

## ***EU Climate policy as a driver of change***

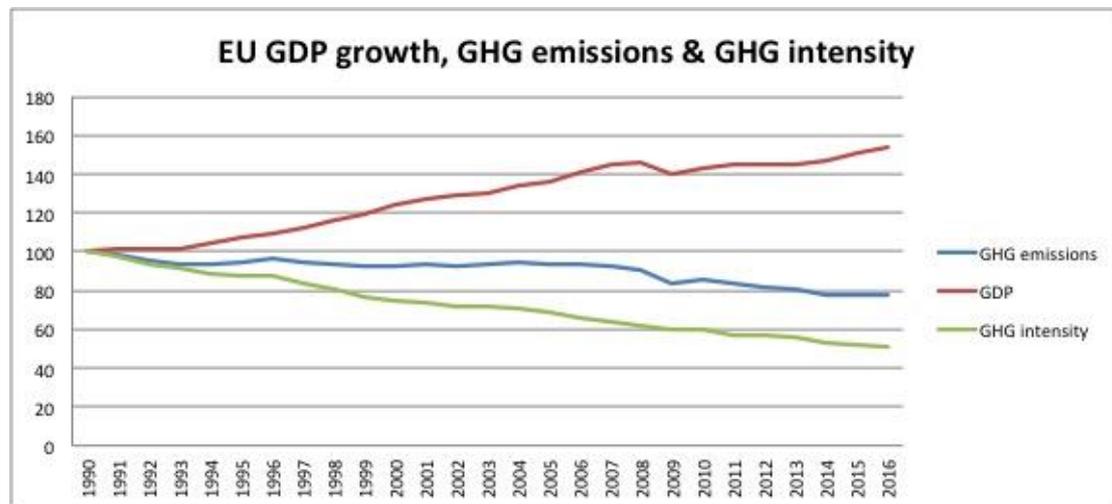
*by Jos Delbeke & Peter Vis*

### **1. Introduction**

The scientific imperative to address climate change is taken as accepted. The Paris Agreement succeeded in acknowledging universal recognition of the problem and the need for action by (almost) all countries, developed as well as developing ones. The question for policymakers has been and remains, what policies will get us to where we need to be while maintaining jobs and growth?

For the past 25 years the EU has been progressively building a toolbox of European policies to address climate change. To do this there needed to be accurate emissions data, excellent economic analysis, and the ability to learn through experience, adjusting existing policies if needed and establishing new policies when necessary. Learning-by-doing has been essential. The result since 1990 has been a reduction of emissions by 22% to 2016 and a clear decoupling of greenhouse emissions from economic growth in the European Union.

Figure 1: Evolution of EU GDP, greenhouse gas emissions and greenhouse gas intensity 1990-2016



(Source: European Commission)

### **2. International process**

The first major international climate agreement is the United Nation's Framework Convention on Climate Change, agreed in 1992 at the Earth Summit held in Rio de Janeiro. The goals of that Convention were insufficient, aspiring only to stabilise greenhouse gas emissions 'at a level that would prevent dangerous anthropogenic interference with the climate system'. It soon became clear that more specificity was needed, and the response was the Kyoto Protocol

in which it was agreed in 1997 that the industrialised countries would reduce their emissions, collectively by about 5.2%. Differentiated targets were set for the 38 countries covered by the 'quantitative emission limitation and reduction commitments'. The European Union collectively committed to an 8% reduction target compared to emissions levels of 1990, and it was importantly agreed that European countries could form a 'bubble' arrangement<sup>1</sup> that would allow that the target be met collectively rather than individually. This was the first important flexibility of the Kyoto Protocol that has shaped European policymaking since.

The Member States of what was then the 'European Community', and is now the 'European Union', agreed differentiated targets between themselves, which took account of their different comparative wealth but which would ensure their collective target was met. Although there was some modelling basis behind the setting of these differentiated targets, there was also a substantial degree of political arm-twisting and horse-trading. What mattered to the rest of the world was that the EU met its obligations, which it comfortably did by the end of 2012. Some countries, such as China, criticised the fact that under European bubble arrangements some European countries could emit more than in 1990 even though these were countries listed in Annex B of the Kyoto Protocol and were expected to limit or reduce emissions. The rationale for that re-distribution of effort within the European bubble was to take account of fairness. Fairness is exactly the concept that underlies the concept of 'Common but Differentiated Responsibilities and Respective Capabilities' of the Climate Change Convention and the Kyoto Protocol. This probably explains why criticism of the bubble concept has gradually subsided; the approach has even been praised by some as a model of how to ensure fairness within large and diverse countries.

