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PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL  
COMMITTEE, THE COMMITTEE OF THE REGIONS AND THE EUROPEAN  
INVESTMENT BANK**

**Third Report on the State of the Energy Union**

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## I. INTRODUCTION

Europe's transition to a low-carbon society is becoming the new reality on the ground. The Energy Union, one of the ten priorities of this Commission, is creating new jobs, growth and opportunities for investment. Last year's Clean Energy Package for All Europeans<sup>1</sup> and the proposals on low-emission mobility presented in November 2017 were major milestones in this process<sup>2</sup>. Less than three years since the publication of the Energy Union Framework Strategy<sup>3</sup>, the Commission has presented nearly all the proposals needed to deliver on the energy efficiency first principle, support EU global leadership in climate action and renewable energy and provide a fair deal for energy consumers.

This third State of the Energy Union tracks the progress made over the past year and looks forward to the year ahead. Now is the time to mobilise all of society - citizens, cities, rural areas, companies, academia, social partners - to take full ownership of the Energy Union, take it forward and **engage** in developing the solutions of the future.

The Commission welcomes the strong commitment of the European Parliament and the Council to adopt, as a priority, the legislative initiatives on energy and climate proposed in 2015 and 2016, in line with the Joint Declaration of the three Presidents<sup>4</sup>. The Commission calls on the co-legislators to retain a high level of ambition and coherence between the different proposals.

In the meantime, it is important to continue rapidly delivering a number of **enabling measures**<sup>5</sup>, to ensure that the transition to a low carbon economy fully contributes to the modernisation of Europe's economy. This will also help Member States to comply with the jointly agreed 2020 and 2030 energy and climate targets and with the wider Energy Union objectives.

Completing the Energy Union requires close cooperation between the Commission, Member States and all segments of society. It is a process of co-creation in which the timely submission by Member States of draft **integrated national energy and climate plans** for the post-2020 period is a key milestone. Most Member States have started to prepare their national plans, but they all need to make substantial efforts to finalise the draft plans by early 2018.<sup>6</sup> Early submission is crucial to generate investor confidence and certainty for the period after 2020. Having the draft plans by early 2018 is also essential to demonstrate the Union's strong leadership on the global stage.

Global changes in energy production and demand have a significant impact on geopolitics and industrial competitiveness. This poses serious challenges to Europe, but also creates unique opportunities. In this context, the EU wants to step up its role as a global leader in the clean energy transition while providing energy security to all its citizens. Therefore, its ambition to complete and deliver the Energy Union remains high. The work is by no means finished. Showing ambition on issues such as renewables, energy efficiency, climate action and clean

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<sup>1</sup> See the Communication "Clean Energy Package for All European" (COM(2016) 860).

<sup>2</sup> COM (2017) 283 of 31 May 2017 and COM(2017) 675 final

<sup>3</sup> The Energy Union project is one of the ten political priorities of the current Commission: "A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy (COM(2015) 80).

<sup>4</sup> [http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016C1224\(01\)&from=EN](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016C1224(01)&from=EN).

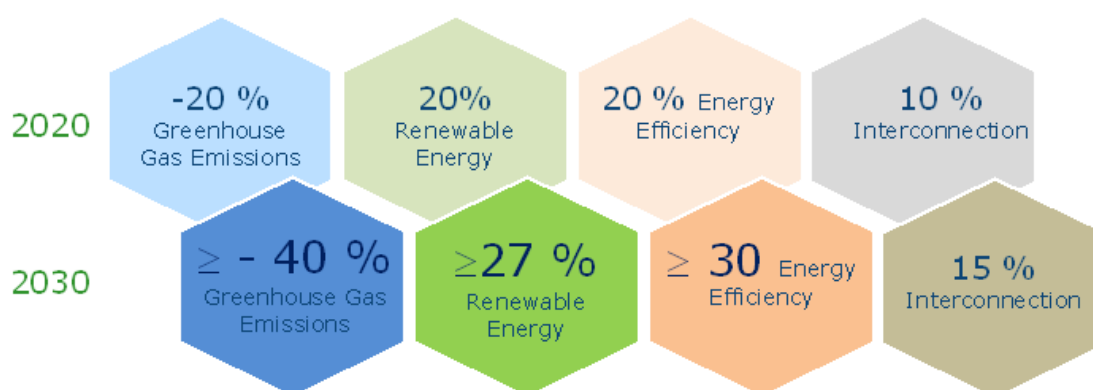
<sup>5</sup> COM(2016) 860 and its 2 annexes

<sup>6</sup> See Annex 3 to this Communication on the state of progress towards the national energy and climate plans.

energy innovation and ensuring the right price signals in the market, is a precondition to attract investments in modernising the entire economy.

We must therefore accelerate our cooperative efforts and deliver on our commitment to complete the Energy Union by the end of the current Commission mandate. By 2019, the Energy Union must no longer be a policy. It must be a reality.

## 2030 Framework for Energy and Climate - Agreed headline targets



## II. TRENDS AND POLICY OBSERVATIONS

Europe is moving from a fossil fuels-based energy system to a low-carbon and fully digital and consumer centric one. The main trends observed in recent years have continued and even been strengthened in some areas<sup>7</sup>.

The share of renewable energy in the EU energy mix continues to rise and is on track to reach the 20% target in 2020. In 2015, renewable energy accounted for most (77 %) of the new EU generating capacity for the eighth consecutive year.<sup>8</sup> The cost of renewables is falling, for instance for solar (photovoltaic)<sup>9</sup> as well as onshore and off-shore wind. This is a sign of investors' confidence in technological progress, good policy design and electricity market reforms.<sup>10</sup> In the past, investments in renewables have been negatively affected when Member

<sup>7</sup> See detailed Commission reports accompanying this Communication, more detailed policy observations for the five dimensions in Annex 2 to this Communication and the 28 country fact sheets accompanying this Communication, which outline the situation in each Member State, including for air quality. See also the accompanying European Environment Agency Report No 17/2017 Trends and projections in Europe 2017.

<sup>8</sup> EEA Report No 3/2017: Renewable energy in Europe 2017,

<https://www.eea.europa.eu/publications/renewable-energy-in-europe-2017>

<sup>9</sup> See the accompanying document "Study on Residential Prosumers in the European Energy Union", JUST/2015/CONS/FW/C006/0127, Figure 8 at p. 77.

<sup>10</sup> Previous tender-based support schemes in the period 2010-2015 for offshore wind resulted in final prices between 103.2 EUR/MWh (Horns Rev III, Denmark) and 186.1 EUR/MWh (Dudgeon, United Kingdom). This continuously decreased and the latest competitive bidding process for offshore wind in Germany in April 2017 three winning projects placed a € 0 bid. For PV installations in Germany the support came down from 9.17 ct/kWh in April 2015 to 5.66 in June 2017.

