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**The Role of Cross-Border Energy Infrastructure in Accelerating Germany's  
Energy Diversification and Renewable Energy Expansion: Implications for  
Alberta's Energy Transition**

**Dr. Rudiger Tscherning**

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MFH 3353, Faculty of Law, University of Calgary, Calgary, Alberta, Canada T2N 1N4  
Tel: (403) 220-3200 Fax: (403) 282-6182 E-mail: [cirl@ucalgary.ca](mailto:cirl@ucalgary.ca) Web: [www.cirl.ca](http://www.cirl.ca)

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All enquiries should be addressed to:

The Executive Director  
Canadian Institute of Resources Law  
Murray Fraser Hall, Room 3353 (MFH 3353)  
Faculty of Law  
University of Calgary  
Calgary, Alberta, Canada T2N 1N4  
Telephone: (403) 220-3200  
Facsimile: (403) 282-6182  
E-mail: [cirl@ucalgary.ca](mailto:cirl@ucalgary.ca)

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Directeur exécutif  
Institut canadien du droit des ressources  
Murray Fraser Hall, pièce 3353  
Faculté de droit  
L'Université de Calgary  
Calgary, Alberta, Canada T2N 1N4  
Téléphone: (403) 220-3200  
Télécopieur: (403) 282-6182  
Courriel: [cirl@ucalgary.ca](mailto:cirl@ucalgary.ca)  
Site Web: [www.cirl.ca](http://www.cirl.ca)

## Table of Contents

<i>Acknowledgements</i> .....	<i>vii</i>
<i>Author's Profile</i> .....	<i>vii</i>
<b>1. Introduction</b> .....	<b>1</b>
<b>2. The Foundation of Germany's Energy Diversification: The Energy Concept 2050</b> .....	<b>4</b>
2.1 Development of Renewable Energy Generation Capacity.....	5
2.2 Competition in Germany's Energy Mix and Electricity Grid Limitations.....	6
2.3 The Energy Concept 2050 and European Collaboration.....	8
<b>3. The 2008 Economic Crisis and the European Energy Programme for Recovery</b> .....	<b>8</b>
3.1 The Infrastructure and Energy Priority Area.....	9
3.2 Actions for Recovery - Regulation 663/2009.....	10
3.3 Identifying and Selecting EEPR Projects.....	12
3.4 Financing of Infrastructure Projects and Identification of Risk.....	13
3.5 Amending the Programme to include Sustainability and Energy Efficiency.....	14
<b>4. Priority Trans-European Energy Infrastructure: Projects of Common Interest</b> .....	<b>15</b>
4.1 Regulation 347/2013 on Trans-European Energy Infrastructure .....	16
4.1.1 The Concept of Projects of Common Interest.....	17
<b>5. Implementing European Energy Infrastructure Reforms in Germany</b> .....	<b>18</b>
5.1 Expansion of Offshore Wind Energy and Decline in Onshore Capacity .....	18
5.1.1 Dismantling, Recycling and Repowering of Wind Energy Installations .....	19
5.2 Formalising the German Coal Phase-Out by 2038.....	21
5.2.1 Repurposing former Lignite Mining Regions as Renewable Energy Hubs... ..	22
<b>6. Towards a Resilient Energy Union with an Ambitious Climate Action Policy</b> .....	<b>23</b>
6.1 Regulation 2018/1999 on the European Energy Union and Climate Action .....	24
6.1.1 The Decarbonisation Dimension.....	25
6.1.2 The Internal Energy Market Dimension.....	25
6.1.3 The Energy Security Dimension .....	26
6.1.4 Emphasis on Regional Cooperation between Member States.....	27
6.2 Germany's Draft Integrated National Energy and Climate Plan.....	27
6.2.1 Draft Plan on the Decarbonisation Dimension.....	29
6.2.2 Draft Plan on the Internal Energy Market Dimension .....	29
6.2.3 Draft Plan on the Energy Security Dimension.....	30
6.3 Assessment of Germany's Draft Plan by the European Commission .....	30

<b>7. Implementing Germany’s Climate Action Plan 2050.....</b>	<b>33</b>
7.1 The Energy and Industry Sectoral Focus of the Climate Action Plan 2050.....	33
<b>8. The European Green Deal 2019 – Sustainability as an Economic Model .....</b>	<b>35</b>
8.1 Increasing the EU’s Climate Ambition from 2030 and 2050.....	36
8.2 Supplying Clean, Affordable and Secure Energy .....	36
8.3 Accelerating the Shift to Sustainable and Smart Mobility .....	37
8.4 Mainstreaming Sustainability – Financing the Cost of the Green Deal .....	38
8.5 Focusing the European Union as a Global Leader on Climate Neutrality .....	39
8.6 Emphasis on Citizen and Stakeholder Engagement – The European Climate Pact.....	39
<b>9. Energy and Climate Impulses Post COVID-19: Quo Vadis Europe?.....</b>	<b>40</b>
<b>10. Looking Ahead and Conclusions .....</b>	<b>45</b>

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### ***Author's Profile***

Dr. Rudiger Tscherning is an Assistant Professor at the University of Calgary, Faculty of Law. His research focuses on energy infrastructure, renewable energy, clean energy (including nuclear law and policy), climate adaptation of energy infrastructure and private international law (the conflict of laws). At the University of Calgary, Professor Tscherning teaches in the areas of international energy and natural resources law, infrastructure and construction law as well as private international law.

## The Role of Cross-Border Energy Infrastructure in Accelerating Germany's Energy Diversification and Renewable Energy Expansion: Implications for Alberta's Energy Transition

### 1. Introduction

Unlike Canada, the European Union, a collection of 27 (formerly 28) Member States, is in the midst of undergoing a radical energy diversification. The generation of electricity from renewable energy sources has been a focus of European Union policy as early as 1986 but started building momentum, in earnest, in 1997 with a “White Paper for a Community Strategy and Action Plan” on renewable sources of energy.<sup>1</sup> Since then, the promotion of electricity produced from renewable energy sources has been a “high Community priority” for reasons of “security and diversification of energy supply, of environmental protection and of social and economic cohesion.”<sup>2</sup> Having set truly ambitious legally binding climate targets in the United Nations Framework Convention on Climate Change’s Paris Agreement 2015,<sup>3</sup> the European Union must now deliver collectively on its efforts to decarbonise energy generation, to achieve ambitious climate targets, and to develop the interconnector infrastructure to guarantee a stable, reliable, and sustainable energy generation for the next fifty years and beyond. These efforts are underpinned by binding renewable energy targets for each Member State, as set out in the European Union’s December 2018 Renewable Energy Directive.<sup>4</sup>

This paper examines the European Union’s energy diversification agenda and the corresponding rapid expansion of renewable energy capacity, with a special focus on the Federal Republic of Germany. The paper discusses the impulses that have driven an unprecedented scaling-up of renewable energy capacity during one of post-war Europe’s greatest economic recoveries in the period of 2009-2020. Largely driven by the landmark “Energy Concept 2050” policy document of 2010,<sup>5</sup> Germany has grown its supply of electricity from renewable energy sources from approximately 6 per cent in 2000 to 37.8 per cent in 2018, with a target of 40-45 per cent by 2025.<sup>6</sup>

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<sup>1</sup> European Commission, COM(97) 599 final, Energy for the Future: Renewable Sources of Energy, White Paper for a Community Strategy and Action Plan, 26 November 1997,

[https://europa.eu/documents/comm/white\\_papers/pdf/com97\\_599\\_en.pdf](https://europa.eu/documents/comm/white_papers/pdf/com97_599_en.pdf).

<sup>2</sup> Directive 2001/77/EC of the European Parliament and of the Council on the promotion of electricity produced from renewable energy sources in the internal electricity market, 27 September 2001, OJ L 283/33, 27.10.2001, Recital 2; see also European Commission, COM(97) 599 final, Energy for the Future: Renewable Sources of Energy, White Paper for a Community Strategy and Action Plan, 26 November 1997, Chapter 1,

[https://europa.eu/documents/comm/white\\_papers/pdf/com97\\_599\\_en.pdf](https://europa.eu/documents/comm/white_papers/pdf/com97_599_en.pdf).

<sup>3</sup> *Paris Agreement*, 12 December 2015, FCCC/CP/2015/L.9/Rev.1 (entered into force 4 November 2016),

[https://unfccc.int/files/essential\\_background/convention/application/pdf/english\\_paris\\_agreement.pdf](https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf).

<sup>4</sup> Directive 2019/2001 of the European Parliament and of the Council on the promotion of the use of energy from renewable energy sources (recast), 11 December 2018, OJ L328/82, 21.12.2018.

<sup>5</sup> Federal Ministry for the Environment and Ministry of Economics and Technology, “Energiekonzept für eine unweltschonende, zuverlässige und bezahlbare Energieversorgung”, 28 September 2010, [“*Energy Concept 2050*”], (in German) [https://www.bmwi.de/Redaktion/DE/Downloads/E/energiekonzept-2010.pdf?\\_\\_blob=publicationFile&v=3](https://www.bmwi.de/Redaktion/DE/Downloads/E/energiekonzept-2010.pdf?__blob=publicationFile&v=3).

<sup>6</sup> Federal Ministry for Economic Affairs and Energy, Renewable Energy, <https://www.bmwi.de/Redaktion/EN/Dossier/renewable-energy.html>. See also (in German), Bundesministerium für Wirtschaft und Energie, Erneuerbare Energien in Zahlen, October 2019, [https://www.erneuerbare-energien.de/EE/Redaktion/DE/Downloads/Berichte/erneuerbare-energien-in-zahlen-2018.pdf?\\_\\_blob=publicationFile&v=6](https://www.erneuerbare-energien.de/EE/Redaktion/DE/Downloads/Berichte/erneuerbare-energien-in-zahlen-2018.pdf?__blob=publicationFile&v=6).

The paper also explores the importance of interconnected energy infrastructure, in particular electricity grid infrastructure, which has facilitated the aggressive diversification of Germany's energy mix through a rapid expansion of renewable energy generation capacity. Similar diversification of the energy mix is ongoing in Alberta, with a shift away from coal-fired electricity generation. Germany's transition has taken place against the phase-out of nuclear energy generation, which will be completed by 2022, and the January 2020 decision to formalise a phase-out of coal by no later than 2038. In all of this, Germany's energy transition has taken place amidst concerted economic recovery action, driven by the European Commission, in response to the 2008 economic crisis. As part of these response measures, the Commission focused on investments in strategic interconnected energy infrastructure in the gas and electricity, the offshore wind energy, and the carbon capture and storage sectors.<sup>7</sup>

To introduce the concept of 'interconnected energy infrastructure' to the reader and to demonstrate the true scale of Europe's ambitious energy diversification agenda, consider the example of two sources of renewable energy generation which form the backbone of Germany's energy transition: offshore wind energy and solar energy. In 2008, the European Commission noted that in physical energy terms, Europe's offshore wind energy resources could theoretically cover the continent's entire electricity demand.<sup>8</sup> For readers from outside the European energy debate, this is a stark illustration of the near unlimited potential for harnessing renewable energy capacity to power the world's largest single economic trading block. In fostering large-scale renewable energy generation from mega-renewable energy sources such as offshore wind energy and solar energy, three core elements of the European Union's energy policy are addressed: greenhouse gas emissions are reduced, energy security is increased, and the Union's technical and economic competitiveness is cemented.

In 2008, for example, the European Commission predicted that Europe's offshore wind energy potential could be up to 150 GW by 2030.<sup>9</sup> This was later confirmed by the European Wind Energy Association as "eminently realistic and achievable", provided that the European Union maintained its focus on reaching a mid-term target of 40 GW installed capacity by 2020.<sup>10</sup> If these ambitious targets are achieved, European offshore wind energy capacity would make a significant contribution to independence from (predominantly) imported fossil fuel energy sources, replacing these, in large part, with "home-grown" renewable energy generation capacity. At the same time, the European Union's total installed solar energy capacity has grown from 1.77 GW in 2000 to just over 109 GW in 2017.<sup>11</sup> Of the total installed renewable electricity capacity in the European

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<sup>7</sup> European Commission, Communication from the Commission to the European Council, A European Economic Recovery Plan, COM(2008) 800 final, 26.11.2008, ["*European Economic Recovery Plan*"], [https://ec.europa.eu/economy\\_finance/publications/pages/publication13504\\_en.pdf](https://ec.europa.eu/economy_finance/publications/pages/publication13504_en.pdf).

<sup>8</sup> European Commission, COM (2008) 768, 13 November 2008, Offshore Wind Energy: Action needed to deliver on the energy policy objective of 2020 and beyond, at 3, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0768:FIN:EN:PDF>.

<sup>9</sup> *Ibid.*

<sup>10</sup> European Wind Energy Association, Oceans of Opportunity - 20 Year Offshore Network Development Master Plan, Brussels, September 2009, at 7 [http://www.ewea.org/fileadmin/ewea\\_documents/documents/publications/reports/Offshore\\_Report\\_2009.pdf](http://www.ewea.org/fileadmin/ewea_documents/documents/publications/reports/Offshore_Report_2009.pdf).

<sup>11</sup> European Commission, EU Energy in Figures, Statistical Pocketbook 2019, May 2019, Energy, Part 2: Energy in the EU - Solar Installed Capacity, page 106, [https://op.europa.eu/en/publication-detail/-/publication/e0544b72-db53-11e9-9c4e-01aa75ed71a1/language-en?WT.mc\\_id=Searchresult&WT.ria\\_c=37085&WT.ria\\_f=3608&WT.ria\\_ev=search](https://op.europa.eu/en/publication-detail/-/publication/e0544b72-db53-11e9-9c4e-01aa75ed71a1/language-en?WT.mc_id=Searchresult&WT.ria_c=37085&WT.ria_f=3608&WT.ria_ev=search).

Union, wind (both offshore and onshore) amounts to a share of 38.9 per cent, solar photovoltaic to a share of 24.6 per cent, and solar thermal to a total share of 0.5 per cent. Solar is second only to a total share of 35.7 per cent installed hydro-electricity.<sup>12</sup>

Within the context of Europe's aggressive renewable energy development agenda, the European Union has pioneered, and subsequently dominated, the development of a large-scale offshore wind energy industry. The proposal to develop a "North-Sea Offshore Supergrid", a "meshed" network of sub-sea high voltage direct cabling and interconnector infrastructure, will play a central role in the wider energy diversification agenda, including Germany. The project, which is a phased development in the Northern European region, is expected to be completed by 2050. It will cover the north-eastern part of the European continent, interconnecting offshore wind farms located in the North Sea, the Baltic Sea, and the Irish Sea. Its range will be from Norway to the Bay of Biscay in Northern Spain. The sheer geographic scope and scale of this interconnected energy infrastructure will ensure that at any one point in time, the wind will be of sufficient strength and capacity to generate electricity for cross-border trade and export. Generated capacity offshore will have to be transmitted to key markets of consumption. Using the example of Germany, this will require an aggressive expansion and upgrading of onshore electricity grid infrastructure, including the development of so-called electricity super-highways that transmit capacity from Northern Europe's offshore areas to the industrial centres of middle and southern Germany. At the same time, transmission of solar energy generation from the strategic Mediterranean region to the central European markets of consumption, including Germany, will require aggressive improvements in the south-north electricity interconnection. Capacity bottlenecks have been identified to exist in both the trans-Pyrenees and trans-Alpine interconnector corridors. Capacity shortfalls in existing grid infrastructure present a major obstacle to renewable energy expansion in the Southern European region, limiting the export potential of renewable energy generated in Spain and Italy. Due to these constraints, this capacity cannot reliably be exported, for example, to the lucrative key markets of demand in Southern Germany via a "trans-Alpine" interconnection.

In light of these developments, this paper examines how Germany has achieved, in large part, its renewable energy transition goals in the relatively short period of 2009 to 2020, and explores what role the European Commission's energy diversification and energy interconnection agendas have played in accelerating Germany's expansion of renewable energy. What lessons and conclusions can be drawn for other economies, including Canada, who may be considering a transition towards a more sustainable and climate-active economic model? A critical driver of the European Union's energy transition has been the Commission's response to the 2008 economic crisis, which identified and prioritised key energy interconnector infrastructure in its 2009 European Energy Programme for Recovery. A further impulse toward continued European energy interconnection may be found in the December 2019 "Green Deal for Europe" economic plan of the European Commission as well as the Commission's proposed "Next Generation EU" recovery instrument, presented on May 27, 2020. Thus, the paper also looks forward, by undertaking a first analysis of this ambitious economic plan and evaluating emerging indications from both the European Commission and Germany as to how Europe's post-2020 COVID-19 pandemic recovery plan will be linked to already ambitious sustainable development goals, climate action priorities, and energy and economic diversification objectives. These ongoing and emerging impulses will have

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<sup>12</sup> European Commission, *EU Energy in Figures, Statistical Pocketbook 2019*, May 2019, Energy, Part 2: Energy in the EU - Solar Installed Capacity, page 91.

significant implications (both positive and negative) internationally, including for the Canadian economy in general, and for Alberta's fossil-fuel-centric economy in particular. The paper is current as of May 27, 2020.

## 2. The Foundation of Germany's Energy Diversification: The Energy Concept 2050

The German Government approved its long-term "Energy Concept 2050" strategy on 28 September 2010.<sup>13</sup> As the joint vision of the (then) Ministry for the Environment and the Ministry of Economics and Technology, it identifies the steps for an economic transition towards an environmentally sound, reliable, and affordable energy supply up to 2050. The strategy sets out Germany's long-term direction but also acknowledges that there must be a degree of flexibility to accommodate new technical and economic developments.<sup>14</sup> Electricity generated from renewable energy sources is at the core of the policy's focus on future energy sources. Thus, the transition will see a structured displacement of Germany's traditional energy sources, including domestic and imported coal, nuclear energy, and fossil-fuel energy. At the time of the 2010 document, nuclear energy was still identified as an "interim" source of energy on the path towards a rapid expansion of renewable energy capacity, and is anticipated to form part of Germany's energy mix until 2034.<sup>15</sup>

The Energy Concept 2050 envisaged that 35 per cent of electricity generation by 2020 should be from renewable energy sources.<sup>16</sup> Internationally, the German policy document received greater attention for its confirmation of extending the country's reliance on nuclear energy. The Concept formally affirmed the continued operation of Germany's fleet of nuclear reactors until 2034, a date beyond the initially-agreed end date of 2020 set out in a law of 2002.<sup>17</sup> Since the 2010 document, there has been (yet) another nuclear policy shift in Germany. In 2011, it was announced that German nuclear power generation will now be phased out no later than 2022, when the final nuclear plant will be formally taken off the electricity grid and subsequently decommissioned.<sup>18</sup>

Pursuant to the Energy Concept 2050, Germany's greenhouse gas emissions will be reduced by 40 per cent by 2020 and by a minimum of 80 per cent by 2050, based in both instances on levels in 1990.<sup>19</sup> Renewable energy sources are the foundational pillar of the policy. They are identified as safeguarding future energy security in Germany, whilst also promoting innovation and advancing a modernisation of Germany's energy infrastructure, including transmission and interconnection infrastructure, storage infrastructure and smart grids.<sup>20</sup>

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<sup>13</sup> *Energy Concept 2050*.