The Kyoto Protocol's other crucial achievement was to get the EU going with respect to climate policies, which is exactly what it was supposed to do. Before the Protocol was agreed, there were no explicit European policies to address climate change mitigation. A CO<sub>2</sub>-energy tax had been proposed by the Commission in 1992<sup>2</sup>, in the context of the Rio Summit, but it had proven impossible to agree by unanimity (as is required for European tax measures). The only explicit climate policy instrument before Kyoto was the Monitoring Mechanism Regulation<sup>3</sup>, which was primarily intended to ensure European Member States properly reported their emissions to the UNFCCC Secretariat.

However, to prepare for ratification of the Kyoto Protocol, the Commission launched a European Climate Change Programme in 2000 to look closely at

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<sup>1</sup> Article 4 of the Kyoto Protocol.

<sup>2</sup> Proposal for a Council Directive introducing a tax on carbon dioxide emissions and energy COM(92)226 of 30.06.1992 (OJ C 196, 03.08.1992), later amended by Amended proposal for a Council Directive introducing a tax on carbon dioxide emissions and energy COM(95)172 of 10.05.1995.

<sup>3</sup> Initially Decision 93/389/EEC, and currently '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' published in OJ L 165 of 18.06.2013, pages 13-40.

options for policy instruments, in conjunction with stakeholders. Among the instruments being examined was that idea of introducing a European greenhouse gas Emissions Trading System. A Green Paper (consultative document) was published in March 2000<sup>4</sup> and a proposal for a Directive in 2001<sup>5</sup>. Remarkably, European Member States were the first to agree legislation<sup>6</sup> to introduce an Emissions Trading System from 2005 despite that fact that in Kyoto they had not been favourable towards its so-called 'flexible mechanisms' (allowing emissions trading between States and project mechanisms that generated carbon 'credits'). The fact is, though, that the Kyoto Protocol was instrumental in initiating the process that led to the introduction of the world's first multi-country greenhouse gas emissions trading (or 'cap-and-trade') scheme. No one can ever say that Kyoto was ineffective and without a real impact on policymaking. Several other policy measures grew out of the European Climate Change Programme, including policies relating to vehicle emissions, fluorinated gases, and energy efficiency measures.

Europe ratified the Kyoto Protocol in 2002 and led the efforts to ensure the Protocol's entry into force despite the US having decided in 2001 not to ratify. These efforts bore fruit and the Kyoto Protocol achieved the necessary number of ratifications to enter into force in 2005.

The targets of the Kyoto Protocol were applicable for a 5-year period, called the 'commitment period', running from 2008 to 2012. These years coincided with a number of extraneous events, such as a severe financial and economic crisis in the West and a very considerable expansion of shale gas in North America. At the same time policies generated a remarkable expansion of renewable energy across the world, such that the costs of solar energy fell by 73% between 2010-2017 and of on-shore wind by 18% between 2010-2016<sup>7</sup>.

Although the US never joined the Kyoto Protocol and Canada withdrew during the first commitment period, it was nevertheless agreed in Doha in 2012 to extend the Kyoto Protocol for a second commitment period running from 2013-2020. However, this amendment has not yet come into force and it is unclear whether it will ever do so<sup>8</sup>. It nevertheless served to renew the resolve of the European Union to show leadership, and in this context the EU set itself targets for 2020 that included a 20% greenhouse gas reduction goal<sup>9</sup>, a 20% renewable energy goal by the same year and a 20% improvement in energy efficiency

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<sup>4</sup> COM(2000) 87 final, 08.03.2000.

<sup>5</sup> Proposal for a Directive of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, OJ 75E 26/03/2002, p. 33-44.

<sup>6</sup> Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, OJ L 275, 25.10.2003, p. 32-46.

<sup>7</sup> 'Renewable Power: sharply falling generation costs', IRENA document 2017 [www.irena.org/costs](http://www.irena.org/costs).

<sup>8</sup> As of 3 May 2018, 112 Parties have deposited their instrument of acceptance of the Doha Amendment to the Kyoto Protocol (144 ratifications are needed for it to enter into force).

<sup>9</sup> Compared to 1990.

(compared to a business-as-usual projection without any additional policies and measures).

The setting of these goals for 2020 once again served to catalyse policy development within the European Union. After a communication by the Commission early in 2008<sup>10</sup>, the European Council endorsed the targets and by 2009 amendments had been agreed to several legislative instruments, including the EU's Emissions Trading System<sup>11</sup>, a Directive on renewable energy<sup>12</sup>, CO<sub>2</sub> performance standards for cars<sup>13</sup>, an amendment to the Fuel Quality Directive<sup>14</sup> mandating a reduction in the carbon content of fuels by 2020, and several energy efficiency measures. So once again, the international negotiations were the context within which climate policies were substantially developed further within Europe.

Most recently, in December 2015, the Paris Agreement was adopted, in which all countries made pledges, called 'Intended Nationally Determined Contributions'. Once again, the Europeans knew that they had to show leadership and set an example. It was never likely that all countries would make quantitative commitments to reduce greenhouse gases, but Europe had made such commitments previously and it was only a question of how large the commitments should be. There was, of course, considerable debate within Europe, and indeed within the European Commission, on the size of the reduction target. In the end, the European Union pledged a reduction of 'at least 40%' of its greenhouse gases by 2030 (compared to 1990). Furthermore, it was decided that this 40% reduction would be done within Europe, so without carbon credits from projects in other countries.

