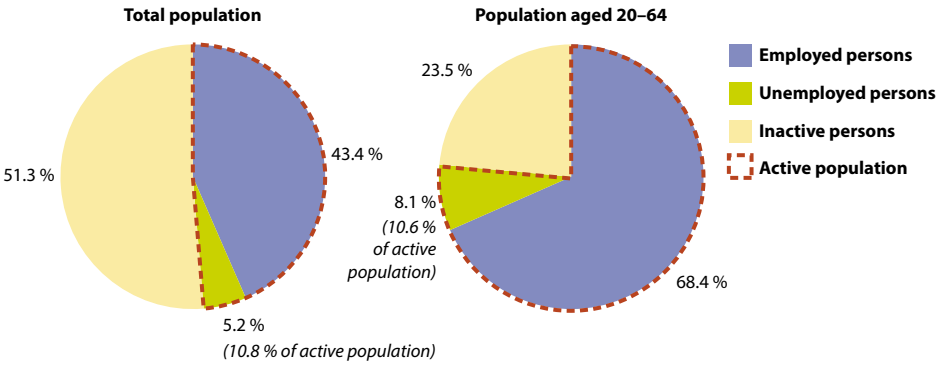
(2) Available to start work — they were available for paid employment or self-employment before the end of the two weeks following the reference week.

(3) Actively seeking work — they had taken specific steps in the four-week period ending with the reference week to seek paid employment or self-employment or had found a job to start within a period of at most three months.

» The **unemployment rate** is the number of unemployed people as a percentage of the labour force (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

Figure 1.2: Population by age and labour status, EU-28, 2013
(%)



Source: Eurostat (online data code: lfsa_pganws)

analysis is extended to the age group 15 to 29, 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.

To take into account people who 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 years. As a result, the observed age group for unemployed persons is 15 to 74 years.

Figure 1.2 shows the distribution of employed, unemployed and inactive persons for the total population ([14]) and for the population aged 20 to 64 years. The latter shows the working-age population addressed by the Europe 2020 strategy's employment target.

In 2013, less than half of the total LFS population of 500 million people ([14]) was economically active. The 257 million inactive people include children and retired people. For labour market analyses, the focus is therefore on people aged 20 to 64. In 2013, more than three-quarters of people aged 20 to 64 were economically active; 209 million (68.4 % of the population aged 20 to 64) were employed and 25 million were unemployed (8.1 % of the same age group, equalling a 10.6 % share of the economically active population aged 20 to 64 years); 72 million people aged 20 to 64 were economically inactive.

Based on these data, the following indicators are usually calculated to analyse labour market trends:

- **Activity rate**: in 2013, 48.7 % of the total population or 76.5 % of the population aged 20 to 64 years were active on the labour market.
- **Employment rate**: in 2013, 43.4 % of the total population or 68.4 % of the population aged 20 to 64 years were employed.
- **Unemployment rate**: in 2013, 10.8 % of the active population (referring to the age group 15 to 74) or 10.6 % of economically active 20 to 64 year olds were unemployed.

Crisis brings rise in EU employment rate to a halt

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. The reason for choosing this age group over the 'usual' working-age population of 15 to 64 years old is explained in Box 1.1.

As indicated in Figure 1.3, the EU's employment rate grew more or less steadily during the decade before the economic crisis, peaking at 70.3 % in 2008. In 2009, however, the crisis hit the labour market, knocking the employment rate back to the level of 2006. Employment in the EU continued to fall to 68.5 % in 2010 and further to 68.4 % in 2012, where it has remained since. As a result, in 2013 the EU was 6.6 percentage points below the target value of 75 %.

North–South divide in employment rates across the EU

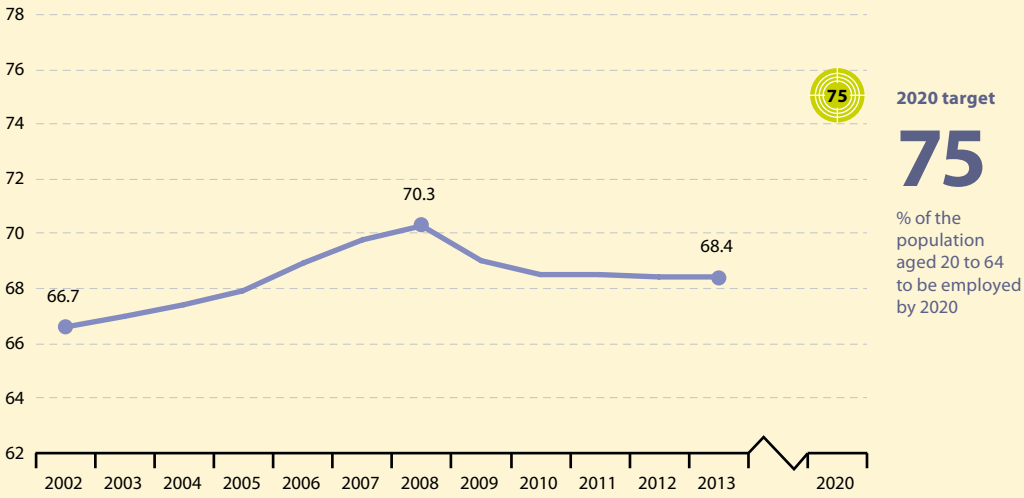
To reflect different national circumstances, the common EU target has been translated into national targets ([15]) (see Figure 1.4). These range from 62.9 % for Croatia to 80.0 % for Denmark, the Netherlands and Sweden. In 2013, Germany had already met its national target, with an employment rate of 77.1 %. Of the remaining Member States, Sweden was closest at 0.2 percentage points below its national target. Greece and Spain were the most distant, at 17.1 and 15.4 percentage points below their national targets respectively.

Employment rates among EU Member States ranged from 52.9 % to 79.8 % in 2013. Northern and Central Europe had the highest rates, in particular

EUROPE 2020 HEADLINE INDICATOR

Europe 2020 headline indicator

Figure 1.3: Employment rate age group 20 to 64, EU-28, 2002–13
(%)



Source: Eurostat (online data code: t2020_10)

Sweden, Germany, the Netherlands, Denmark and Austria. All of these countries exceeded the 75% EU target. Countries at the lower end of the scale, with employment rates below 60%, were Greece, Croatia, Spain and Italy. Rates in the European Free Trade Association (EFTA) countries Iceland, Norway and Switzerland tended to be higher than in the EU, while figures were lower in acceding countries. Employment rates in Japan and the United States were on the same level as the 'top third' of EU Member States, and above the EU-28 aggregate.

Over the past five years, employment has fallen in a majority of the EU countries; in 2013, employment rates in 22 Member States were below 2008 levels. This means these countries have still not fully recovered from the impacts of the crisis on their employment rates. The strongest falls were in Greece (– 13.4 percentage points), Spain (– 9.9 percentage points) and Cyprus (– 9.3 percentage points).

The remaining six countries (Czech Republic, Germany, Luxembourg, Hungary, Malta and Austria) were back on a 'growth path' by 2013, meaning their employment rates were higher than before the economic crisis. Malta (5.6 percentage points) and Germany (3.1 percentage points) have experienced the strongest growth in employment rates since 2008.

The variations in the employment rate across different Member States, depicted in Figure 1.4, are also reflected in the maps of cross-country regional distribution of employment rates (at NUTS 2 level). As shown in Map 1.1 (see p. 32), the highest regional employment rates were predominantly recorded in North-western and Central Europe, particularly in Germany, the Netherlands, Austria, Sweden and the United Kingdom. In 2013, the Finnish region Åland had the highest employment rate in the EU, at 85.5%, followed by Stockholm (Sweden) with 82.7% and Freiburg (Germany) with 82.5%.

At the other end of the scale, the lowest employment rates were observed around the Mediterranean,

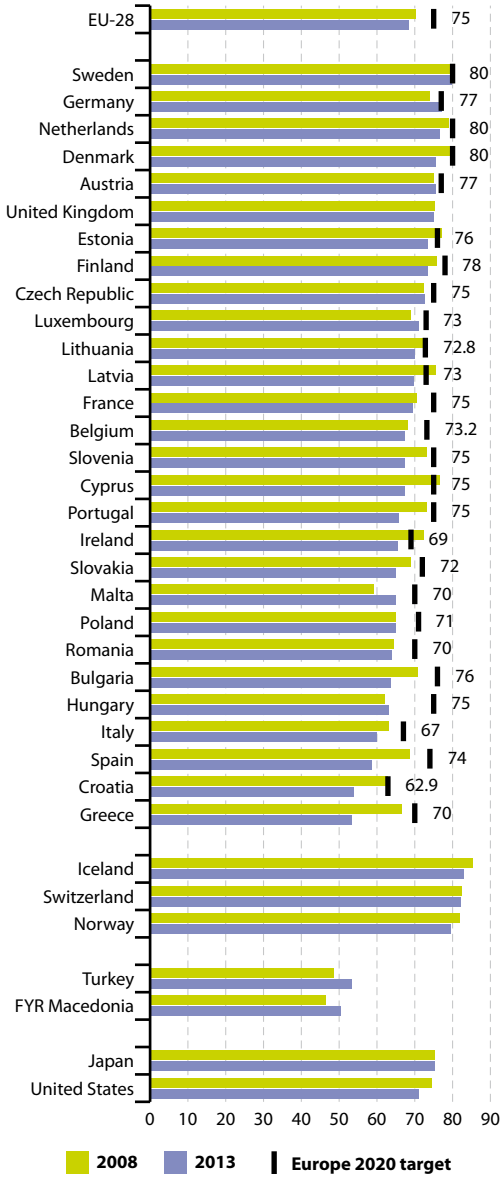
in particular in the southern parts of Spain and Italy, and in Greece and Croatia, as well as in the French overseas regions and the outlying Spanish autonomous cities (Ceuta and Melilla). In 2013, the Italian regions Calabria, Sicilia and Campania had the lowest employment rates in the EU of less than 45 %.

In 2013 Italy also showed the biggest within-country dispersion of employment rates, with a factor of 1.8. This means employment rates in the country's worst performing regions were 1.8 times lower than in its best performing ones. Strong within-county dispersions of regional employment rates could also be found in Spain and France, with a factor of about 1.4. In contrast, Denmark, Ireland, Croatia, the Netherlands and Sweden were the most 'equal' countries, with almost no disparities in employment rates across their regions.

Map 1.2 shows the change in regional employment rates since 2008. Almost two-thirds (65 %) of the 272 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, with reductions of 10 percentage points or more, were several regions in Greece and Spain as well as the Portuguese autonomous region of Madeira.

Despite the economic crisis, employment rates increased in 93 regions over 2008 to 2013. Of these, 15 showed growth of more than 4 percentage points, 11 of which were in Germany (with the highest increases in Sachsen-Anhalt, Berlin, Leipzig and Chemnitz). The remaining four were in Hungary (Dél-Dunántúl), Romania (Nord-Est and Nord-Vest) and Malta.

Figure 1.4: Employment rate age group 20 to 64, by country, 2008 and 2013 (*)
(%)

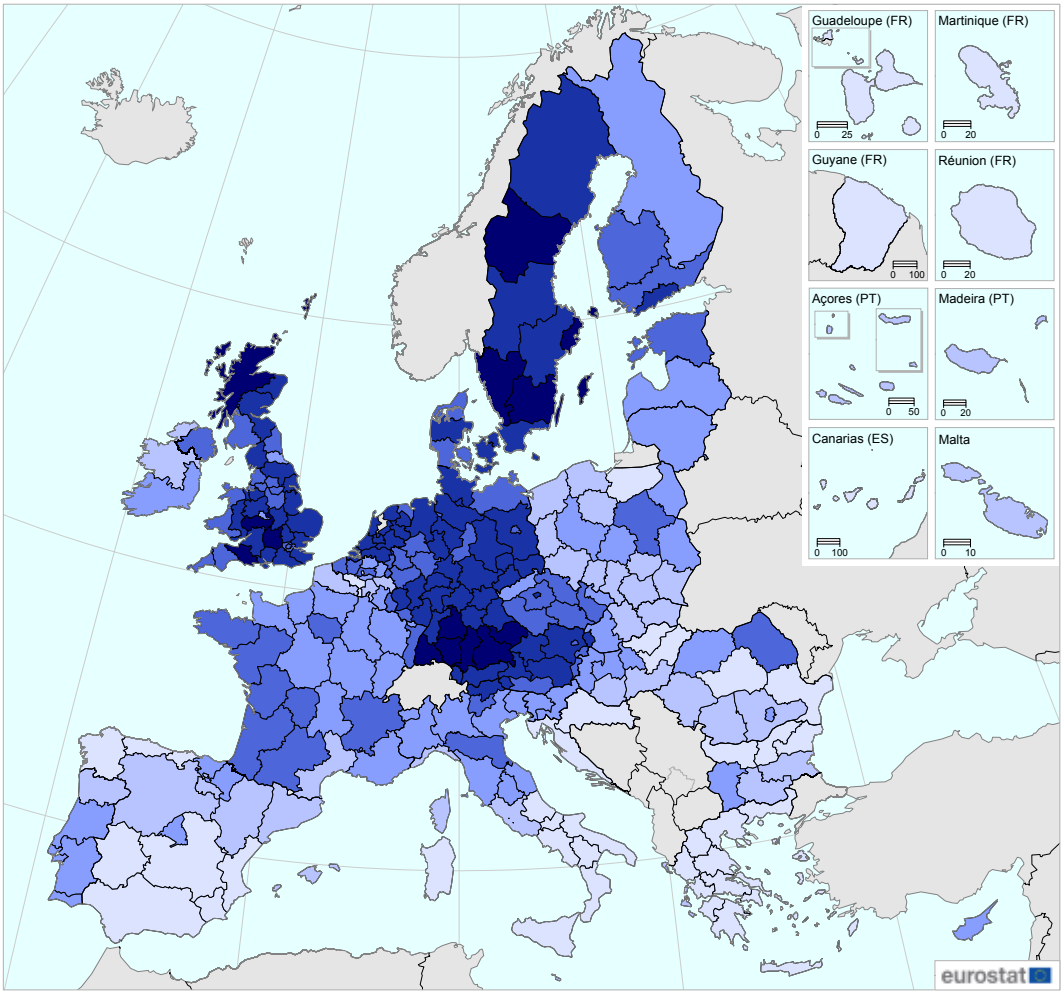


(*) 2012 data (instead of 2013) for JP and US; break in series for IE and CY (2009), NL, PL and CH (2010), BG, CZ, LV, PT and SK (2011), EE, FR and AT (2013).

Europe 2020 national targets: IE: 69–71 %, IT: 67–69 %, CY: 75–77 %, AT: 77–78 %, UK: no national target.

Source: Eurostat (online data code: t2020_10)

Map 1.1: Employment rate, by NUTS 2 regions, 2013
(% of population aged 20 to 64)



(% of population aged 20–64)

EU-28 = 68.4

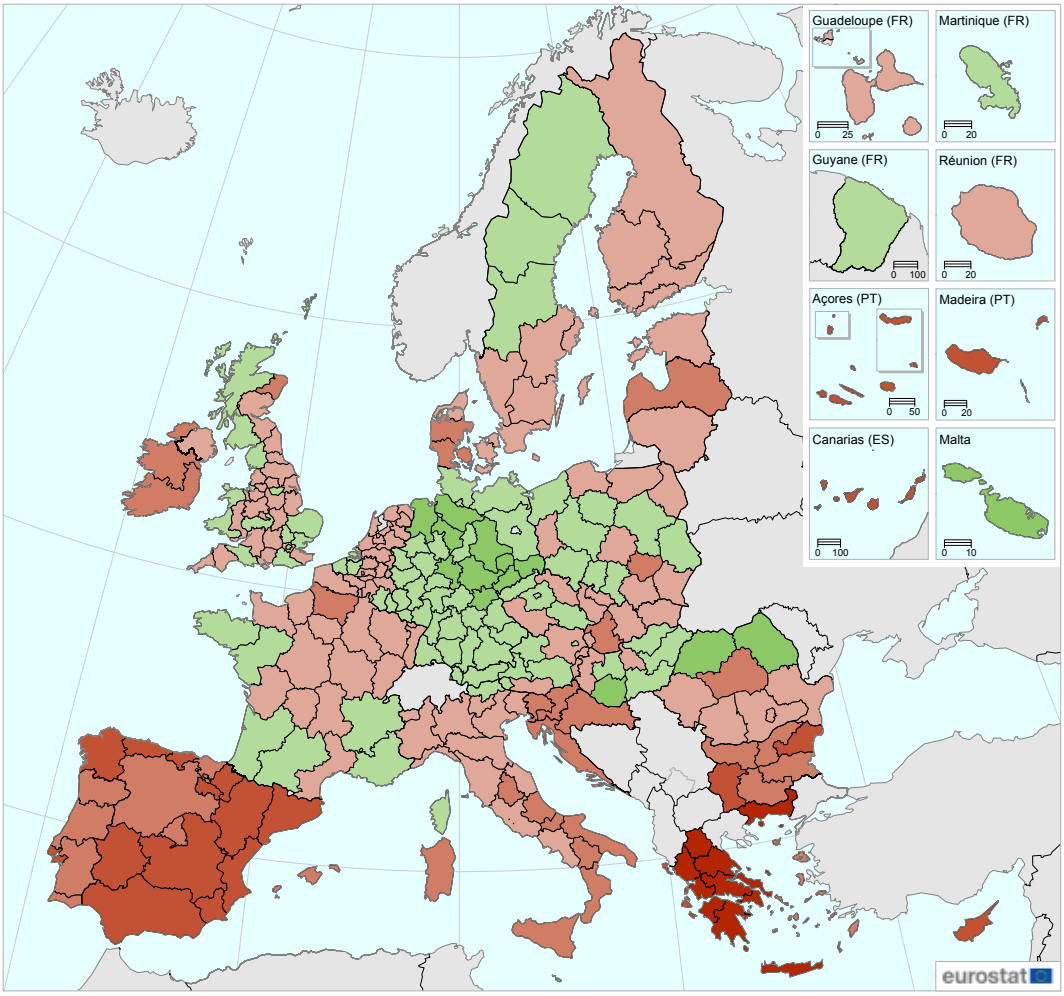
< 60
60 – < 65
65 – < 70
70 – < 75
75 – < 80
≥ 80
Data not available

Administrative boundaries: © EuroGeographics © UN-FAO
Cartography: Eurostat — GISCO, 12/2014

0 200 400 600 800 km

Source: Eurostat (online data code: lfst_r_lfe2emprt)

Map 1.2: Change in employment rate, by NUTS 2 regions, 2008–13 (*)
(percentage points difference between 2013 and 2008, persons aged 20 to 64)



(*) Change 2009–13 for UKD6 Cheshire and UKD7 Merseyside; break in time series for IE, EL, CY and LU (2009), NL and PL (2010), BE, BG, CZ, DE, PT and SK (2011), FR and NL (2013).

Source: Eurostat (online data code: lfst_r_lfe2emprt)

How long-term labour supply factors influence employment rates

Employment rates are a result of labour supply and demand: workers supply labour to businesses and businesses demand labour from workers 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 economic cycle (see p. 41).

Labour supply is characterised by the number of people available to the labour market (determined by demographic structure) and the skills they offer (approximated by education). 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.

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

The EU is confronted with a growing, but ageing population, which is driven by low fertility rates and a continuous rise in life expectancy. This ageing, already apparent in many Member States, means older people will make up a much greater share of the total population in the coming decades, while the share of the population aged 20 to 64 years will fall (see Figure 1.5). This in turn means that despite a growing population, the EU labour force is shrinking, increasing the burden on the employed population to provide for the social expenditure needed by an ageing population ([16]).

Over the past two decades the total EU population grew from 475 million in 1990 to 507 million in 2013 ([17]). Between 2002 and 2013 the number of older persons aged 65 and above increased by 17.7 %. There was a particularly steep rise of 44.8 % for the group aged 80 or over. The population aged 20 to 64 years grew only slightly, by 3.6 % over the same period. In contrast, the number of 0 to 19 year olds fell by 5.8 %.

While the most recent projections ([18]) 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 enter their 60s and retire. As a result, the share of 20 to 64 year olds is expected to gradually decline from 60.8 % in 2013 to 58.9 % in 2020. This equals a reduction of 6.5 million people. At the same

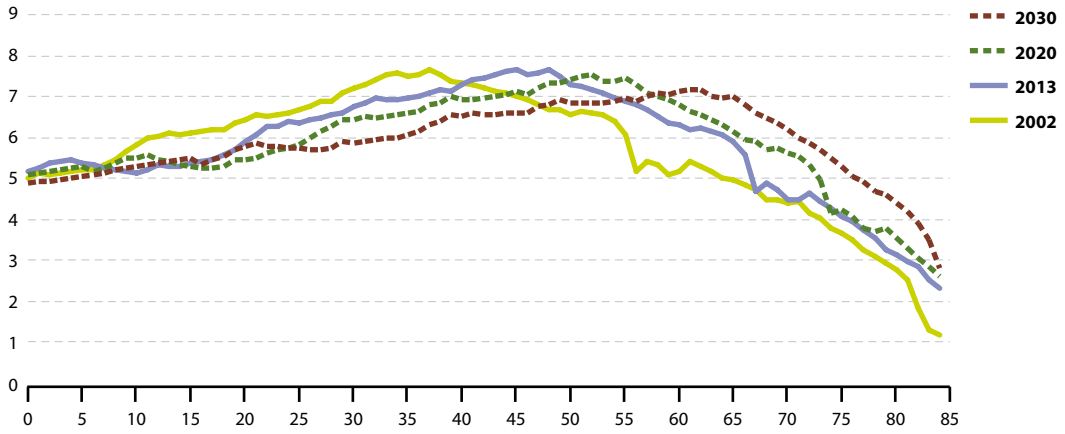
Figure 1.5: Population age structure, by major age groups, EU-28, 2002, 2013, 2020 and 2030 (*) (%)



(*) 2002–13: observed populations as of 1 January; 2020–30: projections based on EUROPOP2013 main scenario.

Source: Eurostat (online data codes: demo_pjan and proj_13npms)

Figure 1.6: Demographic profile of the EU-28 population by single year age, 2002, 2013, 2020 and 2030 (*)
(Million persons)



(*) 2002–2013: observed populations as of 1 January; 2020–2030: projections based on EUROPOP2013 main scenario; age group '85 or over' not shown.

Source: Eurostat (online data code: demo_pjan and proj_13npms)

time, the number of older people aged 65 or over will grow by about 12 million, reaching 20.4 % of the total population in 2020. As indicated in Figure 1.5, these trends will continue — at an even faster rate in the following decade, with the population aged 20 to 64 shrinking to 55.9 % and those aged 65 or over climbing to 23.9 %, thus making up almost a quarter of the total population in 2030.

Figure 1.6 shows how the baby boomer generation has moved up the age pyramid since 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 these large cohorts are now reaching retirement age.

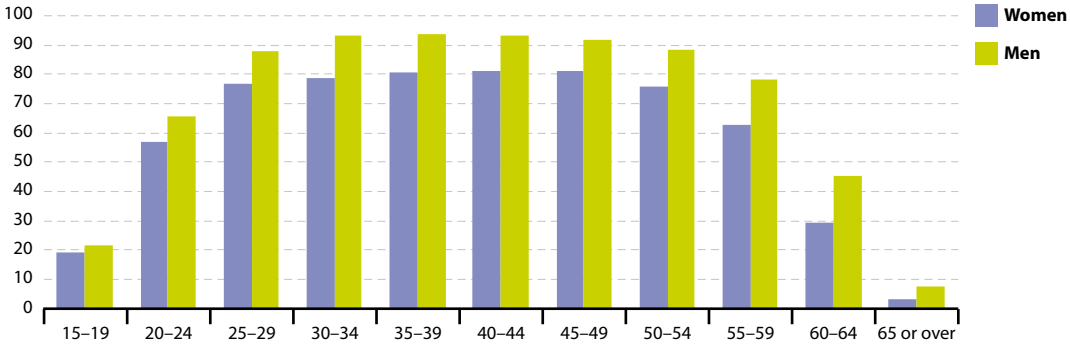
As a result of these demographic changes the old-age dependency ratio has increased from 26.3 % in 2002 to 29.9 % in 2013. This ratio shows the share of the population aged 65 and above compared with the population of 20 to 64 year olds. This means that while there were 3.8 people of working age for every dependent person over 65 in the EU in 2002, this number had fallen to 3.3 people by 2013. 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…

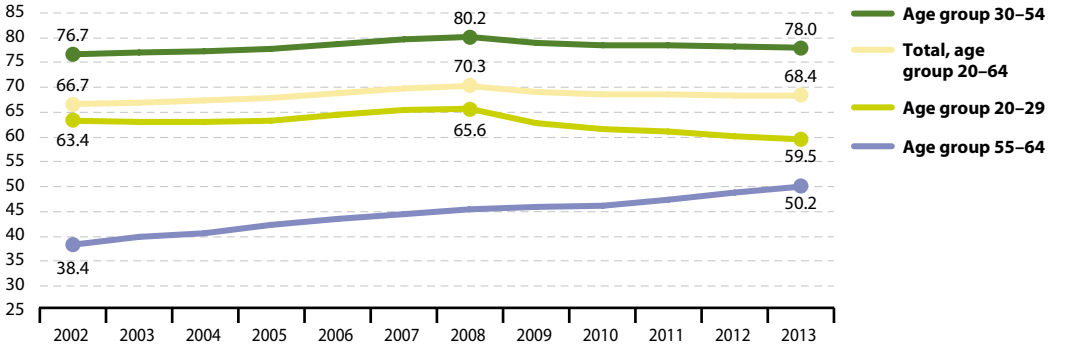
Not all people are economically active, as shown in Figure 1.2. This also concerns part of the population aged 20 to 64 years. Figure 1.7 shows the differences in activity rates between the sexes and across age groups.

Figure 1.7: Activity rates, by five-year age group, EU-28, 2013
(%)



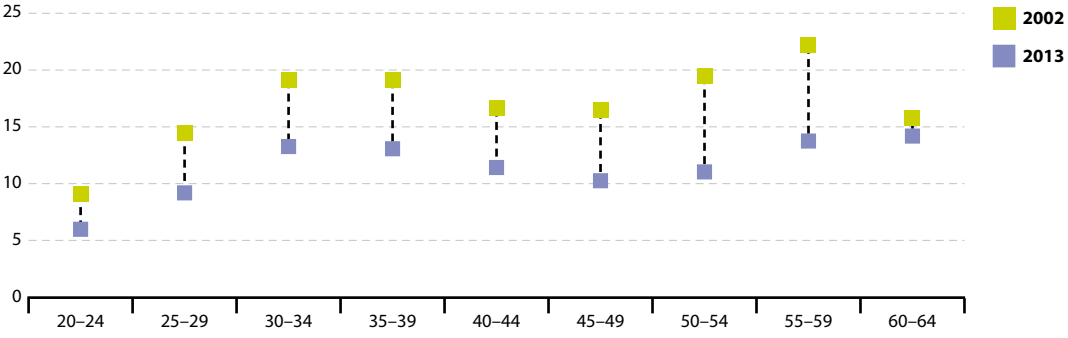
Source: Eurostat (online data code: lfsa_pganws)

Figure 1.8 Employment rate, by age group, EU-28, 2002–13
(%)



Source: Eurostat (online data codes: lfsa_pganws, tsdde100 and t2020_10)

Figure 1.9: Gender employment gap, by age group, EU-28, 2002 and 2013
(Difference between employment rates of men and women, in percentage points (*))



(*) A positive value indicates higher employment rates for men than for women; break in series in 2005.

Source: Eurostat (online data code: lfsa_ergan)

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 2013, this was the case for about 90 % of the inactive population aged 15 to 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 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 (see Figure 1.7) are a result of women staying at home for childcare (38.3 % in 2013) and other family or personal circumstances such as marriage, pregnancy or long vacation (15.5 % in 2013) ([19]). In contrast, the main reasons why 25 to 49 year old men did not seek employment were illness or disability (36.4 % in 2013) and participation in education or training (20.5 % in 2013).

… and these groups therefore have lower employment rates

Figure 1.8 illustrates how the differences in activity rates (as shown in Figure 1.7) are mirrored in different employment rates for different age groups, and how these have changed over the past 10 years.

Employment rates of people aged 30 to 54 are about 10 percentage points higher than the overall EU employment rate (referring to the population aged 20 to 64). Young people aged 20 to 29 have lower employment rates, and the gap between this group and those aged 30 to 54 years has widened since the crisis began (see Figure 1.8).

Employment rates of women and older people have risen more or less continuously over the past decade. Between 2002 and 2013, the employment rate of 55 to 64 year olds rose by 11.8 percentage points. Growth was even more pronounced for older women, at 14.3 percentage points. These increases are partly a result of the demographic changes in the EU: as baby boomers with high activity and employment rates move up the age pyramid, they eventually enter the 55 to 64 age group, pushing up the employment levels of older people.

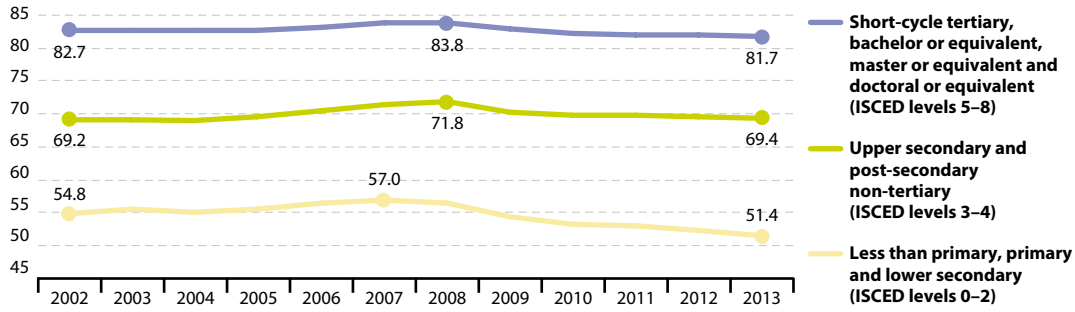
This development is also apparent in the increase in the duration of working life. This is measured as the number of years a person aged 15 is expected to be active in the labour market. Over the past decade, the duration of working life in the EU has risen by 2.1 years, from 32.9 years in 2002 to 35.0 years in 2012. The increase was higher for women (+ 2.8 years) than for men (+ 1.4 years). However, in 2012 men could still expect to stay in work much longer (37.6 years) than women (32.2 years).

This reaffirms the focus Europe 2020 puts on 55 to 64 year old women to boost the overall employment rate: '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' ([20]) (see also the 'Poverty and social exclusion' chapter on p. 135).

Lower activity rates of women due to parenthood (see Figure 1.7) also strongly influence the employability of women. The longer women are out of the labour market or are unemployed, notably due to care duties, the harder it will be for them to find a job in the long term. The gender employment gap, showing the difference in employment rates of men and women, is highest for 30 to 39 year olds and for the older cohort, as shown in Figure 1.9. However, the gap is slowly closing due to the stronger growth in employment rates of women over the past decade.

Figure 1.10: Employment rate age group 20 to 64, by highest level of education attained, EU-28, 2002–13 (*)

(%)



(*) Break in time series in 2005.

Source: Eurostat (online data code: tsdec430)

Box 1.2: Employment policies specifically 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': '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.' ([21])

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. 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.' ([22])

European employment policies are addressing the specific situation of women to help raise their employment rates in line with the headline target (see Box 1.2).

Better educational attainment increases employability…

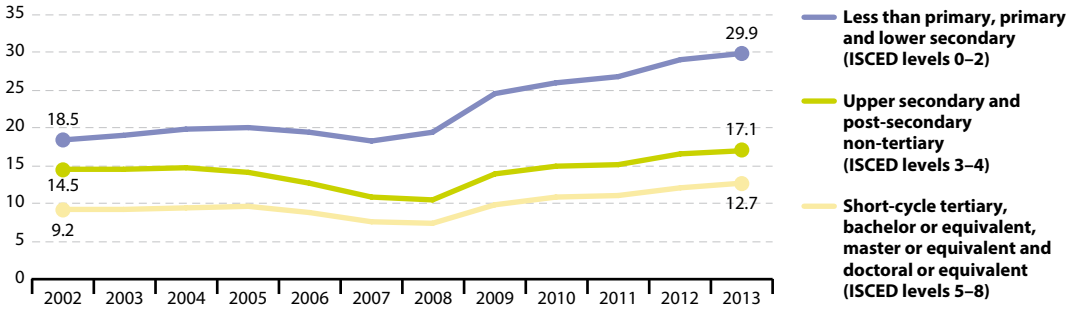
Educational attainment levels are another important factor for explaining the variation in employment rates between different groups in the labour force. Figure 1.10 shows employment rates are generally higher for more highly educated people.

In 2013, people who had completed tertiary education had a significantly higher employment rate than the EU average, at 81.7 %. In contrast, just slightly more than half (51.4 %) of those with at most primary or lower secondary education were employed. The rate for people with upper secondary or post-secondary non-tertiary education was in between these levels, at 69.4 %, slightly above the EU average.

These findings underline the importance of people's education for their employability. Increasing educational attainment and equipping people with skills for the knowledge society are therefore major concerns for European employment policies addressing the Europe 2020 headline targets on both employment and education (see Box 1.3 and the 'Education' chapter on p. 103).

Figure 1.11: Unemployment rate of young people aged 15 to 29, by educational attainment, EU-28, 2002–13 (*)

(%)



(*) Break in time series in 2005.

Source: Eurostat (online data code: yth_empl_090)

…and 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 2013, unemployment among those aged 15 to 74 with tertiary education was 6.4 %. This was significantly lower than the EU average of 10.8 %. In contrast, unemployment was considerably higher for those with at most lower secondary education, at 19.1 %.

Young people aged 15 to 29 generally face a higher risk of being unemployed. In 2013, their unemployment rate was 18.7 % and thus about eight percentage points above the EU average of 10.8 % (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 'Education' chapter on p. 103).

Box 1.3: Employment policies and education

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 ([23]).

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 a better monitoring of skills needs and 'close cooperation between the worlds of education and work' ([24]). It also addresses youth employment (see Box 1.4), 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' ([25]).

Box 1.4: 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 ([26]):

- **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.

Box 1.5: 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' ([27]). 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.'

As shown in Figure 1.11, young people aged 15 to 29 with at most lower secondary education are clearly the most disadvantaged group, with an unemployment rate of almost 30 % in 2013. Unemployment rates for the other two groups were more than 12 percentage points lower.

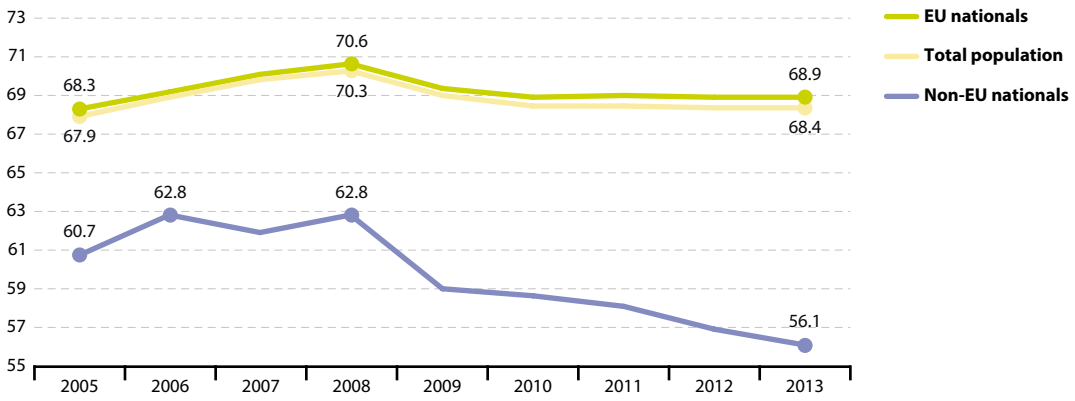
At the same time, low-educated 15 to 29 year olds have experienced the biggest growth in unemployment since 2002, when their unemployment rate was about 11 percentage points lower. It is interesting to note that this decline compared with the other two subgroups has not only been caused by the recent economic crisis. The situation of low-educated 15 to 29 year olds had already started deteriorating gradually in the period before 2007 (see Figure 1.11), while unemployment in the other two, higher-educated groups had been falling until 2008.

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' (see Box 1.4).

Migration — a way to balance the ageing population

Economic migration is increasingly acquiring strategic importance for the EU in dealing with a shrinking labour force and expected skills shortages. Without net migration, the European Commission estimates the working-age population will shrink by 12 % in 2030 and by 33 % in 2060 compared with 2009 levels ([28]).

Figure 1.12: Employment rate age group 20 to 64, by nationality, EU-28, 2005–13 (*)
(%)



(*) Break in time series in 2005.

Source: Eurostat (online data code: lfsa_ergan)

In 2013, non-EU citizens accounted for 3.9 % of the total EU population ([14]). Their share in the labour force was even higher, at 4.4 %. However, migrant workers do not only often occupy low-skilled, low-quality jobs, they also show considerably lower employment rates than EU citizens (see Figure 1.12). In 2013, the employment rate of non-EU nationals aged 20 to 64 was 12.3 percentage points below the total employment rate and 12.8 percentage points below that of EU nationals. This is a significant widening of the gap since the onset of the economic crisis in 2008.

How short-term labour demand factors influence the employment rate

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 its capacity to create new jobs. This relationship is illustrated by Figure 1.13. It shows 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).

The situation observable in 2010 and 2011, with GDP growth picking up but employment recovery more or less stalled, can be described as 'jobless growth'. This means GDP growth corresponded mostly to an increase in productivity and hours worked, leaving little room for employment growth ([29]). As the result of another GDP contraction following the slight recovery in 2010 and 2011, the number of employed people fell again in 2012 and 2013.

The link between GDP growth and employment growth is also reflected in the share of newly employed people as a share of total employment, which dropped considerably in 2009, thus 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.

How do enterprise births contribute to job creation?

The birth of new enterprises is often seen as one of the key drivers of job creation and economic growth. Enterprise births are thought to increase the competitiveness of a country's enterprise population, by obliging them to become more efficient in view of newly emerging competition. As such, they stimulate innovation and facilitate the adoption of new technologies, while helping to increase an economy's overall productivity.

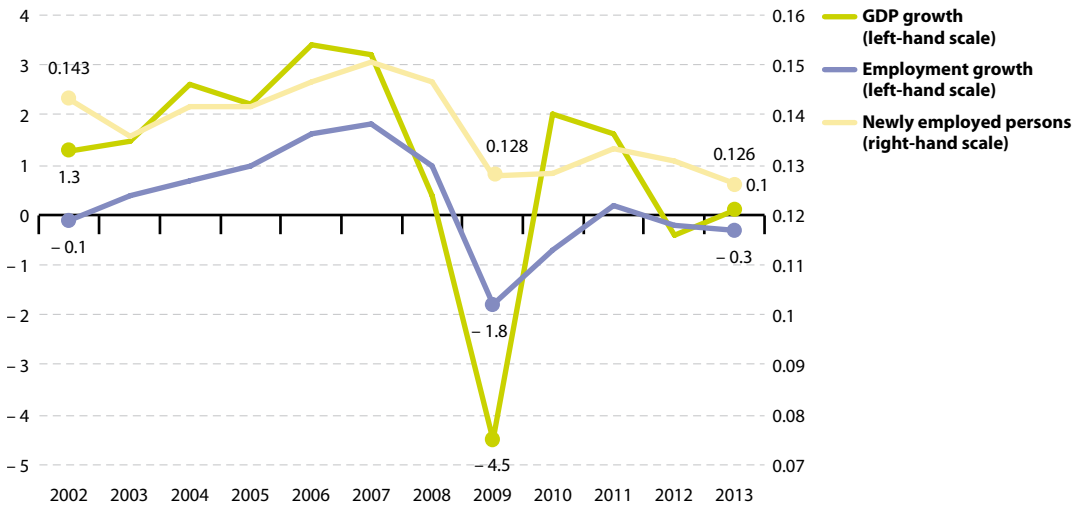
Figure 1.14 shows the share of newly born enterprises in total employment of active enterprises, in terms of number of persons employed in the business economy ([30]). In 2011, employment shares ranged from more than 5 % in Lithuania and Latvia to slightly above 0.7 % in Finland. The EU average stood at 2.5 %, slightly lower than two years earlier.

The green economy as another key source of job creation?

The 'Employment Package' identified the green economy as a key source of job creation in Europe. According to European Commission estimates, the implementation of energy efficiency measures could create or retain two million jobs by 2020 and the development of renewable energy sources could lead to three million jobs by 2020 ([31]). These so-called 'green jobs' cover 'all jobs that depend on the environment or are created, substituted or redefined in the transition process towards a greener economy' ([32]).

Available data on employment in the environmental goods and services sector (EGSS) encompass a set of sectors in the fields of environmental protection (for example waste management) and resource management (for example renewable energy, renewable raw materials and products). As Figure 1.15 shows, employment in the EU eco-industry is estimated to

Figure 1.13: GDP growth, employment growth and newly employed persons, EU-28, 2002–13 (*)
(left-hand scale: GDP growth and employment growth (percentage change over previous period); right-hand scale: newly employed persons (share of persons aged 20–64 whose job started within the past 12 months in total employment))



(*) EU-27 data for newly employed persons for 2005–06.

Source: Eurostat (online data codes: lfsi_grt_a and nama_gdp_k), European Commission services

have risen more or less continuously over the past decade, reaching 4.2 million full-time equivalent positions in 2011. This represents about 2 % of total employment in the EU ([32]).

The economic crisis reversed positive employment trends

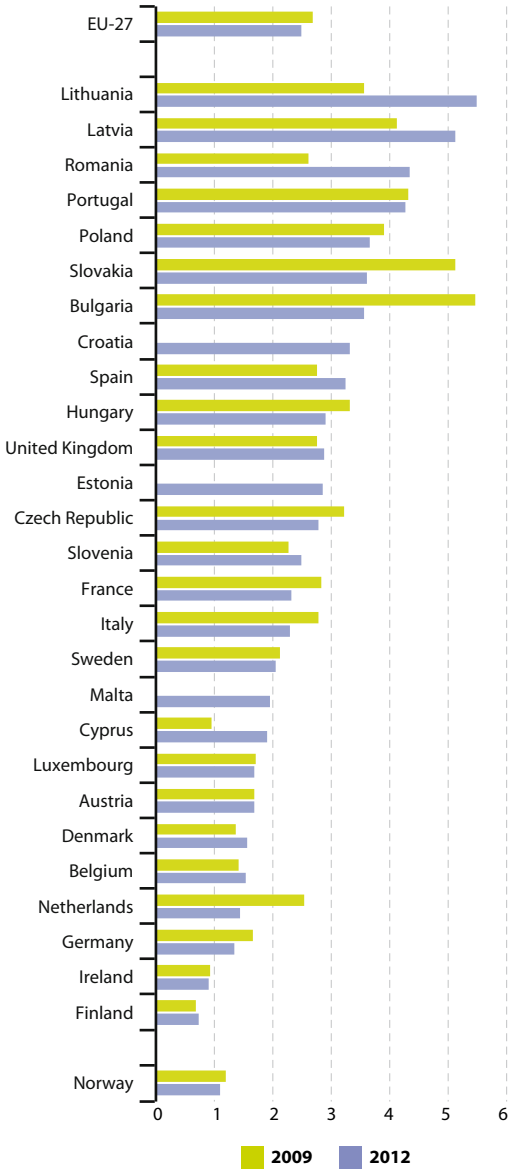
The overall favourable trend observable since the early 2000s in relation to employment and unemployment has been reversed by the economic crisis, with unemployment rates rising to above pre-crisis levels by 2013.

The crisis had a bigger impact on employment in male-dominated sectors, such as construction and manufacturing. This led to men accounting for more than 80 % of the decline in employment between 2008 and 2010 in the EU ([33]).

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 six percentage points, from 65.6 % in 2008 to 59.6 % in 2013. This reflects their generally weaker 'attachment' to the labour market. They are more likely to be in non-permanent contracts (see the analysis on 'temporary contracts', p. 44) and are more vulnerable to 'last-in, first-out' redundancy policies ([34]). In contrast, employment among older people aged 55 to 64, in particular women, has grown continuously from 38.4 % in 2002 to 50.2 % in 2013. Growth in this group has amounted to 4.6 percentage points since the onset of the crisis.

Looking at educational attainment, employment rates for all three subgroups have generally followed the overall EU trend before and after the crisis. People with the lowest education levels, however, were hardest hit, experiencing a 5.6 percentage points fall in their employment rate between 2007 and 2013 (see Figure 1.10). Similarly, migrants were especially affected by the crisis, being among the first to lose their jobs. Since 2008, the employment rate of non-EU nationals aged 20 to 64 has fallen by 6.7 percentage points. In comparison, employment of EU nationals of the same age had fallen by only 1.7 percentage points up to 2013 (see Figure 1.12).

Figure 1.14: Employment share of enterprise births, business economy, by country, 2009 and 2012 (*)
(%)



(*) 2011 data (instead of 2012) for LT and FI; EU-27 data are estimates; the employment share of enterprise births is the number of people employed in the reference period (t) among enterprises newly born in t divided by the number of persons employed in t among the stock of enterprises active in t.

Source: Eurostat (online data code: bd_9bd_sz_cl_r2)

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 addition pool of the work force that could be available to the labour market if the economic situation improves. In the EU, the number of people 'available to work but not seeking' employment has risen by 25.7 % since the onset of the economic crisis, from 2.0 % of the population aged 15 to 74 ([14]) in 2008 to 2.4 % in 2013. This group includes mainly discouraged jobseekers and people prevented from seeking work by personal or family circumstances.

Temporary contracts as adjustment variable for companies during crises

Fluctuations in EU job numbers since the crisis began have been driven mainly by part-time work and temporary contracts. In particular, companies have used temporary contracts to adjust to changes in their labour needs. Employees having these types of contracts have made up the most reactive segment of the labour market since the crisis broke out ([35]).

The proportion of the EU labour force working on a fixed-term contract has risen steadily since 2001. Temporary employment in the EU was most widespread among young people, with 31.4 % of 15 to 29 year olds working on a time-limited contract in 2013. The rate of temporary employment was much lower for 20 to 64 year olds at 12.8 % and for older people aged 55 to 64 at 6.5 % in the same year.

However, some people prefer fixed-term contracts to permanent ones. Therefore, involuntary temporary employment provides a better insight into the overuse of fixed-term contracts.

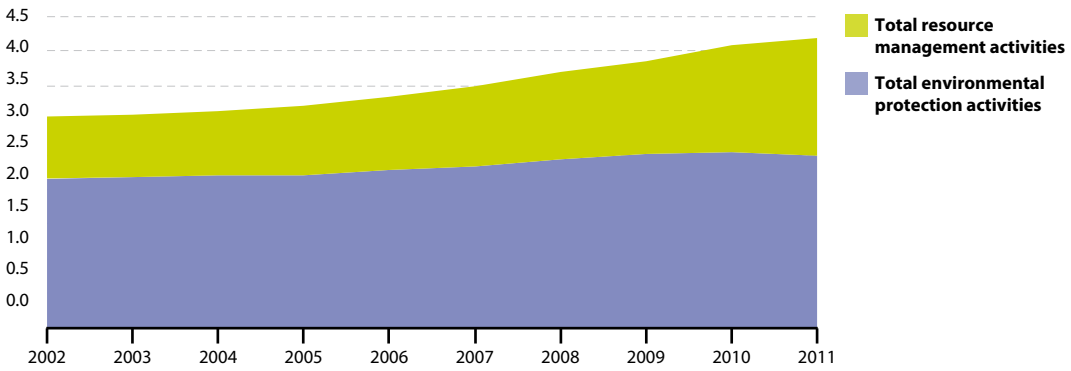
In 2013, 8.4 % of employed 20 to 64 year olds were involuntarily working on temporary contracts. The share was much higher for young people aged 15 to 29, at 14.8 %. Despite some fluctuations, the overall trend since 2001 indicates growing use of involuntary fixed-term contracts.

The rise in temporary contracts and other non-standard forms of employment, in particular for newly created jobs, signals increasing fluidity in the labour market. This is making it easier for firms to adapt labour input to new forms of production and work organisation ([36]).

Job vacancies as an indicator of unmet labour demand

Job vacancy statistics provide an insight into the demand side of the labour market, in particular

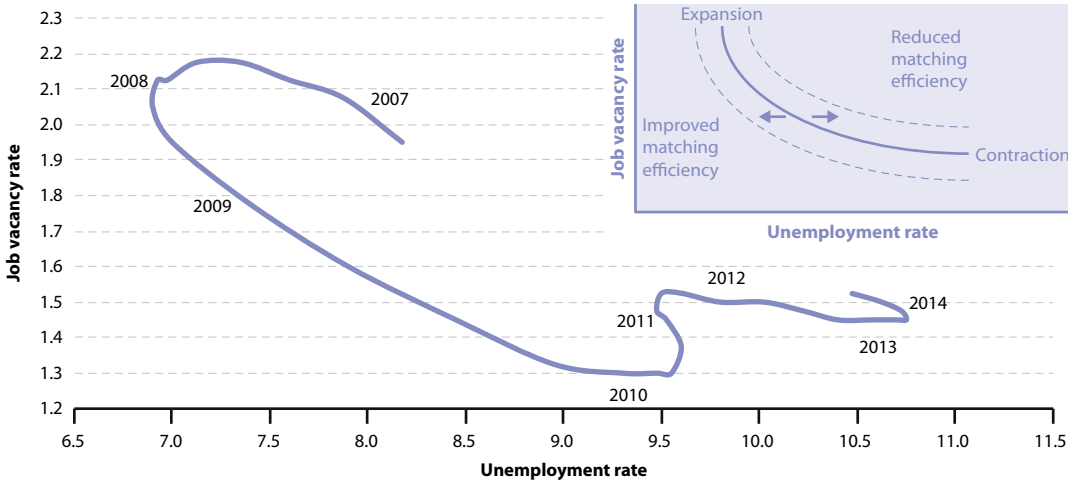
Figure 1.15: Employment in the environmental goods and services sector, EU-28, 2002–11 (*)
(Million full-time equivalent)



(*) Data are estimates.

Source: Eurostat (online data code: env_ac_egss1)

Figure 1.16: Beveridge curve, EU-27, 2006–14 (*)
(%)



(*) EU-28 data for first quarter of 2014; job vacancy data from 2006 to 2008 cover NACE Rev. 1.1 sections A to O; data from 2009 onwards cover NACE Rev. 2 sections B to S; all job vacancy data are provisional.

Source: Eurostat (online data codes: jvs_q_nace2, jvs_q_nace1 and une_rt_q)

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 possibly substantial deterioration in the matching process: unemployment has been growing, while the job vacancy rate has remained 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 over the past years ([37]).

EU policies that address job vacancies aim to improve the functioning of the labour market by trying to match supply and demand more closely (see Box 1.3, p. 39).

Conclusions and outlook towards 2020

Between 2002 and 2008, the EU employment rate for the age group 20 to 64 rose by 3.6 percentage points, from 66.7 % in 2002 to 70.3 % in 2008. Growth was visible throughout different labour groups, such as men, women, older and younger people, high- and low-skilled people and migrants. Older people aged 55 to 64 years showed the strongest growth, starting from a low employment level of 38.1 % in 2002. Similarly, employment rates for women grew faster than for men, reducing the gender employment gap.

Mirroring these trends, unemployment rates declined over 2000 to 2008, with 7.0 % of economically active 15 to 74 year olds unemployed in 2008. However, despite falling considerably by 2.6 percentage points between 2002 and 2008, the unemployment rate of young people aged 15 to 29 was still much higher at 12.0 % in 2008.

As a result of the EU economy shrinking by 4.5 % in 2009 due to the economic crisis, employment levels fell and unemployment in turn rose up to 2013. The fall in employment rates in recent years has most affected young people aged 15 to 29, people with low education levels and non-EU nationals. The unemployment rate of young people aged 15 to 29 increased to 18.7 % in 2013. Similarly, unemployment levels of low-skilled people have increased by 7.6 percentage points since 2007, reaching 19.1 % in 2013. Low-educated young people are clearly the worst off, with their unemployment rate climbing to 29.9 % in 2013, which is 10 percentage points higher than in 2007.

Additionally, the economic crisis has prompted more and more people to drop out of the labour market, meaning they are no longer included in unemployment statistics. Since 2008, the number of people that would be available to work but are not seeking employment has risen by 25.7 %.

Temporary contracts are one reason why young people are more vulnerable to economic disruptions. Fluctuations in EU job numbers since the crisis have been mainly driven by part-time work and fixed-term contracts. In 2013, 31.4 % of 15 to 29 year olds worked on time-limited contracts, although almost half (47.2 %) wanted a permanent contract. Also, data on job vacancies point to a possible deterioration in the job matching process, with unemployment rising while job vacancies have remained stable and, recently, have started rising again.

The economic crisis thus highlighted some of the most vulnerable groups (young people, migrants, low-skilled) that need to be addressed in view of the Europe 2020 strategy's 'inclusive growth' priority. In addition, women, especially those aged 55 to 64 years, and older people in general still have considerably lower employment rates than other groups. Boosting employment within these groups is considered necessary for making progress towards the overall EU and national employment targets ([38]).

Additionally, 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, low fertility rates combined with continuous rises in life expectancy are predicted to lead to a shrinking EU labour force. Increases in the employment rate are therefore necessary to compensate for the expected decline in the working-age population by 3.5 million people by 2020.

Efforts needed to meet the Europe 2020 target on employment

Overall, in 2013 the EU was 6.6 percentage points below its 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. 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 ([38]). To reach the 75 % target an extra 16 million people would need to enter employment, taking into account the expected working-age population in 2020. While a large share of young and well-educated people will be available to work (also see the chapter 'Education' on p. 103), achieving the EU target will require greater use of the potential labour force, including women, older people and so far inactive adults such as migrants ([38]).

Notes

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

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

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

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

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

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

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

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

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

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

(12) 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).

(13) João Medeiros & Paul Minty, *Analytical support in the setting of EU employment rate targets for 2020*, Working Paper 1/2012, Brussels: European Commission (Directorate-General for Employment, Social Affairs & Inclusion), 2012 (p. 15).

(14) 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).

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

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

(17) Please 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.

(18) EUROPOP2013 main scenario; see http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/proj_13n_esms.htm.

(19) Eurostat, *EU Labour Force Survey — explanatory notes*, Luxembourg, 2011 (p. 80).

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

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

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

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

(24) European Commission, *Towards a job-rich recovery*, COM(2012) 173 final, Strasbourg, 2012 (p. 13).

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

(26) 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, Brussels, 2010 (p. 3f).

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

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

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

(30) NACE Rev. 2 code B-N_X_K642: Business economy except activities of holding companies.

(31) European Commission, *Towards a job-rich recovery*, COM(2012) 173 final, Strasbourg, 2012 (p. 5).

(32) European Commission, *Green jobs: employment potential and challenges* (accessed 11 July 2014).

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

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

(35) European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2012*, Publications Office of the European Union, Luxembourg, 2012 (p. 31).

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

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

(38) European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, Brussels, 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. Investment in R&D and innovation, by fostering an increase or substantial improvement in the quality of innovative goods and services, contributes to the strategy's smart growth objective, creating jobs and addressing societal challenges. By paving the way towards increased industrial competitiveness, labour productivity and the efficient use of resources, they are also at the heart of sustainable growth.

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 that makes it easier for great ideas to be turned into products and services.

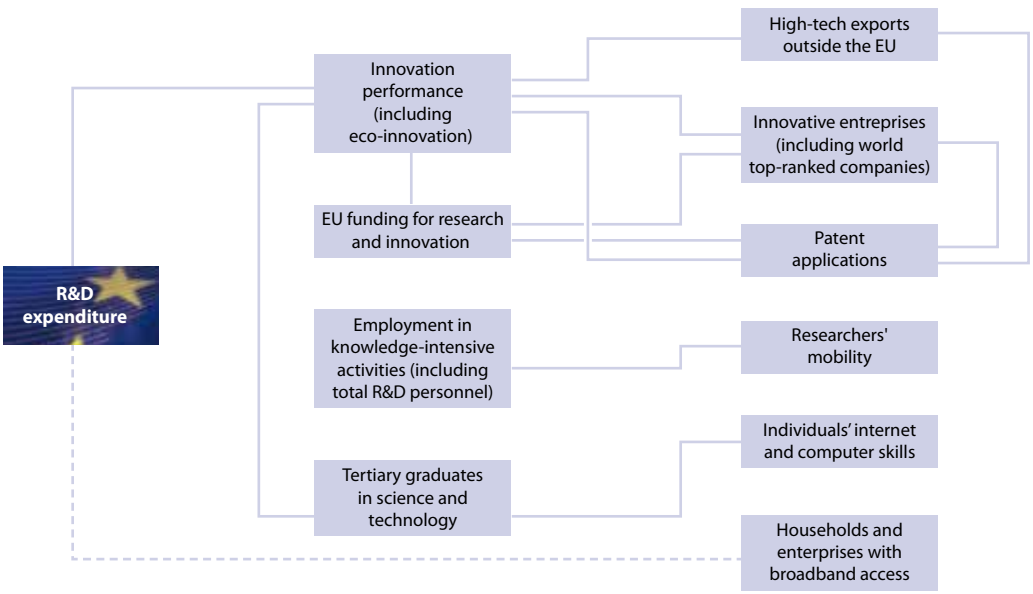
R&D and innovation contribute to a well-functioning, knowledge-based economy. The well-being of the EU population also depends on scientific and technical solutions being found to global societal challenges such as climate change and clean energy, security, and active and healthy ageing.

The analysis in this chapter benchmarks the EU average against the performance of individual Member States and — whenever data are available — against countries of the European Free Trade Association (EFTA) and EU candidate countries. It is based on the headline indicator 'Gross

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]).

Figure 2.1: Indicators and concepts presented in this chapter and their links to the headline indicator on the R&D target





domestic expenditure on R&D', which monitors the strategy's research and development target. The headline indicator is complemented with other contextual indicators. These present a broader picture, looking into potential drivers behind the changes in the headline indicator and the impacts of the EU's expenditure on its R&D and innovation performance.

The analysis first sheds light on fundamental enabling factors that drive innovation. These are the first link in the innovation chain and include R&D investment by EU Member States and the way it is financed by the various public and private societal actors. The role of education, in particular higher education, in providing the necessary science and technology skills and workforce is also highlighted.