<sup>14</sup> *Energy Concept 2050*, page 3.

<sup>15</sup> *Energy Concept 2050*, page 4.

<sup>16</sup> *Energy Concept 2050*, page 5.

<sup>17</sup> Gesetz zur geordneten Beendigung der Kernenergienutzung und gewerblichen Erzeugung von Elektrizität, 22 April 2002, Bundesgesetzblatt Jahrgang 2002 Nr. 26

<sup>18</sup> Deutsche Welle DW.com, Germany shuts down atomic plant as nuclear phase-out enters final stretch, 31 December 2019, <https://www.dw.com/en/germany-shuts-down-atomic-plant-as-nuclear-phase-out-enters-final-stretch/a-51845616>.

<sup>19</sup> *Energy Concept 2050*, page 5.

<sup>20</sup> *Energy Concept 2050*, page 7.

With such a strong emphasis on renewable energy generation, the policy acknowledges that Germany's entire electricity supply system will have to be optimised in order to accommodate a significant increase in this new and intermittent renewable energy capacity. Thus, the objectives of the Energy Concept 2050 include:

- an expansion of wind energy generation capacity (both onshore and offshore);
- an increased capacity to integrate renewables in the wider energy mix;
- increases in electricity grid capacity and improvements in grid reliability;
- the promotion and development of energy storage infrastructure;
- an increased use of renewables in heat and cooling; and
- a concerted effort to strengthen the European cross-border electricity market.<sup>21</sup>

Components of Germany's Energy Concept 2050 can also be found in policy developments in Alberta, where the rapid expansion of wind energy generation forms part of a concerted effort to integrate renewable electricity in the province's energy mix. At the same time, electricity grid infrastructure challenges also exist in Alberta, where increased intermittent renewable capacity is being fed into the electricity grid, requiring a re-think on electricity storage and potential interconnection with neighbouring electricity markets. Although not comparable to the scale of the European Union's truly interconnected electricity grid system and market, Alberta is interconnected to both the British Columbia and Saskatchewan electricity markets, as well as to Montana via the Alberta-Montana Tie Line (MATL) project, which commenced commercial operation in September 2013.<sup>22</sup>

## **2.1 Development of Renewable Energy Generation Capacity**

The Energy Concept 2050 firmly prioritises the rapid development and expansion of offshore wind energy generation capacity, as part of a wider shift toward increasing renewable energy generation capacity in Germany. Crucially, the German government sets out that it is actively supporting political discussions for an offshore grid network in the North Sea (involving what are termed the North Sea Member States), together with a coordinated development of the domestic onshore grid infrastructure to achieve this.<sup>23</sup> The Energy Concept further states that the Government intends to formulate the necessary legal framework to enable cluster-connection by way of electricity interconnections of offshore wind parks in the North and Baltic Seas.<sup>24</sup> These developments form the legal and policy foundations of Germany's rapid expansion of offshore wind energy capacity, which is generally recognised as highly successful.<sup>25</sup>

The German government identified the expansion of offshore wind energy, the qualitative and quantitative expansion of the national grid, and the strengthening of the European energy market

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<sup>21</sup> *Energy Concept 2050*, page 7.

<sup>22</sup> Alberta Electricity System Operator (AESO), AESO 2020 Long-term Transmission Plan, January 2020, page 7, <https://www.aeso.ca/assets/downloads/AESO-2020-Long-termTransmissionPlan-Final.pdf>

<sup>23</sup> *Energy Concept 2050*, page 20.

<sup>24</sup> *Ibid.*

<sup>25</sup> Deutsche Windguard, Status of Offshore Wind Energy Development in Germany, First Half of 2019, Offshore Wind Energy Development, [https://www.wind-energie.de/fileadmin/redaktion/dokumente/dokumente-englisch/publications/Status\\_of\\_Offshore\\_Wind\\_Energy\\_Development\\_First\\_Half\\_of\\_2019.pdf](https://www.wind-energie.de/fileadmin/redaktion/dokumente/dokumente-englisch/publications/Status_of_Offshore_Wind_Energy_Development_First_Half_of_2019.pdf).

as among the greatest challenges to achieving its ambitious energy targets.<sup>26</sup> For offshore wind energy, the Energy Concept notes that prioritisation action is needed in order to expedite the expansion of capacity to at least 25 GW by 2030. Due to the relatively novel nature of offshore wind technology, an investment of at least €75 billion would be required. In order to achieve these ambitious targets, financial support by the German government of €5 billion at market interest rates is to be made available from 2011 onwards for the first 10 offshore wind park energy projects.<sup>27</sup> In addition, the government intends to study the option of revising the financial support mechanism so as to introduce increased up-front financial support mechanisms for offshore wind energy projects.

To support this rapid expansion of offshore wind energy capacity, it is essential for Germany to develop an “overlay network” of interconnected electricity transmission infrastructure. This is to allow Germany, based on its favourable geographic location, to fully benefit from a single European electricity market and to play a central role in the future pan-European exchange and trade of electricity. Of the proposed energy highways, the north-south route is identified as the most critical to Germany. It will transfer capacity generated in the offshore wind energy zones in Germany’s north to the core centres of electricity consumption in the centre and west of the country.<sup>28</sup> To further the integration of Germany’s electricity system and market, the four transmission system operators (TSOs) will be required to coordinate and optimise their grid capacity expansion planning by way of 10-year grid upgrade plans.<sup>29</sup> These projects form part of a wider European Union electricity grid infrastructure upgrade, with the European Commission noting in 2010 that 50,000km of grid infrastructure will either have to be built or upgraded in the next 10 years.<sup>30</sup>

In addition to developing the nascent offshore wind energy industry, the Energy Concept 2050 also places significant reliance on the continued development of onshore wind energy capacity. A central focus of the policy is a reform of the land-use planning regime in Germany, which will require coordination between all levels of government (federal, regional and municipal). In addition, the promotion of bioenergy and the increased use of organic waste products, agricultural by-products, and forestry products form part of the federal government’s policy direction.<sup>31</sup>

## **2.2 Competition in Germany’s Energy Mix and Electricity Grid Limitations**

A central focus of the government’s policy statement is the importance of liberalised electricity and gas markets so as to safeguard competition and keep electricity prices for both industry and consumers affordable. The policy notes that the government will retain power to intervene, where necessary, to safeguard competitive markets in both the electricity and gas sectors.<sup>32</sup>

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<sup>26</sup> *Energy Concept 2050*, page 7.

<sup>27</sup> *Energy Concept 2050*, page 8.

<sup>28</sup> *Energy Concept 2050*, page 18.

<sup>29</sup> *Energy Concept 2050*, page 19.

<sup>30</sup> Euractive.com, Brussels Finalises Energy Infrastructure Plan, 4 October 2010, <https://www.euractiv.com/section/energy/news/brussels-finalising-eu-energy-infrastructure-plan/>.

<sup>31</sup> *Energy Concept 2050*, page 9 and 10.

<sup>32</sup> *Energy Concept 2050*, page 15.

The importance of interconnecting electricity grid infrastructure and the maintenance of competitive access for renewable energy capacity was further underscored by Germany's announcement, in May 2011, to formally phase out nuclear energy generation by 2020. This decision was taken seven months after the release of the Energy Concept 2050 (which had stated the phase-out of German nuclear energy by 2034). Thus, any references to nuclear energy generation in the 2010 policy document are now outdated, as they are based on the previous decision to extend the operation of a number of Germany's nuclear power plants until 2034.

Thus, electricity grid capacity limitations, and the challenge of effectively integrating renewable energy into the German grid system, is identified by the Energy Concept 2050 as a key obstacle to the transition. The expansion and development of grid infrastructure is vital to achieving Germany's energy transition, and accordingly, the government has tasked itself with promoting this critical aspect of the Energy Concept 2050. One of these measures is to reform and harmonise the infrastructure permitting process, including reform of existing land-use planning laws. Another is an effort to make investments in electricity grid infrastructure more attractive to current grid operators and future investors. So-called electricity grid "highways" are necessary to accommodate the anticipated generation of offshore wind energy, in addition to the development of an offshore electricity grid system to connect wind farms to the electricity grid.<sup>33</sup>

The intermittent nature of renewables, in particular wind and solar energy generation, inherently poses a number of challenges to Germany's existing electricity grid system. The Energy Concept 2050 acknowledges that Germany will require a much more flexible electricity grid system following structural reforms to transition away from existing electricity grid infrastructure, which was designed for centralised fossil-fuel and nuclear energy powered electricity generation. This transition must take place in parallel to maintaining a stable electricity grid to accommodate the dominant non-renewable energy sources which are needed, even in the long-term, to balance out the fluctuating generation of renewable energy sources and to stabilise the electricity grid.<sup>34</sup> In order to balance these potentially competing interests, additional electricity market reforms are proposed in the 2010 policy document, including revisions to the priority grid access for renewable energy generation.

The Energy Concept 2050, one could argue, is somewhat realistic about the limitations and potential challenges posed by this transition. The long-term scaling-up of renewable energy generation in Germany will require a corresponding expansion of electricity storage capacity to safeguard a stable and reliable electricity grid and to ensure adequate security of supply. Four critical points of action arise from the Energy Concept 2050's emphasis on storage capacity and related infrastructure. In the first instance, an expansion of pumped-storage capacity must be explored, arguably within technical and economic constraints due to limited suitable sites in the Alpine region. In light of this, the Energy Concept 2050 identifies that the capacity of electricity storage in Germany will be insufficient to meet the anticipated generation of renewable energy. Securing storage capacity outside of Germany will therefore be essential. Germany has identified Norway as having the greatest potential for pumped-storage capacity, due to Norway's existing hydro-electricity infrastructure and long-term capacity potential.<sup>35</sup> The scaling-up of electricity

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<sup>33</sup> *Energy Concept 2050*, page 20.

<sup>34</sup> *Energy Concept 2050*, page 20.

<sup>35</sup> *Energy Concept 2050*, page 21.

interconnection with Norway, by way of long-distance sub-sea HDVC cables, is therefore critical to Germany's energy transition. Interconnector infrastructure between Norway and Northern Germany, through projects such as the 500km NordLink project, is absolutely critical to Germany's ambitions.<sup>36</sup>

### **2.3 The Energy Concept 2050 and European Collaboration**

European Union policy, including energy policy, is grounded in “a spirit of solidarity between Member States”,<sup>37</sup> as well as the close coordination between Member States and the European Commission. To reflect the objective of an internal European market on energy (as set out in Article 194 of the Treaty on the Functioning of the European Union) and to align Germany's energy policy with that of the European Union, the Energy Concept 2050 emphasises the importance of a common European approach on energy, which is focused on:

- the expansion of pan-European networked energy infrastructure;
- the development of a liberalised internal market for electricity and gas;
- the European Union Emissions Trading Scheme as the primary instrument to address climate change;
- achieving the European Union's energy efficiency target of 20 per cent by 2020; and
- safeguarding energy security and access to critical resources, including a coordinated European Union strategy on oil and gas security of supply.<sup>38</sup>

Furthermore, the Energy Concept 2050, even as early as in 2010, recognises that Germany's long-term need for renewable energy capacity will not be met with domestic capacity generation alone. As such, Germany will have to supplement its domestic capacity with imports of renewable energy, in particular from solar energy electricity generation and electricity storage capacity in North Africa and the Mediterranean region. This will entail both imports from Member States and strategic third countries. The policy acknowledges that Germany will work closely with the Member States of the Mediterranean region, as well as the European Commission, to develop a masterplan on solar energy generation capacity pursuant to this objective.<sup>39</sup> The importance of increasing electricity interconnector and transmission capacity from the European South, including the trans-Pyrenees and trans-Alpine bottlenecks, is therefore vital to Germany's energy diversification and energy security.

## **3. The 2008 Economic Crisis and the European Energy Programme for Recovery**

In light of the financial and economic crisis of 2008 in Europe, the European Commission prepared a comprehensive action plan to set out the European Union's coordinated response, known as the

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<sup>36</sup> *Energy Concept 2050*, page 21. See also, Statnett Norway, NordLink – New subsea interconnector between Norway and Germany, <https://www.statnett.no/en/our-projects/interconnectors/nordlink/>.

<sup>37</sup> Consolidated Version of the Treaty of the Functioning of the European Union, OJ C 326/134, 26.10.2012, Part III - Union Policies and Internal Actions, Title XXI Energy, Article 194 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A12012E194>.

<sup>38</sup> *Energy Concept 2050*, page 30 and 31.

<sup>39</sup> *Energy Concept 2050*, page 31.

“European Economic Recovery Plan.”<sup>40</sup> In its first elaboration of the plan, the European Commission acknowledged that “given the scale of the crisis we are facing, the [union] needs a co-ordinated approach, big enough and ambitious enough to restore consumer and business confidence.”<sup>41</sup> The immediate budgetary response amounted to €200 billion, with the recovery consisting of two areas of priority, a major injection of purchasing power “to boost demand and stimulate confidence” as well as direct short-term action “to reinforce Europe’s competitiveness in the long term” by way of a comprehensive programme to “direct action to “smart” investment” including expediting the transition toward a low carbon economy.<sup>42</sup> Four priority areas of action, known as the “Actions for Recovery” make up the recovery plan’s focus. For purposes of this paper, discussion will be limited to the “infrastructure and energy” priority area only. The other three action areas focused on “people, business... research and innovation.”<sup>43</sup>

### 3.1 *The Infrastructure and Energy Priority Area*

The infrastructure and energy priority area falls under the Plan’s focus on “continuing to invest in the future.”<sup>44</sup> The Plan emphasises that the European Union is at the beginning of a “major structural shift toward a low carbon economy”, which will provide it with an opportunity to create new businesses, industries and well-paying jobs.<sup>45</sup> One of the tasks of the European Commission will be to “clarify the legal framework for partnerships between the public and private sector” to carry out major infrastructure investments.<sup>46</sup>

In the first instance, the European Union will need to expedite its investment in infrastructure, “particularly in the environmentally-friendly transport-modes, high-speed ICT networks...energy interconnections.”<sup>47</sup> Investments in infrastructure will result in supporting the construction sector and “also enhance Europe’s longer-term sustainable growth-potential.”<sup>48</sup> This is especially so in the energy sector, where high profile trans-European projects “would help to increase the EU’s energy security and integrate more Member States into the European electricity grid.”<sup>49</sup>

Given the importance of energy infrastructure to the European Union’s recovery programme, three of the ten Actions for Recovery are dedicated to the energy and infrastructure sectors. Action point five focuses on investments to modernise Europe’s infrastructure, which will be drastically increased. This will include the launch of €500 million in investment funding for “trans-European transport (TEN-T) projects” to finance projects where construction would commence by the end of 2009.<sup>50</sup> In addition, a concerted increase in financing of “climate change, energy security and

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<sup>40</sup> European Commission, Communication from the Commission to the European Council, A European Economic Recovery Plan, COM(2008) 800 final, 26.11.2008, [*“European Economic Recovery Plan”*], [https://ec.europa.eu/economy\\_finance/publications/pages/publication13504\\_en.pdf](https://ec.europa.eu/economy_finance/publications/pages/publication13504_en.pdf).

<sup>41</sup> *European Economic Recovery Plan*, page 5.

<sup>42</sup> *European Economic Recovery Plan*, page 2.

<sup>43</sup> *European Economic Recovery Plan*, page 10.

<sup>44</sup> *European Economic Recovery Plan*, page 13.

<sup>45</sup> *European Economic Recovery Plan*, page 13.

<sup>46</sup> *European Economic Recovery Plan*, page 13.

<sup>47</sup> *European Economic Recovery Plan*, page 13.

<sup>48</sup> *European Economic Recovery Plan*, page 13.

<sup>49</sup> *European Economic Recovery Plan*, page 13.

<sup>50</sup> *European Economic Recovery Plan*, page 14.

infrastructure investments” by the European Investment Bank, of up to €6 billion per year, is identified. Further, action point six targets the aggressive improvement in energy efficiency of public buildings as well as private and public housing infrastructure, which is to be accompanied by innovative financing models. Action point seven is focused on the promotion of a rapid up-take of so-called green products and services, in particular aimed at “improving [the] energy efficiency of buildings.”<sup>51</sup>

### 3.2 *Actions for Recovery - Regulation 663/2009*

As the European Economic Recovery Plan identifies, spending in defined strategic sectors “in which action would make a clear contribution to the objectives of the security of energy supply and the reduction of greenhouse gas emissions”<sup>52</sup> will best achieve the European Union’s overall objective of stimulating growth and economic recovery. Providing financial assistance to “large, mature projects capable of making efficient and effective use of significant amounts of investment”<sup>53</sup> is therefore a key priority of the European Commission’s economic response measures.

Regulation 663/2009 of July 2009 sets out the formal establishment of the “European Energy Programme for Recovery” (EEPR), a programme “to aid economic recovery by granting Community financial assistance to projects in the field of energy.”<sup>54</sup> As the recitals to the Regulation indicate, the Regulation takes concerted action on the objectives of the European Economic Recovery Plan, in addition to delivering on the Union’s wider energy policy related to energy security and greenhouse gas emission reduction action. Accordingly, the EEPR’s scope is limited to the sectors of gas and electricity infrastructure, as well as infrastructure related to offshore wind energy and carbon capture and storage.<sup>55</sup> Energy infrastructure projects falling within these sectors will be selected based on their importance to the operation of the internal European energy market, the safeguarding of security of supply in Europe, and to the overall recovery of the European economy.<sup>56</sup> Given the urgency of the economic recovery objective and the European Union’s “pressing energy needs”, the Regulation sets out detailed provisions for the EEPR’s financial assistance, with the largest tranche of funding reserved for gas and electricity infrastructure, followed by carbon capture and storage projects and offshore wind energy projects.<sup>57</sup> Unusually for a European Union regulation, the Regulation already includes a pre-identified “list of eligible projects.”<sup>58</sup>

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<sup>51</sup> *European Economic Recovery Plan*, page 15.