States applied retro-active measures. In terms of security of supply, renewables have saved an estimated €16 billion in fossil fuel imports (2015 data)<sup>11</sup>.

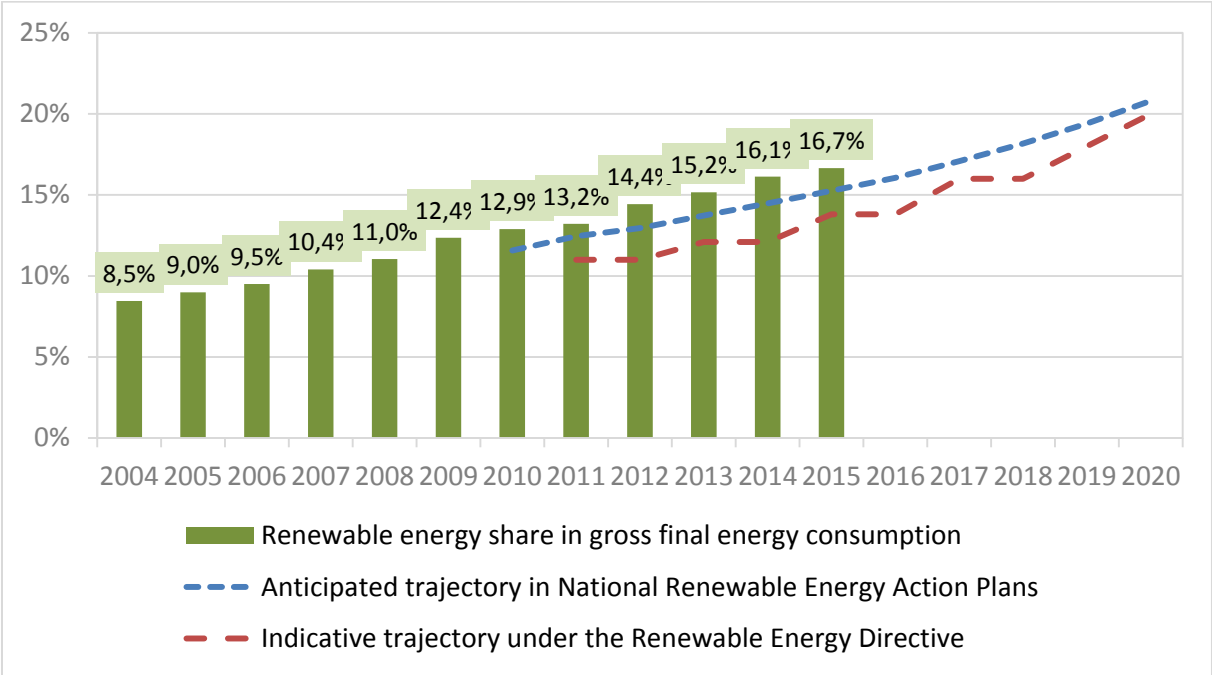


Figure 1: Renewable energy shares in EU gross final energy consumption vs. Renewable Energy Directive and National Renewable Energy Action Plan trajectories

The decoupling of greenhouse gas emissions and Gross Domestic Product (GDP) has continued, mainly driven by innovation.<sup>12</sup> In 2016, the recovery of Europe's economy led to an increase in industrial and economic activities and an overall increase of 1.9% in GDP. This could have increased greenhouse gas emissions. But instead, emissions decreased by 0.7% overall and even faster (2.9%) in the sectors covered by the EU Emission Trading System. Overall, between 1990 and 2016, the EU's combined GDP grew by 53%, while total emissions<sup>13</sup> decreased by 23%<sup>14</sup>. In the transport sector, however, greenhouse gas emissions continue to rise.

<sup>11</sup> Renewable Energy Progress Report 2017, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017DC0057&qid=1488449105433&from=EN>  
<sup>12</sup> [https://ec.europa.eu/clima/sites/clima/files/strategies/progress/docs/dca\\_report\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/strategies/progress/docs/dca_report_en.pdf).  
<sup>13</sup> Excluding land use, land-use change and forestry (LULUCF) but including international aviation.  
<sup>14</sup> According to the approximated inventory for 2016. See "Two years after Paris, Progress towards meeting the EU's climate commitments" (COM(2017) 646 final)

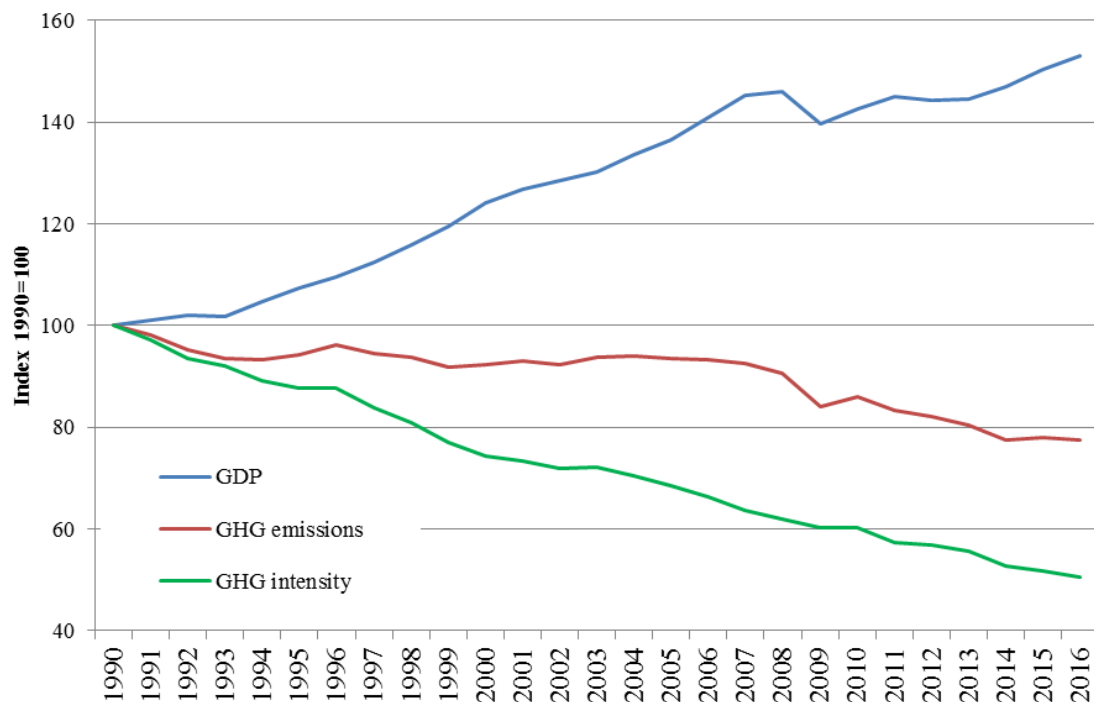


Figure 2: Changes in EU GDP (in real terms), EU greenhouse gas (GHG) emissions, and EU GHG emissions intensity of the economy (ratio between emissions and GDP) Index (1990 = 100)

Economic growth and energy consumption have also been decoupled. The steadily declining demand for energy in the EU is primarily due to energy efficiency measures in the Member States. Although energy consumption increased slightly in 2015 due to higher economic growth, lower oil and gas prices and a colder winter compared to an exceptionally warm 2014, the long-term downward trend is clear: in 2015, the EU consumed 2.5 % less primary energy than it did in 1990, while GDP grew by 53% over the same period. That said, the EU still needs to reduce its primary energy consumption by 3.1% between 2015 and 2020 to reach its energy efficiency target.<sup>15</sup>

<sup>15</sup> Final energy consumption is the energy supplied to industry, transport, households, services and agriculture excluding deliveries to the energy transformation sector and the energy industries themselves. Primary energy consumption also includes the latter.

