



Brussels, 14.12.2017
C(2017) 8511 final

REPORT FROM THE COMMISSION

Seventh national communication and third biennial report from the European Union under the UN Framework Convention on Climate Change (UNFCCC) (required under the UNFCCC and the Kyoto Protocol)

{SWD(2017) 457 final} - {SWD(2017) 458 final}

i. INTRODUCTION

The European Union (EU) and its Member States, both jointly and individually, have engaged in domestic and international action on climate change for a number of years and this has resulted in significant emission reductions.

The staff working documents accompanying this report constitute the EU's seventh national communication as required under Article 12 of the United Nations Framework Convention on Climate Change (UNFCCC) and Article 7 of the Kyoto Protocol, and its third biennial report as required under Decision 2/CP.17 of the Conference of the Parties under the UNFCCC. This report is an executive summary of those documents.

ii. NATIONAL CIRCUMSTANCES

The EU comprises 28 Member States, with a total population of 510 million. Over the last 26 years, the population in the 28 Member States has grown on average by 0.3 % a year.

Total energy consumption grew between 1990 and 2006 (by around 0.5 % a year), but since then it has generally declined; in 2015, it was back to 1990 levels. The trend observed since 1990, of a shift in the primary fuel mix from coal to gas, has slowed in recent years. There has been an increasing shift to renewables, with their share rising from 4 % in 1990 to 13 % in 2015, largely driven by an increase in biomass consumption. Production of energy from solar photovoltaics and wind also increased very substantially over the period.

iii. GREENHOUSE GAS INVENTORY

Emissions included in this executive summary are those relevant to the EU target under the Convention and the data are taken from the latest submission of the EU inventory to the UNFCCC. Total greenhouse gas (GHG) emissions in the EU, excluding emissions and removals from land use, land-use change and forestry (LULUCF) but including emissions from international aviation, decreased by around 22 % between 1990 and 2015, and by 23% between 1990 and 2016.

The most prevalent GHG by far is CO₂, which accounted for 81.8 % of total EU emissions in 2015, excluding LULUCF. The energy sector accounted for most of the EU's GHG emissions in 2015 (77.9 %), followed by agriculture (10.1 %) and industrial processes and product use (8.7 %).

Per capita emissions dropped by 28.7 % between 1990 and 2015, from 11.9 t to 8.5 t. The ratio of GHG emissions to GDP also fell considerably, thanks to steady progress since 1990 on decoupling economic activity from GHG emissions.

iv. POLICIES AND MEASURES

Under the UNFCCC, the EU and its Member States have taken a joint emission reduction target to reduce its GHG emissions by at least 20% compared to 1990 by 2020, with a conditional offer to move to a 30% reduction, provided that other developed countries commit themselves to comparable emission reductions and developing countries contribute adequately according to their responsibilities and respective capabilities.

The EU target is enshrined in legislation, and is being implemented by the EU and its Member States. At the heart of this legislation, the EU Climate and Energy package sets for

the Union a 20% GHG emission reduction target by 2020 compared to 1990, which is equivalent to -14% compared to 2005. This effort has been divided between the sectors covered by the EU Emission Trading System (EU ETS) and non-ETS sectors under the Effort Sharing Decision (ESD).

The EU has agreed that at least 20 % of its budget for 2014-2020 – as much as €180 billion – should be spent on climate change-related action. To achieve this increase, mitigation and adaptation actions are integrated into all major EU spending programmes. By current estimates, this target has been exceeded in 2016 and spending will remain close to it over 2017-2020.

Since the last national communication and biennial report, the EU and its Member States have continued to strengthen legislation to enable GHG reductions and the transition to a low-carbon economy. Key policy developments include developments to the EU ETS, new legislative instruments for emissions in the ‘non-traded’ sectors, and proposed amendments to renewable energy and energy efficiency policies.

Cross-cutting policies

EU ETS

The EU ETS, which has been operational since 2005, is based on the ‘cap and trade’ principle. It limits emissions from nearly 11 000 heavy energy-using installations (power stations and industrial plants) and slightly over 500 aircraft operators operating between countries in the European Economic Area, and covers around 45 % of the EU’s GHG emissions.