<sup>52</sup> Regulation 663/2009 of the European Parliament and of the Council establishing a programme to aid economic recovery by granting Community financial assistance to projects in the field of energy, 13 July 2009, OJ L 200/31, 31.7.2009, Recital 6, [*“Regulation 663/2009”*].

<sup>53</sup> *Regulation 663/2009*, Recital 6.

<sup>54</sup> *Regulation 663/2009*, Article 1.

<sup>55</sup> *Regulation 663/2009*, Recital 6.

<sup>56</sup> *Regulation 663/2009*, Recital 10.

<sup>57</sup> *Regulation 663/2009*, Article 3.

<sup>58</sup> *Regulation 663/2009*, Recital 18; see also Article 1.

### 3.2.1 *The Four Strategic Energy Infrastructure Sectors*

The gas and electricity infrastructure sector is recognised as having “the highest Community added value” and as the infrastructure investment that would best achieve the objectives of the Regulation. These include the security and diversification of energy, the optimisation of capacity of the Union’s energy network, the integration of the internal energy market (especially concerning cross-border sections), the development of a network of infrastructure to strengthen economic and social cohesion, the connection and integration of renewable energy resources, and the interoperability of interconnected energy networks (including multidirectional gas flows).<sup>59</sup>

For gas and electricity infrastructure projects, the Regulation also sets out a number of stated priorities. The EEPR “shall serve urgently to adapt and develop energy networks of particular importance to the Community...[where] support is necessary to develop energy networks more intensively and to accelerate their construction.”<sup>60</sup> Article 7 sets out the eligibility criteria for EEPR assistance in this sector. Eligibility is limited to proposals submitted by one or more Member States acting jointly. Where all Member States directly concerned with the project agree, a proposal may be submitted by one or several public or private undertakings or bodies acting jointly, or by one or several international organisations acting jointly, or by a joint undertaking.<sup>61</sup> In any case, proposals submitted by natural persons “shall not be eligible.”<sup>62</sup>

The Regulation is less detailed on the objectives and priorities for infrastructure projects in the offshore wind and carbon capture and storage infrastructure sectors. For offshore wind projects, eligible projects relate either to grid integration of offshore wind energy, or to new turbines, structures and components, or the optimisation of manufacturing capacities.<sup>63</sup> Projects shall be led by a commercial undertaking and proposals for funding may be submitted by one or several undertakings, acting jointly.<sup>64</sup>

For infrastructure in the carbon capture and storage sector, in order to be considered eligible projects for EEPR funding, the projects must demonstrate that they have the ability to capture at least 80 per cent of CO<sub>2</sub> in industrial installations and to transport and geologically store this CO<sub>2</sub> safely underground. In the case of power installations, CO<sub>2</sub> capture must be demonstrated on an installation of at least 250 MW electrical output. Given the relatively novel nature of the technology, project promoters must make a binding declaration that the generic knowledge generated by the demonstration plant will be made available to the wider industry and to the Commission.<sup>65</sup>

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<sup>59</sup> *Regulation 663/2009*, Article 4.

<sup>60</sup> *Regulation 663/2009*, Article 5.

<sup>61</sup> *Regulation 663/2009*, Article 7.

<sup>62</sup> *Regulation 663/2009*, Article 7.3.

<sup>63</sup> *Regulation 663/2009*, Annex, Part B: Offshore Wind Projects.

<sup>64</sup> *Regulation 663/2009*, Article 13.

<sup>65</sup> *Regulation 663/2009*, Article 18.

### 3.3 Identifying and Selecting EEPB Projects

On 19 May 2009, the European Commission launched a single call for proposals related to the three sub-programmes of the EEPB. Potential project promoters were invited to submit proposals by 15 July 2009.<sup>66</sup> A total of 87 applications were received by the Commission, 46 for gas and electricity infrastructure, 29 for offshore wind and 12 for carbon capture and storage.<sup>67</sup> Evaluations were conducted from the second half of July 2009 and completed in September for offshore wind energy and carbon capture and storage proposals, and by November 2009 for gas and electricity infrastructure.<sup>68</sup> After submission of the selected proposals to the European Parliament for review, the European Commission adopted the award decisions on 9 December 2009 (for offshore wind energy and carbon capture and storage) and on 4 March 2010 for the gas and electricity infrastructure projects.<sup>69</sup>

The European Union's promotion and development of natural gas and carbon capture and storage projects also carries currency for Alberta and recent developments in Alberta may offer important lessons for the European Union by way of reverse flow. For example, in June 2020, the Alberta Carbon Trunk Line Project (ACTL), the "world's newest integrated, large-scale carbon capture, utilization and storage (CCUS) system", will become fully operational.<sup>70</sup>

#### i) Gas and electricity infrastructure projects

For gas and electricity infrastructure projects, the selection criteria for proposals entails the soundness and technical adequacy of the approach as well as the soundness of the financial package for the full investment phase of the project. In assessing proposals, the Commission is to apply a series of award criteria, including the maturity of the proposal (reaching the investment stage and incurring substantial capital expenditure by the end of 2010), the extent to which a lack of access to financing is delaying the implementation of the project, and the extent to which EEPB assistance will stimulate public and private finance. Socioeconomic and environmental impacts also form part of the award criteria, as does the contribution of the infrastructure project to the continuity and interoperability of the European energy network and to the optimisation of its capacity.<sup>71</sup>

Of the 46 proposals received by the Commission, 43 proposals were selected, 31 for gas infrastructure and 12 for electricity infrastructure, resulting in an award of €2.299 billion of financial support (€1.391 billion for gas infrastructure and €908 million for electricity infrastructure).<sup>72</sup>

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<sup>66</sup> European Commission, Report on the implementation of the European Energy Programme for Recovery, COM (2010) 191 final, 27.4.2010, page 6 ["COM (2010) 191 final"].

<sup>67</sup> COM (2010) 191 final, page 6.

<sup>68</sup> COM (2010) 191 final, page 7.

<sup>69</sup> COM (2010) 191 final, page 7.

<sup>70</sup> See, for example, Alberta Carbon Trunk Line, The ACTL System, <https://actl.ca>; see also Enhance Energy, <https://enhanceenergy.com/actl/>.

<sup>71</sup> Regulation 663/2009, Article 8.

<sup>72</sup> COM (2010) 191 final, page 7.

ii) Offshore wind energy projects

The selection criteria for offshore wind energy projects considers the soundness and technical adequacy of the proposal and the soundness of the financial package for the full investment phase of the project. The award criteria focuses generally on: (a) the level of maturity and investment stage of the project; (b) the extent to which lack of access to finance is delaying the implementation of the project; (c) the extent to which the project may improve or increase the scale of installations and infrastructure that is already under construction or in the planning phase; and (d) the extent to which the project includes the construction of full-size and industrial-scale installations and infrastructure that address a general scaling-up of offshore wind energy capacity.<sup>73</sup>

The European Commission noted that the offshore wind energy sub-programme was “particularly successful” with 29 proposals that exceeded the allocated envelope of €565 million by asking for a total financial support of €1.669 billion. Of the 29 proposals, 9 were ultimately funded, therefore exhausting the limits of the €565 million allocation.<sup>74</sup>

iii) Carbon capture and storage projects

In its selection process for carbon capture and storage projects, the Commission considers a number of criteria related, in particular, to the economic feasibility of the proposed project. Thus, the soundness and technical adequacy of the proposed approach of the carbon capture and storage project, the maturity of the investment stage of the project, the soundness of the financial package, and the identification of all necessary permits required for the construction and operation of the project make up the selection criteria. The Commission may consider, as award criteria, the extent to which lack of access to finance is delaying the implementation of the action, the requested funding per tonne of CO<sub>2</sub> to be abated in the first five years of operation of the project, the complexity of the project and the level of innovation of the installation, as well as the readiness of the proposed concept by 31 December 2015.<sup>75</sup>

Of the 12 proposals received for carbon capture and storage projects, half were awarded, close to exhausting the allocated €1.050 billion to the sub-programme. A total of €1 billion was awarded to the six best-ranked proposals.<sup>76</sup>

### ***3.4 Financing of Infrastructure Projects and Identification of Risk***

Following formal selection and adoption of the projects by the Commission, individual legal commitments were made by the Commission. For offshore wind energy and carbon capture and storage sub-programmes, these commitments consisted of grant agreements to be signed by the Commission and the beneficiary. For gas and electricity infrastructure projects, the Commission adopted individual grant decisions and notified the beneficiaries accordingly.<sup>77</sup>

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<sup>73</sup> Regulation 663/2009, Article 14.

<sup>74</sup> COM (2010) 191 final, page 8.

<sup>75</sup> Regulation 663/2009, Article 19.

<sup>76</sup> COM (2010) 191 final, page 8.

<sup>77</sup> COM (2010) 191 final, page 7.

Initial assessment of the EEPR by the European Commission, at the very early stage in April 2010, indicated “a first qualitative appreciation of the impact of the EEPR...[and that] the success of the call for proposals must be stressed.”<sup>78</sup> The Commission noted that the high number and quality of submitted proposals “confirms the relevance of the EEPR and the readiness of the industry.”<sup>79</sup> The programme is identified as an “accelerator” of infrastructure investments by attracting co-financiers and encouraging investments, thereby making it “possible to set up projects that otherwise would have been delayed or abandoned.”<sup>80</sup> Using the example of gas and electricity projects, the Commission identified that the expected volume of €2.299 billion EEPR grants “will help mobilise up to €22 billion of private sector investment over the next 3 to 5 years.”<sup>81</sup>

Given the intended financing volume of the EEPR, the European Commission identified potential risks in overall project implementation as well as a number of mitigation measures to address these. The high degree of “technical, organisational and financial complexity” of EEPR-funded projects will inherently involve “some level of risk.”<sup>82</sup> Regulatory risk is flagged by the Commission, as successful project implementation requires compliance with “all relevant environmental legislation” and the securing of construction permits. In addition, it is critical that “project promoters stick to their funding commitment.”<sup>83</sup> For offshore wind energy projects, technological risks are also identified, given the relatively new and novel development of this sector. For carbon capture and storage projects, whilst “implementation is progressing smoothly...continued national funding and industrial commitment will be necessary.”<sup>84</sup> Accordingly, Member States will need to provide the necessary legal framework for CO<sub>2</sub> storage and transportation by implementing the 2009 directive on carbon capture and storage into their respective national laws.<sup>85</sup> In light of these anticipated risks to infrastructure project delivery, the European Commission noted that “active cooperation” of national, regional and local authorities was critical so as to “deliver the necessary authorisations.”<sup>86</sup> The Commission will therefore coordinate the project management of identified infrastructure projects “in close cooperation” with Member States and/or project promoters.<sup>87</sup>

### **3.5 Amending the Programme to include Sustainability and Energy Efficiency**

One of the criticisms of the first stage of the EEPR was that both energy efficiency and a greater focus on renewable energy were omitted in the original programme. In late 2010, the European Union acknowledged that part of the original €3.98 billion financial envelope of the EEPR “will not be committed under [its] sub-programmes.”<sup>88</sup> Recognising that the development of further “renewable energy sources and the promotion of energy efficiency” would contribute both to the

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<sup>78</sup> COM (2010) 191 final, page 8.

<sup>79</sup> COM (2010) 191 final, page 8.

<sup>80</sup> COM (2010) 191 final, page 8.

<sup>81</sup> COM (2010) 191 final, page 8.

<sup>82</sup> COM (2010) 191 final, page 9.

<sup>83</sup> COM (2010) 191 final, page 9.

<sup>84</sup> COM (2010) 191 final, page 9.

<sup>85</sup> COM (2010) 191 final, page 9.

<sup>86</sup> COM (2010) 191 final, page 9.

<sup>87</sup> COM (2010) 191 final, page 9.

<sup>88</sup> Regulation 1233/2010 of the European Parliament and of the Council amending Regulation (EC) No 663/2009 establishing a programme to aid economic recovery by granting Community financial assistance to projects in the field of energy, 15 December 2010, OJ L 346/5, 30.12.2010, Recital 2. [“*Regulation 1233/2010*”].

priority focus of Europe's green growth, the challenge of climate change, and the overall objective of creating a competitive and sustainable European economy, a dedicated financial facility was proposed to "use the funding" of the EEPR, which could not have been committed by the end of 2010. Regulation 1233/2010, which amended Regulation 663/2009, established this new "financial facility for sustainable energy projects" for the sole purpose of developing funding instruments with financial institutions to give "a major stimulus to energy efficiency projects and projects for the exploitation of renewable energy sources."<sup>89</sup> The comprehensive details on the financial facility are set out in the newly added Annex II of the amended Regulation 663/2009.<sup>90</sup> In short, the amendments are focused on "the development of energy saving, energy efficiency and renewable energy projects...particularly in urban settings."<sup>91</sup> The main beneficiaries of the facility are intended to be public authorities "preferably at local and regional level" as well as public and private entities acting on behalf of those authorities.<sup>92</sup>

Funding from the financial facility was the main driver and subsequent source of capital for the newly established "European Energy Efficiency Fund" (EEEF). The EEEF, in the language of the Commission, "brings a new market-oriented approach with a simple one stop shop for both project financing and technical assistance"<sup>93</sup> to the critical area of energy efficiency. After the European Commission acted as its initiator and key funder in the amount of €125 million,<sup>94</sup> the fund was launched in July 2011, poised to support the promotion of a "sustainable energy market" and action on climate mitigation by attracting private and public capital to climate financing.<sup>95</sup> Thus, pursuant to the objective of Regulation 1233/2010, the Commission cooperated with a number of financial institutions in establishing the EEEF. Together with the European Commission, the founding investors are the European Investment Bank (EIB), Cassa Depositi e Prestiti SpA (CPD) of Italy and DWS Deutsche Bank of Germany.<sup>96</sup> In its mid-term review of the EEEF in 2013, the Commission observed that the European Union's contribution had been more than doubled by additional investor commitments.<sup>97</sup> In a subsequent progress report in March 2018, the Commission noted that the total investment volume had reached €265 million and that between July 2011 and December 2016, the Fund had signed contracts with 11 projects for a total of €121 million which generated €224 million of final investments.<sup>98</sup>

#### 4. Priority Trans-European Energy Infrastructure: Projects of Common Interest

Despite concerted efforts at the European Union and Member State levels to develop Europe's cross-border energy infrastructure, by 2010, the European Commission acknowledged that "major efforts [were] needed to modernise and expand Europe's energy infrastructure and to interconnect

<sup>89</sup> Regulation 1233/2010, Article 1.3.

<sup>90</sup> Regulation 663/2009, Chapter IIa, Article 21a.

<sup>91</sup> Regulation 1233/2010, Annex II.

<sup>92</sup> Regulation 1233/2010, Annex II.

<sup>93</sup> Commission Staff Working Document, Mid-term evaluation of the European Energy Efficiency Fund, SWD(2013) 457 final, 18.11.2013.

<sup>94</sup> European Energy Efficiency Fund, EEEF, <https://www.eeef.eu/organizational-setup.html>.

<sup>95</sup> *Ibid.*

<sup>96</sup> *Ibid.*

<sup>97</sup> Commission Staff Working Document, Mid-term evaluation of the European Energy Efficiency Fund, SWD(2013) 457 final, 18.11.2013, 3.2 Leverage effect.

<sup>98</sup> European Commission, Report on the implementation of the European Energy Programme for Recovery and the European Energy Efficiency Fund, COM(2018) 86 final, 5.3.2018, page 4.

networks across borders.”<sup>99</sup> In response to this conclusion, in October 2010, the European Commission set out a proposal for a new regulation on trans-European energy infrastructure. The Commission identified total investment volumes in energy infrastructure by 2020 of “about EUR 200 billion...EUR 140 billion for high voltage electricity transmission systems, both onshore and offshore, storage, and smart grid applications at transmission and distribution level.”<sup>100</sup> In April 2013, the Commission published a new Regulation 347/2013 on trans-European energy infrastructure. The Regulation identifies electricity interconnectors, both on- and offshore, as “energy infrastructure priority corridors” and as European priority projects.

Strategic electricity interconnector projects of importance to the European Union are identified due to their significance in achieving a comprehensively integrated European electricity network and market. In light of anticipated shortfalls in renewable energy capacity in the European Union, including in Germany, these projects are critical for the transmission of renewable energy capacity from the strategic North Africa and Mediterranean solar region to the European centre. Priority interconnector projects can therefore be divided into two geographic regions:

- The North Sea countries for a multi-jurisdictional offshore interconnector infrastructure (the North Sea Offshore Grid); and
- The trans-Pyrenees and trans-Alpine corridors for cross-border interconnection infrastructure.<sup>101</sup>

#### **4.1 Regulation 347/2013 on Trans-European Energy Infrastructure**

When Regulation 347/2013 was adopted, the European Union identified twelve strategic trans-European energy infrastructure priorities, “the implementation of which by 2020 is essential for the achievement of the Union’s climate and energy policy objectives.”<sup>102</sup> The twelve energy infrastructure priorities cover different geographic regions of Europe or thematic areas in the wider field of European energy infrastructure. They are set out in Appendix I of the Regulation, and consist of priority electricity and gas corridors, a priority oil corridor in Central Eastern Europe, and priority themes including smart grid deployment and cross-border carbon dioxide network infrastructure.<sup>103</sup> At the core of the Regulation lies the European Union’s overall energy policy objective of facilitating “the functioning of the internal energy market and security of supply in the Union.”<sup>104</sup> By seeking to deliver on these goals, the Regulation will contribute to “smart, sustainable and inclusive growth...[bringing] benefits to the entire Union in terms of competitiveness and economic, social and territorial cohesion.”<sup>105</sup> The scope of Regulation

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<sup>99</sup> European Commission, Proposal for a Regulation of the European Parliament and of the Council on guidelines for trans-European energy infrastructure and repealing Decision No 1264/2006/EC, COM(2011) 658 final, 19.10.2011, page 2.

<sup>100</sup> *Ibid.*, page 4.

<sup>101</sup> Regulation No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009, 17 April 2013, OJ L 115/39, 25.4.2013, Annex I, [“*Regulation 347/2013*”].