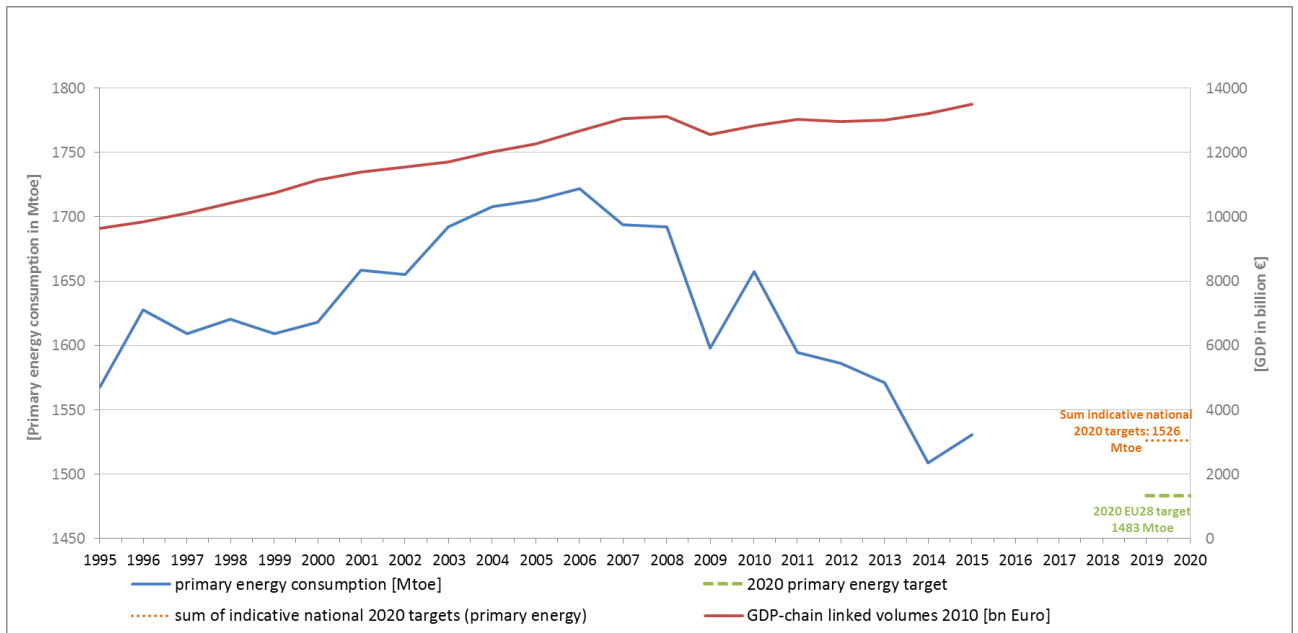


Figure 3: Evolution of GDP and primary energy consumption in the EU 28. Source: Eurostat

The ongoing energy transition feeds into the modernisation of the European economy. For example, patenting activity in clean energy technologies in Europe is increasing. European companies are also increasingly seeking protection for their inventions internationally, proving a growing confidence of their competitiveness in the global energy technology market. The EU ranks second following Japan on international patents.

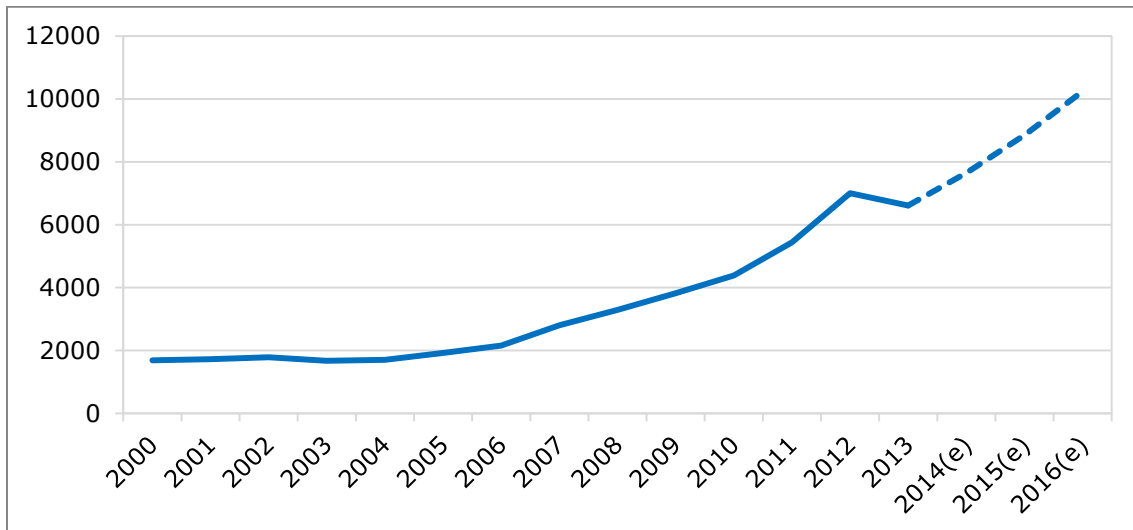


Figure 4: Trend of EU patents in clean energy technologies. Data source: European Commission/Joint Research Centre (based on data of the European Patent Office). Data for years 2014, 2015 and 2016 are estimates.

Despite these positive trends, the clean energy transition may be hindered by unfair competition if Member States continue to provide fossil fuel subsidies. These come in many forms, such as direct subsidies to uneconomical coal mines<sup>16</sup>, capacity mechanisms for

<sup>16</sup> Member States are allowed to provide closure aid until 2018, to cover the current production losses in the context of the definitive closure of uncompetitive coal mines. Aid to cover exceptional costs in order to alleviate

emission intensive power plants, tax relief for company cars or diesel fuel and similar measures. Fossil fuel subsidies also increase the risk of investing in stranded assets, which need to be replaced before the end of their lifetime. The integrated national energy and climate plans should help to better monitor and assess Member States' efforts to reduce fossil fuels subsidies. The next report on energy prices and costs in 2018 will provide updates on fossil fuel subsidies in the EU.