Although it looks as if the EU will meet, and even over-achieve, its commitments for 2020, all the Member States are not on track to fulfil their differentiated targets. The closure of nuclear power plants in Germany after the nuclear accident in Fukushima, Japan, has resulted in more coal and lignite being burnt in Germany, making its 2020 commitments harder to achieve. However, the EU is still on track and there is still time for all Member States to come into compliance with their obligations, including their renewable energy obligations, even if this

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<sup>10</sup> Communication '20 20 by 2020 - Europe's climate change opportunity' COM(2008)30 final, 23.01.2008.

<sup>11</sup> Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community, OJ L 140, 5.6.2009, p. 63–87.

<sup>12</sup> Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, OJ L 140, 5.6.2009, p. 16–62.

<sup>13</sup> 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<sub>2</sub> emissions from light-duty vehicles, OJ L 140, 5.6.2009, p. 1–15.

<sup>14</sup> Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC, OJ L 140, 5.6.2009, p. 88–113.

means using the flexibilities and cooperation mechanisms available between European States.

What is clear from the above is that the international negotiations are intricately linked to climate and clean energy policy development within Europe. Furthermore, Europe and European businesses can see very clearly the direction of travel. In 2011 the Commission published a low carbon economy 2050 roadmap<sup>15</sup>, but also an Energy Roadmap for 2050<sup>16</sup> and a Transport White Paper<sup>17</sup>. All three documents were based on economic analysis carried out jointly by the respective departments of the Commission and are consistent with each other. There is a clear longer-term commitment to reduce the EU's emissions by at least 80% by 2050.

The 2011 economic analysis is now being updated and the European Council has asked the Commission to come up with a new 2050 Strategy by the end of 2018. Taking into account the temperature goals of the Paris Agreement, to limit temperature increase to well below 2°C compared to pre-industrial levels while pursuing efforts to limit the increase to 1.5°C, it would seem inevitable that the analysis now being undertaken will not weaken but rather reinforce the effort required of the European Union over the coming decades. Whether that will entail a strengthening of the 2030 greenhouse gas reduction target remains to be seen, as logically that would re-open the fixing of national reduction targets for each Member State. The new European Commission, taking office in the autumn of 2019, will have to decide what further action to take to remain consistent with the EU's long-term goal and those of the Paris Agreement. Actions will certainly include strengthening research and development efforts, and doubtless strengthening existing policy instruments. The new Governance rules of the Energy Union will allow for much closer and more structured dialogue between the Commission and Member States, which could enhance emissions reductions as a result of the energy transition to be made across Europe. However, the real challenge will be identifying potentially new policy instruments, which could focus on new obligations for sectors where it has proven difficult to reduce emissions, such as transport.

What is more important in the near term is that the legislation that has already been proposed by the Commission, and is now being negotiated in Council and the European Parliament, such as the proposals on CO<sub>2</sub> standards for cars and vans<sup>18</sup>, as well as for trucks and buses<sup>19</sup>, and also proposals in the energy field

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<sup>15</sup> COM(2011) 112: 'A Roadmap for moving to a competitive low carbon economy in 2050' of 08.03. 2011.

<sup>16</sup> COM(2011) 885 'Energy roadmap 2050' of 15.12.2011.

