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**REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND  
THE COUNCIL**

**Implementing the Paris Agreement - Progress of the EU towards the at least -40%  
target**

**(required under Article 21 of Regulation (EU) No 525/2013 of the European Parliament  
and of the Council of 21 May 2013 on a mechanism for monitoring and reporting  
greenhouse gas emissions and for reporting other information at national and Union  
level relevant to climate change and repealing Decision No 280/2004/EC)**

{SWD(2016) 349 final}

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# 1. GENERAL OVERVIEW

## 1.1. Ratification of the Paris Agreement

On 4 October 2016, the EU ratified the Paris agreement on climate change, thus enabling its entry into force on 4 November 2016. On 5 October 2015, the EU deposited its ratification instruments together with eight Member States which already completed their national ratification procedures: Hungary, France, Austria, Malta, Germany, Portugal, Poland and Slovakia. Greece and Sweden deposited their ratification instruments later in October 2016. The remaining Member States will continue their domestic ratification processes with a view to depositing their ratification instruments as soon as possible.

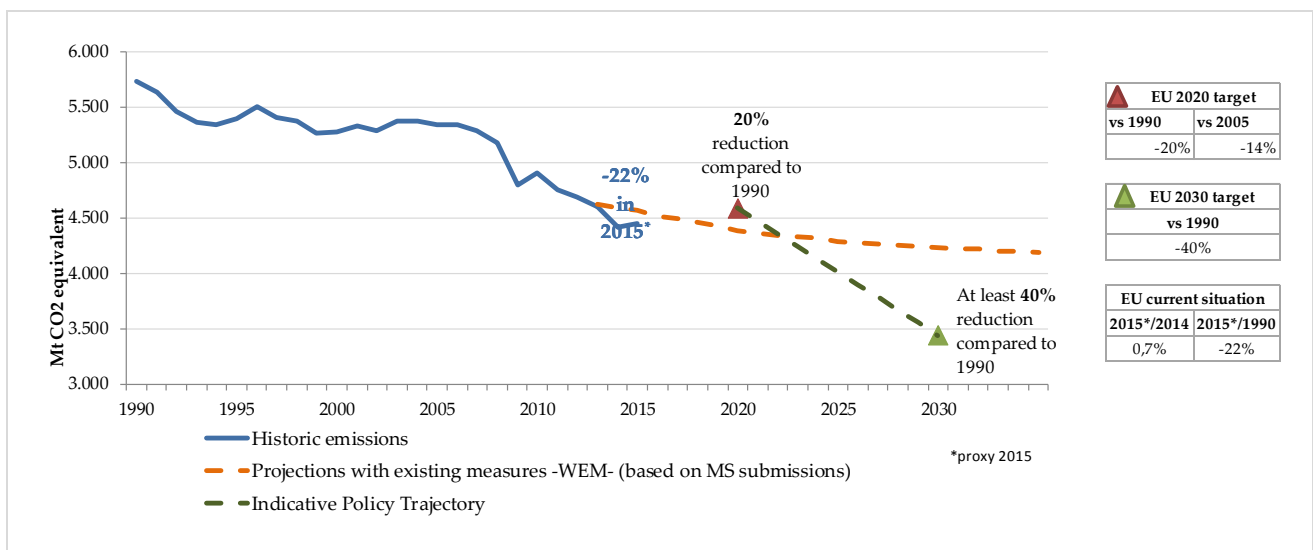
The Paris Agreement is a global milestone for enhancing collective action and accelerating the global transformation to a low-carbon and climate resilient society. The Commission presented its assessment of the Paris Agreement in March 2016. Based on this communication, European leaders underlined the EU's commitment to reduce greenhouse gas emissions domestically and to increase the share of renewable energies and improve energy efficiency as agreed in October 2014. Adapting the legislation in order to implement this framework remains a priority for the EU.

The Paris Agreement will replace the approach taken under the 1997 Kyoto Protocol, that contains commitments until the end of 2020. The second phase of the Kyoto Protocol serves as a bridge towards the post-2020 global climate change agreement. The EU is already delivering results of its 2020 legislation (Effort Sharing Decision, EU Emission Trading System, Monitoring Mechanism Regulation) and the EU and its Member States are well on track to jointly meet their target for the second commitment period of the Kyoto Protocol.

## 1.2. Progress towards the at least -40 % 2030 target

As seen in Figure 1 below, in 2015, the EU greenhouse gas emissions were 22 % below the 1990 level. The EU's share of global emissions has also been declining over time. According to the latest available EDGAR database, this share stood at 8.8 % in 2012.

