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European Union Committee

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10th Report of Session 2017–19

# **Brexit: energy security**

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Evidence is published online at [www.parliament.uk/brexit-energy-security-inquiry-lords](http://www.parliament.uk/brexit-energy-security-inquiry-lords) and available for inspection at the Parliamentary Archives (020 7219 3074).

Q in footnotes refers to a question in oral evidence.

## SUMMARY

Individuals and businesses across the UK depend on a reliable and affordable supply of gas and electricity. In recent years, the UK has achieved such a supply in partnership with the EU, working with other Member States to make cross-border trade in energy easier and cheaper.

Despite having played a leading role in developing the EU's Internal Energy Market (IEM), the UK is now on course to leave it. Our inquiry revealed strong support across the energy sector to continue to participate in the IEM, but this is unlikely to be possible if the Government pursues its policy of leaving the Single Market and the jurisdiction of the Court of Justice of the European Union. The UK will need to continue to trade energy with the EU in order to meet demand, but if such trade takes place outside the IEM it is likely to be less efficient, potentially raising costs for consumers.

In addition to changing the UK-EU trading relationship, Brexit raises a number of other potential challenges to the UK's energy security. The UK's use of nuclear material is currently enabled by its membership of Euratom, which facilitates trade in such material and ensures it is not diverted for military use (as required by international law). The UK will be leaving Euratom as well as the EU and, if the Government does not replicate its provisions by the date of departure, the UK could be unable to trade in nuclear goods and services, including importing nuclear material, as a result. The Government is taking measures to avoid this worst-case scenario, which could quickly lead to power shortages. But serious concerns have also been raised over whether the Office for Nuclear Regulation will be able to recruit and train sufficient inspectors in time, and whether it will be possible to build new nuclear generation sites, such as Hinkley C, without access to specialist EU workers.

The Single Electricity Market (SEM) on the island of Ireland has been a key dividend of the peace process, reducing energy prices in both Northern Ireland and the Republic of Ireland, and helping to achieve decarbonisation targets. It is therefore vital that the SEM is able to continue post-Brexit. Given that its functioning requires the implementation of EU energy laws in Northern Ireland, the mechanics of maintaining the SEM will require careful consideration and new arrangements, particularly if the UK were to leave the IEM.

EU investment has made a significant contribution to constructing and maintaining a secure energy system in the UK, but the UK's ability to draw on these investment sources post-Brexit is uncertain. It will be particularly important to replace the EU's funding of interconnectors, in order to ensure there is sufficient infrastructure to enable future energy trading.

The experience of other countries suggests that the UK is likely to have little influence on EU energy policy post-Brexit. This will be particularly concerning in the event the UK continues to participate in the IEM, given the corresponding requirement to comply with current and future relevant EU legislation.

Witnesses highlighted many benefits of the UK's current energy relationship with the EU, and the Minister acknowledged these benefits when he stated his hope that Brexit would result in as little change as possible. It remains unclear, however, how this can be achieved, without remaining in the single market, IEM and the other bodies that develop and implement the EU's energy policy. We call on the Government to clarify its post-Brexit energy policy in the event the UK no longer participates in the IEM.



# Brexit: energy security

## CHAPTER 1: INTRODUCTION

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### Energy and Brexit

1. The UK's energy industry supplies over 26 million homes and businesses with energy, provides employment for over 619,000 people and adds £83 billion to the economy.<sup>1</sup> The UK's withdrawal from the EU could have a substantial impact upon that industry, for a number of reasons:
  - Consumers have benefitted from the UK playing a leading role in shaping the EU's energy policies, and the current systems for trading gas and electricity between EU countries.<sup>2</sup>
  - Energy policy is a shared competence between the UK and the EU, so although the UK already has a degree of independence, withdrawing from the EU could affect the UK's domestic energy arrangements and its ability to meet consumers' energy demand.
  - The EU is a key energy trading partner for the UK, supplying approximately 12%<sup>3</sup> of the UK's gas and 5%<sup>4</sup> of electricity in 2016. Levels of electricity imports are expected to increase over the next five years.<sup>5</sup>
  - The UK's withdrawal from Euratom, which underpins the nuclear industry and trade in nuclear materials, could impact the UK's ability to maintain current levels of electricity generation.