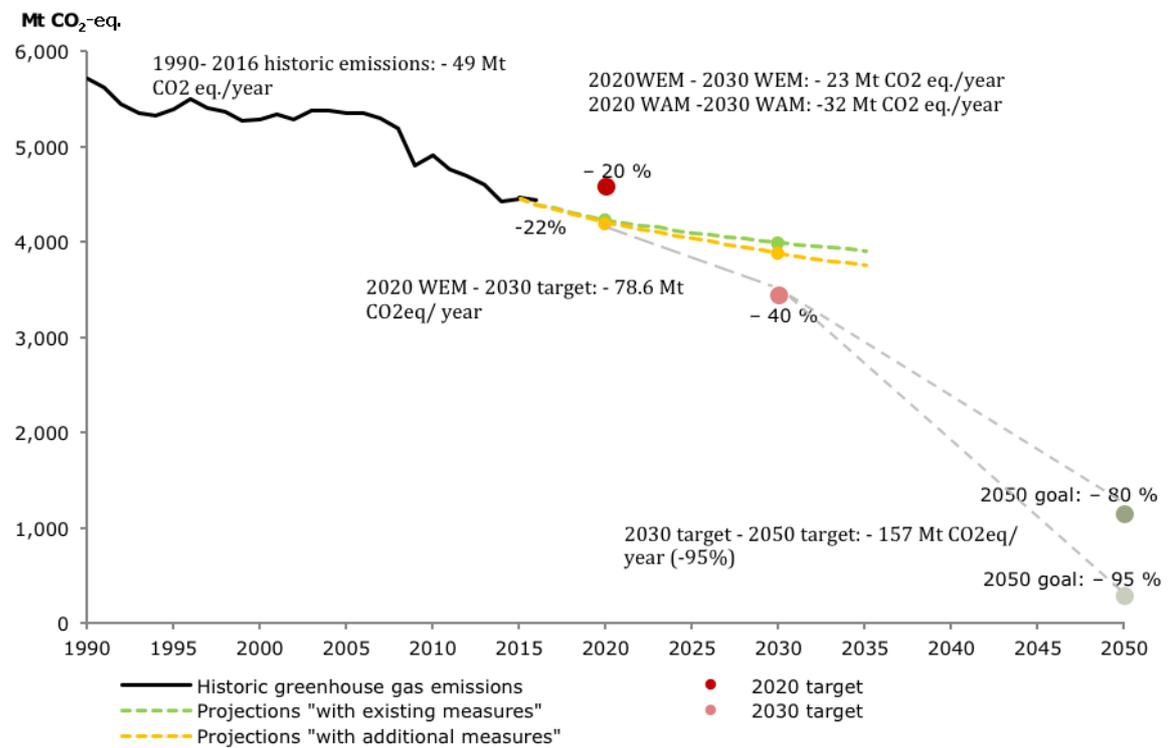
<sup>17</sup> COM/2011/0144 'White Paper: Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system' of 28.03.2011.

<sup>18</sup> COM/2017/676 - Proposal for a Regulation of the EP and of the Council setting emission performance standards for new passenger cars and for new light commercial vehicles as part of the Union's integrated approach to reduce CO<sub>2</sub> emissions from light-duty vehicles and amending Regulation (EC) No 715/2007 (recast), of 08.11.2017.

<sup>19</sup> COM(2018) 284 - Proposal for a Regulation of the European Parliament and of the Council setting CO<sub>2</sub> emission performance standards for new heavy-duty vehicles, of 17.05.2018.

related to the Market Design Initiative<sup>20</sup>, are adopted as quickly as possible. All legislation takes time to have its full effect. But the recently agreed energy targets, respectively 32% for renewable energy and 32.5% for energy efficiency improvements, may well lead to a higher than 40% greenhouse gas emission reduction. That would be entirely consistent with the ‘at least 40%’ target agreed by the Heads of State and Government in 2014<sup>21</sup>. It would put Europe in the right position for the much steeper emissions reductions that will be necessary in the period 2030-2050 than have been achieved so far (see Figure 2).

Figure 2: EU’s greenhouse gas reductions since 1990, commitments to 2020 and 2030, and possible trajectories to 2050 (Source: EEA)



What is evident from this graph is that steeper reductions will be needed post 2030 than have been achieved so far if we are to meet our 2050 goals. Businesses and investors that choose to ignore the clear direction of travel being given by the European Union on climate change, risk making the wrong investments in out-dated technologies that will likely incur higher compliance costs in the future, and possible economic loss through ‘stranded assets’. Opportunities risk also being lost in new technologies, where other countries, in particular China, are racing to create an industrial based producing goods that are needed in a low-carbon world, such as solar panels and electric vehicles of all sizes and types.

<sup>20</sup> Including Proposals COM(2016) 861 final/2 and COM(2016) 864 final/2 of 23.02.2017 relating to the Market Design Initiative, which would provide a new rule book for the EU energy market.

<sup>21</sup> European Council conclusions of 23/24 October 2014, EUCO 169/14.

### 3. EU policy response

In terms of the EU policy response to the progression of international agreements, two things are striking. First the number of climate policies at the European level has increased, and they cover a wide range of economic sectors such as energy, transport, industry, Research and Development. Fairness considerations and economic analysis both argue for such a wide coverage. There have developed over time a mix of policy instruments ranging from economic instruments (such as the Emissions Trading System) to regulatory standards (e.g. CO<sub>2</sub> performance standards for cars), to rather 'softer' measures that inform consumers when buying new products (such as energy labelling for appliances<sup>22</sup> and buildings<sup>23</sup>, and CO<sub>2</sub> labelling for cars on promotional material and at the point of sale<sup>24</sup>).

The second clear development is the need to adjust policies in the light of experience. Policymaking has been, and must remain, reactive and always looking to improve effectiveness. Given how comparatively new this policy area is, and the use of innovative instruments, such as emissions trading or CO<sub>2</sub> standards for cars, it is not really surprising that these policies needed to be adjusted and improved. This is certainly true for the Emissions Trading System, which essentially suffered from an unquestionable and unintentional over-supply of allowances (unintentional because the allocation of allowances had taken no account of the severe economic recession that started in 2008, but also because of the unexpected abundance of project credits that could be used within the EU's Emissions Trading System). It is also true of the methods of testing vehicle performance, in view of the increasing divergence over time between laboratory test results and the real driving performance of vehicles (not to mention the illegal use of 'defeat devices' with respect to some pollutants). In the necessary policy adjustments, there has been a combination of learning-by-doing as well as responding to fast evolving exogenous factors, such as the quantities of poor quality offset credits generated under the Clean Development Mechanism<sup>25</sup>, the economic slowdown in Europe after 2008-2009 financial crisis and the development of technologies behind the 'dieselpgate' episode.