<sup>102</sup> *Regulation 347/2013*, Recital 20.

<sup>103</sup> *Regulation 347/2013*, Appendix I.

<sup>104</sup> *Regulation 347/2013*, Recital 17.

<sup>105</sup> *Regulation 347/2013*, Recital 17.

347/2013 focuses on “the timely development and interoperability of priority corridors and areas of trans-European energy infrastructure”, by identifying “projects of common interest” in the electricity, gas, oil, and carbon dioxide transportation sectors.<sup>106</sup>

#### 4.1.1 *The Concept of Projects of Common Interest*

In order to qualify as a “project of common interest”, the Regulation requires: (a) the project to be necessary for at least one of the identified priority energy infrastructure corridors or areas; (b) the potential overall benefits of the project to outweigh its costs (including long-term costs); and (c) the project to be truly cross-border in scope.<sup>107</sup> Projects of common interest are granted priority status based on the “necessity of these projects from an energy policy perspective.”<sup>108</sup> Pursuant to Article 3 of the Regulation, the European Commission is to draw up a “Union list” of priority projects every two years. The first list was set out in Regulation 1391/2013 of 13 October 2013, with subsequent projects lists every two years. In October 2019, the Commission published its most up to date fourth list, which included 149 projects of common interest.<sup>109</sup>

Once projects are designated projects of common interest, the project promoters and all regulatory authorities involved in the approval process shall “ensur[e] that the most rapid treatment legally possible” is given to the application.<sup>110</sup> To underscore the priority status further, each Member State must designate a single national competent authority to facilitate and coordinate the permit granting process.<sup>111</sup> The priority status may also influence the project’s treatment within the European Union’s environmental impact assessment regime and the assessment at the Member State level, given that “projects of common interest shall be considered as being of public interest from an energy policy perspective.”<sup>112</sup>

Given the diversity amongst Member States in regulating the approval process, the permit granting process pursuant to the Regulation may be achieved by each Member State using one of three schemes. The harmonising objective is to issue a comprehensive decision within the prescribed time limits set out in the Regulation. Thus, the national competent authority may issue a decision as the “sole legally binding decision” pursuant to an “integrated scheme” that permits other regulatory authorities, pursuant to relevant national law, to “give their opinion as input to the procedure.”<sup>113</sup> Alternatively, the competent national authority may pursue a “coordinated scheme”, whereby it coordinates several individually legally binding decisions issued by different authorities.<sup>114</sup> The third “collaborative” model sees the comprehensive decision “coordinated by

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<sup>106</sup> Regulation 347/2013, Article 1.

<sup>107</sup> Regulation 347/2013, Article 4.1.

<sup>108</sup> Regulation 347/2013, Chapter III, Article 7.

<sup>109</sup> European Commission, Energy, Projects of Common Interest, Key cross border infrastructure projects, undated, [https://ec.europa.eu/energy/topics/infrastructure/projects-common-interest/key-cross-border-infrastructure-projects\\_en](https://ec.europa.eu/energy/topics/infrastructure/projects-common-interest/key-cross-border-infrastructure-projects_en).

<sup>110</sup> Regulation 347/2013, Chapter III, Article 7.

<sup>111</sup> Regulation 347/2013, Chapter III, Article 8.

<sup>112</sup> Regulation 347/2013, Chapter III, Article 7.

<sup>113</sup> Regulation 347/2013, Chapter III, Article 8.

<sup>114</sup> Regulation 347/2013, Chapter III, Article 8.

the competent authority” but individual decisions are issued pursuant to reasonable time limits, in consultation with the competent authority, by the individual authorities.<sup>115</sup>

To advance the development of cross-border energy infrastructure projects, the Regulation provides that where a project requires approval, “decisions to be taken in two or more Member States”, the respective competent authorities “shall take all necessary steps for efficient and effective cooperation and coordination” between them.<sup>116</sup> In particular on the assessment of environmental impacts, Member States “shall endeavour” to provide for joint procedures between them.

## 5. Implementing European Energy Infrastructure Reforms in Germany

Since the Energy Concept 2050, the European Union has passed a number of policies to promote the development of energy infrastructure and renewable energy generation capacity. But what impact have these had on Germany’s energy transition, and in particular, with regard to the expansion of renewable energy capacity? What role has the development of critical energy interconnection infrastructure had on Germany’s goal to diversify the country’s energy mix and to achieve wider European Union energy security and climate objectives?

### 5.1 Expansion of Offshore Wind Energy and Decline in Onshore Capacity

According to the Federal Ministry for Economic Affairs and Energy, 2017 saw a significant increase in newly installed capacity of offshore wind energy generation, “with 1,275 megawatts connected to the grid (compared to 849 megawatts in 2016).”<sup>117</sup> By the end of 2017, a total of 5.4 GW of offshore wind energy capacity had been installed in Germany.<sup>118</sup> By 2019, the amount of total installed capacity had increased to 7.5 GW, with projected expansion to reach 7.7 GW in 2020 and 15 GW by 2030.<sup>119</sup> For 2019, the share of offshore wind energy capacity in Germany’s gross electricity generation amounted to an impressive 4.1 per cent.<sup>120</sup>

Onshore wind energy generation has been the backbone of Germany’s renewable energy transition, starting with 18.4 GW of installed capacity in 2005 and growing to approximately 50.77 GW of installed capacity and 28,675 installations by 2017.<sup>121</sup> In 2019, however, the rapid expansion came

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<sup>115</sup> Regulation 347/2013, Chapter III, Article 8.

<sup>116</sup> Regulation 347/2013, Chapter III, Article 8.5.

<sup>117</sup> Federal Ministry for Economic Affairs and Energy, Renewable Energy Sources in Figures, National and International Development, 2017, page 10, [https://www.bmwi.de/Redaktion/EN/Publikationen/renewable-energy-sources-in-figures-2017.pdf?\\_\\_blob=publicationFile&v=4](https://www.bmwi.de/Redaktion/EN/Publikationen/renewable-energy-sources-in-figures-2017.pdf?__blob=publicationFile&v=4).

<sup>118</sup> Federal Ministry for Economic Affairs and Energy, Renewable Energy Sources in Figures, National and International Development, 2017, page 10, [https://www.bmwi.de/Redaktion/EN/Publikationen/renewable-energy-sources-in-figures-2017.pdf?\\_\\_blob=publicationFile&v=4](https://www.bmwi.de/Redaktion/EN/Publikationen/renewable-energy-sources-in-figures-2017.pdf?__blob=publicationFile&v=4).

<sup>119</sup> Clean Energy Wire, German offshore wind power – output, business and perspectives, 17 April 2020, <https://www.cleanenergywire.org/factsheets/german-offshore-wind-power-output-business-and-perspectives>.

<sup>120</sup> Clean Energy Wire, German offshore wind power – output, business and perspectives, 17 April 2020, <https://www.cleanenergywire.org/factsheets/german-offshore-wind-power-output-business-and-perspectives>.

<sup>121</sup> German Wind Energy Association, Press Release, Ausbauzahlen für das Gesamtjahr 2017 in Deutschland, Windenergie und Land, 25.01.2018, (in German) <https://www.wind-energie.de/presse/pressemitteilungen/detail/ausbauzahlen-fuer-das-gesamtjahr-2017-in-deutschland-windenergie-und-land-starker-zubaupfad-im-ueberga/>.

to a halt when just 86 new turbines were installed.<sup>122</sup> This marked the lowest level of newly installed turbine expansion since the Renewable Energy Act was first introduced in 2000.

A number of considerations caused this negative trajectory. First, Germany's wind power industry association BWE reported that the drop in newly installed turbines marked a fall of 82 per cent in the first half of 2019, compared to the same period in 2018.<sup>123</sup> This was, in large part, due to the change in financial support mechanisms for renewable energy generation in 2017, when the previously generous feed-in tariffs (set out in the Renewable Energy Law of 2000) were replaced with a more realistic model of renewable energy generation, consisting of "caps on annual expansion, and power producers competing for a share of...new capacity."<sup>124</sup> Second, efficiencies in power generation and increased wind speeds due to unusually strong winter storms in 2019 meant that actual onshore wind energy generation was up 20 per cent compared to 2018.<sup>125</sup>

This development of increased generation marked the continuation of an interesting trend. As the BWE has previously reported, new technologies in wind energy generation do not require a corresponding increase in installed turbine numbers. Repowering existing wind energy installations with more powerful turbine technologies (such as increasing current average operating capacity from 1.8 MW to 3.3 MW, and potentially even further to 6-7 MW) will require a total installed number of wind turbines of 30,000 to achieve the target of 200 GW of generation capacity by 2030.<sup>126</sup> This would require only a total of approximately 2,000 new onshore wind generation installations.

One of the biggest obstacles to a continued and stable expansion of onshore wind energy capacity in Germany are the constraints posed by regulatory limitations, including environmental and land use planning objections. As the BWE reported in summer 2019, construction of approximately 2,000 turbines "with a combined capacity of 11 GW" is currently constrained by litigation involving residential and environmental opposition to onshore wind energy generation.<sup>127</sup> This is a serious challenge to Germany's ongoing energy transition, given that the country will require an average of 4.7 GW of new onshore wind power capacity annually until 2050 in order to achieve the ambitious target of carbon-neutrality by 2050.

### *5.1.1 Dismantling, Recycling and Repowering of Wind Energy Installations*

As of 2018, Germany had an onshore wind energy inventory of approximately 28,000 turbines.<sup>128</sup> Germany's development of onshore wind energy capacity dates back more than thirty years and, understandably, older installations require dismantling or repowering. In a 2019 study, the Federal

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<sup>122</sup> Clean Energy Wire, Germany's onshore wind power expansion threatens to grind to a halt, 25 July 2019, ["*Clean Energy Wire 2019*"], <https://www.cleanenergywire.org/news/germanys-onshore-wind-power-expansion-threatens-grind-halt>.

<sup>123</sup> *Clean Energy Wire 2019*.

<sup>124</sup> *Clean Energy Wire 2019*.

<sup>125</sup> *Clean Energy Wire 2019*.

<sup>126</sup> *Clean Energy Wire 2019*.

<sup>127</sup> *Clean Energy Wire 2019*.

<sup>128</sup> Umwelt Bundesamt, Entwicklung eines Konzepts und Maßnahmen für einen ressourcensichernden Rückbau von Windenergieanlagen, Studie, 117/2019, October 2019, ["*Umwelt Bundesamt*"], (in German) <https://www.umweltbundesamt.de/publikationen/entwicklung-eines-konzepts-massnahmen-fuer-einen>.

Ministry of Environment identified that the “need for dismantling, recycling and repowering will increase significantly in the upcoming years.”<sup>129</sup> Decommissioning or repowering of wind installations has become a new industry sector. This development will continue, in particular from 2021 on, as installations installed prior to 2000 (when the generous financial subsidies of the Renewable Energy Act, 2000 were introduced) will reach the end of their life cycles. As a result, “the number of [installed] turbines will fall significantly.”<sup>130</sup>

Despite the fact that Germany has a relatively long history of generating electricity by way of onshore wind turbines, there is little experience in dismantling these installations. As noted, the problem will become “increasingly relevant from around 2020” onwards, when efficiencies of older installations will be expired and their economic viability will decline.<sup>131</sup> Repowering of these installations, by replacing operating plants with more powerful and efficient turbines, will further contribute to the challenges arising from the dismantling and disposing of existing installations and, where applicable, their replacement with new turbines and associated infrastructure.

Whilst the physical dismantling of wind turbines is subject to a sophisticated construction law regime pursuant to the Federal German Construction Code (which includes provisions on the usual decommissioning securities etc.), “no general guidelines...exist so far regarding the dismantling process” or “specific targets under waste law.”<sup>132</sup> Consequently, the Federal Ministry of Environment proposed to undertake a number of measures to set out recommendations for what it calls a regime for the “resource-saving dismantling and a high-quality utilization of wind turbines.”<sup>133</sup> These measures have a clear focus on environmental protection (e.g. the prevention of waste, including electronic waste) as well as resource conservation by way of recycling to ensure that “resulting material flows...safeguard the environment and resources.”<sup>134</sup> As a result, the proposed measures by the Federal Ministry of Environment include:

- the creation of technical guidelines to safeguard the dismantling and recycling of wind turbines;
- the creation of technical standards and norms for certain dismantling and disposal activities;
- an examination of the introduction of specific elements of producer responsibility for rotor blades;
- the need for optimization in the management of specific waste streams; and
- economic and organizational needs.<sup>135</sup>

The proposed measures are of particular interest to international readers generally, and to those watching with interest what Germany is doing in terms of recycling and resource efficiency. This is especially so if one considers that the volume of waste, including glass fiber reinforced plastics in rotor blades, will increase significantly from 2020/2021 onward and is expected to peak by

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<sup>129</sup> *Umwelt Bundesamt*, page 5.

<sup>130</sup> *Umwelt Bundesamt*, page 39.

<sup>131</sup> *Umwelt Bundesamt*, page 35.

<sup>132</sup> *Umwelt Bundesamt*, page 35.

<sup>133</sup> *Umwelt Bundesamt*, page 45.

<sup>134</sup> *Umwelt Bundesamt*, page 45.

<sup>135</sup> *Umwelt Bundesamt*, page 46.

approximately 2037. The 2019 study therefore recommends the introduction of technical guidelines as the preferred method of non-binding flexible instruments instead of the creation of new laws and regulations. It concludes that “guidelines for decommissioning, including information for authorities on the scope for licensing would...appear to be more useful.”<sup>136</sup> Further, the adoption of technical standards for dismantling and disposing of wind turbines would also address the lack of harmonization and introduce uniform standards in Germany’s Federal state structure.<sup>137</sup> These could be developed and introduced as part of the formulation of non-binding guidelines on the decommissioning process.

## 5.2 *Formalising the German Coal Phase-Out by 2038*

The Federal Government confirmed its plans to end coal-fired power generation in Germany by no later than 2038 in its cabinet decision of 29 January 2020. This decision followed lengthy consultation headed by a multi-stakeholder “Commission on Growth, Structural Change, and Employment”, more commonly known as the “coal phase-out commission.” It was active from June 2018 and delivered its final report in January 2019. To accompany the formal phase-out by 2038, the Commission recommended extensive compensation payments for existing operators of coal-fired power plants and mining operations, as well as the financing of substantial sums to undertake structural reforms and transformation of the affected lignite mining regions and their economies.<sup>138</sup>

Phasing out Germany’s generation of electricity from coal will be implemented by way of a stepped plan with three key target stages. In the first stage, a limit of 15 GW hard coal and 15 GW lignite generation capacity will be imposed by 2022 (compared to approximately 22.8 GW hard coal and 21.2 GW lignite generation capacity in 2019). Stage two will see a further reduction to 8 GW hard coal and 9 GW lignite generation capacity by 2030, with a reduction of any coal-powered capacity by the target date of 2038. Encouragingly, three formal reviews of the phase-out will be undertaken in 2026, 2029 and 2032, to study whether the phase-out could be brought forward to 2035.<sup>139</sup>

For hard coal power plant operators, the phase-out will involve a system of capacity auctions until 2026, devised to remove electricity capacity generated from hard coal. After 2026, the phase-out will be enforced by way of mandatory closures on hard coal fired power plants. The Federal Network Agency (BNetzA) will administer the auction process until 2026. Operators of coal plants will receive a so-called “hard coal premium” for each MW of capacity taken offline, based on a scaled and decreasing maximum remuneration per MW of capacity. The highest price per MW in the first auction is designed to act as a strong incentive for operators to take part in the early rounds of auctions, as the maximum remuneration will drop from an initial 165,000 Euro/MW to 49,000 Euro/MW in the final auction in 2023. The phase-out includes the prospect that the Federal Government, in the event that the final auction rounds of 2022 and 2023 do not include successful bids, can undertake forced shutdowns of hard coal plants. These shutdowns would be determined

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<sup>136</sup> *Umwelt Bundesamt*, page 45.

<sup>137</sup> *Umwelt Bundesamt*, page 45.

<sup>138</sup> Clean Energy Wire, Spelling out the coal exist – Germany’s phase-out plan, 31 January 2020, [“*Clean Energy Wire Coal*”], <https://www.cleanenergywire.org/factsheets/spelling-out-coal-phase-out-germanys-exit-law-draft>.

<sup>139</sup> *Clean Energy Wire Coal*.

by the age of the plant. After expiration of the auction rounds to voluntarily remove hard coal capacity by 2026, the BNetzA has the power to force shutdowns of plants for the 2027-2038 period. Again, the agency will prepare a list of plants for closure, based on when the power plant first came online.<sup>140</sup>

The Federal Government achieved agreement with Germany's four lignite coal operators in January 2020. Of these, RWE will be responsible for all shutdowns between 2021 and 2022, taking close to 3 GW of capacity offline. No closures are planned for the period of 2023 and 2024 due to the anticipated phase-out of nuclear energy generation in Germany, and again between 2030 and 2033. In total, €4.35 billion will be paid out as compensation for the planned shutdowns by 2030, with RWE slated to receive some €2.6 billion from this amount. This sum does not include the additionally earmarked sum of €5 billion, available until 2048, to facilitate adaptation payments for those employed in the coal industry, including at power plants or lignite mining operations.

Despite a formal recommendation by the Commission not to permit the development of any new coal fired power generation, Germany will see the commissioning of a new 1.1 GW coal fired power plant (Datteln 4) in the summer of 2020. The plant will be permitted to operate for a maximum of 18 years pursuant to the 2038 end-date of the phase-out.<sup>141</sup> The Federal Government's decision to permit the German utility Uniper to connect Datteln 4 to the electricity grid has been highly contentious and the subject of numerous vocal protests.<sup>142</sup>

### 5.2.1 Repurposing former Lignite Mining Regions as Renewable Energy Hubs

On the eve of the coal phase-out commission's final meeting in January 2019, German media reported that Vattenfall, a Swedish energy company active in Germany, had indicated its interest in developing industrial-scale wind and solar parks on the site of former lignite mines with a view to repurposing the areas as future renewable energy hubs.<sup>143</sup> This announcement will no doubt be of interest to international readers as a potential post-coal industrial repurposing model. For those following European energy developments more closely, it is noteworthy that in September 2016, Vattenfall actually disposed of its German coal operations to the Czech energy group EPH. EPH, in turn, is expected to be a significant beneficiary of the Federal Government's financial compensation regime pursuant to stage two of the coal phase-out (2022 to 2030).