**Figure 1: Progress towards meeting Europe 2020 targets**

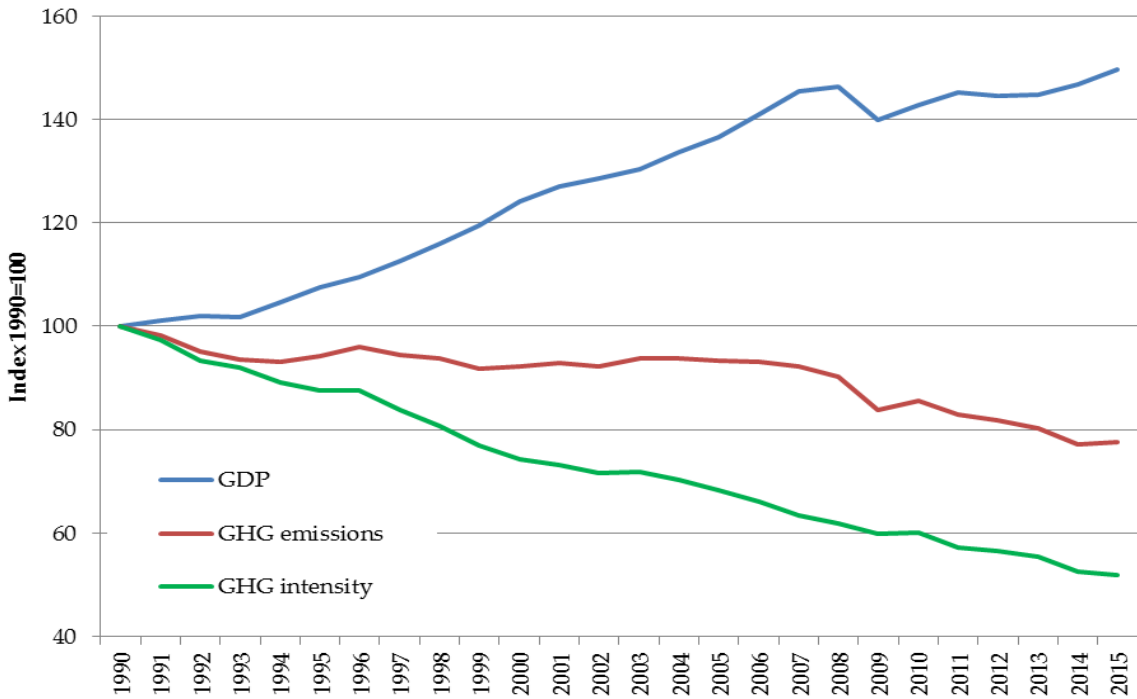


Emissions slightly increased (by 0.7 %) in 2015 after a significant drop of 4 % in 2014. Although it is widely acknowledged that the year 2015 was the warmest ever globally, the weather in Europe was colder in 2015 than in 2014 with an increase of 'heating degree days' of 4 %. Furthermore, the price of fossil fuels, notably propellant, also decreased in 2015 contributing to an increase in purchases compared to 2014. In the medium to long run, however, emissions are following a decreasing trend.

According to Member States' projections based on existing measures, in 2030, the total EU emissions are estimated to be 26 % below 1990 levels. New mitigation policies are being put in place so that the EU target at least a 40 % domestic reduction in greenhouse gas emissions by 2030 compared to 1990, agreed in Paris, is reached. As these policies are being implemented, EU emissions will follow the trajectory indicated on Figure 1 in green. A description of these legislative and non-legislative instruments is available in the following sections.

The EU continues to successfully decouple its economic growth from its emissions. During the 1990-2015 period, the EU's combined GDP grew by 50 %, while total emissions (excluding LULUCF but including international aviation) decreased by 22 %. The EU's greenhouse gas emissions intensity of the economy, defined as the ratio between emissions and GDP, decreased by almost half between 1990 and 2015.

**Figure 2: Changes in GDP (in real terms), greenhouse gas (GHG) emissions, and emissions intensity of the economy (ratio between emissions and GDP) Index (1990 = 100)**



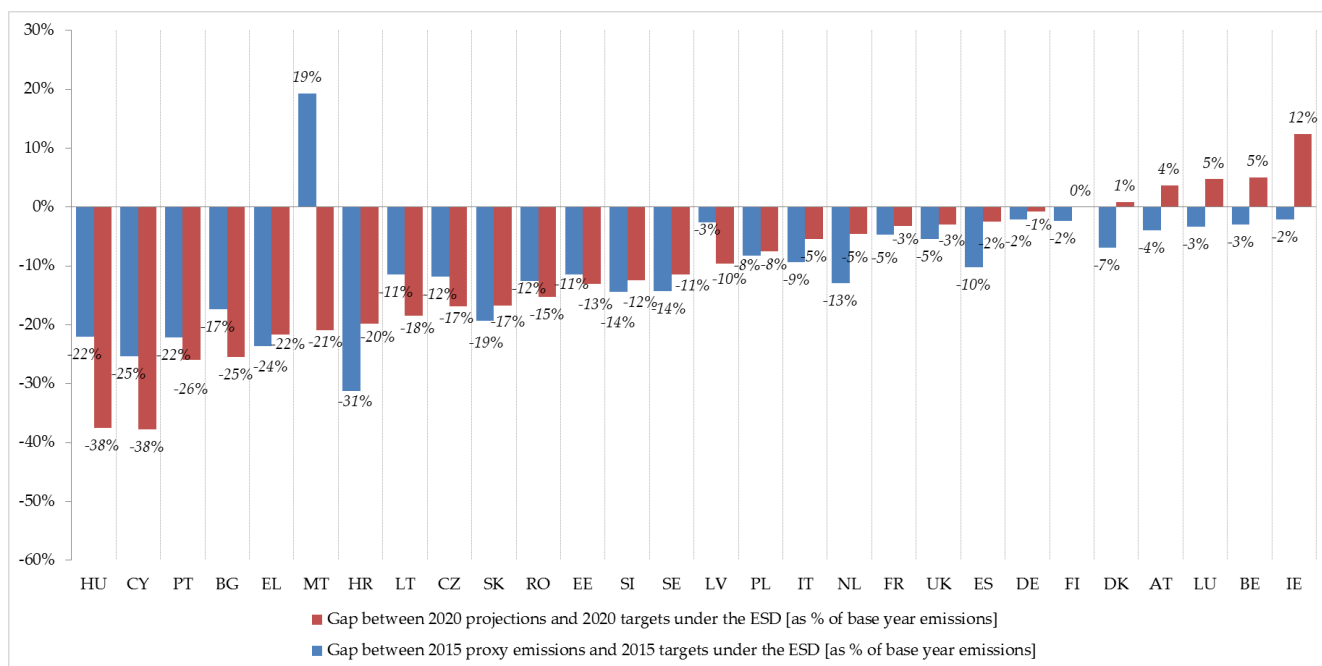
**1.3. Progress towards the 2020 targets**