### This inquiry

2. This inquiry, one of a series of Brexit-related inquiries conducted by the EU Committee and its six sub-committees since the June 2016 referendum, evaluates key issues for energy security that the Government will need to consider before or immediately after the UK withdraws from the EU.
3. The UK's energy sector undertakes a wide range of activities, from extracting oil from the North Sea to installing domestic heat pumps. This report does not address the implications of Brexit on the entire sector, but focuses on the ability of the energy industry to ensure secure supplies of gas and electricity and deliver them to UK consumers post-Brexit. We do not address the implications of Brexit for the supply of oil to the UK, because

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1 Written evidence from Energy UK ([BES0024](#))

2 Written evidence from Ofgem ([BES0025](#))

3 Department for Business, Energy & Industrial Strategy, 'UK Energy in Brief 2017' (2017) p 10: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/631146/UK\\_Energy\\_in\\_Brief\\_2017.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/631146/UK_Energy_in_Brief_2017.pdf) [accessed 16 November 2017]

4 *Ibid.*, p 25

5 See Department of Business, Energy & Industrial Strategy, 'Annex L: Total electricity generating capacity: Updated Energy & Emissions Projections 2017': (2 January 2018): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/666267/Annex-l-total-capacity.xls](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/666267/Annex-l-total-capacity.xls) [accessed 16 January 2018]

oil consumption in the energy sector is relatively low compared to gas and electricity.<sup>6</sup>

4. For the purposes of this report, ‘energy security’ is taken to mean the UK’s ability to ensure secure energy supplies for UK consumers, at a reasonable cost, while also decarbonising the energy system.
5. We acknowledge that a single policy will often have implications for both energy and climate change. In this report we therefore address specific issues relating to climate change policy where they affect the UK’s ability to maintain secure energy supplies post-Brexit. More general climate change policies, such as those relating to the EU Emissions Trading Scheme, were considered in our report *Brexit: environment and climate change*.<sup>7</sup>
6. The EU Energy and Environment Sub-Committee, whose members are listed in Appendix 1, met in September and October 2017 to take evidence for this inquiry. It also visited the National Grid Control Centre in Wokingham to inform its understanding of energy system management both within and beyond the UK.
7. We are grateful to those who gave oral evidence and to those who responded to our targeted request for written contributions, all of whom are listed in Appendix 2.
8. **We make this report to the House for debate.**

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6 In this context ‘the energy sector’ includes energy consumption by domestic, industry, commercial and public users. Department of Business, Energy & Industrial Strategy, ‘Digest of United Kingdom Energy Statistics (DUKES), ‘Chapter 1: Energy’, (2017) Table 1.1: <https://www.gov.uk/government/statistics/energy-chapter-1-digest-of-united-kingdom-energy-statistics-dukes> [accessed 16 January 2018]

7 European Union Committee, *Brexit: environment and climate change* (12th Report, Session 2016–17, HL Paper 109)

## CHAPTER 2: EU ENERGY POLICY

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### Development of EU energy policy

9. European energy cooperation has moved beyond the foundations initially laid out in the European Coal and Steel Community of 1951 and the European Atomic Energy Community of 1957.
10. The oil crisis in 1973–74 heightened concerns over energy security, leading to the then European Community adopting two Directives in 1975 designed to reduce the risk of supply interruptions.<sup>8</sup> Three subsequent legislative packages—in 1990, 2003 and 2009—aimed to liberalise and integrate European energy markets, providing the basis for the Internal Energy Market (IEM). The 2009 ‘Third Package’ included provisions on access to markets, networks and cross-border exchange for gas and electricity.<sup>9</sup> It also established the Agency for the Cooperation of Energy Regulators (ACER).<sup>10</sup>
11. Over the same period legislation was enacted to decarbonise the energy system. For example, in 2005 the EU Emissions Trading Scheme (EU ETS) was launched to reduce emissions from industry,<sup>11</sup> and the 2009 Renewable Energy Directive set renewable energy targets for each Member State.<sup>12</sup>
12. In 2015 the European Commission renewed its focus on consumers and the need for affordable, secure energy, as part of the major Energy Union strategy. The 2015 Energy Union Package had five key ‘dimensions’: energy security, solidarity and trust; a fully integrated European energy market; energy efficiency contributing to a moderation of demand; decarbonising the economy; and research, innovation and competitiveness.<sup>13</sup> The UK Government has been a strong advocate of the Energy Union agenda.<sup>14</sup>