### III. ASSESSMENT OF PROGRESS

The energy transition should be **socially fair**, lead to **innovation** and be based on a future-proof **infrastructure**, while enhancing security of supply. The European Union's **investment** instruments and its **foreign and development policies** underpin Europe's energy transition. In all these areas, considerable progress was made in 2017.

#### *A socially-fair energy transition*

The transition to a low-carbon society affects many people, as consumers, workers, employees or energy market participants. While not everybody may benefit from the energy transition in the short term, it will, if carefully managed, ultimately benefit the entire EU economy, by creating new job opportunities, bringing savings on energy costs or improving air quality. Many of the enabling actions under the 'Clean Energy for all Europeans' package are meant to address the difficulties some regions or population groups have in reaping the benefits of the energy transition.

#### *Enabling actions on carbon-intensive regions and islands*

*In 2017, the Commission started to provide tailor-made support and assistance to regions in transition which have been or remain reliant on coal and carbon-intensive industries. These regions face specific economic and social challenges. Work has started with the regions of Trenčín in Slovakia and Śląsk in Poland, in close partnership with national and regional authorities. The support includes providing research on the economic strengths of these regions, technical assistance and advice on the targeted use of a number of available EU funds and programmes. The Commission will continue to work closely with these regions and will extend the pilot to other interested Member States. This initiative will also aim to tap into the experiences of European regions that have been successful in making the transition. To that effect, an EU-wide platform of stakeholders will be set up in December 2017.*

*Although islands are often well placed to attract clean energy investments, they face specific challenges due to their geography, small economy and heavy reliance on imported fossil fuels. The Commission, together with 14 Member States, signed a political declaration in May 2017, in Malta, to accelerate the clean energy transition on islands. The first forum under the initiative took place in Crete, in September. The initiative aims to provide Europe's 2400 inhabited islands with a long-term framework, helping them reduce their dependency on energy imports by making better use of their own renewable energy sources.*

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the social and environmental impact cannot expand later than 2027 (Council Decision 2010/787/EU of 10 December 2010 on State aid to facilitate the closure of uncompetitive coal mines).

The transition to a low-carbon economy will create new jobs in the energy sector<sup>17</sup> and in the wider economy. This job potential requires new **skills** and competences. The Commission has therefore just published a call for proposals for Blueprints for Sectoral Cooperation on Skills to address skill needs on clean technologies, renewable energies and in the construction sector<sup>18</sup>. A similar framework for the automotive sector was launched last year. To improve the understanding of skill gaps across countries and sectors, the European Centre for the Development of Vocational Training (Cedefop) is undertaking big data analysis based upon real-time interrogation of job vacancies and the first results will be available in 2018.

**Energy poverty** in the EU affects close to 50 million people. As part of the clean energy package, the Commission has proposed a range of measures to address energy poverty through energy efficiency, safeguards against disconnection and a better definition and monitoring of the issue at Member State level. By the end of 2017, the European Energy Poverty Observatory will publish statistics and reports on an interactive web portal. In the next phase, it will focus on the exchange of information and sharing of best practice among experts and policy makers. A pilot awareness-raising campaign has been launched and will be rolled out in four Member States (Czech Republic, Greece, Portugal, and Romania) in the course of the next year. The campaign focuses on increasing the awareness of energy-poor consumers of their rights and will provide consumers with energy-saving tips and information on low-cost energy efficiency improvements.

The energy transition has a positive impact on the **health** of many European citizens. Total emissions of pollutants like sulphur dioxides, nitrogen dioxides and particulate matter are decreasing in the EU but air pollution still leads to over 400,000 premature deaths every year.<sup>19</sup> By adopting the National Emissions Ceilings Directive in December 2016<sup>20</sup>, the EU aims to decrease by half the number of premature deaths caused by air pollution by 2030. The energy transition could further reduce toxic emissions and accelerate the improvement of quality of life in many European cities where citizens are confronted with air pollution every day<sup>21</sup>. Smart investments in cleaner transport and domestic heating will also support the economy by reducing health care costs and sickness days caused by respiratory diseases.

### *An energy transition that innovates*

The Energy Union is a major driver of clean energy innovation in Europe and the rest of the world. European companies and innovators should be at the forefront of this movement and gain an early mover advantage for new technologies and business models. This is one of the key objectives of the Accelerating Clean Energy Innovation strategy<sup>22</sup>.

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<sup>17</sup> While jobs related to the supply of carbon intensive energy sources in the EU decreased by 67.000 from 2008 to 2014, green jobs in the energy sector increased by over 400.000 during the same period (data from Eurostat).

<sup>18</sup> The Erasmus+ Sector Skills Alliance call for proposals was published on 25 October: [https://eacea.ec.europa.eu/erasmus-plus/actions/key-action-2-cooperation-for-innovation-and-exchange-good-practices/sector-skills-alliances\\_en](https://eacea.ec.europa.eu/erasmus-plus/actions/key-action-2-cooperation-for-innovation-and-exchange-good-practices/sector-skills-alliances_en)

<sup>19</sup> EEA report 'Air Quality in Europe - 2017', p. 17.

<sup>20</sup> Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC, OJ L 344, 17.12.2016, p. 1–31

<sup>21</sup> See Commission Impact Assessment accompanying the proposal for the amended Energy Efficiency Directive, SWD(2016) 405 final, p. 59

<sup>22</sup> COM (2016) 763 final



Europe is one of the most innovative regions worldwide, but more efforts are needed to bring these innovations to the market and turn them into growth and job opportunities.

As research and innovation take time, medium-term benefits on the ground depend on immediate preparatory action. Therefore, last year EU funding was scaled up. Cohesion policy supports innovation through smart specialisation (at least €2.6 billion will be targeted to research and innovation in low-carbon technologies<sup>23</sup>), while Horizon 2020 will deploy over €2 billion in the period 2018-2020, focussing on four key energy and climate priorities: storage, renewables, buildings and (urban) e-mobility. Accounting for bottom-up activities, the total amount may even rise to €3 billion.<sup>24</sup> Furthermore, the budget of the InnovFin Energy Demonstration Projects facility, a financial instrument that supports first-of-a-kind projects on low-carbon energy technologies doubled to €300 million using Horizon 2020 funds and is now also able to channel the additional undisbursed revenues from the NER 300's first call<sup>25</sup>.

Batteries are a strategic part of the innovation priorities defined last November. With increasing performance and falling costs, batteries will be an essential enabling technology for reaching the Energy Union objectives, in particular through applications in electro-mobility and electricity storage. On the financing side, the Commission is ready to mobilise substantial support for batteries and battery cell technology. For this purpose, the Commission is working with the innovation ecosystem, Member States and industrial stakeholders along the full battery value chain to identify priorities and needs, to build an EU Battery Alliance with battery cell manufacturing at its core. The outcome will feed into the Clean Energy Industrial Competitiveness Forum to be held February 2018. This complements regulatory action to remove disincentives to energy storage and promote electro-mobility. Similar joined-up approaches are replicated in other priority areas, such as renewable energy and the decarbonising of Europe's building stock, leading to tangible industrial and economic benefits for Europe.