A political agreement was reached in the beginning of November 2017 on phase 4 of the EU ETS, to help achieve a 43 % reduction (from 2005 levels) of emissions from energy production and industry by 2030, providing for:

- increasing the annual reduction in the overall number of allowances ("cap") from 1.74 % to 2.2 % from 2021 onwards, in order to deliver the emission reductions and achieve the underlying environmental objective;
- continued free allocation after 2021, including updates to the relevant benchmarks to reflect technological progress, criteria for the future inclusion of sectors in the carbon leakage list and procedures to account for changes in production levels and a continued possibility to compensate sectors for indirect carbon costs;
- several low-carbon funding mechanisms, in particular an Innovation Fund of at least 450 million allowances (to support the demonstration of innovative renewable-energy and low-carbon innovation in industry, and carbon capture, use and storage) and a Modernisation Fund of at least 310 million allowances (to help modernise the energy systems of 10 Member States with lower GDP).

Non-ETS

The EU Effort Sharing Decision covers emissions from the non-ETS sectors, such as buildings, transport and agriculture. Evaluation of the legislation that has been in place since 2013 shows that it has stimulated new national policies and measures.

Two legislative proposals tabled in July 2016 set out how Member States should implement their commitment to reduce its non-ETS emissions by 30 % by 2030 compared to 2005.

- First, for the 'effort sharing sectors', which are sectors outside the ETS and Land Use, Land Use Change and Forestry (LULUCF), each Member State would be subject to a binding annual greenhouse gas emission limits for the period 2021–2030. Member States agreed to share the relevant efforts on the basis of fairness, solidarity, cost-effectiveness and environmental integrity. The proposal thus recognises Member States' varying capacities to take action by differentiating 2030 targets primarily based on 2013 GDP *per capita*. The proposed 2030 targets range from 0 % to -40 % compared to 2005 levels.
- Second, Member States would be required to balance GHG emissions and removals from LULUCF under the 'no debit rule'. It is proposed that any debit from LULUCF would have to be entirely compensated by an equivalent removal of CO₂ from the atmosphere through action in the sector or, alternatively, in the effort-sharing sectors. For example, if a Member State increases its forest harvest, even within the limits imposed by sustainable forest management, it must compensate for the resulting emissions by establishing more forest area, and/or by improving the carbon management of existing forests, croplands and grasslands, or by further reductions in the effort-sharing sectors. In addition, Member States will also have the possibility to trade LULUCF credits. If implemented, this accounting system will help Member States to incentivise farmers and foresters to move towards climate-smart agriculture and forest management.

Energy

The EU has made progress towards achieving its targets of renewable generation equalling 20 % of energy, with a 16 % share of renewable energy in 2014 and an estimated 16.4 % in 2015. Moreover, the vast majority of EU countries are well on track to achieving their 2020 binding targets for renewable energy.

Likewise, the EU is broadly on track to meet its 20% 2020 energy efficiency target, despite an increase in primary and final energy consumption in 2015 driven by a colder winter and lower fuel prices. In 2015, primary energy consumption was 3.2 % above the 2020 primary energy consumption target and slightly below the 2020 final energy consumption target.

Continued efforts are needed to ensure that the 2020 targets are met and to lay the foundations for achieving the 2030 targets of a share of at least 27 % of EU energy consumption for renewable energy and 30 % energy efficiency. To support the delivery of these targets, the Commission adopted the Clean Energy for All Europeans Package in 2016, which aims to keep the EU competitive as the clean-energy transition changes global energy markets.

In this way, the EU can lead the clean energy transition, not only adapt to it. The eight legislative proposals in the package aim to put energy efficiency first, achieve global leadership in renewable energies and provide a fair deal for consumers. They include amendments to the directives on energy efficiency, the energy performance of buildings and renewable energy. On the same day, the Commission adopted measures in relation to eco-design and energy labelling as well as an overarching strategy, "Accelerating Clean Energy Innovation".

The proposed amendments to the Renewable Energy Directive include reforms across electricity, heating and cooling, and transport, including the introduction of coordinated regional approaches, targeted financial instruments, renewable heat and cooling obligations for fuel suppliers, and facilitation of uptake of district heating and cooling system. The reforms have been supported by the introduction of an EU heating and cooling strategy.

The proposal for an amended Energy Efficiency Directive includes provisions to align energy efficiency targets with the EU's 2030 climate and energy framework, extending beyond 2020 the obligation on energy suppliers and distributors to save 1.5 % of energy each year from 2021 to 2030.

The proposal for an amended Energy Performance of Buildings Directive includes provisions to help achieve a decarbonised building stock by 2050, clarify feasibility study and inspection requirements and promote electric vehicle uptake through infrastructure provision. It includes the provision of a smartness indicator for buildings, enhances the flexibility of funding mechanisms and increases building-data availability and quality.