According to the projections based on existing measures provided by Member States in 2015, emissions are expected to be 24 % lower in 2020 compared to 1990. As part of its 2020 Strategy, the EU committed to cut greenhouse gas emissions in 2020 by 20 % from 1990 levels. The EU is consequently on track to meet this domestic target.

The EU Emissions Trading System is a cornerstone of the EU's climate policy. It applies mainly to the industrial and power sectors. Between 2005 and 2015, emissions covered by the EU ETS, which represent slightly less than half of the total emissions in the EU, decreased by 24 %. During this period of time, the emissions outside the EU ETS decreased by 12 %. In 2015, greenhouse gas emissions from installations participating in the EU ETS are estimated to have decreased by just under 0.4 %. This confirms the decreasing trend over the last five years. Moreover, the surplus of emission allowances that has built up in the system since 2009 fell significantly to around 1.78 billion allowances as a result of the implementation of back-loading. The surplus is thus at the lowest level since the start of the current trading period in 2013. The back-loading postponed the auctioning of 400 million allowances in 2014, 300 million in 2015 and 200 million in 2016. These allowances will be transferred to the Market Stability Reserve (MSR) which will start operating as of January 2019 and will address the current surplus of allowances. A report on the functioning of the carbon market will be published later this year.

According to the Effort Sharing Decision (ESD), Member States need to meet binding annual greenhouse gas emission targets for the period 2013–2020 in sectors not covered by the ETS, for instance building, transport, waste and agriculture. According to the inventory for 2013 and 2014 and to the approximated inventory for 2015 (see Figure 2), 27 Member States have achieved their targets for the three-year 2013-2015 period. Only Malta's emissions have exceeded the target for each of these three years. Malta's emissions are consequently higher than originally estimated in national projections. Therefore, the country needs to use flexibility provisions under the Effort Sharing Decision (for example buying units from other Member States) and may also have to update its projections for 2020 based on recent emissions data.

**Figure 3 Estimated (2015) and projected (2020) relative gap between emissions and ESD targets (in % of 2005 base year emissions). Negative and positive values respectively indicate over-delivery and shortfall.**



Furthermore, in 2020 most Member States are expected to reach their ESD targets, according to national projections based on policies already implemented. According to their own projections, a few Member States still need to put in place additional measures or make use of flexibilities in 2020:

- In Ireland, emissions are expected to remain stable until 2020, with transport emissions expected to significantly increase by then. In June 2016, in the context of the European Semester (an annual cycle of macro-economic, budgetary and structural policy coordination in the EU), EU leaders recommended Ireland to further mitigate emissions by investing more in public transport.
- According to the most recent national projections, Luxembourg's emissions will exceed the national target by 5 % by 2020.
- Belgium is also expected to miss the 2020 target by 5 %. Further investment in transport infrastructure and energy generation capacity could however contribute to reducing emissions. The continued favourable treatment of company cars contributes to pollution, congestion and greenhouse gas emissions.
- According to their projections, Austria, Denmark and Finland could also fail to meet their 2020 emissions targets, but by a margin of less than 5 %. If their planned additional measures are implemented, however, Austria and Finland could still meet their targets.

#### **1.4. Compliance with the Kyoto target for the first commitment period and progress towards the target for the second commitment period**

On 2 August 2016, the UNFCCC published the final reports of the Parties of the Kyoto Protocol for the first commitment period ('CP1') which corresponds to the 2008-2012 period. 26 Member States and the EU as party made a commitment for this period. During CP1, the EU's emissions were 23.5 Gt CO<sub>2</sub> eq. against a cumulative target of 26.7 Gt CO<sub>2</sub> eq. This target was consequently met with a margin of 12 % as is explained in more details in Table 7 of the staff working document.

The EU as a whole used 21.8 billion Assigned Amount Units (AAU), 818 million Certified Emission Reduction (CERs), 1.6 million temporary CER, 508 million Emission Reduction Units (ERUs), and 390 million Removal Units (RMUs) for compliance. It carried over 4 billion AAUs, 1.5 billion CERs and 1.7 billion ERUs. Carried over units can be used for compliance with the second commitment period ('CP2') subject to the rules set out by the Doha amendment to the Kyoto Protocol. However, carried over AAUs cannot be used for compliance with the targets set by the EU climate and energy legislation and the use of CERs and ERUs is limited by quality and quantity.

In the second commitment period (2013-2020), all 28 Member States jointly committed to an EU wide target. According to Member States' projections, the EU and its 28 Member States are on track to overachieve this target.