This is followed by a look at the EU's performance concerning business frontrunners, their innovative capacity, including in 'green' domains, and the technological output at the end of the innovation chain in terms of commercialisation and the relevance for societal challenges.

The analysis closes by comparing the EU's position with that of global competitors such as the United States, Japan, South Korea and China.

R&D and innovation are major drivers of economic growth, competitiveness and employment in a knowledge-based economy. Public investment generates the knowledge base and talent that innovative companies need. It also leverages investment in research and innovation. These are all crucial to fulfilling the ambitions of the Europe 2020 strategy ([3]).

The EU's R&D target has a mutually beneficial relationship with the strategy's tertiary educational attainment and employment targets (see chapters on 'Employment' on p. 25 and 'Education' on p. 103). On the one hand, the attainment of new skills feeds the development of academic knowledge and innovative products. On the other, greater investment in R&D provides new jobs in business and academia, increasing demand for scientists and researchers in the labour market. Moreover, increased investment in education and skills development, as well as a rise in the output of tertiary education graduates, improves the skills base of the EU labour force and, therefore, its employability.

A competitive and innovative knowledge-based economy relies strongly on its human capital. R&D investment and the Europe 2020's tertiary education target are closely interlinked. Mutual benefits also exist between the strategy's targets on R&D and on climate change and energy when taking into account the future potential of innovative new products and processes to tackle these societal challenges (see the chapter on 'Climate change and energy', p. 81).

How much is the EU investing in R&D?

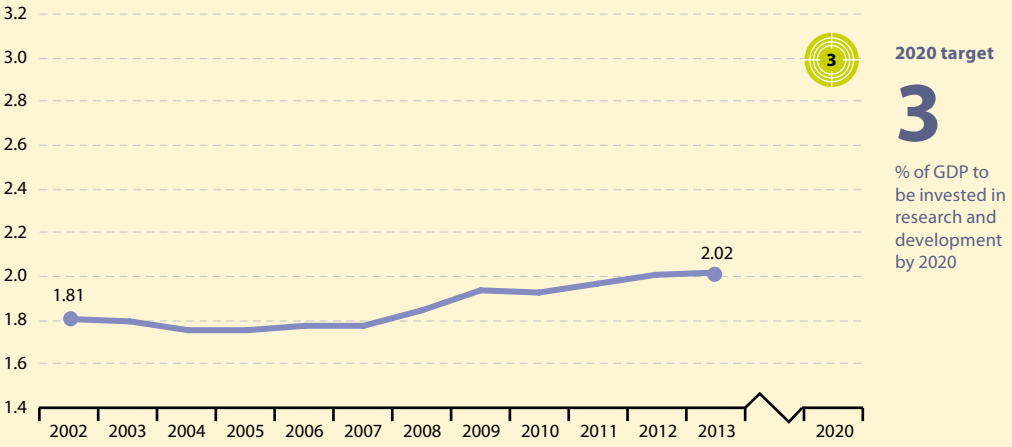
The headline indicator 'gross domestic expenditure on R&D' shows the proportion of GDP dedicated to research and development ([4]). It is also referred to as 'R&D intensity' and reflects the extent of research and innovation undertaken in a country in terms of resources input.

Figure 2.2 shows a relative stagnation of gross domestic expenditure on R&D at around 1.77 % of gross domestic product (GDP) for the period 2004 to 2007. At the onset of the economic crisis, R&D intensity increased to 1.94 % in 2009 and has continued to grow marginally since 2011, reaching 2.02 % in 2013. The reasons for the increase between 2007 and 2009 include GDP falling more rapidly than overall R&D expenditure ([5]) and the actions taken by individual EU Member States to step up public R&D investment. In 2009 many Member States sustained nominal growth in public R&D expenditure to counter the impacts of the crisis on private investment ([6]).

EUROPE 2020 HEADLINE INDICATOR

Europe 2020 headline indicator

Figure 2.2: Gross domestic expenditure on R&D (R&D intensity), EU-28, 2002–13 (*)
(% of GDP)



(*) Data for 2002–03 and 2013 are estimates.

Source: Eurostat (online data code: t2020_20)

Member States stepping up spending on R&D

Figure 2.3 shows a rather varied picture of EU Member States' R&D expenditure as a percentage of GDP. In 2013 R&D expenditure ranged from 0.48 % to 3.32 % across the EU. Northern European countries such as Finland and Sweden not only share a pattern of high expenditure, they also have the most ambitious national targets. In 2013, Denmark achieved its national target of 3 % and Germany came very close to meeting its target. Countries with lower R&D expenditure levels, below 1 %, were mostly in Eastern and Southern Europe, for instance Romania, Bulgaria, Cyprus, Malta and Greece. Of these countries, Cyprus came closest to its national target.

The financial crisis and its adverse impact on GDP growth in the following years, along with an increase in nominal government spending on R&D, led to an increase in R&D intensity in most Member States (with the exception of some countries including Croatia, Luxembourg, Portugal, the United Kingdom and Sweden). Germany has experienced the fastest growth, exceeding the EU average since 2011 ([7]). The analysis showed that the European Commission and individual Member States put R&D investment high on the agenda for combating the crisis.

Private R&D investment remains the largest source of expenditure

Expenditure on R&D is split into four institutional sectors: government, business enterprise, higher education and the private non-profit sector (see Box 2.1, p. 54). The two sectors with the highest expenditure on R&D in Europe have been the business enterprise sector, which made up 63.8 % (EUR 174.4 billion), and the higher education sector, which made up 23.2 % (EUR 63.4 billion) of total R&D expenditure in 2013. With a more

modest 12.2 % (EUR 33.4 billion), the government sector plays an important role, especially in terms of the long-term stability of R&D expenditure. The importance of the private non-profit sector is negligible, spending less than 1 % of the total (EUR 2.3 billion).

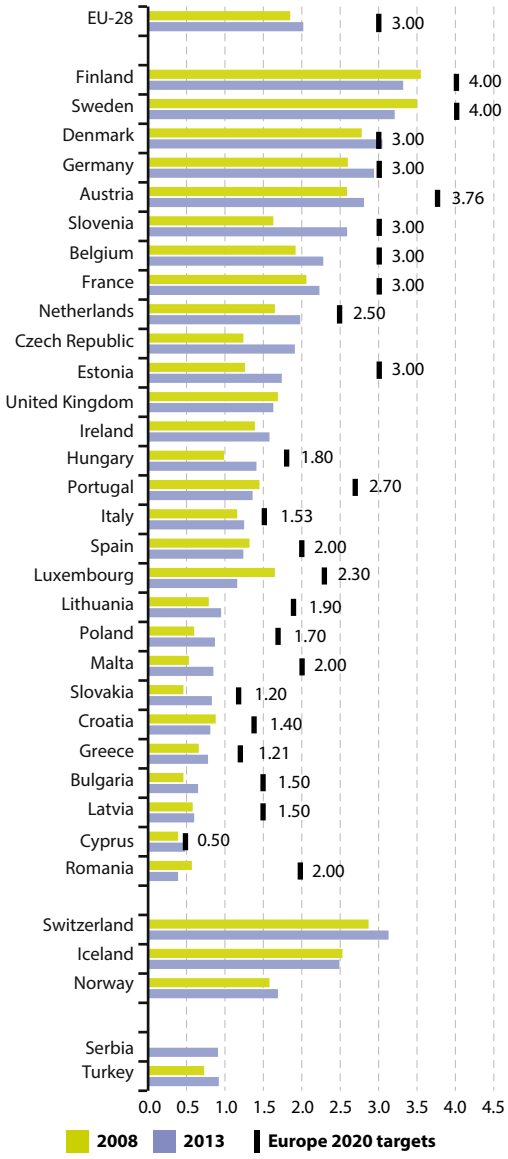
Between 2002 and 2013, expenditure grew almost constantly across all sectors in absolute terms at the European level (see Figure 2.5 and Table 2.1). The higher education sector grew the fastest by 52.4 %, followed by the business and government sectors by 46.2 % and 37.2 % respectively. The private non-profit sector grew by 41.7 % over the period but experienced ups and downs along the way.

When the financial and economic crisis hit Europe in 2008, some EU Member States such as Germany, Austria and the Nordic countries boosted public R&D expenditure to stimulate economic growth and encourage private R&D investment, which remains the largest source of R&D expenditure ([8]). Government-sector R&D expenditure grew by about 2.7 % between 2008 and 2009 (see Figure 2.5 and Table 2.1). It continued to grow further in spite of the crisis, though at a slower pace than in most of the pre-crisis years. The same applied for higher-education expenditure, which grew by 3.1 % between 2008 and 2009 and continued to rise after the onset of crisis.

In comparison, R&D expenditure by the business sector fell by 3.4 % between 2008 and 2009. During an economic crisis businesses usually decrease their R&D expenditure (see next section). However, R&D spending actually started to rise again after 2009, with growth rates of 4.2 % and 7.4 % in 2010 and 2011 and more moderate rates of 4.3 % and 1.9 % in 2012 and 2013 respectively. These rates were still below pre-crisis levels of 7.9 % in 2006 and 6.5 % in 2007.

In some countries (Poland, Romania, Slovakia, Croatia, Lithuania, Latvia, Cyprus and Greece), R&D effort relies predominantly on the public sector (higher education and government). This indicates conditions for business R&D investment are still insufficiently attractive ([9]). Private non-profit sector trends show a succession of ups and downs.

Figure 2.3: Gross domestic expenditure on R&D (R&D intensity), by country, 2008 and 2013 (*)
(% of GDP)



(*) 2011 data (instead of 2013) for IS, 2012 data (instead of 2013) for IE, CH, RS and TR; 2008 data are estimates for EL, AT, SE and UK, 2013 data are estimates or provisional for all countries except HR, HU, PL, RO, SK and FI; break in series for FR (2010) and for NL, RO, SI and IS (2011).

National targets: CZ: 1 % (public sector only), IE: approximately 2 % (2.5 % of GNP), LU: 2.3–2.6 %, PT: 2.7–3.3 %, UK: no target.

Source: Eurostat (online data code: t2020_20)

The role of anti-cyclic public R&D investment policy

In general, private investment — including R&D expenditure — typically follows cyclical patterns with regard to GDP growth. In contrast, growth in public or government-financed R&D investment usually experiences counter-cyclical trends. During the economic crisis in 2008–09, the European Commission and EU Member States took concerted action to increase public R&D investment, not just to stimulate economic growth but also to encourage private R&D investment. As a result, the disparities in R&D investment rose in the EU during the crisis.

Box 2.1: The EU R&D sector in a snapshot

In the EU, R&D activities are carried out by four main institutional sectors:

Business enterprise sector: 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 institutes that mainly serve them.

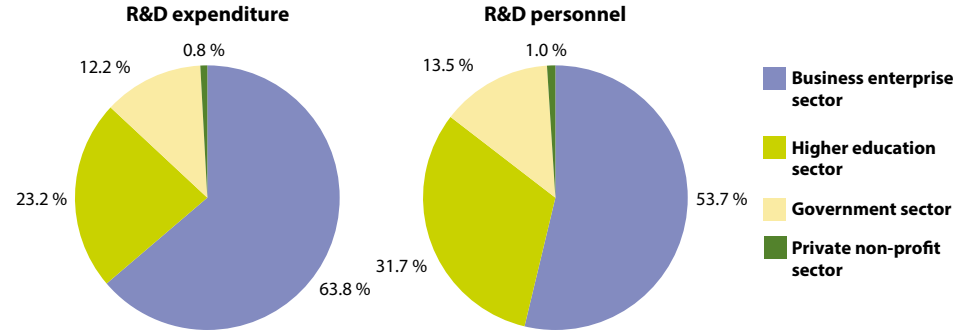
Government sector: all departments, offices and other bodies that furnish but normally do not sell to the community those common services, other than higher education, that cannot otherwise be conveniently and economically provided, and which administer the state and the economic and social policy of the community. It also includes non-profit institutes controlled and mainly financed by government. Public enterprises are included in the business enterprise sector.

Higher education sector: 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.

Private non-profit sector: non-market, private non-profit institutions serving households (the general public); private individuals or households ([10]).

Figure 2.4 shows the distribution of R&D expenditure and employment between these four sectors in the EU in 2013.

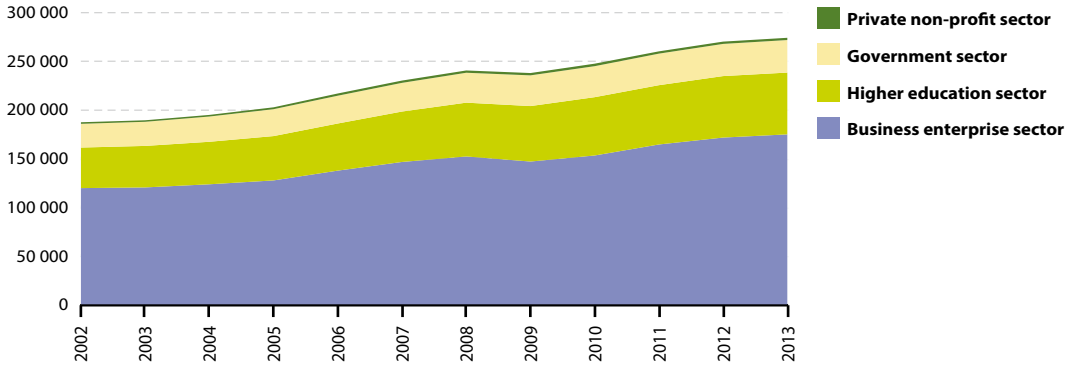
Figure 2.4: R&D expenditure and personnel, by sectors of performance, EU-28, 2013 (*) (%)



(*) Data for business enterprise sector and private non-profit sector are estimates.

Source: Eurostat (online data codes: rd_e_gerdtot and rd_p_persocc)

Figure 2.5: Gross domestic expenditure on R&D, by sectors of performance, EU-28, 2002–13 (*)
(EUR million)



(*) Data for private non-profit sector are estimates (whole time series); data for 2002–2003 and 2008–2010 are estimates (all other sectors); 2012 data for government sector are estimates, 2013 data for business enterprise sector are estimates.

Source: Eurostat (online data code: rd_e_gerdtot)

Table 2.1: Gross domestic expenditure on R&D, by sectors of performance, EU-28, 2002–13 (*)
(% change over previous year)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
All sectors	4.2	1.1	2.9	4.0	7.0	6.1	4.5	– 1.1	4.1	5.1	3.9	1.5
Business enterprise sector	2.9	0.6	2.7	3.2	7.9	6.5	3.9	– 3.4	4.2	7.4	4.3	1.9
Government sector	2.8	1.7	4.7	6.5	3.3	3.2	4.3	2.7	0.9	1.8	2.0	1.1
Higher education sector	8.1	2.3	2.4	4.3	6.3	7.0	6.7	3.1	5.1	1.7	3.7	0.5
Private non-profit sector	24.2	– 4.7	7.2	15.2	18.7	3.2	– 0.2	1.2	8.2	– 8.8	0.7	– 2.0

(*) Data for private non-profit sector are estimates; data for 2002–03 and 2008–10 are estimates (all sectors); 2012 data for government sector are estimates; 2013 data for business enterprise sector are estimates.

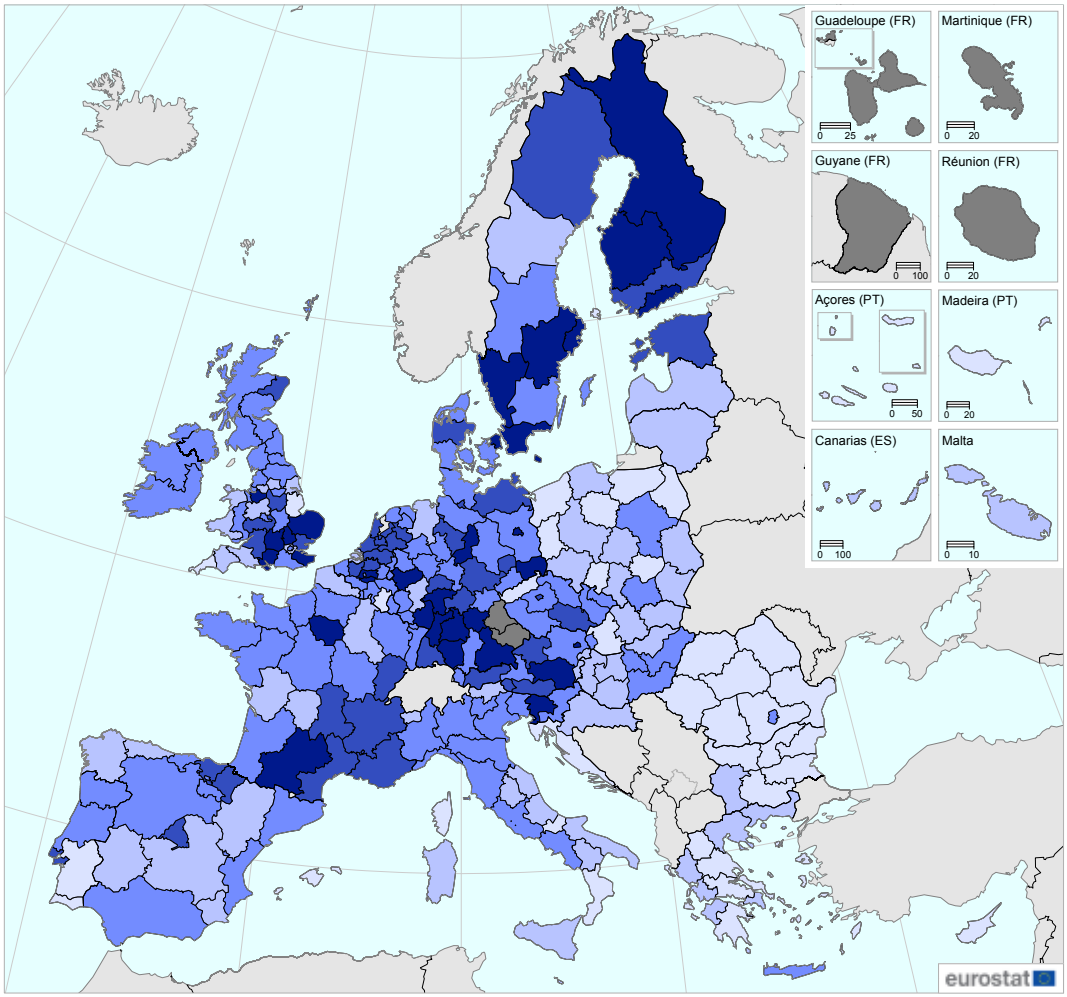
Source: Eurostat (online data code: rd_e_gerdtot)

Despite severe budgetary constraints, government R&D funding grew faster (or decreased less) than GDP during the crisis in half of the EU Member States: Malta, Luxembourg, Estonia, the Czech Republic, Denmark, Germany, Austria, Croatia, Slovenia, Poland, Cyprus, Finland, Sweden and Portugal. In some countries direct government R&D funding complemented efforts by providing indirect support through tax incentives. This was particularly the case in France, Portugal, Ireland, the Netherlands, Austria, Denmark, Italy and Slovakia. In the remaining countries (mostly with low government R&D budgets), government R&D budgets grew much more slowly than GDP. However, the situation differs widely across countries. Efforts to preserve government R&D investment have been strongest in Estonia, Slovakia, Luxembourg, Portugal and Germany since 2007 ([11]).

R&D intensity concentrated in regions in Germany, the United Kingdom and some Nordic countries

When analysing R&D intensity by region (see Map 2.1), a high level of R&D spending can be seen in 32 of the NUTS 2 regions in Germany (11 regions), Sweden (four) and Finland (three), followed by regions in Belgium, France and Austria

Map 2.1: Gross domestic expenditure on R&D, by NUTS 2 regions, 2011 (*)
(% of ESA 95 based GDP) (**)

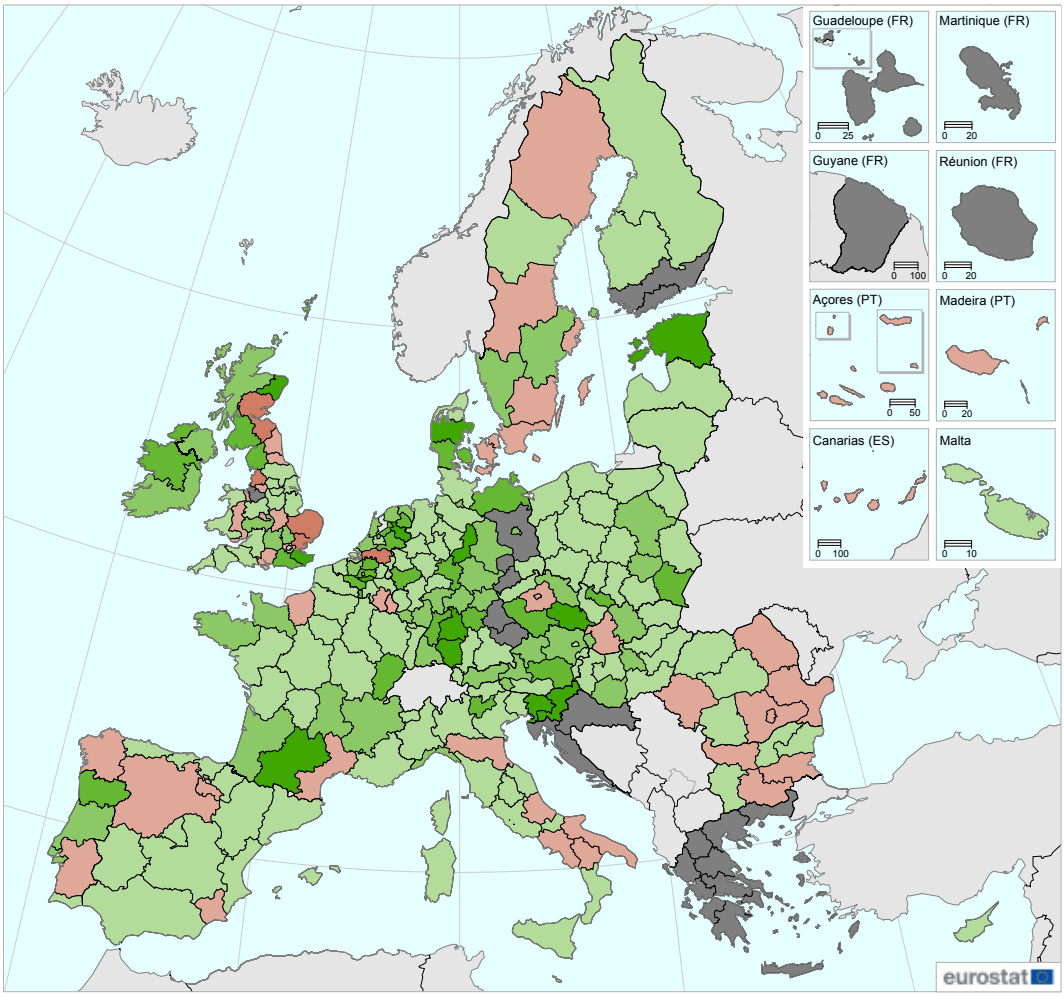


(*) Data for IE and NL are estimates.

(**) GDP data in this map are based on the ESA 95 methodological framework, as at the time of producing this map the Eurostat database was still in the process of transition to national accounts data compiled on the upgraded methodological framework ESA 2010.

Source: Eurostat (online data code: rd_e_gerdreg)

Map 2.2: Change in gross domestic expenditure on R&D, by NUTS 2 regions, 2007–11 (*)
(percentage points difference between 2011 and 2007, % of ESA 95 based GDP) (**)



(*) 2008 instead of 2007 data for HR, 2009 instead of 2007 data for FI (Helsinki-Uusimaa and Etelä-Suomi); 2007 data are estimates for LU, NL and UK, 2011 data are estimates for IE and NL; 2008 break in series for PT, 2011 break in series for NL and SI; 2007 and 2011 definition differs for HU (Észak-Alföld), 2007 definition differs for SE.

(**) GDP data in this map are based on the ESA 95 methodological framework, as at the time of producing this map the Eurostat database was still in the process of transition to national accounts data compiled on the upgraded methodological framework ESA 2010.

Source: Eurostat (online data code: rd_e_gerdreg)

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

Horizon 2020 is the current EU research and innovation programme. It follows up on the previous EU research framework programmes, which were implemented in 1984 and provided funding for a total of almost EUR 120 000 million of wide-ranging research projects up to 2013 ([12]).

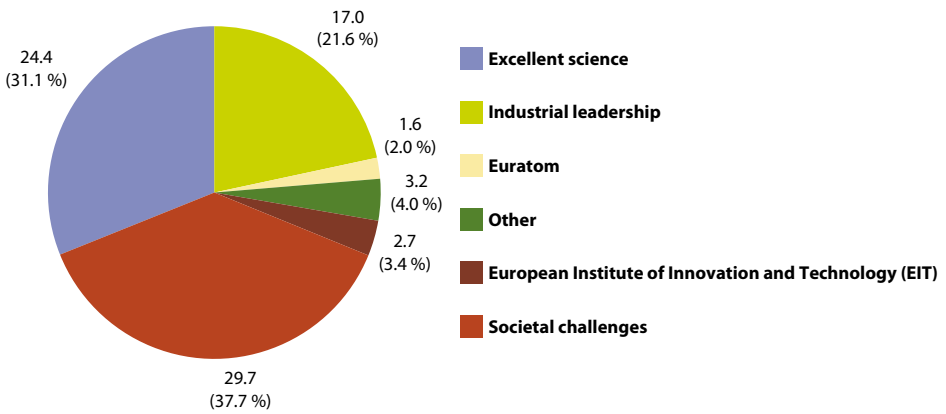
With EUR 78.6 billion ([13]) of funding available for the seven-year period from 2014 to 2020, Horizon 2020 is the financial instrument implementing the 'Innovation Union' in the EU. It focuses on three priorities ([14]):

- 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 ambitions for smart, sustainable and inclusive growth and jobs. The goal is to ensure that Europe 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, 37.7 %, representing EUR 29.7 billion, is devoted to tackling societal challenges in the field of environment (including climate change), energy, transport, health and demographic changes, and security. Almost one-third (31.1 %) of the budget is allocated to bringing about excellence in science, namely through the European Research Council. Another 21.6 % are 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 Euratom — the research funding programme for the peaceful use of nuclear energy in the EU — receive 3.4 % and 2.0 % of the funding respectively.

Figure 2.6: Horizon 2020 budget breakdown
(EUR billion)



Source: European Commission, DG RTD, Factsheet: Horizon 2020 budget



(two regions each), and Denmark and Slovenia (one region each). Altogether these regions were responsible for 44.1 % of the EU's total R&D expenditure in 2011. Some research-intensive 'clusters' also become apparent in this group, particularly in southern Germany, the French Midi-Pyrénées region and the Cheshire and East Anglia regions in the United Kingdom. All of these clusters are far exceeding the 3 % target the EU set itself for 2020 with shares comprised between 7.7 % and 5.0 %. Though, the most remarkable share is in Belgian's Brabant Wallon province, with 8.9 % of GDP spent on R&D.

At the other end of the scale, the 44 regions with R&D intensity below 0.5 % of GDP mainly belong to southern or central European countries: Greece, Romania and Poland (seven 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 EU Member States. In addition, in 17 countries, the capital regions' R&D intensity exceeded the national average but was not necessarily the highest in the country. Only the United Kingdom and Belgium clearly bucked this trend, while in Ireland and the Netherlands the capital regions and national averages were very close. Those multi-regional Member States such as Bulgaria, Ireland, Greece, Croatia, Hungary, Romania and Slovakia, with relatively low national R&D intensities also experienced a narrow range of regional R&D intensities.

Changes in R&D intensity over time are highlighted in Map 2.2. Of the 244 regions for which data is available, 51 experienced a decline in R&D intensity between 2007 and 2011. This decline was below one percentage point in all regions except in Essex and Lancashire in the United Kingdom. Intensity in these two regions dropped by more than two percentage points. In five regions, including Brussels, one region from Italy and the United Kingdom, and two regions from Bulgaria, the decline was marginal, at just 0.01 percentage points. Three regions remained unchanged: Dresden in Germany, Calabria in Italy and Gloucestershire in the United Kingdom. In the remaining 190 regions, R&D intensity increased by between 0.01 percentage points (Koblenz, Umbria and Wien) and 1.44 percentage points (Belgian Brabant Wallon). The increase was below one percentage point, except in four regions.

While EU funding seeks to target all regions, an innovation divide across Europe's regions remains. There appears to be a regional innovation paradox, 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 efforts to target these regions for funding and policy prescriptions (see about EU funding in Box 2.2 and Figure 2.6) ([15]).

How the EU strengthens its human capital and knowledge base

Current skill mismatches are a threat to Europe's innovation capacity at a time of increasing technological needs (also see chapters on Employment on p. 25 and Education on p. 103). Demand in Europe for highly qualified people is predicted to rise by almost 16 million in the period up to 2020 ([16]). In particular the stock of human resources such as scientists, researchers and engineers, is insufficient ([17]), a situation which Horizon 2020 and the European Research Area (ERA) initiative attempt to improve by supporting researchers' careers and mobility and further facilitate the entry and stay of third-country researchers ([18]).

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 % ([19]).

Businesses and higher education institutions can work together to share knowledge. In particular, close and effective links between education, research and innovation will stimulate the development of entrepreneurial, creative and innovative skills in all disciplines. It will also promote innovation in higher education through more interactive learning environments and increased knowledge exchange, and contribute ultimately to growth and job creation ([20]).

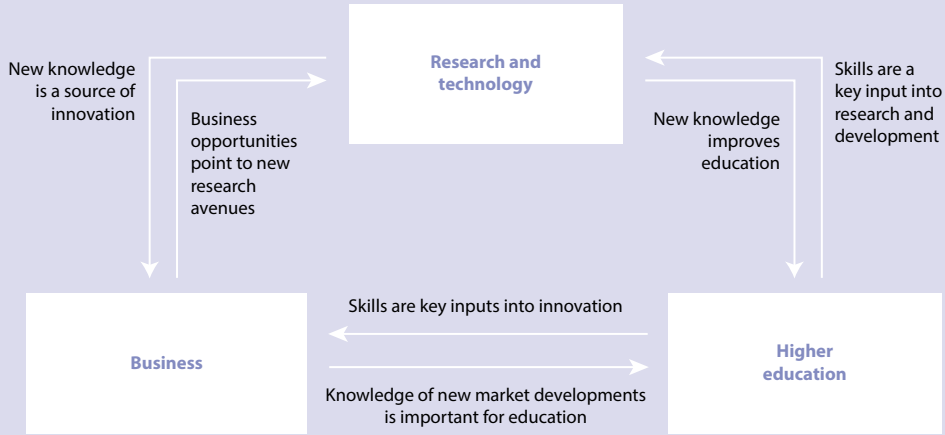
The number of science graduates in the EU is increasing...

In line with Europe'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.

In spite of some weaknesses with science teaching in some Member States, and the still too limited number of girls taking science to an advanced level, Europe has a good basic education system ([21]). As a result, an ever-increasing number of the EU population are graduating from tertiary education in science and technology. Figure 2.7 shows how this trend has developed over the past

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

Education is the ultimate means of building up human capital and is strongly linked to the concepts of research and innovation. These three concepts, which are central drivers of a knowledge-based society, form the so-called knowledge triangle ([22]). 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, see Box 2.4), education, research and innovation need to develop strong links with each other.



decade. Between 2008 and 2012, the number of tertiary graduates in science and technology grew by 17.9 %, from 14.5 graduates per 1 000 inhabitants in 2008 to 17.1 graduates per 1 000 inhabitants in 2012.

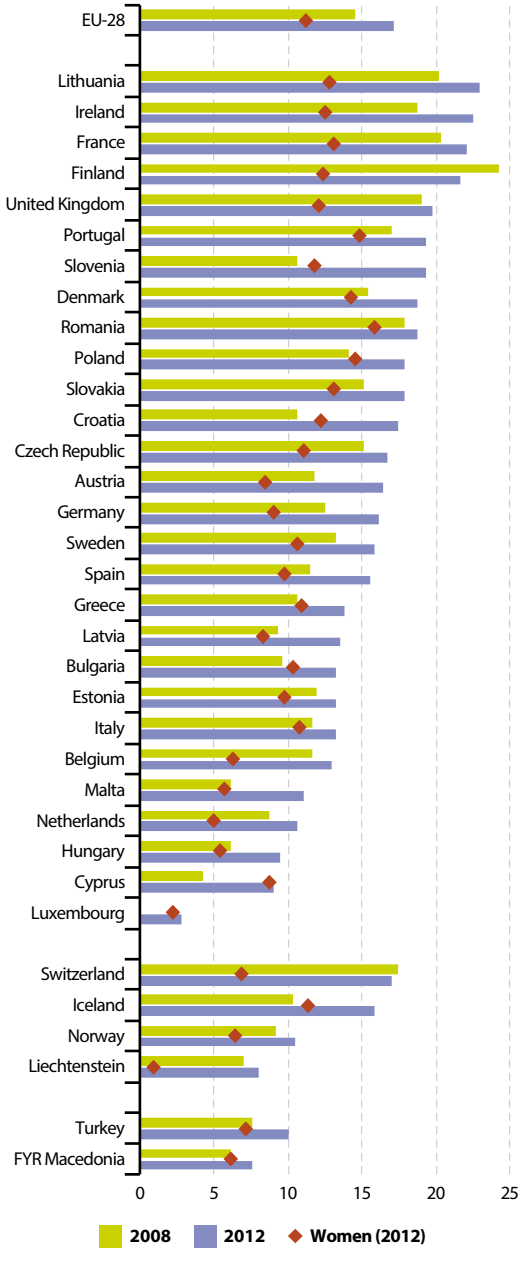
This trend varies considerably across EU Member States (see Figure 2.7). In 2012, the number of science and technology graduates ranged from about 23 per 1 000 inhabitants in Lithuania to 9 per 1 000 inhabitants in Cyprus (Luxembourg being an exception with only 2.8 per 1 000 inhabitants) ([23]). This gap has serious implications for labour mobility and the notion of an open EU labour market (see Box 2.4). All countries except Finland have increased their graduation from tertiary education rates since 2008. Between 2008 and 2012, Cyprus more than doubled its tertiary graduate rate, while the rate grew by more than 50 % in Hungary, Croatia, Slovenia and Malta.

...but gender differences remain

Empowering women in tertiary education and enhancing their employment opportunities in the R&D sector is also an important issue for the EU. However, gender equality relies heavily on many factors such as R&D innovation systems, the importance of science to the national economy, the features of the labour market and equality policies.

Starting from a modest level of 9.6 graduates per 1 000 inhabitants in 2008, the share of female tertiary graduates grew faster than the growth of males in science and technology graduates until 2012. This trend could in future help address the current underrepresentation of women in science and research careers and PhD positions. It could also mean the trend of men outnumbering women in employment of researchers might be reversed. Currently, men account for 67 % ([24]) of research positions, 51 % of PhD students and 54 % of graduates. However, women are much less likely to reach a top-level ([25]) position in research than men and progress has been slow ([26]). For example, in 2010 only 20 % of women held a top-level position.

Figure 2.7 Tertiary graduates in science and technology, by country, 2008 and 2012 (*)
(Graduates per 1 000 inhabitants, 20 to 29 years old)



(*) 2011 data (instead of 2012) for FR; definition differs for IT (2008) and EU-28 (2012).

Source: Eurostat (online data code: tps00188)

How is the EU performing with regard to employment in knowledge-intensive activities?

As outlined earlier, Europe has been improving its academic tertiary education output. In addition, many countries have put in place national measures intended to attract a highly qualified workforce and human resources to science and research, including women ([27]).

In the EU, the number of people employed in knowledge-intensive activities as a share of total employment increased slightly from 34.0 % in 2008 to 35.6 % in 2012. However, the picture across Members States is rather mixed, as shown in

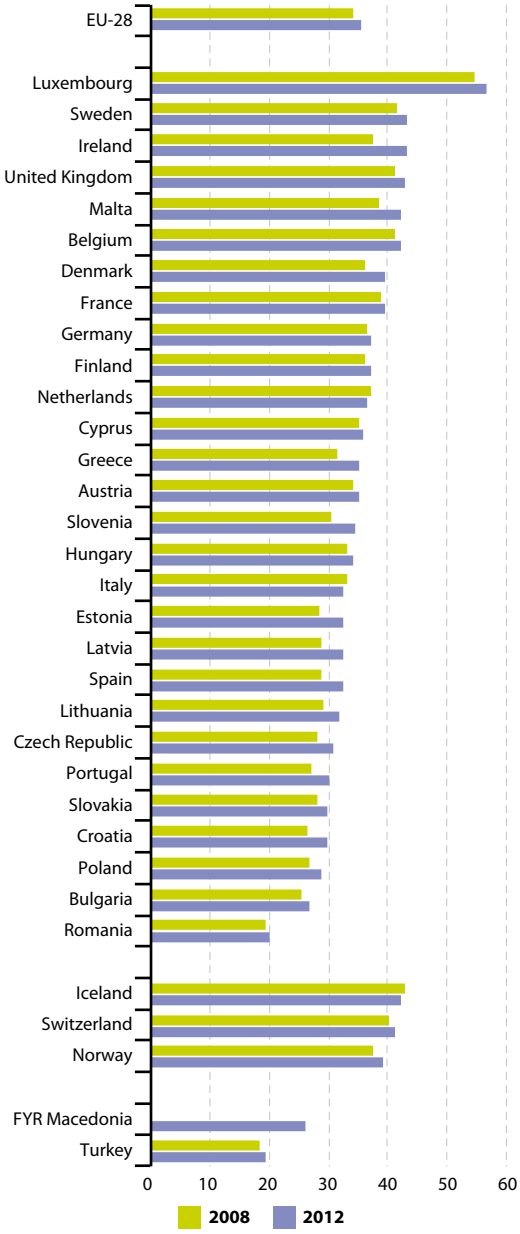
Box 2.4: An open labour market for researchers is an essential factor for the completion of a European Research Area ([28])

The constrained mobility of European researchers within EU borders and Europe's relative attractiveness to researchers from other parts of the world are breaks to the so-called 'Fifth Freedom' ([29]), that is the free movement of knowledge. Promoting mobility across institutions, disciplines, countries and sectors for opening up and connecting EU research systems, is the objective of the ERA ([30]) reform agenda which focuses on five key priorities:

- More effective national research systems.
- Optimal transnational co-operation and competition.
- An open labour market for researchers.
- Gender equality and gender mainstreaming in research.
- Optimal circulation and transfer of scientific knowledge, including via digital means.

Together, the EU Member States, the European Commission and Research Organisations should ensure the completion of the ERA by 2014.

Figure 2.8: Employment in knowledge-intensive activities, by country, 2008 and 2012 (*)
(% of total employment)



(*) 2009 data (instead of 2008) for TR.

Source: Eurostat (online data code: htec_kia_emp2)

Figure 2.8. While in 2012 Romania (20 %), Bulgaria (26.9 %) and Poland (28.9 %) showed the lowest percentages, Luxembourg (56.6 %), Sweden (43.3 %) and Ireland (43.2 %) had the highest.

As a general trend, between 2008 and 2012, employment in knowledge-intensive activities increased in almost all EU Member States, demonstrating that the EU is moving towards a more knowledge-based economy. Countries making substantial progress were Ireland (5.7 percentage points), followed by Estonia, Latvia, Spain, Slovenia, Greece, Malta, Croatia, Denmark and Portugal. All of these have been experiencing a period of continuous expansion of employment in knowledge-intensive activities of 3.0 to 4.2 percentage points. However, there were falls in the Netherlands (– 0.9 percentage points) and Italy (– 0.4 percentage points).

In 2012, the share of women employed in knowledge-intensive activities exceeded that of men in all countries, making up 43.6 % of total EU employment in that sector. However, only 13.1 % of women were employed in EU knowledge-intensive business enterprises, highlighting the need for more efforts towards gender mainstreaming.

At the EU level, the stock of R&D personnel — including researchers and other staff employed directly in R&D — constituted 1.22 % of total employment in 2012, translating into more than 2.6 million full-time equivalent positions. More than a half of the R&D personnel (53.0 %) were employed in the business enterprise sector (see also Figure 2.4).

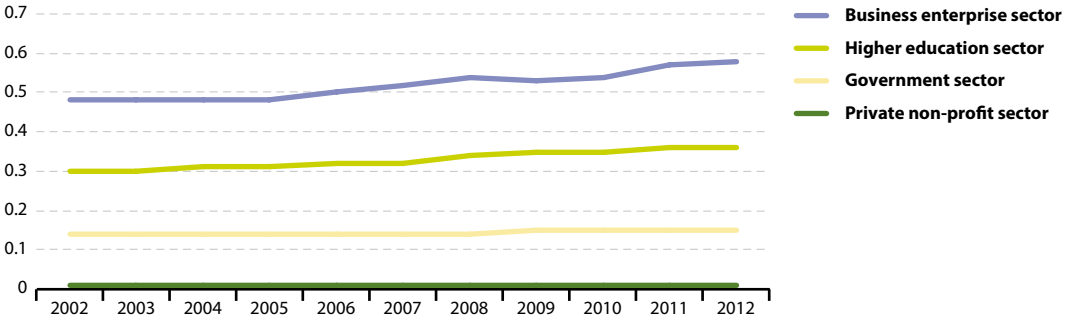
Between 2002 and 2012 the share of R&D personnel in the labour force increased by 0.18 percentage points, from 0.92 % to 1.10 %. As shown in Figure 2.9, this trend was supported by growth in three of the four institutional sectors. However, the rate of growth was quite different between the sectors. The business enterprise sector grew by 0.1 percentage points between 2002 and 2012, followed by the higher education sector which grew by 0.06 percentage points over the same period. The government sector increased by only 0.01 percentage points; the private non-profit sector remained stable at 0.01 %.

Around one-third of EU researchers have been mobile

The ERA ([31]) is defined as a unified research area open to the world based on the Internal Market, in which the removal of barriers to researcher mobility, training and attractive careers will be ensured ([32]).

In recent years, significant progress has been made and the EU has increased its stock of researchers. However, as already stated, it was estimated that in 2010 one million more researchers — an increase of more than 60 % — were still needed to meet the objective of 3 % R&D intensity by 2020 ([33]). This figure takes into consideration the number of

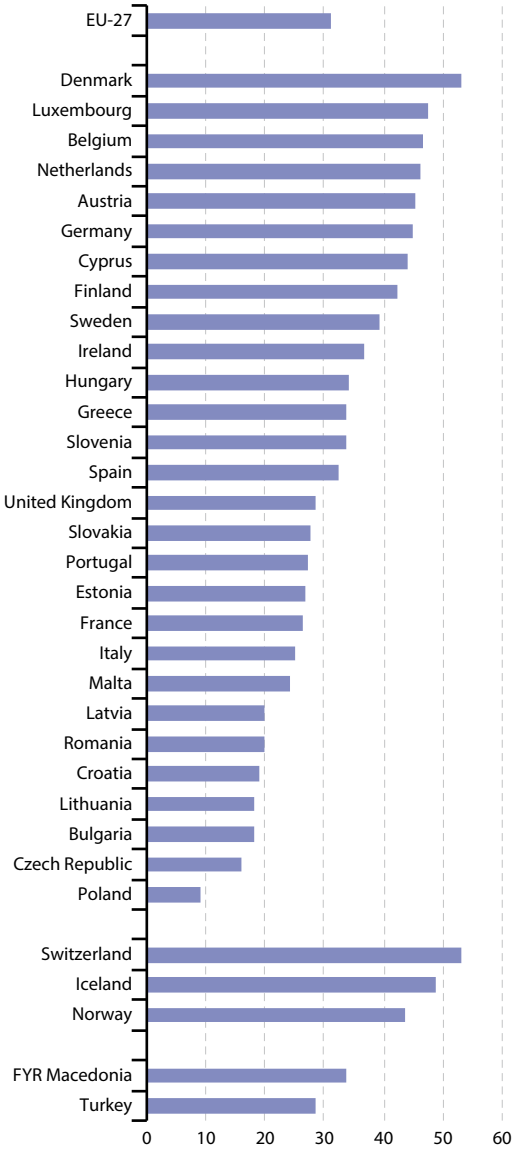
Figure 2.9: Total R&D personnel by sectors of performance, EU-28, 2002–12 (*)
(Full-time equivalents, % of the labour force)



(*) Data for 'Private non-profit sector' are estimates (whole time series); data for 2002–04, 2008–10 and 2012 are estimates (all other sectors).

Source: Eurostat (online data code: rd_p_perslf)

Figure 2.10: Share of researchers that have worked abroad for three months or more at least once in the past 10 years of their post-PhD career, by panel country, 2012 (*)
(%)



(*) Based on direct question to R2, R3 and R4 researchers; R2: Recognised researcher (PhD holders or equivalent who are not yet fully independent), R3: Established researcher (researchers who have developed a level of independence) and R4: Leading researcher (researchers leading their research area or field).

Source: MORE2 Higher Education Survey (2012)

researchers who will retire and the existence of a persistent 'brain drain' from the EU to the United States ([34]).

The mobility of EU researchers is high. Around 31 % of EU post-PhD researchers have worked abroad, whether in the EU or worldwide, as researchers for more than three months at least once during the past 10 years ([35]). In half of the Member States, the proportion is above the EU average, ranging from 32.3 % in Spain to 53 % in Denmark (see Figure 2.10). In the other half, shares vary from 9.1 % in Poland to 28.5 % in the United Kingdom.

The gender gap in mobility is still highly visible: only 25 % of female researchers experienced a post-PhD mobility of more than three months in another country in the past 10 years, compared with 34 % for men ([36]). Their share exceeds that of men only in Ireland (52 %). The gap varies widely in the remaining countries, from seven percentage points in Finland to 100 percentage points in Latvia where mobility of the female research population has been zero over recent years ([37]).

On the whole, the mobility experience is largely positive: at EU level, 80 % of internationally mobile researchers believe mobility has strongly increased the advancement of their research skills and 62 % felt it had improved the quality of their research publications ([38]).

ICT connectivity and digital skills are central to a knowledge-based economy

Information and communications technology (ICT) 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.

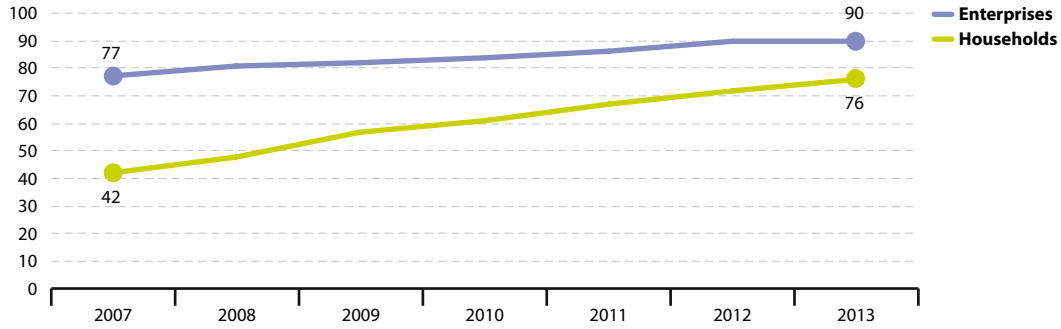
Furthermore, ICT development and usage skills are a new driver for employment and R&D in Europe. The value added of the ICT sector, including information industries, accounted for 4 % of GDP in 2010. In addition, the sector represented 2.5 % of

Box 2.5: Policies contributing to the development of a digital economy and society

A series of high-level Europe 2020 initiatives address the issue of investment in digital technologies, in particular to increase 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' ([39]) that 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' ([40]). It facilitates the inclusive growth priority, supporting the improvement of e-skill levels in the labour force and the creation of jobs through an enhanced set of skills and in the ICT sector overall. The flagship initiative 'Innovation Union' ([41]) called for the completion of ERA (see Box 2.4) by 2014, which should optimise the circulation, access to and transfer of scientific knowledge including via digital ERA ([42]).

Figure 2.11: Households and enterprises with broadband internet access, EU-28, 2007–13 (*)
(% of households and % of enterprises)



(*) Usage of broadband for accessing the internet includes fixed and mobile broadband; however, for the enterprises it does not include mobile broadband connections. Households refers to households with at least one member aged 16 to 74; Enterprises refers to enterprises with at least 10 persons employed in the given NACE sectors; break in series in 2009 (NACE Rev 2 since 2009).

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

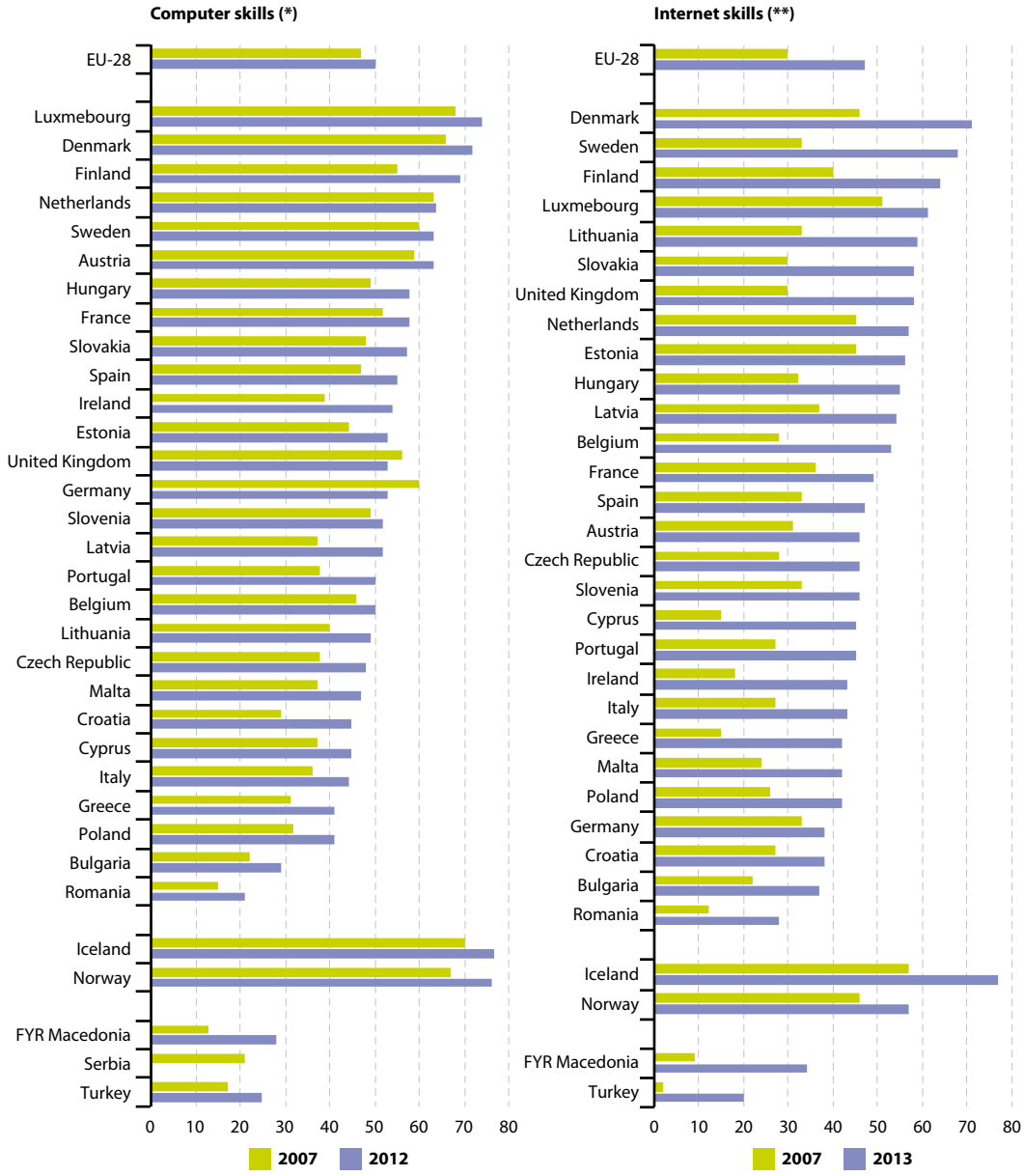
EU total employment while R&D personnel in ICT made up 20 % of total R&D personnel. In the same year, R&D intensity in the ICT sector amounted to 5.2 % ([43]). A number of EU policy strategies under the Europe 2020 strategy umbrella tackle the issue of ICT connectivity and skills at the business and citizen levels and address knowledge circulation among the research community (see Box 2.5).

A large part of the EU population is, however, still affected by a digital literacy deficit. The exclusion of many people from the digital knowledge-based society and economy is holding back the large multiplier effect that ICT take-up has on innovations and productivity growth. These skills do not only improve employability, they also enhance societal learning, creativity, emancipation and empowerment.

Broadband internet connections in businesses and households increased substantially

Infrastructure availability is vital to the process of diffusing the digital and knowledge-based economy into the very corners of society. Increased broadband internet access opportunities for

Figure 2.12: Individuals with at least a medium level of computer and internet skills, by country
(% of the total number of individuals aged 16 to 74)
left: computer skills, 2007 and 2012 (*)
right: internet skills, 2007 and 2013 (**)



(*) 2006 data (instead of 2007) for MK
(**) 2006 and 2010 data (instead of 2007 and 2013) for MK.

Source: Eurostat (online data codes: tsdsc460 and tsdsc470)



private and business usage are an important enabling factor for this process.

The share of European households and business with broadband internet access rose considerably between 2007 and 2013, in line with advances in the global internet, wider network coverage and increased affordability. Enterprises' usage of broadband internet connections increased by 13 percentage points over the same period, from 77 % to 90 %. At the same time, the share of households enjoying broadband access increased by 34 percentage points, from 42 % to 76 % (see Figure 2.11).

Growth in access to ICT infrastructure is also reflected at Member State level. Between 2007 and 2013 the share of both households and enterprises with broadband internet access increased in all countries. The only exception is enterprise access in Croatia, which fell by 3.8 %. In 2013, the share of household connectivity exceeded the EU average in 11 Member States, with rates ranging from 78 % in France to 88 % in Finland. The other 17 countries had lower access rates, from 54 % in Bulgaria to 74 % in Slovenia. In general, the highest growth rates over the period 2007 to 2013 were mainly in Eastern and Southern European countries. Some of these, such as Romania and Greece, had access rates in 2013 that were about seven times higher than in 2007.

Compared with household connectivity, differences in enterprises' broadband internet access in 2013 were less pronounced, with nine Member States below the EU average. In 2013 enterprises' access varied from 99 % in Finland to 61 % in Romania.

Rise in the EU population's digital skills

Between 2007 and 2012 the share of individuals with at least a medium level of basic computer skills ([44]) in the EU grew slightly from 47 % ([45]) to 50 % (see Figure 2.12). At the Member State level, the share ranged from 74 % to 21 % in 2012. The highest shares, close to or exceeding 70 %, could be found in Luxembourg, Denmark and Finland.

As for computer skills, internet skills are equally important for a society's digital knowledge base. Figure 2.12 (right-hand graph) shows that between 2007 ([46]) and 2013 the share of individuals with at least a medium level of internet skills ([47]) increased substantially at the EU level from 30 % to 47 %. This favourable trend is mirrored at the Member State level, where all countries improved their populations' internet skills between 2007 and 2013.

Increases in internet skills across the EU in general reflect connectivity improvements (see Figure 2.11). Thus it is not surprising that several Member States, such as Belgium, Ireland, Greece, Cyprus, Romania, Slovakia, Sweden and the United Kingdom, increased the share of people with advanced internet skills by close to or more than two times.

How are businesses achieving technology-based innovation and bringing good ideas to the market?

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, for example, through the creation of technology markets and licensing schemes, are just as important as investment in knowledge generation (see Box 2.6). 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.

Furthermore, 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 of this is the depletion of fossil fuels and the resulting transition towards more renewable energy sources.

Significant progress in achieving knowledge diffusion and absorption is measured through growth in innovative firms, the number of patent applications, the export of high-tech products and the number of patents related to societal challenges such as climate change.

The EU's innovation performance has improved

The EU has become more innovative in recent years, rising from an innovation performance index of 0.493 in 2006 to 0.554 in 2013 (see Figure 2.13). As a result the EU has decreased its innovation gap with the United States and Japan ([48]), although it still lags behind these countries and South Korea.

While all Member States have become more innovative, differences in innovation performances are still high and are diminishing only slowly. This is particularly visible in business innovation co-operation, and knowledge excellence and internationalisation ([49]).

The overall ranking within the EU remains relatively stable. Four 'innovation leaders' include Sweden at the top, followed by Denmark, Germany and Finland. At the other end of the scale, 'modest innovators' are made up of three Eastern Member States. In between, two large groups of 11 'moderate innovators' and 10 'innovation followers' can be observed (see Figure 2.13).

Portugal, Estonia and Latvia have shown the most improvement over the past few years. In these countries the index increased by more than 25 % between 2006 and 2013. The least progress was made by the innovation leader Sweden and the innovation follower UK. In these two countries the index has increased by a mere 0.02 points.

Most progress achieved by countries lies in the openness and attractiveness of the EU research system as well as business innovation collaboration and the commercialisation of knowledge as measured by licence and patent revenues from abroad. However, the growth of public R&D expenditure over the past few years has been offset by a continuous decline in venture capital investments and non-R&D innovation investments by companies ([50]) (see also indicators on R&D expenditure and patent applications).

An analysis of the regional situation indicates that over the seven-year period from 2004 to 2010, innovation performance has improved for 155 out of 190 EU regions. In the remaining 35 regions, scattered across 15 Member States, innovation performance has worsened ([51]). In the same way as for Member States, the 190 regions

Box 2.6: 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 ([52]), 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 patent applications is that it excludes other parties from using the invention, unless permitted by the patent holder, and therefore limits its diffusion into society ([53]).

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

Next to patent development, the extent to which patents — reservoirs of potential innovations — are actually used for economic and societal purposes remains of major importance. Licensing has largely been used to alleviate the risk that innovations are patented for reasons other than increasing productivity and further innovation (for example, guaranteeing protection from rivals) and are not used ([53]).

have also been grouped into 'regional innovation leaders' (34 regions), 'regional innovation followers' (57 regions), 'regional moderate innovators' (68 regions) and 'regional modest innovators' (31 regions).