The proposal to repurpose coal mining regions for industrial scale renewable energy generation has also gained credibility due to a feasibility study prepared by the highly respected Fraunhofer ISE Institute. The 2020 study examines the prospect of repurposing artificial lakes at former open pit lignite mines to generate renewable energy from industrial-scale floating photovoltaic

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<sup>140</sup> *Clean Energy Wire Coal*.

<sup>141</sup> Businessinsider.com, Activists occupy German coal plant site Datteln 4 in green protest, 2 February, 2020, <https://www.businessinsider.com/activists-occupy-german-coal-plant-site-datteln-4-in-green-protest-2020-2>.

<sup>142</sup> Deutsche Welle DW.com, Will German Uniper power plant be hauled over the coals, 14 January 2020, <https://www.dw.com/en/will-german-uniper-power-plant-be-hauled-over-the-coals/a-51996173>.

<sup>143</sup> Photon.info, Greenpeace Energy criticises Vattenfall and Baywa's plans for wind and solar power in German lignite mining areas, 27 January, 2019, <https://www.photon.info/en/news/greenpeace-energy-criticises-vattenfall-and-baywas-plans-wind-and-solar-power-german-lignite>.

installations.<sup>144</sup> Commissioned by renewable energy company BayWa, the study concluded that 4.9 per cent of all existing artificial lakes associated with lignite mining projects in Germany could be exploited for renewable energy generation, with the potential to generate up to 2.74 GW of floating photovoltaic energy.<sup>145</sup>

Floating photovoltaic technology, the study concludes, has several advantages over traditional ground-mounted photovoltaic installations. In addition to minimising land-use impact, the Fraunhofer study identified that floating installations would generate “greater power production due to the cooling effect of water” upon which the photovoltaic array floats.<sup>146</sup> Further, repurposing former lignite mining installations for purposes of large-scale renewable energy generation also has the advantage of benefiting from existing infrastructure, including electricity grid connections. These advantages would make a significant contribution to offsetting the anticipated 10 to 15 per cent increased costs versus conventional ground-mounted photovoltaic power plants.<sup>147</sup> The Fraunhofer Institute noted that BayWa renewable energy already commercialized three floating photovoltaic systems in the Netherlands, with a total installed capacity of 25 MW, further underscoring “that there is enormous potential for floating PV in Germany.”<sup>148</sup>

Developments on post-coal industrial transition in Germany and the European Union may also offer important lessons and impulses for Alberta policy makers as they explore the transition away from coal-fired electricity generation. Already, there are initial indications that some of Alberta’s former coal mines may be repurposed for the development of renewable energy generation, in the form of stored hydroelectric power projects. These are exciting developments and in May 2020, TC Energy Corp. announced that it was partnering with Calgary-based WindRiver Power Corp. on a stored hydroelectric power project east of Jasper National Park.<sup>149</sup>

## 6. Towards a Resilient Energy Union with an Ambitious Climate Action Policy

In February 2015, the European Commission presented its “Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy.”<sup>150</sup> This document sets out details on uniting the energy rules and policies of individual Member States into an “Energy Union” with an integrated energy market.<sup>151</sup> The 2015 Framework recognised that in the specific context of

<sup>144</sup> Fraunhofer Institute for Solar Energy Systems ISE, Fraunhofer ISE Analyzes Potential of Solar Power Plants Located on Pit Lakes in Former Lignite Mines, Press Release, February 5, 2020, [“Fraunhofer”],

[https://www.ise.fraunhofer.de/content/dam/ise/en/documents/press-releases/2020/0120\\_ISE\\_e\\_PR\\_FloatingPV.pdf](https://www.ise.fraunhofer.de/content/dam/ise/en/documents/press-releases/2020/0120_ISE_e_PR_FloatingPV.pdf)  
<sup>145</sup> <https://www.rechargenews.com/transition/german-former-lignite-mines-hold-2-7gw-potential-for-floating-pv/2-1-750371>.

<sup>146</sup> Fraunhofer, page 1.

<sup>147</sup> Fraunhofer, page 1.

<sup>148</sup> Fraunhofer, page 2.

<sup>149</sup> CBC News, TC Energy joins hydroelectric power storage project at retired coal mine site, May 20, 2020, <https://www.cbc.ca/news/canada/calgary/tc-energy-joins-pumped-hydro-power-storage-project-retired-coal-mine-site-1.5577377>.

<sup>150</sup> European Commission, A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, COM(2015) 80 final, 25.2.2015, [https://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC_1&format=PDF).

<sup>151</sup> European Commission, A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, COM(2015) 80 final, 25.2.2015, page 3.

energy market interconnections, cross-border connections “are not sufficient to make the internal energy market work properly.”<sup>152</sup> What was missing from the 2015 framework strategy, however, was an integrated governance mechanism “to ensure that energy-related actions at Union, regional, national and local level all contribute to the Energy Union’s objectives.”<sup>153</sup> This mechanism is now set out in Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action.

### **6.1 Regulation 2018/1999 on the European Energy Union and Climate Action**

Regulation (EU) 2018/1999 addresses the lack of a legislative foundation for a governance mechanism of the Energy Union and related climate action, first set out in 2015. This mechanism is designed to assist the European Union in its achievement of 2030 objectives “in line with the 2015 Paris Agreement.”<sup>154</sup> The core objective of the governance mechanism is to implement strategies and measures designed to achieve the targets of the 2030 Framework for Climate and Energy, in particular a target of 15 per cent electricity interconnection by 2030 and a share of renewable energy consumed in the Union of at least 27 per cent by 2030.<sup>155</sup> To achieve the Energy Union’s long-term targets on energy and climate, each Member State is to prepare and present to the European Commission, by 31 December 2019 and subsequently on a ten-yearly basis, an “integrated national energy and climate plan.”<sup>156</sup>

The plans are to be structured around the five “dimensions” of the Energy Union, which must be addressed in each Member State’s plan. The dimensions relate to decarbonisation, the internal energy market, energy security, energy efficiency, and research, innovation and competitiveness (the latter two will not be explored further).<sup>157</sup> Each Member State is to set out in its integrated national energy and climate plan “the main objectives, targets and contributions” as related to action on the five dimensions, including the main “existing and planned policies and measures” to achieve the objectives of the national plan.<sup>158</sup> Details of measures to provide for regional cooperation and “appropriate financing at national and regional level” should also be included in the plans.<sup>159</sup> By 15 March 2023, and “every two years thereafter”, each Member State shall also report on the status of implementation of its integrated national energy and climate plan by way of a progress report.<sup>160</sup>

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<sup>152</sup> European Commission, A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, COM(2015) 80 final, 25.2.2015, page 8.

<sup>153</sup> Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, 11 December 2018, OJ L 328/1, 21.12.2018, Recital 13, [“*Regulation (EU) 2018/1999*”].

<sup>154</sup> *Regulation (EU) 2018/1999*, Recital 1.

<sup>155</sup> *Regulation (EU) 2018/1999*, Recital 6. See also, Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions, A policy framework for climate and energy in the period from 2020 to 2030, COM(2014) 15 final, 22.1.2014, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0015&from=EN>.

<sup>156</sup> *Regulation (EU) 2018/1999*, Article 3, Article 9.

<sup>157</sup> *Regulation (EU) 2018/1999*, Article 4, Annex I.

<sup>158</sup> *Regulation (EU) 2018/1999*, Article 4, Article 7.

<sup>159</sup> *Regulation (EU) 2018/1999*, Article 4.

<sup>160</sup> *Regulation (EU) 2018/1999*, Article 17. See also Article 18 (reporting on greenhouse gas policies and measures and projections), Article 20 (reporting on renewable energy), Article 22 (reporting on energy security) and Article 23 (reporting on the internal energy market).

### 6.1.1 *The Decarbonisation Dimension*

The decarbonisation dimension is divided into two sections, focusing on greenhouse gas emissions (and their removal) as well as on renewable energy. Each Member State is to set out its individual objectives and targets on emission reductions with a view to contributing to the collective European Union target on greenhouse gas emission reductions.<sup>161</sup> This shall include details of each Member States' respective binding national target for emissions and the annual binding national limits pursuant to European Union law,<sup>162</sup> as well as other national objectives and targets consistent with the Paris Agreement.<sup>163</sup> With respect to national objectives and targets on renewable energy, and with a view to achieving the European Union's binding target of a minimum 32 per cent renewable energy by 2030, each Member State shall set out its contribution to this target, with an estimated trajectory "for the sectoral share of renewable energy in final energy consumption from 2021 to 2030."<sup>164</sup> By 2030, the indicative trajectory "shall reach at least the Member State's planned contribution."<sup>165</sup> Integrated progress reporting on renewable energy shall include the indicative national trajectory "for the overall share of renewable energy in gross final energy consumption from 2021 to 2030" as well as estimated trajectories for renewable energy in final energy consumption from 2021 to 2030 in the electricity sector.<sup>166</sup>

Policies and measures on greenhouse gas emissions and removals to aid with the European Union meeting its target of a 40 per cent reduction of domestic greenhouse gas emissions by 2030 based on 1990 levels is to be included in Member States' national plans, as well as details on regional cooperation in the area.<sup>167</sup> On renewable energy, details to report in the plan should include policies and measures to achieve the national contribution "to the binding 2030 Union target for renewable energy and trajectories" as well as details on regional cooperation and financial support for the promotion of renewable energy sources.<sup>168</sup>

### 6.1.2 *The Internal Energy Market Dimension*

As set out in Annex I of the Regulation, the internal energy market dimension relates to electricity interconnectivity, energy transmission infrastructure, energy market integration and energy poverty.<sup>169</sup> Accordingly, the international market dimension is of particular importance to this paper. Member States' integrated national energy and climate plans should include details on the level of electricity interconnectivity that the respective Member State aims for in 2030 "in

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<sup>161</sup> *Regulation (EU) 2018/1999*, Article 4(a)(1).

<sup>162</sup> *Regulation (EU) 2018/1999*, Article 4(a)(1).

<sup>163</sup> *Regulation (EU) 2018/1999*, Article 4.2(c). See also Annex I – General Framework for Integrated National Energy and Climate Plans, 2.1 Dimension Decarbonisation.

<sup>164</sup> *Regulation (EU) 2018/1999*, Article 4(a)(2). See also Annex I – General Framework for Integrated National Energy and Climate Plans, 2.1 Dimension Decarbonisation.

<sup>165</sup> *Regulation (EU) 2018/1999*, Article 4(a)(2).

<sup>166</sup> *Regulation (EU) 2018/1999*, Article 20.

<sup>167</sup> *Regulation (EU) 2018/1999*, Annex I – General Framework for Integrated National Energy and Climate Plans, 3.1 Dimension Decarbonisation.

<sup>168</sup> *Regulation (EU) 2018/1999*, Annex I – General Framework for Integrated National Energy and Climate Plans, 3.1 Dimension Decarbonisation.

<sup>169</sup> *Regulation (EU) 2018/1999*, Annex I – General Framework for Integrated National Energy and Climate Plans, 2.4 Dimension Internal Energy Market.

consideration of the electricity interconnection target for 2030 of at least 15%”.<sup>170</sup> Further, objectives and targets on energy transmission infrastructure should include details of “key electricity and gas transmission infrastructure projects...that are necessary for the achievement of objectives and targets under the five dimensions of the Energy Union.”<sup>171</sup> This can include, where relevant, also the modernisation of existing transmission infrastructure as well as “main infrastructure projects” other than projects of common interest as designated pursuant to Regulation 347/2013. Plans should also contain details regarding national objectives related to market integration of the internal energy market, including system flexibility and market integration with a view to increasing the tradeable capacity of existing interconnectors.<sup>172</sup> Integrated progress reporting on the internal energy market dimension should include the information set out in Article 23 of the Regulation.

Policies and measures on the internal energy market for inclusion in the integrated national energy and climate plan of a Member State should include regional cooperation and financing measures on electricity infrastructure and energy transmission infrastructure. In addition, details on the measures taken by a Member State to increase the “flexibility of the energy system with regard to renewable energy production” and measures “to ensure the non-discriminatory participation of renewable energy” in energy markets shall also be included in any plans.<sup>173</sup>

### 6.1.3 *The Energy Security Dimension*

With regard to the energy security dimension, integrated national energy and climate plans shall report on the Member State’s objectives with regard to increasing the diversification of energy sources and supply from third countries so as to increase resilience of regional and national energy systems, as well as details of objectives to reduce energy import dependency from third countries.<sup>174</sup> National objectives should also address “constrained or interrupted supply of an energy source” so as to improve resilience of regional and national energy systems.<sup>175</sup> When completing progress reports on the energy security dimension, Member States shall include the prescribed information as set out in Article 22 of the Regulation.<sup>176</sup> Any policies and measures pursuant to the energy security dimension should include a focus on regional cooperation and, where applicable, details on financing measures at the national level as well as European Union support.<sup>177</sup>

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<sup>170</sup> *Regulation (EU) 2018/1999*, Article 4.2(d).

<sup>171</sup> *Regulation (EU) 2018/1999*, Article 4.2(d).

<sup>172</sup> *Regulation (EU) 2018/1999*, Article 4.2(d).

<sup>173</sup> *Regulation (EU) 2018/1999*, Annex I – General Framework for Integrated National Energy and Climate Plans, 3.4 Dimension Internal Energy Market.

<sup>174</sup> *Regulation (EU) 2018/1999*, Article 4.2(c). See also Annex I – General Framework for Integrated National Energy and Climate Plans, 2.3 Dimension Energy Security.

<sup>175</sup> *Regulation (EU) 2018/1999*, Article 4.2(c).

<sup>176</sup> *Regulation (EU) 2018/1999*, Article 22.

<sup>177</sup> *Regulation (EU) 2018/1999*, Annex I – General Framework for Integrated National Energy and Climate Plans, 3.3 Dimension Energy Security.

#### 6.1.4 *Emphasis on Regional Cooperation between Member States*

The Regulation specifies that regional cooperation between Member States is “key to the effective achievement of the objectives of the Energy Union in a cost-optimal manner.”<sup>178</sup> Accordingly, Article 12 of the Regulation emphasises that “Member States shall cooperate with each other, taking account of all existing and potential forms of regional cooperation.”<sup>179</sup> This is to ensure that Member States “effectively” meet their objectives, targets and contributions as set out in their respective plans.<sup>180</sup>

Each Member State shall “identify opportunities for regional cooperation and consult neighbouring states” and Member States may also engage in “voluntary joint drafting” for parts of their integrated plans and progress reports.<sup>181</sup> Although not explicitly addressed in the Regulation, it can be anticipated that there is potential for overlap between the emphasis on regional cooperation and the provisions on an Energy Union renewable energy financing mechanism, pursuant to Article 31 of the Regulation. For the financing mechanism, the European Commission, by 1 January 2021, shall “establish the Union renewable energy financing mechanism to tender support for new renewable energy projects in the Union.”<sup>182</sup> This type of support may include a premium additional to market prices and the financing mechanism “may...provide support in the form of low-interest loans, grants, or a mix of both.”<sup>183</sup> The mechanism may also be available to support “joint projects between Member States...[or] Member States’ participation in joint projects with third countries” in geographical proximity to the European Union.<sup>184</sup>

## 6.2 *Germany’s Draft Integrated National Energy and Climate Plan*

Pursuant to Regulation 2018/1999, Germany was due to submit its draft integrated national energy and climate plan to the European Commission by 31 December 2018 and its final plan to the European Commission by 31 December 2019. To date, Germany has only submitted a draft plan to the Commission on 20 December 2018. It therefore joins Ireland and Luxembourg as the only Member States to have fallen behind the December 2019 deadline to submit their final plans.<sup>185</sup>

Germany has explained that its integrated national energy and climate plan is of a “provisional nature” only, due to the fact that “a great many of the political processes currently underway are aimed at identifying the future shape of Germany’s energy and climate policy.”<sup>186</sup> These processes relate, in particular, to Germany’s Climate Action Plan 2050 (examined further below) to develop of a stand-alone energy efficiency strategy. This plan is aimed at optimising and accelerating

<sup>178</sup> Regulation (EU) 2018/1999, Recital 31.

<sup>179</sup> Regulation (EU) 2018/1999, Article 12.

<sup>180</sup> Regulation (EU) 2018/1999, Article 12.

<sup>181</sup> Regulation (EU) 2018/1999, Article 12.

<sup>182</sup> Regulation (EU) 2018/1999, Article 33.

<sup>183</sup> Regulation (EU) 2018/1999, Article 33.1, 33.2(b).

<sup>184</sup> Regulation (EU) 2018/1999, Article 33.2(b).

<sup>185</sup> European Commission, National energy and climate plans (NECPs), [https://ec.europa.eu/info/energy-climate-change-environment/overall-targets/national-energy-and-climate-plans-necps\\_en](https://ec.europa.eu/info/energy-climate-change-environment/overall-targets/national-energy-and-climate-plans-necps_en).

<sup>186</sup> Draft Integrated National Energy and Climate Plan, Federal Republic of Germany, 4 January 2019, Courtesy Translation of the Translation Service of the European Commission, [“Draft Integrated Plan, Germany”], [https://ec.europa.eu/energy/sites/ener/files/documents/ec\\_courtesy\\_translation\\_de\\_necp.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/ec_courtesy_translation_de_necp.pdf).

electricity grid infrastructure expansion, measures to achieve Germany's climate goals in the energy sector (including the coal phase-out), and the development of a strategy on the future of affordable and sustainable mobility.<sup>187</sup> The outcome of these and "other political processes" will determine the content of Germany's final integrated national energy and climate plan, which was due to be submitted to the Commission by 31 December 2019.<sup>188</sup> The draft plan emphasises that "the topic of energy and climate policy is of vital importance for an industrial nation like Germany" and that the policy goal of Germany's energy transition therefore "is and will remain a key benchmark" for that country's energy policy, namely affordability, reliability of supply and environmental soundness.<sup>189</sup>

The draft plan acknowledges Germany's central geographical location in continental Europe and the fact that "expansion of renewable energies within its border has multiple impacts on neighbouring states."<sup>190</sup> As a result, the draft plan places high priority on network and system integration of renewable energies and acknowledges that "over the next few years, the Federal Government will focus on regional cooperation with other Member States as a significant driver for the market integration of renewable energies."<sup>191</sup> This is particularly relevant to the emphasis on cooperation between Member States on cross-border energy infrastructure interconnection, e.g. pursuant to Article 12 of Regulation 2018/1999. In the context of energy security, the plan sets out Germany's support for "functioning energy markets [as] the best possible guarantee for energy supply security within the EU as a whole."<sup>192</sup> For example, gas supplies to Germany via various import routes reduce the risk of supply disruptions not only to the German gas market, but "also for markets in neighbouring states."<sup>193</sup> In addition, Germany's electricity market is also firmly integrated into the European Union's internal electricity market. Specifically, on the internal energy market dimension, the draft integrated national energy and climate plan recognises that "exchanges of electricity between EU Member States are gaining in importance. Supra-regional synergies in respect of generation and consumption can be harnessed to make the electricity system even more flexible."<sup>194</sup>

Regional cooperation is further emphasised in the draft plan as "a core component of the Federal Government's energy and climate policy",<sup>195</sup> with further details to follow in the final plan. The draft plan does, however, provide an overview of the most important regional cooperation arrangements between Germany and its "European partners." In particular, these relate to bi-lateral cooperation (especially the Franco-German Energy Platform), the European Climate Initiative, the Baltic Energy Market Interconnection Plan, the North Seas Energy Forum/North Seas Energy Cooperation, and the Pentalateral Energy Forum (between Belgium, Luxembourg, the Netherlands, France, Austria, and Germany) as well as the Pentalateral Gas Forum. The draft plan

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<sup>187</sup> *Draft Integrated Plan, Germany*, page 14.