## **2. ACTING DOMESTICALLY AND INTERNATIONALLY THROUGH CLIMATE FINANCE**

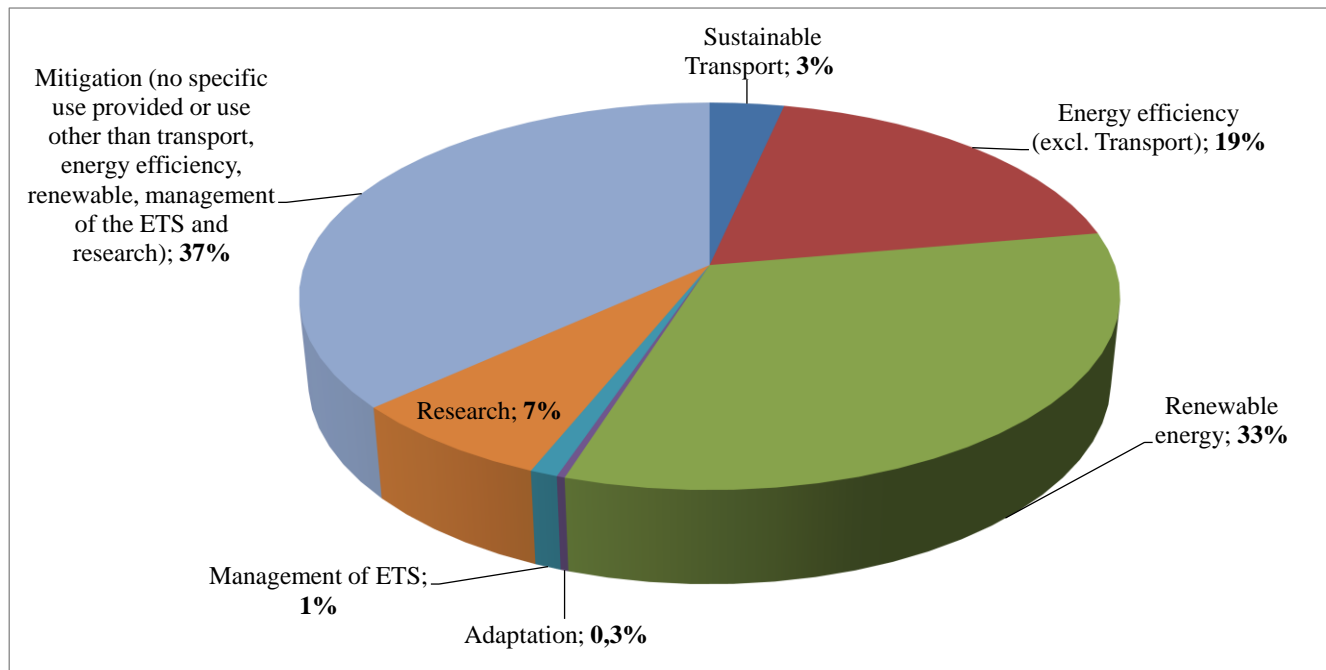
### **2.1. Mobilising the revenue from the auctioning of EU ETS allowances**

#### **Member States' use of auctioning revenues**

In 2015, the auctioning of ETS allowances generated € 4.9 billion of revenues for the Member States, of which 98 % came from fixed installations and 2 % from aviation. According to the information submitted to the Commission, the Member States spent or planned to spend 77 % of these revenues on climate related purposes.

As seen in Figure 4, these revenues have been spent based on Member States' priorities. For instance, Hungary recently decided to invest part of these revenues in e-mobility. France and the Czech Republic spend most of the revenues on energy efficiency. Spain's priority is still the development of renewable energy. More information on the use of auctioning revenues will be available in the next State of the Energy Union.

**Figure 4: Use of the auctioning revenues spent in climate and energy in the Member States by sectors (EU weighted average) in 2015**



### NER 300

NER 300 is one of the world's largest funding programmes for innovative low-carbon energy demonstration projects funded by the auctioning of 300 million ETS allowances. Under the NER 300 programme, 37 renewable energy projects and one Carbon Capture Storage (CCS) project were selected for funding in 19 Member States. Three of these are already operational and are producing clean energy. Total NER 300 funding awarded comes to € 2.1 billion, which is expected to leverage an additional € 2.7 billion of private investment.

### 2.2. Mainstreaming climate policies into the EU budget

On average over the 2014-2020 period, at least 20 % of the EU budget is expected to be climate relevant expenditure. This is expected to be approximately € 200 billion. The situation varies across instruments:

- The European structural and investments funds (ESIFs) constitute more than 43 % of the EU budget. 28 partnership agreements and more than 530 fund-specific programmes contribute to financing climate policies. A common methodology has been set up to determine the level of support for climate change objectives. More than € 115 billion will support climate action objectives, corresponding to about 25 % of the total funds.
- Common agricultural policy (CAP). The European agricultural guarantee fund (EAGF) and the European agricultural fund for rural development (EAFRD) represent together 39 % of the EU



budget. Since 1990, agriculture-related non-CO<sub>2</sub> emissions have decreased by 24 % in the EU. Support for climate-friendly agriculture through the CAP has contributed to this decoupling. The CAP rural development policy, for instance, supports farm modernisation in order to cut energy consumption, produce renewable energy, improve input efficiency, and thereby reduce emissions. In 2015, it is estimated that €13.6 billion of the CAP budget was climate relevant.

- Horizon 2020. This EU funding programme for research, represents € 79 billion for the period 2014-2020 (which is 7 % of the total EU budget). At least 35 % of this funding is expected to be invested in climate-related projects. The latest data show that the research targeting societal challenges (i.e. energy, transport or food) are close to delivering this 35 % target. However, the bottom-up parts of Horizon 2020 (i.e. thematically open calls for proposals) are lagging behind. A higher level of ambition and corrective action will therefore be needed to reach the 35 % mainstreaming target.