#### *Enabling actions on innovation in cities*

*Cities are where much of the innovation and investment needed for the energy transition occur. In 2017, cities across the EU took a number of concrete initiatives to develop and implement new and innovative technologies to support the energy transition. Through the Urban Innovative Actions, the cities of Gothenburg, Paris and Viladecans started testing innovative solutions that could be transferred to other EU cities.<sup>26</sup> Under the Covenant of Mayors initiative, now being expanded beyond Europe<sup>27</sup>, cities in Europe, the neighbourhood and enlargement regions have adopted an integrated approach and taken decisive action on climate change mitigation and adaptation, and on access to affordable and sustainable*

<sup>23</sup> The Commission has established five interregional partnerships for energy innovation (on bioenergy, marine renewable energy, smart grids, solar energy and sustainable buildings); COM(2017)376.

<sup>24</sup> This includes €15 million for two innovation prizes, on artificial photosynthesis and on batteries.

<sup>25</sup> NER 300 is a funding programme for innovative low-carbon energy demonstration projects. It is funded from the sale of 300 million emission allowances from the New Entrants' Reserve (NER) set up for the third phase of the EU emissions trading system. EUR 2.1 billion has been allocated to innovative renewable energy projects and CCS projects in 20 Member States. Five projects have not materialized, and related undisbursed revenues are being provided back to market via InnovFin EDP and CEF Debt Instrument.

<sup>26</sup> <http://www.uia-initiative.eu/en/uia-cities>

<sup>27</sup> [http://www.covenantofmayors.eu/index\\_en.html](http://www.covenantofmayors.eu/index_en.html); see also the accompanying Report Covenant of Mayors in figures: 8-year assessment, JRC 2017

*energy. Moreover, different Urban Partnerships were set up under the Urban Agenda for the EU<sup>28</sup>, offering an innovative governance approach that involves local authorities, Member States, and European Institutions working together. The Partnerships on Energy Transition, Urban Mobility, Air Quality, Sustainable use of Land and Nature-Based solutions, Digital Transition, Circular Economy, Climate Adaptation and Housing will play an important role to deliver an innovative energy transition. Under the Smart Cities and Communities European Innovation Partnership, cities and industry have worked towards the goal of ensuring that 300 million European citizens are served by cities with interoperable urban data platforms by 2025<sup>29</sup>; a guide was also developed to facilitate buy-in from city decision makers<sup>30</sup>.*

The Commission is also taking the lead at the global level. In February 2017, the Commission took over the chairmanship of the Mission Innovation Steering Committee from the United States, and took the lead on two innovation challenges: 'Converting sunlight into storable solar fuels' and 'Affordable Heating and Cooling'. As co-organiser of the Mission Innovation summit in May 2018 and the Clean Energy Ministerial the Commission is aiming to give considerable space to non-state stakeholders including businesses, innovators, private investors and cities. This could be done in close cooperation with the Global Covenant of Mayors<sup>31</sup>, which became operational in 2017. At the same time, the European Union is working in partnership with China and Canada to drive clean energy innovation worldwide.

The Commission also remains, on behalf of Euratom, the leading party in the international innovative ITER Project for the development of fusion as a commercially viable energy source<sup>32</sup>.

#### *An energy transition that requires future-proof infrastructure*

There will be no energy transition if the infrastructure is not adapted to the needs of the future energy system. Energy, transport and telecommunication infrastructure are more and more interlinked. This trans-sectorial integration will continue, with local networks becoming ever more important in the daily lives of European citizens, who will increasingly switch to electro-mobility, decentralised energy production and demand response. To bring about the next generation of smart infrastructure and optimise the use of existing infrastructure, the Commission encourages project promoters applying for financial support to seek to create synergies between energy, transport and telecommunication infrastructure. The Commission will evaluate how to continue to promote such innovative infrastructure projects in the period post 2020.

The increasing digitalisation of infrastructure already enables smart management of the grid and demand response. The Clean Energy for All Europeans package laid out a coherent framework for demand response that enables smart charging of electric vehicles, gives consumers incentives to charge at times of low electricity prices and empowers distribution system operators to actively manage the grid<sup>33</sup>. The Alternative Fuels Infrastructure Directive

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<sup>28</sup> <https://ec.europa.eu/futurium/en/urban-agenda>

<sup>29</sup> [http://beta.eu-smartcities.com/sites/default/files/2017-09/EIP\\_Mgnt\\_Framework.pdf](http://beta.eu-smartcities.com/sites/default/files/2017-09/EIP_Mgnt_Framework.pdf)

<sup>30</sup> <http://beta.eu-smartcities.com/sites/default/files/2017-09/ShC-EIP%20Humble%20Lamppost%20Mgmt%20F%27rwork%20-%20Component%20Design.pdf>

<sup>31</sup> <http://www.globalcovenantofmayors.org/>.

<sup>32</sup> Commission communication on EU contribution to a reformed ITER project (COM(2017) 319 of 14 June 2017).

<sup>33</sup> In the proposal for a Directive on common rules for the internal market in electricity (recast) (COM (2016) 864 final of 30.11.2016)

resulted in national policy frameworks and supporting actions that the Commission has assessed in detail. To address the shortcomings identified, the Commission proposed, earlier this month, additional actions, including financing of up to €800 million for alternative fuels infrastructure.<sup>34</sup>

In the digital age, better protecting our energy infrastructure is of crucial importance. The Energy Expert Cyber Security Platform identified the challenges and the specific needs of the energy sector not currently covered under EU legislation in its report published in February 2017<sup>35</sup>. The Commission has started work with stakeholders under the Smart Grids Task Force on a network code on energy-specific cyber security until the end of 2018. A study has been launched on the risks and prevention of cyber incidents in the energy sector.

At the same time, work to improve the internal energy market integration and security of supply continues. Regional cooperation, which was initially aimed at improving physical infrastructure and its efficient use, is expanding its scope, and covers aspects such as renewables development and energy efficiency. It could further evolve towards joint renewables projects between Member States and respective project promoters or even towards joint longer-term renewables deployment strategies on regional scale.

Nevertheless, despite considerable achievements, it should be stressed that important bottlenecks remain. Four Member States (Cyprus, Poland, Spain and the UK) are expected to remain below the 10% electricity interconnection target in 2020<sup>36</sup>. To address this, the Commission today adopted a Communication on the 2030 electricity interconnection target. It also adopted the 3<sup>rd</sup> list of Projects of Common Interest. The list includes the key projects needed to reach the objectives of an interconnected internal energy market, in particular those agreed by the four High Level Groups, such as the interconnectors to link the Iberian Peninsula to France and the rest of the EU ensuring the development of renewables, projects in view of the Baltic synchronisation with the European networks, gas projects bringing security of supply and competition to Central/South-Eastern Europe as well as the first projects in view of an integrated North Seas grid.