The most innovative regions also appear to be located in the most innovative countries, revealing a concentration of innovation excellence in relatively few areas in Europe. All regional innovation leaders are located in only eight Member States, of which the four national innovation leaders and four innovation followers (see Figure 2.13) consist of Denmark, Germany, Finland, France, Ireland, the Netherlands, Sweden and the United Kingdom.

More than half of EU enterprises contribute to innovation activity

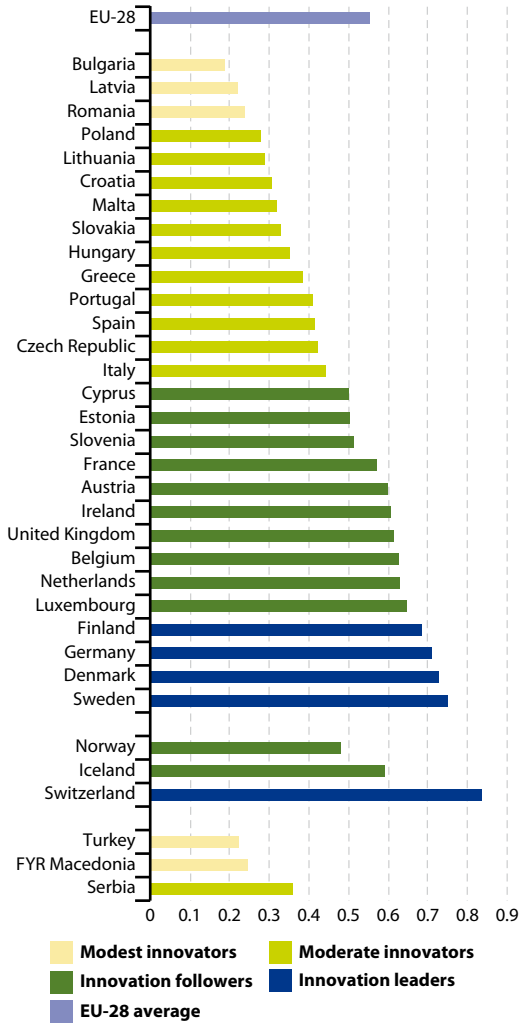
An analysis of business innovativeness reveals that more than half of the EU's enterprises are innovative and reported innovation activity in 2010 (see Figure 2.14). Member States considered as innovation leaders have a share of innovative enterprises substantially above the EU average of 53 %. This is namely the case for Germany (79 %) and Luxembourg (68 %).

Innovative companies can be distinguished by the type of innovation they pursue. Figure 2.14 shows how different business strategies lead to different innovation types such as product and/or process as well as organisational and/or marketing innovation.

Northern European countries are leaders in eco-innovation

Eco-innovation, like all innovations, is bringing a new product (good or service) to the market or implementing a new solution in the production or organisational processes of a company ([54]). Eco-innovation reduces the use of natural resources and decreases the release of harmful substances across the whole lifecycle, bringing economic, social and environmental benefits. Environmental benefits include improved resource productivity,

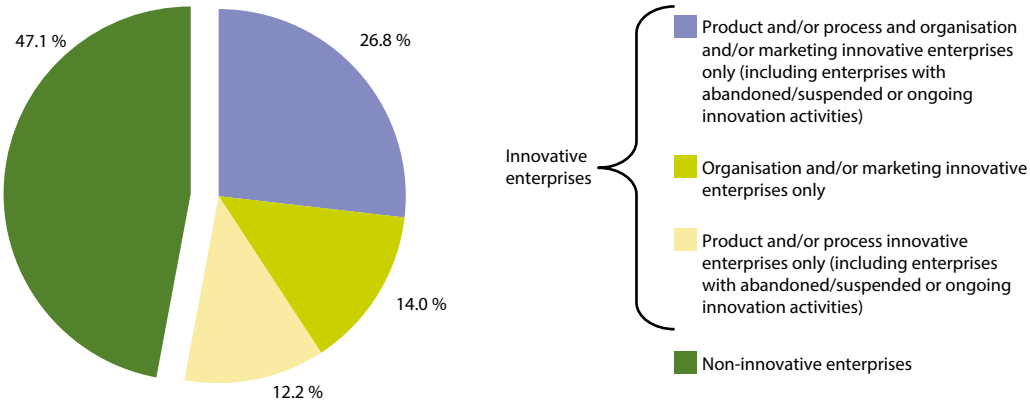
Figure 2.13: Innovation performance by country, 2013 (*)
(Index)



(*) 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 EU Member States are classified into four groups, based on their average innovation performances: 'Innovation leaders' have an innovation performance well above that of the EU average, 'Innovation followers' group comprises countries whose performance is above or close to that of the EU average, 'Moderate innovators' have a performance below that of the EU average, and the last group covers 'Modest innovators' whose performance is well below that of the EU average.

Source: European Commission, Innovation Union Scoreboard 2014, Brussels, 2014

Figure 2.14: Enterprises by type of innovation, 2010
(% of the total number of enterprises)



Source: Eurostat (online data code: inn_cis7_type)

Box 2.7: The relevance of research and innovation for societal progress

Research enlarges the scientific and technological knowledge needed to tackle societal problems or simply to satisfy intellectual curiosity. Innovation creates value by introducing new or improved products (goods or services), processes and logistics or distribution methods. The two concepts are intertwined, with scientific and technological research providing knowledge inputs for innovation.

Innovation is a broad concept that encompasses the capacity of a company, economy or society to adapt to changing environments and circumstances in different ways. It comprises a variety of aspects ([55]):

- **Product and process innovation:** the introduction of new or significantly improved goods, services or processes.
- **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 may encompass ([56]):

- **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.

All of these innovation types have socioeconomic impacts, for example, research and innovation have a strong relationship with technical change, knowledge capabilities and the productivity of companies. More specifically, a positive relationship exists between innovation and socioeconomic performance. For example, regions with high levels of innovation are more likely to have higher levels of development (in GDP terms), labour productivity and employment rates and, to a lesser extent, lower energy usage ([57]).

The addition of the third concept of education forms the notion of the knowledge triangle: education, research and innovation. These three concepts benefit from their strong interlinkages (see Box 2.3).

in particular better material and energy efficiency, lower GHG emissions and reduced waste generation, which is both beneficial for companies and end users.

Measuring eco-innovation performance helps with assessing whether the EU and its Member States are moving towards smart and sustainable growth in Europe, as requested by the Europe 2020 strategy.

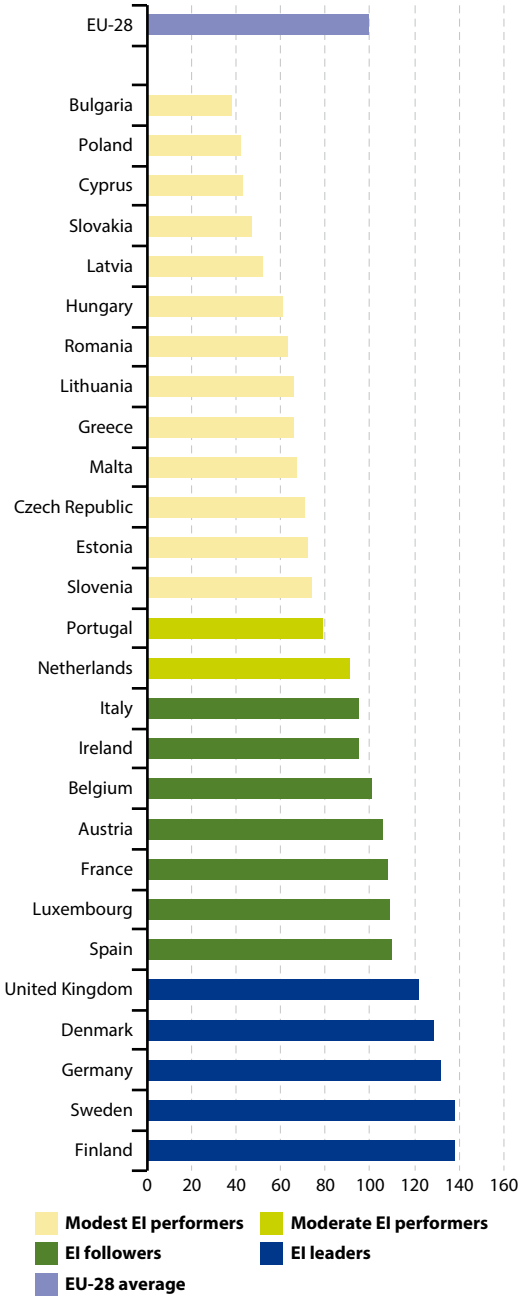
In 2013, the overall eco-innovation performance of EU countries ranged from around 40 in Bulgaria, Poland and Cyprus to almost 130 or more in Denmark, Germany, Finland and Sweden. The latter four countries are also the innovation leaders in the Union innovation scoreboard (see Figure 2.13). The majority of EU-15 countries can be found at the top, particularly Scandinavian countries, but also Germany, the United Kingdom, Spain, Luxembourg, Austria and Belgium. These all persistently show an index value above the EU average over the four years analysed by the index (2010 to 2013). The less well performing countries are in Eastern and Southern Europe. Another set of four countries made up of France, Italy, Ireland and the Netherlands, has values rather close to or exceeding the EU average in 2013 and in the preceding years.

The ranking of a few Member States has improved considerably since 2010: this is namely the case

Box 2.8: Eco-Innovation Scoreboard

The Eco-Innovation Scoreboard (Eco-IS) ([58]) assesses and illustrates eco-innovation performance across the 28 EU Member States. The Eco-IS shows how well individual Member States perform in different dimensions of eco-innovation compared with the EU average. It is based on 16 indicators grouped in to five thematic areas: eco-innovation inputs, eco-innovation activities, eco-innovation outputs, resource efficiency and socio-economic outcomes. In the index, EU Member States are ranked in relation to the EU average of 100 (see Figure 2.15).

Figure 2.15: Eco-innovation index, by country, 2013
(Index EU-28 =100)



Source: European Commission, Eco-Innovation Observatory (online data code: t2020_rt20)

of Lithuania, which gained eight places, and Estonia and Luxembourg, gaining six places each. However, the ranking was less favourable in some other countries: Cyprus and Bulgaria both lost seven places and the Netherlands six places ([59]).

How are EU sectors performing with regard to new patent applications?

The more cutting-edge knowledge is produced, the more likely it is such knowledge 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 inventiveness of countries, regions and firms (see Box 2.6).

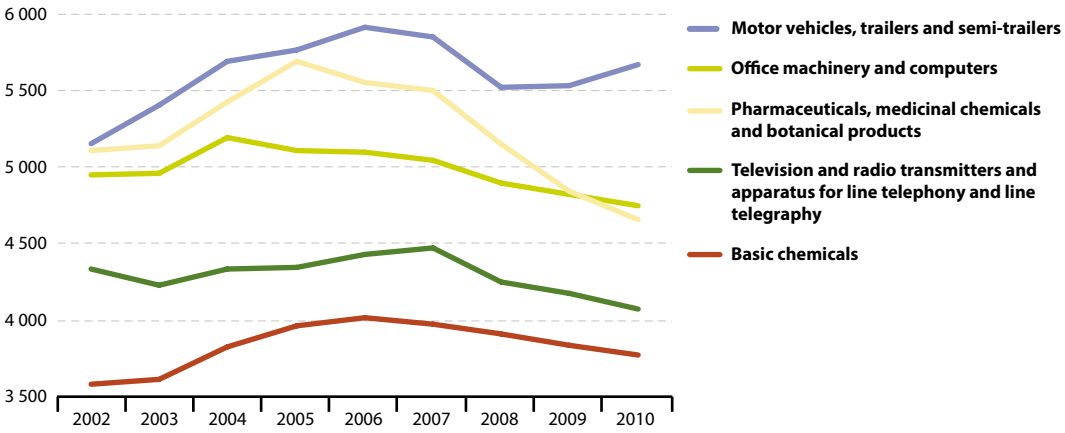
Over the period 2002 to 2007, patent applications in the EU manufacturing sector increased almost continuously until the global economic and financial crisis began to be felt in 2008. After peaking in 2006, EU patent applications fell by 7.2 % between 2007 and 2010. This was more than for total EU patent applications, which declined by 4.5 % over the same period.

Taking a more detailed view of the manufacturing sector, the trend at EU level is to a large extent mirrored in the individual sectors as outlined in Figure 2.16 ([60]). Of the five largest EU manufacturing subsectors, the pharmaceuticals sector has been hit the hardest, with patent applications dropping by more than 15.4 % between 2007 and 2010. This was followed by the television and radio transmitters sector (– 9.0 %). All of the remaining sectors — basic chemicals; office machinery and computers; and motor vehicles, trailers and semi-trailers — have been hit to a lesser degree (varying between – 3.0 % and – 5.9 %). During that period, industrial patents as a share of total patent applications also declined gradually, from 47.7 % in 2007 to 46.3 % in 2010.

Technological solutions addressing climate change

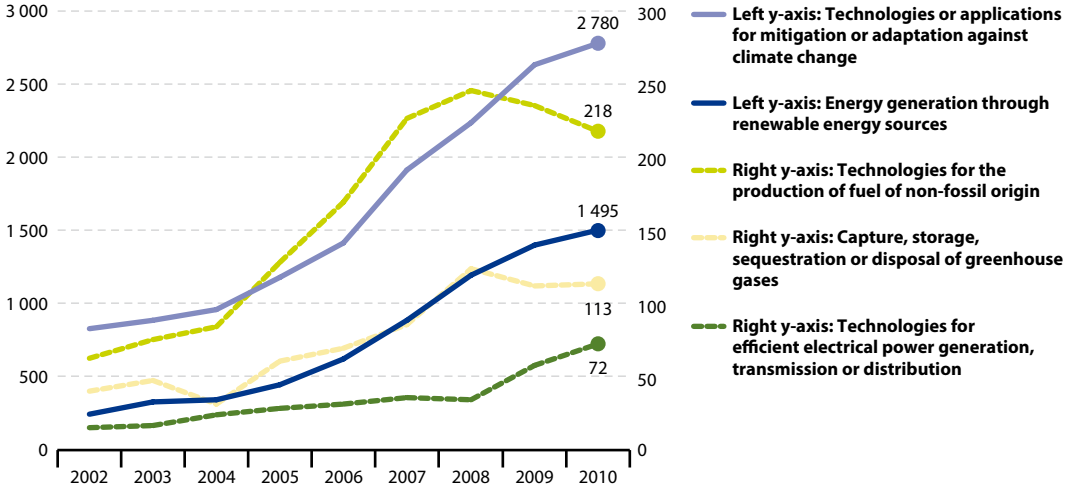
The EU focuses its investment strategies towards innovation-oriented sectors that help address some of society's most pressing challenges. Combining research and innovation with market development measures can help provide the necessary structural and technological solutions to societal challenges, such as climate change adaptation, healthy ageing or security of material supply.

Figure 2.16: Patent applications to the European Patent Office (EPO) in the manufacturing sector by priority year at the national level, by sector of economic activity, EU-28, 2002–10
(Number)



Source: Eurostat (online data code: pat_ep_nnac)

Figure 2.17: Patent applications of technologies or applications for mitigation or adaptation against climate change, EU-28, 2002–10
(Number)



Source: Eurostat (online data code: pat_ep_nrg)

Accordingly, targeted sectors also represent future areas of potential economic growth and jobs.

In this regard the European Commission initiated a series of 'innovation partnerships' under the flagship initiative 'Innovation Union'. These aim to foster the development and deployment of technologies needed to meet the challenges identified.

Climate change patents have been equally hit by the crisis

During the past decade Europe's progress in addressing societal challenges through patenting has been focused on climate change mitigation and adaptation ([61]). Figure 2.17 shows EU patent applications in relation to climate change mitigation and adaptation. Like conventional manufacturing patent applications, the market for patent applications targeting climate change adaptation and mitigation did not escape the turmoil created by the financial and economic crisis.

Europe's patent market for climate change mitigation and adaptation experienced an almost increasingly strong growth rate between 2002 and 2008, peaking at 34.9 % between 2007 and 2008. In the next three years, patent applications continued to rise but at a much slower pace, easing to a particularly low growth rate in 2010 (5.4 %). This slowdown might be due to organisations postponing some applications because of cost or risk reasons during the crisis.

The newer 'capture, storage, sequestration or disposal of greenhouse gases' sector, which only accounts for about 4 %, was most affected by the crisis. Patent applications in this sector dropped by nearly 10 % in 2009 before rising slightly again in 2010. Other sectors affected include the 'electrical power generation, transmission or distribution' sector which dropped by 3.5 % in 2008 before rising sharply in 2009 and 2010, and the production of fuel of non-fossil origin sector which has been declining since 2009 (– 10.9 %). During the crisis the most important driver for a technological push towards more efficient, secure and clean energy generation was the geopolitical situation in many oil-exporting countries worldwide and the oil crisis during 2003 and 2008. This push was mirrored by the expansion of patent applications.

Is the EU a competitive global player in R&D?

Investment in R&D remains crucial for maintaining a competitive advantage over other world leaders with regard to high-quality science and innovative products. The EU is currently lagging behind other global players such as the United States, Japan and South Korea in terms of business R&D expenditure, patent applications and tertiary education ([62]).

Between 2002 and 2013, EU R&D intensity remained relatively stable, increasing slightly from 1.81 % of GDP in 2002 to 2.02 % in 2013. Other world competitors experienced different patterns of growth in R&D intensity (see Figure 2.18). South Korea and China showed the highest growth rates. South Korea grew by 1.34 percentage points between 2002 and 2010, while China grew by 0.77 percentage points between 2002 and 2011. The United States and Japan showed more moderate growth. The United States showed a 0.22 percentage point increase between 2002 and 2011 and Japan grew by 0.13 percentage points between 2002 and 2010.

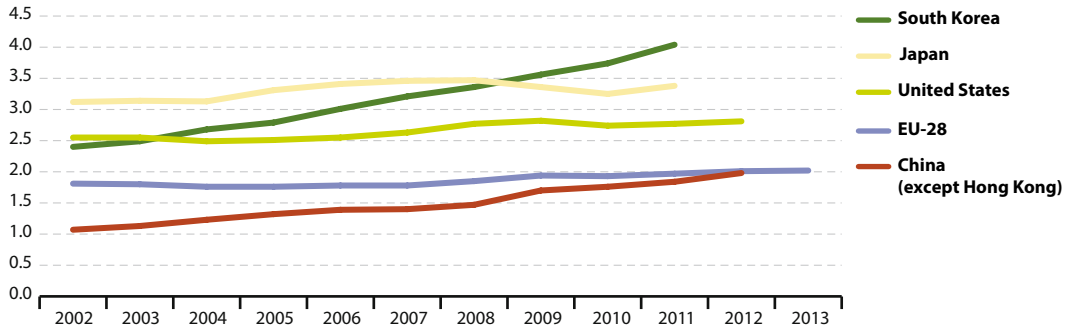
The United States, Japan and South Korea are not only outperforming the EU in overall R&D intensity, but also in terms of business enterprise R&D intensity. While only 62.0 % of EU R&D intensity originated from the business enterprise sector in 2010, the United States, China, South Korea and Japan registered between 68.5 % and 76.6 % of R&D intensity from this sector.

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 manufactured goods, for the benefit of an economy's balance of trade. Even though only 13 % of the EU's small and medium enterprises (SMEs) are active in markets outside the EU, evidence suggests that these exporters show greater employment growth than non-exporters ([63]).

Total EU high-tech exports to outside the EU fell during 2008 and 2009. However, after the sharp drop in 2009 high-tech exports quickly recovered and had increased continuously by more than 40 % by 2012. Similar development trends can be observed at the individual sector level. Since the recovery

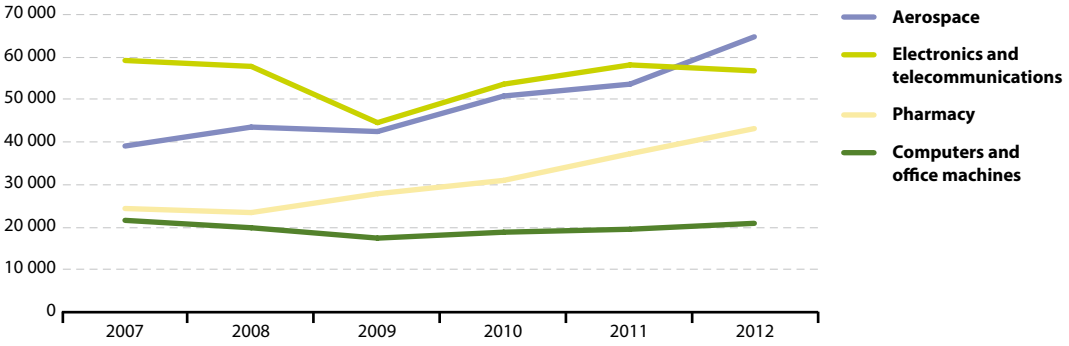
Figure 2.18: International comparison of gross domestic expenditure on R&D (R&D intensity), 2002–13 (*)
(% of GDP)



(*) EU-28 data for 2002–03 and 2013 are estimates; break in series for KR (2007), JP (2008) and CN (2009); US data for 2012 are provisional; definition differs for KR (2002–06) and US (whole time series).

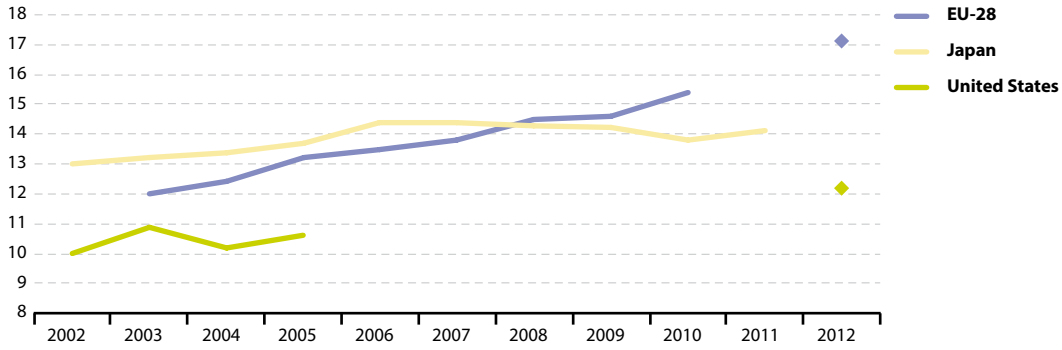
Source: Eurostat (online data code: rd_e_gerdtot)

Figure 2.19: High-tech trade exports outside of EU-27, by high-tech group of products, EU-27, 2007–12
(EUR million)



Source: Eurostat (online data code: htec_trd_group4)

Figure 2.20: International comparison of tertiary graduates in science and technology, 2002–12
(Per 1 000 of population aged 20 to 29)



Source: Eurostat (online data code: tps00188)

from the economic crisis, the aerospace and pharmacy sectors have been the main drivers behind high-tech exports by the EU, growing by more than 50 % between 2009 and 2012 (Figure 2.19).

The EU's international performance with regard to human capital

Since 2003, Europe's international position in terms of tertiary education has improved continuously compared with the United States and Japan (see Figure 2.20). Increasing the number of tertiary graduates is fundamental. First, the EU target of raising R&D intensity to 3 % will require substantial investment in future human capital to absorb the extra investment. Second, it is needed to address the looming demographic challenge of an increasing number of elderly and a decreasing number of young people.

Since 2008 the EU has outperformed Japan with regard to tertiary graduates. In 2010, the EU produced 1.6 more graduates per 1 000 inhabitants than Japan. In 2012, it also produced 4.9 more graduates per 1 000 inhabitants than the United States.

Conclusions and outlook towards 2020

The EU is facing increasing competition but remains a main knowledge production centre of the world, accounting for almost a third of the world's science and technology production ([64]). Over the past 30 years, Europe has supported wide-ranging research projects developed by Member States, spending almost EUR 120 000 million by 2013. It will have another EUR 78.6 billion at its disposal for the period from 2014 to 2020.

Between 2002 and 2007, the EU followed a relatively stable trend of 1.8 % in gross domestic expenditure on R&D as a percentage of GDP. Since then, it has grown marginally. This was due to the combined effects of the crisis on GDP growth and an increase in nominal government R&D spending to combat the long-term impacts of the crisis, especially during the first period of the crisis (from 2008 to 2010) ([3]).

The EU's investment in R&D and innovation is increasingly targeted at supporting growth-enhancing policies to strengthen 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. Particularly, the share of female graduates grew faster than the overall growth in science and technology graduates, potentially impacting on future employment gender equality. Moreover, between 2008 and 2012, employment in knowledge-intensive activities increased in almost all EU Member States, demonstrating that the EU is moving towards a more knowledge-based economy. In recent years, the EU also increased its stock of researchers and encouraged their mobility. One-third of researchers have worked abroad in the past 10 years, but mobile male researchers still outnumber female researchers in almost all countries.

The EU also invested in developing its population's digital literacy and improving the ICT connectivity of both businesses and households. Between 2007 and 2012, the share of individuals having at least a medium level of computer skills increased from 47 % to 50 %; between 2007 and 2013, individuals' internet skills grew substantially from 30 % to 47 %. Overall these trends have been partly facilitated by some far-reaching developments in terms of connectivity of both households and businesses.

The EU has become more innovative, with Sweden, Denmark, Germany and Finland acting as 'innovation leaders' at both national and regional levels. A majority of European firms also reported innovation activity in 2010. Eco-innovation, a more recent innovation type, is helping Europe transition to a more resource-efficient region. The number of patents in the EU manufacturing sector experienced an almost continuous increase until the impact of the crisis began to be felt. EU patent applications, having peaked in 2006, decreased by more than 4 % between 2007 and 2009. Moreover, the market addressing technological solutions for climate change has been equally hit by the crisis, causing a slowdown in the number of patent applications in that sector after 2008.

At the global level, even though the EU is an attractive location for R&D investment, it is still lagging behind its Asian and American competitors in terms of R&D expenditure, in particular by business enterprise. Nonetheless, although Europe is still more focused on traditional industries than its international competitors and needs more strategic high-tech investment ([65]), it's high-tech exports to outside the EU have recovered since the crisis and have increased by more than 40 % between 2010 and 2012. Strong growth in the aerospace and pharmacy sectors has been a major driver of this. In addition, Europe's position in terms of tertiary education graduates has improved constantly since 2003 and it is now outperforming Japan.

Efforts needed to meet the Europe 2020 target on R&D

The Europe 2020 strategy tries to overcome the economic crisis and its impacts by addressing the shortcomings of the European growth model. It also attempts to create the conditions for a different



type of growth through more effective investments in education, research and innovation. However, with a current level of 2.02 % in 2013 and limited progress over time, the R&D intensity is expected to remain below the 3 % objective that the EU has set itself for 2020. According to latest projections ([66]), and if current reforms and financial efforts continue, investment in R&D is forecast to rise to 2.2 % by 2020. Progressing more rapidly towards the 3 % target would need faster structural shift to more knowledge-based economic activities. If Member States meet their national targets, this share could amount to 2.6 %. However, progress towards the national targets is very uneven, with targets ranging from 0.5 % to 4.0 % of GDP. In 2013, Denmark had already met its national target, while Germany came very close, with a gap of 0.06 percentage points 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 by the EU. These instruments aim to foster private investment in R&D and to maintain and promote public funding of R&D despite the crisis.

Among the EU policy instruments, the flagship initiative 'Innovation Union' is one of the most prominent. It places renewed emphasis on using public sector intervention to stimulate the private sector and to remove bottlenecks to enable the conversion of Europe's scientific expertise into marketable goods and services. More specifically the flagship initiative is putting emphasis on the challenges facing our society, such as climate change.

Delivery of the actions set out in the 'Innovation Union' flagship initiative is on course, but with various levels of implementation. In particular, the initiative has not prevented the growing persistence of innovation performance gaps among EU countries, although it has reduced the gap between the EU and its main competitors ([67]).

For the period from 2014 to 2020, the 'Innovation Union' will be implemented through financial support provided by Horizon 2020 (see Box 2.2), Europe's current framework programme for research and innovation. With EUR 78.6 billion of funding available for the next seven years, Horizon 2020 will namely finance the further development of ERA which is at the heart of Europe 2020 and 'Innovation Union' (see Box 2.4). 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. Ninety per cent 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 Europe ([68]).

Notes

([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, *Research and innovation as sources of renewed growth*, COM(2014) 339 final, Brussels (p. 1–2).

([4]) '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, § 63).

([5]) European Commission, *Innovation Union Competitiveness Report 2011*, Brussels, 2011 (p. 64).

([6]) European Commission, *Innovation Union Competitiveness Report 2013*, Brussels 2013 (p. 38).

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

([8]) European Commission, *Innovation Union Competitiveness Report 2013*, Brussels 2013 (p. 38).

([9]) European Commission, *Innovation Union Competitiveness Report 2013*, Brussels 2013 (p. 38).

([10]) For some countries, the PNP is included in the GOV.

([11]) European Commission, *Innovation Union Competitiveness Report 2013*, Brussels 2013 (p. 38–46).

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

([13]) Current 2011 prices.

([14]) Regulation (EU) No 1291/2013 of the European Parliament and of the Council of 11 December 2013 establishing Horizon 2020 — the Framework Programme for Research and Innovation (2014–2020).

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

([16]) European Commission, *Researchers' report – Final report 2013*, Brussels, 2013 (p. 26).

([17]) 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).

([18]) European Commission, *A Reinforced European Research Area Partnership for Excellence and Growth*, COM(2012) 392 final, Brussels, 2012 (p. 12 and 15).

([19]) European Commission, *Researchers' report — Final report 2013*, Brussels, 2013 (p. 11).

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

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

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

([23]) On the other hand, Luxembourg has one of the highest levels of mobile researchers; see Figure 2.10 illustrating the indicator on researchers' mobility.

([24]) 2009 figure; (European Commission, *She figures 2012 — Gender in Research and Innovation,* Luxembourg, 2012 (p. 25)).

([25]) Grade A: the single highest grade/post at which research is normally conducted. (*She figures 2012 — Gender in Research and Innovation*, 2012, p. 135).

([26]) European Commission, *Researchers' Report — Final Report 2013,* Brussels, 2013 (p. 42 and 45).

([27]) European Commission, *European Research Area, Facts and Figures for 2013*, Luxembourg, 2013.

([28]) European Commission, *European Research Area, Facts and Figures for 2013*, Luxembourg, 2013.

([29]) The need for a 'Fifth Freedom' relating to research was first raised by Commissioner Potočnik in a speech in April 2007; see http://europa.eu/rapid/press-release_SPEECH-07-257_en.htm.

([30]) European Commission, *A Reinforced European Research Area Partnership for Excellence and Growth*, COM(2012) 392 final, Brussels, 2012.

([31]) European Commission, *A Reinforced European Research Area Partnership for Excellence and Growth*, COM(2012) 392 final, Brussels, 2012).

([32]) European Commission, *Researchers' report — Final report 2013*, Brussels, 2013 (p. 11).

([33]) 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. 87).

([34]) European Commission, *Innovation Union Competitiveness Report 2013*, Brussels, 2013 (p. 15).

([35]) MORE2 Higher Education Survey, 2012; see: http://www.more-2.eu/www/index.php?option=com_content&view=article&id=118&Itemid=125.

([36]) European Commission, *Researchers' report — Final report 2013*, Brussels, 2013 (p. 104).

([37]) 2009 figures, (European Commission, *She figures 2012 — Gender in Research and Innovation.* Luxembourg, 2012 (p. 43)).

([38]) European Commission, *European Research Area, Progress report 2013*, Luxembourg, 2013, (p. 22).

([39]) European Commission, *A Digital Agenda for Europe*, COM(2010)245 final, Brussels, 2010 ; see also: Digital "to-do" list: new digital priorities for 2013-2014 at http://ec.europa.eu/digital-agenda/en/news/digital-do-list-new-digital-priorities-2013-2014.

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

([41]) European Commission, *Innovation Union*, COM(2010)546 final, Brussels, 2010.

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

([43]) European Commission, *Scoreboard 2014 — The EU ICT Sector and its R&D performance 2014*, Brussels, 2014 (p. 3 onwards).

([44]) The data refer to individuals having either a medium or a high level of computer skills. A high level of basic computer skills refers to individuals who were able to carry out 5 or 6 of 6 computer-related items, whereas a medium level of basic computer skills refers to individuals who have carried out 3 or 4 of the following 6 computer-related items: copy or move a file or folder; use copy and paste tools to duplicate or move information within a document; use basis arithmetic formula (add, subtract, multiply, divide) in a spreadsheet; compress files; connect and install new devices, e.g. a printer or a modem; write a computer program using a specialised programming language.

([45]) EU average based on 2007 data.

([46]) EU average based on 2007 data.

([47]) The data refer to individuals having either a medium or a high level of internet skills. A high level of basic internet skills refers to individuals who were able to carry out 5 or 6 of 6 internet-related items, whereas a medium level of basic internet skills refers to individuals who have carried out 3 or 4 of the following 6 internet-related items: use a search engine to find information; send an e-mail with attached files; post messages to chatrooms, newsgroups or any online discussion forum; use the Internet to make telephone calls; use peer-to-peer file sharing for exchanging movies, music etc.; create a web page.

([48]) European Commission, *Innovation Union Scoreboard 2014*, Brussels, 2014 (p. 6).

([49]) European Commission, *Innovation Union Scoreboard 2014*, Brussels, 2014 (p. 6).

([50]) European Commission, *Innovation Union Scoreboard 2014*, Brussels, 2014 (p. 6).

([51]) European Commission, *Regional Innovation Union Scoreboard 2014*, Brussels, 2014 (p. 5).



(52) 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).

(53) 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, 31).

(54) http://www.eco-innovation.eu/media/EIO_introduction_brief1.pdf.

(55) European Commission, *Community Innovation Survey 2010* (CIS 2010), Luxembourg (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).

(57) European Commission, 2013. *Innovation Union Scoreboard 2013*, Brussels, 2013 (p. 64).

(58) http://www.eco-innovation.eu/index.php?option=com_content&view=article&id=2&Itemid=34

(59) Detailed data is available in the database at: http://www.eco-innovation.eu/index.php?option=com_content&view=article&id=2&Itemid=34.

(60) The selection of sectors is based on the most active ones in terms of patent applications.

(61) European Commission, 2011. *Innovation Union Competitiveness Report 2011*, Brussels, 2011 (p. 415).

(62) European Commission, 2013. *Innovation Union Scoreboard 2013, Brussels*, 2013 (p. 7).

(63) 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).

(64) European Commission, *New report shows Europe needs more strategic high-tech investment*, Press release, Brussels, 2013; see: http://ec.europa.eu/research/index.cfm?pg=newsalert&year=2013&na=na-021213.

(65) European Commission, New report shows Europe needs more strategic high-tech investment, Press release, Brussels, 2013; see: http://ec.europa.eu/research/index.cfm?pg=newsalert&year=2013&na=na-021213.

(66) European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM(2014) 130 final, Brussels, 2014 (p. 12) and 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. 7–10).

(67) 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).

(68) 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).

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 EU has committed to limiting the mean global temperature rise to 2 °C above pre-industrial levels. This objective was endorsed by the international community in 2009 ([1]). To contribute to this global goal, the EU has pledged to continually reduce the amount of greenhouse gases (GHGs) it emits. The Europe 2020 strategy has renewed this commitment, aiming to turn the EU into a so-called 'low carbon' economy compatible with the EU objective of reducing GHG emissions by 80–90 % by 2050 compared with 1990. Among all GHGs, emissions of carbon dioxide (CO_2) are the most prevalent, accounting for about 80 % of the EU's GHG emissions in 2012. Other GHGs include nitrous oxide, methane and fluorinated gases. The aggregate of GHGs is often measured in CO_2 equivalents to make the data comparable.

The transition towards a low-carbon economy is not only a strategy to prevent catastrophic climate change. Climate and energy policies contribute to the Europe 2020 strategy's core objective of enabling sustainable growth. A push for renewable energies and energy efficiency — two key levers for reducing emissions — can spur innovation and create jobs. According to the 2012 'Employment package', implementing energy efficiency measures could create or retain two million jobs by 2020. The potential from the development of the renewable energy sector is estimated at three million jobs by this date ([2]). Creating demand for ever-better green products while boosting innovation and export strength in this growing global market 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.

A low-carbon economy also generates wider socio-economic benefits. It reduces energy dependence by replacing parts of the EU's fossil fuel imports with domestic resources. Climate and energy policies help reduce air pollution and the health risks it poses. This lowers health costs and increases well-being, particularly in cities. Many measures to reduce GHG emissions, particularly energy savings, also lower the use of other resources such as minerals. In return, many resource efficiency measures reduce emissions. Thus, there is a great potential for synergies with the Europe 2020 strategy's goal of making the EU more resource efficient ([3]). One of the strategy's flagship initiatives is 'A resource-efficient Europe'. It aims to create a framework for policies to support the shift towards a resource-efficient and low-carbon economy. To ensure statistical support for the strategy, Eurostat disseminates a 'Resource Efficiency Scoreboard' via its website ([4]). The Scoreboard comprises about 30 indicators tracking the progress towards a resource efficient Europe.

The Europe 2020 strategy's three climate and energy targets are interrelated and mutually support each

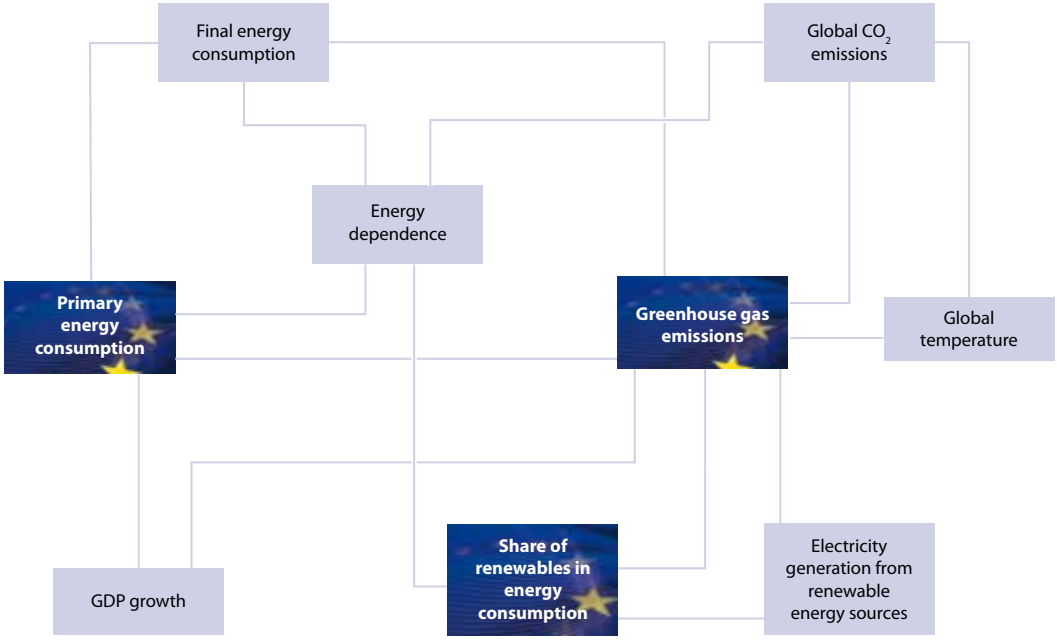
Europe 2020 strategy targets on climate change and energy

The Europe 2020 strategy sets three objectives for climate and energy policy, to be reached by 2020 ([5]):

- 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. Additionally, the strategy points out that 'the EU is committed to taking a decision to move to a 30 % reduction by 2020 compared with 1990 levels. The offer is conditional on other developed countries committing themselves to comparable reductions and developing countries contributing adequately' ([6]).

Figure 3.1: Indicators and concepts presented in the chapter and their links to the headline indicators on the climate and energy target



other. Energy used for electricity generation, transport and heating and cooling is responsible for the lion's share of the EU's GHG emissions. Therefore, reducing energy use and switching to low-carbon, renewable energy sources are the major levers for cutting emissions. Moreover, a decrease in final energy consumption makes it easier to reach the renewable energy target.

The analysis presented here is based on the three headline indicators that have been chosen to monitor each of the climate and energy targets:

1. GHG emissions
2. Share of renewable energy in gross final energy consumption
3. Primary 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 are assessed with a special focus on the wider socio-economic effects of the emerging green economy.

The EU's '20-20-20' targets are interlinked with the other Europe 2020 goals, in particular those for research and development (R&D) (see p. 49) and employment (see p. 25). A greater capacity for R&D and innovation across all sectors of the economy, combined with increased resource efficiency, will improve competitiveness and foster job creation ([7]).

EU's GHG emission reductions are approaching the 2020 target

As a central objective of the Europe 2020 strategy, the EU as a whole aims to reduce GHG emissions (including emissions from international aviation) by 20 % compared with 1990 levels. The main policy instruments to achieve the target are the EU Emissions Trading System (EU ETS) ([8]) and the Effort Sharing Decision (ESD) ([9]). Both instruments use 2005 — the year when the EU ETS started — as base year, thus the 20 % target compared with 1990 is translated into 14 % reductions below 2005 levels by 2020.

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 to reach 21 % emission reductions compared with 2005 by 2020.

The Effort Sharing Decision establishes binding annual GHG emissions targets for Member States for emissions from 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, the national targets will collectively deliver a reduction of around 10 % in total EU emissions from the non-EU ETS sectors compared with 2005 levels.

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 ([11]) 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 2012 Energy Efficiency Directive (EED) ([12]) creates an overarching framework for efficiency improvement in the Member States to ensure that the energy-efficiency EU headline target is met. It is complemented by sector-specific instruments such as the Energy Performance of Buildings Directive ([13]), which sets standards on insulation in newly built buildings, the Ecodesign Directive ([14]) defining performance standards for energy-using products and the Energy Taxation Directive ([15]), which sets minimum rates for energy products.

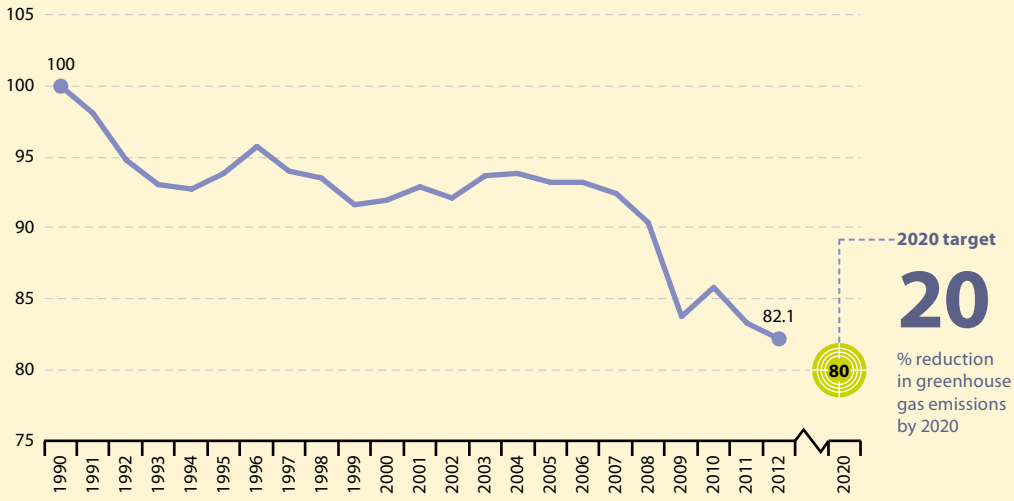
To increase energy efficiency in the transport sector, the EU has set mandatory emissions reduction targets for new passenger cars ([16]). The fleet standards will have to go down to an average of 95 grams of CO_2 per kilometre by 2020. Similarly, the Vans Regulation ([17]) limits CO_2 emissions from new vans to a fleet average of 175 grams of CO_2 per kilometre by 2017.

In addition, the 'Roadmap for moving to a competitive low carbon economy in 2050' ([18]) indicates that to be in line with the 80–95 % overall greenhouse gas reduction objective by 2050, a cost-effective and gradual transition would require a 40 % domestic reduction in greenhouse gas emissions compared with 1990 as a milestone for 2030 and 80 % for 2050.

EUROPE 2020 HEADLINE INDICATOR

Europe 2020 headline indicator

Figure 3.2: Greenhouse gas emissions, EU-28, 1990–2012 (*)
(Index 1990 = 100)



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

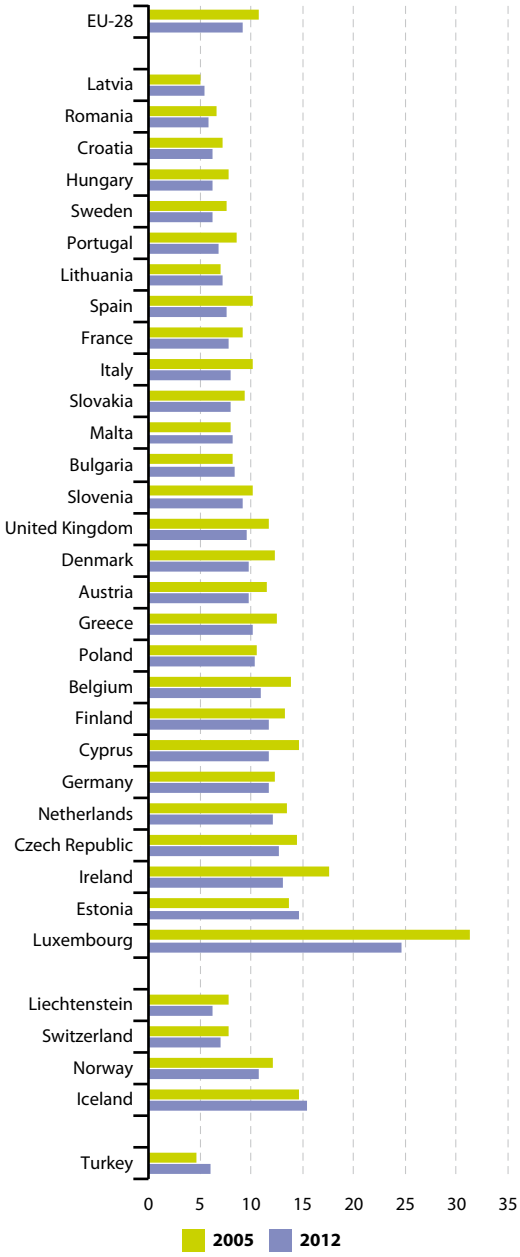
Source: European Environment Agency, Eurostat (online data code: t2020_30)

Together, the EU ETS and the Effort Sharing Decision will reduce overall emissions to 14 % below 2005 levels by 2020. This will 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. The most important tools are listed in Box 3.1.

By 2012, the EU as a whole had cut man-made GHG emissions by 17.9 % compared with their 1990 levels (see Figure 3.2). If emissions from international aviation are excluded, the reduction is 19.2 %, as reported by the European Environment Agency ([19]). A large portion of this reduction occurred during the 1990s. Between 1990 and 1994 a large drop of 7.3 % occurred, mostly due to structural changes (such as a shift from heavy manufacturing industries to more service-based economies), modernisation in industries and 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 levels of 92 % to 93 %. This was mostly a result of an increase in primary energy consumption (PEC) being offset by a rise in the share of fuels with lower carbon content, in particular renewable energy sources. Significant cuts were also made in the waste sector through use of better treatment processes with a lower carbon footprint and in agriculture due to a decline in livestock numbers and nitrogenous fertiliser use ([20]).

The economic crisis, which started in 2008, led to an overall economic slowdown and resulted in a fall in GHG emissions. A sharp drop of 7.3 % in 2009 was followed by a rebound in 2010. However, the downward trend continued in 2011. GHG emissions fell by 2.9 % compared with 2010 levels, despite GDP growing by 1.6 %. The reduction was caused by lower demand for heating due to a mild winter, lower electricity consumption, particularly

Figure 3.3: Greenhouse gas emissions per capita, by country, 2005 and 2012 (*)
(Tonnes of CO_2 equivalent)



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

Source: European Environment Agency

in France and the UK, reduced road transport and lower cement production ([21]). In 2012 GHG emissions fell further, by 1.3 % compared with 2011, and GDP fell by 0.4 %. The 2012 reduction was the result of falls in road passenger and freight transport in the countries affected by the recession, such as Italy, Greece and Spain, as well as lower industrial production, especially of iron, steel and cement. Moreover, lower emissions from energy production, especially in Germany, Italy and UK, contributed to the decrease ([22]).

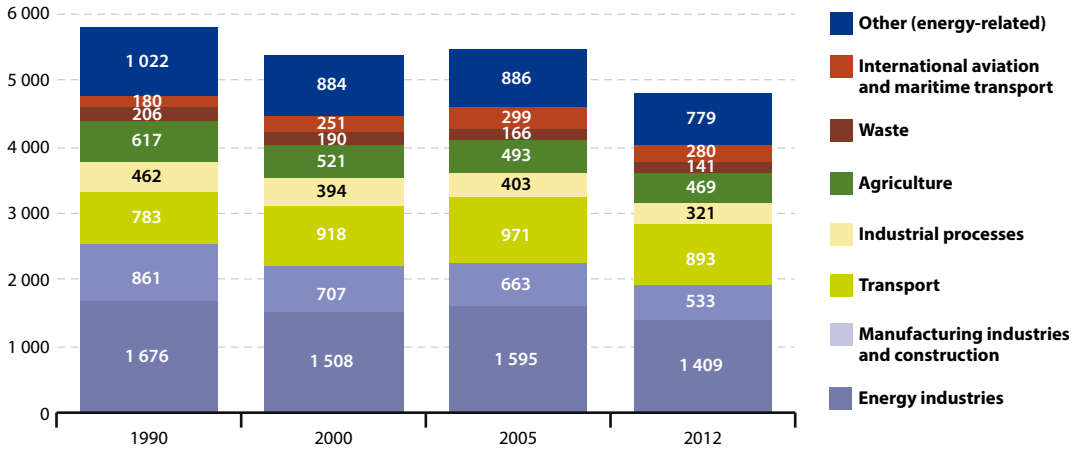
Dividing emissions figures by population provides a way of comparing countries' GHG emissions on a per capita basis. Figure 3.3 shows overall per capita GHG emissions for the EU Member States, the countries of the European Free Trade Association (EFTA) and Turkey for the years 2005 and 2012. Overall, Luxembourg emitted the most GHG per capita in the EU in 2012. 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 ([23]). Luxembourg was followed by Estonia, Ireland, the Czech Republic and the Netherlands. In contrast, Latvian per capita emissions were lowest within the EU.

Between 2005 and 2012, Luxembourg showed the highest reduction in per capita emissions. Ireland, Belgium and Cyprus too showed a considerable decrease in emissions. On the contrary, per capita GHG emissions rose in some eastern European Member States between 2005 and 2012, with the largest increases taking place in the Baltic countries Latvia, Estonia and Lithuania.

All sectors except transport have lowered emissions since 1990

Except transport, all sectors helped to reduce the EU's overall emissions between 1990 and 2012 (see Figure 3.4). In absolute terms, manufacturing industries and construction achieved the largest reduction of almost 327 million tonnes of CO_2 equivalent during that period. The second largest reduction of 267 million tonnes of CO_2 equivalent was achieved in

Figure 3.4: Greenhouse gas emissions by sector, EU-28, 1990, 2000, 2005 and 2012
(Million tonnes of CO_2 equivalent)



Source: European Environment Agency, Eurostat (online data code: tsdcc210)

the energy industries, which was the sector responsible for the largest share of total emissions.

By contrast, transport emissions were 14 % above 1990 levels in 2012. The sector accounted for about 19 % of total EU emissions in 2012, making it the second largest source after the energy industries. However, the continual upward trend in transport emissions appears to have been broken. After peaking in 2007, emissions fell by 10 % over the following five years. Both the increase between 1990 and 2007 as well as the recent decline might be linked to corresponding changes in the volume of passenger and freight transport ([24]). Causes for reduced transport volumes since 2007 may include the economic downturn and a hike in fuel prices. Notwithstanding this positive trend, promoting energy efficiency and increasing the share of renewable energy remain crucial to limiting the transport sector's GHG emissions, particularly when economic growth picks up again.

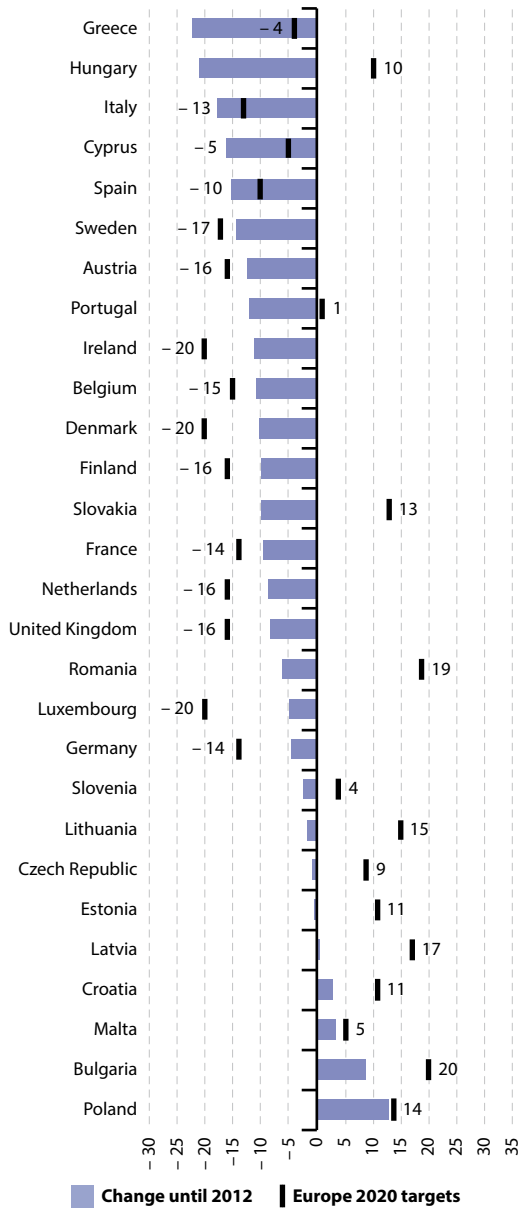
Emissions from international aviation and maritime transport peaked in 2007, at 321 million tonnes of CO_2 equivalent, equalling a 78 % increase since 1990. Emission levels have fallen since then, to 280 million tonnes of CO_2 equivalent in 2012. This figure is nevertheless 56 % above 1990 levels; with emissions from international aviation alone having increased by 93 % between 1990 and 2012, and emissions from maritime transport by 32 %. Together these two categories made up 6 % of total GHG emissions in 2012.

Overall positive developments in non-ETS emissions since 2005

Figure 3.5 shows the development of Member States's non-ETS emissions between the ESD base year ([25]) and 2012, as well as their 2020 non-ETS targets. Twelve countries reduced their emissions and have already fulfilled their national targets. Five Member States increased emissions, but the rise was below their national targets for 2020. Eleven Member States are still above their national reduction targets, although all of them reduced emissions until 2012. Luxemburg is 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 to lower primary energy consumption in the transport and building sectors since 2005. These sectors are the two most important sources of non-ETS emissions. However, the continued economic depression and mild winter temperatures are also, at least in part, responsible for the decrease in energy demand.

Figure 3.5: Greenhouse gas emissions in non-ETS sectors, by country, 2012 (*)
(% change since ESD base year)



(*) Total emissions, excluding emissions covered by the Emissions Trading System (ETS); change until 2010 for HR.

Source: European Environment Agency, Eurostat (online data code: t2020_35)

Global CO_2 emissions and mean temperature continue to rise

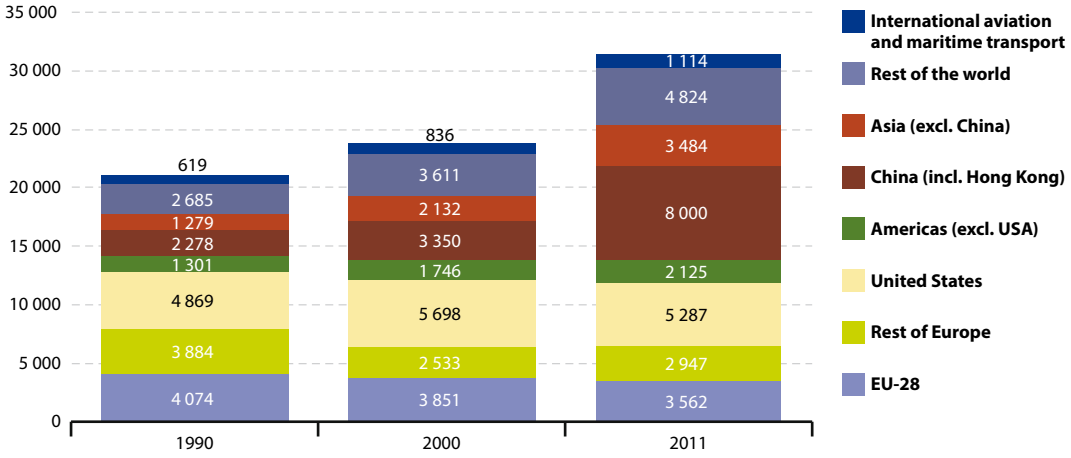
Despite reductions in the EU, global CO_2 emissions from fuel combustion rose by 49 % between 1990 and 2011, as shown in Figure 3.6. Most of the increase took place in emerging economies. Emissions growth was strongest in China, both in relative and absolute terms. Between 1990 and 2011, China's annual CO_2 emissions more than tripled and the country overtook the United States as the world's biggest emitter. At the same time, its per-capita emissions represented only 84 % of EU-27 levels in 2011.

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 2011 (172 % and 79 % respectively). As a result of these trends, the EU's share of global CO_2 emissions has been shrinking, from almost a fifth in 1990 to 11.4 % in 2011.

Rising emissions have dramatically increased CO_2 concentrations in the atmosphere. Although there is a time lag between CO_2 being emitted and the corresponding increase in average global surface temperature, recordings already show a clear upward trend (see Figure 3.7). Between 2001 and 2010, global surface temperature was 0.88 °C higher than during the first decade of the 20th century ([26]). The year 2013 tied with 2007 as the sixth warmest year since records began in 1850 ([27]). Current projections estimate that global mean temperatures could continue to rise by as much as 1.1 °C to 6.4 °C by 2100 if CO_2 emissions remain at current levels ([28]).