European Climate policies have never just been about setting targets and hoping that they be met. First, target setting has always been informed by the best economic analysis possible, searching for cost-efficient outcomes and the maintenance of fairness between Member States. For example, although the least energy efficient Member States tend to be those in Central and Eastern Europe,

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<sup>22</sup> Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU, OJ L 198, 28.7.2017, p. 1–23.

<sup>23</sup> Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings, OJ L 153, 18.6.2010, p. 13–35.

<sup>24</sup> Directive 1999/94/EC of the European Parliament and of the Council of 13 December 1999 relating to the availability of consumer information on fuel economy and CO<sub>2</sub> emissions in respect of the marketing of new passenger cars, OJ L 12, 18.1.2000, p. 16–23 and Commission Directive 2003/73/EC of 24 July 2003 amending Annex III to Directive 1999/94/EC of the European Parliament and of the Council, OJ L 186, 25.7.2003, p. 34–35.

<sup>25</sup> A flexibility foreseen by Article 12 of the Kyoto Protocol.

these are also poorer Member States in terms of GDP per capita. Consequently, it cannot be expected that these States make the largest emissions reductions just because it would be cheaper to do so there than in richer, more energy efficient countries. The way to overcome such problems has been to propose flexibilities or funds that serve to redistribute revenues to finance investment in these less wealthy Member States. Specifically, this has in part been done by the differentiated national climate and energy targets for 2020, the climate targets for 2030, the successive amendments to the EU's Emissions Trading System and by the cooperation mechanisms of the Renewable Energy Directive.

Policies can be facilitators of greater fairness if designed carefully and with full engagement with all countries. Europe has not just looked for the existence of a qualified majority among Member States in Council but has sought to persuade all Member States by addressing their specific difficulties. The framing of the trade-offs has sometimes been very usefully made at the level of the European Council, through European Council conclusions, precisely because the bigger picture can be seen and the trade-offs and compromises crafted in a way that Ministers in the Environment Council or Transport, Telecommunications and Energy Council cannot do. At the level of fairness between companies, the CO<sub>2</sub> standards for cars do not treat all car manufacturers in the same way: the composition of each manufacturer's fleet is different and to address fairness between them, the average weight of the vehicles is taken into account in the establishment of each manufacturer's target.

As time has passed, the flexibilities of the differentiated climate targets for 2030 have been expanded compared to what they were for the sharing of effort within the EU bubble for 2008-2012 or for 2020. For 2030, the Climate Action Regulation not only provides for a novel limited flexibility with the EU's Emissions Trading System for Member States where economic analysis indicates higher costs of compliance in the sectors outside the Emissions Trading System, but there has also been introduced a limited flexibility with the agriculture and forestry sectors. We know that Member States differ considerably. Over time, therefore, EU climate policies have become more attuned to the specificities of each Member State, whether with larger agriculture or forestry sectors, more energy intensive industries, or a greater dependency on coal for generating electricity.

Finally, climate considerations were also taken into account in the elaboration of the EU budget for the period 2014-2020 more than ever before. Other than climate having a place in specific Funding programmes, such as LIFE, the European Regional Development Fund and Horizon 2020s research funding programme, for example, there was a political commitment made that 20% of EU Budget expenditure would be related to climate change<sup>26</sup>. This was a bold 'mainstreaming' of climate considerations into the EU Budget as a whole, and has not only had real effect in the last few years, but the Commission has proposed that it be continued and increased to 25% in the next multiannual EU Budget

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<sup>26</sup> The 20% commitment triples the share of between 6-8% in the previous Multiannual Financial Framework (2007-2013) and could yield as much as EUR 180 billion in climate finance in all major spending areas.

negotiations. This climate related expenditure objective in the EU Budget demonstrates that the EU is ready to put its money where its mouth is.

Space does not permit a more detailed description and explanation of climate-related policies developed at the European level, and this Chapter makes no attempt to detail the main measures developed at national and sub-national level across the Member States of the European Union. However, it is perhaps worth mentioning that the UK's Carbon Price Floor for emitters covered by the EU's Emissions Trading System in the UK does not result in an environmental improvement in terms of greenhouse gases, as UK operators are able to sell their allowances to operators throughout the rest of Europe who, as a result, are able to increase their emissions correspondingly. The UK's unilateral move resulted rather in extra revenues for the UK Treasury, and although it is likely to have accelerated the rate of decarbonisation of the UK economy, it has at the same time resulted in cheaper allowances across the rest of Europe due to the lower demand for allowances by UK operators, who try to minimise their liability under the Climate Price Floor. This illustrates how unilateral measures, though well intentioned, may result in competitive distortions, however marginal, without there necessarily being an overall environmental benefit, which impairs cost-efficiency as a whole. Indeed, any carbon price floor will not only give rise to demands to fix a price ceiling as well, but will constrain the market-based cost-efficiency gains of an economic instrument such as the EU's Emissions Trading System. Cost-efficiency is maximised by the comprehensiveness of EU-wide policies.