Progress is also being made on the energy efficiency of products, through a new eco-design working plan for 2016-2019 which sets out existing and new product measures that have the potential to deliver more than 600 TWh of annual primary energy savings by 2030.

The Accelerating Clean Energy Innovation strategy, part of the Clean Energy for All European package, recognises the central role played by innovation and the importance of a regulatory framework that is conducive to innovation. This strategy sets 20 different actions to boost research and innovation in clean energy solutions and to bring results to the market quickly and successfully.

Transport

The 2011 White Paper on Transport put forward a goal of reducing by 2050 the EU GHG emissions from transport, by at least 60% (relative to 1990 levels). This target was reiterated by the EU low-emission mobility strategy, adopted in 2016, which also set an ambition goal of reducing – drastically and without delay – the emissions of air pollutants from transport. The analytical work underpinning the strategy highlighted how a reduction by 18-19% (relative to 2005 levels) of CO₂ emissions from transport would provide a cost-effective contribution to the 2030 Climate and Energy policy framework.

Although GHG emissions from transport have not shown the same decline as those in other sectors, provisional data published by the European Environment Agency show good progress on fuel efficiency of new cars, with average emission level of a new cars sold in 2016 at 118.1 grams of CO₂ per kilometre, significantly below the 2015 target of 130 g (the 2020 target is 95 g CO₂/km).

In order to optimise the transport system and improving its efficiency, the Commission has adopted a European Strategy for Low-emission mobility and an agenda for a socially fair transition towards clean, competitive and connected mobility for all. The Commission also adopted a European strategy on Cooperative Intelligent Transport Systems, a milestone towards cooperative, connected and automated mobility.

The EU Strategy on Low-emission mobility looks at how the transport sector can contribute to the 2030 climate and energy targets, and the transition to a low carbon circular economy. It presents an integrated, holistic approach through a wide range of actions, to address three key

levers: optimising the transport system and improving its efficiency, scaling up the use of low-emission alternative energy for transport, improving vehicles efficiency and the deployment of low and zero emission vehicles.

Different measures are being proposed to implement the Strategy:

- The revision of the regulatory framework for road charging. This proposal aims to broaden the scope of the legislation to include coaches and other light vehicles (such as passenger cars), support the shift to the "user and polluter pays" principles for all vehicles, and modernise road charging methods. The revision of the EU rules on buses and coaches aims to achieve a level playing field for all operators and better travel options for consumers. The proposed revision on combined transport will promote cleaner road freight.
- The revision of the Renewable Energy Directive. This proposal aims to support the development of advanced alternative fuels for transport. The Commission's favoured approach to achieve this is the incorporation of an obligation for advanced renewable transport fuels (including advanced biofuels and renewable electricity), alongside a reduction of food-based biofuels.
- The revision of the Clean Vehicle Directive, that aims to promote the use of public procurement to incentivise the creation of markets for innovative and low-emitting vehicles.
- An Alternative Fuels Infrastructure Action Plan, adopted by the Commission, to support the deployment of an EU backbone charging infrastructure.
- A proposal on new CO₂ emissions standards for cars and vans for the period post 2020. This proposal aims to further curb emissions from road transport, setting new EU-fleet wide targets for 2025 and 2030 and providing incentives for the uptake of low and zero emissions vehicles. Monitoring and governance is improved, in order to reduce deviations between real-world and test-cycle emissions.
- A proposal on monitoring and reporting of CO₂ emissions and fuel consumption from heavy duty vehicles. For this purpose, the Commission has developed a new measurement tool, the Vehicle Energy Consumption Calculation Tool (VECTO). This new monitoring and reporting scheme will enable the Commission to collect data on emissions and fuel consumption, and make them publicly available through the European Environment Agency.

Research and innovation are also identified as instrumental to the decarbonisation of the transport system. The EU foresees actions in the short term (2018-2020) and in the medium to long term (towards 2030 and up to 2050). Efforts will be coordinated at EU, national and local levels for implementation and deployment of innovative mobility solutions. To date, this has included the development of hydrogen fuel for transport, led by a Public-Private Partnership – the 'Fuel Cells and Hydrogen Joint Undertaking' (JU) – between the European Commission, industry and the research community, that will enable the commercial deployment of hydrogen by 2020. In addition, a Strategic Transport Research and Innovation Agenda was adopted this year as part of the European Commission's Strategy for low emission mobility.