In Europe and globally, the rise in temperature has already led to observable changes in the natural systems and society. Damage costs from natural disasters have increased and are likely to rise substantially in the future. A recent European Environment Agency (EEA) assessment shows that the negative impacts of climate change will not affect European regions equally. Climate change can increase existing vulnerabilities such as exposure to flood risk in coastal areas or drought in the Mediterranean region ([29]). By hitting marginalised regions and poor people the hardest, climate

Figure 3.6: Global CO_2 emissions from fuel combustion, 1990, 2000 and 2011
(Million tonnes of CO_2)

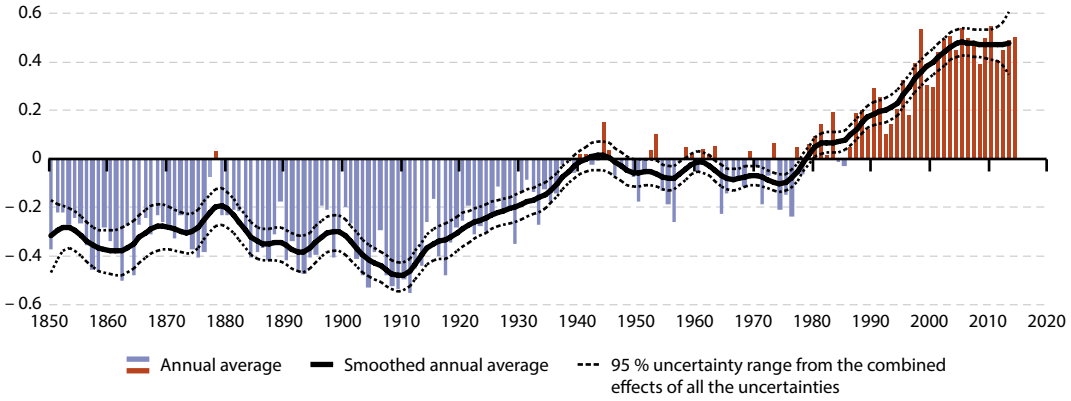


Source: International Energy Agency (IEA)

change might deepen socioeconomic imbalances in Europe (see Box 3.2, p. 90). This could undermine the Europe 2020 strategy's objective of inclusive growth.

Despite the EU's shrinking share in global CO_2 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.

Figure 3.7: Global annual mean temperature deviations, 1850–2014 (*)
(Temperature deviation in °C, compared with 1961–1990 average)



(*) 2014 data refer to the first half of the year (until June 2014).

Source: Climatic Research Unit, University of East Anglia and the UK Met Office Hadley Centre

Box 3.2: The consequences of climate change

In Europe, 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 °C to 2 °C, putting the region's agricultural sector at risk ([30]).

Climate change will also have an impact on human and animal health. Heat-related net extra deaths in the EU are projected to reach 86 000 per year in 2071–2100 relative to 1961–1990 if the global mean temperature increases by 3 °C. Disasters such as floods and storms and new diseases are likely to cause additional loss of life ([31]).

Climate change already has an impact on ecosystems and biodiversity in Europe. For example, water temperatures in lakes and rivers have increased, leading to more frequent algal blooms and forcing some species to move northwards ([32]).

More renewable energy means fewer EU emissions

Renewable energy has been growing steadily since 2004

The second energy and climate headline target of the Europe 2020 strategy is to increase the share of renewable energy in gross final energy consumption to 20 % by 2020.

Between 2004 and 2012, the share of renewable energy increased by 70 %, reaching 14.1 % of gross final energy consumption in 2012 (see Figure 3.8). The two main drivers of this increase were support schemes for renewable energy technology and shrinking costs. As a result of policies such as feed-in tariffs, grants, tax credits and quota systems, installed capacity for renewable electricity and heat generation as well as the use of renewable transport fuels has grown steadily over the past decade. The EU is now the world's biggest renewable energy investor ([33]). The scaling up of global production volumes and technological advances have allowed producers to substantially cut costs per unit. Prices of photovoltaic modules experienced the biggest plunge, falling by 76 % between 2008 and 2012. Onshore wind turbines became 25 % cheaper during the same period ([34]). As a result, wind and solar installations have started to become economically viable without subsidies in areas where the weather is favourable.

Box 3.3: 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 ([9]) requires Member States to put in place support schemes and remove administrative barriers with respect to authorisation, certification and licensing of renewable energy plants.

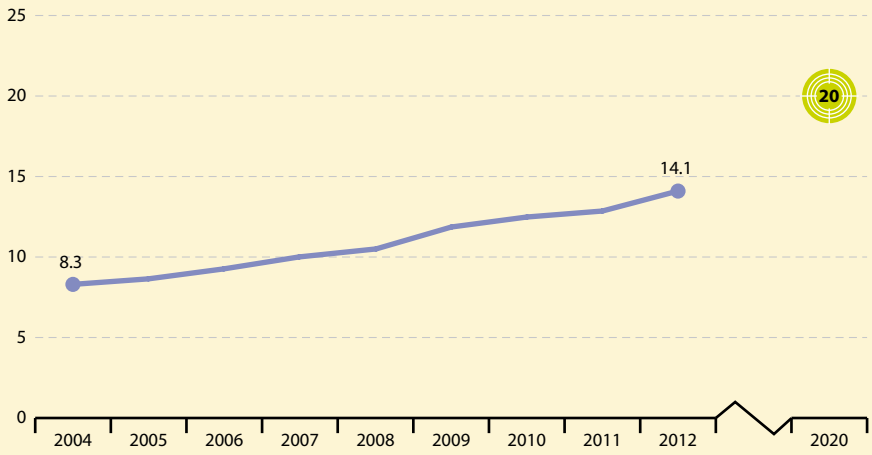
In 2010 all Member States developed national renewable energy action plans (NREAPs), detailing how they plan to achieve their target, including interim targets and trajectories per sector and technology.

Based on this planned development they report on progress to the European Commission every two years. In addition, Member States report on their national renewable energy targets in the National Reform Programmes under the Europe 2020 strategy.

EUROPE 2020 HEADLINE INDICATOR

Europe 2020 headline indicator

Figure 3.8: Share of renewable energy in gross final energy consumption, EU-28, 2004–12
(%)



2020 target

20

% share of renewable energy in gross final energy consumption by 2020

Source: Eurostat (online data code: t2020_31)

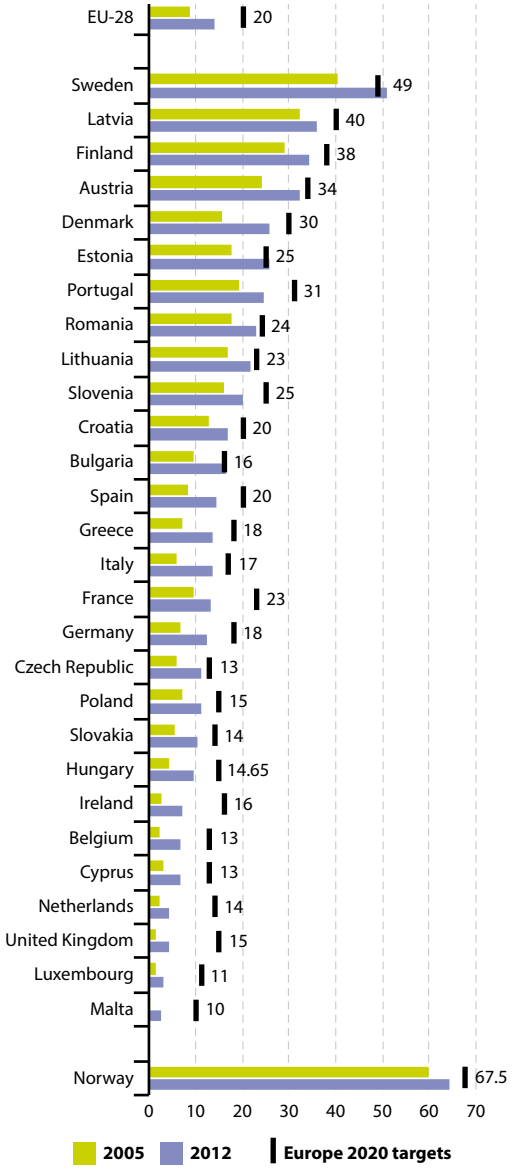
The expansion of renewable energy sources reduces the EU's dependence on imported fuels and, by creating jobs, contributes to the Europe 2020 strategy's employment objective (see the 'Employment' chapter on p. 25). Energy dependence, the share of total energy needs met by imports from non-EU countries, has increased significantly over the past two decades, reaching 53.4 % in 2012 (see Figure 3.16, p. 98). Fossil fuels make up the largest share. The dependence on imports exposes the European economy to high price volatility, significant costs and the risk of supply shortages, for example, due to geopolitical conflicts. Renewable energies, most of which can be sourced domestically, reduce these risks. They also generate more of their value added within EU borders, unlike imported fossil fuels.

The share of renewable energy in gross final energy consumption in 2012 ranged from 51.0 % in Sweden to 2.7 % in Malta (see Figure 3.9). Most differences stem from variations in natural resources, mostly in the potential for building hydropower plants and the availability of biomass. All Member States have increased their renewable energy share between 2005 and 2012. Ten countries have doubled their share, albeit all of them from a small base. The United Kingdom even tripled and Malta more than quadrupled its share, according to estimates. Sweden, Estonia and Bulgaria have already met their 2020 targets. In 2012 Romania, Lithuania, Austria and the Czech Republic were closest to reaching their national targets. The United Kingdom, the Netherlands and France were farthest away.

Biomass dominates 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. Biomass, the only renewable energy source contributing to all energy use sectors (electricity generation, transport and heating and cooling), remains by far the most important source in the EU. In 2012, solid biofuels,

Figure 3.9: Share of renewable energy in gross final energy consumption, by country, 2005 and 2012 (*)
(%)



(*) Data for MT are estimates; National target for HU differs from the ones set in Directive 2009/28/EC on the promotion of the use of energy from renewable sources; NO has adopted a mandatory target under Directive 2009/28/EC (see EEA Agreement, Annex IV).

Source: Eurostat (online data code: t2020_31)

renewable waste, biogas and bioliquids provided two-thirds of all gross inland consumption of renewable energy (see Figure 3.10). At the same time, wind and solar energy are growing the fastest. In 2012, the EU generated 17.7 million tonnes of oil equivalent (Mtoe) from wind energy, a more than nine-fold increase compared with 2000. In the same year, solar energy contributed a total of 9.1 Mtoe, 21 times as much as in 2000.

An analysis of the EU's renewable energy sector shows that in 2012 the renewable share was highest in the electricity sector. After rapid expansion in the past decade, renewables contributed 23.5% of total gross electricity generation in 2012. Hydropower remained the largest source, but was declining in relative weight as solar, wind and biogas were developing rapidly (see Figure 3.11).

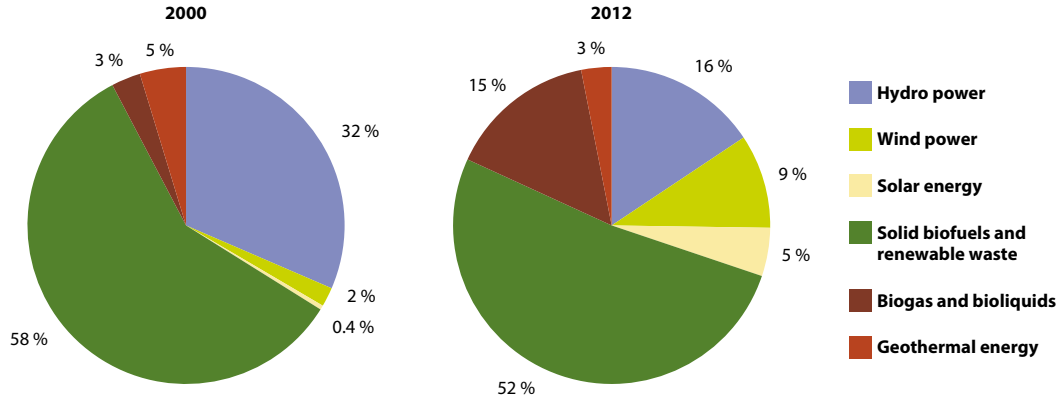
Moreover, renewable energies provided 15.6% of Europe's energy for heating and cooling in 2012, up from 9.9% in 2004. Solid biomass delivered the largest share of the total renewable share, followed by minor contributions from biogas, solar thermal and heat pumps ([35]).

Most countries lag behind regarding renewable energies in transport

Between 2011 and 2012, the share of renewables in transport energy use increased from 3.4% to 5.1%. Figure 3.12 shows an almost continuous increase of this share even since 2004. However, due to methodological reasons, data from 2011 onwards cannot be compared directly with data up to 2010.

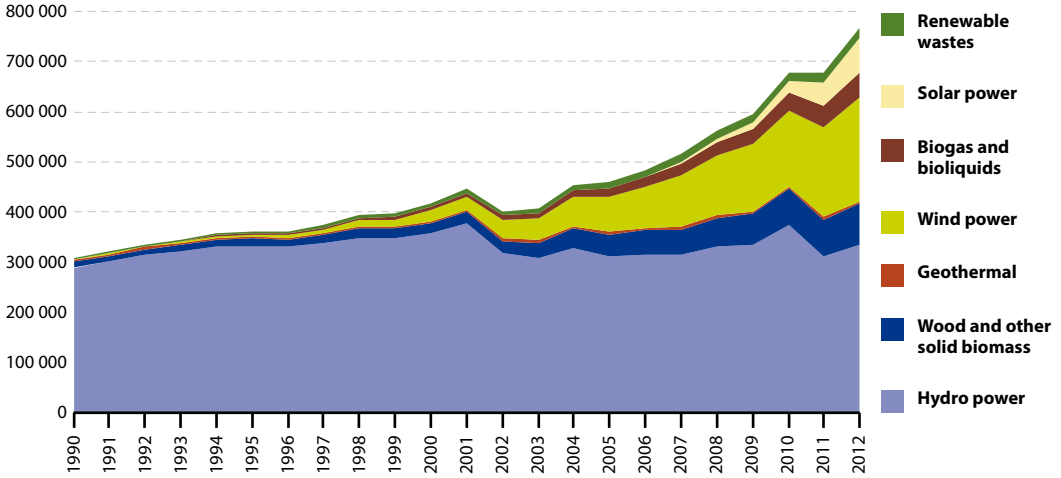
The Renewable Energy Directive sets sustainability criteria for the production of liquid biomass which makes up the lion's share of renewables in transport ([36]). Starting from 2011, only those biofuels certified as sustainable according to the Directive are included in the Eurostat statistics. Some Member States have not yet transposed the sustainability standards into national law. Biofuels consumed in these countries are no longer included in the indicator. This explains the drop in the share of renewables in transport from 2010 to 2011.

Figure 3.10: Gross inland consumption of renewable energy, by source, EU-28, 2000 and 2012
(%)



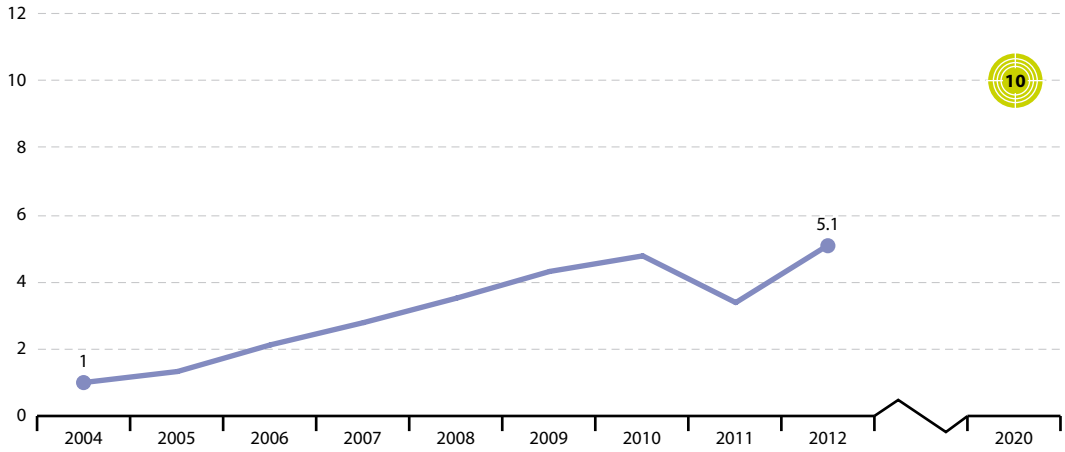
Source: Eurostat (online data codes: nrg_107a)

Figure 3.11: Gross electricity generation from renewable energy sources, EU-28, 1990–2012
(Gigawatt hours)



Source: Eurostat (online data code: nrg_105a)

Figure 3.12: Share of renewable energy in fuel consumption of transport, EU-28, 2004–12 (*) (%)



(*) 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)

Even without this statistical change, data for 2010 show 22 Member States did not achieve their interim target of increasing renewable energy's share to 5.75 % of final energy use in transport by 2010 ([37]). Extra efforts will be needed to achieve the 2020 objective of 10% by 2020. The target is defined relative to the total amount of energy consumed in transport. Therefore, reducing energy needs in the transport sector, for example, by introducing more energy-efficient cars, will also contribute to achieving it.

The EU needs to further pursue energy-efficiency improvements

Delivering the same service or product but using less energy is one of the most cost-effective options for reducing GHG emissions. Building refurbishment, followed by the transport and industry sectors, offers the biggest potential for improvement ([38]).

The headline 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 ([39]).

Primary energy consumption (PEC) includes all gross inland energy consumption except energy carriers employed for non-energy purposes, for example, petroleum 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 during energy transformation (particularly electricity generation), transmission and distribution.

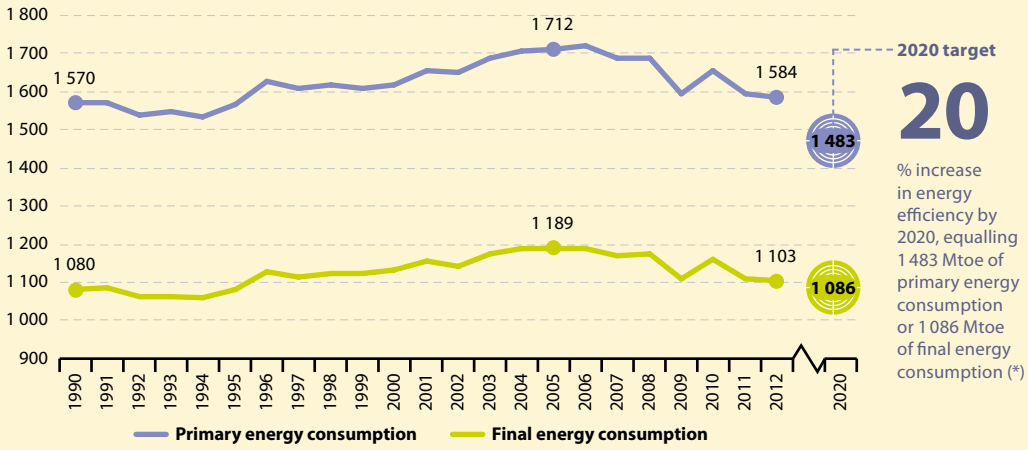
EU energy consumption has been falling since 2006, but the trend has not been continuous

As shown in Figure 3.13, PEC was relatively stable in the EU between 1990 and 1995. In 1996 it

EUROPE 2020 HEADLINE INDICATOR

Europe 2020 headline indicator

Figure 3.13: Primary energy consumption and final energy consumption, EU-28, 1990–2012
(Million tonnes of oil equivalent (Mtoe))



(*) Due to regular data updates, the target values have been revised compared with the previous publication.

Source: Eurostat (online data codes: t2020_33 and t2020_34)

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 1 721 Mtoe. Following the economic crisis, it fell sharply by 126 Mtoe until 2009, reaching a level lower than in 1997. After a rebound in 2010, PEC decreased again in the following years to 1 584 Mtoe in 2012. In 2012, the EU thus consumed roughly as much primary energy as it did in 1990 and 7.5 % less than in 2005. To achieve its 2020 target, the EU needs to reduce PEC by an additional 6.3 % in the eight years between 2012 and 2020.

Much of the decrease for the period from 2008 to 2010 may be attributed to the lower level of economic activity as a result of the financial and economic crisis, rather than to a structural shift in energy consumption patterns. With respect to the drop of 3.5 % between 2010 and 2011, a mild winter resulting in lower heating demand also played a role ([40]). The most recent reduction of 1 % between 2011 and 2012 can again be partly attributed to reduced economic output expressed by a 0.4 % contraction of GDP in 2012. The analysis underlines the need to further pursue energy-efficiency measures. Continuous effort can ensure that PEC will remain on a downward path even when economic growth accelerates again.

The trend in final energy consumption has closely followed the trend in primary energy consumption, reaching 1 103 Mtoe in 2012.

Breaking the energy efficiency target down to Member State level

As shown in Figure 3.14, 25 Member States have reduced primary energy consumption between 2005 and 2012 by values ranging from 1.2 % to 25.9 %. A look at the data for 2007, the year before the onset of the economic crisis, shows that reduced economic output in addition to energy-efficiency measures also helped lower consumption. In the remaining three Member States, primary energy

Box 3.4: Measuring progress towards the EU energy efficiency target

The third Europe 2020 headline target on climate change and energy is to move towards a 20% improvement in the EU's energy efficiency. According to the Energy Efficiency Directive (EED) ([41]), the EU efficiency target is measured as a 20% saving compared with a hypothetical projection for EU primary energy consumption (PEC). Starting with the 2005 base year, this business-as-usual projection (carried out in 2007) estimated a primary energy consumption of 1 853 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 1 483 Mtoe PEC for 2020 ([42]). Compared with the level of PEC in 2005, this is equivalent to a reduction of 13%. For all years between 2005 and 2020, the PEC savings indicate the percentage achieved towards the target, as shown in Table 3.1. The indicator is only calculated for the EU as a whole, and not for individual Member States.

It is important to note that the economic growth in the EU since 2008 has been much lower than the projections underlying the energy-efficiency target assume. Given that growth is a key driver of energy consumption, the savings expressed in relation to the virtual projection need to be treated with caution. They do not necessarily mean that EU products and services are produced with less energy input per unit and are thus more energy efficient; they can also result from lower production levels.

Table 3.1: Savings in primary energy consumption compared with the PEC projection for 2020, EU-28, 2005–12
(% of savings)

	2005	2006	2007	2008	2009	2010	2011	2012	Target 2020
EU-28	0.0	0.0	2.2	2.8	8.4	5.7	9.3	10.5	20

Source: Eurostat (online data code: t2020_33)

Box 3.5: National energy efficiency targets

The Energy Efficiency Directive (EED) 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 ([43]). While all Member States have set their targets, two have not expressed them in absolute primary and final levels in 2020, as requested. Taken collectively, the national indicative targets are projected to only deliver about 16% of primary energy savings by 2020, falling short of the 20% overall aim ([44]).

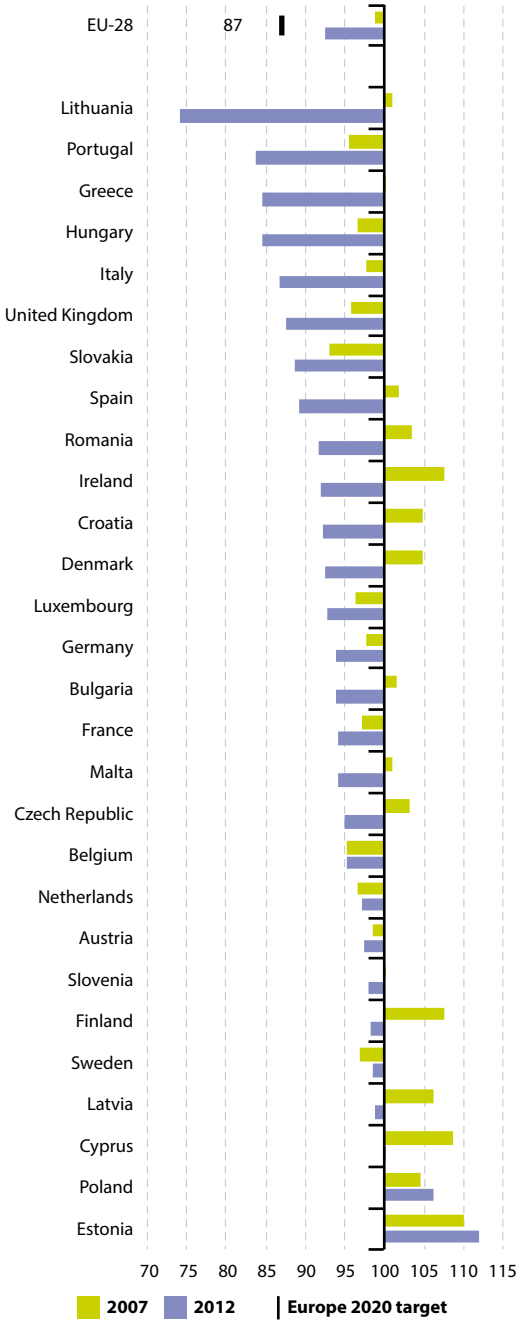
consumption has gone up by 0.1 % to 12 % since 2005, stressing the importance of additional efforts to improve energy efficiency.

Between 1990 and 2012, economic sectors developed differently with respect to final energy consumption (see Figure 3.15). The agriculture and forestry sector as well as industry have reduced final energy consumption by 24.6 % and 23.1 % respectively. By contrast, energy consumption in the services and transport sectors has gone up by 36.4 % and 23.8 % over the same time period. The residential sector's consumption has remained fairly stable. These changes reflect sector-specific levels of energy-efficiency improvement, but 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, rising volumes of freight and personal transport have outweighed efficiency gains in the past few decades.

Despite recent reductions in energy consumption, substantial potential for cost-efficient improvements in energy efficiency remain untapped. This includes in particular the refurbishment of buildings but also transport, green procurement in the public sector and savings along the energy supply chain from extraction to distribution.

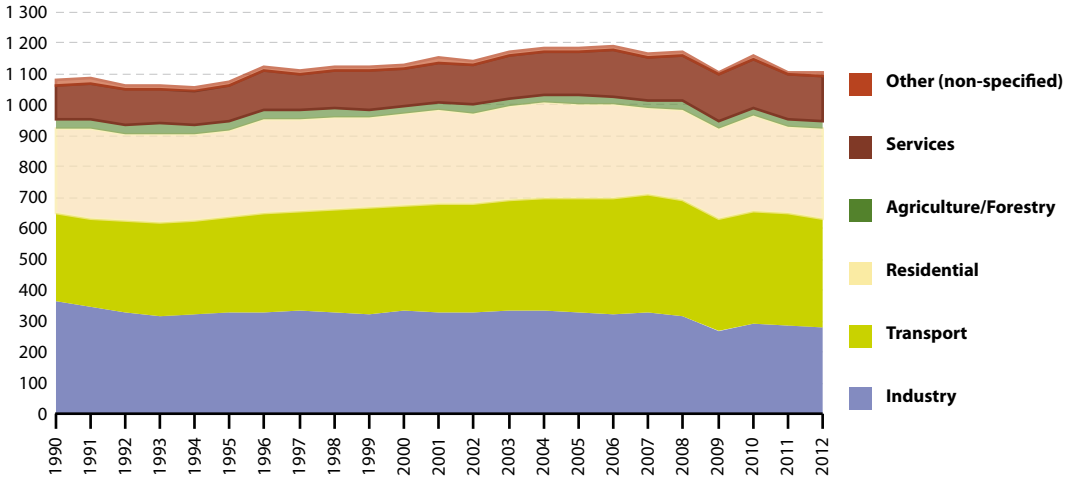
Energy-efficiency improvements can strengthen the EU's competitiveness and lower its dependence on fossil fuel imports. As mentioned before, the EU's energy dependence has increased significantly over the past decade, reaching 53.4 % in 2012 (see Figure 3.16). Imports of fossil energy carriers such as petroleum, natural gas and hard coal are mostly responsible for this dependence. By contrast, most renewable energies can be sourced domestically.

Figure 3.14: Change in primary energy consumption, by country, 2007 and 2012
(Index 2005 = 100)



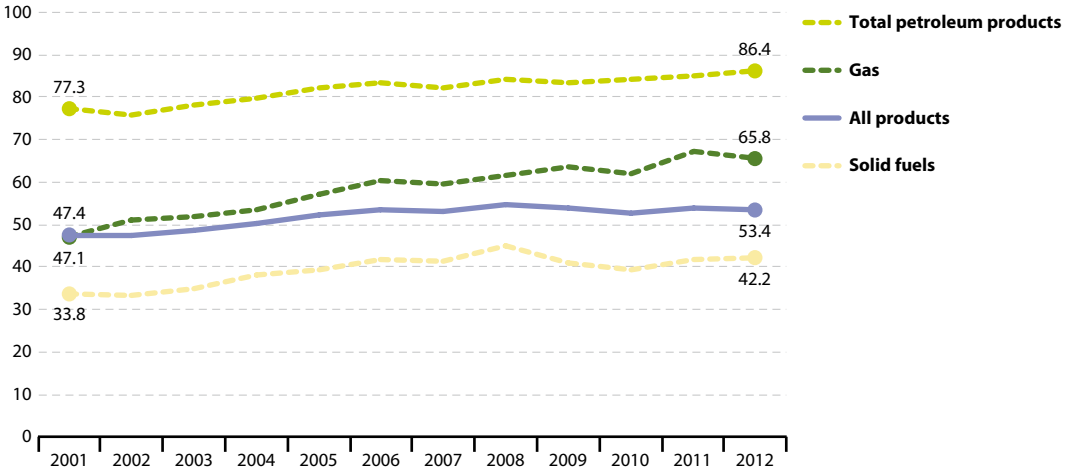
Source: Eurostat (online data code: t2020_33)

Figure 3.15: Final energy consumption, by sector, EU-28, 1990–2012
(Million tonnes of oil equivalent (Mtoe))



Source: Eurostat (online data code: tsdpc320)

Figure 3.16: Energy dependence, EU-28, 2001–12 (*)
(% of imports in total energy consumption)



(*) 'Total' is not the average of the other three fuel categories shown. It also includes other energy sources, such as renewable energy or nuclear energy, parts of which are treated as domestic sources.

Source: Eurostat (online data code: tsdcc310)

Conclusions and outlook towards 2020

At first glance, the EU has made substantial progress towards its energy and climate objectives. In 2012, GHG emissions (including international aviation) were down by 18 % compared with 1990 levels, approaching the headline target to reduce emissions by 20 % by 2020. Primary energy consumption (PEC) fell to 1 584 Mtoe in 2012, after growing almost continuously between 1990 and 2007. In 2012, the EU consumed 7.5 % less primary energy than in 2005 – the base year of the energy-efficiency target. To achieve the target of improving energy efficiency by 20 % by 2020, the EU has to reduce PEC by a further 6.3 % over a period of eight years.

By far the strongest decline in energy consumption and GHG emissions within one year since the early 1990s occurred from 2008 to 2009 (– 7.3 %). During this time the economic crisis led to reduced industrial production, transport volumes and energy demand. The following years only saw slow recovery in many parts of Europe. The decline of CO_2 emissions observed during the 2009 to 2012 period can be attributed to three main factors: the improvement of the primary energy intensity of the EU economy, the development of renewables and the economic slowdown. The economic slowdown, however, accounts for less than a half of the total emission reductions achieved during this period ([45]).

With respect to renewable energies, progress towards a restructured low-carbon economy is clearly noticeable. Between 2004 and 2012, the share of final energy from renewable source increased by 70 %, reaching 14.1 % in gross final energy consumption in 2012. Thanks to effective support schemes and dramatic cost reductions, the share of wind and solar energy has increased particularly quickly. The renewable energy industry has become a key sector for research and innovation in Europe, generating a rapidly increasing number of patents between 2000 and 2009 (see the 'R&D and innovation' chapter, p. 49). In regions with favourable weather conditions and high electricity prices, solar and wind projects are becoming increasingly competitive with fossil fuel based power generation, even without subsidies.

On the global level, reductions in EU GHG emissions and energy consumption have been offset by significant increases in other parts of the world. Global CO_2 emissions from fuel combustion rose by 49 % between 1990 and 2011. The increase was particularly strong in China, which more than tripled its annual CO_2 emissions in these two decades.

Efforts needed to meet the Europe 2020 targets on climate change and energy

According to the latest Member State projections, the EU-28 will overachieve its 2020 emission reduction target for the sectors not covered by the EU ETS by 1 % ([46]). However, only 15 Member States are expected to reach their commitments with the existing policies and measures, while 13 are unlikely to be able to meet their commitments unless additional measures are implemented. A major policy challenge is to improve consistency in the Member States' domestic climate policy frameworks. Additional measures could focus on ensuring investment security for innovative green technologies and changing the tax system to give greater incentives for energy efficiency ([47]).

With respect to the renewable energy target, the European Commission's 2013 Progress Report ([48]) warns that more effort will be needed to sustain high levels of investment in renewable energy projects. Compared with the National Renewable Energy Action Plans prepared by Member States, projections indicate that only 50 % of total wind generation planned in 2020 might actually be produced. By contrast, projections for electricity generation from photovoltaics are above planned levels. In its progress report, the European Commission also states that fundamental changes to the support schemes in some Member States have raised the regulatory risk for investors. This has added to an already difficult financing environment. The

Commission also concludes that the removal of planning and licensing administrative barriers is not occurring fast enough.

As foreseen by the Europe 2020 strategy, tapping the remaining greenhouse gas reduction potential can have significant socioeconomic and environmental benefits. This has been demonstrated in the 'Roadmap for moving to a competitive low carbon economy in 2050' ([49]). The EU can create jobs in high-technology industries; it can become a lead market in fields with high global demand and reduce energy dependence. More renewables and improved energy efficiency could save the EU between EUR 175 and 320 billion of energy import costs per year over the next 40 years. As recognised in the flagship initiative 'Innovation Union', a push for technological and policy innovation will be crucial to accomplishing this transformation.

Notes

([1]) United Nations Framework Convention on Climate Change, *Copenhagen Accord*, Copenhagen: United Nations, 2009.

([2]) European Commission, *Renewable energy: progressing towards the 2020 target,* COM (2011) 31 final, Brussels, 2011 (p. 2).

([3]) European Commission, *A resource-efficient Europe — Flagship initiative under the Europe 2020 Strategy*, COM (2011) 21, Brussels, 2011, (p. 2).

([4]) See http://ec.europa.eu/eurostat/web/environmental-data-centre-on-natural-resources/resource-efficiency-indicators/resource-efficiency-scoreboard.

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

([6]) *European Council conclusions 17 June 2010, EUCO 13/10,* Brussels, 2010.

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

([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]) 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.

([12]) Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC [OJ L315 p. 1].

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

([14]) Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products.

([15]) Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity.

([16]) Regulation (EC) No 443/2009 of the European Parliament and of the Council of 23 April 2009 setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO_2 emissions from light-duty vehicles.

([17]) 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 CO_2 emissions from light-duty vehicles.

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

([19]) EEA, *Annual greenhouse gas inventory 1990–2012 and inventory report 2014.* EEA Report No. 9/2014. Copenhagen 2014, (p. v).

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

([21]) EEA, *Annual greenhouse gas inventory 1990–2011 and inventory report 2013.* EEA Report No. 8/2013. Copenhagen 2013, (p. 6).

([22]) EEA, *Annual greenhouse gas inventory 1990–2012 and inventory report 2014*. EEA Report No. 9/2014. Copenhagen 2014, (p. viii).

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

([24]) Viktoria Bolla and Velina Pendolovska, *Driving forces behind EU-27 greenhouse gas emissions over the decade 1999–2008*, Statistics in Focus 10/2011, Eurostat, Luxembourg, 2011, (p. 5).

([25]) 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.

([26]) World Meteorological Organization, *The global climate 2001–2010. A decade of climate extremes*, WMO-No. 1119, Geneva, 2013, (p. 3).

([27]) World Meteorological Organization, *WMO statement on the status of the global climate in 2013*, WMO, No 1130, Geneva, 2014, (p. 4).

([28]) EEA, *The European environment — state and outlook 2010: Synthesis Report*, Copenhagen, 2010.

([29]) EEA, *Climate change, impacts and vulnerability in Europe 2012*, Copenhagen, 2013.

(30) EEA, *Climate change, impacts and vulnerability in Europe 2012*, Copenhagen, 2013.

(31) European Commission, *Impact Assessment — Part 2 accompanying the document An EU Strategy on adaptation to climate change*, SWD(2013) 132 final, (p. 37–40).

(32) EEA, *Climate change, impacts and vulnerability in Europe 2012*, Copenhagen, 2013.

(33) McCrone, Angus et al, *Global Trends in Renewable Energy Investment 2012. Frankfurt School of Finance and Management*, commissioned by UNEP's Division of Technology, Industry and Economics (DTIE) and endorsed by REN21, Frankfurt, 2012.

(34) McCrone, Angus et al, *Global Trends in Renewable Energy Investment 2012. Frankfurt School of Finance and Management*, commissioned by UNEP's Division of Technology, Industry and Economics (DTIE) and endorsed by REN21, Frankfurt, 2012.

(35) Eurostat: *Shares 2012 — Short assessment of renewable energy sources*. Last update: 14 April 2014 including the latest data on renewable energy generation.

(36) Marek Sturc, *Renewable Energy: Analysis of the latest data from renewable sources*. Statistics in Focus 44/2012, Eurostat, Luxembourg, 2012.

(37) European Commission, Council, the European Economic and Social Committee and the Committee of The Regions: *Renewable energy progress report*. (SWD (2013) 102 final), Brussels, 2013, (p. 4).

(38) European Commission, *Energy Efficiency Plan 2011*, COM (2011) 109 final, Brussels, 2011.

(39) 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.

(40) European Commission, *Europe 2020 targets: climate change and energy* (accessed 23 July 2013).

(41) 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.

(42) EUR-Lex, *Access to European Union Law* (accessed 20 June 2014)

(43) 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.

(44) European Commission, *Europe 2020 targets: climate change and energy* (accessed 19 June 2014).

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

(46) European Commission, *Europe 2020 targets: climate change and energy* (accessed 19 June 2014).

(47) European Commission, *Europe 2020 targets: climate change and energy* (accessed 19 June 2014).

(48) European Commission, Council, the European Economic and Social Committee and the Committee of The Regions: *Renewable energy progress report*. European Commission, Brussels, 2013.

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

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 ([2]).

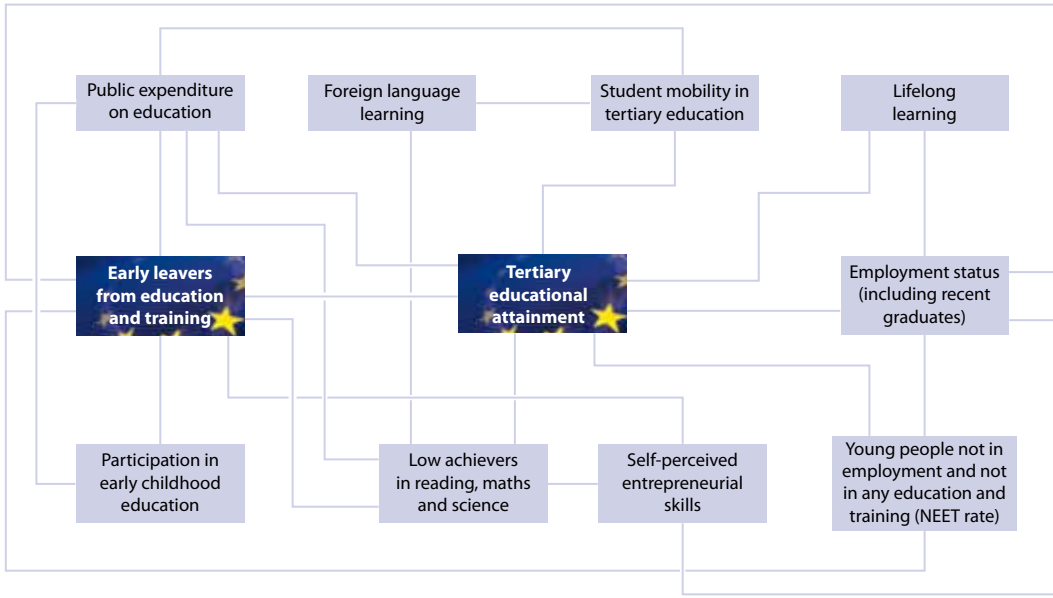
Nowadays upper secondary education is considered the minimum desirable educational attainment level for EU citizens. Young people who leave education and training prematurely lack crucial skills and run the risk of facing serious, persistent problems in the labour market and experiencing poverty and 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 also less likely to be 'active citizens' or engage in lifelong learning ([4]).

In addition, tertiary education, with its links to research and innovation, provides highly skilled human capital (see the chapter 'R&D and innovation' on p. 49). A lack of these skills presents a severe obstacle to economic growth and employment in an era of rapid technological progress, intense global competition and labour market

Europe 2020 strategy target on education

The Europe 2020 strategy sets out a target of 'reducing school drop-out rates 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 ([3]).

Figure 4.1: Indicators and concepts presented in the chapter and their links to the headline indicators on education





Box 4.1: ET 2020 — the EU's Strategic Framework for Education and Training 2020

The two Europe 2020 targets are embedded in the broader Strategic Framework for Education and Training 2020 (ET 2020) ([5]). ET 2020 aims to foster European cooperation 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; creativity, innovation and entrepreneurship at all levels of education and training. To support the achievement of these objectives ET 2020 sets EU-wide benchmarks. Apart from the two Europe 2020 targets for education, there are six additional 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 should have had a period of higher education-related study or training (including work placements) abroad, representing a minimum of 15 ECTS credits ([6]) or lasting a minimum of three months.
- An EU average of at least 6 % of 18 to 34 year olds with an initial vocational education and training (VET) qualification should have had an initial VET-related study or training period (including work placements) abroad lasting a minimum of two weeks, or less if documented by Europass ([7]).
- 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 %.

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 ([8]).

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 presentation of the headline and contextual indicators starts with early leaving from education and training, followed by early childhood education, acquisition of basic skills (reading, maths and science) and foreign languages, leading to tertiary education and lifelong learning in adulthood. The analysis then switches to the 'outcome' side. Here it looks at educational attainment in the EU labour force and the impacts of low levels of attainment. Last, it investigates the input into the education system, in the form of public expenditure on education.

The EU's education targets are interlinked with the other Europe 2020 goals: higher educational levels help employability and progress in increasing the employment rate in turn helps to reduce poverty ([9]). The tertiary education target is furthermore interrelated with the research and development (R&D) and innovation target. Investments in the R&D sector will raise demand for highly skilled workers (see the 'Research and development' chapter on p. 49).

Early leaving from education and training is declining

The headline indicator 'Early leavers from education and training' shows the share of the population aged 18 to 24 with at most lower secondary education and not in further education or training. This indicator refers to both people who failed and dropped out of school and those who did not fail but left education without continuing. Figure 4.2 indicates that since 2002 the share of early leavers from education and training has fallen continuously in the EU. This trend mirrors reductions in almost all EU Member States for both men and women.

Young men, foreign-born and ethnic minorities leave education and training earlier

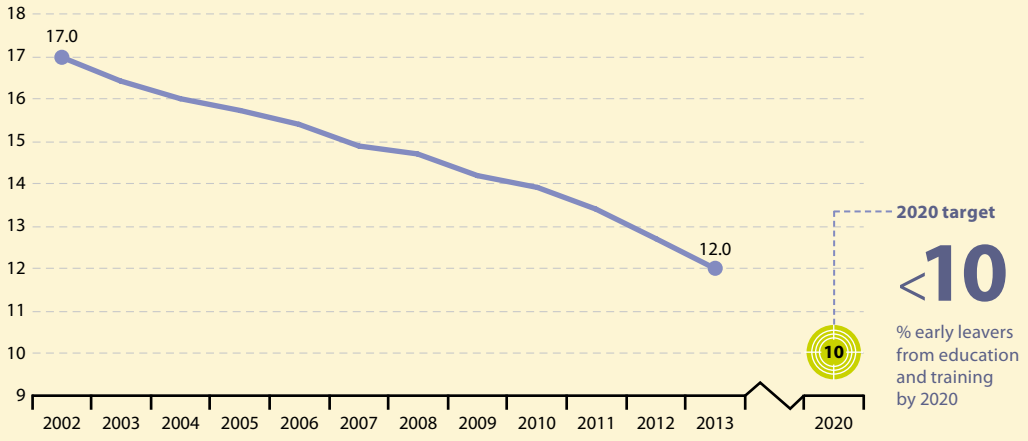
In the EU as a whole, rates of early leaving from education and training are about three percentage points higher for men than for women. Since 2002, this gap has closed only slightly. Bulgaria and Czech Republic were the only EU Member States in 2013 where men were more likely to stay in education and training. A similar situation could be observed in the candidate countries Turkey and FYR Macedonia ([10]). In all other EU Member States men were more likely to leave education earlier. Gender differences were particularly strong in Cyprus, Estonia, Spain, Latvia, Portugal and Italy. In these countries, early leaving was twice as high or more for men than for women.

Similarly, young foreign-born residents have a higher tendency to abandon formal education prematurely. In the EU, the share of early leavers among migrants in 2013 was more than twice as high as for natives (22.6 % compared with 11 %). Language difficulties, leading to underachievement and lack of motivation, are possible reasons. Lower socioeconomic status of foreign-born residents increasing the risk of social exclusion is another ([11]).

EUROPE 2020 HEADLINE INDICATOR

Europe 2020 headline indicator

Figure 4.2: Early leavers from education and training, EU-28, 2002–13 (*)
(% of the population aged 18 to 24 with at most lower secondary education and not in further education or training)



(*) Break in series in 2003; Europe 2020 target under 10 %.

Source: Eurostat (online data code: t2020_40)

Educational systems may also exacerbate these circumstances if they are not set up to respond to the special needs of pupils from vulnerable groups ([12]).

In a number of Member States the proportion of pupils dropping out early or even not attending school at all is especially high among ethnic minority groups, such as Roma. In 2011 more than 10 % of Roma children were not attending compulsory education in Romania, Bulgaria, France and Italy. This figure reached 35 % in Greece ([13]).

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 ([14]). In response to persistent marginalisation and social exclusion of Roma minorities, the European Commission in 2011 adopted the 'EU Framework for national Roma integration strategies up to 2020' ([15]). The framework reflects the EU's commitment to ensuring Roma inclusion in four key areas, including access to education.

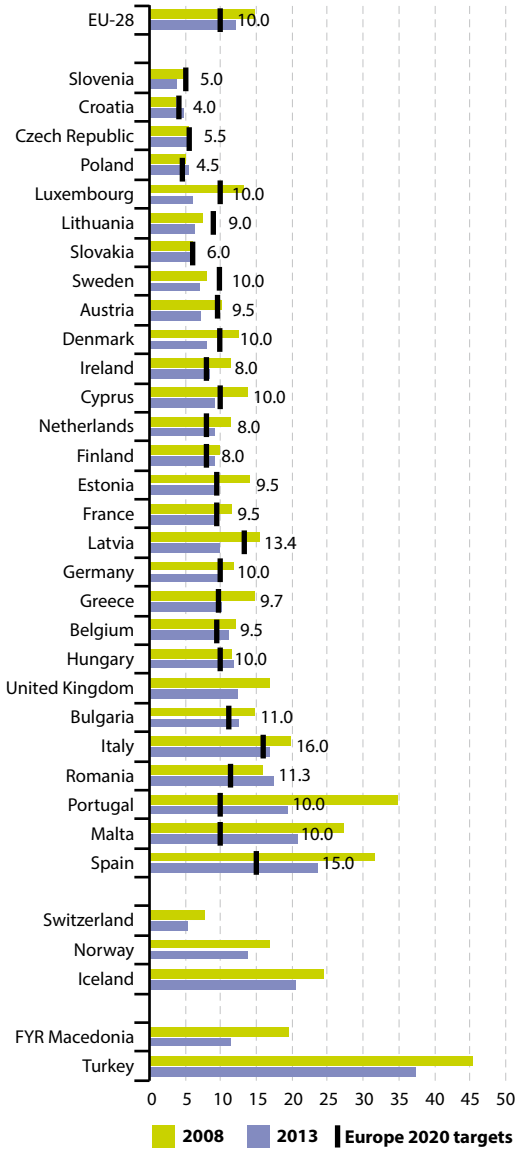
Early leaving from education and training is highest in Southern Europe

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 ([16]). National targets range from 4 % for Croatia to 16 % for Italy. In 2013, 10 countries had already achieved their targets: Austria, Cyprus, the Czech Republic, Denmark, Germany, Lithuania, Luxembourg, Latvia, Sweden and Slovenia. On the other end of the scale, Portugal and Malta were the furthest away by some 10 percentage points.

In 2013 rates of early leaving varied by a factor of six across EU Member States. The lowest proportion of early leavers was in Croatia, Slovenia, the Czech Republic and Poland with less than 6 %. The share was highest in Spain, Malta, Portugal, Romania and Italy, with 17 % or more.

At the same time Southern European countries experienced strong falls in early leaving from education and training over the period 2008 to 2013, especially Portugal (from 34.9 % to 18.9 %),

Figure 4.3: Early leavers from education and training, by country, 2008 and 2013 (*)
(% of the population aged 18–24 with at most lower secondary education and not in further education or training)

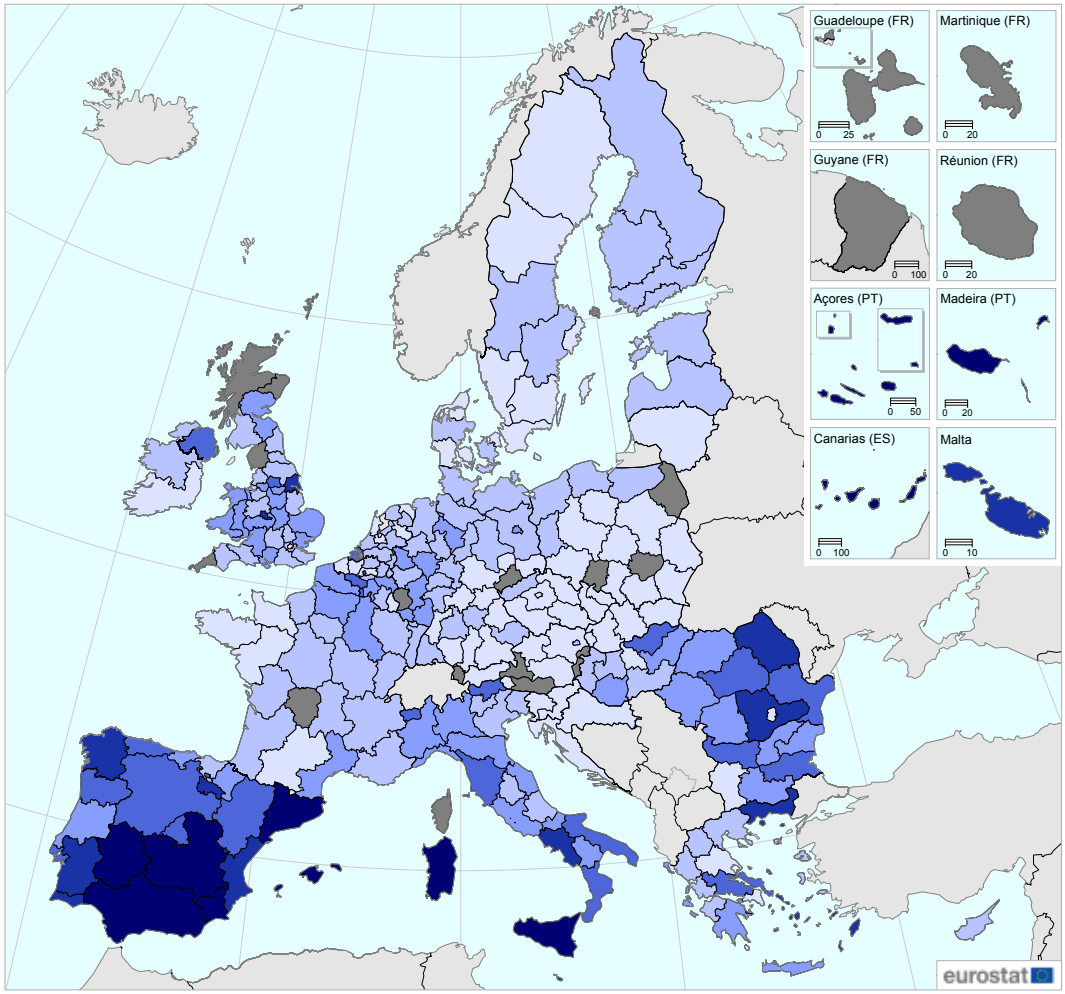


(*) Break in series for LU (2009), NL (2010), LV (2011) and FR (2013).

National targets: EU-28, DK, DE, LU, SE: under 10 %, ES: 15 % (drop-out rate), NL: under 8 %, LT: under 9 %, SK: under 6 %, UK: no target.

Source: Eurostat (online data code: t2020_40)

Map 4.1: Early leavers from education and training, by NUTS 2 regions, 2013 (*)
(% of population aged 18 to 24)



(% of population aged 18–24)

EU-28 = 12.0

< 8
8 – < 12
12 – < 16
16 – < 20
20 – < 24
≥ 24
Data not available

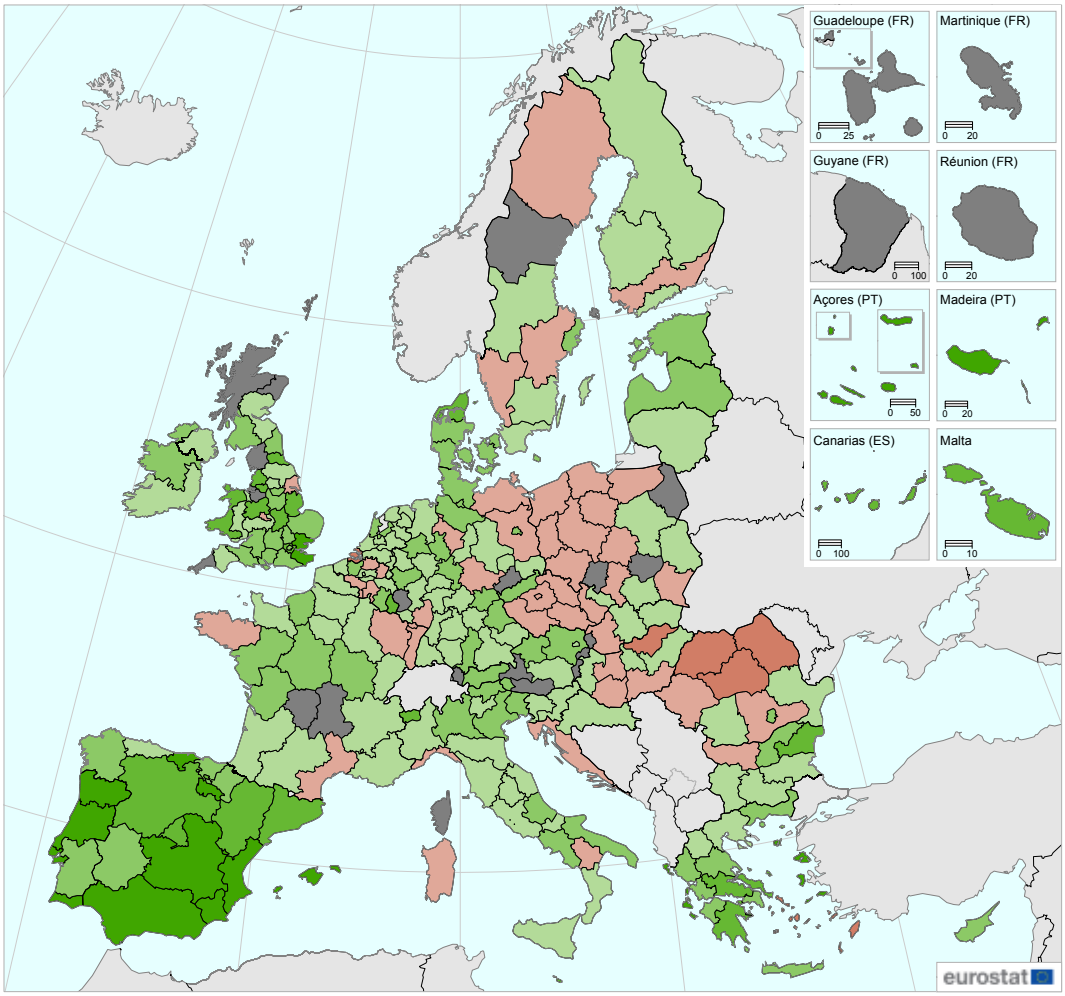
Administrative boundaries: © EuroGeographics © UN-FAO
Cartography: Eurostat — GISCO, 12/2014

0 200 400 600 800 km

(*) Low data reliability for BE (Prov. Brabant Wallon and Prov. Luxembourg), CZ (Praha), DK (Nordjylland), EL (Dytiki Makedonia, Thessalia, Ipeiros, Ionia Nisia and Voreio Aigaio), ES (Cantabria, La Rioja, Ciudad Autónoma de Ceuta and Ciudad Autónoma de Melilla), FR (Basse-Normandie, Franche-Comté, Limousin and Auvergne), HR, IT (Valle d'Aosta/Vallée d'Aoste), AT (Steiermark, Tirol and Vorarlberg), PL (11 regions), SI, SK (Bratislavský kraj), SE (Mellersta Norrland), UK (Cumbria, North Yorkshire, Lincolnshire, Cornwall and Isles of Scilly, Devon, North Eastern Scotland and Highlands and Islands); 2012 data for DE (Trier and Chemnitz), FR (Limousin), AT (Vorarlberg), PL (Swietokrzyskie) and UK (Cornwall and Isles of Scully and North Eastern Scotland); 2011 data for PL (Podlaskie and Opolskie) and UK (Cumbria and Highlands and Islands).