#### *Regional integration across the European Union*

*In September 2017, the Central and South-Eastern Europe Gas Connectivity (CESEC) High-Level Group agreed to extend its geographical scope to cover the entire Western Balkans region and to focus on building an interconnected market for electricity, boosting investment in renewables and energy efficiency. Thanks to the Connecting Europe Facility, the first gas interconnector between Romania and Bulgaria, was substantially improved.*

*In the framework of the Baltic Energy Market Interconnection Plan (BEMIP), a technical and economic analysis was done on the synchronisation of the Baltic States' electricity grid with*

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<sup>34</sup> COM(2017) 652 final

<sup>35</sup> [https://ec.europa.eu/energy/sites/ener/files/documents/eecsp\\_report\\_final.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/eecsp_report_final.pdf)

<sup>36</sup> Of the eleven Member States below the 10% target in 2017 (Bulgaria, Cyprus, Germany, France, Ireland, Italy, Poland, Portugal, Romania, Spain and the United Kingdom), seven – Romania, Germany, France, Italy, Bulgaria, Portugal and Ireland – are currently implementing projects of common interest that should allow them to reach the 10% target by 2020.

*the EU's electricity network via Lithuania/Poland<sup>37</sup>. This analysis provides a good basis for swiftly moving ahead towards energy independence.*

*The first regional projects involving energy cooperation between the North Seas Countries are emerging and regional clusters are being defined. The North Sea Power Hub, a planned artificial island with thousands of wind turbines around it, will bring concrete benefits for European workers and consumers.*

*The construction on the Southern Gas Corridor pipeline has progressed. This project remains of strategic importance for the diversification efforts of the EU, bringing new sources of gas via a new route.*

*Though not sufficient, progress was achieved to better interconnect the Iberian Peninsula with the internal energy market. In 2017, a cross border cost allocation decision was made between the regulators of France and Spain for the Biscay Bay line, which will almost double the electricity interconnection capacity between both countries when completed in 2025.. The development of the Spain-Portugal interconnector is on schedule and, once commissioned, Portugal will achieve its 10% interconnection target. The development of an Eastern Gas Axis from Spain and Portugal towards the internal gas market has progressed and a planned new pipeline will remove congestion on the French network.*

Beyond physical infrastructure, an interconnected and securely operated energy market also requires better coordination between transmission system operators (TSOs) and ending the prioritisation of internal over cross-zonal exchanges. To provide full flexibility in gas supply, a more efficient use of gas storage facilities and the development of a genuine global liquefied natural gas market will equally be of paramount importance<sup>38</sup>.

#### *The energy transition as an investment opportunity*

Completing the Energy Union and speeding up the energy transition bring huge investment opportunities. Therefore, one of the main priorities of the Energy Union in 2017 was to unlock investments. The European Union contributed to this in several ways.

The European Investment Plan has triggered €240.9 billion worth of investment so far through the European Fund for Strategic Investments (EFSI), with the energy sector being the first in terms of the number of approved EFSI operations. The majority of the supported projects are investments in renewable energy, energy efficiency and energy infrastructure<sup>39</sup>.

Member States have also accelerated the use of European Structural and Investment Funds in support of the energy transition: there has been a sharp increase in the selection of projects on the ground in the first half of 2017. Under the low-carbon economy investment priority, about 28% (or €18 billion<sup>40</sup>) of the budget has been allocated to more than 8,500 concrete projects by the end of June 2017 (compared to 19% by end-2016<sup>41</sup>) with implementation going on

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<sup>37</sup> <https://publications.europa.eu/en/publication-detail/-/publication/8d3b7da2-562e-11e7-a5ca-01aa75ed71a1/language-en/format-PDF/source-31392329>

<sup>38</sup> See also the strategy proposed by the Commission in 2016 (COM(2016)49).

<sup>39</sup> Source: EIB-European Commission data as of October 2017.

<sup>40</sup> Includes the EU support and national co-financing.

<sup>41</sup> Some of the results by end of 2016 include decisions on over 1,000 MW of additional renewable energy capacity and 130,000 households with improved energy consumption classification.

until the end of 2023.<sup>42</sup> In the transport sector, the Connecting Europe Facility (CEF) for Transport will have committed €22.4 billion by the end of 2017, mobilising about €46.7 billion of overall investments in the EU.

Last year, the Commission also announced the Smart Finance for Smart Buildings Initiative to boost investment in the energy renovation of Europe's building stock<sup>43</sup>. The initiative, being developed in cooperation with the European Investment Bank, will allow Member States to combine different sources of public and private funding in order to provide households and SMEs access to tailor-made refurbishment loans.

Given the huge investment needs in building renovation, private sources of funding have to be mobilised on a much greater scale. To build trust and help project developers and investors better assess the risks and benefits of energy efficiency investments, the De-risking Energy Efficiency Platform (DEEP) was launched in November 2016 by the Energy Efficiency Financial Institutions Group (EEFIG), with the support of the European Commission.<sup>44</sup> It is the largest EU-wide open-source database containing data of over 7,800 projects, showing that energy efficiency is financially attractive. Furthermore, an Underwriting Toolkit for financial institutions was launched in June 2017 to help banks and investors scale up their deployment of capital into energy efficiency by providing a framework for assessing the risks and benefits of such investments<sup>45</sup>.

Another initiative to be launched this year is an advisory platform for urban investments. This platform, under development by the Commission in partnership with the European Investment Bank, will build on already existing structures under the European Investment Advisory Hub. It provides urban authorities acting as project promoters and/or beneficiaries with tailor-made advisory services and financing possibilities.

*Enabling actions on investments: the European Fund for Strategic Investments (EFSI) or the European Structural and Investment Funds (ESIF) at work*

*ITALY-FRANCE ELECTRICITY INTERCONNECTOR (IT-FR): (€170 million) Support to the Italian part of the high voltage direct current link Piedmont-Savoy connecting France and Italy across the Alps.*

*NORDBLINK HVDC INTERCONNECTOR (DE-NO): (€150 million) Support for the first interconnection between Germany and Norway, thereby improving diversification and security of supply and enhancing electricity market integration in both countries and in the region.*

*ENERGA HYBRID BOND (PL): (€250 million) 3-year investment programme (2017-2019) for the modernisation and extension of the electricity distribution network in northern and central Poland. It will also facilitate the connection of new system users, including renewable energy generators.*

<sup>42</sup> To ensure transparency, the Commission publishes updated data on European Structural and Investment Funds, available at: <https://cohesiondata.ec.europa.eu/>, including annual reports on progress towards the agreed indicator target values. Further data on implementation for the different areas will be provided in December 2017 with the first European Structural and Investment Funds Strategic report.