The industry and the European authorities have also launched several public private partnerships (PPP), such as 'Sustainable Process Industry through Resource and Energy Efficiency', to improve resource efficiency and reduce CO<sub>2</sub> emissions in industry and buildings. Recent analysis show that these PPPs provide significant reductions in energy use and CO<sub>2</sub> emissions.

The results of COP21 and the innovation dimension of the Paris Agreement help to address the gap in upcoming work programmes covering the 2018-2020 period. Moreover, the integrated strategic energy technology (SET) plan is the very first research & innovation deliverable under the Energy Union, giving a new impetus to the development and deployment of low-carbon technologies by better coordinating and prioritising work. It focuses on ten key action lines aimed at delivering the Energy Union research & innovation priorities based on an assessment of the energy system needs, their importance for the energy system transformation and the potential to create growth and jobs in the EU. These actions address the whole innovation chain, from basic research to market uptake, both in terms of financing as well as in terms of regulatory framework. It also proposes a new financial product, the "Energy Demo Projects facility" developed with the European Investment Bank (EIB) to target first-of-a-kind large-scale commercial demonstration projects.

- European fund for strategic investments (EFSI) is a € 16 billion guarantee from the EU budget, complemented by a € 5 billion allocation of the EIB's own resources. This fund supports strategic investment in key areas such as infrastructure, education, research, innovation and risk finance for small businesses. It is capable of leveraging € 315 billion. The EFSI has already financed renewable energy demonstration projects, including RES-related transport, industry and energy storage. On 16 September 2016, the Commission proposed an extension of the fund to focus further on innovative, low-carbon projects for the 2018-2020 period. This proposal reinforces the concept of "additionality" to ensure that only projects that would not have happened without the EFSI are chosen. In view of their importance for the single market, cross-border infrastructure projects, including services, have been specifically identified as providing additionality. The proposal should deliver a total of at least half a trillion euro of investment by

2020. The Commission called on the co-legislators to consider its proposal as a matter of priority.

- The LIFE sub-programme for climate action, which in 2015 contributed to the implementation and development of climate policy and legislation through action grants and financial instruments. Under it, the Commission awarded € 56 million to 40 projects with European added value in terms of climate mitigation, adaptation or governance & information. Some 30 NGOs primarily active in the field of environment and climate action received funding in the order of € 10 million from operating grants. Progress was also made on the two Financial Instruments. Three PF4EE operations have been signed (Spain, France, the Czech Republic). Under NCFE a due diligence appraisal of two operations which could be signed in the autumn of 2016 was conducted.
- External action instruments. To follow up on the Paris Agreement and support developing and neighbouring countries in implementing their climate action plans, the EU aid budgets also integrate climate.

### **2.3. Supporting developing countries**

Following the conclusion of the Paris Agreement, support for developing countries to implement their nationally determined contributions (NDCs) plays an important role in achieving the transformation to low emissions economies.

At the 2009 Climate Change Conference in Copenhagen, developed countries committed to a long-term goal of jointly mobilising USD 100 billion per year as from 2020 for meaningful mitigation actions and transparency of implementation. This funding will come from a wide variety of sources, including public and private, bilateral and multilateral, and alternative sources of finance. At the 2015 Paris Climate Change Conference, developed country parties agreed to continue their existing collective mobilisation goal through to 2025 and set a new collective quantified goal from a floor of USD 100 billion per year.

The USD 100 billion pledge has helped to significantly scale up climate finance in the context of development cooperation and through multilateral and development banks. The EU and its Member States are the biggest providers of official development assistance to developing countries, delivering € 68 billion in 2014. In 2015, the EU, EIB and Member States provided € 17.6 billion to help developing countries tackle climate change.

## **3. MITIGATING EU EMISSIONS**

In October 2014, the EU leaders reached an agreement on the main building blocks of the EU 2030 Climate and Energy Framework. The EU set a binding, economy-wide emissions reduction target of at least 40 % by 2030, compared to 1990 levels. This commitment is in line with a cost-effective pathway to reach the EU's long-term climate objective and became the basis for the EU's international commitment under the Paris Agreement on climate change and will be delivered by all Member States collectively.

To start implementing that commitment, in July 2015, the Commission presented a proposal to reform the EU Emissions Trading System (see section 3.1). In July 2016, the Commission presented measures

to address the other main elements of the economy that will contribute to climate action: the sectors of buildings, transport, waste, agriculture, as well as land-use and forestry (see section 3.2).

The Commission is also rolling out the initiatives foreseen in the context of the Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Policy, to address renewable energy, energy efficiency, transport and research and development and to develop the governance of the Energy Union.

### **3.1. Revision of the EU ETS - phase 4 (2021-2030)**

The Commission's legislative proposal of July 2015 on revising the EU ETS for phase 4 is now under consideration by the Council and the European Parliament. The proposal aims to achieve a 43 % reduction in EU ETS emissions by 2030, compared to 2005 levels.

### **3.2. Legislative proposals for an Effort Sharing Regulation and on Land Use for 2021-2030**

In October 2014, EU leaders made a political commitment to reduce the emission of sectors of the economy not covered by the EU ETS by 30 % by 2030 compared to 2005. They also agreed that all sectors, including land use, should contribute to the EU's commitments under the Paris Agreement on climate change.