Source: Eurostat (online data code: edat_lfse_16)

Map 4.2: Change in early leavers from education and training, by NUTS 2 regions, 2008–13 (*)
(percentage points difference between 2013 and 2008, population aged 18 to 24)



(*) 2013 low data reliability for DK (Nordjylland), EL (Thessalia, Ipeiros and Ionia Nisia), ES (Cantabria, La Rioja), FR (Limousin), HR, AT (Steiermark), PL (11 regions), SI, SK (Bratislavský kraj), SE (Mellersta Norrland), UK (Lincolnshire, Devon and North Eastern Scotland); 2008 and 2013 low data reliability for BE (Prov. Brabant Wallon and Prov. Luxembourg), CZ (Praha), EL (Dytiki Makedonia and Voreio Aigaio), ES (Ciudad Autónoma de Ceuta and Ciudad Autónoma de Melilla), FR (Basse-Normandie, Franche-Comté and Auvergne), IT (Valle d'Aosta), AT (Tirol and Vorarlberg), UK (Cumbria, North Yorkshire, Cornwall and Isles of Scilly, Highlands and Islands); 2008 low data reliability for BE (Namur), FR (Alsace and Bretagne), HR (Jadranska Hrvatska), AT (Salzburg), PL (13 regions), DK (Övre Norrland); 2010 data instead of 2008 for DK (Mellersta Norrland); 2009 data and low data reliability for UK (North Eastern Scotland); 2012 data instead of 2013 for DE (Trier and Chemnitz), FR (Limousin), AT (Vorarlberg), PL (Swietokrzyskie) and UK (Cornwall and Isles of Scully and North Eastern Scotland); 2011 data instead of 2013 for PL (Podlaskie and Opolskie) and UK (Cumbria and Highlands and Islands); 2010 break in series for NL, 2013 break in series for FR (except regions Basse-Normandie, Franche-Comté, Limousin and Auvergne).

Source: Eurostat (online data code: edat_lfse_16)

Spain (from 31.7 % to 23.6 %) Malta (from 27.2 % to 20.8 %), Greece (from 14.4 % to 10.1 %) and Cyprus (from 13.7 % to 9.1 %). In 2013, 21 EU Member States showed early leaving rates below the EU average of 12 % and 18 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 above the EU average in Norway, Iceland and up to three times the EU average in Turkey.

The variations in the incidence of 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 %) that can be seen 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 stark contrast, regions in Spain, Portugal, Italy and Romania stand out with above average rates of early leavers from education and training. The autonomous cities and islands of Spain and Portugal recorded the highest proportions of 18 to 24 years olds who were classified as early leavers in 2013 (26 % and above). The share of early leavers was also higher than 20 % in three regions from the extremities of Italy (including the islands of Sardegna and Sicilia), the far north-eastern Greek region of Anatoliki Makedonia and the Greek island group of Notio Aigaio. Outside southern Europe, more than one fifth of the population aged 18 to 24 was composed of early leavers from education and training in two regions in the United Kingdom and two in Romania.

In 2013, Poland and Bulgaria showed the biggest within-country dispersion of early leaving rates, with a factor higher than four. This means that the worst performing regions in these countries had early leaving rates that were about four times the rates of the best performing regions. In 2013, the Polish region Warminsko-Mazurskie had early leaving rates 4.5 times higher than the best performing regions in Poland. In contrast, Slovenia, Croatia and Finland 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. More than three quarters (78.5 %) of the 295 NUTS 2 regions for which data are available have experienced a fall in their proportion of early leavers aged 18 to 24 during the five consecutive years from 2008 to 2013. The biggest reductions were recorded in Portuguese and Spanish regions. The largest declines were in two regions of Portugal — Norte and the autonomous region of Madeira, where the proportion of early leavers fell by 19.9 percentage points.

In contrast, early leaving rates increased in 50 regions over the period from 2008 to 2013. Four regions had increases of more than four percentage points; two of which were in Romania (Centru and Nord-Est), one was in the Netherlands (Zeeland) and the remaining one was in Hungary (Észak-Magyarország).

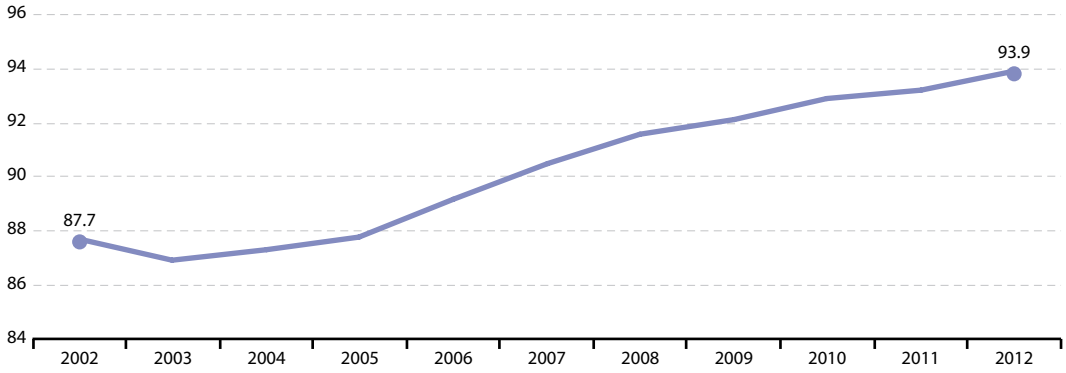
Starting early

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 European Union therefore aims to ensure that all young children can access and benefit from high-quality education and care ([17]).

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

Figure 4.4: Participation in early childhood education, EU-28, 2002–12 (*)
(% of the age group between four years old and the starting age of compulsory education)



(*) ET 2020 benchmark for the EU 2020 benchmark for the EU: at least 95 %.

Source: Eurostat (online data code: tps00179)

offers higher medium- and long-term returns and is more likely to help children from low socio-economic status than investments at later educational stages ([18]).

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 risen more or less continuously in the EU since 2002. Several countries had already exceeded the ET 2020 benchmark in 2012, implying almost universal pre-school attendance. France and Malta had already achieved a 100 % pre-school attendance, and in Italy, the Netherlands and Ireland participation rates were above 99 %. On the opposite end of the spectrum, the lowest pre-school attendances were observed in Croatia (71.7 %), Finland (75.1 %) and Greece (75.2 %).

Integrating foreign-born population and ethnic minorities in 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 revealed a large gap between Roma and non-Roma children attending pre-school and kindergarten in nine of the countries ([19]). The EU has since identified accessibility to early childhood education and care for children from ethnic minorities a priority area within the ECEC participation framework. 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 ([20]).

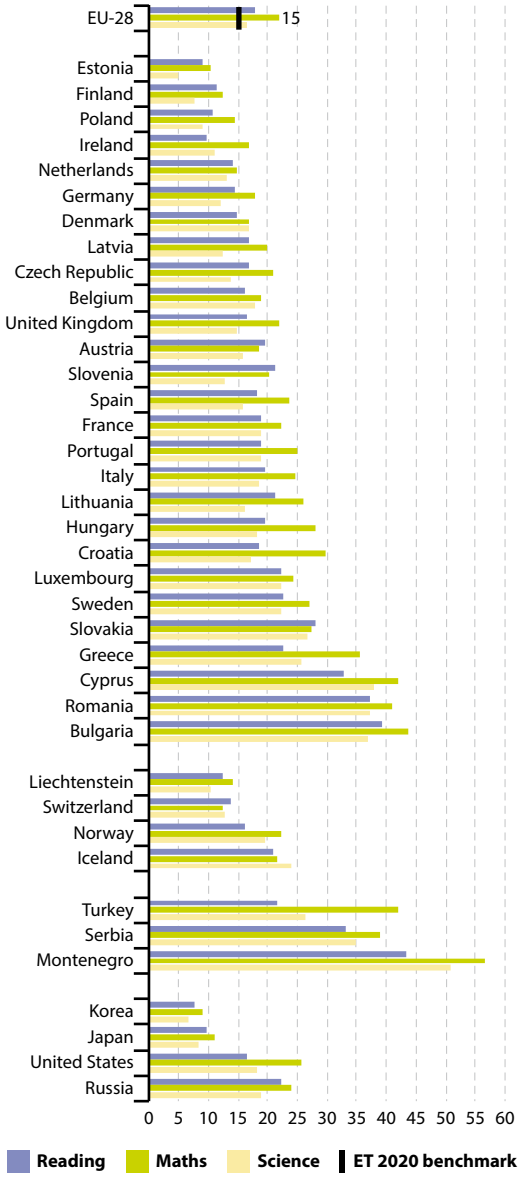
Acquiring the relevant skills for the knowledge society

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

Figure 4.5: Low achievers in reading, maths and science, by country, 2012 (*)
(Share of 15 year old pupils who are below proficiency level 2 on the PISA scales for reading, maths and science)



(*) EU-28 data are estimates; ET 2020 benchmark for the EU — below 15 %.

Source: OECD/PISA, Eurostat (online data code: tsdsc450 (table only includes data for low reading literacy))

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 low levels of reading, mathematics and science to less than 15 % by 2020.

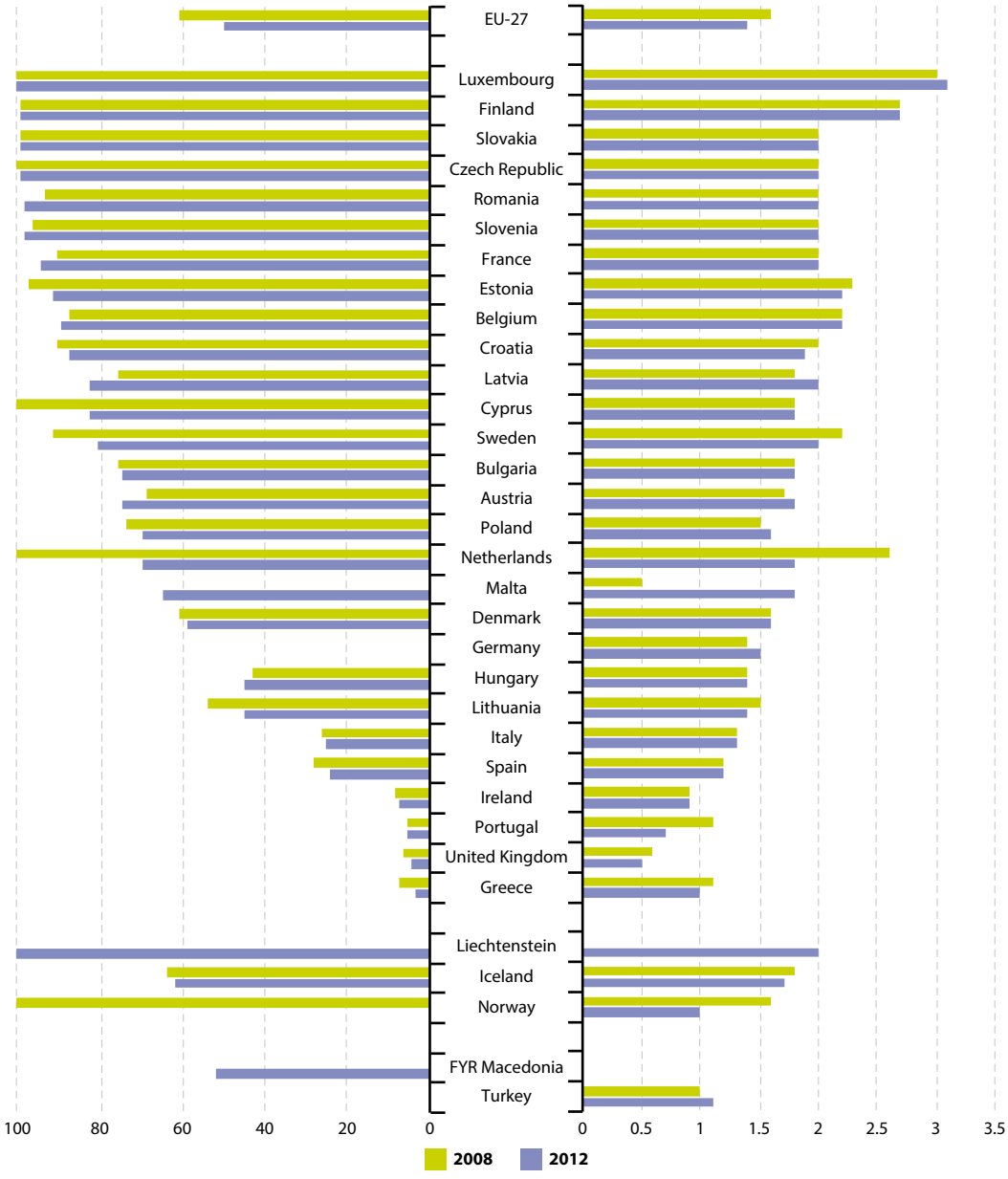
In 2012, about one-sixth to almost one-fourth of 15 year old EU citizens showed insufficient abilities in reading, mathematics and science as measured by the OECD's PISA study ([21]). The test results were best for science, with 16.6 % low achievers, followed by reading with 17.8 % and maths with 22.1 %. 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 in the key subjects surpassed 38 % in Bulgaria and Romania. However, Northern Europe, in particular Finland, Estonia and the Netherlands, as well as Poland showed the lowest share of low achievers in reading, mathematics and science with levels below 15 %.

Compared with international competitors, the overall EU's share of low-achievers in reading, maths and science was similar to that of the United States. However, it was higher than for Japan or Korea, where the shares of low-achieving pupils in 2012 were below 12 % and 10 % respectively.

Achievement in science has shown the most progress at the EU level since 2000, while progress 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) up to almost a third (for maths) compared with 2012 levels.

When looking at gender, a large 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, implying 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.

Figure 4.6: Foreign language learning in general upper secondary education, by country, 2008 and 2012 (*)
(% of pupils at ISCED level 3 general learning two or more foreign languages (left); average number of foreign languages learned per pupil at ISCED level 3 general (right))



(*) 2011 data (instead of 2012) for EU-27; 2007 data (instead of 2008) for MT (number of languages), 2009 data (instead of 2008) for HR, AT, PL (share of pupils) and PT.

Source: Eurostat (online data code: educ_thfrlan)

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 that the quantity and quality of foreign language education is scrutinised and that teaching and learning is geared towards practical, real-life application. Foreign language skills should be taken into account in the effort to equip young people with the competences needed to meet labour market demands. This aim is reflected in the recent Communication on youth unemployment and a number of 2013 country-specific recommendations ([22]).

Figure 4.6 shows that in 2012 the study of a second foreign language in general upper secondary education (ISCED level 3 general) was almost universal in Luxembourg, Finland and most Eastern European countries. It was much less popular in English-speaking countries (United Kingdom and Ireland) and in Italy, Portugal, Greece and Spain.

In many Member States the proportion of general upper secondary students learning two or more foreign languages has stagnated or fallen compared with 2008 levels.

In terms of the average number of foreign languages studied as part of compulsory education, Luxembourg takes first place (three languages), followed by Finland (2.7), Belgium and Estonia (2.2). Pupils enrolled in upper secondary education in Sweden, France and most Eastern European countries study on average at least two foreign languages. In contrast, students in the United Kingdom, Ireland, and Portugal learn less than one foreign language on average. Only a few countries have expanded the number of foreign languages taught in mandatory curriculums over the past eight years, in particular Malta, Luxembourg, Latvia, Cyprus, Germany and Italy.

English was the most studied foreign language across the EU, with 96.7 % of students learning it in 2012 (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' 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' ([23]).

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 Research and Development (R&D) and Innovation chapter (see p. 49).

How tertiary education and lifelong learning contribute to the EU's human capital

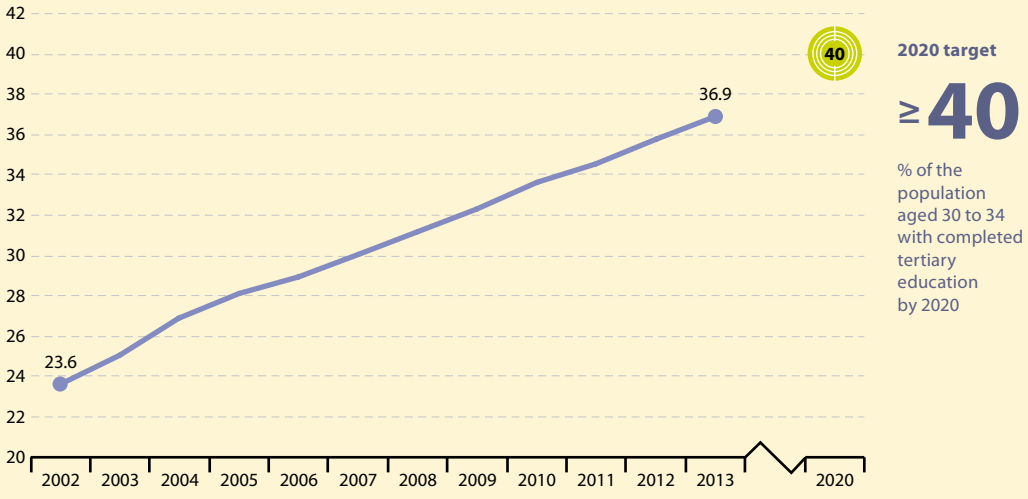
The proportion of tertiary graduates is growing rapidly

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.

Figure 4.7 shows a steady and considerable growth in the share of 30 to 34 year olds who have successfully completed university or other tertiary-level

Europe 2020 headline indicator

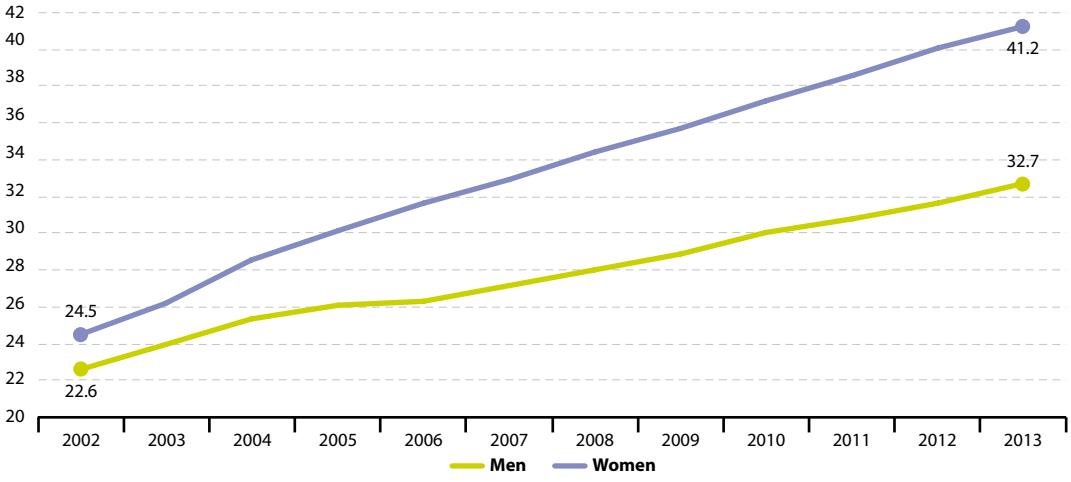
Figure 4.7: Tertiary educational attainment, EU-28, 2002–13 (*)
(% of the population aged 30 to 34 with completed tertiary education (ISCED levels 5 and 6))



(*) Europe 2020 target: at least 40%.

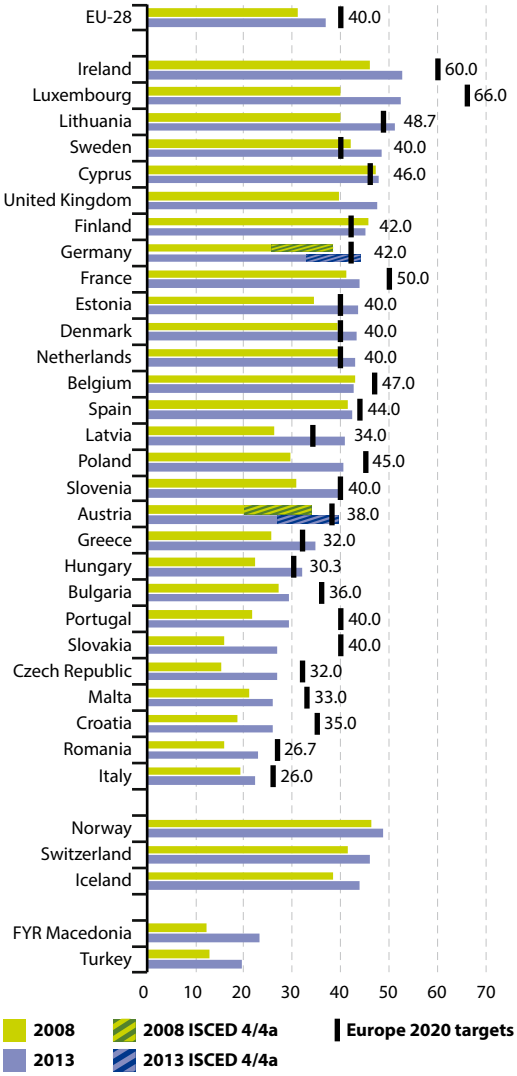
Source: Eurostat (online data code: t2020_41)

Figure 4.8: Tertiary educational attainment by sex, EU-28, 2002–13
(% of the population aged 30 to 34 with completed tertiary education (ISCED levels 5 and 6))



Source: Eurostat (online data code: t2020_41)

Figure 4.9: Tertiary educational attainment, by country, 2008 and 2013 (*)
(% of the population aged 30 to 34 with completed tertiary education (ISCED levels 5 and 6))



(*) Data for AT including ISCED 4a, data for DE including ISCED 4; break in series for LU (2009), LV (2011), NL (2010) and LV (2011).

National targets: EU-28, NL: at least 40 %, DE: 42 % (including ISCED 4), FR: 50 % (17 to 33 year olds), IT: 26–27 %, LV: 34–36 %, AT: 38 % (including ISCED 4/4a), FI: 42 % (narrower national definition), SE: 40–45 %, UK: no target.

Source: Eurostat (online data code: t2020_41), Statistics Austria, DESTATIS

education since 2002. The 13.3 percentage point growth over the period 2002 to 2013 equals an increase of about 57 % in tertiary graduates in the EU ([24]).

Women significantly outnumber men in tertiary educational attainment

Figure 4.8 shows a significantly widening gender gap among tertiary education graduates across the EU. While in 2002 the share of 30 to 34 year olds with tertiary educational attainment was similar for both sexes, the increase up to 2013 was almost twice as fast for women. In 2013 women outnumbered men significantly in terms of tertiary educational attainment in all Member States. In fact, 15 Member States showed a gender gap of more than 10 percentage points in 2013, and in Estonia and Latvia the differences were more than 20 percentage points.

Gender differences can also be seen in the fields studied. A significantly higher proportion of men than women graduate in mathematics, science or engineering subjects. Women tend to dominate education, humanities, art and service-oriented fields ([25]).

Northern and Central Europe show the highest tertiary educational attainment levels

The trend in the EU as a whole mirrors increases in tertiary educational attainment levels across all EU Member States. This to some extent reflects Member States' investment in higher education to meet demand for a more skilled labour force. Moreover, the increases can also be ascribed to the shift to shorter degree programmes following implementation of Bologna ([26]) process reforms in some Member States ([24]).

National targets for tertiary education ([27]) range from 26 % for Italy to 66 % for Luxembourg. Austria and Germany's targets are slightly different from the overall EU target because they include post-secondary attainment (ISCED level 4 for Germany, and ISCED level 4a for Austria). This is considered equivalent to university education in these two countries. For France the target definition refers to the age group of 17 to 33 year olds while for Finland the target is based on a narrower

national definition which excludes former tertiary vocational education and training (VET).

In 2013, 13 countries had already achieved their national targets: Denmark, Germany, Estonia, Greece, Cyprus, Latvia, Lithuania, Hungary, the Netherlands, Austria, Slovenia, Finland and Sweden. Spain, Italy and Romania were close at less than four percentage points from their national targets. Croatia, Luxembourg, Portugal and Slovakia were the most distant, at some 10 percentage points or more below their targets.

Levels of tertiary educational attainment varied by a factor of about 2.5 across Europe in 2013. Northern and Central Europe had the highest percentage of tertiary graduates, with 16 countries exceeding the overall EU target of 40 %. The lowest levels could be observed in Italy and Romania, which were both below 25 %.

At the same time, some Eastern European countries experienced the strongest increases over the period 2008 to 2013. Changes were most pronounced in the Czech Republic, Latvia, Hungary, Romania and Slovakia, with shares growing by more than 140 %.

Looking at non-EU Europe, the EFTA countries Norway, Switzerland and Iceland were at the level of the best performing EU Member States in 2013. However, the candidate countries FYR Macedonia ([10]) 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 4.9). In 2013 many regions in France, the United Kingdom, Finland and Sweden had above average rates. On the other hand, most regions in Italy, Hungary and Romania showed a very small proportion of tertiary graduates.

Czech Republic and Romania showed the biggest within-country dispersion of tertiary educational attainment rates, with factors of 3.4 and 3.1. This means the worst performing regions had rates that were more than three times as low as the best performing regions. In contrast, Ireland, Slovenia and Croatia were the most 'equal' countries, with almost no disparities in tertiary educational attainment rates across their regions.

Map 4.4 shows the change in regional tertiary educational attainment rates since 2008. Of the 297 NUTS 2 regions for which data are available, 84.5 % (or 219 regions) experienced an increase in the share of the population that has attained a tertiary education between 2008 and 2013. Among the regions with the highest increases are capital regions such as Bratislavský kraj (Slovakia), Praha (Czech Republic) and London (United Kingdom).

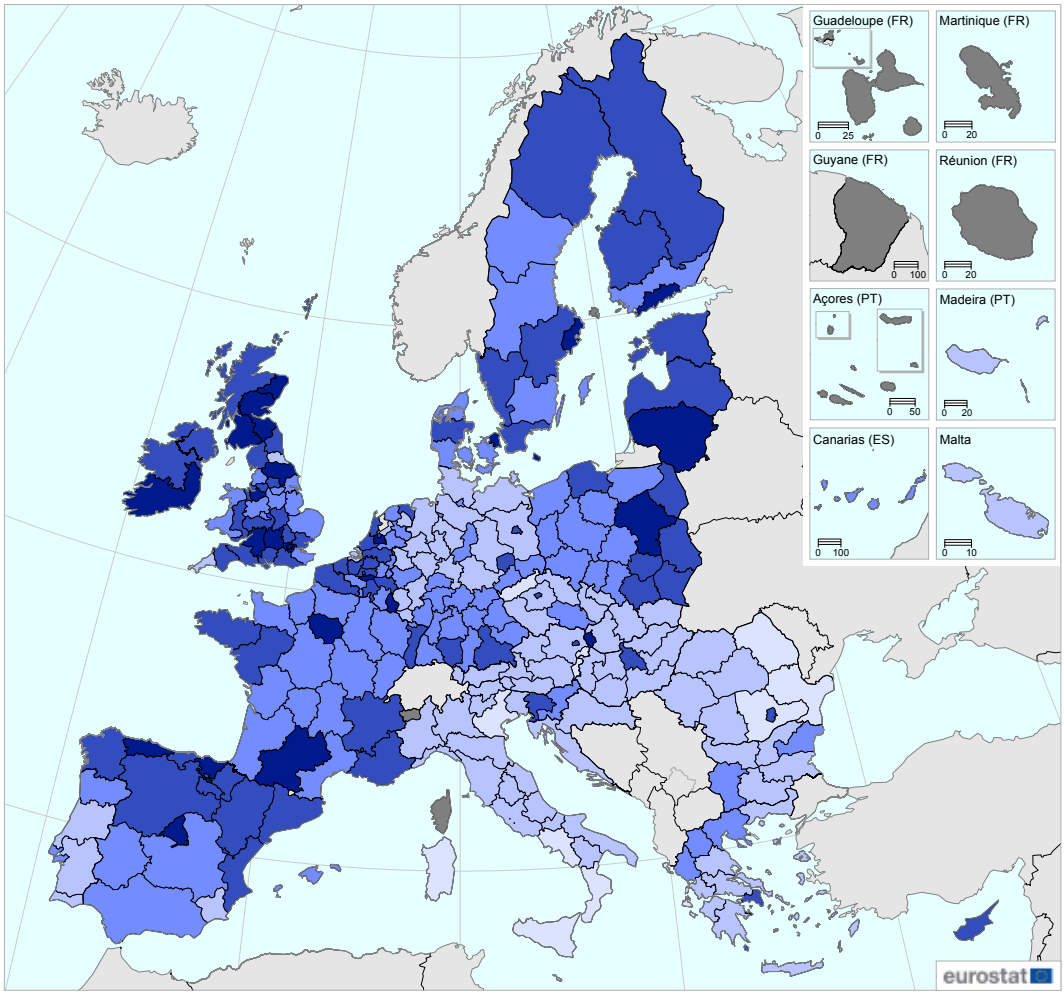
In contrast, 39 regions experienced a fall in tertiary educational attainment rates over the period from 2008 to 2013. Eight regions had falls of more than four percentage points. Two of these were in France (Languedoc-Roussillon and Auvergne), two were in the United Kingdom (Devon and Cornwall and Isles of Scilly) and the remaining four in Spain (Castilla y León), Bulgaria (Severen tsentralen), Finland (Etelä-Suomi) 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 access to the labour market ([28]). Increased mobility in higher education — of students, researchers and staff — has been established as a key priority area within the framework of the Bologna Process ([29]). 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' ([30]). 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) ([28]).

Direct assessment of Member States' progress towards the EU mobility benchmark cannot be made because the current data on students going

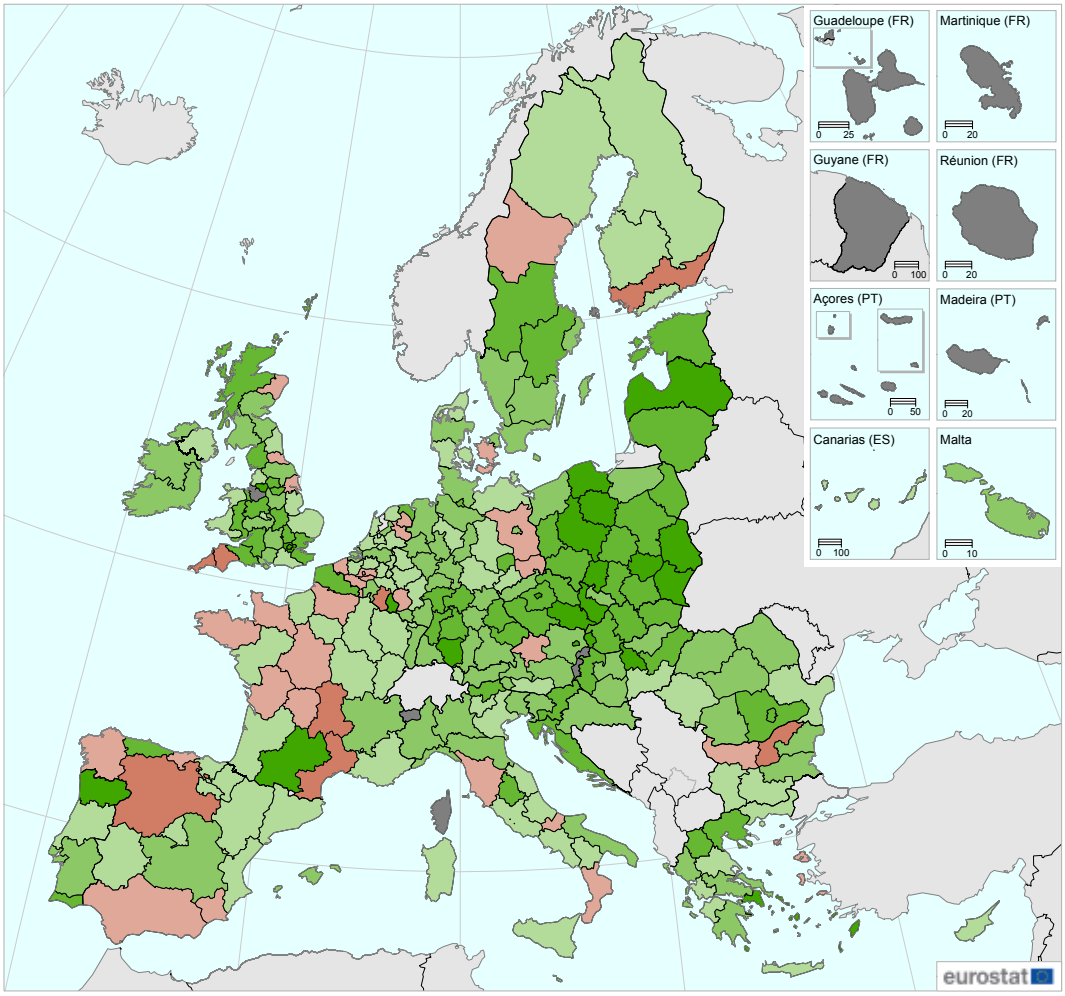
Map 4.3: Tertiary educational attainment (ISCED level 5 and 6), by NUTS 2 regions, 2013 (*)
(% of population aged 30 to 34)



(*) Low data reliability for EL (Ionia Nisia and Voreio Aigaio), ES (Ciudad Autónoma de Melilla), AT (Burgenland and Voralrlberg), UK (Cumbria, Cornwall and Isles of Scilly and Highlands and Islands).

Source: Eurostat (online data code: edat_lfse_12)

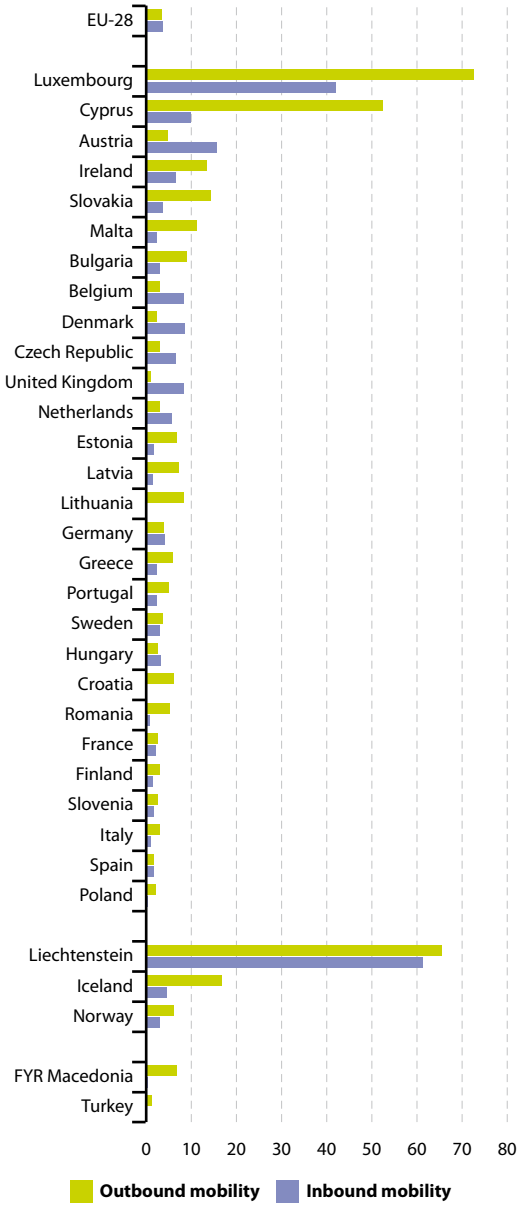
Map 4.4: Change in tertiary educational attainment (ISCED level 5 and 6), by NUTS 2 regions, 2008–13 (*)
(percentage points difference between 2013 and 2008, population aged 30 to 34)



(*) 2008 and 2013 low data reliability for EL (Ionia Nisia and Voreio Aigaio), ES (Ciudad Autónoma de Melilla), AT (Burgenland and Voralrlberg), UK (Cumbria and Highlands and Islands); 2008 low data reliability for EL (Notio Aigaio); 2013 low data reliability for UK (Cornwall and Isles of Scilly); 2010 break in series for NL; 2009 instead of 2008 data for AT (Burgenland) and PT (Região Autónoma da Madeira).

Source: Eurostat (online data code: edat_lfse_12)

Figure 4.10: Student mobility in tertiary education, by country, 2012
(outbound: students (ISCED 5–6) studying in another EU-28, EEA or Candidate country as % of all students; inbound: inflow of students (ISCED 5–6) from EU-28, EEA and Candidate countries as % of all students in the country)



Source: Eurostat (online data code: educ_thmob)

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 2012 the average mobility rate for the EU was rather low, at 3.6 % for incoming and 3.5 % for outgoing students. This average, however, obscures huge variation across Member States. More than half of tertiary students from Cyprus, Luxembourg and Liechtenstein were enrolled in another European country in 2012 (see Figure 4.10). Limited provision of study places within their own educational system is the most likely reason for this. In contrast, 11 EU Member States showed rather low outbound mobility levels below 3 %, in particular the United Kingdom and Spain. Many Eastern European countries had a significant flow of outgoing students, but very few incoming ones.

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 ([31]). 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) ([28]).

Learning as a lifelong process

In addition to tertiary educational attainment, lifelong learning is also crucial for providing Europe with 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 one's career or returning to the labour market ([32]) (also see the 'Employment' chapter, p. 25). In recognition of this, lifelong learning plays a crucial role in the Europe 2020 flagship initiatives 'Youth on the move' and 'An Agenda for new skills and jobs'. In addition, the European Council in 2011 adopted a resolution on a renewed European agenda for adult learning ([33]). The EU's ET 2020 framework also includes a benchmark that aims to raise the share of adults participating in lifelong learning ([34]) to at least 15 %.

Box 4.2: EU initiatives promoting mobility in higher education

The EU has set up a number of initiatives to promote mobility in higher education under the Lifelong Learning Programme ([35]), including Erasmus for study exchanges and placements ([36]), Erasmus Mundus for postgraduate studies ([37]), Leonardo Da Vinci for vocational education and training ([38]), Marie Curie for research fellowships ([39]) and Grundtvig for adult education ([40]).

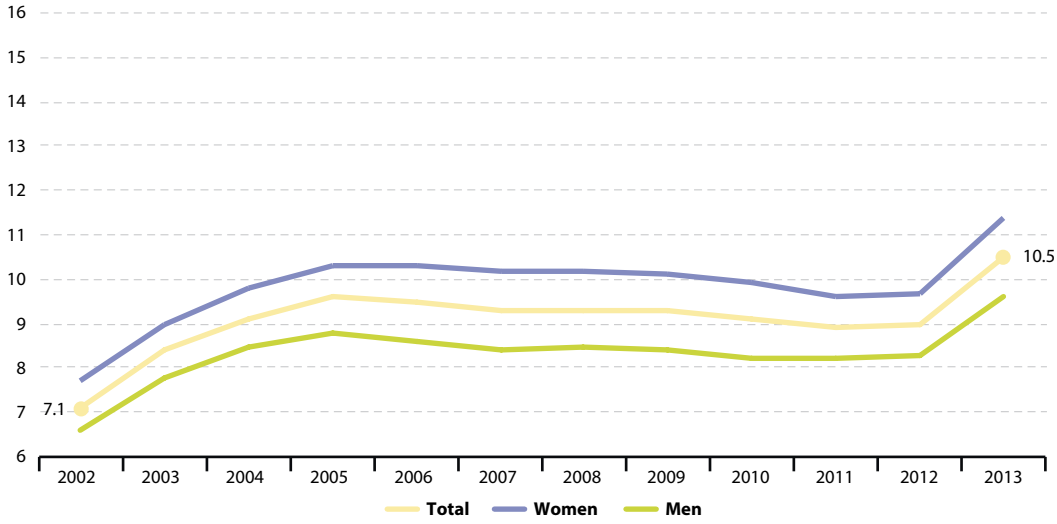
For the period 2014 to 2020, the activities of the Lifelong Learning Programme continue under the new Erasmus+ programme, which integrates seven earlier programmes in the fields of education, youth and culture ([41]). The programme has received 40 % higher budget compared with the previous programming period.

As part of the Europe 2020 strategy, the flagship initiative 'Youth on the move' ([42]) also aims to extend opportunities for learning mobility to all young people in Europe, mainly through financial support and dissemination of information.

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 2012–2013 nearly 270 000 students from 33 European countries spent time abroad with an Erasmus grant. Since the programme began in 1987–1988, 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 ([43]).

Figure 4.11: Participation in lifelong learning, EU-28, 2002–13 (*)
(% of population aged 25 to 64) (**)

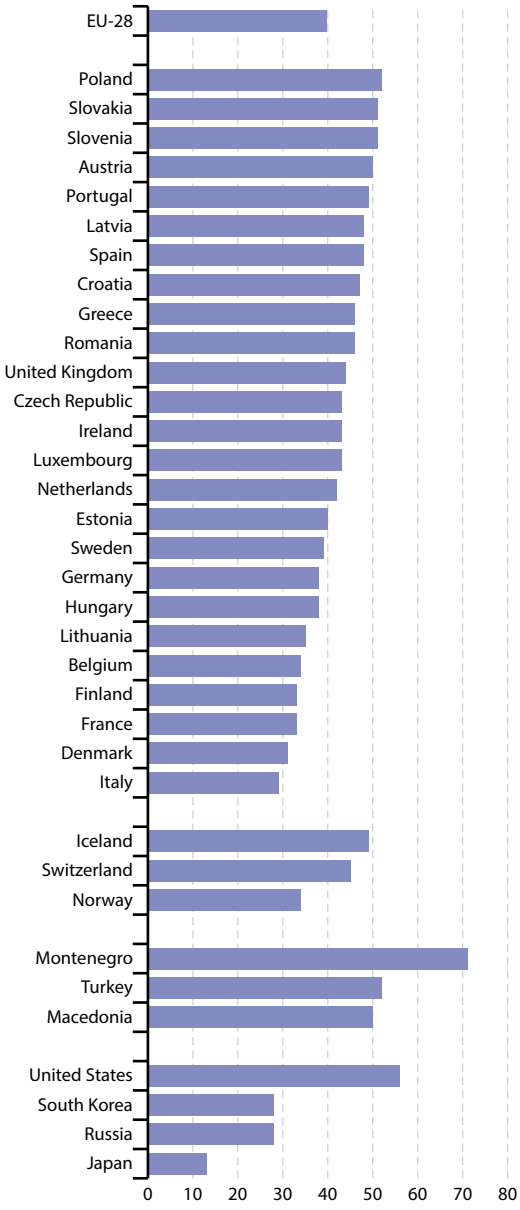


(*) Break in time series in 2003 and 2013; ET 2020 benchmark for the EU: at least 15 %.

(**) 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)

Figure 4.12: Self-perceived entrepreneurial skills, by country, 2013 (*)
(% of individuals aged 18 to 64 who believe they have the required skills and knowledge to start a business)



(*) EU aggregate based on 25 countries; 2012 data for AT and DK, 2010 data for IS and ME.

Source: Global Entrepreneurship Monitor (GEM)

After growing between 2003 and 2005, the share of EU adults participating in lifelong learning fell slightly to about 9 % in 2012. It increased to 10.5 % in the following year, but this rise was mainly influenced by a methodological change to the French Labour Force Survey ([44]).

From 2012 to 2013, participation in lifelong learning increased in 15 countries. Over the whole period 2002 to 2013, nine countries experienced a substantial increase of more than five percentage points: Denmark, Sweden, Finland, Estonia, Portugal, Luxembourg, Spain, Austria and France. In 2013, only five EU countries from Northern Europe (Denmark, Sweden, Finland, the Netherlands and the United Kingdom) as well as France exceeded the ET 2020 benchmark. In 13 Member States participation in lifelong learning was less than half the required level of 15 %. In 2013, participation rates in lifelong learning in Bulgaria (1.7 %), Romania (2.0 %), Croatia and Slovakia (2.9 % each) were more than 20 percentage points lower than in Finland (24.9 %), Sweden (28.1 %) and Denmark (31.4 %).

Women, migrants, highly educated people and employed people participate more in lifelong learning

Women are more likely to participate in lifelong learning than men. In 2013, the share of women engaged in lifelong learning was 1.8 percentage points higher than for men (11.4 % as opposed to 9.6 %). Men, however, show a higher preference for non-formal job-related learning.

The foreign-born population also tends to be slightly more involved in lifelong learning activities (11.9 % in 2013). 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 measures ([45]) (see 'Employment' chapter, p. 25).

There is a clear gradient of participation in lifelong learning and a person's educational attainment. In 2013, people with at most lower secondary education were much less engaged in lifelong learning (4.4 %) than those with upper secondary (8.7 %) or tertiary education (18.6 %).

In relation to labour status, employed people in general show a slightly higher participation rate in lifelong learning. Some 11.3 % of employed 25 to 64 year olds took part in lifelong learning in 2013. For unemployed people, the rate was slightly lower than the total participation rate, at 9.9 %.

Entrepreneurial skills are crucial for the transition towards a knowledge-based society

The EU's framework for key competences identifies and defines the key abilities and knowledge that a person needs to achieve employment, personal fulfilment, social inclusion and active citizenship in today's rapidly changing world ([46]). In this context, entrepreneurship competences are defined as an individual's ability to turn ideas into action. This transversal set of skills refers to creativity, innovation and risk-taking as well as general management skills needed to achieve objectives ([47]).

Enhancement of entrepreneurial skills is endorsed as a key long-term priority in the ET 2020 framework. The Europe 2020 strategy also recognises it is crucial to the transition to a knowledge-based society. The importance of enhancing creativity, innovation and entrepreneurship through education is highlighted in three flagship initiatives: 'Youth on the move', 'An Agenda for new skills and jobs' and 'Innovation Union'.

The Global Entrepreneurship Monitor (GEM) provides a source of annual country data on the population's perceived levels of entrepreneurship skills, based on adult population surveys. The GEM project is run by a consortium of universities with special teams of experts from almost 100 participating countries ([48]). Figure 4.12 shows that in 2013 at least 50 % of the adult population in four EU Member States believed they have the skills and knowledge to start a business. Poland takes the lead with more than half its working-age population expressing good self-perceived entrepreneurial capabilities. However, in most Nordic countries, as well as in Italy and France, fewer adults display confidence in their competences. It should be noted that differences in attitudes might reflect not only levels of entrepreneurial education and training, but also factors such as individuals' levels of confidence or voluntary training beyond formal education ([49]).

Education levels and labour market participation

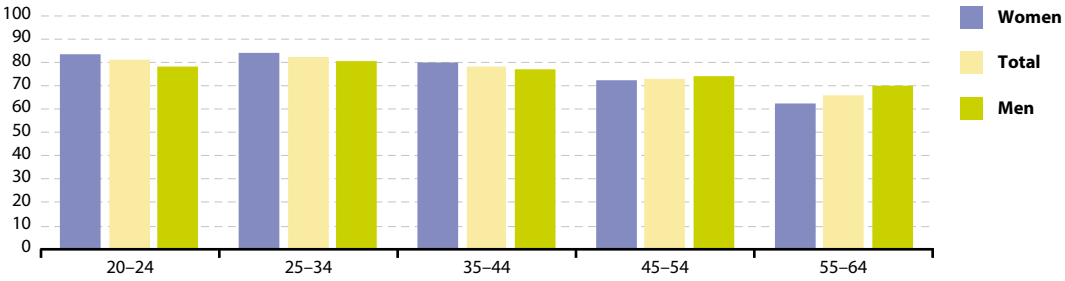
Younger people show higher educational attainment levels

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 in this publication, in particular 'Employment' (see p. 25) and 'Poverty and social exclusion' (see p. 135).

Upper secondary education is now considered the minimum 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 (see p. 106). Figure 4.13 shows the share of the population that has completed upper secondary or tertiary education, broken down by sex and age groups.

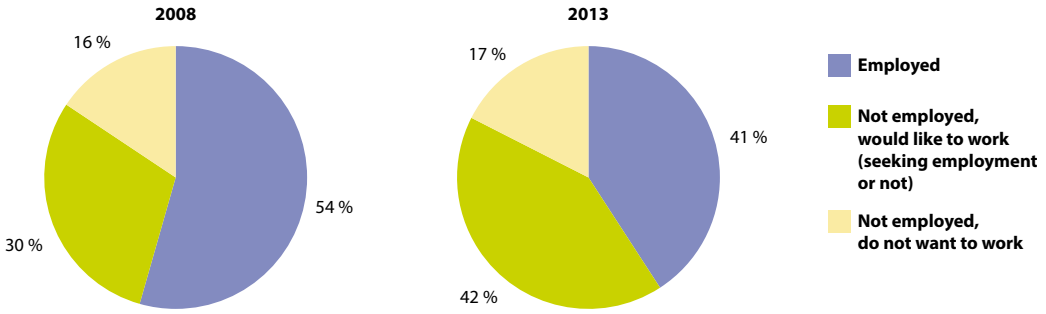
In 2013, more than 80 % of 20 to 34 year olds had completed at least upper secondary education, while the share for the age group 55 to 64 was lower, at 66 %. This difference reflects the growing demand for a more highly skilled workforce in most parts of Europe over the past few decades. A more skilled 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 ([50]). For older workers aged 55 to 64, lower educational attainment levels, especially among women, highlight the importance of lifelong learning to

Figure 4.13: Persons with upper secondary or tertiary education attainment by age and sex, EU-28, 2013
(%)



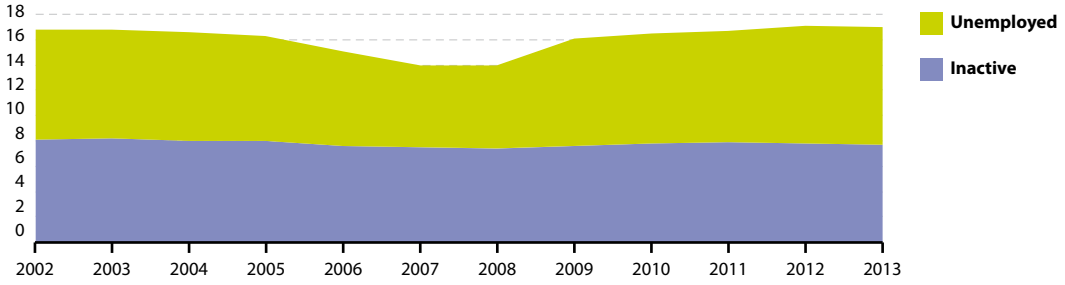
Source: Eurostat (online data code: edat_lfse_08)

Figure 4.14: Early leavers from education and training, by employment status, EU-28, 2008 and 2013
(% of the population aged 18–24 with at most lower secondary education and not in further education or training)



Source: Eurostat (online data code: edat_lfse_14)

Figure 4.15: Young people neither in employment nor in education and training, EU-28, 2002–13 (*)
(% of population aged 18–24)



(*) Break in series in 2003.

Source: Eurostat (online data code: edat_lfse_20)

increase their employability and help meet the Europe 2020 strategy's employment target (see the 'Employment' chapter, p. 25).

Educational attainment is highest in Eastern Europe, where upper secondary education has long been the standard ([50]). Southern European countries in contrast show the lowest education levels. In 2013, less than half the population aged 25 years or over living in Spain, Italy, Malta and Portugal 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 is higher for men, the situation is 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.

Consequences of low educational attainment

Low educational attainment — at most lower secondary education — is usually negatively linked with other socioeconomic variables. The most important of these are employment, unemployment and the risk of poverty or social exclusion. Some of these relationships are also analysed in detail in their respective chapters (see the chapters 'Employment' on p. 25 and 'Poverty and social exclusion' on p. 135).

Early leavers from education and training and low-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 2013. 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 29 years, stood at 18.7 %. 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 ([51]). For a further analysis on youth unemployment see the chapter 'Employment' on p. 25.

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 2013, 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 more than 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 ([52]). Other factors include having a disability or coming from a migrant background.

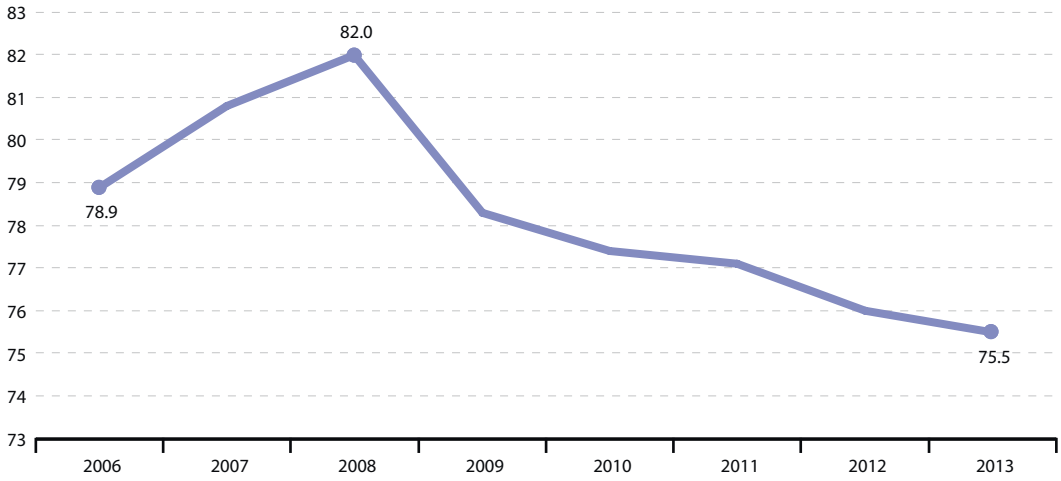
In 2013, 17.0 % of 18 to 24 year olds were in the NEET status, putting them at risk of being excluded from the labour market and becoming dependent on benefits. This represents a considerable increase since 2008, when the NEET rate stood at a low of 13.9 %.

As shown in Figure 4.15, the EU's NEET rate has been largely influenced by changes in unemployment for 18 to 24 year olds. In comparison, the share of inactive youths has remained stable at or slightly below 8 %. The rate is slightly higher for women than for men, although the gender gap has closed slightly since the economic crisis began in 2008. In 2013, the NEET rate for 18 to 24 year old women was 17.4 %, with more than half (54.6 %) being economically inactive. At the same time, the NEET rate for men of the same age group was 16.6 %, but almost two-thirds (63.9 %) were unemployed.

Low educational attainment negatively influences quality of life

The negative impacts of low educational attainment described here and in the chapters 'Employment' (see p. 25) and 'Poverty and social exclusion' (see

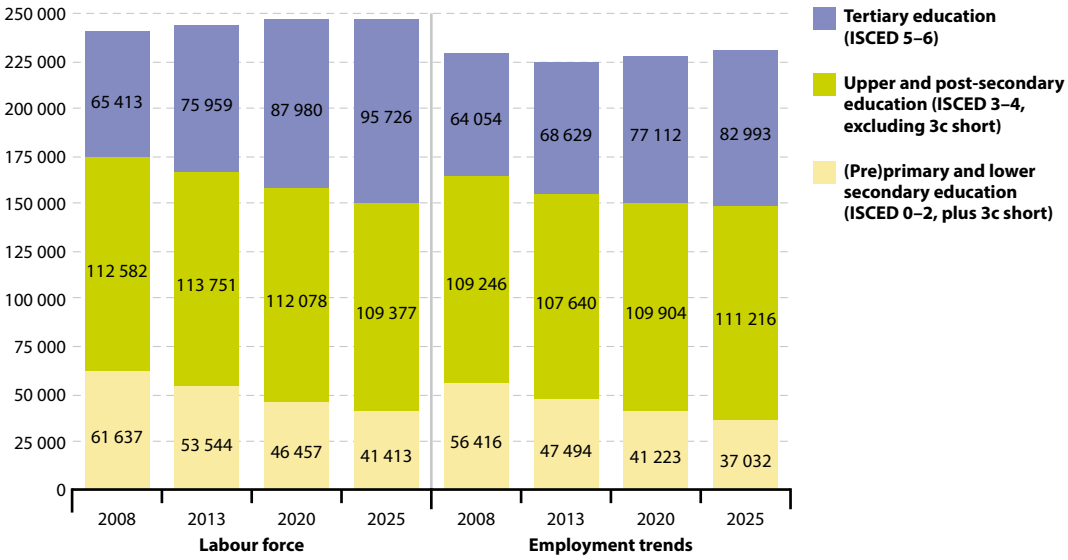
Figure 4.16: Employment rate of recent graduates, EU-28, 2006–13 (*)
(Share of employed graduates (20 to 34 years old) having left education and training in the past one to three years)



(*) Data refer to graduates having left education and training with at least upper-secondary qualifications (ISCED 3–6); ET 2020 benchmark for the EU: at least 82 %.

Source: Eurostat (online data code: edat_lfse_24)

Figure 4.17: Labour force and employment trends by educational attainment, EU-28, 2008, 2013, 2020 and 2025
(1 000 persons)



Source: Cedefop skills forecasts 2014

p. 135) also influence other aspects of a person's perceived quality of life ([53]). Across the EU, the perception of being in good or very good health in 2012 was highest among people having completed tertiary education (81.6 %). Only slightly more than half (55.1 %) of the people with at most lower secondary educational attainment shared this perception.

Matching skills with labour market needs

The EU's ET 2020 framework acknowledges the important role of education and training in raising employability. It has set a benchmark that at least 82 % of graduates (20 to 34 year olds) should have found employment no more than three years after leaving education and training ([54]).

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 6.5 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.

The data in Figure 4.16 refer to graduates having left education and training with at least upper-secondary qualifications (ISCED levels 3 to 6). Disaggregation by educational attainment reveals that the fall in the employment rate has been stronger for the lower educated cohort (– 7.6 percentage points since 2008) than for those with tertiary education (– 6.0 percentage points since 2008). This is in line with trends in the overall employment rate (see the 'Employment' chapter, p. 25), and underlines the importance of educational attainment for employability.

Matching educational outcomes and labour market needs is a key component of the Europe 2020 strategy (see the 'Employment' chapter, p. 25). '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 ([56]).

Most recent forecasts from the European Centre for the Development of Vocational Training (Cedefop) ([57]) indicate that between 2013 and 2025 some 20 million jobs requiring high educational attainment will be created, while low-qualified jobs will decline by about more than 10 million.

Figure 4.17 mirrors these estimates with projected changes in the EU labour force. The population holding a university degree or equivalent is expected to grow by more than 25 % between 2013 and 2025. In comparison, the number of low-skilled people will fall by more than 20 %.

Overall, the Cedefop forecasts show a parallel rise in skills from both the demand and the supply side until 2020. Changes in skills levels are expected to occur faster for the labour force than in employment trends. This parallel rise does not prevent potential skills mismatches, such as overqualification gaps ([58]).

Box 4.3: Policies tackling the transition from education to employment

The EU employment package 'Towards a job-rich recovery', 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: '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 tackle 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' ([55]).

Investment in future generations: the case of public expenditure on education

Public expenditure on education as a percentage of GDP is often considered an indicator of how committed a government is to developing skills and competences.