<sup>43</sup> Buildings represent around 40% of final energy consumption and 3 in 4 buildings standing today are inefficient.

<sup>44</sup> <https://deep.eefig.eu/>

<sup>45</sup> <https://valueandrisk.eefig.eu/>

*RIGA TRANSPORT COMPANY (LV): (€175 million) EFSI loan combined with CEF grant funding to the Riga Transport Company in building up its hydrogen fuel infrastructure to run hydrogen fuel cell buses.*

*BALTCAP INFRASTRUCTURE FUND (LT, LV, EE): EFSI project supporting the EIB investment (up to €20 million) in BaltCap Infrastructure Fund, a general infrastructure fund focusing on renewable energy, energy efficiency and transport projects in the three Baltic countries.*

*NAVARRA NZEB SOCIAL HOUSING Project (ES): Supported by the EU guarantee under EFSI, this EIB loan of €39 million will support the construction of 524 social housing units in Pamplona, in Navarra region. The housing units will be Near Zero Energy Buildings.*

*RENOVATION OF MULTI-APARTMENT BUILDINGS PROGRAMME (LT): (€314 million of ESIF support in 2014-2020, with possible upscaling from EFSI) – Aimed at increasing energy efficiency of the most heat-intensive multi-apartment buildings, through several financial instruments (loans and guarantees).*

It should also be recalled that, as part of the revision of the European Union Emissions Trading System for the period after 2020, the Commission proposed an Innovation Fund to support innovation in the power sector and industry. In 2017, the Commission launched a series of sector-specific expert roundtables to appropriately scope this fund.<sup>46</sup> The proposal also includes creating a Modernisation Fund to support lower-income Member States to modernise their energy systems.

Despite all these efforts, more could be done to bring about an investment-friendly environment. Uncoordinated and unpredictable national energy and climate policies reduce investment certainty. Until very recently, only some Member States had climate and energy plans and strategies going beyond 2020. None had a comprehensive plan across the five dimensions of the Energy Union, and only a limited number of governments considered cross-border impacts when defining national policies. Integrated national energy and climate plans will allow to potential investors to take the necessary long-term investment decisions for the post-2020 timeframe<sup>47</sup>.

To meet the investment challenge associated with the energy transition, funding has to be aligned with energy and climate policy goals. Sustainable investment has become one of the new priority actions of the Capital Markets Union. An important initiative was taken in June 2017 with the publication of guidelines to help companies disclose environmental and social information. The Commission launched the High-Level Expert Group on Sustainable Finance to advise it on how to ensure that sustainability is taken into consideration in EU financial regulation and markets practices. The group's recommendations will be delivered in early 2018<sup>48</sup>. Meanwhile, leadership in this domain continues to come from Europe, notably with France issuing the first ever sovereign benchmark green bond (of a record €7 billion) in January. The EIB continues to be the world's largest issuer of green bonds with an ever-increasing portfolio.

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<sup>46</sup> COM(2015) 337.

<sup>47</sup> A summary indicating the state of play for each Member State in preparing their draft integrated national energy and climate plan is annexed to this report.

<sup>48</sup> High-Level Expert Group issued its Interim Report in July 2017 and carried out a public consultation until 20 September.

An important decision to facilitate investments in the energy performance of buildings was made in September. A recent Eurostat Guidance on the recording of energy performance contracts in government accounts<sup>49</sup> clarifies the statistical recording of such contracts, including the circumstances in which these contracts are to be recorded off government balance sheets. This will make it easier for municipalities to use energy performance contracts to make public buildings such as hospitals, schools or social housing more energy efficient without a negative impact on public deficit and debt. It will also facilitate the development of a stronger market of energy performance contract providers, including many small and medium-sized companies. A practical guide for practitioners will be issued later in the year.

### *The external dimension of the energy transition*

EU external and development policies are essential to support the clean energy and low-carbon transition globally and to strengthen the EU's energy security and competitiveness.

In 2017, the EU reinforced synergies between its climate and energy diplomacies. In response to the intention of the US Administration to withdraw from the Paris Agreement, the EU reaffirmed its commitment to the global fight against climate change and is strengthening its existing global partnerships. The EU will continue to seek new alliances, from the world's largest economies to the most vulnerable island states. The EU has significantly increased climate finance during last year and provided more than €20 billion to developing countries in 2016<sup>50</sup>.

The EU fully supported the G20 Hamburg Climate and Energy Action Plan for Growth and strengthened cooperation with a number of key partners, in particular in Asia. The EU signed an Energy Work plan with China and a Memorandum of Cooperation with Japan to promote a global market for liquefied natural gas. Strengthening ties with India continued with the EU-India Leaders' Statement on Energy and Climate endorsed on 6 October 2017. The EU also stepped up energy and climate relations with Iran and held the first ever EU-Iran Business Forum on Sustainable Energy.

The EU has been promoting the adoption of an ambitious Greenhouse Gas Emission Reduction Strategy in the International Maritime Organisation to ensure that the international shipping sector contributes to joint global efforts to achieve the goals of the Paris Agreement and continued its work within the International Civil Aviation Organisation to reduce greenhouse gas emissions from aviation.

The emergence of a global carbon market, notably by linking emissions trading systems, is a longstanding goal of the EU. Such a market offers opportunities for further emission reductions while reducing further the cost of climate change mitigation. Proposals for signing and concluding an agreement with Switzerland on linking emissions trading systems are now with Council and the European Parliament. In other parts of the world the EU continues to play an active role as well, both through multilateral initiatives<sup>51</sup> and bilateral activities, in particular by stepping up cooperation with China, which is preparing a nationwide system.

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<sup>49</sup> <http://ec.europa.eu/eurostat/documents/1015035/7959867/Eurostat-Guidance-Note-Recording-Energy-Perform-Contracts-Gov-Accounts.pdf/>

<sup>50</sup> EU, EIB and Member States climate finance.

<sup>51</sup> Such as the Partnership for Market Readiness, run by the World Bank, and involvement in International Carbon Action Partnership (ICAP) activities and training.

Energy is a major focus of EU co-operation with its neighbours. The priority is on regulatory and market reforms, promoting energy efficiency and the use of renewable energies, building interconnections, fostering security of energy supply, and promoting the highest standards of nuclear safety. In 2017, Ukraine made significant progress on regulatory reforms. It has reformed its policy framework for the electricity market and for energy efficiency. Furthermore, it is setting up a sizeable fund to finance energy efficiency in the residential sector, with financial support from the EU, among others.

The EU also continues to ensure that energy is properly addressed in ongoing and future trade negotiations with third countries. This is crucial to ensure sustainable access to energy on global markets, to enable European companies to take full benefit from business opportunities on export markets and to support the energy transition in third countries through EU knowshow and technology.