The EU has concentrated efforts on policies that potentially have the biggest environmental impact, that relate to companies competing with other companies in the same sector (e.g. electricity generators or energy intensive industries) or that relate to the performance standards of new products and appliances that are sold across the Union. There would be no sense in individual Member States setting their own standards in a single market where goods sold in one Member States must necessarily be allowed to be sold in all others. Economies of scale are maximised by harmonised standards across the EU.

#### **4. Carbon pricing and the EU's Emissions Trading System**

The establishment of carbon markets, implementing the polluter pays principle by putting an explicit price on carbon emissions, has not only been a novel development in Europe over the past 20 years but across the whole world. Other States and sub-regions of States have now introduced or are introducing carbon markets, such as China, New Zealand, US States and Canadian Provinces. More countries are considering doing the same.

Carbon taxes are clearly preferred by most economists, due to their greater predictability and the possibility of covering more sectors of the economy. However, despite the Commission's efforts, agreement on a CO<sub>2</sub>/energy tax between the EU Member States was impossible (the European Parliament does not have a strong role in taxation matters, giving only its non-binding Opinion). Later in the 1990s, when it was clear that the CO<sub>2</sub>/energy tax was not going to

win the support it needed, the EU did strengthen its energy products taxation Directive that worked through excise duties, but this Directive only imposes minimum rates of taxation – and industry benefits from substantial exemptions if Member States wish.

Given the climate commitments that Europe undertook under the Kyoto Protocol, more measures were needed in order to be certain to reduce emissions by the required amount. Article 17 of the Kyoto Protocol incorporates a reference to emissions trading between States, but this was enough for the Commission to take the initiative to do more work in this area. The Commission made a legal proposal for an emissions trading in 2001 that covered electricity and heat generation as well as more energy-intensive industries, which was adopted in 2003<sup>27</sup>.

The EU's Emissions Trading System started in 2005 with a 'pilot phase' of 3 years (2005-2007) that preceded the Kyoto Protocol's first commitment period (2008-2012). The pilot phase was always designed to familiarise governments and businesses with the instrument, and the learning from this phase was very rapid.

It was quickly realised that more stringent and more harmonised allocation rules were necessary to ensure that the system reduced emissions and that distortions were not created between competitors operating within the internal market. Initially allocation was practically all done by free allocation based on historic emissions, but from 2012 auctioning became the default rule for the electricity generation sector, and for industry free allocation was based on harmonised benchmarking per sector, based on the 10% most efficient plants of each sector. Essentially, these are the allocation rules that exist today, and in the next phase of the EU's Emissions Trading System (2021-2030) these free allocation rules will be based on more dynamic benchmarks, updated in the case of significant changes of production or of technological progress.

Other crucial changes have been introduced to the Emissions Trading System over time. Some of the most important were the restriction of offset credits to projects based in the Least Developed Countries from 2013<sup>28</sup>, and from 2021 offset credits will not be eligible for use at all within the EU's Emissions Trading System<sup>29</sup>. From 2012 the EU's Emissions Trading System included the aviation sector<sup>30</sup>, but this has in practice only applied only to flights within the European Economic Area<sup>31</sup>.

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<sup>27</sup> For references see footnotes 5 & 6.

<sup>28</sup> Directive 2009/29/EC (see footnote 11).

<sup>29</sup> Directive 2018/410.

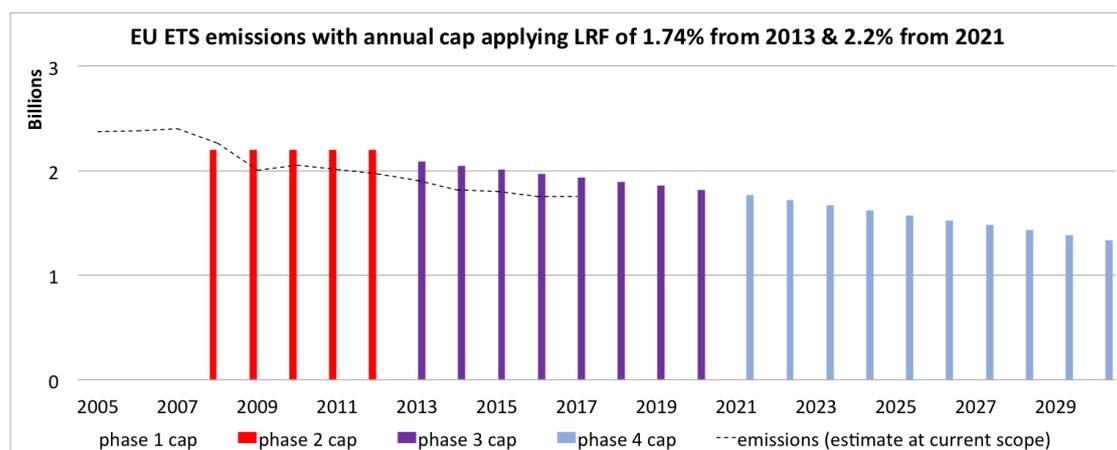
<sup>30</sup> Directive 2008/101/EC of the European Parliament and of the Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community, OJ L 8, 13.1.2009, p. 3–21.