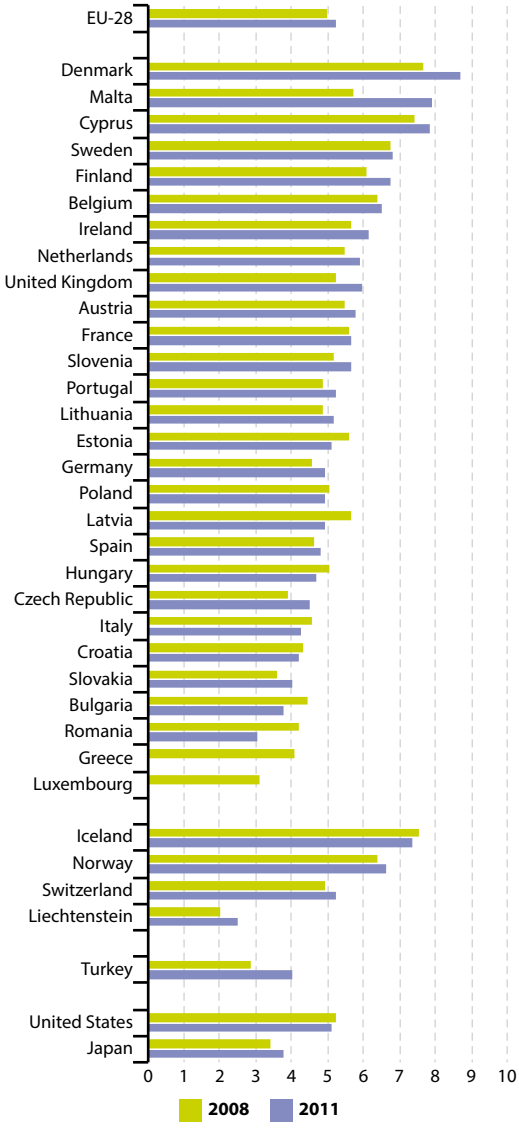
Two developments have had major impacts on the role of education and training systems: the recent economic crisis and the ageing of the population. The financial and economic crisis has affected EU labour markets, economies and societies in general. Population ageing across most Member States affects educational systems through its impacts on the labour market and public finances ([59]).

Investment in education is essential for facing both of these challenges. It helps foster economic growth and productivity, and enhances innovation and competitiveness. While fiscal and monetary policies can counteract the adverse effects of the crisis in the short run, investment in education is a necessary policy measure for addressing its long-term impacts on unemployment. Not only can human capital accumulation reduce pressure on labour markets during an economic crisis, it can also compensate for the projected shrinking labour force in European economies ([60]).

As shown in Figure 4.18, public expenditure on education as a % of GDP slightly increased in the EU, from 5.0 % in 2008 to 5.3 % in 2011. This average figure conceals considerable cross-country variations in the allocation of public resources for education, ranging from 3.1 % in Romania to 8.8 % in Denmark in 2011.

Education systems across the EU have been affected differently by the recession. This partly reflects the extent to which the crisis has hit national economies. While 11 countries have managed to keep their spending on education at a higher or comparable level in absolute terms from 2008 to 2011, cuts in education expenditure were significant during this period in Estonia, Ireland, Latvia and Hungary as well as in Bulgaria, Greece, Italy and Romania, where spending levels in

Figure 4.18: Public expenditure on education, by country, 2008 and 2011 (*)
(% of GDP)



(*) EU-28 data are estimates; 2005 data (instead of 2008) for EL, 2006 data (instead of 2008) for TR, 2007 data (instead of 2008) for LU and RO.

Source: Eurostat (online data code: tsdsc510)

relation to the GDP were already low and have been cut further. The European Commission considers the fall in education spending in recent years in these Member States a worrying trend calling for strengthening the efficiency of education investment and supporting innovation and competitiveness. This is of particular relevance in the context of limited GDP growth forecasts for 2014 ([61]).

Students from disadvantaged groups most affected by cutbacks on education

Economic downturns and education cutbacks are likely to affect students from disadvantaged backgrounds particularly severely ([62]). This is because disadvantaged children often tend to be concentrated in schools with fewer resources. Furthermore, households from higher socio-economic backgrounds might have the financial resources to compensate for the reduction in support at school through private tuition, for example. Disadvantaged students have much fewer options for overcoming these obstacles.

Apart from general funding mechanisms for allocating resources across different educational levels, governments can also provide additional educational support to disadvantaged students by awarding specific programme funds. These funds can be distributed according to predefined need-based criteria targeting, for example, specific geographic, social, language or other groups ([63]).

The targeted support could cover a variety of programmes ranging from language classes for minority groups and improvement in student–teacher ratio to general schemes that reduce student drop-out rates.

In some Member States, such as the Czech Republic and Ireland, crisis-led adjustments included a reduction in the number of support teachers in schools, or supplementary programmes targeting low-performing or migrant students. In contrast, against the background of austerity measures, Belgium (French and Flemish Communities) and Spain have reported an increase in their budgets for specific support programmes. The United Kingdom (England and Wales) has taken similar measures by making available new support funds for students from disadvantaged backgrounds ([64]).

Conclusions and outlook towards 2020

Early leaving from education and training has fallen continuously in the EU since 2002, for both men and women. The fall from 17.0 % in 2002 to 12.0 % in 2013 represents steady progress towards the Europe 2020 target. Young men, foreign-born residents and ethnic minorities are more likely to leave education and training with at most lower secondary education. While in 2013 women were already close to the overall EU target at 10.2 %, the rate was much higher for men at 13.6 %.

Improvements have also been visible in the second Europe 2020 headline indicator. Between 2002 and 2013, the share of 30 to 34 year olds having completed tertiary education grew continuously from 23.6 % to 36.9 %. Growth was considerably faster for women, who in 2013 were already above the Europe 2020 target. In contrast, only 32.7 % of 30 to 34 year old men had completed tertiary education in the same year.

Educational attainment strongly influences successful participation in the labour market. In 2013, 59 % 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, 17 % were neither in employment nor in any further education or training (NEET) and thus at risk of being excluded from the labour market. This is also reflected in youth unemployment, which was particularly high for low-educated 15 to 24 year olds (see chapter 'Employment' p. 25).

Progress in the other education indicators for which benchmarks have been set in the EU's ET 2020 framework is mixed. Participation in early

childhood education and care (ECEC) has grown more or less continuously in the EU since 2001. In 2012, 93.9 % of children between the age of four and the starting age of compulsory education participated in ECEC, compared with 86.6 % in 2001. This is a considerable move towards the ET 2020 benchmark of at least 95 %.

The picture is less optimistic when it comes to basic skills such as reading, maths and science. In 2012 about one-fifth of 15 year olds showed insufficient abilities in reading, maths and science. This means that a reduction of almost a third will be necessary to reach the ET 2020 benchmark. In 2012, the average EU mobility rate taking into account only degree mobility was around 3 %. However, this masks huge differences across Europe and between incoming and outgoing students.

In relation to adult education, which is important because it covers the longest time span in the process of lifelong learning, the share of adults participating in lifelong learning does not seem to be increasing at a pace fast enough to meet the ET 2020 benchmark of raising the share of adults engaging in lifelong learning activities to at least 15 % by 2020.

Last, in relation to the important role of education and training 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 since the economic and financial crisis began. It has fallen from 82 % in 2008 to 75.4 % in 2013. This trend, which shows that the targeted age group has been affected particularly strongly by the crisis, has moved the EU away from the ET 2020 benchmark of raising the employment rate of recent graduates to at least 82 % by 2020.

Forecasts concerning the skills required by the labour market up to 2025 underline the importance of higher education. Between 2013 and 2025 some 20 million jobs requiring medium or high qualifications are expected to be created, whereas at the same time low-qualified jobs will fall by about 12 million.

Efforts needed to meet the Europe 2020 targets on education

Knowledge about current student cohorts and the existing demographic projections allow estimations of educational trends up to 2020, which can

Box 4.4: Projections up to 2020 in relation to 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 it would need to be below 10 % by 2020, ten years later. It follows from a basic calculation 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 2013 has been – 5.1 %. This means that the EU on average is on track and that the headline target is within reach if current progress is sustained ([65]).
- The EU average tertiary attainment rate in 2010 was 33.4 % 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 2013 has been considerably higher (3.3 %). This means that the EU is well on track to reach its 40 % target by 2020 if recent progress can be sustained ([66]).

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 is increasing, up by 0.7 percentage points from 2011. In fact, women, taken as a separate group, achieved the 40 % benchmark in 2012, eight years ahead of the 2020 target date ([67]).

help identify priority issues that may need particular political attention on the path towards meeting the Europe 2020 targets. For example, students who are now in their mid-20s will in 2020 fall within the scope of the Europe 2020 headline indicator on 'tertiary educational attainment', which looks at education levels of the population aged 30 to 34 years.

The flagship initiatives 'Youth on the move' and 'An Agenda for new skills and jobs' address 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 ([68]), giving guidance to Member States on the implementation of strategies and measures tackling this problem. Vocational Education and Training (VET) systems are seen as an important contribution to the employability of young people and the reduction of early leaving from education and training, by offering an interesting alternative to general education ([69]).

Additionally, the Europe 2020 strategy puts particular efforts on making sure that higher education courses develop skills profiles relevant to the world of work, both for meeting future labour demand and for ensuring the long-term attractiveness of higher education ([70]). Moreover, the European Council's Resolution on a renewed European agenda for adult learning ([33]) addresses the challenge of raising participation rates of adults in lifelong learning activities.

Notes

([1]) For further details on the impact of demographic ageing on the labour force see the chapter on 'Employment' on p. 25.

([2]) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2012*, Publications Office of the European Union, Luxembourg, 2012 (p. 10).

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

([4]) European Commission, *Early School Leaving* (accessed 23 July 2013); European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2012*, Publications Office of the European Union, Luxembourg, 2012 (p. 17).

([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]) ECTS is the European Credit Transfer and Accumulation System. The system allows for the transfer of learning experiences between different institutions, greater student mobility and more flexible routes to gain degrees. It also aids curriculum design and quality assurance. For further details, see http://ec.europa.eu/education/lifelong-learning-policy/ects_en.htm.

([7]) Europass is a common European standard for making skills and qualifications clearly and easily understood across Europe. It includes five documents, two of which are completed by European citizens themselves (Curriculum Vitae and Language Passport) and three of which are issued by education and training authorities (Europass Mobility, Certificate Supplement, Diploma Supplement). For further details see http://europass.cedefop.europa.eu/en/about.

([8]) European Commission, *Early School Leaving* and European Commission, *Tertiary Education* (accessed 23 July 2013).

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

([10]) The former Yugoslav Republic of Macedonia, see p. 193.

([11]) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2012*, Publications Office of the European Union, Luxembourg, 2012 (p. 18); International Organization for Migration, Foreign-born Children in Europe: An Overview from the Health Behaviour in School-Aged Children (HBSC) Study, 2009 (p. 36).

([12]) Dale et al., *Early School leaving: Lessons from Research for Policy Makers*, European Commission, 2010 (p. 30).

([13]) European Union Agency for Fundamental Rights & UNDP, *The Situation on Roma in 11 EU Member States*, 2012 (p. 14)

([14]) Speech of Morten Kjaerum, Director of the European Union Agency for Fundamental Rights, Exclusion and Discrimination in Education: *the Case of Roma in the European Union*, 8 April 2013.

([15]) European Commission, *An EU Framework for National Roma Integration Strategies up to 2020*, COM(2011) 173 final, Brussels, 2011.

([16]) See http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/targets/index_en.htm.

([17]) European Commission, *Key Data on Early Childhood Education and Care in Europe: 2014* (p. 11).

([18]) 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. 1 and p. 5).

([19]) European Union Agency for Fundamental Rights & UNDP, *The Situation on Roma in 11 EU Member States*, Publications Office of the European Union, Luxembourg, 2012 (p. 13).

([20]) 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).

([21]) 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/.

([22]) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2013*, Publications Office of the European Union, Luxembourg, 2013 (p. 36).

([23]) European Commission, *A Digital Agenda for Europe*, COM(2010) 245 final, Brussels, 2010 (p. 6).

([24]) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2013*, Publications Office of the European Union, Luxembourg, 2013 (p. 40).

([25]) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2013*, Publications Office of the European Union, Luxembourg, 2013 (p. 42).

([26]) The Bologna Process has created a European Higher Education Area (EHEA) to connect national educational systems. The intention is to allow the diversity of national systems and universities to be maintained while the European Higher Education Area improves transparency between higher education systems, as well as implements tools to facilitate recognition of degrees and academic qualifications, mobility, and exchanges between institutions. (source: EUA (European University Association (accessed 05 August 2014).

([27]) See http://ec.europa.eu/europe2020/europe-2020-in-a-nutshell/targets/index_en.htm.

([28]) Eurydice (Education, Audiovisual and Culture Executive Agency), *The European Higher Education Area in 2012: Bologna Process Implementation Report*, 2012 (p. 153).

([29]) The Bologna Process is an intergovernmental initiative involving the European Commission, the European Council and UNESCO-CEPES as well as representatives of higher education institutions, students, staff, employers and quality assurance agencies. It was aimed at creating a European Higher Education Area by 2010, and to promote the European system of higher education worldwide. For further details see http://ec.europa.eu/education/higher-education/bologna_en.htm.

([30]) 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.

([31]) Eurostat, *Key indicators on the social dimension and mobility: The Bologna Process in Higher Education in Europe*, 2009 edition, Office for Official Publications of the European Communities, Luxembourg, 2009 (p. 98).

([32]) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2012*, Publications Office of the European Union, Luxembourg, 2012 (p. 48).

([33]) Council Resolution on a renewed European agenda for adult learning (2011/C 372/01), Official Journal of the European Union, 20.12.2011.

([34]) The benchmark of 15 % refers to persons aged 25 to 64 who stated that they received education or training in the four weeks preceding the survey.

([35]) See http://ec.europa.eu/education/lifelong-learning-programme/index_en.htm.

([36]) See http://ec.europa.eu/education/erasmus/students_en.htm.

([37]) See http://ec.europa.eu/education/lifelong-learning-programme/erasmus_en.htm.

([38]) See http://ec.europa.eu/education/lifelong-learning-programme/ldv_en.htm.

([39]) See http://ec.europa.eu/research/mariecurieactions/about-mca/actions.

([40]) See http://ec.europa.eu/education/grundtvig/what_en.htm.

([41]) See http://ec.europa.eu/programmes/erasmus-plus/index_en.htm.

([42]) 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, Brussels, 2010.

([43]) See http://ec.europa.eu/education/tools/statistics_en.htm.

([44]) 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'. Due to this revision, comparisons with the past should be avoided, both for the French data and for the EU aggregates, which are also affected.

In particular, the variable EDUCSTAT (participation in regular/formal education during the last 4 weeks) has been calculated from 2013 based on a question on formal education (and no longer on initial education); this has some (rather minor) impact on the number of students aged 25–64. The variable COURATT (participation in non-formal education during the last 4 weeks) from 2013 covers all non-formal education and training activities (4 questions are asked instead of 1 question = the implementation of the variable in the questionnaire changed and now covers/catches these activities better). As a result the participation in non-formal activities triples for the age group 25-64, and this change explains the change in the overall LLL indicator. The online table 'trng_lfs_09' provides the breakdown by formal / non-formal and age group for further evaluation of the change in the percentages.

Given the share of France in the population 25–64 in 2013 (about 12.2 %) the impact of this methodological change in France has been assessed by Eurostat as having had an impact of about 1.5 % on the EU-28 average.

([45]) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2013*, Publications Office of the European Union, Luxembourg, 2013 (p. 68).

([46]) See http://ec.europa.eu/education/lifelong-learning-policy/key_en.htm.

([47]) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2012*, Publications Office of the European Union, Luxembourg, 2012 (p. 39).

([48]) For further details see http://www.gemconsortium.org.

([49]) Alicia Coduras Martínez et al., *Global Entrepreneurship Monitor Special Report: A Global Perspective on Entrepreneurship Education and Training*, Global Entrepreneurship Research Association, 2010 (p. 30).

([50]) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2012*, Publications Office of the European Union, Luxembourg, 2012 (p. 54).

([51]) European Commission, *Early School Leaving* (accessed 23 July 2013).

([52]) European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2011*, Publications Office of the European Union, Luxembourg, 2012 (p. 28).

([53]) Breakdowns of several 'Quality of Life' (QoL) indicators are available in a dedicated section on Quality of Life indicators on the Eurostat website: http://ec.europa.eu/eurostat/web/gdp-and-beyond/quality-of-life/data/overview.

([54]) Council conclusions of 11 May 2012 on the employability of graduates from education and training (2012/C 169/04), Official Journal of the European Union, 15.6.2012.

([55]) European Commission, *Towards a job-rich recovery*, COM(2012) 173 final, Strasbourg, 2012 (p. 10).



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

(57) The Cedefop skills forecasts are available at http://www.cedefop.europa.eu/EN/about-cedefop/projects/forecasting-skill-demand-and-supply/skills-forecasts.aspx.

(58) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2012*, Publications Office of the European Union, Luxembourg, 2012 (p. 57).

(59) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2012*, Publications Office of the European Union, Luxembourg, 2012 (p. 7).

(60) Bilal Barakat, Johannes Holler, Klaus Prettner, and Julia Schuster, *The Impact of the Economic Crisis on Labour and Education in Europe*, Vienna Institute of Demography, 2010 (p. 12).

(61) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2013*, Publications Office of the European Union, Luxembourg, 2013 (p. 14).

(62) OECD, *Equity and Quality in Education: Supporting Disadvantaged Students and Schools*, 2012 (p. 31).

(63) European Commission, *Funding of Education in Europe 2000–2012: The Impact of the Economic Crisis*, 2013 (p. 69).

(64) European Commission, *Funding of Education in Europe 2000–2012: The Impact of the Economic Crisis*, 2013 (p. 69).

(65) European Commission, *Early School Leaving* (accessed 19 August 2014).

(66) European Commission, *Tertiary Education* (accessed 19 August 2014).

(67) European Commission (Directorate-General of Education and Culture), *Education and Training Monitor 2013,* Publications Office of the European Union, Luxembourg, 2013 (p. 41).

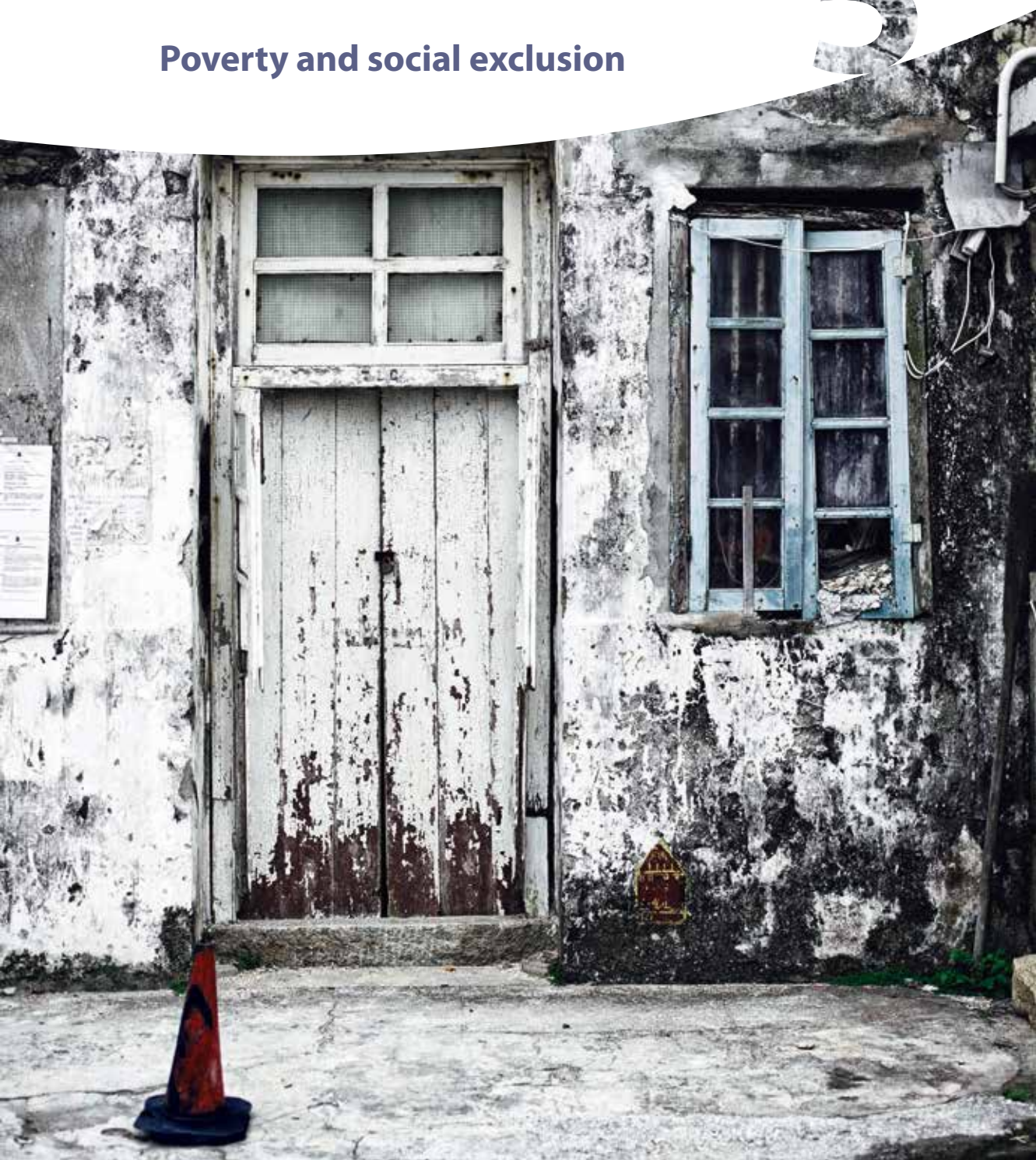
(68) Council recommendations of 28 June 2011 on policies to reduce early school leaving (2011/C 191/01), Official Journal of the European Union, 1.7.2011.

(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, Brussels, 2010 (p. 6); European Commission, *Early School Leaving* (accessed 23 July 2013).

(70) European Commission, *Tertiary Education* (accessed 04 July 2014).

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 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.

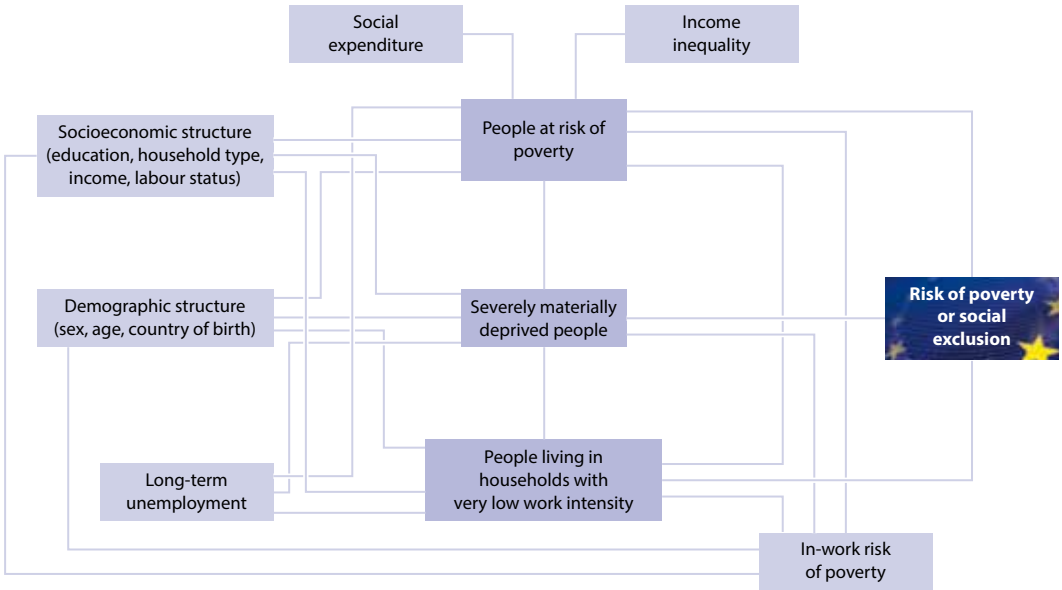
To prevent this downward spiral, the European Commission has made 'inclusive growth' one of the three priorities of the Europe 2020 strategy. It has set a target to lift at least 20 million people out of the risk of poverty and social exclusion by 2020. To underpin this objective, the European Commission has launched two flagship initiatives under the 'inclusive growth' priority: 'An Agenda for new skills and jobs' ([3]) and the 'European platform against poverty and social exclusion' ([4]).

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 ([2]).

The strategy's poverty target is monitored with the headline indicator 'people at risk of poverty or social exclusion'. This indicator is based on a multidimensional concept, incorporating three sub-indicators on monetary poverty ('People at risk of poverty after social transfers'), material deprivation ('Severely materially deprived people') and low work intensity ('People living in households with very low work intensity').

Figure 5.1: Indicators and concepts presented in the chapter and their links to the headline indicator on the poverty target



Due to the structure of the survey on which most of the key social data is 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 ([5]). This is the reason for using 2008 as a 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 also why the analysis of the headline indicator and the three sub-indicators refers to both EU-27 data (from 2005) and EU-28 data (from 2010).

Additional contextual indicators are used to present a broader picture and show the drivers behind the changes in the headline indicator. They break down the top-level indicator by sex, age, educational attainment level, household type, country of birth and labour status. They also help identify the groups most at risk and reveal how their vulnerability has changed over time. Some indicators refer to factors that put people at risk of poverty and social exclusion or help them emerge from this status. These include social protection expenditures and long-term unemployment, which are linked to employment indicators (see the 'Employment' chapter, p. 25).

Employment and education help people escape poverty. Thus, the EU's poverty target is interrelated with the other Europe 2020 targets. Achieving the target to reduce the number of people at risk of poverty and social exclusion will therefore depend on successfully implementing the priorities and actions addressing the other targets.

How do poverty and social exclusion affect Europe?

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 or 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 they are present in more than one sub-indicator (for more details see p. 145).

As shown in Figure 5.2 the number of people at risk of poverty or social exclusion in the EU-27 had been decreasing steadily before the economic crisis. The indicator reached its lowest level in 2009 with about 114 million people at risk in the EU-27.

Box 5.1: Measuring poverty in absolute and relative terms

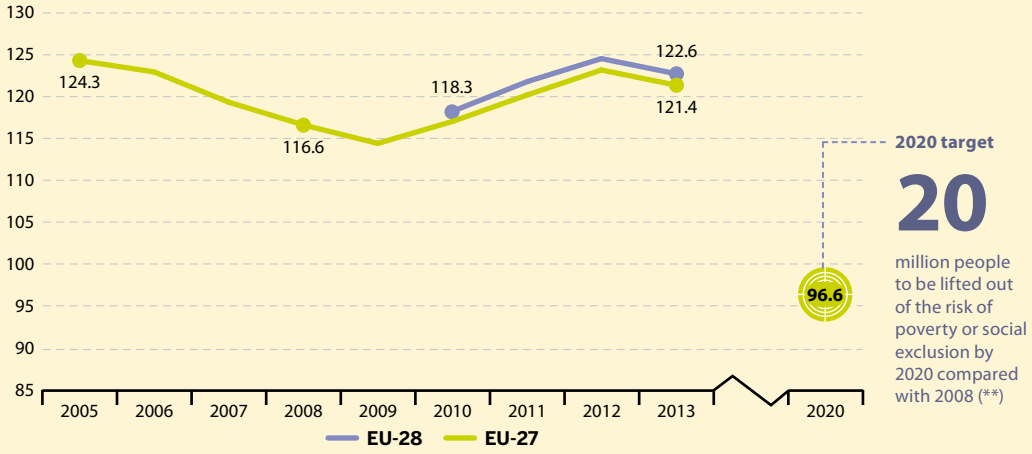
Absolute poverty refers to the deprivation of basic human necessities for survival, such as food, clean water, clothing, shelter, health care and education. This poverty line is considered the same for different countries, cultures and technological levels and it is often based on a given basket of goods and services. For example, absolute poverty can be measured as the number of people eating less food than needed to sustain the human body ([6]).

Relative poverty occurs when someone's standard of living and income are much worse than the general standard in the country or region where they live. 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 linked to inequality ([6]).

EUROPE 2020 HEADLINE INDICATOR

Europe 2020 headline indicator

Figure 5.2: People at risk of poverty or social exclusion, EU-27 and EU-28, 2005–13 (*)
(million people)



(*) 2013 data are estimates; EU-27 data for 2005 and 2006 are estimates.

(**) The overall EU target (referring to the EU-27, i.e. the 27 EU countries before the accession of Croatia) is to lift at least 20 million people out of the risk of poverty or social exclusion by 2020. Due to the structure of the survey on which most of the key social data is based (the 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 monitoring of progress towards the Europe 2020 strategy's poverty target takes 2008 as a baseline year.

Due to regular updates, the target value has been revised compared with the previous publication.

Source: Eurostat (online data code: t2020_50)

Box 5.2: What is social exclusion?

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 and education and training opportunities, as well as social and community networks and activities. They have little access to power and decision-making bodies and thus often feel powerless and unable to take control over the decisions affecting their day-to-day lives' ([7]).

However, this figure grew again in the following years. It reached its peak in 2012, with about 123 million people at risk, before decreasing again slightly in 2013 to 121.4 million. This translates into a gap of 24.8 million between the number of people at risk of poverty and social exclusion in the EU-27 in 2013 and the target set for 2020.

For the EU-28 the number of people at risk of poverty or social exclusion followed a similar trend, although at a slightly higher level due to the inclusion of Croatia. As shown in Figure 5.2 it accounted for about 118 million people in 2010 and rose to almost 125 million people in 2012 before falling again in 2013 to 122.6 million. The serious impact

of the economic crisis on Member States' financial and labour markets was the most likely cause for the rise from 2009 onwards (see the 'Employment' chapter, p. 25).

Automatic stabilisers and other discretionary measures were used to help cushion the recession's negative social effects. By 2013 almost 123 million people — about 24.5 % of the EU population — were at risk of poverty or social exclusion. This means almost one in four people in the EU experienced at least one of the three forms of poverty or social exclusion.

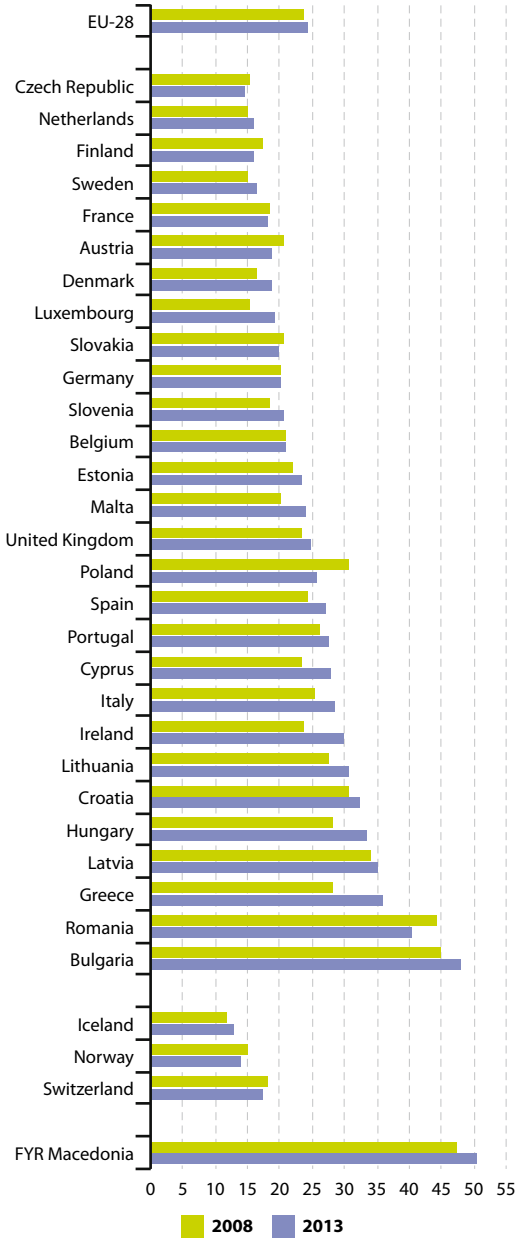
The current economic situation poses a major challenge to policy makers trying to fight poverty and ensure social inclusion. The emphasis needs to shift from short-term measures to structural reforms to spur economic growth, promote high levels of employment (tackling in-work poverty), guarantee adequate social protection and access to quality services (such as healthcare, childcare and housing). Social policies alone cannot deliver on the Europe 2020 poverty target. This objective must be underpinned by other public policies in the economic, employment, tax and education fields ([8]).

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 ([9]) in their National Reform Programmes. As noted in the European Council conclusions from 17 June 2010 ([4]), 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. As mentioned earlier, this base year is also used for the overall EU target ([5]).

Most countries have experienced an increase in the number of people at risk of poverty or social exclusion since 2008, widening the distance from their national targets. Poverty levels have improved in only a few countries. Three countries — the Czech Republic, Poland and Romania — had already reached their national poverty targets by

Figure 5.3: People at risk of poverty or social exclusion, by country, 2008 and 2013 (*)
(% of population)



(*) 2010 data (instead of 2008) for EU-28, HR and MK; 2011 data (instead of 2013) for MK; 2012 data (instead of 2013) for IE, HR and CH; EU-28 data for 2013 are estimates; break in time series in 2012 (UK) and 2013 (ES).

Source: Eurostat (online data code: t2020_50)

2013. Germany and Latvia have also reached their national targets, however, these refer to different indicators than those used at the EU level ([10]). The other Member States remain some distance from their targets, which range from 4.4 million people in Italy to about 25 000 people in Malta.

Overall, 24.5 % of the EU population were at risk of poverty or social exclusion in 2013. However, this conceals considerable variations among Member States in both the level and dynamics of this indicator (see Figure 5.3). In Bulgaria almost half of the population (48 %) were included in this category in 2013. In the Czech Republic (14.6 %), the Netherlands (15.9 %) and Finland (16.0 %) the rate was about three times lower.

In the EU as a whole, and in most Member States, the number of people at risk of poverty or social exclusion reached its lowest level in 2009 before rising again. Significant differences between Member States could be seen during 2008 to 2013. Some countries have 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 2 % to 15 % in Poland (– 15 %), Romania (– 9 %), Austria (– 9 %), Finland (– 8 %), Slovakia (– 4 %), Czech Republic (– 5 %) and France (– 2 %). A number of countries have experienced less inclusive growth. In Cyprus, Greece, Malta and Luxembourg the number of people at risk increased by more than 20 % or even more than 30 %.

One reason for the disparity in poverty rates across the EU is the uneven impact of the economic crisis on Member States. Differences in the structure of labour markets, welfare systems, the fiscal position and fiscal consolidation measures have also played a role ([11]) (see 'Employment' chapter, p. 25).

In this respect, a link between the average risk of poverty and social exclusion at EU level and the disparities across the EU can be observed: the higher the average percentage of people at risk in the EU as a whole, the higher the distance between the lowest and the highest percentage observed across the Member States. In 2008, the distance between the countries with the lowest and the highest risk of poverty or social exclusion was about 30 percentage points. In 2013, this gap had grown slightly to 33 percentage points. This divergence of inequality and poverty levels between Member States has raised serious concern. In particular, a persistent widening of the gap in social exclusion levels could lead to a dangerous polarisation within the EU ([8]).

Which groups are at greater risk of poverty or social exclusion?

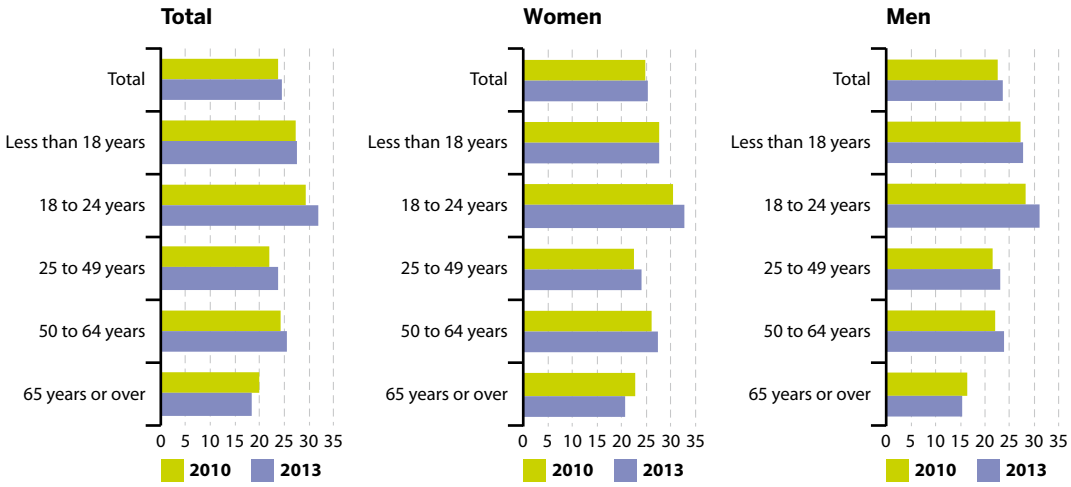
Compared with the EU average, some groups are at a higher risk of poverty and social exclusion. The most affected are women, children, young people, people living in single-parent households, lower educated people and migrants. EU policies aimed at reducing the number of people at risk therefore tend to focus on these groups. They call on Member States to define and implement measures to address their specific circumstances ([12]).

Women are more likely to live in poverty and social exclusion than men

In 2013, 25.4 % of women were at risk of poverty or social exclusion across the EU compared with 23.6 % of men. This put the EU-wide gender gap at 1.8 percentage points. Women were worse off in all countries except Spain and Portugal where the risk of poverty or social exclusion was the same for women and men in 2013. In 2013, the gaps were highest in Lithuania (4.7 percentage points), Germany (3.1 percentage points), the Czech Republic and Sweden (3 percentage points each) and Bulgaria (2.9 percentage points). Portugal, Finland and Denmark were the most egalitarian countries with gender gaps of less than or about 0.5 percentage points. The gender gap narrowed in most countries between 2008 and 2013, except in the Netherlands, Lithuania and Sweden.

The disparities between women and men become more distinct when looking at age groups. Among men, the young aged 18 to 24 were most at risk (31 %) in 2013 compared with older people aged 65 or over (15.3 %). In contrast, women were more likely to be at risk of poverty or social exclusion in all age groups (see Figure 5.4). The risk was the

Figure 5.4: People at risk of poverty or social exclusion, by sex and age group, EU-28, 2010 and 2013 (*)
(% of population)



(*) 2013 data are estimates.

Source: Eurostat (online data code: ilc_peps01)

most unequal among the older groups aged 65 or over. In this age group the gender gap was 5.3 percentage points in 2013.

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. More than 30 % were at risk in 2013 (31.0 % for men and 32.6 % for women). People younger than 18 years were the next most at risk, at 27.6 %. Moreover, the situation for 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 in the following years.

In contrast, older people aged 65 or over showed the lowest rates of 18.3 % (15.3 % for men and 20.6 % for women) in 2013. The rates of this group have shown a steady decline over the period 2010 to 2013 (see Figure 5.4). As a result the age gap has widened. This indicates the burden of the financial crisis has fallen more heavily on those already belonging to the most vulnerable groups of society.

The 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 for Germany, the gap increased, in some cases massively, between 2008 and 2013. In Denmark, the age gap grew by about 18 percentage points. This was due to the number of young people at risk of poverty or social exclusion rising by 11 percentage points and the number of elderly

Box 5.3: Education and employment policies targeting young people

The Europe 2020 strategy puts forward a flagship initiative focusing on young people. 'Youth on the move' aims to enhance the performance of education systems and help young people find work. This is to be done by raising the quality of all levels of EU education and training, promoting student and trainee mobility and improving the employment situation of young people ([13]).

at risk falling by about seven percentage points (see 'Employment' chapter, p. 25).

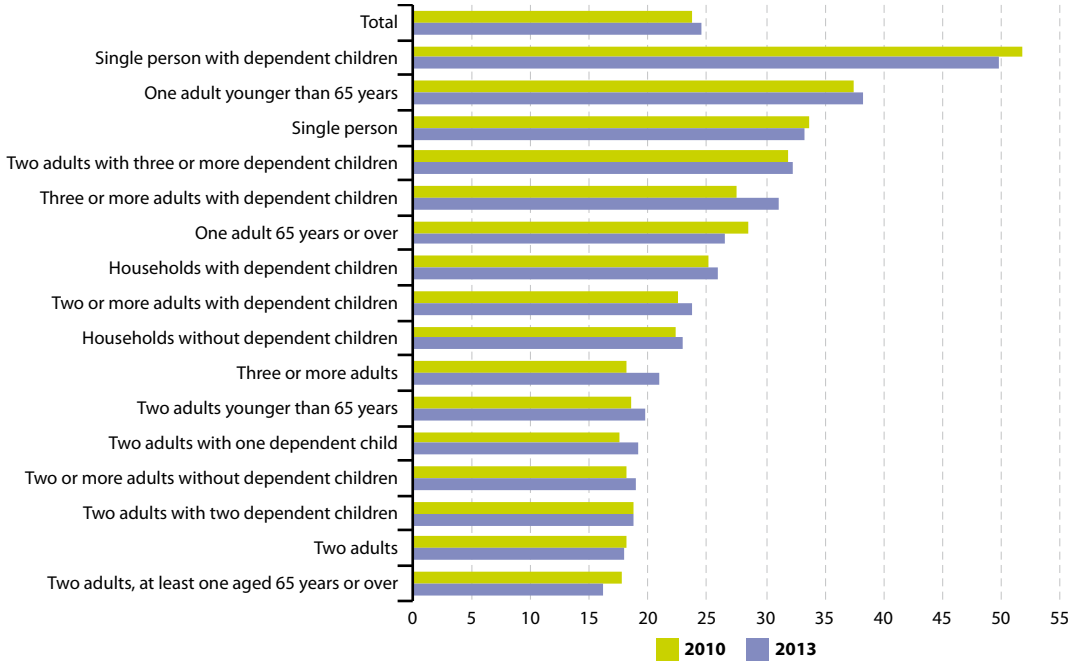
Single parents face the highest risk of poverty or social exclusion

Almost 50 % of single people with one or more dependent children were at risk of poverty or social exclusion in 2013. This was double the average and higher than in any other household type or group analysed. Figure 5.5 shows that the situation for single parents at EU level has improved only marginally since 2010 when almost 52 % of single-parent households were at risk of poverty or social exclusion. Even though this is a serious problem for this household type, single-parent households only account for 4.6 % of all households. The group with the lowest poverty rate in 2013, and showing the most improvement since 2005, was households with two adults where at least one person was aged 65 years or over.

At the national level, changes in the risk of poverty or social exclusion rate varied widely among single-parent households during 2008 to 2013. Changes between 2008 and 2013 ranged from an increase of 10.8 percentage points in Latvia to a fall of 19.1 percentage points in the Czech Republic. Other countries that also experienced big increases were Denmark (8.2 percentage points) and Bulgaria (6.7 percentage points). The biggest falls, besides the Czech Republic, were in Romania (– 12.7 percentage points) and Malta (– 9.5 percentage points), as well as Finland and Slovenia (both – 6.6 percentage points).

In contrast, for households with two adults with at least one aged 65 or over, the at-risk rate decreased in most countries. Hence the absence of children seems to lower the risk of poverty or social exclusion.

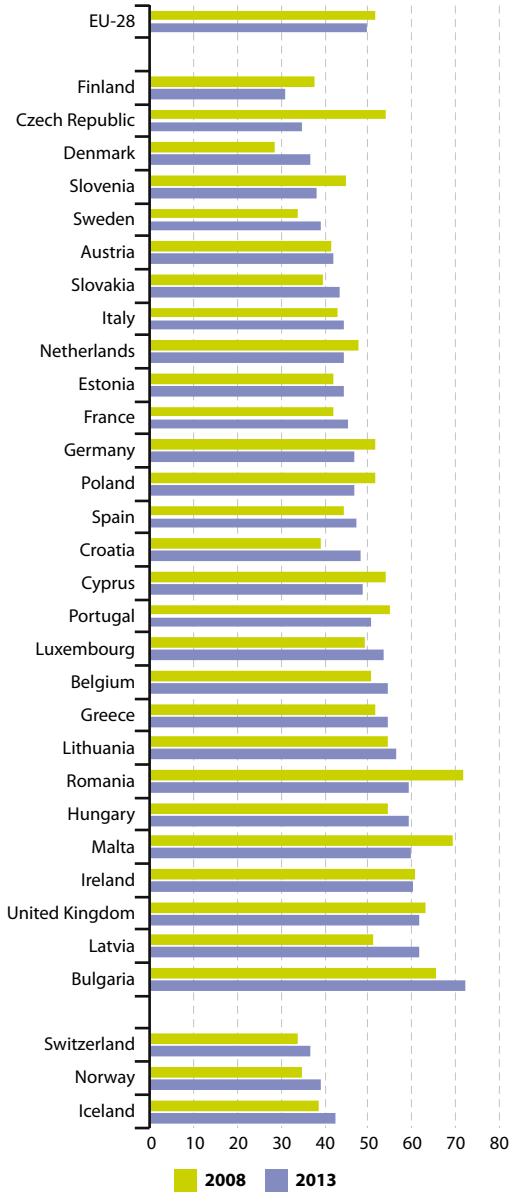
Figure 5.5: People at risk of poverty or social exclusion, by household type, EU-28, 2010 and 2013 (*) (% of population)



(*) 2013 data are estimates.

Source: Eurostat (online data code: ilc_peps03)

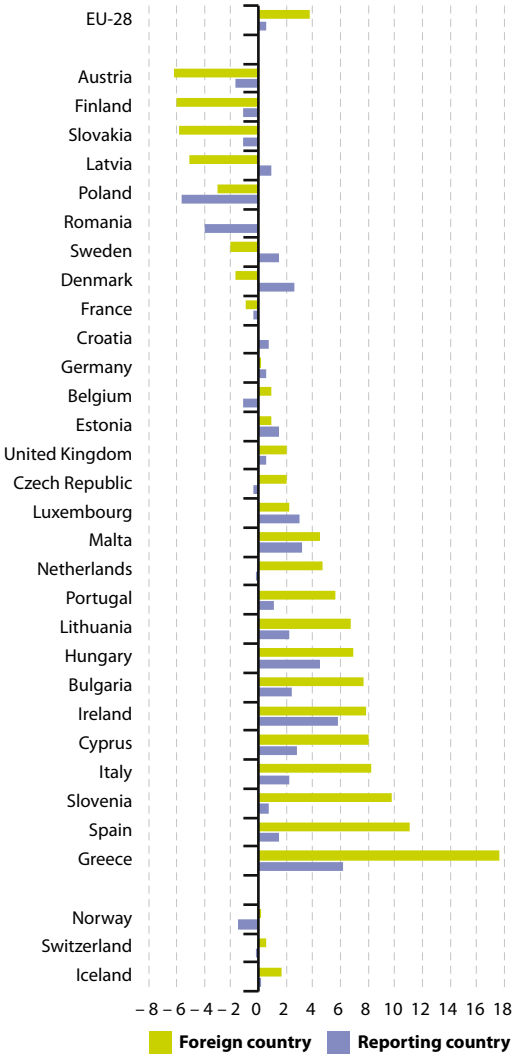
Figure 5.6: Single persons with dependent children at risk of poverty or social exclusion, by country, 2008 and 2013 (*)
(% of population)



(*) 2010 data (instead of 2008) for EU-28 and HR; 2012 data (instead of 2013) for IE, HR and CH; EU-28 data for 2013 are estimates; break in time series in 2012 (UK) and 2013 (ES).

Source: Eurostat (online data code: ilc_peps03)

Figure 5.7: Change in people at risk of poverty or social exclusion by broad group of country of birth (population aged 18 and over), by country, 2008–13 (*)
(Percentage point change 2008–13) (**)



(*) Change 2010–13 for EU-28; change 2008–12 for IE and CH; change 2010–12 for HR; EU-28 data are estimates; no data for RO for 'foreign country' due to low data reliability.

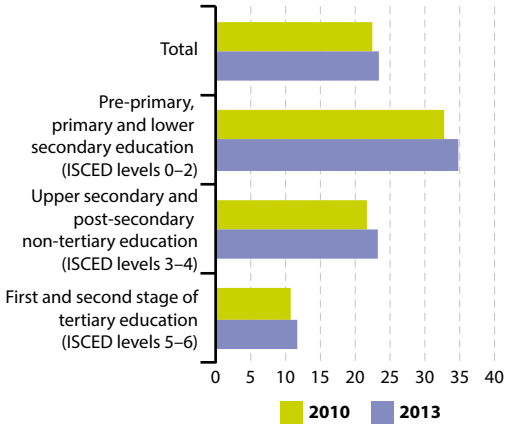
(**) Positive values mean an increase in the number of people at risk of poverty or social exclusion, negative values mean a decrease; 'foreign country' covers people born in a different country than the one they are living in; 'reporting country' covers people born in the country in which they are living.

Source: Eurostat (online data code: ilc_peps06)

Box 5.4: The flagship initiative 'A European platform against poverty' focusing on migrants' integration

The flagship initiative 'A European platform against poverty' incorporates policies to help integrate the most vulnerable groups of the population. It aims to provide innovative education, training and employment opportunities for deprived communities, fight discrimination and develop a new agenda to help migrants integrate and take full advantage of their potential. To underpin this, the initiative asks Member States to define and implement measures, addressing the specific circumstances of groups at particular risk, such as minorities and migrants ([3]).

Figure 5.8: People at risk of poverty or social exclusion, by education level, EU-28, 2010 and 2013 (*)
(% of population aged 18 and over)



(*) 2013 data are estimates.

Source: Eurostat (online data code: ilc_peps04)

Migrants are worse off than people living in their home countries

People living in the EU but in a different country from where they were born had a 34.4 % risk of poverty or social exclusion in 2013. This is almost 12 percentage points higher than for people living in their home countries. This 'origin gap' could be seen in most European countries in 2013, except Hungary, Poland and Slovakia. It was highest in Greece, where the risk of poverty or social exclusion among migrants was 30.3 percentage points higher than among those born in the country. In 18 Member States, the risk of poverty or social exclusion among foreigners increased between 2008 and 2013 (see Figure 5.7). Greece showed the highest increase of 17.6 percentage points. In contrast, in Austria the risk decreased by 6.1 percentage points. The overall trend might be explained by the fact that migrants have suffered the most from rising unemployment in the EU ([14]).

People with low educational attainment are three times more likely to be at risk

In 2013, 34.8 % of people with at most lower secondary educational attainment were at risk of poverty or social exclusion (see Figure 5.8). In comparison, only 11.8 % with tertiary education were in the same situation. This indicates that the least educated people were about three times more likely to be at risk than those with the highest education levels (also see the 'Education' chapter, p. 103).

This situation is even more distinct in Member States such as the Czech Republic, Malta, Slovenia, Romania, Croatia and Poland. In these countries people with the lowest educational attainment were about five (5.5 times in Malta) to almost eight times (7.9 times in the Czech Republic) more likely to be at risk of poverty or social exclusion. In Bulgaria, Denmark, Germany and the Czech Republic the disparities between these groups has grown within the last six years. In these countries the number of people at risk of poverty or social exclusion among the least educated increased, while it decreased for those with the highest levels of education. However, a better education did not necessarily protect everyone against the crisis. In 21 Member States the rate also increased in 2013 compared with 2008 among those with the highest educational attainment. For example in Greece it increased by 7.8 percentage points and in Cyprus by 6.4 percentage points.

The three dimensions of poverty

The 122.6 million people who were at risk of poverty or social exclusion in the 28 EU Member States in 2013 were affected by one or more dimensions of poverty (see Box 5.5).

As shown in Figure 5.9, monetary poverty was the most widespread form in 2013, with 83.5 million people living at risk of poverty after social transfers. This was followed by material deprivation, affecting 48.2 million people, and low work intensity, affecting 40.2 million people.

More than one-third affected by more than one dimension of poverty

About 40 million people, or almost one third (32.6 %) of all people at risk of poverty or social exclusion, were affected by more than one dimension of poverty in 2013. Of these, 13.6 million people suffered from monetary poverty and material deprivation, 3.7 million were both materially deprived and living in households with very low work intensity, and 13.5 million were affected by low work intensity and monetary poverty. Another 9.3 million people were affected by all three forms (see Figure 5.9).

Divergent developments of the three forms of poverty

As shown in Figure 5.10, the three forms of poverty developed quite distinctly between 2005 and 2013. Monetary poverty has been the most

Box 5.5: The headline indicator 'People at risk of poverty or social exclusion' combines three dimensions of poverty

Measuring poverty and social exclusion requires a multidimensional approach. Household income is a key determinant of standard of living, 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.

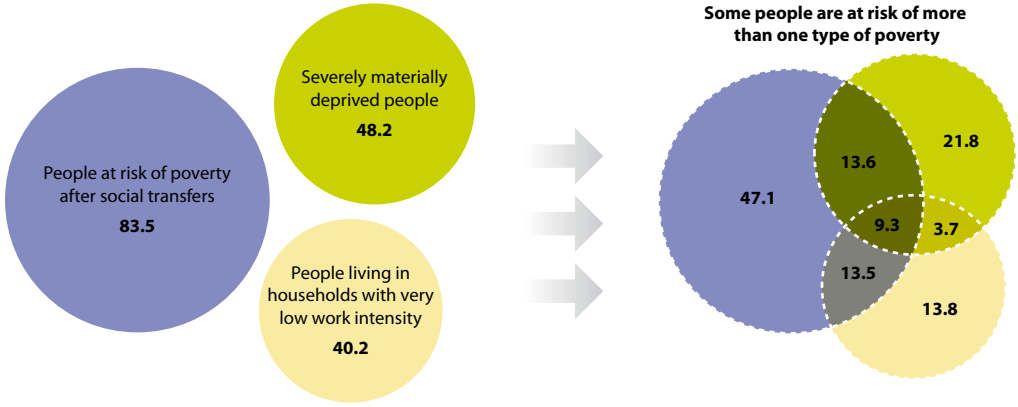
1. Monetary poverty is measured by the indicator 'People at risk of poverty after social transfers'. The indicator measures the share of people with an equivalised disposable income below the risk-of-poverty threshold. This is set at 60 % of the national median equivalised disposable income after monetary social transfers. Social transfers are benefits provided by national or local governments, including benefits relating to education, housing, pensions or unemployment.

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.

3. Very low work intensity describes the number of people aged 0 to 59 living in households where the adults worked less than 20 % of their work 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 will become clearer when looking at the current numbers of people at risk of poverty or social exclusion (see Figure 5.9).

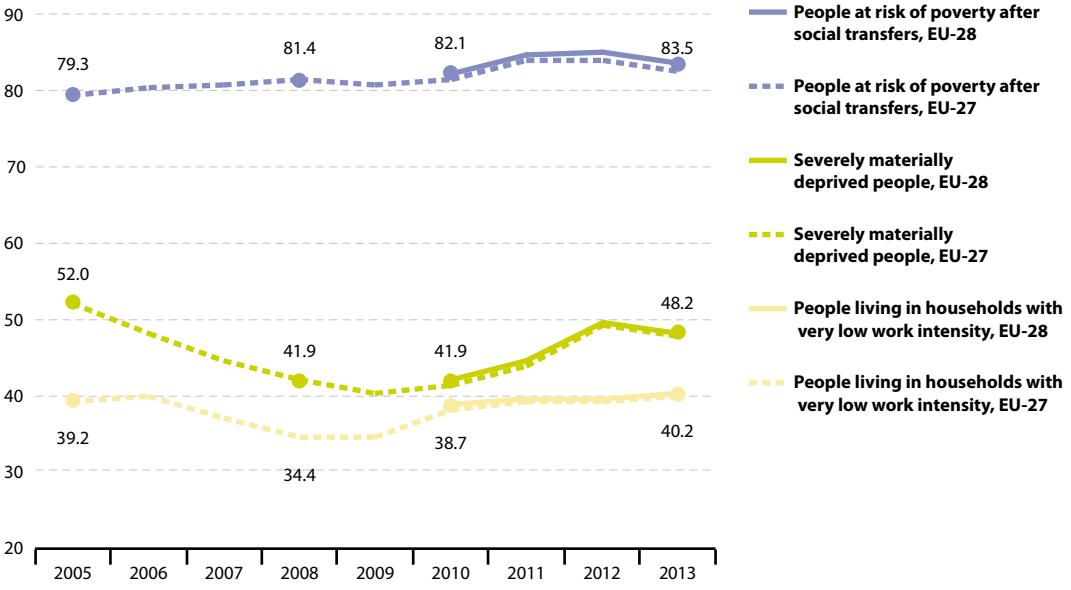
Figure 5.9: Aggregation of sub-indicators of 'People at risk of poverty or social exclusion', EU-28, 2013 (*)
(million people)



(*) Estimated data.

Source: Eurostat (online data codes: ilc_pees01)

Figure 5.10: Sub-indicators of 'People at risk of poverty or social exclusion', EU-27 and EU-28, 2005–13 (*)
(million people)



(*) 2013 data are estimates; 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)

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 2008/09, but has since grown again. This shows that improvements in the headline indicator between 2005 and 2009 (see Figure 5.2) can mainly be traced back to the reduction in material deprivation and low work intensity. One possible reason for the divergence of monetary poverty on the one hand and material deprivation and low work intensity on the other is the different structure of the indicators (see Box 5.5). While monetary poverty is measured in relative terms, material deprivation and low work intensity are absolute measures (see Box 5.1). The relativity of monetary poverty means the at-risk rate may remain stable or even increase even if a country's average or median disposable income increases. Absolute poverty measures, however, are likely to decrease during economic recoveries.