The Africa-EU Energy Partnership provides an important framework for sustainable energy co-operation. The EU is also supportive of the African Renewable Energy Initiative<sup>52</sup>. The Commission contributes to the targets and objectives of this initiative, in particular through its blending instruments which use grant funding to unlock public or private sector investment in the renewable energy sector. So far, this has leveraged an estimated total of €4.8 billion for additional renewable energy generation capacity. The Commission also offers direct support to the private sector through the ElectrIFI initiative, whose current investment portfolio of about €30 million is anticipated to result at this stage in approximately 88 MW of newly installed renewable energy. Finally, the Commission co-hosted a High Level Round Table on investments in sustainable energy in Africa in April 2017 to boost EU private sector involvement in the African clean energy sector. A Research and Innovation Partnership on Climate Change and Sustainable Energy is due to be endorsed during the November 2017 African Union-European Union Summit.

The EU also continued to strengthen energy security, working with international partners to reinforce global energy markets through transparency and exchange of best practices. In this context, the relationship with the United States remains important and continues to be pursued through the EU-US Energy Council and its working groups.

On 9 June 2017, the Commission adopted a Recommendation to the Council of the European Union to authorise the negotiation of an agreement with the Russian Federation on the operation of the planned Nord Stream 2 gas pipeline. The Commission is seeking an agreement in the Council on a strong mandate, on the basis of which the Commission stands ready to start negotiations with Russia. The recent proposal for an amendment to the Gas Directive clarifies that pipelines to and from third countries are subject to the common rules for the internal market in natural gas up to the border of Union jurisdiction. International agreements with the third countries concerned will remain the most appropriate instrument to ensure that there is a coherent regulatory framework for the entire pipeline.

#### **IV. Energy Union – The road to completion**

Thanks to progress in 2017, the EU is on track to implement the Energy Union project and deliver jobs, growth and investments. The Commission has tabled most of the legislative proposals necessary to provide a predictable regulatory framework, and enabling actions are

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<sup>52</sup> Africa-led initiative with the objective to increase Africa's renewable energy capacity by 10GW by 2020 and mobilise Africa's 300GW renewable energy potential by 2030.



being put in place to accelerate public and private investment and support a socially fair clean energy transition. However, further efforts are urgently required to ensure the completion of the Energy Union by the end of the current Commission's mandate in 2019. Therefore, there has to be real progress in adopting the legislative framework, implementing the enabling framework and securing the involvement of all parts of society.

#### *Delivering the legislative framework*

In line with the Joint Declaration on legislative priorities, discussions in and between the European Parliament and the Council need to come to a successful conclusion rapidly. The co-legislators have already adopted a Decision on information exchange on intergovernmental agreements between Member States and third countries in the field of energy<sup>53</sup> and a Regulation concerning measures to safeguard the security of gas supply<sup>54</sup>, ensuring better cross-border cooperation and more solidarity in case of crisis. This month, co-legislators also reached a political agreement on the review of the EU Emission Trading System. These examples illustrate the ability of the European Union and its institutions to deliver important achievements, when the political will is there.

The Commission encourages the co-legislators to maintain the overall coherence among the remaining legislative proposals and to keep the ambition high so that the EU consolidates its leadership role in the clean energy transition, in particular on governance, renewables, climate action, energy efficiency and clean energy innovation. This will enable the EU – as part of the 2018 Facilitative Dialogue – to make real progress on its commitments under the Paris Agreement and deliver on the high expectations of Europe's citizens for a clean energy transition.

#### *Delivering the enabling framework*

Promoting investment in innovative urban projects, within the overall context of the EU Urban Agenda, will be a priority in 2018. The Commission will work with pioneering cities and regions to support cross-sectoral, innovative projects that can serve as testbeds for new business models and applied technologies. Such innovative projects should be replicated across Europe and globally. The upcoming One Planet Summit in December 2017, the Third Ministerial Meeting of Mission Innovation in May 2018 and the San Francisco climate summit of non-State actors in September 2018 are good opportunities to showcase European leadership in clean energy innovation and the leading role Europe's cities play in it.

The Commission will also intensify its support for carbon-intensive regions in transition, helping them develop short-term solutions and longer-term strategies to drive sustainable economic transformation. This will be achieved by combining the work of the EU country teams for a larger number of Member States and the Multi-Stakeholder Platform on Coal and Carbon-Intensive Regions in Transition which will be set up in December 2017.

Another priority will be to ensure that the efforts by industry are consistent with efforts by policy-makers to support the clean energy transition in strategic sectors such as renewable energy, construction and batteries. The launch of the Clean Energy Industrial Competitiveness Forum will help to drive the process further.

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<sup>53</sup> Decision (EU) 2017/684, OJ L 99, 12.4.2017, p. 1–9

<sup>54</sup> Regulation 2017/1938, OJ L 198, 28.10.2017, p. 1–56

Finally, the Commission will encourage investment into clean energy as a major aspect of economic modernisation in its various investment initiatives such as the Investment Envoys, the Structural Reform Support Service and the European Investment Advisory Hub.

### *Engagement of all parts of society*

The Energy Union will only be successful if all segments of society come together and move in the same direction, as some pioneers have already shown<sup>55</sup>. In the 2<sup>nd</sup> Energy Union Tour, Vice-President Šefčovič has so far visited 17 Member States, discussing with governments and national stakeholders the state of implementation of the Energy Union. Meetings with young people, citizens affected by the energy transition, inventors, social partners and civil society, mayors and other politicians provide positive examples of how the energy transition is achievable in practice. The Commission will continue to secure the participation of all levels of society, young people in particular, and create stronger connections between European, national and local efforts. It will provide opportunities to launch a transparent and constructive dialogue among all concerned parties on the draft integrated national energy and climate plans which Member States are requested to deliver in early 2018. The Commission will carefully assess these draft plans and report back in its next report on the State of the Energy Union.

## **V. CONCLUSION**

The Energy Union project has reached a critical juncture. Like the past year, 2018 too should bring important deliverables. The Commission will therefore continue its efforts to implement the enabling actions that bring changes on the ground and tangible benefits to all Europeans. It calls on

- co-legislators to redouble their efforts to reach swift agreement on the legislative proposals. The Commission will do its utmost to facilitate an ambitious and timely outcome.
- the Member States to step up their work on their integrated national energy and climate plans to create predictability for investors and to submit draft plans in time to enable the EU and its Member States to continue demonstrating leadership as part of the 2018 global Facilitative Dialogue on climate. The Commission stands ready to provide further assistance.
- society as a whole and all European, national, regional or local stakeholders concerned to engage actively in the energy transition and contribute to its success.

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<sup>55</sup> Such as Bertrand Picard's World Alliance for Efficient Solutions (<http://alliance.solarimpulse.com>) or the Breakthrough Energy Coalition launched by Bill Gates and others at the Paris Climate Summit in December 2015 (<http://www.b-t.energy/>).