Industry

The regulation of fluorinated GHGs (F-gases), including hydrofluorocarbons (HFCs), through the adoption of the EU directive on mobile air conditioning systems and the ‘F-gas Regulation’ is projected to lead to cumulative emission savings of 1.5 Gt CO₂-eq by 2030 and 5 Gt CO₂-eq by 2050. These acts have enabled the EU to rapidly ratify the Kigali amendment to the Montreal Protocol and show leadership in this area.

Agriculture

An initial analysis of Member States’ implementation choices under the new common agricultural policy regulations suggests that most are relevant to identified GHG emission reduction/climate needs and priorities. Important contributions to climate action will come from the combined effects of a number of measures, including cross-compliance, direct payments and rural development policy under the European agricultural fund for rural development, accompanied by support from the Farm Advisory Service and the activities of the European Innovation Partnership for Agriculture.

‘Greening’ rules mean that 30 % of the payments going directly to farmers are linked to adopting and mainstreaming farming practices that help meeting environment and climate goals. More than 30% of EU's rural development funds are dedicated to measures relevant for the environment and climate. In 2015, EUR 13.6 billion of the allocations committed under the CAP budget were climate-relevant; this value rose to EUR 18.7 billion in 2016.

Forestry

As outlined above, the Commission has adopted a legislative proposal to integrate GHG emissions and removals from LULUCF into the 2030 climate and energy framework. This does not include normative rules for the sector, but essential for capturing the GHG impact of activities not accounted under the ETS and Effort Sharing Regulation, such as biomass burning and agricultural CO₂ emissions.

Waste

Implementation of the EU’s circular economy action package has been key in progressing efforts to reduce emissions from waste. It provides a clear, systematic and holistic approach that focuses on a number of priority issues, including plastics, food waste, critical raw materials, and construction and demolition, and sets out clear actions, commitments and timetables.

The Commission has adopted a raft of legislative proposals on areas such as waste, packaging, landfill, end-of-life vehicles, batteries and accumulators, and waste electrical and electronic equipment. They include stricter targets, such as recycling 65 % of municipal waste and 75 % of packaging waste by 2030, and reducing landfill to 10 % of municipal waste by 2030.

v. PROJECTIONS

The latest available GHG projections, as reported by Member States show that the EU is on track to achieving its 2020 target. Under the ‘with existing measures’ (WEM) scenario, total GHG emissions (including international aviation) are projected to be 26 % lower in 2020 than

in 1990 and 30 % lower in 2030. Under the ‘with additional measures’ (WAM) scenario, projected GHG emissions are 27 % lower in 2020 and 32 % lower in 2030 than 1990.

It is projected that the most significant sectoral contribution in absolute GHG emission reductions from 1990 to 2020 will come from the energy sector (without transport), with emissions down by 36.5 % in 2020 and 41.8 % in 2030 under the WEM scenario, and by 37.1 % in 2020 and 44.0 % in 2030 under the WAM scenario. The energy sector is followed by agriculture, industry and the waste sector.

The transport sector is the only sector where emissions would still be higher in 2030 relative to 1990, due to high emissions growth during the 90s. GHG emissions from the sector are projected to be 13.8 % higher than 1990 levels in 2020 and 13.4 % higher in 2030 under the WEM scenario, and 12.7 % and 9.9 % higher in 2020 and 2030 respectively under the WAM scenario.

Reductions in CO₂ emissions are expected to contribute most to overall emission reductions in the EU. In the two scenarios, CO₂ reductions account for slightly over 80 % of the total between 2015 and 2020, followed by CH₄ (around 10 %) and N₂O (around 6 %).

Total estimated GHG reductions amount to 560 Mt CO₂-eq in 2020 under the WEM and 600 Mt CO₂-eq under the WAM scenario.

vi. IMPACTS, VULNERABILITY AND ADAPTATION

The EU recognises that some climate change impacts are unavoidable due to past emissions. It is investing in work to understand climate change impacts and is taking action to reduce vulnerability and adapt to a changing climate.

Since the last national communication, the EU has continued to strengthen the evidence base that supports decision-making on climate change adaptation and has stepped up its efforts to improve climate resilience in Europe. It is also strengthening cooperation with developing countries on adaptation.

Notable actions include: Mainstreaming adaptation into EU instruments such as regional development and the CAP. Dedicated instruments, such as: financial support for climate change adaptation projects in EU Member States through the LIFE programme; inclusion of the reports from Member States of their adaptation activities into the country pages of Climate-ADAPT; the fourth ‘Climate change, impacts and vulnerability in Europe report’, which considers past and projected climate change’s impacts on ecosystems and society; and the fourth macro-regional strategy (MRS) in the EU being published for the Alpine region.