The current Effort Sharing Decision, which obliges Member States to meet binding annual greenhouse gas emission targets in sectors outside the ETS except for land use, is applicable for the 2013-2020 period. On 20 July 2016, the Commission presented a package of measures to accelerate the transition to low-carbon in all sectors of the economy in Europe for the 2021–2030 period in response to the 2014 political commitment. The first legislative proposal sets Member States binding annual greenhouse gas emission targets for 2021–2030 for sectors not regulated under the EU ETS including building, agriculture, waste management, transport and certain industrial activities.

The setting of national emissions reduction targets is based on fairness, solidarity, cost-effectiveness and environmental integrity. The proposal recognises Member States' varying capacities to take action by differentiating targets based on GDP per capita. This ensures fairness because higher income Member States take on more ambitious targets than lower income Member States. The 2030 targets range from 0 % to -40 % compared to 2005 levels.

EU leaders also recognised that an approach based solely on relative GDP per capita would result in relatively high compliance costs for certain high income Member States. The targets of high income Member States are consequently adjusted in the proposal to reflect cost-effectiveness. Two strictly limited new flexibilities are also proposed – eligible Member States could access allowances from the EU ETS, and all Member States are allowed to use enhanced action in the land use sectors to meet their binding targets.

The second legislative proposal concerns CO<sub>2</sub> emissions and removals from agricultural land use and forestry (LULUCF), and sets out a binding commitment for each Member State and the accounting rules to determine compliance. The proposal requires each Member State to ensure that accounted greenhouse gas emissions from land use are entirely compensated by an equivalent removal of CO<sub>2</sub> from the atmosphere through action in the sector. For example, if a Member State cuts down their forests (deforestation), it must compensate for the resulting emissions by planting new forest (afforestation), by improving the sustainable management of their existing forests, croplands and grasslands, or alternatively by further reductions in the Effort Sharing sectors.

The Commission's proposal is based on a careful balance between more incentives to capture carbon in soil and forests, and the need to maintain the environmental integrity of the EU climate framework, so as to incentivise emission reductions in the buildings, transport and agriculture sectors. It also includes the possibility for Member States to trade LULUCF credits.

Land use and forestry include use of soils, trees, plants, biomass and timber, and are in a unique position to contribute to an effective climate policy. This is because the sector not only emits greenhouse gases but can also remove CO<sub>2</sub> from the atmosphere.

### **3.3. Road transport sector**

On July 2016, the Commission adopted a European strategy for low-emission mobility, as part of a package of measures to accelerate the transition to a low-carbon economy in Europe. Transport accounts for almost a quarter of Europe's greenhouse gas emissions and is the main cause of air pollution in cities.

The strategy sets a clear ambition: by mid-century greenhouse gas emissions from transport will need to be at least 60 % lower than in 1990 and be firmly on the path towards zero. Emissions of air pollutants from transport are harmful to human health and need to be drastically reduced without delay. Facing these challenges will offer opportunities to modernise the European economy and strengthen its internal market.

The strategy frames the actions that the Commission is planning in the coming years, focusing especially on road transport, which accounts for over 70 % of transport emissions and much of the air pollution. These actions address three key areas: (i) improved efficiency of the transport system, (ii) low-emission alternative energy for transport, and (iii) low- and zero-emission vehicles. In addition, horizontal enablers such as the Energy Union strategy, research and innovation, industrial and investment policy, the digital single market strategies and the skills agenda will support this transformation.

### **3.4. The monitoring, reporting and verification (MRV) system for EU shipping**

The EU has been supporting a global approach to reducing emissions from international shipping, which is a large and growing source of emissions. In April 2015, it adopted a Regulation that set up an EU-wide MRV system for shipping as the first step in the EU strategy towards cutting emissions in this sector. This Regulation requires that large ships over 5 000 gross tons using EU ports after 1 January 2018 monitor and later report their annual verified CO<sub>2</sub> emissions and other energy related data.

The EU's MRV system for shipping emissions is designed to contribute to building an international system in the shipping sector. Discussions on this are ongoing at the International Maritime Organisation. The EU-shipping MRV system will also provide new opportunities to agree on efficiency standards for existing ships. Once a global system is adopted, the EU MRV legislation requires the Commission to make an assessment of it with a view of alignment of the EU system where appropriate.

### **3.5. Carbon Capture Storage**

In the reports submitted to the Commission on the implementation of the CCS Directive, Member States have indicated that, despite the lack of positive assessment for technical and economic feasibility for CCS retrofitting, newly built power plants are generally going beyond the legal requirements and are setting aside land for possible retrofitting with CCS should the conditions change in the future.

More information will follow in the Commission's second report on the implementation of the Directive on the geological storage of carbon dioxide planned to be published later this year. The report will also provide an overview of the latest developments related to the preparation of storage sites, exploration and permits, operation licences of large power plants, national plans to develop storage and CO<sub>2</sub> transport infrastructure and research projects with relevance to the Directive.

### **3.6. F-gases**

The new European Regulation to control gases from fluorinated greenhouse gases (F-gases) applies since 1<sup>st</sup> January 2015. It strengthens existing measures (i.e. containment of gases through the detection of leaks, installation of equipment by trained personnel, recovery of used gases, etc.) and introduces a phasing-out of hydrofluorocarbons (HFCs) that will help cut total EU emissions from F-gases by two-thirds by 2030 compared to 2014 levels. In 2016, the quotas needed for legally placing HFCs on the EU market were reduced to 93 % of 2015 levels. The F-gas Regulation also prohibits the placing of F-gases on the market in certain circumstances where alternatives are available. For instance, since 1<sup>st</sup> January 2016 a prohibition on fire equipment that uses HFC-23 is in force.