<sup>31</sup> Regulation (EU) 2017/2392 of the European Parliament and of the Council of 13 December 2017 amending Directive 2003/87/EC to continue current limitations of scope for aviation activities and to prepare to implement a global market-based measure from 2021, OJ L 350, 29.12.2017, p. 7–14.

Another major innovation to the EU's Emissions Trading System was the introduction of a 'Market Stability Reserve' that will come into being from 2019<sup>32</sup>. It has been decided that when there is an excess supply of allowances in the markets, predictable quantities of allowances will be put into the reserve (rather than be auctioned), and only released when liquidity tightens to a pre-defined level. Although at first sight this may look like an additional complication, it is actually a crucial mechanism that ensures there is sufficient liquidity in the market without there being prolonged over- or under-supply. Also, importantly, the Emissions Trading System is now able to automatically adjust the supply of allowances if unforeseen economic situations arise, or other climate related policies are adopted and function effectively. As such, the Market Stability Reserve increases the compatibility of the EU's Emission Trading System with other policies, such as energy efficiency and renewable energy policies.

One other important feature of the EU's Emissions Trading System is that the overall supply of allowances (so, the overall level of emissions permitted by the system) is subject to an annual reduction of 1.74% per year, every year. With effect from 2021 the Linear Reduction Factor will change to 2.2% per year, and continue indefinitely unless changed. Figure 3 shows the steady reductions in the allowable emissions within the EU's Emissions Trading System through to 2030 taking into account the change of the Linear Reduction Factor. This crucial feature ensures not only that emissions covered are reduced through to 2030, but also that reductions will continue beyond that date. It is this predictable environmental outcome that delivers much greater certainty that the European Union will fulfil its international commitments. It does so in a way that businesses can plan for, and which can steer new long-term investments.

Figure 3: Actual emissions covered by EU's Emissions Trading System and the projection with the 1.74% and 2.2% Linear Reduction Factors



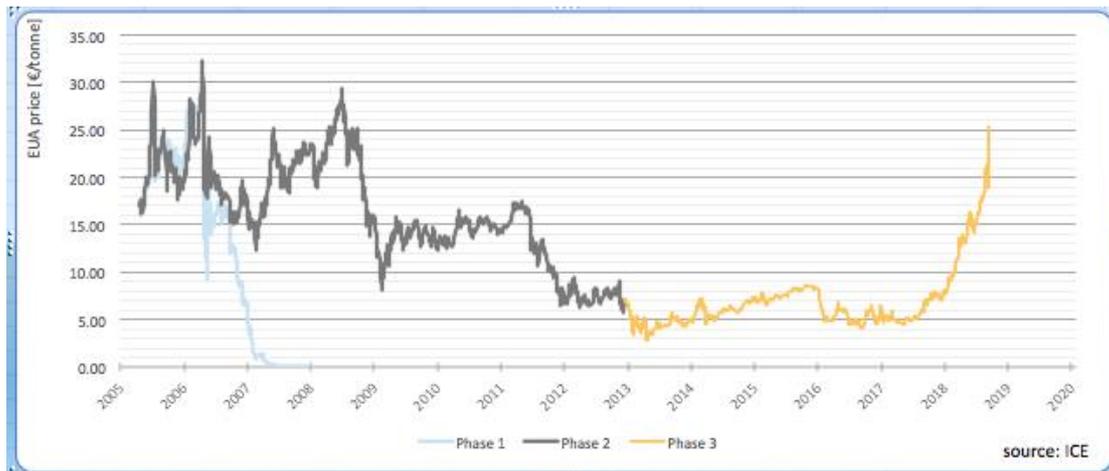
(Source: European Commission)

<sup>32</sup> Decision (EU) 2015/1814 of the European Parliament and of the Council of 6 October 2015 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and amending Directive 2003/87/EC, OJ L 264, 9.10.2015, p. 1–5.