Monetary poverty increased in more than half of Member States

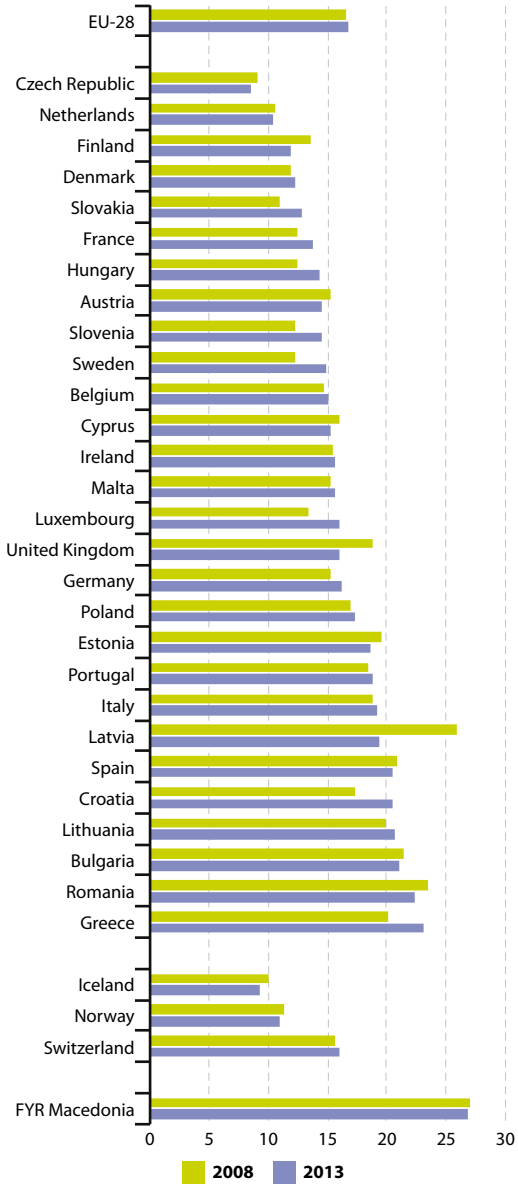
In 2013, 16.7 % of the EU population earned less than 60 % of their respective national median equivalised disposable income, the so-called 'poverty threshold'. This represents a slight increase compared with 2008, when the risk-of-poverty rate was 16.5 %.

The increase did not take place in all countries (see Figure 5.11). Between 2008 and 2013 the share of people at risk of monetary poverty rose in 17 Member States and fell in the rest. The countries reporting the highest rates in 2013 were Greece (23.1 %), Romania (22.4 %) and Bulgaria (21.0 %). The best performing Member States for monetary poverty were the Czech Republic (8.6 %), the Netherlands (10.4 %) and Finland (11.8 %).

Impact of the poverty threshold

Monetary poverty is related to disposable income after monetary social transfers. It is reached when disposable income falls below a certain threshold. Hence, the number of people considered

Figure 5.11: People at risk of poverty after social transfers, by country, 2008 and 2013 (*)
(% of population)



(*) 2010 data (instead of 2008) for EU-28 and MK; 2011 data (instead of 2013) for MK; 2012 data (instead of 2013) for IE, HR and CH; EU-28 data for 2013 are estimates; break in time series in 2010 (HR), 2012 (UK) and 2013 (ES).

Source: Eurostat (online data code: t2020_52)

monetarily poor depends on the level at which the poverty threshold is set (see Table 5.1).

If the poverty threshold was set at 70 % of the national median disposable income, nearly one out of four people would be at risk of poverty. This holds for 2010 and 2013. If the threshold was set at 50 % or 40 %, then about 10 % or 5 % of the population would be at risk respectively. For all poverty thresholds, the number of people at risk of monetary poverty increased from 2010 to 2013.

Single parents, large families, low educated and young people most affected

Single parenthood bears the biggest risk of monetary poverty. Almost one out of three or 32 % of households in this group were affected in 2013. The number of children also influences the risk, with one out of four large family households being touched. Single-wage and part-time employment may also cause monetary poverty ([15]). A lack of affordable childcare might prevent parents from fully participating in the labour market ([16]) .

Households with children are more at risk of poverty because young people generally face a greater risk of living in this condition (see Figure 5.12).

Children and young people (up to 24 years old) remained vulnerable groups in 2013. One out of five was at risk of poverty. Compared with 2008 ([17]), the number of poor people aged 65 years or over has fallen by 5.2 percentage points but the number of poor young people has risen. Among those aged less than 18 years, the number of poor people remained stable at about 20 %. However, among those aged 18 to 24, the number of poor people increased by 2.7 percentage points.

The most vulnerable age groups vary between Member States. Commission analyses point to the persistent gender pay gap and the higher presence of women in precarious employment as possible reasons. In 2013, children were the most at risk in Romania (32.1 %) and Greece (28.8 %), while young people aged 18 to 24 were most at risk in Denmark (40.5 %) and the elderly were most at risk in Estonia (24.4 %). The risk of suffering from monetary poverty is slightly higher for women in most Member States ([18]).

As with poverty and social exclusion, a low level of education is a major risk factor for monetary poverty. While only 7.7 % of the population aged 18 to 64 with higher education were affected by monetary poverty in 2013, almost 28 % of people in the same age group with lower education were affected. This could also be related to the higher level of unemployment and in-work poverty among low-skilled workers.

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 and considering social policy expenditures (see Figure 5.13). The amount of money spent on social assistance is a good indicator of income support expenditure ([19]).

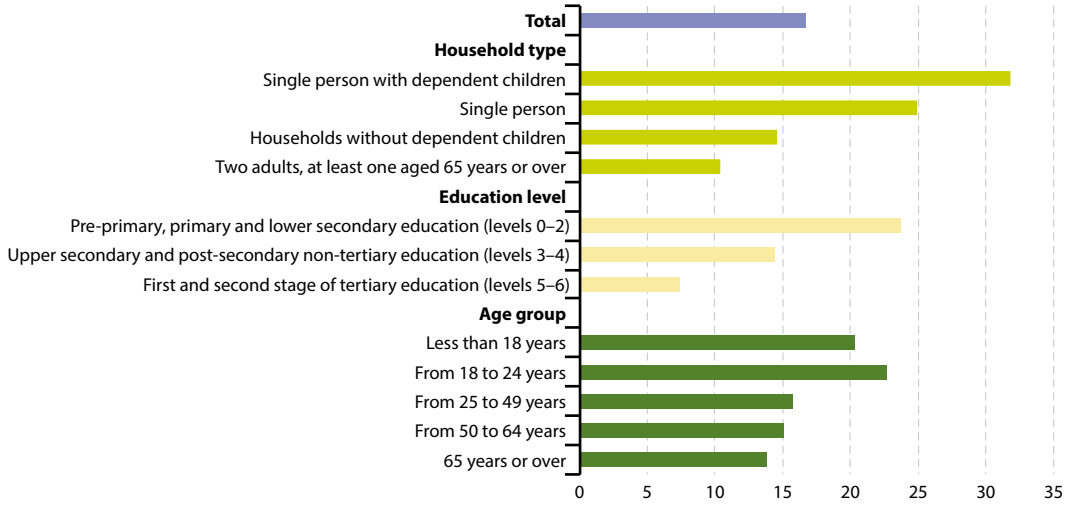
Table 5.1: People at risk of poverty after social transfers, by poverty threshold, EU-28, 2010 and 2013 (*)

Poverty threshold	2010		2013	
	1 000 persons	% of population	1 000 persons	% of population
40 %	28 216	5.7	28 769	5.7
50 %	50 115	10.1	51 039	10.2
60 %	82 147	16.5	83 462	16.7
70 %	120 933	24.3	123 242	24.6

(*) 2013 data are estimates.

Source: Eurostat (online data code: ilc_li02)

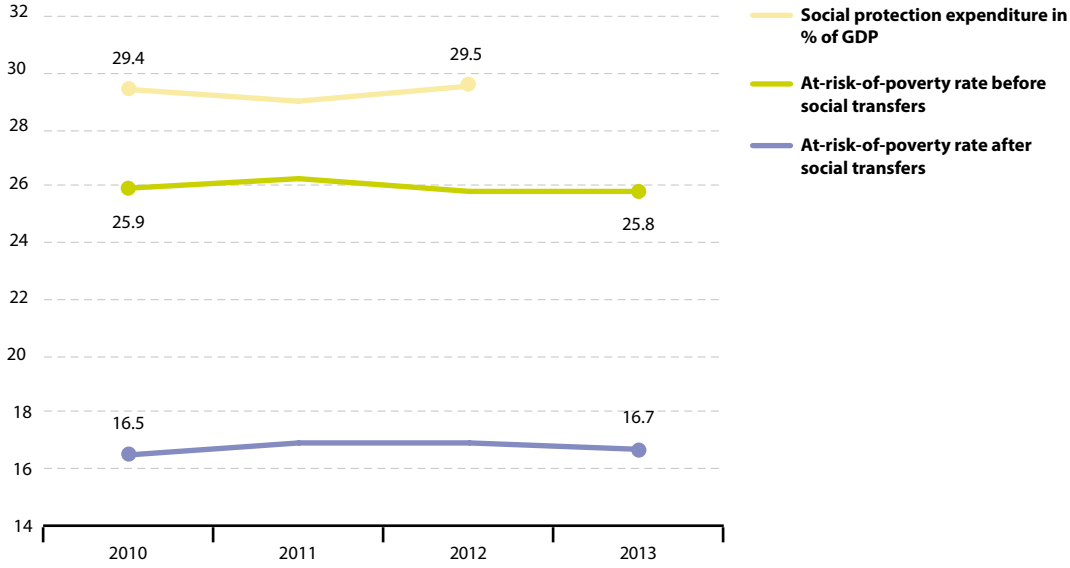
Figure 5.12: People at risk of poverty after social transfers, by age group, household type and educational attainment, EU-28, 2013 (*)
(%)



(*) Estimated data; for education the population is restricted to those aged 18 years and over.

Source: Eurostat (online data codes: ilc_li02, ilc_li03 and ilc_li07)

Figure 5.13: Impact of social expenditure on the at-risk-of-poverty rate, EU-28, 2010–13 (*)
(%)



(*) 2013 data for the risk of poverty are estimates; data on social protection expenditure are provisional; pensions are excluded from social transfers.

Source: Eurostat (online data codes: ilc_li02, ilc_li10, spr_exp_sum)

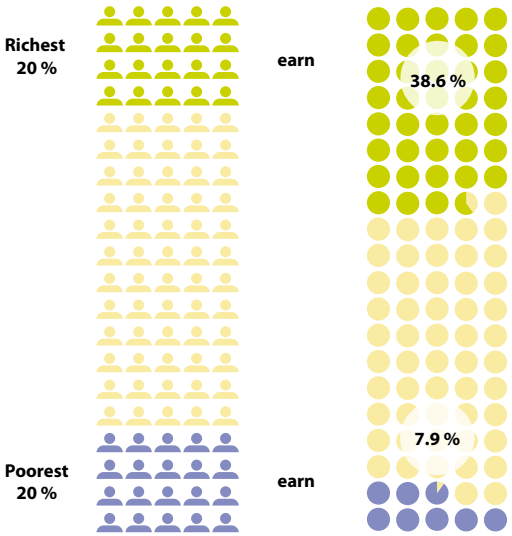
The at-risk-of-poverty rate before social transfers had been relatively stable since 2010 at around 26 %. The same holds for the at-risk-of-poverty rate after social transfers, but at the much lower level of slightly above 16.5 %. The expenditure for social protection ([20]) was at 29.4 % of GDP in 2010 and decreased slightly in 2011, only to rise again to 29.5 % in 2012.

Inequality of income distribution remained stable

As with the number of people suffering from monetary poverty after social transfers, income inequality has also remained stable. To measure income inequality, the income quintile share ratio and the Gini coefficient ([21]) can be considered. Between 2008 and 2013, income inequality remained stable in the EU, with the richest 20 % of the population earning 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 2013 Bulgaria, Greece and Romania recorded the highest inequality in income distribution. In all of these three Member States the total income of the richest 20 % was almost seven times higher than the income of the poorest 20 %. On the other hand the Czech Republic and the EFTA countries Norway and Iceland had income quintile share ratios below 3.5.

Figure 5.14: Distribution of income by quintiles, EU-28, 2013
(%)



Source: Eurostat (online data code: ilc_di01)

The Gini coefficient for the EU was 30.5 in 2013, a level similar to previous years (a coefficient of 100 expresses total inequality and a coefficient of 0 expresses perfect equality). Income inequality according to the Gini coefficient was again lowest in Norway, Iceland, Slovakia, Slovenia, the Czech Republic and Sweden, with coefficients of less than 25. On the other hand, in Bulgaria, Latvia, Lithuania and Greece the index exceeded the EU average by four percentage points, indicating relatively high income inequality in these countries.

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.

In 2013, 48.2 million people in the EU were living in conditions severely constrained by a lack of resources. This equalled 9.6 % of the total EU population or 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 2013, from 43 % in Bulgaria to as low as 1.8 % in Luxembourg and 1.4 % Sweden (see Figure 5.15).

A combination of factors are likely to cause these persistent disparities between Member States. Differences in living standards, levels of development and social policies all play a part ([22]).

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. For example, in Bulgaria the proportion of people living in severely deprived conditions was almost twice

as high as the share living in monetary poverty. On the other hand, in a number of countries with higher standards of living such as Sweden, Luxembourg and Denmark, monetary poverty rates appear high.

Since 2008 the number of people living in severe material deprivation increased in the majority of countries. The rate has decreased in nine countries and remained stable in two. In general, these were countries with initially low rates below or around 5.5 % such as Austria, Finland, Belgium, France, Germany and Sweden. However, in Romania the rate decreased by 4.4 percentage points from 32.9 % in 2008.

The most distinct improvements took place in Poland, which improved by 5.8 percentage points from 17.7 % in 2008.

Women and young people more affected

As is the case for the other indicators analysed in this chapter, women and people aged 18 to 24 were the most affected by material deprivation in 2013. Figure 5.16, illustrating the rates of materially deprived people among different age groups and by gender, shows age disparities were greater for men. Moreover men aged 65 years or over were better off than any other group in 2013.

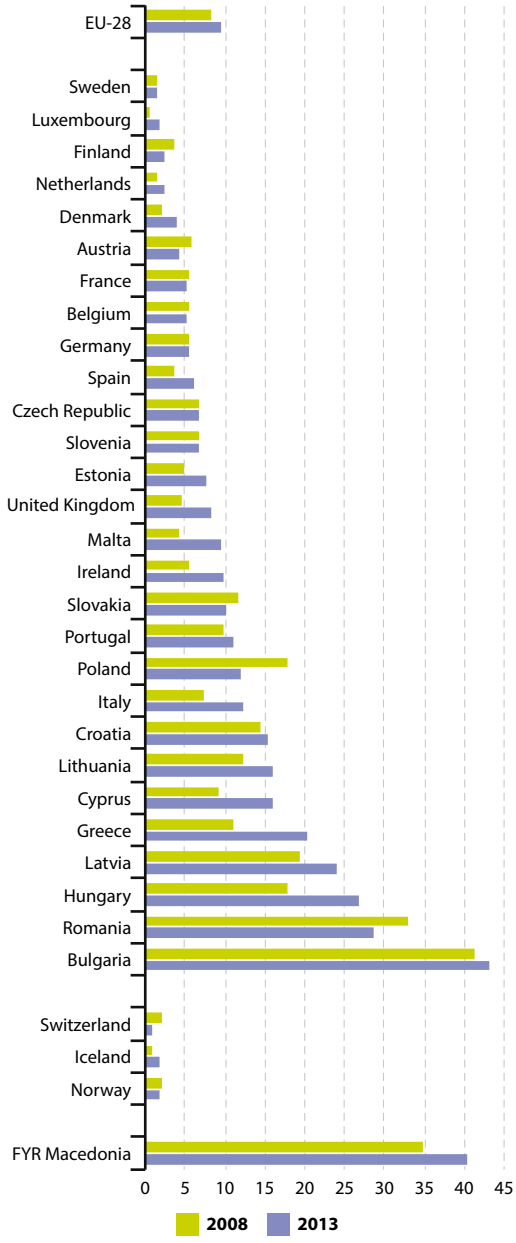
Single parents, poorly educated and migrants were worse off

People living in single households with children, those who are poorly educated and foreigners are the most vulnerable to material deprivation (see Figure 5.17).

Inability to face unexpected financial expenses or to make ends meet

Material deprivation can threaten a person's existence or make them fear 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 2013, almost 40 % of the EU population reported their household was unable to face unexpected expenses. About 12 % declared they had great

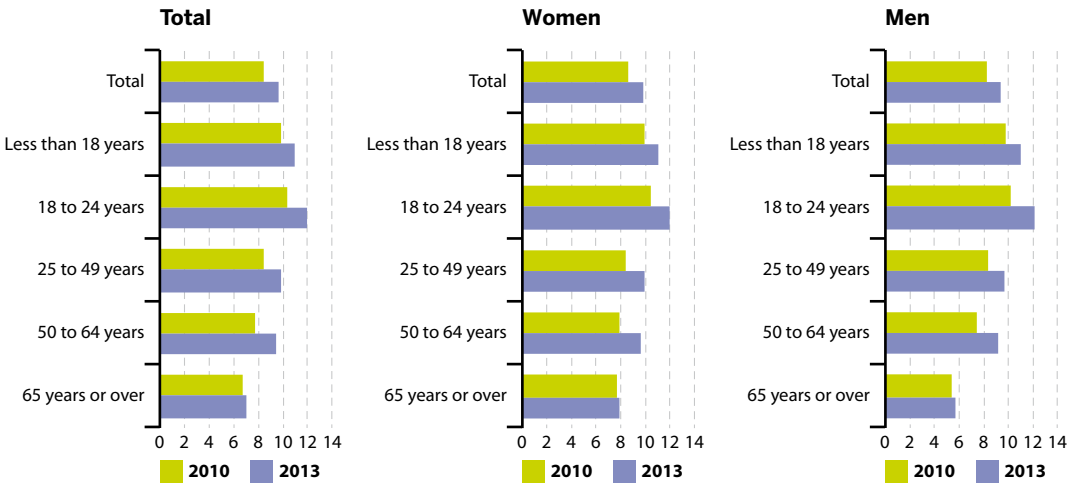
Figure 5.15: Severely materially deprived people, by country, 2008 and 2013 (*)
(% of population)



(*) 2010 data (instead of 2008) for EU-28, HR and MK; 2011 data (instead of 2013) for MK; 2012 data (instead of 2013) for IE, HR and CH; EU-28 data for 2013 are estimates; break in time series in 2012 (UK).

Source: Eurostat (online data code: t2020_53)

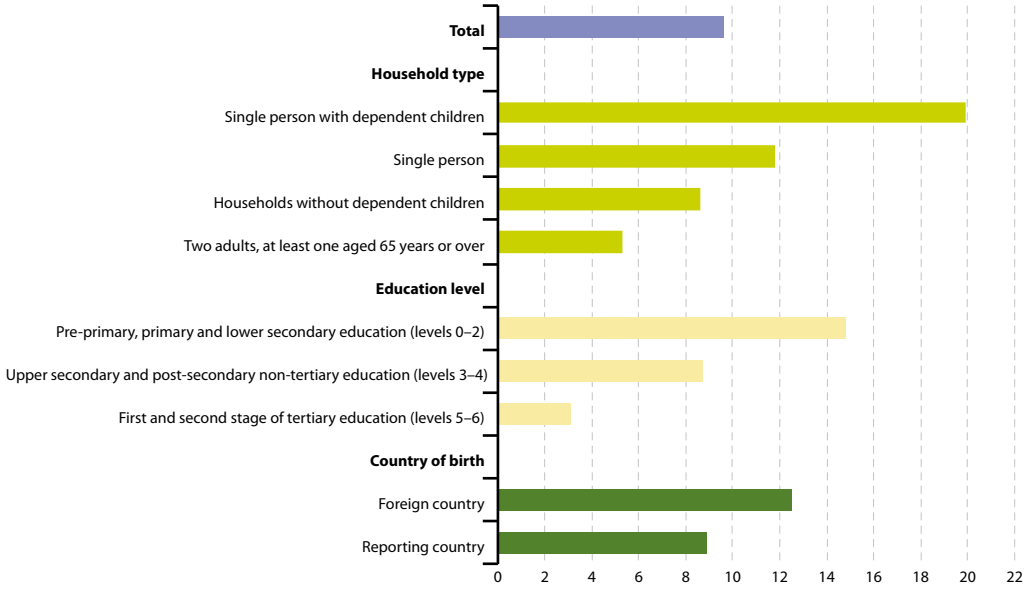
Figure 5.16: Severe material deprivation rate, by sex and age group, EU 28, 2010 and 2013 (*)
(% of population)



(*) 2013 data are estimates.

Source: Eurostat (online data code: ilc_mddd11)

Figure 5.17: Severe material deprivation rate by household type, educational attainment and country of birth, EU-28, 2013 (*)
(%)



(*) Estimated data; for education the population is restricted to those aged 18 years and over.

Source: Eurostat (online data codes: ilc_mddd13, ilc_mddd14 and ilc_mddd16)

difficulties making ends meet. As shown in Figure 5.18, material deprivation is often associated with these concerns. 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.

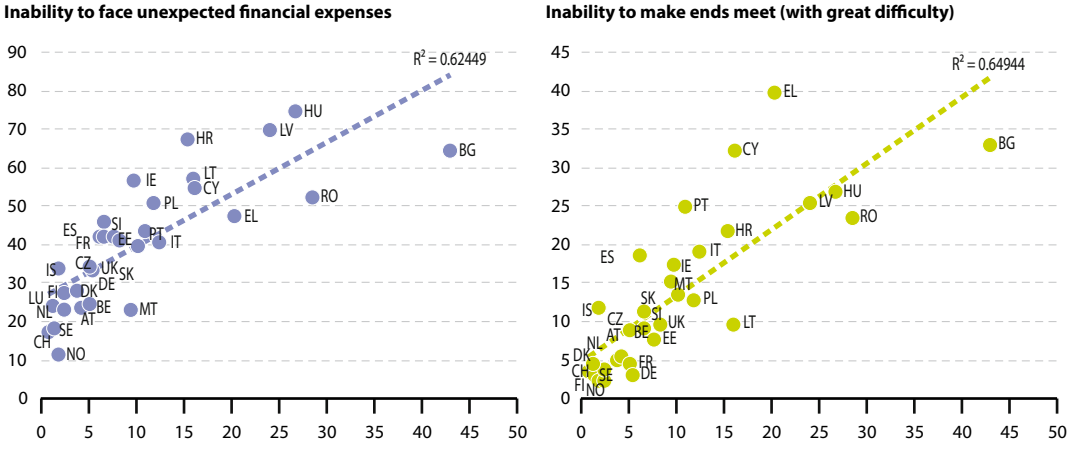
Low work intensity lowers income security

In 2013, 10.7 % (or 40.2 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 less than 20 % of their potential during the previous year. Across Europe, this figure ranged from 6.4 % in Romania and 6.6 % in Luxembourg to more than 23.4 % in Ireland (2012 data) (see Figure 5.19). 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 2013 Greece, Ireland and Spain reported the highest increases (by 10.7, 9.7 and 9.1 percentage points respectively) in the amount of households with very low work intensity. Improvements were observed in Romania (by 1.9 percentage points), Germany (by 1.8 percentage points), France (by 0.9 percentage points), Poland (by 0.8 percentage points) and the Czech Republic (by 0.3 percentage points).

Some countries reported that the share of people living in households with very low work intensity increased by a similar amount to the decrease in the employment rate. In some cases such as Greece and Spain the increase was even stronger. This trend indicates that a deterioration in employment rates has the biggest effect on the most vulnerable households ([23]).

In many 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. Ireland, for example, in 2012 had a high proportion of households with very low work intensity (23.4 %) despite its risk of monetary poverty (15.7 %) being below

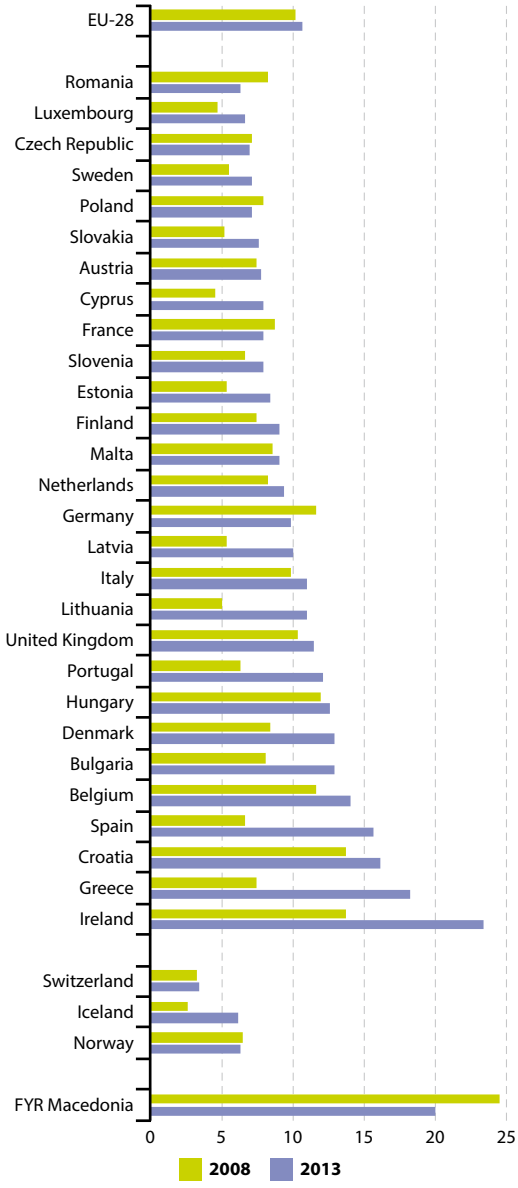
Figure 5.18: Relation between severe material deprivation, inability to face unexpected financial expenses and inability to make ends meet, by country, 2013 (*)
(% of total population)



(*) 2012 data for IE, HR and CH.

Source: Eurostat (online data codes: ilc_mdes04, ilc_mdes09 and ilc_mddd11)

Figure 5.19: People living in households with very low work intensity, by country, 2008 and 2013 (*)
(% of population aged 0 to 59)



(*) 2010 data (instead of 2008) for EU-28, HR and MK; 2011 data (instead of 2013) for MK; 2012 data (instead of 2013) for IE, HR and CH; EU-28 data for 2013 are estimates; break in time series in 2012 (UK).

Source: Eurostat (online data code: t2020_51)

the EU average. In contrast, Romania had one of the highest proportions of its population living at risk of monetary poverty in 2013 (22.4 %) and at the same time one of the lowest shares of households with very low work intensity (6.4 %).

Work intensity lowest for single parents and single households

In many cases, low work intensity means low income. In 2013, one out of every three people (33 %) in the lowest income quintile in the EU was living in a household with very low work intensity. This figure increases to more than one in two for single people (56.5 %) and almost one in two for single-parent households (47.2 %) in this lowest income quintile.

At 28.4 %, single parents were more than twice as likely to live in a household with very low work intensity than the average (10.7 %) in 2013. However, unlike the other forms of poverty, large households with three or more dependent children were less likely (8.1 %) to experience very low work intensity than single-person households. Single people were more than twice as likely (23.3 %) to live in a household facing problems accessing labour than the average. The most vulnerable groups for labour exclusion were therefore single parents and single people.

Education is one of the keys to lifting people out of poverty. People with a low level of education find it hardest to gain work. In 2013, 21.5 % of this group were living in a household with very low work intensity. This represents an increase of 5.6 percentage points since 2008. Migrants, especially women, also face greater difficulty finding work. In 2013, 17.9 % of women originating from a country outside the EU lived in households with low work intensity. With regard to gender and age groups, women aged 25 to 59 are the most vulnerable to low work intensity.

Lack of work drives monetary poverty and material deprivation

As depicted in the 'Employment' chapter (see p. 25), unemployment and economic inactivity are

major drivers of monetary poverty and material deprivation. Figure 5.20 illustrates the variations of the risk of monetary poverty by economic activity and the shifts between 2010 and 2013.

Being unemployed poses the highest risk of monetary poverty. In 2013, almost every second unemployed person was at risk of poverty after social transfers. Also, 26.8 % of other economically inactive people were at risk of poverty in 2013. With the exception of retired people, these risks have risen since 2010. For example, the at-risk-of-poverty rate of unemployed people increased from 45.3 % in 2010 to 46.5 % in 2013.

Long-term unemployment describes people aged 15 or over who have been unemployed for longer than a year. These people usually find it harder to obtain a job than those unemployed for shorter periods, so they face a higher risk of social exclusion. Figure 5.21 shows how the generally favourable trend of falling long-term unemployment in the early 2000s has been reversed since the onset of the economic crisis. In 2013, 5.1 % of the economically active population had been unemployed for longer than a year, with more than half of these (about 57 %) having been unemployed for more than two years. In addition, differences between men and women have disappeared over the past five years.

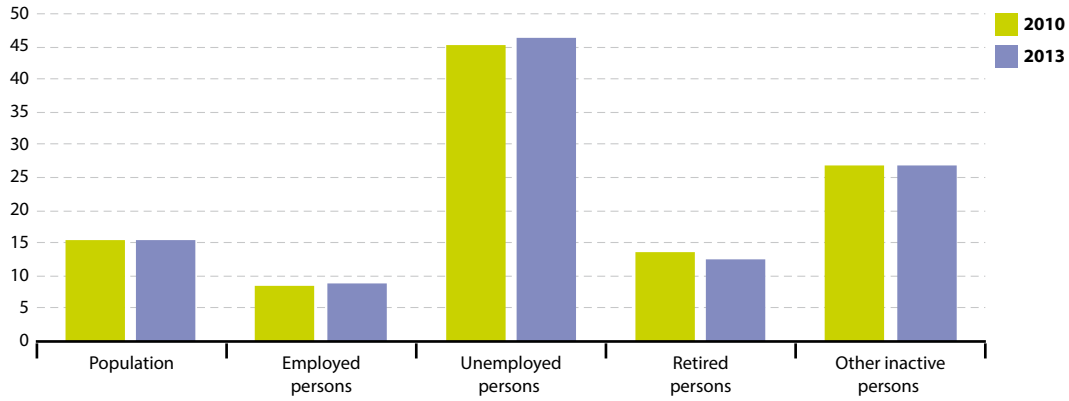
People in work can also be affected by poverty

Poverty and social exclusion do not only affect those who are economically inactive or unemployed. Some groups among those in work also face higher risks of being poor. The developments of income-related aspects of poverty and lack of access to labour are also interrelated with in-work poverty (see Figure 5.22). Factors affecting in-work poverty rates include household type, type of contract, working time and hourly wages, among others.

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 2013. Part-time employment can also lead to this form of poverty.

In general men were more affected by in-work poverty than women (9.4 % compared with 8.5 % in 2013). The situation was the opposite for young workers aged 18 to 24 years. In this case women were more affected (12.5 % compared with 10.7 %). Of all age groups, young workers showed the highest in-work at-risk-of-poverty rates.

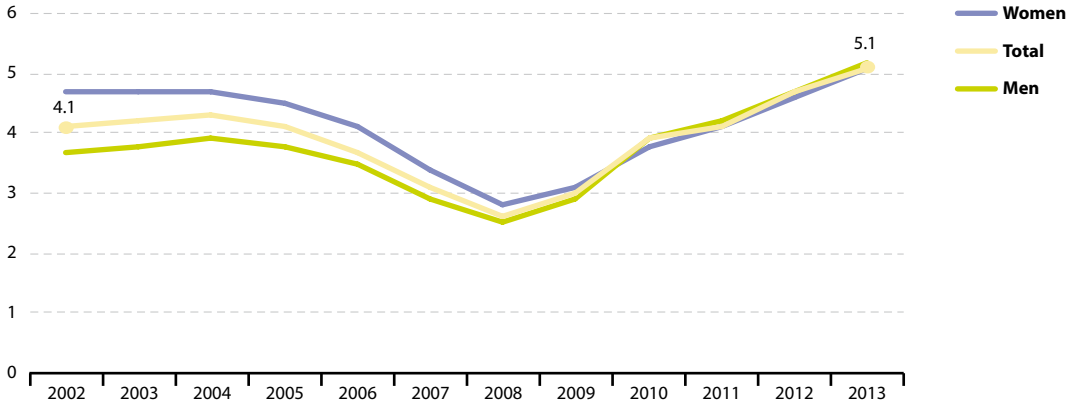
Figure 5.20: At-risk-of-poverty rate, by economic activity, EU-28, 2010 and 2013 (*)
(% of population aged 18 or over)



(*) 2013 data are estimates.

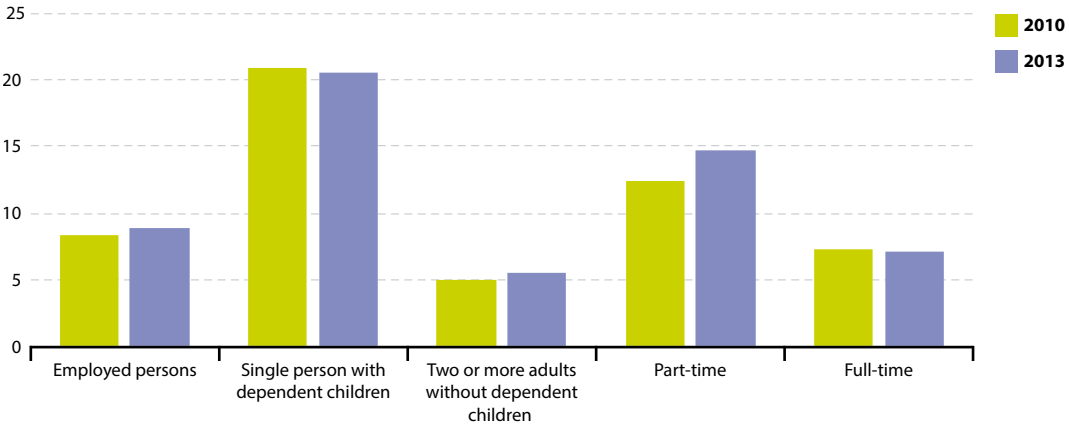
Source: Eurostat (online data code: ilc_li04)

Figure 5.21: Long-term unemployment rate, by sex, EU-28, 2002–13
(%)



Source: Eurostat (online data code: tsdsc330)

Figure 5.22: In-work at-risk-of-poverty rate, by household type, full-time and part-time work, EU-28, 2010 and 2013 (*)
(% of population aged 18 or over)



(*) 2013 data are estimates; 2010 data are estimates for 'single person with dependent children' and 'part-time'.

Source: Eurostat (online data codes: ilc_iw01, ilc_iw02 and ilc_iw07)

Conclusions and outlook towards 2020

The European Commission has a goal to reduce the number of people at risk of poverty or social exclusion by 20 million by 2020 compared with 2008. Nevertheless, almost every fourth person in the EU was still at risk of poverty or social exclusion in 2013.

Monetary poverty is the most widespread form of poverty. The number of people at risk of poverty after social transfers in 2013 was 83.5 million or 16.7 % of the total EU-28 population. Next was material deprivation, covering 48.2 million people or 9.6 % of all EU citizens. The third dimension is low work intensity, with 40.2 million people experiencing it in 2013. This equals 10.7 % of the total population aged 0 to 59.

The year 2009 marks a turning point in the development of all three dimensions of poverty. While monetary poverty had been stable until 2009 and started to increase afterwards, the other two dimensions decreased considerably until 2009 and started to increase from then on.

Furthermore, the analysis shows that across all three dimensions of poverty, the same groups appear the most vulnerable: children, young people, single parents, households with three or more dependent children, people with low educational attainment and migrants.

More than 30 % of young people aged 18 to 24 and 27.6 % of children aged less than 18 were at risk of poverty or social exclusion in 2013. Moreover, one out of five children and young people aged 18 to 24 were subject to monetary poverty.

Poverty also seemed to be much more pronounced for the less educated and migrants. Almost 35 % of adults with at most lower secondary educational attainment and 34.4 % of adults with a migrant background were at high risk of poverty or social exclusion. Of all groups examined, single parents with one or more dependent children faced the greatest risk of poverty. They were the most affected by low work intensity (28.4 %), monetary poverty (31.8 %), in-work poverty (20.5 %) and material deprivation (19.9 %). Overall, about 49.7 % of all single parents were at risk of poverty or social exclusion in 2013. This was double the average and higher than in any other household type or group analysed.

The development of the risk of poverty or social exclusion indicators also shows that the gap between high-risk and low-risk groups has been growing since 2009. This suggests that the burden of the financial crisis has fallen more heavily on those who already belonged to the weakest groups.

Efforts needed to meet the Europe 2020 target on poverty and social exclusion

As the most widespread form of poverty, monetary poverty is 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. 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 ([24]).

To make progress towards the Europe 2020 poverty goal it will be particularly important to focus on groups of society 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', 'An Agenda for new skills and jobs' and 'European Platform against poverty'. These include EU funded study programmes, learning projects and trainings aimed at facilitating the employment of young people ([25]), as well as reforms to improve the flexibility and security in the labour market ('flexicurity'), to improve the quality of jobs and to ensure better conditions for workers and for job creation ([26]). Measures directly addressing poverty and social exclusion include the monitoring of Member States' economic and structural reforms through the European Semester and a number of actions designed to help meet the poverty target at the European level ([27]).

In its stocktaking of the Europe 2020 strategy, the European Commission acknowledges that there is no sign of rapid improving in the situation and estimates 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 and has been 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.' ([28]).

Notes

([1]) European Commission, *Social trends and dynamics of poverty*, ESDE conference, Brussels, 2013.

([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, *An Agenda for new skills and jobs: A European contribution towards full employment*, COM(2010) 682 final, Strasbourg, 2010.

([4]) European Commission, *The European Platform against Poverty and Social Exclusion: A European framework for social and territorial cohesion*, COM(2010) 758 final, Brussels, 2010.

([5]) European Commission, *Social Europe — Current challenges and the way forward*. Annual Report of the Social Protection Committee (2012), Publications Office of the European Union, Luxembourg, 2013, (p. 12).

([6]) European Anti-Poverty Network, *Poverty and inequality in the EU*, EAPN Explainer, 2009, (p. 5ff).

([7]) European Commission (Directorate-General for Employment, Social Affairs and Inclusion), *Employment and Social Developments in Europe 2011*, Publications Office of the European Union, Luxembourg, 2012 (p. 144).

([8]) European Commission, *Social Europe — Current challenges and the way forward*. Annual Report of the Social Protection Committee (2012), Publications Office of the European Union, Luxembourg, 2013, (p. 8).

([9]) See http://ec.europa.eu/europe2020/pdf/targets_en.pdf.

([10]) The poverty target in Germany refers to long-term unemployment, and the one in Latvia refers to two of the three sub-indicators ('People at risk of poverty after social transfers' and 'Severely materially deprived people') only.

([11]) European Commission, *Social Europe — Current challenges and the way forward*. Annual Report of the Social Protection Committee (2012), Publications Office of the European Union, Luxembourg, 2013, (p. 18).

([12]) European Commission, *Europe 2020 — A Strategy for smart, sustainable and inclusive growth*, COM(2010) 2020 final, Brussels, 2010.

([13]) 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*, Brussels, 2010.

([14]) European Commission, *Social Europe — Current challenges and the way forward*. Annual Report of the Social Protection Committee (2012), Publications Office of the European Union, Luxembourg, 2013, (p. 17).

([15]) European Commission, *The social dimension of the Europe 2020 strategy*. A report of the social protection committee, Luxembourg, 2011, (p. 21).

([16]) European Commission, *The European Platform against Poverty and Social Exclusion: A European framework for social and territorial cohesion*, COM (2010) 758 final, Brussels, 2010, (p. 5).

([17]) 2008 data refers to EU-27 (instead of EU-28) due to data availability.

([18]) European Commission, *The social dimension of the Europe 2020 strategy*. A report of the social protection committee, Luxembourg, 2011, (p. 21).

([19]) European Commission, *Europe 2020 Targets: Poverty and social exclusion. Active inclusion strategies*, (p. 4) (accessed 23 July 2013).

([20]) Social protection expenditure includes in-kind transfers that are not reflected in the at-risk-of-poverty rates.

([21]) The GINI coefficient measures the extent to which the distribution of income within a country deviates from a perfectly equal distribution. A coefficient of 0 expresses perfect equality where everyone has the same income, while a coefficient of 100 expresses full inequality where only one person has all the income.

([22]) European Commission, *Social Europe — Current challenges and the way forward*. Annual Report of the Social Protection Committee (2012), Publications Office of the European Union, Luxembourg, 2013, (p. 27).

([23]) European Commission, *Social Europe — Current challenges and the way forward*. Annual Report of the Social Protection Committee (2012), Publications Office of the European Union, Luxembourg, 2013, (p. 28).

([24]) European Commission, *Improving the efficiency of social protection, Lisbon*, 2011, (p. 8).

([25]) For more information see: http://ec.europa.eu/youthonthemove/index_en.htm#theme_pos_3.

([26]) For more information see: http://ec.europa.eu/social/main.jsp?langId=en&catId=958.

([27]) For more information see: http://ec.europa.eu/social/main.jsp?catId=961&langId=en.

([28]) European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, COM (2014) 130 final, 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 for each Member State the state of play in relation to its national targets.

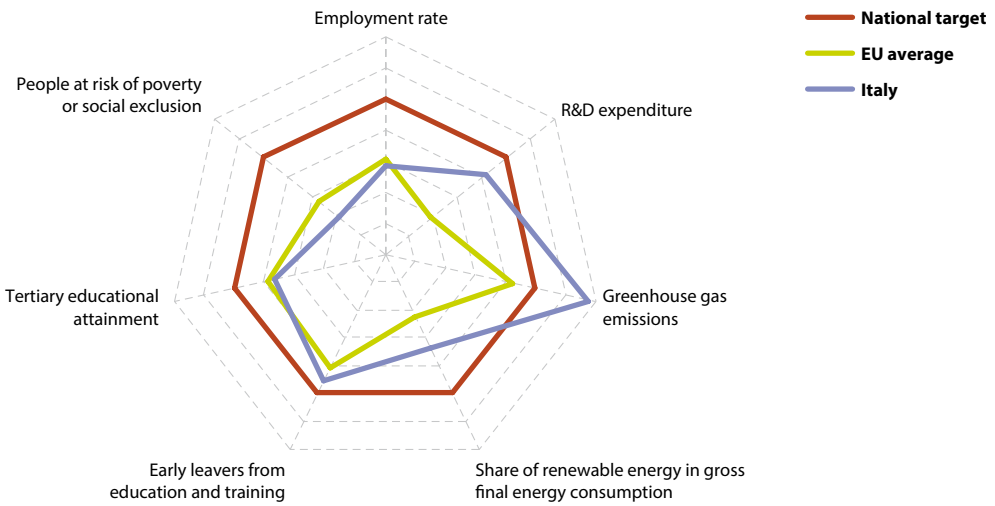
As already mentioned in the introduction, Member States have defined their national targets in their National Reform Programmes (NRPs), reflecting the current situation of each country. The NRPs outline the actions and measures planned in each country to progress towards the national targets. They are 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 to its national targets relative to the range of distances observed across all Member States and relative to the EU average.

The closer a country is to the centre of the 'spider web' for an indicator, the greater its distance to the respective national target. Thus the country has to make a greater effort than other countries to meet its national target. On the other hand, the closer a country is to the outer red line of the spider web, the closer it is to the respective national target. Figures outside the outer line mean the country has met this target, thus showing the degree of 'overachievement'.

The green line in the radar chart shows the average EU distance to the overall EU-level targets. The comparison of a country's performance with the green line reveals whether a country is performing better or worse than the EU as a whole.

National targets that are not harmonised with the overall EU targets are not presented in the diagram.





For example, this is the case for energy efficiency, where in line with the Energy Efficiency Directive Member States can set indicative national targets based on different indicators (primary or final energy consumption, or primary or final energy savings, or energy intensity).

Progress towards the national greenhouse gas (GHG) emissions targets is analysed based on emissions in sectors not covered by the EU Emissions Trading System (EU ETS) and in relation with the base year defined in the Effort Sharing Decision (ESD) ([1]). For further details on the EU ETS and the ESD see the chapter 'Climate change and energy' on p. 81.

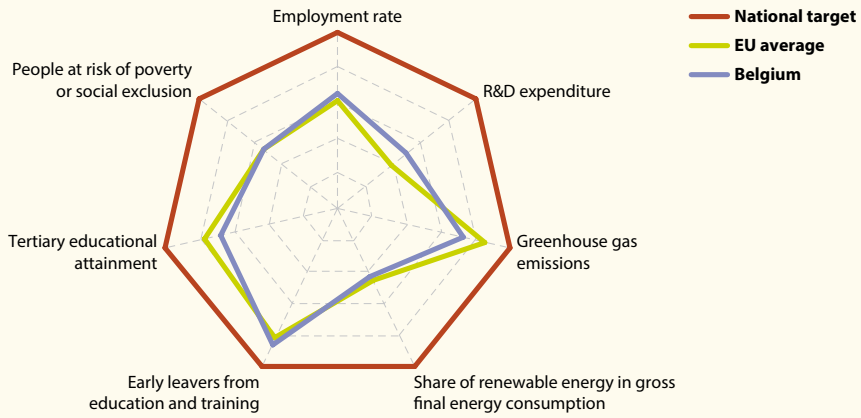
The national targets (as defined in the NRPs) and the latest available national data for the headline indicators are presented in a separate table. Data on Europe 2020 headline indicators, targets and related issues are disseminated by Eurostat on a dedicated section of its website.

([1]) 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

Belgium's employment rate has remained stagnant at about 67 % since the economic crisis began in 2008. Although still at some distance from its national targets, Belgium performed slightly better than the EU average in terms of reducing the rate of early leavers from education and training and increasing R&D intensity. A drop of 1.2 percentage points in the share of the population aged 30 to 34 with tertiary education from 2012 to 2013 has moved Belgium further from its national target. Over the same period the number of people at risk of poverty or social exclusion fell by 3 %, following a steady rise since 2009. Despite the rapid uptake of renewable energy, from 2.3 % of gross final energy consumption in 2005 to 6.8 % in 2012, Belgium still lagged considerably behind its target. The downward trend in GHG emissions in non-ETS sectors in the period 2010 to 2012 brought Belgium closer to its target, although it remained at a greater distance than the EU average.

Figure 6.1: Distance to national targets and comparison with EU average (*)



(*) 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	2013	73.2
Gross domestic expenditure on R&D (% of GDP)	2.28 (1)	2013	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 (%)	6.8	2012	13
Primary energy consumption (million tonnes of oil equivalent)	48.7	2012	:
Early leavers from education and training (% of population aged 18–24)	11.0	2013	9.5
Tertiary educational attainment (% of population aged 30–34)	42.7	2013	47
People at risk of poverty or social exclusion (thousands)	2 286	2013	1 814

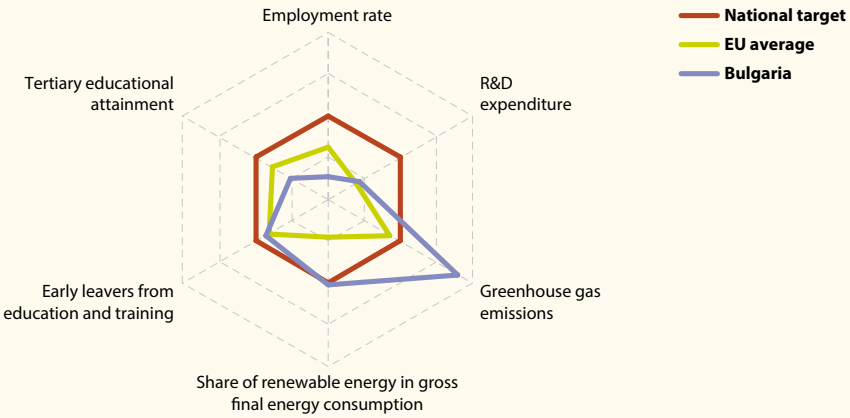
(1) Provisional data.

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

Bulgaria

Despite a surge in GHG emissions by 8.4 % until 2012, Bulgaria remained well below its national target to limit the rise in non-ETS sector GHG emissions to 20 % by 2020. In 2012, the country also had already reached its 16 % target on renewable energies, and in 2013 it was not far from reaching its target on early leavers from education and training. In contrast, the distance in 2013 to the national targets on tertiary education and employment was significantly larger than for the EU average. Despite the slight increase in R&D expenditure in 2013, Bulgaria would need to double its efforts in the coming years to reach its goal of 1.5 % of GDP. Progress towards the country's poverty target has been tentative since the start of the crisis; in 2013, the number of people at risk of poverty after social transfers was 6.4 % below its 2008 level.

Figure 6.2: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	63.5	2013	76
Gross domestic expenditure on R&D (% of GDP)	0.65 (1)	2013	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 (%)	16.3	2012	16
Primary energy consumption (million tonnes of oil equivalent)	17.8	2012	:
Early leavers from education and training (% of population aged 18–24)	12.5	2013	11
Tertiary educational attainment (% of population aged 30–34)	29.4	2013	36
People at risk of poverty after social transfers (thousands)	1 528	2013	1 372 (2)

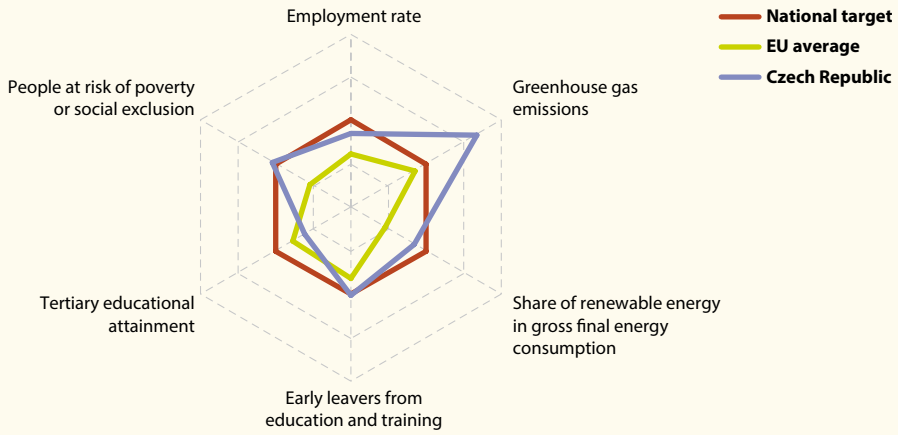
(1) Provisional data. (2) National target differs from the overall EU target on 'risk of poverty or social exclusion' as it refers to the sub-indicator 'People at risk of poverty after social transfers' only.

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

Czech Republic

The Czech Republic had reduced its GHG emissions by 0.9 % until 2012, thus remaining within the national GHG emissions target to limit increases to 9 % by 2020. In 2013, the country also exceeded its poverty target, by lifting some 28 000 more people out of risk of poverty or social exclusion than the envisaged national target, and was close to achieving its target on early leavers from education and training. The gradual rise in employment figures in the period 2011 to 2013 also brought the Czech Republic close to its 75 % employment target. With a share of 11.2 % in 2012, the country was moreover closer than the EU average to meeting its target on renewable energies. Despite the increase in the share of 30 to 34 year olds with tertiary education by 11.3 percentage points between 2008 and 2013, the gap to the national target remained larger than the EU average.

Figure 6.3: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	72.5	2013	75
Gross domestic expenditure on R&D (% of GDP)	1.91 (1)	2013	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 (%)	11.2	2012	13
Primary energy consumption (million tonnes of oil equivalent)	40.1	2012	:
Early leavers from education and training (% of population aged 18–24)	5.4	2013	5.5
Tertiary educational attainment (% of population aged 30–34)	26.7	2013	32
People at risk of poverty or social exclusion (thousands)	1 508	2013	1 536 (3)

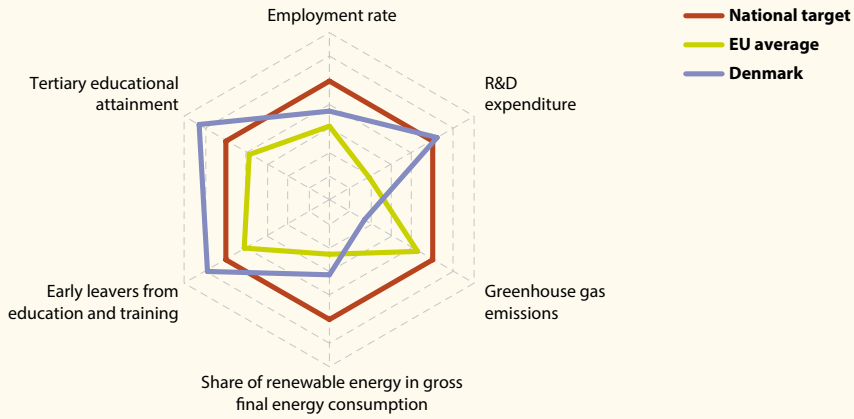
(1) Provisional data. (2) National target refers to public sector expenditure only. (3) National target: 'Maintaining the number of persons at risk of poverty or social exclusion at the level of 2008 (15.3 % of total population) with efforts to reduce it by 30 000'.

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

Denmark

In 2013, Denmark exceeded its national targets on early school leavers and tertiary educational attainment, by 2 and 3.4 percentage points respectively. Denmark was the only EU country to exceed its national R&D expenditure target of 3 % of GDP. In 2013, the employment rate in Denmark increased for the first time since the start of the economic crisis, but the distance to the national target was reduced only marginally. In 2012, the country was closer than the EU average to meeting its renewable energies objective but lagged behind in terms of reducing its levels of GHG emissions in non-ETS sectors. 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 — increased by 12.5 % from 2012 to 2013, further enlarging the gap to the national target.

Figure 6.4: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	75.6	2013	80
Gross domestic expenditure on R&D (% of GDP)	3.05 (1)	2013	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 (%)	26.0	2012	30
Primary energy consumption (million tonnes of oil equivalent)	17.9	2012	:
Early leavers from education and training (% of population aged 18–24)	8.0	2013	10 (2)
Tertiary educational attainment (% of population aged 30–34)	43.4	2013	40
People living in households with very low work intensity (thousands)	522	2013	325 (3)

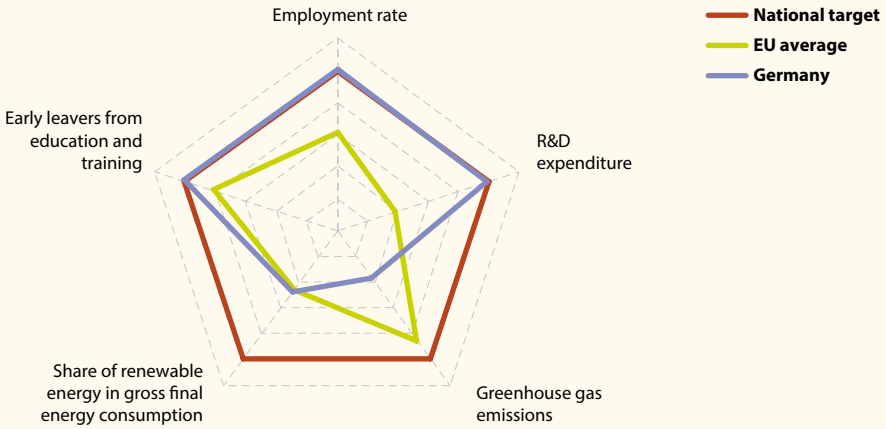
(1) Estimated/provisional data. (2) National target: less than 10 %. (3) National target differs from the overall EU target on 'risk of poverty or social exclusion' as it refers to the sub-indicator 'people living in households with very low work intensity' only.

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

Germany

Long-term unemployment, which is used in Germany as a national target for poverty and social exclusion, was reduced by about 617 000 people in the period 2008 to 2013. This means it significantly exceeded its target to reduce long-term unemployment by 320 000 people by 2020. Moreover, the country met its employment target seven years early. In 2013, Germany surpassed its national target on tertiary educational attainment, with 44.5 % of 30 to 34 year olds having completed tertiary-level education or equivalent (ISCED levels 4, 5 or 6). In addition, Germany is close to its targets on R&D expenditure and early leavers from education and training. In contrast, the gap to its target on GHG emissions in non-ETS sectors has increased from 2011 to 2012 and is significantly larger than the EU average.

Figure 6.5: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	77.1	2013	77
Gross domestic expenditure on R&D (% of GDP)	2.94 (1)	2013	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 (%)	12.4	2012	18
Primary energy consumption (million tonnes of oil equivalent)	297.6	2012	:
Early leavers from education and training (% of population aged 18–24)	9.9	2013	10 (2)
Tertiary educational attainment (% of population aged 30–34)	44.5 (3)	2013	42 (3)
Long-term unemployment (thousands)	1 008.9	2013	1 306 (4)

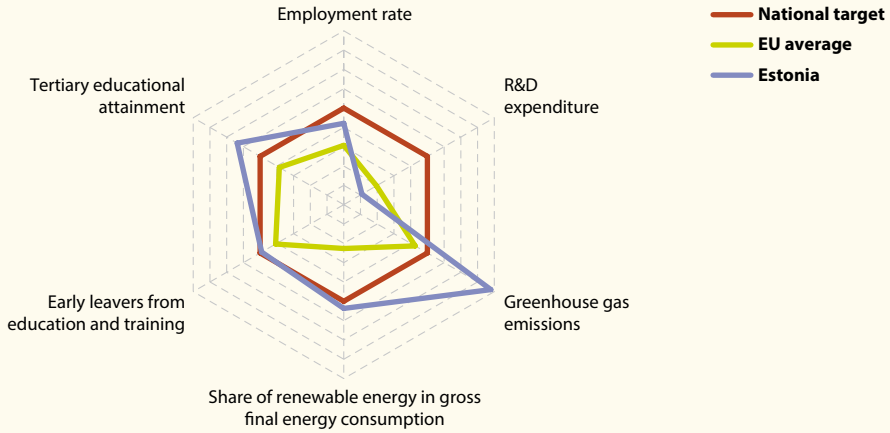
(1) Estimated/provisional data. (2) National target: less than 10 %. (3) Indicator and target refer to ISCED levels 4, 5 and 6. (4) National target differs from the overall EU target on 'risk of poverty or social exclusion' as it refers to long-term unemployed people.