### **3.7. Governance**

The Energy Union Framework Strategy, adopted by the EU Heads of State in February 2015, will ensure that Europe has secure, affordable and climate-friendly energy. It will require major investments in generation, networks and energy efficiency, estimated at some € 200 billion annually in the next decade. The objectives of this Strategy can only be achieved if national policies are coherent with those of other Member States and complement the EU energy and climate legislation.

For these reasons, EU leaders agreed that a reliable and transparent governance system without unnecessary administrative burden will be developed at the level of the EU. It further specified that such governance system will integrate strategic planning and reporting on the implementation of climate and energy policies. Before the end of 2016, the Commission will present a proposal for streamlining existing planning, reporting and monitoring obligations as well as on an Energy Union governance process. It is foreseen that from 2021 onwards, the report on the implementation of the Paris agreement will form part of the regular Commission monitoring report under the upcoming proposal for a Regulation on Energy Union Governance.

### **3.8. Carbon market initiatives and Partnership for Market Readiness (PMR)**

The EU continues to support the implementation of market based instruments, such as the ETS, as key tools to drive cost effective domestic emission reductions. This is achieved through bilateral technical support and exchange, principally in China and South Korea, but also through multilateral initiatives undertaken by the World Bank such as the Partnership for Market Readiness (PMR) to which the EU is the main contributor. This year saw an extension of bilateral support to China, and a reorientation of funding within the PMR towards support to upfront policy analysis of carbon pricing to support implementation of commitments under the Paris Agreement. A focus on domestic action remains key objectives of international engagement on markets.

## **4. ADAPTATING TO CLIMATE CHANGE**

The 2013 EU Strategy on adaptation to climate change aims to prepare the EU for current and future impacts of climate change. It promotes adaptation action throughout the EU, ensuring that adaptation is

mainstreamed across all relevant EU policies and securing greater coordination, coherence and information sharing across Member-States. The Commission will report to the European Parliament and Council on the implementation of the adaptation strategy and will carry out an evaluation of the implementation.

The general trends include the following:

- Many Member States are addressing adaptation planning and are identifying the risks and vulnerabilities to climate change. National adaptation strategies have been adopted by 21 Member States and are under preparation in most of the remaining ones. However most Member States have yet to define and implement adaptation action plans.
- The most commonly identified sectors for the mainstreaming of adaptation are water management and water resources, forests and forestry, agriculture, biodiversity and ecosystems and human health. As mentioned in the global strategy on foreign policy and security presented to the European Council this summer, climate change amplifies situations of conflict in the EU.
- Less than half of the Member States are implementing adaptation in key sectors.
- Development and implementation of monitoring and evaluation systems remains in the early stages in most Member States.
- Work at city level and urban policies on climate change adaptation intensified. Within the new Covenant of Mayors, adaptation has been merged with mitigation efforts in a European initiative involving nearly 7,000 cities around the world. Climate policy in cities has been supported by the Paris Agreement recognition of cities as key actors in implementation.

## **5. PARTICIPATING IN INTERNATIONAL CLIMATE POLICY**

### **5.1. Aviation**

#### **Aviation policy**

The EU has been supporting and involved in the development of a global measure to address CO<sub>2</sub> emissions from international aviation. Since the agreement made at the 38<sup>th</sup> ICAO Assembly in 2013 to develop a global market-based measure, ICAO has been actively working on the design of such a measure together with its Member states. The ICAO has opted for a carbon offsetting scheme with the objective to stabilise the international aviation's emissions at 2020 levels. A Resolution on such a measure to be implemented as of 2020 was adopted at the 39<sup>th</sup> ICAO Assembly in early October 2016. Based on the level of participation in the first voluntary phase of the scheme running until 2027, the emission coverage is around 80 % of what is needed to achieve carbon neutrality from 2020. This first step will need to be complemented by other key design elements of the scheme, notably rules on the monitoring, reporting and verification of emissions and eligibility criteria for emissions units, as well as the set-up of a registry. These are key elements in terms of effectiveness and integrity, and they will all need to be in place ahead of 2020 for the scheme to start operating as planned.

Following the decision of the Assembly on a global market-based measure for aviation, the Commission will report to the European Parliament and to the Council on the Assembly's outcome and will propose, if appropriate, a proposal to review the scope of the EU ETS for aviation.

## **Aviation's overall impact on climate change**

Total reported aviation emissions represented approximately 3.6 % of the EU's total greenhouse gas emissions in 2015. Most of these emissions come from international flights. Although the average burnt fuel per passenger kilometre flown went down by 19 % between 2005 and 2014, CO<sub>2</sub> emissions increased by 5 % over this same period.

Emissions of nitrogen oxides (NO<sub>x</sub>), aerosols and aerosol precursors (soot and sulphate) and increased cloudiness are also contributing to climate change. The EU's Flightpath 2050 recognises such non-CO<sub>2</sub> factors and calls for a 90 % reduction of NO<sub>x</sub> emissions by 2050, relative to 2000 levels. Efforts have been ongoing in recent years to assess the impacts of non-CO<sub>2</sub> factors on climate change. A study partly financed by the EU research funding programme called 'QUANTIFY' attempted to estimate the overall aviation impacts. It concluded that in 2005 aviation represented around a 3.5 % share of total anthropogenic forcing (i.e. change in the Earth's energy balance due to human economical activity).