<sup>188</sup> *Draft Integrated Plan, Germany*, page 14.

<sup>189</sup> *Draft Integrated Plan, Germany*, page 14.

<sup>190</sup> *Draft Integrated Plan, Germany*, page 26.

<sup>191</sup> *Draft Integrated Plan, Germany*, page 26.

<sup>192</sup> *Draft Integrated Plan, Germany*, page 26.

<sup>193</sup> *Draft Integrated Plan, Germany*, page 26.

<sup>194</sup> *Draft Integrated Plan, Germany*, page 26.

<sup>195</sup> *Draft Integrated Plan, Germany*, page 28.

also highlights Germany's participation in regional groups within the framework of the Trans-European Energy Networks on strategic energy infrastructure projects.<sup>196</sup>

### 6.2.1 *Draft Plan on the Decarbonisation Dimension*

As part of the collective sharing of European greenhouse gas emission reductions, Germany will have to achieve a mandatory reduction from non-Emission Trading Scheme sectors of 38 per cent by 2030 (compared to 2005 levels). Germany's draft plan sets out that pursuant to the Energy Concept 2050, the Federal Government set itself the goal of achieving a reduction of "at least 55% by 2030 compared to the baseline year of 1990."<sup>197</sup> The Climate Action Plan 2050 (discussed further below) affirms Germany's post 2030 emission reduction goal of at least 70 per cent by 2040 and that Germany will be "largely GHG-neutral" by 2050 with a drop of 80-95 per cent by 2050, compared to 1990 levels.<sup>198</sup>

Decarbonisation efforts will be "further promoted through an increase in the share of renewables in energy consumption", with the goal of the Federal Government aiming to achieve "a 30% share of renewables in gross final energy consumption by 2030", as previously enshrined in the Energy Concept 2010.<sup>199</sup> This goal will be achieved through concurrent increases "in the share of renewables in the electricity, heating and cooling, and transport sectors"<sup>200</sup> Germany's Renewable Energy Sources Act "provides for a continuous increase in the share of renewables in gross electricity consumption to 40-45% in 2025, 55-60% in 2035, and at least 80% in 2050", as previously set out in the 2010 Energy Concept.<sup>201</sup>

The interim plan also recognises that "the capacity of electricity networks is of crucial importance" to Germany's ambitious renewable energy targets in future electricity consumption.<sup>202</sup> Accordingly, the Federal Government "intend[s] to produce an ambitious set of measures aimed at accelerating grid expansion."<sup>203</sup> With a clear focus on decarbonisation, the draft plan sets out details of estimated trajectories for renewable energy sources with a view to achieving fixed renewable energy targets. For example, the draft plan reports that Germany has a target of an "annual gross increase of 2 900 MW...for onshore wind", an "increase in installed offshore wind capacity to 15 GW by 2030", and an annual gross increase of "2 500 MW...for photovoltaics."<sup>204</sup>

### 6.2.2 *Draft Plan on the Internal Energy Market Dimension*

In the context of electricity interconnectivity, the draft plan observes that "Germany's priority in this area is to strength[en] the internal European electricity market", in particular by way of grid expansion as a "crucially important step in ensuring that electricity can be traded at any time

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<sup>196</sup> *Draft Integrated Plan, Germany*, page 28.

<sup>197</sup> *Draft Integrated Plan, Germany*, page 30.

<sup>198</sup> *Draft Integrated Plan, Germany*, page 30.

<sup>199</sup> *Draft Integrated Plan, Germany*, page 31.

<sup>200</sup> *Draft Integrated Plan, Germany*, page 31.

<sup>201</sup> *Draft Integrated Plan, Germany*, page 31.

<sup>202</sup> *Draft Integrated Plan, Germany*, page 31.

<sup>203</sup> *Draft Integrated Plan, Germany*, page 32.

<sup>204</sup> *Draft Integrated Plan, Germany*, page 33.

between EU-Member States.”<sup>205</sup> Germany therefore “intends to make substantial investments in national and cross-border grid expansion.”<sup>206</sup> The Federal Government also “fundamentally supports the development of additional interconnectors with other Member States in the interests of a functioning internal European electricity market.”<sup>207</sup> To accelerate the development of cross-border electricity grid interconnections, Germany also intends to “synchronise” the expansion of interconnectors to neighbouring Member States with any expansion of its domestic electricity grid.

Given its ambitious renewable energy targets, Germany has indicated that internal energy market measures planned until 2030 include significant expansion and reinforcement of its electricity network, to the tune of approximately 8700 km and an investment volume of EUR 50 billion.<sup>208</sup> The German plan also identifies an increase in total gas pipeline infrastructure length of approximately 848 km, as previously set out in Germany’s national development plan for gas 2016-2026.<sup>209</sup>

### 6.2.3 *Draft Plan on the Energy Security Dimension*

The draft plan acknowledges that “no quantitative goals have been set” in respect of reliability of energy supply into Germany, despite this being one of the “triad of energy transition goals.”<sup>210</sup> Significantly, the plan sets out that over 70 per cent of Germany’s energy demand is met by imported sources of energy.<sup>211</sup> Generally speaking, the plan recognises that “domestic renewables production and improved energy efficiency will reduce demand for sources of energy” which are primarily imported into Germany.<sup>212</sup> For example, the plan notes that natural gas represents “a significant portion of the energy supply in Germany and the European Union as a whole.”<sup>213</sup> On a more positive note, with respect of energy security of electricity supply, “Germany’s supply of electricity is secure; along with Denmark, it ranks top among EU Member States in terms of reliability of supply.”<sup>214</sup>

### 6.3 *Assessment of Germany’s Draft Plan by the European Commission*

Pursuant to the Regulation, the European Commission is required to assess each Member State’s draft integrated national energy and climate plan. The Commission published its “Commission Recommendations” on Germany’s submission in June 2019.<sup>215</sup> As set out in the Commission’s publication, these recommendations are “underpinned”<sup>216</sup> by the Commission’s “Staff Working

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<sup>205</sup> *Draft Integrated Plan, Germany*, page 43.

<sup>206</sup> *Draft Integrated Plan, Germany*, page 43.

<sup>207</sup> *Draft Integrated Plan, Germany*, page 43.

<sup>208</sup> *Draft Integrated Plan, Germany*, page 44.

<sup>209</sup> *Draft Integrated Plan, Germany*, page 45.

<sup>210</sup> *Draft Integrated Plan, Germany*, page 39.

<sup>211</sup> *Draft Integrated Plan, Germany*, page 39.

<sup>212</sup> *Draft Integrated Plan, Germany*, page 39.

<sup>213</sup> *Draft Integrated Plan, Germany*, page 39.

<sup>214</sup> *Draft Integrated Plan, Germany*, page 39.

<sup>215</sup> European Commission, Commission Recommendation of 18.6.2019 on the draft integrated National Energy and Climate Plan of Germany covering the period of 2021-2030, C(2019) 4405 final.

<sup>216</sup> European Commission, Commission Recommendation of 18.6.2019 on the draft integrated National Energy and Climate Plan of Germany covering the period of 2021-2030, C(2019) 4405 final, page 4.

Document” assessment.<sup>217</sup> In total, the European Commission published eleven recommendations. The most relevant recommendations to the energy interconnection and renewable energy expansion discussion are that:

- Germany should provide detailed and quantified policies and measures to enable it to contribute its share to the overall European Union 30 per cent renewable energy target by 2030;
- the final plan should set out a “sufficiently ambitious national contribution for both primary and final energy consumption” to reach the 2030 renewable energy target;
- Germany specify measures supporting energy security objectives on diversification and reduction of energy dependence;
- the plan “define forward-looking objectives and targets concerning [electricity] market integration” and a timetable with appropriate measures “to remove structural congestion in the electricity system”;
- Germany continue its regional cooperation and consultation of neighbouring Member States, including a “focus on the coal and lignite phase-out, renewables deployment and the internal energy market, addressing issues such as interconnection levels and capacity from 2021 onwards”; and
- the final plan extend the analysis of investment needs provided for electricity transmission to “a general overview of investment needs” to reach Germany’s energy and climate objectives.<sup>218</sup>

Providing a more detailed assessment of Germany’s draft plan, the “Staff Working Document”, which was published on the same day as the Commission Recommendations, observed that Germany’s draft submission addresses the triangle of policy objectives set out in the Energy Concept 2050: affordability, security of supply, and environmental soundness. The Commission’s first – and major – criticism of Germany’s plan related to greenhouse gas emission reductions that are not covered by the European Union emission trading scheme. The Commission noted that with a target of minus 38 per cent reduction compared to 2005 and “with existing policies and measures outlined in the draft [plan] Germany is not on track to achieve [it].”<sup>219</sup> In contrast, Germany’s national and sector-wide greenhouse gas emission reduction targets for 2030 “are in line with Germany’s long-term strategy [but] these are not always reflected in sector-specific national contributions (e.g. to the EU energy efficiency target) and policies and measures (e.g. in the transport, building and agriculture sector).”<sup>220</sup> A second and significant criticism by the Commission related to the draft plan’s lack of a stated commitment by Germany to a national contribution target to the European Union’s 2030 collective target on energy efficiency.<sup>221</sup> Accordingly, “no conclusion [could] be drawn on the level of ambition of Germany...” as the draft plan is “largely incomplete as regards energy efficiency.”<sup>222</sup>

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<sup>217</sup> European Commission, Commission Staff Working Document, Assessment of the draft National Energy and Climate Plan of Germany, SWD(2019) 229 final, 18.6.2019, [*“Commission Assessment of National Energy and Climate Plan of Germany 2019”*].

<sup>218</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, Recommendations 1-11.

<sup>219</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 2, page 6.

<sup>220</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 2.

<sup>221</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 7.

<sup>222</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 8.

Nonetheless, as a major positive, the Commission noted that Germany's proposed share of 30 per cent energy from renewable sources in gross final consumption of energy by 2030 "is in line" with the objectives and the formula in Annex II of Regulation 2018/1999.<sup>223</sup> Further, the Commission noted that Germany's plans for the years 2022, 2025 and 2027 "are more ambitious" than the required reference levels.<sup>224</sup> For renewable electricity, the Commission did observe that "while the indicated auction volumes for wind, photovoltaics and biomass provide some investment certainty", it is unlikely that these would actually meet the upper end "indicated for the 2030 target for renewable electricity."<sup>225</sup>

In the context of the internal energy market and electricity interconnectivity, the Commission highlighted that Germany plays "a key role for the internal energy market, in particular in the area of electricity" but that the country faces a number of challenges in organising its energy transition.<sup>226</sup> One such challenge relates to the reduction of grid congestion, which "should be an important element of [Germany's] final plan."<sup>227</sup> The development of the electricity transmission and distribution networks is "also among the key challenges [to achieving] a more flexible electricity system...and reduced congestion."<sup>228</sup> The draft plan also sets out that Germany "supports the development of further interconnectors."<sup>229</sup> Still, the Commission observes that the plan does not "specify the level of electricity interconnectivity that Germany aims for by 2030."<sup>230</sup> This is a significant weakness in Germany's proposed contribution to the internal energy market and electricity interconnectivity.

On the energy security question, Germany's relative dependency on imported capacity "is currently slightly higher than [the] EU average."<sup>231</sup> The Commission acknowledges the plan's immediate preventive action but notes that for long-term action, it "merely states that the gas and oil industry ensures that supplies are and will remain sufficiently diversified."<sup>232</sup> Heavy criticism is levied at the plan's inability to "convincingly explain" how gas supplies are secured or that the purchasing decisions by the gas industry "are in line with the stated objective of the German government that gas will be supplied from different transit routes."<sup>233</sup>

Finally, the focus on regional cooperation in Germany's draft plan is assessed as positive, with Germany "having consulted a larger number of other Member States and third countries" on the draft plan.<sup>234</sup> In particular, Germany has assessed the implications of its coal phase-out on other Member States and the internal energy market, and such an approach of "reflecting shifts in policy with significant implications for other Member States in regional cooperation" is identified by the Commission as an example of good practice "which could be replicated."<sup>235</sup>

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<sup>223</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 6.

<sup>224</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 6.

<sup>225</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 7.

<sup>226</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 9.

<sup>227</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 3.

<sup>228</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 9.

<sup>229</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 9.

<sup>230</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 9.

<sup>231</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 8.

<sup>232</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 7.

<sup>233</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 7.

<sup>234</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 13.

<sup>235</sup> *Commission Assessment of National Energy and Climate Plan of Germany 2019*, page 13.

## 7. Implementing Germany's Climate Action Plan 2050

The Climate Action Plan 2015 was adopted by the German Cabinet on 14 November 2016 with a view to providing “guidance to all areas of action in the process of achieving our domestic climate targets in line with the Paris Agreement.”<sup>236</sup> It was not formally approved by the Federal Government, however, until October 2019.<sup>237</sup> The Plan is not “a rigid instrument; it points to the direction needed to achieve a greenhouse gas-neutral economy.”<sup>238</sup> The Plan will be monitored and updated by the Federal Government in five-yearly intervals, in line with the reporting mechanism of the Paris Agreement.<sup>239</sup>

### 7.1 The Energy and Industry Sectoral Focus of the Climate Action Plan 2050

In its Climate Action Plan 2050, the Federal Government “lays down 2030 targets for individual sectors, describes the necessary development pathways for them, lists initial measures for implementation and establishes a process for monitoring and updating policies and measures.”<sup>240</sup> The Plan therefore charts Germany’s path toward greenhouse gas neutrality. It does so by way of a modernisation strategy for the necessary industrial and social transformation to a low-carbon economy, linking climate action with environmental, economic and social goals on three levels:

- it contains specific guiding principles for the individual areas of action for 2050, leaving scope for innovations and striving to maximise sustainability (pursuant to the UN Sustainable Development Goals);
- it outlines robust transformation pathways for all areas of action, examines critical path dependencies and describes interdependencies; and
- it underpins goals, in particular the interim greenhouse gas target for 2030 of at least 55 per cent reduction compared to 1990, with emission targets for all sectors, specific milestones and strategic measures, and includes impact and cost analysis.<sup>241</sup>

The Climate Action Plan 2050 addresses climate action through sectoral targets focusing on the energy, buildings, transport, industry, agriculture, land use, and forestry sectors.<sup>242</sup> Climate action in the energy and industrial sectors will be the focus of discussion here.

<sup>236</sup> Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Climate Action Plan 2050, Principles and goals of the German government’s climate policy, 1 November 2016, page 6, [*“Climate Action Plan 2050”*], [https://www.bmu.de/fileadmin/Daten\\_BMU/Pool/Broschueren/klimaschutzplan\\_2050\\_en\\_bf.pdf](https://www.bmu.de/fileadmin/Daten_BMU/Pool/Broschueren/klimaschutzplan_2050_en_bf.pdf).

<sup>237</sup> Deutscher Bundestag, Unterrichtung, Klimaschutzprogramm 2030 der Bundesregierung zur Umsetzung des Klimaschutzplans 2050, Drucksache 19/13900, 11.10.2019. See also, Clean Energy Wire, Germany’s Climate Action Plan 2050, 21 March 2019, [*“Green Energy Wire Germany’s Climate Action Plan”*], <https://www.cleanenergywire.org/factsheets/germanys-climate-action-plan-2050>.

<sup>238</sup> *Climate Action Plan 2050*, page 14.

<sup>239</sup> Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Climate Action Plan 2050 – Germany’s long-term emission development strategy, undated, [*“Climate Action Plan 2050 – Long Term Strategy”*], <https://www.bmu.de/en/topics/climate-energy/climate/national-climate-policy/greenhouse-gas-neutral-germany-2050/>. See also, *Green Energy Wire Germany’s Climate Action Plan*.

<sup>240</sup> *Ibid.*

<sup>241</sup> *Climate Action Plan 2050*, page 15. See also, *Climate Action Plan 2050 – Long Term Strategy*.

<sup>242</sup> *Climate Action Plan 2050*, page 32.