Free allocation to industry sectors in competition with third countries has minimised adverse impacts on the competitiveness of European industry, and free allocation will continue for the foreseeable future. Other ways of minimising competitiveness impacts, such as border tax adjustments, are sometimes suggested. These would be highly complex to administer, given the complexities of monitoring emissions in countries across the global. If simplified estimates of the carbon content of primary goods, such as steel, are to be used, these simplifications would also lead to inaccuracies and unfair impacts on the products of some producers: how would steel from electric arc furnaces running on nuclear energy be compared with steel made in blast furnaces using fossil fuels? Border tax adjustments thus fail on implementation practicalities. Moreover, as part of its overall policy agenda, the EU consistently favours more free trade agreements and is less inclined to initiate 'protectionist' measures – even if the US is now introducing greater protectionism.

To conclude, the EU's Emissions Trading System is an instrument covering some 45% of the EU's emissions and ensuring cost-effective greenhouse gas reductions by electricity generators and industry. Between 2005 and 2016, the sectors covered by the EU's Emissions Trading System reduced their emissions by some 26%. The problems of over-supply that have beset the carbon market since its creation have recently been effectively addressed by reforms to the Emissions Trading System that have made it more resilient and increased its stringency. This is reflected in the price of carbon allowances in Figure 4 that have staged a pronounced recovery in recent months. The price of carbon will fluctuate, as do prices in all free markets. It would be wrong to say that there needs to be a particular level of carbon price to have an impact: at whatever level, carbon price has an impact on different technologies and fuel mixes in different sectors. Let us not forget that oil, gas and coal prices fluctuate, as do the prices of new renewable technologies (though the latter are usually on a downward price trajectory). As scarcity increases under the EU's Emissions Trading System, as it will do, carbon prices are expected to rise correspondingly. As the carbon price rises, more and more decarbonisation options become viable.

Figure 4: Prices of European Carbon Allowances (EUAs) from 2005 to September 2018



(Source: Intercontinental Exchange (ICE))

## 5. Conclusion

The international climate negotiations provide a valuable source of inspiration for Europe and serves as a forum in which the European Union provides leadership and urges other countries to act. The Paris Agreement, and its implementing provisions that were largely agreed at the 24<sup>th</sup> Conference of Parties to the UNFCCC in December 2018, is the current vehicle for international action<sup>33</sup>. Europeans have been moving forward on climate policies together: European Council conclusions have always been agreed on the basis of unanimity, and these conclusions have served as a mandate upon which Commission proposals have been based and subsequently agreed by the co-legislators (the Council and the European Parliament). Re-distributional elements are very much at the heart of climate policy, through target differentiation, revenue redistribution and the creation of dedicated funds for modernisation of the energy sector in poorer Member States or to promote innovation in energy intensive industries.

The power of carbon pricing has been reinforced, not just influencing behaviour by application of the polluter pays principle but also by using revenues raised for climate-related expenditure. Since 2012, when the default became auctioning for the power sector, more than EUR 20 billion has been raised by Member States, and in the year 2016 80% of the revenues generated were spent on climate-related expenditure<sup>34</sup>. Between 2021 and 2030 the Innovation Fund alone, assuming a carbon price at today's level of about EUR 20 per tonne of CO<sub>2</sub>-equivalent, may raise revenues of EUR 9 billion for helping to fund innovation in the industry and energy sectors.

<sup>33</sup> The “rulebook” for the Paris Agreement was agreed at COP-24 but adoption of the implementing rules for mechanisms under Article 6 of the Paris Agreement are still being negotiated.

<sup>34</sup> Report from the Commission to the European Parliament and the Council on the functioning of the European carbon market (COM/2017/693) of 23.11.2017, Section 3.1.2.4.

It continues to be the case that global technological leadership eventually translates into global political leadership. This has been true in history, most strikingly during the industrial revolution, but also with regard to today's digital, space and defence technologies. A battle is now being fought around the low carbon economy: the science emphatically tells us that societies must decarbonise. There is a global energy transition in the making that is moving geo-political power away from fossil fuels towards low carbon technologies, such as for renewable energy or electric vehicles. Europe's industrial prowess has, until today, been based on coal and more recently oil. The race is now on to lead on clean technologies, and ideally those at the top of the value chain. If Europe does not act with sufficient determination, we will be dependent on others for essential technologies of the future. This explains the expansion of expenditure for research and innovation in the European Union's present and future budgetary frameworks. This explains the design of the EU's climate policy framework. What may have started as a European wish to fulfil its international obligations under the Kyoto Protocol has become the embryo of a strategy for a clean energy transition that forces the pace of change across Europe so as to ensure that Europe develops and manufactures future-orientated technologies that need to be deployed worldwide.

Although political decisions are difficult to take all at once, the European Union has a clear direction of travel. The last 20 years have been fertile years in terms of European climate policymaking, with adjustments being made when needed as a result of learning-by-doing. Europe has shown that it is ready to step up to the challenge. Everything may have not been optimal from the start, but the policy toolbox is being improved all the time in readiness for the further challenges ahead.