### **5.2. Phasing down hydrofluorocarbons under the Montreal Protocol**

The EU was very active in the negotiations of an ambitious global goal under the Montreal Protocol to limit the global production and use of hydrofluorocarbons (HFCs). Science suggests that an ambitious phase-down of HFCs could prevent up to 0.5°C of global warming by the end of the century. The entry into force of the EU Regulation on fluorinated gases in 2015 and the EU amendment proposal submitted in 2015 helped building consensus on the Kigali Amendment, adopted on 15 October 2016, which is a significant step forward in implementing the Paris Agreement.

To facilitate early action on HFCs in Latin American and Caribbean countries, Africa, Southeast Asia and the Pacific, the European Commission continues to provide financial support for specific projects in these regions.

## **6. SHARING EXPERIENCE**

European Commission regularly carries out ex-post evaluations of climate policies in order to better understand the main drivers behind emission reductions and to quantify the impact of climate policies on emissions. A first study based on decomposition analysis shows that the emission reductions observed since 1990 and the progress in terms of emission intensity of the economy (see Figure 2) have been mainly driven by technological change and innovation. The relative shift between economic sectors, including from industry to services, had a marginal effect across the EU on average. Hence, the decoupling seen in Figure 2 is predominantly explained by the technological developments which make it possible to increase GDP while emitting fewer greenhouse gases.

Two econometrics-based models were developed in 2016 to show how climate policy contributes to reducing emissions. Due to the constraints of the methodologies used, only CO<sub>2</sub> emissions from combustion in 1990-2012 could be analysed. The first model provides a quantitative estimate of the impact of the EU-ETS on emissions. The second model, based on a different approach, quantifies the impact on emissions of national policies including energy and transportation taxes and renewable energy policies.

Figure 5 aims to provide a simplified illustration of the results of the above analysis over the 1990 - 2012 period. In this representation, the ETS abatement is shown in red. The abatement from energy and transportation taxes and renewable energy policies is also represented. These are compared with the

actual emissions, shown at the bottom in blue. The total refers to the emissions that would have occurred in the absence of these policies.

For reasons of methodological simplicity, it is assumed in the graph that the ETS had no effect on the use of renewable energy or on the other policies. A more detailed description of the methodologies and of their limits is provided on the website of DG Climate Action.

**Figure 5: Ex-post evaluation of the impact of the EU-ETS, Renewable, Taxation and other policies on CO<sub>2</sub> emissions from combustion**

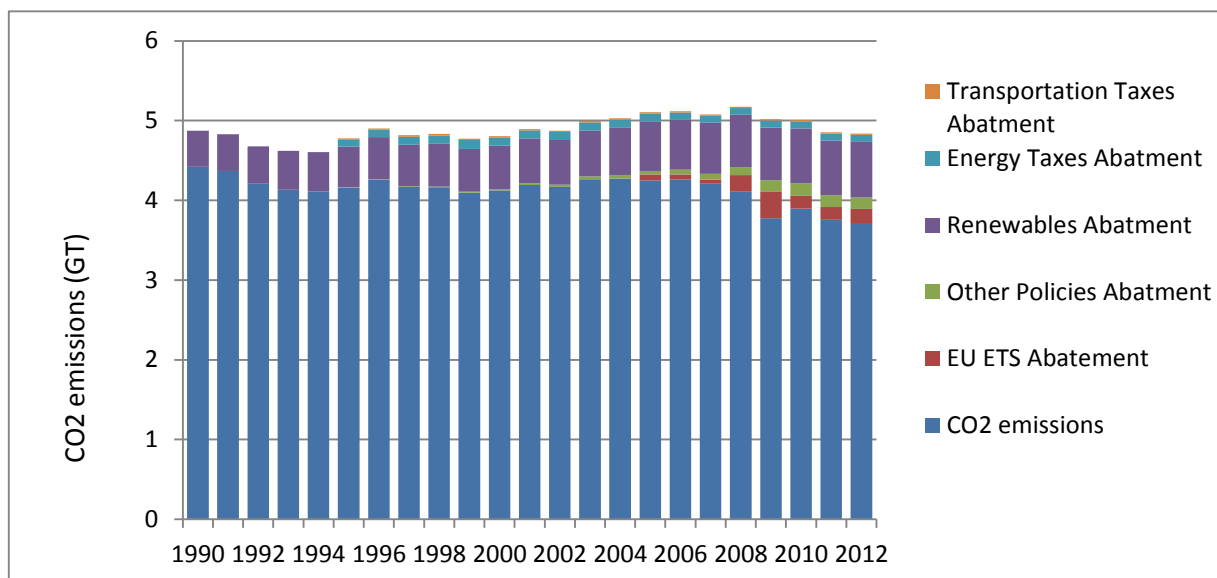


Figure 5 above shows that without the climate policies listed above, in 2012, CO<sub>2</sub> emissions would have been 30 % higher than what has been observed. Furthermore, it is clear that renewable energy development is a decisive factor in reducing emissions and that taxation and the ETS also have an impact on emissions. These ex-post evaluations conclude that climate policy works as it reduces emissions and stimulates the uptake of clean technologies.

In July 2016, the Commission also published an evaluation of the implementation of the Effort Sharing Decision until 2015. The evaluation concluded that, although the Decision was still in the early stages of implementation, commitments under the Decision have contributed to stimulating new national policies aimed at reducing greenhouse gas emissions. The Decision also improved the coordination between national, regional and local governments. Policies which were part of the 2020 climate and energy package, in particular on energy efficiency and renewable energy, have also played a part.