In 2014, the energy sector accounted for approximately 40 per cent of Germany's greenhouse gas emissions. Climate policy and energy policy are therefore "inextricably linked."<sup>243</sup> The Energy Concept 2050 policy set out the initial transition in the energy sector by triggering an "unparalleled change in the sector."<sup>244</sup> The guiding principle driving the energy sector on its transformation path to 2050 is energy from renewable sources and a gradual phase-out of electricity from fossil fuels. The Climate Action Plan 2050 expects the energy sector to make "an appropriate contribution" to Germany's overall reduction target by 2030, with the sector expected to cut its greenhouse gas emissions 61 to 62 per cent compared to 1990, with further reductions in the period beyond 2030 so as to meet the climate target for 2050.<sup>245</sup>

Key to this ambitious decarbonisation of the energy sector is concerted "structural change." The economic modernisation and transition away from traditional fossil-fuel generated electricity, pursuant to the 2010 Energy Concept 2050 and the Climate Action Plan 2050 will therefore have profound structural impacts. First and foremost, the reduction in coal-fired electricity production "should be organised in such a way that structural breaks in the affected regions...are avoided and new prospects for industry...are developed."<sup>246</sup> The transformation process will have to be based on sound policy. The Climate Action Plan 2050 sees the appointment of a commission on "stable growth, sustainable structural change and future-oriented regional development" to prepare recommendations to the Federal Government by 2018.<sup>247</sup>

For the industrial sector of Germany's economy, the Climate Action Plan 2050 sees a greenhouse emission reduction target of 49 to 51 per cent by 2030, compared to 1990. This target includes all emissions from "combustion processes and generation of its own power by the manufacturing industry, as well as emissions from industrial processes and [direct emissions]" under the "industry and business" sector.<sup>248</sup> Given that the industrial sector purchases large quantities of electricity, "it is also an important area of action for reducing emissions from the energy sector."<sup>249</sup> One of the complications for the industrial sector is that production facilities "particularly the emission-intensive raw materials industry, generally have a very long useful life, sometimes more than 50 years" and accordingly, "early action is necessary to avoid destruction of value."<sup>250</sup>

The Climate Action Plan 2050 acknowledges that approximately 38 per cent of industrial emissions "do not result from energy use but are instead directly attributable to production processes in the raw materials industry" such as the production of lime and cement, steel and basic chemicals.<sup>251</sup> The energy intensive industrial sector therefore poses a significant challenge to Germany's overall goal of emission reductions. The Plan notes that the "greatest challenge...is to make a contribution to cutting CO<sub>2</sub> emissions which takes full advantage of its reduction potential."<sup>252</sup> Potential modernisation responses may include a "high-efficiency strategy for

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<sup>243</sup> *Climate Action Plan 2050*, page 34.

<sup>244</sup> *Climate Action Plan 2050*, page 32.

<sup>245</sup> *Climate Action Plan 2050*, page 36.

<sup>246</sup> *Climate Action Plan 2050*, page 37.

<sup>247</sup> *Climate Action Plan 2050*, page 41.

<sup>248</sup> *Climate Action Plan 2050*, page 56.

<sup>249</sup> *Climate Action Plan 2050*, page 56.

<sup>250</sup> *Climate Action Plan 2050*, page 58.

<sup>251</sup> *Climate Action Plan 2050*, page 57.

<sup>252</sup> *Climate Action Plan 2050*, page 57.

reducing the amount of resources and energy needed for production” including a more efficient use of emission-intensive materials along the value chain.<sup>253</sup> One such key element of the Climate Action Plan 2050 relates to the replacement of fossil fuels with CO<sub>2</sub>-free or CO<sub>2</sub>-neutral fuels, including renewable energy options, as well as the setting up of a “circular economy for CO<sub>2</sub>.”<sup>254</sup> Energy-saving recovery from waste and the replacement of primary raw materials could further reduce greenhouse gas emissions “to a considerable extent.”<sup>255</sup> Another focus of the Plan is that, at present, approximately 70 per cent of industry’s “final energy demand is for fuel.”<sup>256</sup> As a result, there is significant potential to capture the heat and waste heat produced, which should be “strategically used for both industry and homes.”<sup>257</sup>

## 8. The European Green Deal 2019 – Sustainability as an Economic Model

The European Union’s “European Green Deal” was presented in December 2019. Spearheaded by the European Commission, it sets out to radically review every aspect of the European economy through the lens of climate change and “environmentally-related challenges that is this generation’s defining task.”<sup>258</sup> The European Green Deal is driven by the European Commission’s focus on implementing the United Nations 2030 Agenda for Sustainable Development and its sustainable development goals<sup>259</sup> as well as the priority objectives set out in the European Commission President’s political guidelines.<sup>260</sup>

The European Green Deal is a “new growth strategy” aimed at transforming the European Union into a “fair and prosperous society” with a “modern, resource-efficient and competitive economy.”<sup>261</sup> Crucially, this new European economy aims to generate “no net emissions of greenhouse gases by 2050” along with decoupling economic growth from resource use.<sup>262</sup>

Central to the policy shift is a recognition that the European Union’s natural capital, its citizens, must be protected from “environment-related risks and impacts.”<sup>263</sup> There is a strong emphasis on recognising that any transition must be “just and inclusive”, given that certain regions, industries and workers will face “the greatest challenges.”<sup>264</sup> At the same time, the new growth strategy acknowledges that the European Union “has the collective ability to transform its economy and society” so as to “put it on a more sustainable path.”<sup>265</sup> The overall objective of the Green Deal is to transform the European Union’s economy and to pivot it towards a sustainable and innovative

<sup>253</sup> *Climate Action Plan 2050*, page 58.

<sup>254</sup> *Climate Action Plan 2050*, page 58.

<sup>255</sup> *Climate Action Plan 2050*, page 58.

<sup>256</sup> *Climate Action Plan 2050*, page 60.

<sup>257</sup> *Climate Action Plan 2050*, page 60.

<sup>258</sup> European Commission, The European Green Deal, COM(2019) 640 final, 11.12.2019, [“*European Green Deal*”], page 2, <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1588580774040&uri=CELEX:52019DC0640>.

<sup>259</sup> Transforming Our World: The 2030 Agenda for Sustainable Development (UNGA Resolution A/RES/70/1, 21 October 2015).

<sup>260</sup> *European Green Deal*, page 3.

<sup>261</sup> *European Green Deal*, page 2.

<sup>262</sup> *European Green Deal*, page 2.

<sup>263</sup> *European Green Deal*, page 2.

<sup>264</sup> *European Green Deal*, page 2.

<sup>265</sup> *European Green Deal*, page 2.

future. This will be achieved by successively implementing a number of elements of the Green Deal, driven by core “policy levers” on:

- regulation and standardisation;
- investment and innovation;
- national reforms;
- dialogue with social partners; and
- international cooperation.<sup>266</sup>

In light of the above, the most salient aspects of the European Green Deal, with particular significance to the development of energy interconnection and renewable energy expansion, are briefly addressed below.

### **8.1 Increasing the EU’s Climate Ambition from 2030 and 2050**

The first objective of the Green Deal is a radical increase in the European Union’s climate ambition for the 2030 to 2050 period. This builds on the European Commission’s vision on how to achieve climate neutrality by 2050, as set out in the “A Clean Planet for all” document of 2018.<sup>267</sup> The European Commission also prepared a proposal for the first ever “European Climate Law.”<sup>268</sup> This will enshrine the European Union’s climate neutrality goal in legislation, to “ensure that the transition is irreversible.”<sup>269</sup> The Climate Law will also set out the conditions for an effective and fair transition and will provide the necessary predictability to investors.<sup>270</sup>

### **8.2 Supplying Clean, Affordable and Secure Energy**

Directly related to the Green Deal’s climate objectives discussed above, decarbonisation of the European energy system is critical to achieving the Union’s ambitious climate objectives of 2030 and 2050. This is critical, as Europe’s production and use of energy “across economic sectors account for more than 75% of the EU’s greenhouse gas emissions.”<sup>271</sup> This will require a power sector that is based “largely on renewable sources, complemented by the rapid phasing out of coal and decarbonising gas.”<sup>272</sup> At the same time, both consumers and industry in Europe will require a secure and affordable supply of energy, which can only be achieved through “a fully integrated, interconnected and digitalised” European energy market.<sup>273</sup> The scaling up of renewable energy sources will thus play an “essential role” in achieving the Green Deal’s ambitious goals, and an

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<sup>266</sup> *European Green Deal*, page 4.

<sup>267</sup> European Commission, Communication from the Commission, A Clean Planet for all – A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy, COM(2018) 773 final, 38.11.2018, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0773&from=en>.

<sup>268</sup> European Commission, Proposal for a Regulation of the European Parliament and of the Council establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law), COM(2020) 80 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020PC0080&qid=1588581905912&from=EN>.

<sup>269</sup> *European Green Deal*, page 4.

<sup>270</sup> *European Green Deal*, page 4.

<sup>271</sup> *European Green Deal*, page 6.

<sup>272</sup> *European Green Deal*, page 6.

<sup>273</sup> *European Green Deal*, page 6.

increase in offshore wind energy production, in particular, will be “essential” to achieving this objective.<sup>274</sup> A transition to climate neutrality will only be achievable where the “smart integration of renewables, energy efficiency and other sustainable solutions across sectors” are deployed to achieve decarbonisation “at the lowest possible cost.”<sup>275</sup> The decarbonisation of the gas sector will also be addressed by the Green Deal, by way of “forward-looking design for a competitive decarbonised market.”<sup>276</sup>

Delivering on the Green Deal’s climate neutrality objective will require smart infrastructure and increased cross-border and regional cooperation between Member States. Accordingly, the European Union’s regulatory framework for energy infrastructure will be reviewed to ensure “consistency with [the] climate neutrality objective.”<sup>277</sup> At the same time, the Green Deal underlines the importance of the regulatory framework fostering the deployment of innovative technologies and associated infrastructure, including smart grids, carbon capture, storage and utilisation, and energy storage.<sup>278</sup>

### **8.3 Accelerating the Shift to Sustainable and Smart Mobility**

The transportation sector accounts for more than 25 per cent of the European Union’s greenhouse gas emissions and these figures are steadily increasing. With its ambitious climate neutrality target by 2050, the Green Deal will require a reduction of 90 per cent in transportation emissions by 2050. Freight transport, in particular, will see a drastic shift from road transport to rail and inland waterway transportation. This shift will be supported and accelerated by a concerted strategy to automate and digitally connect the multi-modal transportation system.

The key aviation and marine transportation sectors will see aggressive reforms with regard to their current exemption from the European Union Emissions Trading Scheme. For example, the marine sector may see restrictions on access of the most polluting ships to European Union ports and the mandatory use of “shore-side electricity” use when ships are docked in port. Emissions from aviation and airport operations will also be addressed.<sup>279</sup> The European Emissions Trading Scheme may also be extended to road transportation “as a complement to existing and future CO<sub>2</sub> emission performance standards for vehicles”<sup>280</sup> and an end to fossil-fuel subsidies is likely.

Of critical importance to the scale-up of renewable energy generation in the European Union, the Green Deal calls for the large-scale deployment of recharging and refuelling stations to support electric vehicle transportation. Urban transportation, in particular, is a key focus of the Green Deal, with a view to addressing emissions and improving urban congestion.<sup>281</sup> Legislative reforms of the CO<sub>2</sub> emission performance standards of both vehicles and vans, are also included in the

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<sup>274</sup> *European Green Deal*, page 6.

<sup>275</sup> *European Green Deal*, page 6.

<sup>276</sup> *European Green Deal*, page 6.

<sup>277</sup> *European Green Deal*, page 6.

<sup>278</sup> *European Green Deal*, page 6.

<sup>279</sup> *European Green Deal*, page 11.

<sup>280</sup> *European Green Deal*, page 11.

<sup>281</sup> *European Green Deal*, page 11.

document, with a view to facilitating zero-emission mobility. The European Union should also “ramp-up production and deployment of sustainable alternative transportation fuels.”<sup>282</sup>

#### **8.4 Mainstreaming Sustainability – Financing the Cost of the Green Deal**

The Green Deal’s proposed cost and investment volume is truly ambitious. To achieve the current 2030 climate and energy targets, the European Commission has estimated that an additional €260 billion of annual funding will be needed, which will include both the public and private sectors.<sup>283</sup> Within the European Union budget, the European Commission has targeted a 25 per cent climate mainstreaming across all EU programmes and at least 30 per cent of the InvestEU Fund will be used to contribute to fighting climate change.<sup>284</sup>

The Green Deal’s financial mechanism is set out in the “Sustainable Europe Investment Plan”, released in January 2020. Confusingly, the Plan is also referred to as the “European Green Deal Investment Plan” (EGDIP).<sup>285</sup> The first objective of the Plan is to mobilise, through the European Union budget and associated instruments, “at least EUR 1 trillion of private and public sustainable investments over the upcoming decade.”<sup>286</sup> In addition to mobilising this vast amount of money, the Plan will “create an enabling framework for private investors and the public sectors” by providing these sectors with the tools to “properly identify sustainable investments.”<sup>287</sup> Lastly, the Plan will offer tailored support to public administrators and project promoters “in identifying, structuring and executing sustainable projects.”<sup>288</sup>

Within the Sustainable Europe Investment Plan, the European Commission has provided details on the “Just Transition Fund.” This fund is designed to facilitate the Green Deal’s proposed economic, social and structural transition. The European Commission acknowledges that the Green Deal will affect regions and cities differently and some may be disproportionately affected because they depend on “fossil-fuels or carbon-intensive processes.”<sup>289</sup> Effectively, this acknowledges that certain industrial regions of Europe, where carbon-intensive industries are located, will be disproportionately impacted by the Green Deal. The Just Transition Fund mechanism will thus ensure that the Green Deal’s transition is conducted “in a fair and inclusive way.”<sup>290</sup>

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<sup>282</sup> *European Green Deal*, page 11.

<sup>283</sup> *European Green Deal*, page 15.

<sup>284</sup> *European Green Deal*, page 15.

<sup>285</sup> European Commission, The European Green Deal Investment Plan and Just Transition Mechanism explained, 14 January 2020, [https://ec.europa.eu/commission/presscorner/detail/en/qanda\\_20\\_24](https://ec.europa.eu/commission/presscorner/detail/en/qanda_20_24).

<sup>286</sup> European Commission, COM(2020) 21 final, 14.1.2020, Sustainable Europe Investment Plan, page 1, [“Sustainable Europe Investment Plan”], <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0021&from=EN>.

<sup>287</sup> *Sustainable Europe Investment Plan*, page 2.

<sup>288</sup> *Sustainable Europe Investment Plan*, page 2.

<sup>289</sup> *European Green Deal*, page 16.

<sup>290</sup> *European Green Deal*, page 16. See also, Mauger, Romain, European Green Deal – What is the Just Transition Mechanism?, Energy and Climate Law blog, January 6, 2020, <http://energyandclimatelaw.blogspot.com/2020/02/european-green-deal-what-is-just.html#more>.

### **8.5 Focusing the European Union as a Global Leader on Climate Neutrality**

The European Green Deal acknowledges that the European Union cannot achieve its ambitious objectives without the requisite “green deal diplomacy”<sup>291</sup> In effect, the European Union is dependent on securing a global response to climate change and environmental degradation. As part of this global effort, the Green Deal endorses the Paris Agreement as “the indispensable multilateral framework for tackling climate change”, together with concerted bilateral engagement with partner countries, in particular the economies of the G20.<sup>292</sup>

In addition to diplomatic engagement with the European Union’s strategic partner-region focus on the Balkans, China, Africa and Latin America, European Union trade policy may also be deployed to “support the EU’s ecological transition” and to act as a “platform to engage with trading partners on climate and environmental action.”<sup>293</sup> As the Green Deal acknowledges, trade agreements with the European Union have increasingly strengthened commitments to sustainability, in particular on climate change action. Any agreements with the European Union have required the parties to commit to a ratification and effective implementation of the Paris Agreement.<sup>294</sup> As the world’s largest single market, the European Union may also exercise its trading power to facilitate “trade and investment in green goods and services”, using its economic weight to “set standards that apply across the global value chain.”<sup>295</sup>

### **8.6 Emphasis on Citizen and Stakeholder Engagement – The European Climate Pact**

The European Commission places the involvement and commitment of the European Union’s public and all involved stakeholders at the centre of the Green Deal’s success. Engagement with the public plays an important role in achieving the European Commission’s objective. A European Climate Pact, to have been due for launch in March 2020, was proposed to focus on “three ways to engage with the public on climate change.”<sup>296</sup> Information sharing on climate change, in order to foster a public understanding of its challenges, is the first way to facilitate public engagement on the Green Deal. Secondly, opportunities for citizens to express their ideas on climate change action will be facilitated by the pact. And lastly, the European Commission will work on capacity building to facilitate “initiatives on climate change and environmental protection.”<sup>297</sup> Here too important lessons may be drawn for policy makers in Alberta, to potentially enhance an already advanced citizen and public stakeholder engagement mechanism, for example in terms of addressing stakeholder concerns on wind energy and carbon capture and storage projects.

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<sup>291</sup> *European Green Deal*, page 20.

<sup>292</sup> *European Green Deal*, page 20.

<sup>293</sup> *European Green Deal*, page 21.

<sup>294</sup> *European Green Deal*, page 21.

<sup>295</sup> *European Green Deal*, page 21, page 22.

<sup>296</sup> *European Green Deal*, page 22.

<sup>297</sup> *European Green Deal*, page 22.

## 9. Energy and Climate Impulses Post COVID-19: Quo Vadis Europe?

Since the start of the global COVID-19 pandemic in the spring of 2020, calls for rebuilding economies on ambitious and sustainable climate principles have become stronger.<sup>298</sup> In light of the announcement to postpone the COP26 United Nations Climate Change Conference, scheduled for November 2020 in Glasgow,<sup>299</sup> impulses on sustainable and climate-focused post-pandemic recovery were set at the April 2020 Petersberg Climate Dialogue. This is an event traditionally hosted by the Federal Republic of Germany, since 2010.<sup>300</sup> At the Dialogue, United Nations Secretary-General Guterres called for six climate-related actions to shape the post-pandemic recovery:

- rebuilding through a clean, green and just transition, with investment accelerating the decarbonization of all aspects of the global economy;
- using taxpayer's money for creating green jobs and sustainable and inclusive growth, and not for bailing out outdated, polluting, carbon-intensive industries;
- using fiscal firepower to shift economies from gray to green, making societies and people more resilient;
- directing public funds for investments in the future, by flowing to sustainable sectors and projects that help the environment and climate; moreover, fossil fuel subsidies must end, and carbon must have a price and polluters must pay for their pollution;
- the global financial system, when shaping policy and infrastructure, must take risks related to climate into account; and
- international collaboration must occur to work on both the pandemic and climate emergencies.<sup>301</sup>

The conclusions of the Co-Chairs of the Dialogue also stressed an alignment of resilient economic recovery with climate action. At the ministerial discussion (of more than thirty climate ministers and representatives), a call for action to align economic recovery plans with both the Paris Agreement and the United Nations Sustainable Development Goals was made. The discussion also stressed the importance of multilateral cooperation and support for developing countries and underlined the importance of each country preparing nationally determined contributions and long-

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<sup>298</sup> The Guardian, Green stimulus can repair global economy and climate, study says, May 5, 2020, <https://www.theguardian.com/environment/2020/may/05/green-stimulus-can-repair-global-economy-and-climate-study-says>; see Pembina Institute, How to rebuild for a healthier economic future, April 8, 2020, <https://www.pembina.org/blog/how-rebuild-healthier-economic-future>; see also IISD, Petersberg Climate Dialogue Keeps Momentum towards COP26, 30 April 2020, <https://sdg.iisd.org/news/petersberg-climate-dialogue-keeps-momentum-towards-cop-26/>.