Member States have made good progress as a result of this action. In all, 23 had adopted adaptation strategies by 2017 (compared to 15 in 2013), in part driven by the implementation of the EU strategy on adaptation to climate change. Evaluation of the adaptation strategy is under way and will be completed in 2018.

vii. FINANCIAL RESOURCES AND TRANSFER OF TECHNOLOGY

The EU and its Member States are the world's biggest providers of official development assistance to developing countries, delivering EUR 75.4 billion in 2016. In particular, the EU,

EIB and Member States provided EUR 20.2 billion to help developing countries tackle climate change in 2016.

For the EU alone, provision of bilateral financial support has increased during the reporting period, from USD 1 281 million (€ 964 million) in 2013 to USD 3 020 million (€ 2 730 million) in 2016. Total financial support provided by the EU in the years 2015 and 2016 amounted to USD 4 702 million (€ 4 247 million).

The EU has increased targeted support to the poorest and most vulnerable countries, through a variety of policies and measures, but specifically through the European Development Fund (EDF), Development Cooperation Instrument (DCI), and a new phase of the EU Global Climate Change Alliance Plus (GCCA+) Initiative, with respective commitments of USD 33 739 million (€ 30 500 million), USD 21 681 million (€ 19 600 million) and USD 479 million (€ 432 million) during 2014-2020.

The EU has mainstreamed technology transfer and capacity building activities into all development support.

viii. RESEARCH AND SYSTEMATIC OBSERVATION

The EU contributes to research and systematic observation (RSO) through the involvement of multiple actors, and various instruments, tools and programmes, and across multiple sectoral policies. Research is a shared competence of the EU and its Member States. Only actions coordinated at EU level are reported in the EU National Communication.

Key vehicles include Horizon 2020, the EU's 2014-2020 framework programme for research and innovation, where approximately 35 % of its budget is expected to be used for climate-relevant research and innovation.

Other action includes: LIFE+ (the EU's 2014-2020 funding instrument for the environment and climate); the 2014-2020 programme for the competitiveness of enterprises and SMEs; international cooperation enhanced through various platforms and instruments; contributions to and/or financial support for major international institutions, research initiatives and programmes, such as the UNFCCC, the Intergovernmental Panel on Climate Change (IPCC) and the global climate observing system (GCOS); and Mission Innovation – launched in the margins of COP 21 to accelerate global clean energy innovation through the doubling of clean energy R&I public investments in the next 5 years.

To facilitate the implementation of the strategy on accelerating clean energy research and innovation, over EUR 2 billion in Horizon 2020's work programme (2018-2020) have been allocated to programmable actions addressing four interconnected research and innovation priorities (decarbonising the EU's building stock by 2050, strengthening EU leadership in renewables, developing affordable and integrated energy storage solutions, and electromobility and a more integrated urban transport system). In addition, further research investments from Member States towards low-carbon energy are planned through the Strategic Energy Technologies (SET) Plan. It promotes research and innovation efforts across Europe by supporting the most impactful technologies in the EU's transformation to a low-carbon energy system. It promotes cooperation amongst EU countries, companies, research institutions, and the EU itself.

ix. EDUCATION, TRAINING AND PUBLIC AWARENESS

The EU has been investing significant effort and resources into raising its citizens' awareness of the challenges posed by climate change, but also the opportunities, in particular as regards reducing GHG emissions. Action in the field of education (e.g. Erasmus+, Horizon 2020 science education, the Knowledge and Innovation Communities of the European Institute of Innovation and Technology – in particular ClimaKIC and InnoEnergy), public information campaigns (e.g. climate-policy and open-door days), communication activities, training and awareness-raising campaigns have all played an important role in this context.

x. CONCLUSION

The domestic and international action taken by the EU and its Member States through the climate and energy package has resulted in significant emission reductions and the GHG reduction trends continue, with a clear decoupling of economic growth from GHG emissions. Action has also been stepped up, *inter alia* through new policy proposals to deliver additional emission reductions in key sectors post-2020.

The EU has continued to strengthen the evidence base for decision-making on climate change adaptation and has strengthened efforts to improve climate resilience in Europe. Furthermore, by stepping up the support and assistance it provides to developing countries, the EU has helped to enhance action globally.