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 % and increased its share of renewables in gross final energy consumption to 25.8 %, thus exceeding two of its climate change and energy targets. In 2013, Estonia also exceeded its target on tertiary education by 3.7 percentage points, and was close to reaching its national target on early leavers from education and training. It was also closer to its national employment target than the EU average, but lagged behind in terms of R&D expenditure. 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: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	73.3	2013	76
Gross domestic expenditure on R&D (% of GDP)	1.74 (1)	2013	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 (%)	25.8	2012	25
Primary energy consumption (million tonnes of oil equivalent)	6.0	2012	:
Early leavers from education and training (% of population aged 18–24)	9.7	2013	9.5
Tertiary educational attainment (% of population aged 30–34)	43.7	2013	40
People at risk of poverty after social transfers (% of population)	18.6	2013	15 (2)

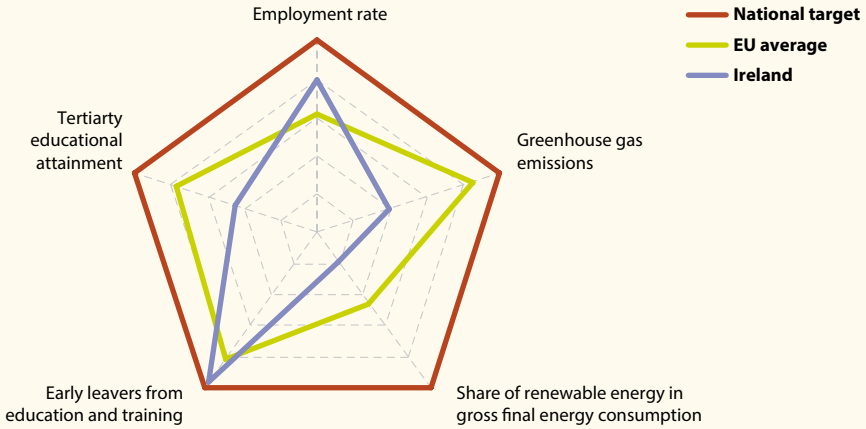
(1) Provisional data. (2) National target differs from the overall EU target on 'Risk of poverty or social exclusion' as it refers to the sub-indicator 'people at risk of poverty after social transfers' only.

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

Ireland

By 2012 Ireland's R&D expenditure had increased to 1.72 % of GDP, moving the country closer to its national target of about 2 % (2.5 % of GNP). From 2012 to 2013 the country's employment rate increased for the first time since 2008, moving the country closer towards the national target than the EU average. Ireland also achieved notable progress in reducing the number of early leavers from education and training, decreasing the gap to its national target to 0.4 percentage points by 2013. The share of 30 to 34 year olds with tertiary educational attainment increased steadily between 2008 and 2013; however, Ireland remained at a distance from its 60 % target. Ireland also lagged behind the EU average in the areas of GHG emissions in non-ETS sectors and renewable energy, with both indicators being 8.8 percentage points below the respective national targets in 2012.

Figure 6.7: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	65.5	2013	69 (1)
Gross domestic expenditure on R&D (% of GDP)	1.58 (2)	2012	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 (%)	7.2	2012	16
Primary energy consumption (million tonnes of oil equivalent)	13.6	2012	:
Early leavers from education and training (% of population aged 18–24)	8.4	2013	8
Tertiary educational attainment (% of population aged 30–34)	52.6	2013	60
People at risk of poverty or social exclusion (thousands)	1 378	2013	: (4)

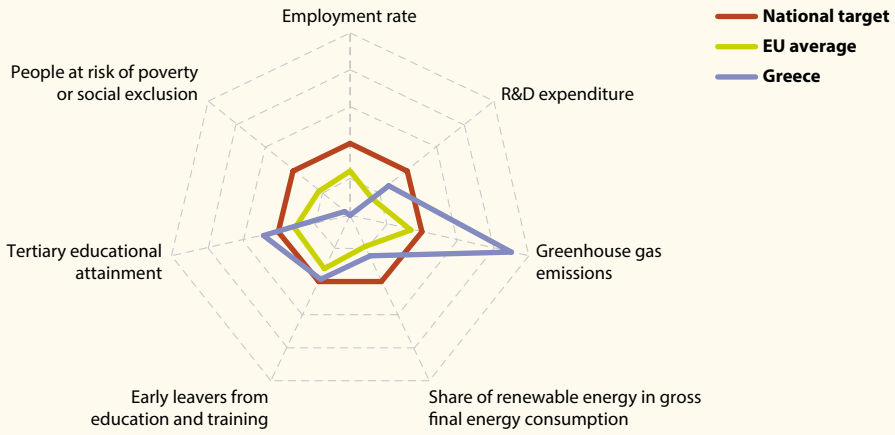
(1) National target: 69–71 %. (2) Estimated data. (3) National target: about 2 % (2.5 % of GNP). (4) National target: To reduce consistent poverty to 4 % by 2016 (interim target) and to 2 % or less by 2020, from the 2010 baseline rate of 6.3 %. Reduce by a minimum of 200 000 the population in combined 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, Greece reduced its GHG emissions in non-ETS sectors by 22.4 % until 2012, significantly exceeding its national target of achieving a 4 % reduction by 2020. In 2013, the country also surpassed its target on tertiary education by 2.9 percentage points and was very close to reaching its target on early leavers from education and training. By 2012, Greece had increased its share of renewable energy in gross final energy consumption to 13.8 %, thus narrowing the gap to its 18 % target. In contrast, the rapid fall in employment since 2010 has resulted in Greece having both the lowest employment rate and the largest distance to its employment target in the EU in 2013. The data also reveal a steady rise in the number of people living at risk of poverty or social exclusion since 2010.

Figure 6.8: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	52.9	2013	70
Gross domestic expenditure on R&D (% of GDP)	0.78 (1)	2013	1.21
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 (%)	13.8	2012	18
Primary energy consumption (million tonnes of oil equivalent)	25.9	2012	:
Early leavers from education and training (% of population aged 18–24)	10.1	2013	9.7
Tertiary educational attainment (% of population aged 30–34)	34.9	2013	32
People at risk of poverty or social exclusion (thousands)	3 904	2013	2 596

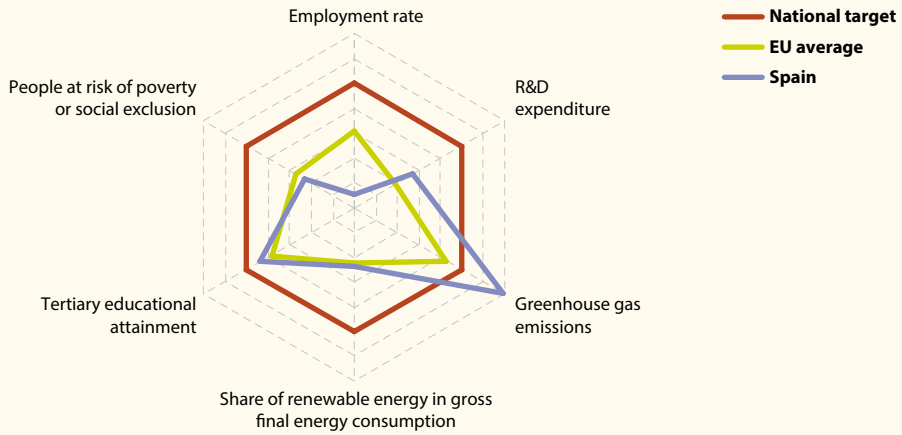
(1) Provisional data.

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 had also narrowed the gap to its tertiary education target to 1.7 percentage points by 2013. Spain was moreover slightly closer to its national targets in the areas of R&D expenditure and renewable energies than the EU average. The country's employment rate has deteriorated sharply since the onset of the economic crisis, falling by almost 10 percentage points between 2008 and 2013. The number of people at risk of poverty or social exclusion also developed unfavourably; most recently (from 2012 to 2013), however, the indicator improved for the first time since the onset of the crisis. Despite the sustained reduction in the rate of early leavers from education and training since 2008, the country remained far from reaching its 15 % target by 2020.

Figure 6.9: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	58.6	2013	74
Gross domestic expenditure on R&D (% of GDP)	1.24 (1)	2013	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 (%)	14.3	2012	20
Primary energy consumption (million tonnes of oil equivalent)	121.3	2012	:
Early leavers from education and training (% of population aged 18–24)	23.6	2013	15 (2)
Tertiary educational attainment (% of population aged 30–34)	42.3	2013	44
People at risk of poverty or social exclusion (thousands)	12 630	2013	9 724 (3)

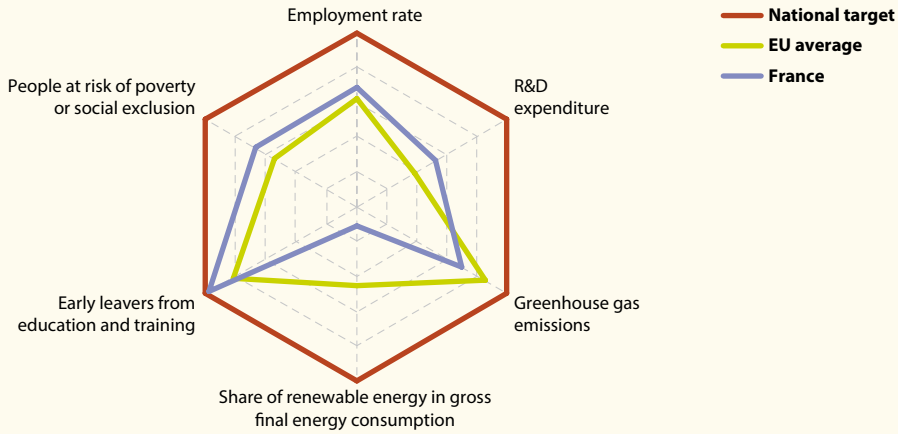
(1) Provisional data. (2) National target refers to school drop-out rate. (3) National target: reduce the number of people at risk of poverty or social exclusion by 1 400 000 to 1 500 000 people (compared with 2008).

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

France

By 2013, France was close to meeting its Europe 2020 commitment regarding early leavers from education and training. The country was also closer to its employment and R&D targets than the EU average. Furthermore, the situation concerning poverty has improved since 2011, moving the country closer to its goal of reducing the number of people at risk of poverty or social exclusion by one sixth by 2020. Progress has also been made in tertiary educational attainment; but the EU-level indicator cannot be directly compared with the French target of 50 %, which refers to the population aged 17 to 33. In terms of renewable energies, in 2012 the country was about 10 percentage points below its target for 2020 and further away than the EU average. GHG emissions in non-ETS sectors have followed a downward trend since 2008; but by 2012 the country still was farther from its Europe 2020 goal than the EU average.

Figure 6.10: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	69.6	2013	75
Gross domestic expenditure on R&D (% of GDP)	2.23 (1)	2013	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 (%)	13.4	2012	23
Primary energy consumption (million tonnes of oil equivalent)	246.4	2012	:
Early leavers from education and training (% of population aged 18–24)	9.7	2013	9.5
Tertiary educational attainment (% of population aged 30–34)	44.1	2013	50 (2)
People at risk of poverty or social exclusion (thousands)	11 229	2013	9 482 (3)

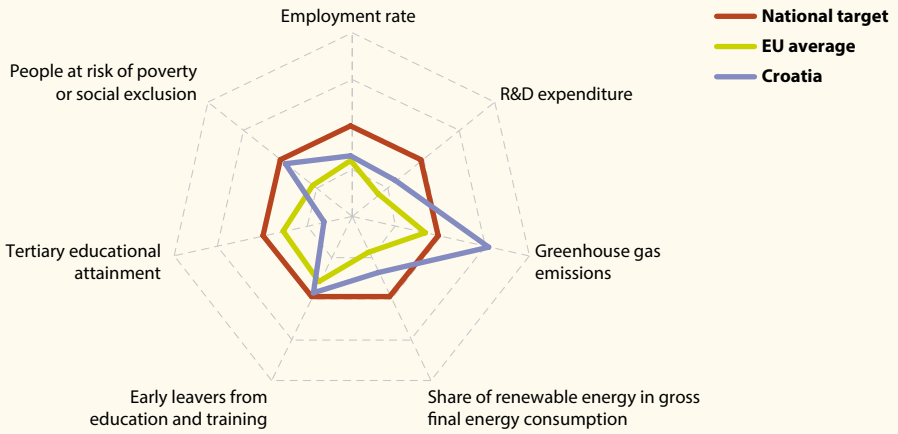
(1) Provisional data. (2) National target differs from the overall EU target on 'tertiary educational attainment' as it refers to 17–33 year olds. (3) National target: reduce by 1/6th the population living in poverty or social exclusion by 2020 (1 900 000 fewer people living in poverty or social exclusion, compared with 2007).

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

Croatia

By 2010 Croatia remained well below its target on GHG emissions in non-ETS sectors, allowing emissions to increase by at most 11 % by 2020. In 2013, the country had the second lowest rate of early leavers from education and training across the EU and was thus close to reaching its national target of 4 %. Croatia was furthermore closer to its national targets for R&D expenditure, renewable energies and poverty alleviation than the EU average. The employment rate has gradually declined in Croatia since the onset of the economic crisis, widening the gap to the national target of 62.9 % to 5.7 percentage points. With a gap of almost 10 percentage points, Croatia also lagged behind the EU average in terms of meeting its tertiary educational attainment target.

Figure 6.11: Distance to national targets and comparison with EU average (*)



(*) 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

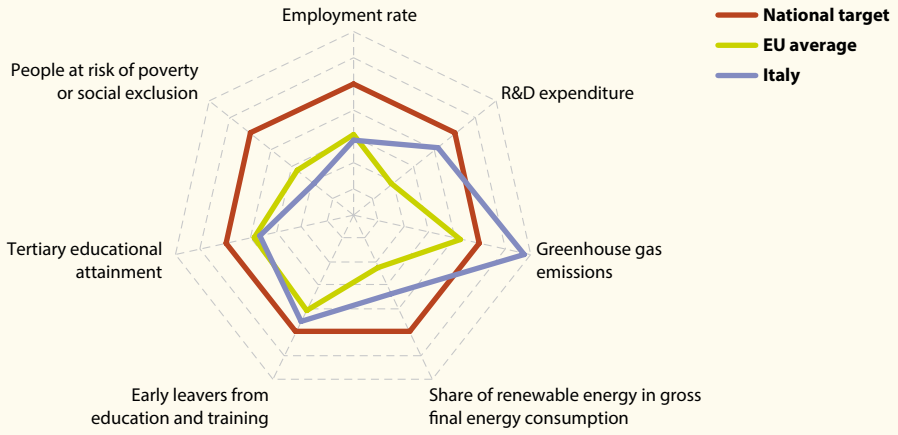
	Data	Year	Target
Employment rate age group 20–64 (%)	57.2	2013	62.9
Gross domestic expenditure on R&D (% of GDP)	0.81	2013	1.4
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	2.6	2010	11
Share of renewable energy in gross final energy consumption (%)	16.8	2012	20
Primary energy consumption (million tonnes of oil equivalent)	7.6	2012	:
Early leavers from education and training (% of population aged 18–24)	4.5	2013	4
Tertiary educational attainment (% of population aged 30–34)	25.6	2013	35
People at risk of poverty or social exclusion (thousands)	1 271	2013	1 234

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

Italy

By 2012 Italy had achieved a notable 18.1 % reduction in GHG emissions in non-ETS sectors, thus already exceeding its national target by five percentage points. The country also was closer to its national targets than the EU average in the areas of renewable energy, R&D expenditure and early leavers from education and training. Italy has also experienced an almost continuous increase in the share of 30 to 34 year olds with tertiary educational attainment since 2008, but remained at a slightly larger distance to its respective national targets than the EU average. In contrast, employment rates have not recovered since the start of the economic recession. In 2013, the country was 7.2 percentage points below its national target of increasing the employment rate to 67–69 %. Due to the significant increase in the number of people at risk of poverty or social exclusion since 2008, Italy also showed a substantial gap to its national poverty reduction target.

Figure 6.12: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	59.8	2013	67 (1)
Gross domestic expenditure on R&D (% of GDP)	1.25 (2)	2013	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 (%)	13.5	2012	17
Primary energy consumption (million tonnes of oil equivalent)	155.2	2012	:
Early leavers from education and training (% of population aged 18–24)	17.0	2012	16
Tertiary educational attainment (% of population aged 30–34)	22.4	2013	26 (3)
People at risk of poverty or social exclusion (thousands)	17 326	2013	12 899

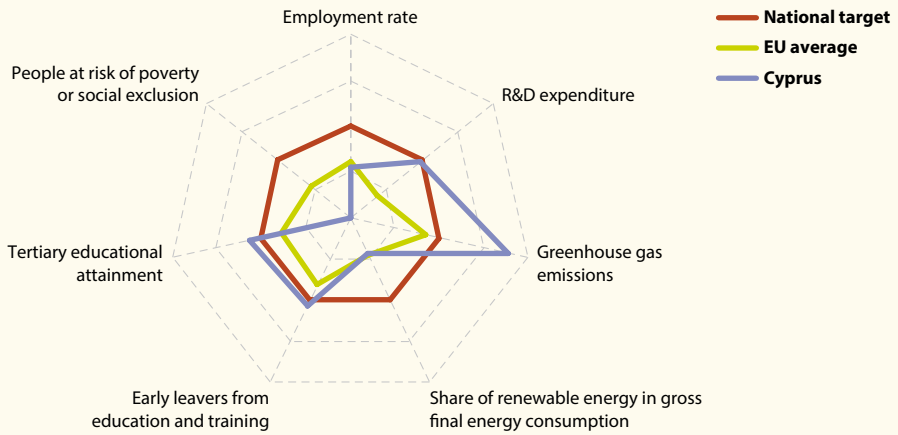
(1) National target: 67–69 %. (2) Provisional data. (3) National target: 26–27 %.

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

Cyprus

In 2013, Cyprus continued to exceed its national target on tertiary educational attainment, despite a fall of two percentage points compared with the year before. By 2012 the country had also recorded a reduction in GHG emission three times larger than the one envisaged in its Europe 2020 commitment. Cyprus also met its target on early leavers from education and training in 2013 and came close to its target on R&D expenditure. Despite the two-fold increase in the share of renewable energy over the period 2006 to 2012, Cyprus remained at some distance from its national target. Developments in social inclusion and employment have been much less favourable. The number of people at risk of poverty or social exclusion has increased substantially since 2008, and in 2013 Cyprus showed the largest gap towards its national target across the EU. Similarly, employment rates have dropped since the onset of the crisis in 2008, placing Cyprus well below its national target.

Figure 6.13: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	67.2	2013	75 (1)
Gross domestic expenditure on R&D (% of GDP)	0.48 (2)	2013	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 (%)	6.8	2012	13
Primary energy consumption (million tonnes of oil equivalent)	2.5	2012	:
Early leavers from education and training (% of population aged 18–24)	9.1	2013	10
Tertiary educational attainment (% of population aged 30–34)	47.8	2013	46
People at risk of poverty or social exclusion (thousands)	240	2013	154

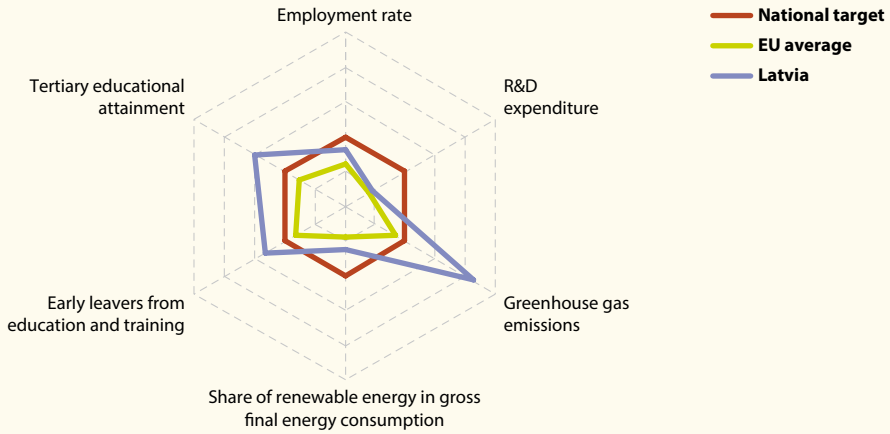
(1) National target: 75–77 %. (2) Provisional data.

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

Latvia

Latvia already exceeded its national targets on early leavers from education and training and tertiary education in 2010 and 2011 respectively. It has continued to show improvement in these areas since. Similarly, the country's GHG emissions in non-ETS sectors had not increased notably up to 2012, thus staying within the limits of the national target to increase emissions by no more than 17 % by 2020. In 2013, Latvia was close to meeting 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 stabilised after deteriorating between 2008 and 2010; in 2013, the gap towards the national employment target was twice as small as the EU average. Latvia also performed better on renewable energy and R&D expenditure than the EU average.

Figure 6.14: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	69.7	2013	73
Gross domestic expenditure on R&D (% of GDP)	0.60 (1)	2013	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 (%)	35.8	2012	40
Primary energy consumption (million tonnes of oil equivalent)	4.4	2011	:
Early leavers from education and training (% of population aged 18–24)	9.8	2013	13.4
Tertiary educational attainment (% of population aged 30–34)	40.7	2013	34 (2)
People at risk of poverty or social exclusion (thousands)	434 (3)	2013	454 (3)

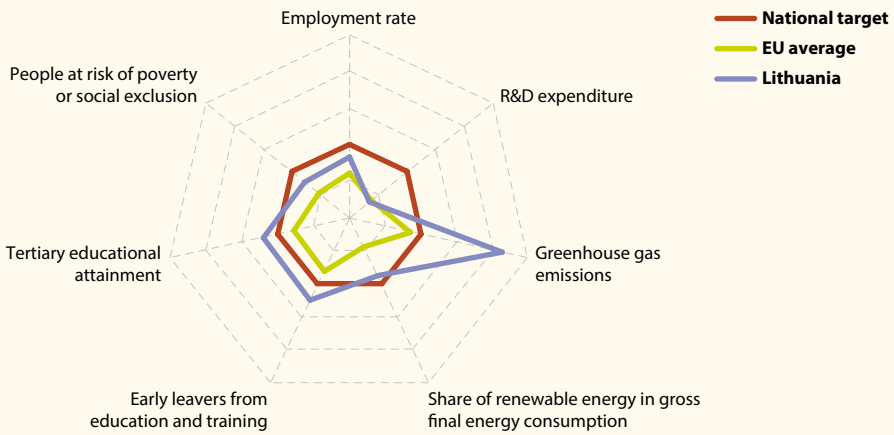
(1) Provisional data. (2) National target: 34–36 %. (3) Indicator and national target differ from the overall EU target on 'risk of poverty or social exclusion' as they refer to the two sub-indicators 'People living at risk of poverty after social transfers' and 'people living in households with very low work intensity' only.

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

Lithuania

Lithuania exceeded both of its national education targets in 2013. It also ranked among the best performing countries across the EU in terms of early leavers from education and training and tertiary educational attainment of 30 to 34 year olds. Additionally, by reducing its GHG emissions by 1.8 % by 2012, Lithuania has remained well below its target to limit emission increases to 15 %. A 4.7 percentage point increase in the share of renewable energies from 2005 to 2012 has moved the country close to its national target of 23 %. After a significant drop between 2008 and 2009, the country's employment rate increased again by 5.6 percentage points between 2010 and 2013, moving it closer to the national target than the EU average. Poverty rates have fallen since 2010, but Lithuania would need to lift another 100 000 people out of poverty to meet its national 2020 commitment. In terms of R&D expenditure, a one percentage point gap needs to be closed for the target of 1.9 % of GDP to be reached.

Figure 6.15: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	69.9	2013	72.8
Gross domestic expenditure on R&D (% of GDP)	0.95 (1)	2013	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 (%)	21.7	2012	23
Primary energy consumption (million tonnes of oil equivalent)	5.9	2012	:
Early leavers from education and training (% of population aged 18–24)	6.3	2013	9 (2)
Tertiary educational attainment (% of population aged 30–34)	51.3	2013	48.7
People at risk of poverty or social exclusion (thousands)	917	2013	814

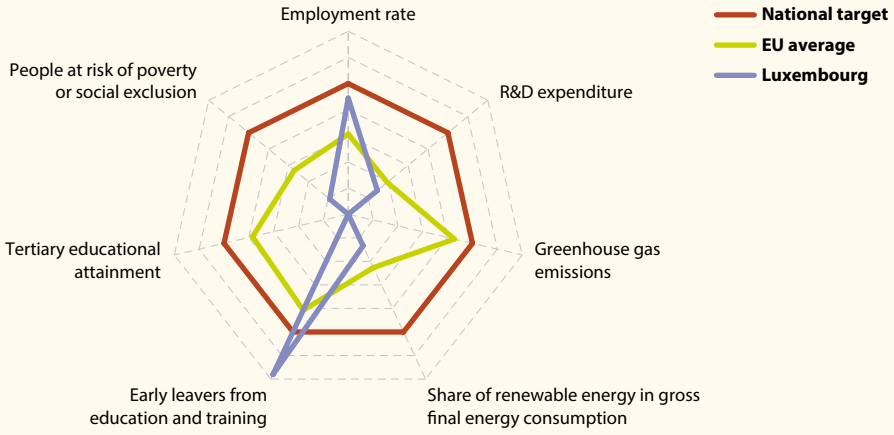
(1) Provisional data. (2) National target: less than 9 %.

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 an almost continuous rise between 2009 and 2013 to 52.5 %, putting Luxembourg in second place across the EU, the country was still the farthest from its national target. In contrast, it has been exceeding its target on early leavers from education and training since 2009, and in 2013 was closer to its employment target than the EU average. In 2013, the country was below the EU average 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 rose by one-third between 2008 and 2013, pushing Luxembourg farther from its poverty alleviation target. In relation to its climate change and energy targets, it has remained far behind the EU average in the uptake of renewable energies. In 2012 it also faced the largest gap to its GHG emissions target across the EU.

Figure 6.16: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	71.1	2013	73
Gross domestic expenditure on R&D (% of GDP)	1.16 (1)	2013	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 (%)	3.1	2012	11
Primary energy consumption (million tonnes of oil equivalent)	4.4	2012	:
Early leavers from education and training (% of population aged 18–24)	6.1	2013	10 (3)
Tertiary educational attainment (% of population aged 30–34)	52.5	2013	66
People at risk of poverty or social exclusion (thousands)	96	2012	66

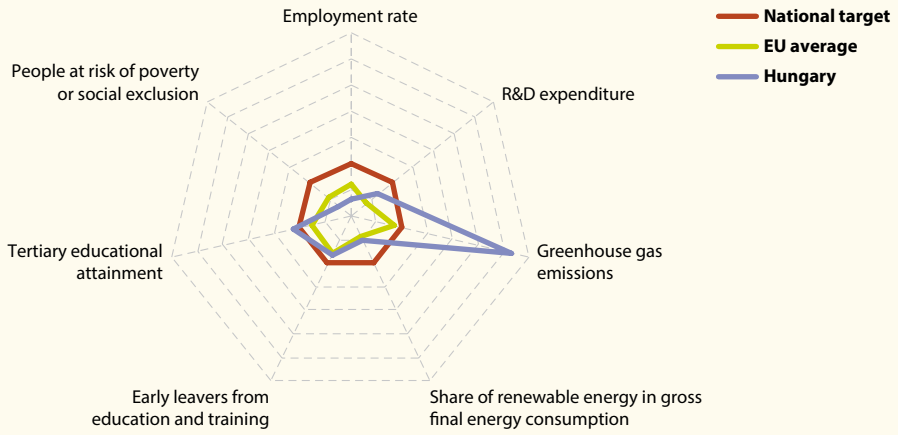
(1) Provisional data. (2) National target: 2.3–2.6 %. (3) National target: less than 10 %.

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

Hungary

By reducing its GHG emissions in non-ETS sectors by 21.4 % until 2012, Hungary remained well below its emissions target to limit emission rises to 10 % by 2020. Progress towards the country's education targets has been ambiguous since 2008. While the country met its national target on tertiary education in 2013, it did not reduce 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 2013 and thus closer than the EU average. The share of renewables in gross final energy consumption has more than doubled since 2005, putting the country slightly closer to its national target than the EU average. Poverty levels, however, have deteriorated in Hungary since the economic crisis began, resulting in a large gap of almost one million people that need to be lifted out of the risk of poverty or social exclusion. Despite the favourable increase in the employment rate from 2010 to 2013, the country had one of the largest gaps to its 75 % target.

Figure 6.17: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	63.2	2013	75
Gross domestic expenditure on R&D (% of GDP)	1.41	2013	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 (%)	9.6	2012	14.65 (1)
Primary energy consumption (million tonnes of oil equivalent)	21.5	2012	:
Early leavers from education and training (% of population aged 18–24)	11.8	2013	10
Tertiary educational attainment (% of population aged 30–34)	31.9	2013	30.3
People at risk of poverty or social exclusion (thousands)	3 285	2013	2 344

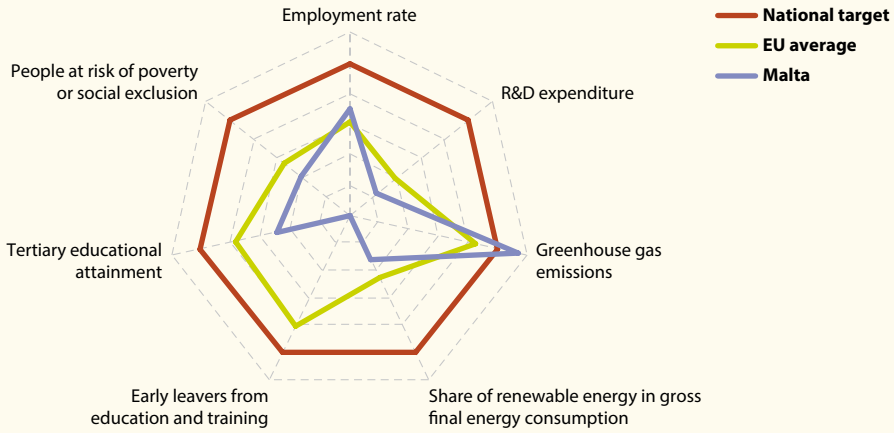
(1) For Hungary, the target differs from the one set in the Directive 2009/28/EC of the European Parliament and of the Council on the promotion of the use of energy from renewable sources.

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

Malta

By 2012 Malta had increased its GHG emissions in non-ETS sectors by 3 %, thus remaining with its Europe 2020 target of increasing emissions by no more than 5 %. Despite the adverse economic situation, Malta has experienced a more or less steady increase in its employment rate since 2008, putting the country closer to its national target than the EU average. However, Malta lagged behind the EU average for renewable energies and R&D expenditure, and the distance to the national target on poverty and social exclusion has been increasing since 2008. Additionally, in 2013 the country was seven percentage points below its target on tertiary education, with only 26 % of the population aged 30 to 34 having completed tertiary education. Despite a significant drop in the share of early leavers from education and training since 2008, in 2013 Malta was farther from its national 2020 target than the rest of the EU was from theirs.

Figure 6.18: Distance to national targets and comparison with EU average (*)



(*) Most recent year for which data are available; see table below.

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 (%)	64.8	2013	70
Gross domestic expenditure on R&D (% of GDP)	0.85 (1)	2013	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 (%)	2.7	2012	10
Primary energy consumption (million tonnes of oil equivalent)	0.9	2012	:
Early leavers from education and training (% of population aged 18–24)	20.8	2013	10
Tertiary educational attainment (% of population aged 30–34)	26	2013	33
People at risk of poverty or social exclusion (thousands)	99	2013	74.44

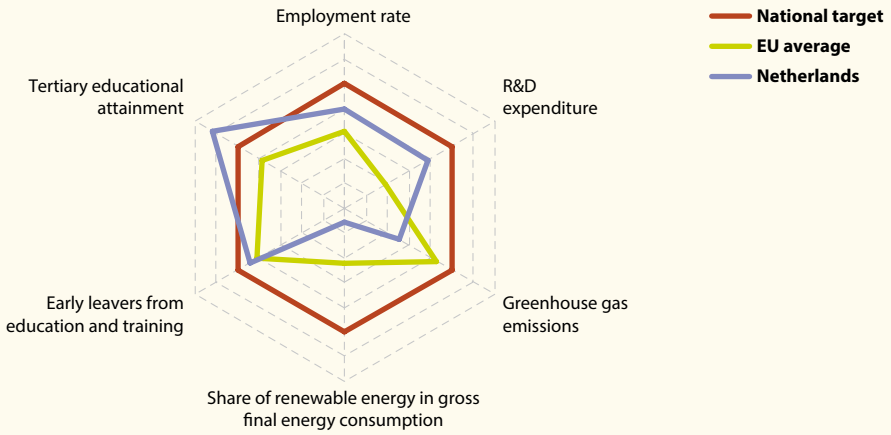
(1) Provisional data.

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

Netherlands

The Netherlands had already exceeded its tertiary educational attainment target in 2008 and the share of 30 to 34 year olds with tertiary educational attainment has continued to increase since then. Despite the adverse impact of the economic crisis on employment, the country was closer to its target of increasing its employment rate to 80 % than the EU average. Although remaining at some distance from the respective targets, the indicators on early school leavers and R&D expenditure have improved over the past few years. In contrast, the country was farther from its climate change and energy targets in 2012. It was among the countries farthest 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: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	76.5	2013	80
Gross domestic expenditure on R&D (% of GDP)	1.98 (1)	2013	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 (%)	4.5	2012	14
Primary energy consumption (million tonnes of oil equivalent)	67.4	2012	:
Early leavers from education and training (% of population aged 18–24)	9.2	2013	8 (2)
Tertiary educational attainment (% of population aged 30–34)	43.1	2013	40 (3)
People at risk of poverty or social exclusion (thousands)	2 650	2013	: (4)

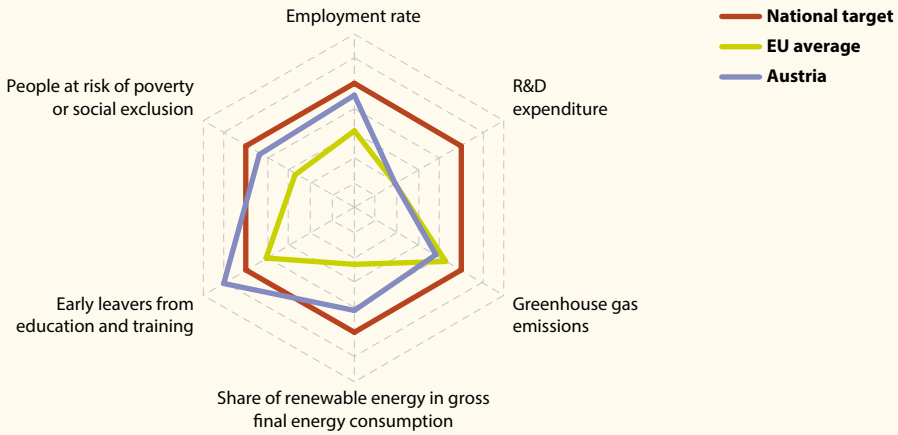
(1) Provisional data. (2) National target: less than 8 %. (3) National target: at least 40 %. (4) National target: Reduce by 100 000 the number of people (aged 0–64 years) living in a jobless household (compared with 2008).

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

Austria

In 2013, Austria continued to meet both of its education targets, with a proportion of early school leavers of 7.3 % and 39.6 % of the 30 to 34 year olds having completed tertiary or equivalent education (referring to ISCED levels 4a, 5 and 6). With an employment rate of 75.5 %, the country was within reaching distance of its respective target of 77–78 %. Austria also performed better than the EU average in terms of reducing the number of people at risk of poverty or social exclusion and increasing the share of renewable energies in gross final energy consumption. Despite having one of the highest R&D intensities (R&D expenditure as a share of GDP) across the EU, Austria was a similar distance from its national target as the EU average. Similarly, in spite of a 12.5 % reduction in GHG emissions in non-ETS by 2012, the country remained at a slightly larger distance to its target than the EU average.

Figure 6.20: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	75.5	2013	77 (1)
Gross domestic expenditure on R&D (% of GDP)	2.81 (2)	2013	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 (%)	32.1	2012	34
Primary energy consumption (million tonnes of oil equivalent)	31.8	2012	:
Early leavers from education and training (% of population aged 18–24)	7.3	2013	9.5
Tertiary educational attainment (% of population aged 30–34)	39.6 (3)	2013	38 (3)
People at risk of poverty or social exclusion (thousands)	1 572	2013	1 464

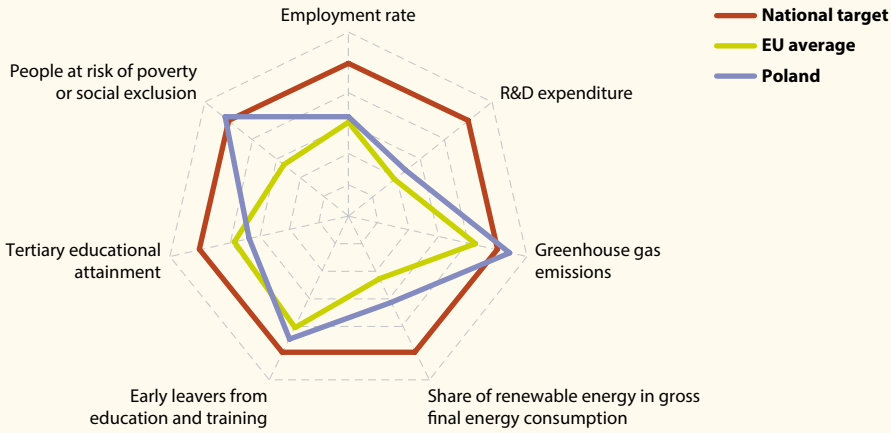
(1) National target: 77–78 %. (2) Estimated/provisional data. (3) Indicator and target refer to ISCED levels 4a, 5 and 6.

Source: Eurostat (see dedicated web section: Europe 2020 headline indicators), Statistics Austria

Poland

Despite a 12.9 % increase in GHG emissions in non-ETS sectors until 2012, 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 2013 achieved its target. The country performed slightly better than the EU average in terms of boosting employment, R&D expenditure and renewable energies and reducing the number of early school leavers. In contrast, it was farther from its tertiary education target than the EU average. In 2013 Poland was 4.5 percentage points below its 2020 target to ensure 45 % of the population aged 30 to 34 has attained tertiary education.

Figure 6.21: Distance to national targets and comparison with EU average (*)



(*) 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

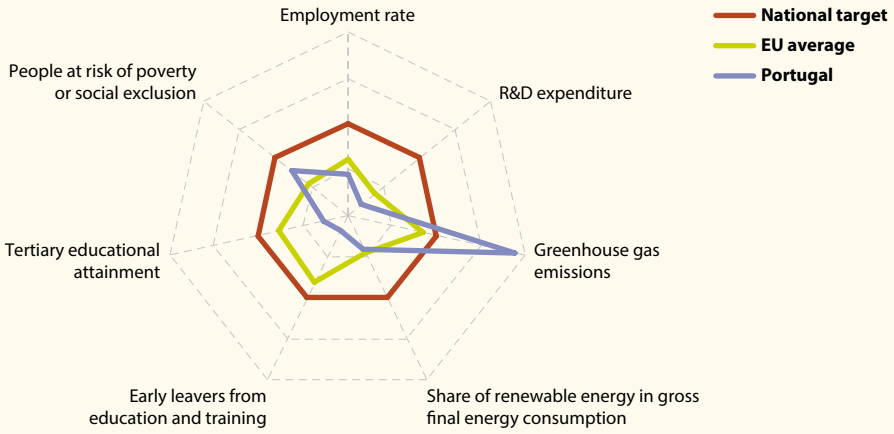
	Data	Year	Target
Employment rate age group 20–64 (%)	64.9	2013	71
Gross domestic expenditure on R&D (% of GDP)	0.87	2013	1.7
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	12.9	2012	14
Share of renewable energy in gross final energy consumption (%)	11.0	2012	15
Primary energy consumption (million tonnes of oil equivalent)	93.3	2012	:
Early leavers from education and training (% of population aged 18–24)	5.6	2013	4.5
Tertiary educational attainment (% of population aged 30–34)	40.5	2013	45
People at risk of poverty or social exclusion (thousands)	9 748	2013	9 991

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

Portugal

By 2012 Portugal had managed to reduce its GHG emissions in non-ETS sectors by 12 %, thus remaining well below its target of an at most 1 % increase by 2020. Despite a 4.4 % increase in the number of people at risk of poverty or social exclusion from 2008 to 2013, the country also remained closer to its national target than the EU average. Portugal, however, was farther from its remaining national Europe 2020 targets than the EU average. Growth in the share of renewables in gross final energy consumption has been somewhat tentative since 2009, keeping the country at a more than six percentage point distance from its target. Portugal has also experienced a steady fall in its employment rate since 2008 due to the impacts of the economic crisis on its labour market. In 2013, the country was also among those farthest from both of its education targets. It was 8.9 and 10.0 percentage points away from its targets on early leavers from education and training and tertiary education respectively.

Figure 6.22: Distance to national targets and comparison with EU average (*)



(*) Most recent year for which data are available; see table below.

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 (%)	65.4	2013	75
Gross domestic expenditure on R&D (% of GDP)	1.36 (1)	2013	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 (%)	24.6	2012	31
Primary energy consumption (million tonnes of oil equivalent)	20.9	2012	:
Early leavers from education and training (% of population aged 18–24)	18.9	2013	10
Tertiary educational attainment (% of population aged 30–34)	30.0	2013	40
People at risk of poverty or social exclusion (thousands)	2 877	2013	2 557

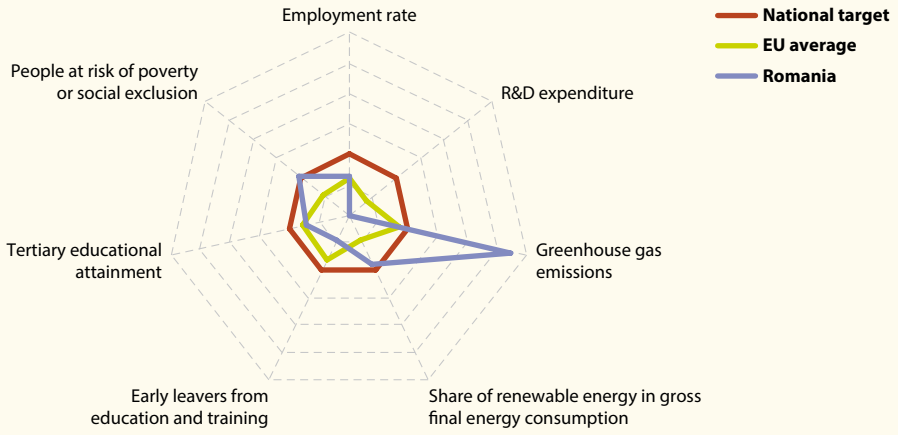
(1) Provisional data. (2) National target: 2.7–3.3 %.

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 %, thus remaining well below its 2020 target of an at most 19 % increase. Romania has also experienced a significant fall of 8.7 % in the number of people at risk of poverty or social exclusion since 2008, falling below its target value in 2013. Although it is still four percentage points below its tertiary education target, Romania made strong progress by raising the tertiary educational attainment rate by 6.8 percentage points between 2008 and 2013. The share of renewable energies has moved closer to the country's commitments, with a gap of 1.1 percentage points to be closed by 2020. In contrast, progress towards the country's targets on employment and early leavers from education and training has been somewhat tentative over the past few years. Romania's R&D intensity deteriorated between 2008 and 2013, making it the farthest from its national target than the other EU countries.

Figure 6.23: Distance to national targets and comparison with EU average (*)



(*) 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

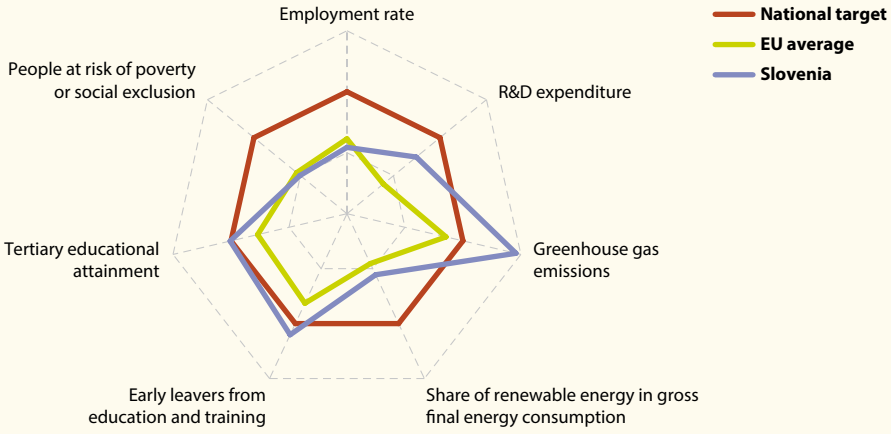
	Data	Year	Target
Employment rate age group 20–64 (%)	63.9	2013	70
Gross domestic expenditure on R&D (% of GDP)	0.39	2013	2
Greenhouse gas emissions in non-ETS sectors (% change since ESD base year)	– 6.5	2012	19
Share of renewable energy in gross final energy consumption (%)	22.9	2012	24
Primary energy consumption (million tonnes of oil equivalent)	33.6	2012	:
Early leavers from education and training (% of population aged 18–24)	17.3	2013	11.3
Tertiary educational attainment (% of population aged 30–34)	22.8	2013	26.7
People at risk of poverty or social exclusion (thousands)	8 601	2013	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 % until 2012, Slovenia remained below its target of an at most 4 % emissions increase by 2020. Although the rate of early school leavers has fluctuated since 2008, the country has been meeting its national target since 2011. In addition, in 2013 Slovenia also achieved its second education target, with a 40.1 % share of 30 to 34 year olds with tertiary educational attainment. The country was moreover closer than the EU average to meeting its commitment on R&D expenditure and renewable energies. Due to the adverse economic situation since the start of the crisis in 2008, the employment and poverty situation has deteriorated more or less continuously over the past few years, putting Slovenia at a larger distance to its respective targets than the EU average.

Figure 6.24: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	67.2	2013	75
Gross domestic expenditure on R&D (% of GDP)	2.59 (1)	2013	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 (%)	20.2	2012	25
Primary energy consumption (million tonnes of oil equivalent)	6.9	2012	:
Early leavers from education and training (% of population aged 18–24)	3.9	2013	5
Tertiary educational attainment (% of population aged 30–34)	40.1	2013	40
People at risk of poverty or social exclusion (thousands)	410	2013	321

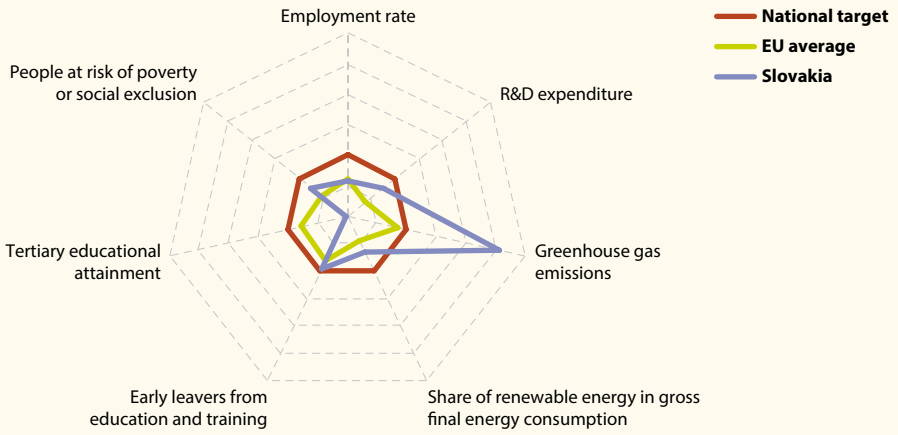
(1) Provisional data.

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

Slovakia

By 2012 Slovak GHG emissions in non-ETS sectors had gone down by almost 10 %. The country thus remained well below its long-term commitment of limiting the increase in emissions to 13 % by 2020. Slovakia had already been meeting its target on early leavers from education and training since 2009, but the steady rise since 2010 eventually put the country 0.4 percentage points above its target in 2013. Despite an 11.1 percentage point improvement in the share of 30 to 34 year olds with tertiary educational attainment since 2008, by 2013 the country still deviated substantially from its respective target, by 13.1 percentage points. The employment rate followed the EU trend and fell considerably after the crisis began in 2008. Over 2011 to 2013 the rate remained at around 65 %, maintaining a seven percentage point gap to the national 2020 target. In contrast, the country was closer to its targets on renewable energies, R&D expenditure and poverty and social inclusion than the EU average.

Figure 6.25: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	65.0	2013	72
Gross domestic expenditure on R&D (% of GDP)	0.83	2013	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 (%)	10.4	2012	14
Primary energy consumption (million tonnes of oil equivalent)	15.7	2012	:
Early leavers from education and training (% of population aged 18–24)	6.4	2013	6 (1)
Tertiary educational attainment (% of population aged 30–34)	26.9	2013	40
People at risk of poverty or social exclusion (thousands)	1 070	2013	941

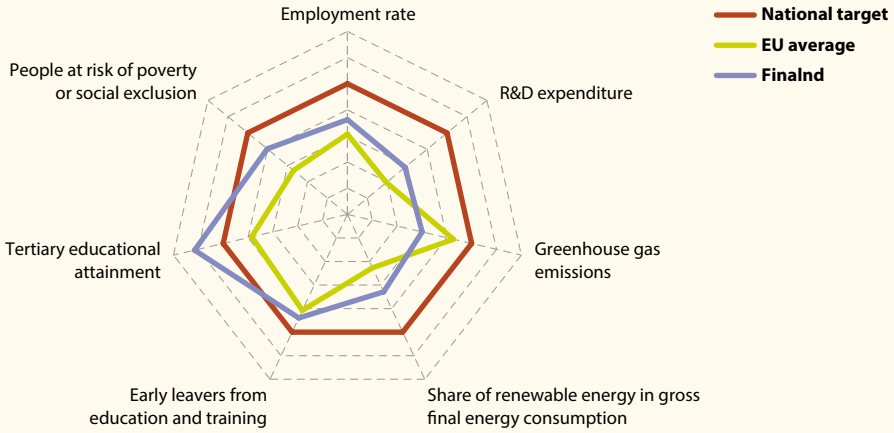
(1) National target: less than 6 %.

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

Finland

With 45.1 % of the population aged 30 to 34 having completed tertiary education in 2013, Finland continued to exceed its target of 42 %. However, its target is defined more narrowly than the EU target because it excludes former tertiary vocational education and training. Finland was also closer to its other national Europe 2020 targets than the EU average, except for GHG emissions in non-ETS sectors. Despite having the highest R&D intensity across the EU, the country in 2013 remained 0.68 percentage points from its national target. Its share of renewables in gross final energy consumption rose slightly between 2009 and 2012 but remained 3.7 percentage points from its national 2020 commitment. The country's employment rate has remained between 73 % and 74 % since 2009, showing no progress towards the 78 % target. Similarly, progress towards the target on early leavers from education and training has been tentative since 2008. Despite a notable 15 percentage point reduction in GHG emissions in non-ETS sectors until 2012, the gap to the national target remained larger than in most other EU countries.

Figure 6.26: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	73.3	2013	78
Gross domestic expenditure on R&D (% of GDP)	3.32	2013	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 (%)	34.3	2012	38
Primary energy consumption (million tonnes of oil equivalent)	32.8	2012	:
Early leavers from education and training (% of population aged 18–24)	9.3	2013	8
Tertiary educational attainment (% of population aged 30–34)	45.1	2013	42 (1)
People at risk of poverty or social exclusion (thousands)	854	2013	770

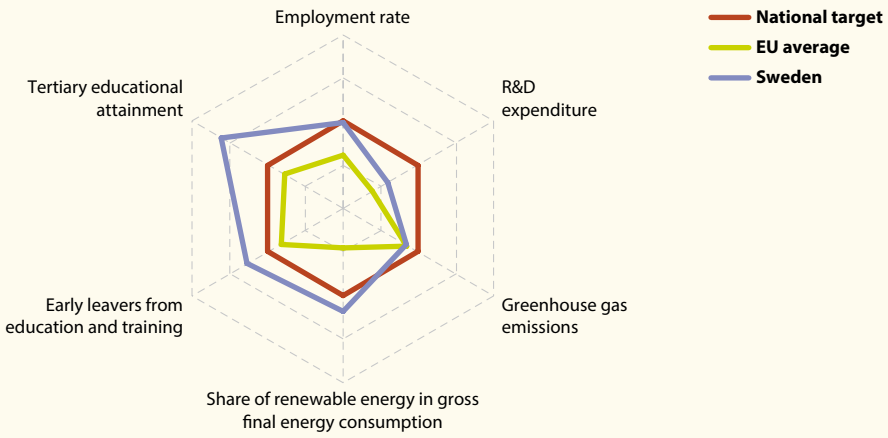
(1) Narrower national definition.

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

Sweden

With 48.3 % of its population aged 30 to 34 years having attained tertiary education in 2013, Sweden exceeded its national 2020 target by 8.3 percentage points. The country also surpassed its target on early leavers from education and training by 2.9 percentage points. Despite the slight deterioration in the labour market situation as a result of the economic crisis, Sweden had the highest employment rate in the EU in 2013 and was second closest to its target among the EU countries (after Germany). In 2012, Sweden also surpassed its renewable energies target by increasing the share of renewables in gross final energy consumption to 51 % – by far the best performance in the EU. Despite having the second highest R&D intensity across the EU (after Finland), a 0.79 percentage point gap remains to be closed between 2013 and 2020 to meet the national target of spending 4 % of GDP on R&D. Similarly, the country remained above its GHG emission target of a 17 % reduction, with a gap of 2.3 percentage points to be closed by 2020.

Figure 6.27: Distance to national targets and comparison with EU average (*)



(*) 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 (%)	79.8	2013	80
Gross domestic expenditure on R&D (% of GDP)	3.21 (1)	2013	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 (%)	51	2012	49
Primary energy consumption (million tonnes of oil equivalent)	48	2012	:
Early leavers from education and training (% of population aged 18–24)	7.1	2013	10 (2)
Tertiary educational attainment (% of population aged 30–34)	48.3	2013	40 (3)
People at risk of poverty or social exclusion (thousands)	1 602	2013	: (4)

(1) Provisional data. (2) National target: less than 10 %. (3) National target: 40–45 %. (4) National target: Reduction in the % of women and men 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 % by 2020.

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 energies commitments. After the deterioration in employment rates during the economic crisis (2008 to 2011), the indicator increased again to 74.9 % in 2013, exceeding the EU average of 68.4 %. In the period between 2008 and 2013, the UK managed to increase the tertiary educational attainment rate from 39.7 % to 47.6 %, against the backdrop of the adverse economic situation in the EU. The indicator on early school leavers recorded a 2.6 percentage point reduction over a three-year period, from 15.0 % in 2011 to 12.4 % in 2013. The development in the area of poverty has been more unfavourable, with the number of people at risk of poverty or social exclusion peaking at 15 586 in 2013. Following a period of volatility, R&D expenditure fell to 1.63 % of GDP in 2013, a value equivalent to 2005-levels. By 2012 the country had recorded an 8.6 % reduction in GHG emissions in non-ETS sectors ; further reductions of a similar magnitude would be required to meet the 16 % reduction target by 2020. With a gap of 10.8 percentage points in 2012, the UK was the farthest from its renewable energies target than the rest of the EU.

Figure 6.28: Distance to national targets and comparison with EU average

No radar chart can be shown for the United Kingdom as the UK has not adopted specific national Europe 2020 targets, apart from the already existing climate change and renewable energies commitments.

Table 6.28: National Europe 2020 indicators: most recent data and targets

	Data	Year	Target
Employment rate age group 20–64 (%)	74.9	2013	: (1)
Gross domestic expenditure on R&D (% of GDP)	1.63 (2)	2013	: (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 (%)	4.2	2012	15
Primary energy consumption (million tonnes of oil equivalent)	195.4	2012	:
Early leavers from education and training (% of population aged 18–24)	12.4	2013	: (1)
Tertiary educational attainment (% of population aged 30–34)	47.6	2013	: (1)
People at risk of poverty or social exclusion (thousands)	15 586	2013	: (3)

(1) No target in the National Reform Programme. (2) Estimated/provisional data. (3) Existing numerical targets of the 2010 Child Poverty Act.

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 ([1])
LI	Liechtenstein
NO	Norway
CH	Switzerland

([1]) Note that Iceland is also an EU candidate country.



EU candidate countries

ME	Montenegro
MK	The former Yugoslav Republic of Macedonia ([2])
AL	Albania
RS	Serbia
TR	Turkey

Units of measurement

%	Per cent
°C	Degree Celsius
:	Data not available
EUR	Euro
GWh	Gigawatt hours
kg	Kilogram
km	Kilometre
Mtoe	Million tonnes of oil equivalent
ppm	Parts per million
TWh	Terawatt hours

Abbreviations

AGS	Annual Growth Survey
CCS	Carbon capture and storage
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

([2]) The name of the former Yugoslav Republic of Macedonia is shown in tables as 'FYR Macedonia'. This does not prejudge 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.

EFTA	European Free Trade Association
EGSS	Environmental goods and services sector
EIT	European Institute of Innovation and Technology
EPO	European Patent Office
ERA	European Research Area
ERDF	European Regional Development Fund
ESA	European System of Accounts
ESD	Effort Sharing Decision
ESS	European Statistical System
ET 2020	'Education and Training 2020' Framework
EU	European Union
EU ETS	EU Emission Trading System
EU LFS	EU Labour Force Survey
EU SDS	EU Sustainable Development Strategy
EU SILC	EU Statistics on Income and Living Conditions
GDP	Gross Domestic Product
GEM	Global Entrepreneurship Monitor
GHG	Greenhouse gas
GNP	Gross national product
HEIs	Higher education institutions
ICT	Information and communications technology
IEA	International Energy Agency
ILO	International Labour Organisation
ISCED	International Standard Classification for Education
JRC	Joint Research Centre
LULUCF	Land use, land-use change and forestry
MIP	Macroeconomic Imbalance Procedure
NACE	National Association of Corrosion Engineers
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
R&D	Research and Development
R&I	Research and Innovation
RDI	Research and Development Initiative
RTD	Research and Technological Development
SCP	Stability Convergence Programmes
SGP	Stability and Growth Pact
SME	Small and medium enterprises
UN	United Nations
UNEP	United Nations Environment Program
US	United States
VAT	Value added tax
VET	Vocational Education and Training
WMO	World Meteorological Organization

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Indicators to support the Europe 2020 strategy

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The analysis in this publication is based on the Europe 2020 headline indicators chosen to monitor the strategy's targets. Other indicators focusing on subgroups of society or on related issues showing underlying trends help deepen the analysis and present a broader picture. The publication presents official statistics produced by the European Statistical System and disseminated by Eurostat. The updated 2015 edition covers the period from 2002 or 2008 up to the most recent year for which data are available (2012 or 2013).

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