<sup>299</sup> Government of the United Kingdom, Press Release: COP26 postponement, April 1, 2020, <https://www.gov.uk/government/news/cop26-postponement>.

<sup>300</sup> Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Petersberg Climate Dialogue XI, 27-28 April 2020, <https://www.bmu.de/en/topics/climate-energy/climate/international-climate-policy/petersberg-climate-dialogue/>.

<sup>301</sup> United Nations Secretary General, Secretary General's remarks to Petersberg Climate Dialogue, 28 April 2020, <https://www.un.org/sg/en/content/sg/statement/2020-04-28/secretary-generals-remarks-petersberg-climate-dialogue-delivered>.

term climate strategies pursuant to the Paris Agreement, despite the postponement of COP26, as the first cycle of the Paris Agreement timeline ends.<sup>302</sup>

In addition, Germany (through the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety) together with the United Kingdom COP26 Presidency and the Climate Policy Initiative organised a high-level side-session at the Dialogue, entitled “Financing Ambition for Climate in the Time of COVID.” The session emphasised three themes to “bridge economic action with the key need for a green, resilient recovery globally.”<sup>303</sup> The first focus must be on policies and solutions that enable “a truly green, resilient recovery” consisting of “mainstreaming of climate change across the financial system.”<sup>304</sup> The second theme focused on the rapid transition in the financial system, with economies in the post-COVID world “fundamentally changed” and the need for an enhanced role for development finance.<sup>305</sup> The third theme emphasises the rapid and unprecedented transition in the financial system posed by the pandemic and by climate change, with a recognition that the global financial system must better respond to manage the physical and transition risks “triggered by climate change.” These themes are underpinned by an enhanced role for international collaboration, in particular between the public and private sectors, to maximise the positive impacts of recovery. Both “short-term economic recovery and long-term structural changes [must be aligned] with sustainable, inclusive growth.”<sup>306</sup>

At the European level, first indications suggest that the European Union will continue to forge ahead with its ambitious Green Deal, which, as previously discussed, will focus on transitioning the European economy towards a smart and sustainable economic powerhouse. On the post-pandemic recovery strategy, European Commission president von der Leyen released a document on April 4, 2020 entitled “How our Europe will regain its strength.”<sup>307</sup> The European Commission set out that Europe will:

need to invest strategically in our future...for clean energy, for a smart circular economy, for transport systems of the future....a Marshall Plan of this nature will help build a more modern, sustainable and resilient Europe. This is the Union that I believe can emerge from this – just as it did after...every crisis in our history.<sup>308</sup>

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<sup>302</sup> Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Petersberg Climate Dialogue XI, 27-28 April 2020, Co-Chairs’ Conclusions,

[https://www.bmu.de/fileadmin/Daten\\_BMU/Download\\_PDF/Klimaschutz/pcd\\_xi\\_cochairs\\_conclusions\\_bf.pdf](https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Klimaschutz/pcd_xi_cochairs_conclusions_bf.pdf).

<sup>303</sup> Climate Policy Initiative, Petersberg Climate Dialogue: Financing Climate Ambition in the Context of COVID-19, 29 April, 2020, [“Climate Policy Initiative 2020”], <https://climatepolicyinitiative.org/event/petersberg-climate-dialogue-financing-climate-ambition-in-the-context-of-covid-19/>.

<sup>304</sup> *Climate Policy Initiative 2020*.

<sup>305</sup> *Climate Policy Initiative 2020*.

<sup>306</sup> *Climate Policy Initiative 2020*.

<sup>307</sup> European Commission, Press corner, How our Europe will regain its strength: op-ed by Ursula von der Leyen, President of the European Commission, 4 April 2020, [https://ec.europa.eu/commission/presscorner/detail/en/AC\\_20\\_602](https://ec.europa.eu/commission/presscorner/detail/en/AC_20_602).

<sup>308</sup> European Commission, Press corner, How our Europe will regain its strength: op-ed by Ursula von der Leyen, President of the European Commission, 4 April 2020, [https://ec.europa.eu/commission/presscorner/detail/en/AC\\_20\\_602](https://ec.europa.eu/commission/presscorner/detail/en/AC_20_602).

One of the concerns related to the implementation of the Green Deal is that the European Union will not seamlessly be able to proceed with the proposed workplan. Initial indications suggest that a number of initiatives are likely to be delayed or postponed as they may not directly be related to the pandemic response or are “considered less essential for delivery of the absolute key priorities.”<sup>309</sup> Indications are that the European Commission is actively reviewing its work programme for the remainder of 2020, but that the key focus on climate action and sustainable financing initiatives will be maintained.

Thus, initiatives that are either maintained or slightly delayed only, include a Renewed Sustainable Finance Strategy, considered an “important” part of the Green Deal and a “key contributor to the recovery.”<sup>310</sup> This initiative has been delayed from the third to the fourth quarter of 2020. The European Union’s 2030 Climate Target Plan, consisting of new climate targets, is deemed a critical component of the Commission’s climate policy and the Green Deal. With the cancellation of the COP26 Climate Change Conference in November 2020, this initiative may now be subjected to “a complex analytical exercise underpinning the elaboration of new targets.”<sup>311</sup> There has been no delay, however, to this plan, as per the European Commission’s work programme released on May 27, 2020.<sup>312</sup> The timing of the offshore renewable energy initiative, scheduled for the fourth quarter of 2020, has also been maintained in the workplan to coincide with major announcements by the Member States of the North Sea Alliance.<sup>313</sup> This initiative, it was noted, is “also a priority for the German Presidency and could also be a significant element of a post-COVID recovery plan.”<sup>314</sup> The European Climate Pact (due to have been established by the third quarter of 2020, ahead of COP26) is now delayed by one quarter only. Finally, the work programme for a number of initiatives on sustainable and smart mobility have also been maintained and not delayed. These include planned initiatives on strategies for sustainable and smart mobility as well as on sustainable aviation and maritime fuel, all scheduled for the fourth quarter of 2020.<sup>315</sup>

Responding to the global pandemic of 2020, the European Commission presented its comprehensive recovery plan on May 27, 2020, entitled “Europe’s moment: Repair and Prepare for the Next Generation.”<sup>316</sup> Whilst details of the recovery plan are still being formalised, a new recovery instrument “Next Generation EU” will be “embedded within a powerful, modern and revamped long-term EU budget.”<sup>317</sup> The budget for Next Generation EU will be an unprecedented

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<sup>309</sup> Euractive.com, LEAKED: Full list of delayed European Green Deal initiatives, April 15, 2020, [*“Euractive.com Delayed Initiatives”*], <https://www.euractiv.com/section/energy-environment/news/leaked-full-list-of-delayed-european-green-deal-initiatives/>.

<sup>310</sup> *Euractive.com Delayed Initiatives*.

<sup>311</sup> *Euractive.com Delayed Initiatives*.

<sup>312</sup> European Commission, Annexes to the Communication from the Commission, Adjusted Commission Work Programme 2020, COM(2020) 440 final, 27.5.2020, [https://ec.europa.eu/info/sites/info/files/cwp-2020-adjusted-annexes\\_en.pdf](https://ec.europa.eu/info/sites/info/files/cwp-2020-adjusted-annexes_en.pdf).

<sup>313</sup> *Euractive.com Delayed Initiatives*. See also, European Commission, Annexes to the Communication from the Commission, Adjusted Commission Work Programme 2020, COM(2020) 440 final, 27.5.2020.

<sup>314</sup> *Euractive.com Delayed Initiatives*.

<sup>315</sup> *Euractive.com Delayed Initiatives*.

<sup>316</sup> European Commission, Communication from the Commission, Europe’s moment: Repair and Prepare for the Next Generation, COM(2020) 456 final, 27.5.2020, [*“Commission COM(2020) 456”*] <https://ec.europa.eu/info/sites/info/files/communication-europe-moment-repair-prepare-next-generation.pdf>.

<sup>317</sup> *Commission COM(2020) 456*, page 4. See also, European Commission, Europe’s moment: Repair and prepare for the next generation, 27 May 2020, [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_20\\_940](https://ec.europa.eu/commission/presscorner/detail/en/ip_20_940).

€750 billion, to boost the budget of the European Union with new financing raised on the financial markets and to be repaid with future EU budgets “not before 2028 and not after 2058.”<sup>318</sup> The operational target for this recovery instrument is January 1, 2021, contingent upon unanimous agreement of all 27 Member States by July 2020 (at the European Council) as well as the consent of the European Parliament.

Money from Next Generation EU will be invested through European Union programmes, to “accelerate the twin green and digital transitions and a fairer and more resilient society.”<sup>319</sup> €500 billion in grants and €250 billion in loans to Member States will be invested across three strategic pillars: support to Member States with investments and reforms; kick-starting the EU economy by incentivising private investments; and addressing the lessons of the crisis.

The key policy fundamental to the European recovery is a relaunch of the economy that repairs “the short-term damage from the crisis in a way that also invests in our long-term future.”<sup>320</sup> The European Green Deal is “Europe’s growth strategy.”<sup>321</sup> To ensure that Europe uses it “to its full potential, it is essential that Next Generation EU drives our competitive sustainability.”<sup>322</sup> Accordingly, public investment in the recovery should respect a green focus, and key green transition policies of the European Union should guide investments. The new Solvency Support Instrument (to support viable European businesses in sectors, regions, and Member States most affected) has investment guidelines that reflect the need to “prioritise green investments.”<sup>323</sup> These initiatives are supported by the “25% of the EU budget spent on climate investments” and additional funding for research and innovation.<sup>324</sup> The European Commission also identifies investor certainty and predictability as essential, underlining the importance of initiatives of the Green Deal, including the European Union Climate Law, the upcoming proposals for more ambitious emission reduction targets for 2030, as well as an EU sustainable finance taxonomy, a renewed sustainable finance strategy and a new initiative in 2021 on sustainable corporate governance.<sup>325</sup>

In the specific context of energy infrastructure and renewable energy development, the Next Generation EU focus is clearly on unlocking investment in “clean technologies and value chains” by way of a new “Strategic Investment Facility” which will invest in technologies “key for the clean energy transition.”<sup>326</sup> Renewable and energy storage technologies, clean energy, batteries, carbon capture and storage and sustainable energy infrastructure are identified by the Commission as critical to the Commission’s recovery response. Proposals to boost offshore renewable energy and to better integrate the energy system are also anticipated by the Commission’s Next Generation EU response. The accelerated deployment of “sustainable vehicles and vessels as well as

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<sup>318</sup> Commission COM(2020) 456, page 4.

<sup>319</sup> Commission COM(2020) 456, page 4.

<sup>320</sup> Commission COM(2020) 456, page 6.

<sup>321</sup> Commission COM(2020) 456, page 6.

<sup>322</sup> Commission COM(2020) 456, page 6.

<sup>323</sup> Commission COM(2020) 456, page 6.

<sup>324</sup> Commission COM(2020) 456, page 6.

<sup>325</sup> Commission COM(2020) 456, page 6.

<sup>326</sup> Commission COM(2020) 456, page 7.

alternative fuels” will also form a core focus of European economic recovery and continued transition in cleaner and more sustainable mobility.<sup>327</sup>

A large-scale financial recovery instrument akin to the European Commission’s “repair and prepare” Next Generation EU response was first suggested by German Chancellor Merkel and French President Macron on May 18, 2020. This Franco-German plan proposed that the European Commission borrow €500 billion from financial markets to fund Europe’s economic recovery, embedding the sum in the European Union’s long-term budget for 2021 to 2027.<sup>328</sup> This proposal has now been taken up by the European Commission in the form of the Next Generation EU instrument. At the national level, initial indications from the German Federal Government have affirmed the continued path toward a sustainable and climate-active economic recovery. Germany will likely maintain this position and seek to shape the European Union’s response accordingly.

Speaking on Europe Day on May 9, 2020, the Federal Minister for Economic Affairs and Energy noted that “post-crisis Europe must be even better than pre-crisis Europe at hatching ideas for structural change that is socially fair, for an economy that is climate-friendly, and for an energy transition that is successful.”<sup>329</sup> This direction is especially important given that the Federal Republic of Germany will take over the presidency of the Council of the European Union on July 1, 2020. Although, to date, very little is formally known of Germany’s planned focus during this six-month rotation, indications suggest that Germany will seek to align its priorities with an implementation of the Green Deal workplan (albeit in a revised fashion). A special area of focus for Germany will be the European Union offshore wind energy strategy, a likely agreement on an European regulatory framework for joint construction projects, as well as increased efforts for the European Union to collaborate with third-party countries to partner “for green energy imports.”<sup>330</sup> Germany’s Presidency will need to “actively contribute to paving [the] way in solidarity with other Member States” as the European Union emerges from the pandemic.<sup>331</sup> A special focus for Germany will be to strengthen the internal market of the European Union, the “economic backbone” of Europe, driven by a roadmap that consists of three priority areas:

- diversification of Europe’s supply chains, driven by a European Industrial Strategy that will bolster Europe’s industrial base;
- strengthening Europe’s small and medium sized enterprises (SMEs); and
- an emphasis on the need for a strong WTO and rules-based international trade.<sup>332</sup>

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<sup>327</sup> Commission COM(2020) 456, page 7.

<sup>328</sup> BBC News, Coronavirus: Why Merkel may help fund Europe’s recovery plan, 27 May 2020, <https://www.bbc.com/news/world-europe-52807748>. See also (in German) Der Spiegel.de, Merkrns 500-Milliarden-Euro-Ding, 28 May 2020, <https://www.spiegel.de/politik/deutschland/merkrns-500-milliarden-euro-ding-a-efaf30ac-7e34-4503-9dad-eb7fa687db88>.

<sup>329</sup> Federal Ministry for Economic Affairs and Energy, Minister Altmaier speaking on the occasion of Europe Day: “Exit the crisis with a strong Europe”, May 9, 2020, [“*Altmaier Europe Day 2020*”], <https://www.bmwi.de/Redaktion/EN/Pressemitteilungen/2020/20200509-minister-altmaier-speaking-on-the-occasion-of-europe-day-exit-the-crisis-with-a-strong-europe.html>.

<sup>330</sup> Euractive.com, German EU-Presidency: Empty wording on the Green Deal, April 15, 2020, <https://www.euractiv.com/section/energy-environment/news/german-eu-presidency-empty-wording-on-the-green-deal/>.

<sup>331</sup> *Altmaier Europe Day 2020*.

<sup>332</sup> *Altmaier Europe Day 2020*.

## **10. Looking Ahead and Conclusions**

This paper has evaluated in detail the aggressive energy diversification and renewable energy expansion agenda of the Federal Republic of Germany, as supported by ambitious economic recovery, energy interconnection and climate action objectives of the European Union. This has resulted in an accelerated energy-mix diversification and the scaling up of renewable energy generation capacity in Europe's largest economy. The objective of this paper was to chart this fundamental transition by examining the role that the "interconnection" of Europe's energy infrastructure has played in facilitating Germany's transition and the lessons that may be learned for other economies contemplating a diversification of their energy mix. In undertaking this review, the paper has highlighted that Germany has achieved rapid energy diversification as a result of concerted interconnection with other Member States of the European Union as well as third-party countries (such as Norway and the United Kingdom) via expanded electricity grid interconnection. What lessons can be learned from this for Canada collectively and for the province of Alberta in particular where discussions on the transition towards a more sustainable and climate active economic model are ongoing?

Since the European Union's early stage attempts at promoting renewable energy generation as an energy union and security policy in 2001, the European Union has utilised the 2008 economic crisis to undertake an aggressive economic recovery programme that was firmly focused on strengthening cross-border energy infrastructure interconnection, both for gas and electricity grid infrastructure. As part of this, the Member States bordering the North Sea and Baltic Sea have proceeded with the rapid scaling-up of offshore wind energy generation capacity, supported by an audacious effort to interconnect these offshore wind energy installations to the onshore electricity grid. At the same time, European energy policy has also strategically sought to interconnect the Southern European energy region with its abundant solar energy capacity to the electricity grids of Northern Europe. To achieve this objective, electricity grid interconnector corridors have been established for both the trans-Pyrenees and trans-Alpine electricity grid interconnection capacity. As a result, Germany, with its strategic geographical location, can now better safeguard its energy security through renewable energy imports via an extensive and interconnected network of electricity grid infrastructure that connects the European electricity market.

Looking ahead, the European Commission's December 2019 "Green Deal for Europe", now a core component of Europe's post-pandemic recovery response "Next Generation EU", formalises the Union's ambitious sustainable development goals, climate action priorities and economic diversification objectives, across the 27 Member States. Germany's upcoming Presidency of the European Council will no doubt set further impulses to drive these priorities. These, one can anticipate, will have significant implications, both positive and negative, for the Canadian economy at large and especially for Alberta's fossil-fuel centric economy. At the same time, Alberta's diversification towards renewable energy sources is accelerating and there are notable developments in terms of repurposing coal mines as stored hydroelectric power projects to address electricity grid stability and intermittency. A concerted drive to decarbonise the European economy will mean continued diversification of the European energy mix, but it may also pose opportunities for Canada, due to an increased reliance on natural gas as clean fuel imports into the European Union. Indeed, Germany's upcoming nuclear and coal phase-outs in 2022 and 2038 respectively, and a push by Germany for a European Industrial Strategy to strengthen the European

Union's industrial base, may see a change in how Germany, and the wider European Union, will address the critical issues of climate action with an accelerated focus on achieving a truly sustainable European economy pursuant to the Green Deal. Whatever the detail may look like, one thing is clear: the Federal Republic of Germany, as the strategic European economy, will continue to influence the direction for the wider European Union energy and economic policy, including during the upcoming European Council Presidency in July 2020.

The interconnecting European model is by no means complete, but the case study of the past 2009 to 2020 period as outlined in this paper charts a very strong indication of how the European Union will continue to address the questions of energy diversification, renewable energy generation, and climate action. Canada, and the province of Alberta in particular, should look closely at these developments and consider the opportunities that this interconnected European transition offers. The tangible opportunities relate to both Germany and the European Union as a model to study as well as a strategic priority market for Canadian natural resources and technology.