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- 8 Council Directive 75/339/EEC of 20 May 1975 on maintenance of minimum stocks of crude oil and/or petroleum products at power stations ([OJ L 153/35](#), 13 June 1975) and Council Directive 75/404/EEC of 13 February 1975 on the restriction of use of natural gas in power stations ([OJ L 178/24](#), 9 July 1975)
  - 9 Council Directive 2009/73/EC of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC ([OJ L 211/94](#), 14 August 2009); Council Directive 2009/72/EC of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC ([OJ L 211/55](#), 14 August 2009); Council Regulation (EC) No 715/2009 of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005 ([OJ L 211/36](#), 14 August 2009); Council Regulation (EC) No 714/2009 of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003 ([OJ L 211/15](#), 14 August 2009)
  - 10 Council Regulation (EC) No 713/2009 of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators ([OJ L 211/1](#), 14 August 2009)
  - 11 Council Directive 2003/87/EC of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC ([OJ L 275/32](#), 25 October 2003). The EU ETS sets a progressively-reducing cap on the total amount of greenhouse gases that can be emitted by the sectors covered by the system. Within the cap, companies receive or buy emission allowances, and each year a company must surrender enough allowances to cover all its emissions.
  - 12 Council Directive 2009/28/EC of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC ([OJ L 140/16](#), 5 June 2009)
  - 13 European Commission Communication ‘A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy’ 2015, p 3 [COM\(2015\) 80 final](#)
  - 14 Antony Froggatt *et al*, *UK Unplugged? The Impacts of Brexit on Energy and Climate Policy*, Chatham House, Royal Institute of International Affairs, Research Paper, May 2016, p 10: <https://www.chathamhouse.org/sites/files/chathamhouse/publications/research/2016-05-26-uk-unplugged-brexit-energy-froggatt-raines-tomlinson.pdf> [accessed 13 December 2017]

13. Most recently, in December 2016 the European Commission presented a set of eight legislative proposals, known as the Clean Energy Package, to enable the EU to deliver its Paris Agreement commitments.<sup>15</sup> The proposals cover energy efficiency, energy performance of buildings, renewable energy, energy governance, electricity market design and ACER.<sup>16</sup> At the time of writing these proposals were making their way through the EU legislative system. Some are progressing more quickly than others, and it is unlikely that they will all be implemented by the time the UK leaves the EU in March 2019.
14. According to Joseph Dutton, Policy Adviser at E3G, this evolution of policy alignment has ensured that “there is a functioning marketplace that delivers security of supply, investment security and the correct price signals for the UK energy sector”.<sup>17</sup> SSE agreed: “The IEM has been beneficial for efforts toward delivering clean, secure and affordable energy in the UK.”<sup>18</sup>

### Energy competence

15. By virtue of Article 4(2)(i) of the Treaty on the Functioning of the European Union (TFEU) Member States and the European Union share competence in the field of energy.<sup>19</sup> The details of this competence are set out in Title XXI Article 194 TFEU, as detailed in Box 1.

#### Box 1: EU and Member State energy competence

According to Article 194 of the TFEU, the EU has the competence to:

- (a) Ensure the functioning of the energy market;
- (b) Ensure security of energy supply in the Union;
- (c) Promote energy efficiency and energy saving and the development of new and renewable forms of energy; and
- (d) Promote the interconnection of energy networks.

Member States, however, retain competence to determine their own energy mix and the structure of their energy supply. Article 194 goes on to state: “Such measures shall not affect a Member State’s right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply”.

Source: Treaty on the Functioning of the European Union [OJ C 326](#), (consolidated version of 26 October 2012)

16. Furthermore, the EU has agreed a large number of energy measures in the field of environment and climate change, notably in the areas of renewable energy and energy efficiency.<sup>20</sup> According to the TFEU, EU environmental policy should contribute to preserving, protecting and improving the quality of the environment; protecting human health; prudent and rational utilisation of natural resources; and promoting measures at international level to deal

15 The Paris Agreement is the first ever legally-binding global climate deal. It was agreed at the Paris climate conference (COP21) in December 2015.

16 European Commission, ‘Clean Energy for All Europeans’: <https://ec.europa.eu/energy/en/topics/energy-strategy-and-energy-union/clean-energy-all-europeans> [accessed 28 November 2017]

17 [Q 2](#)

18 Written evidence from SSE ([BES0012](#))

19 HM Government, *Review of the Balance of Competences between the United Kingdom and the European Union: Energy Report*, (2014) p 25: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/332794/2902398\\_BoC\\_Energy\\_acc.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/332794/2902398_BoC_Energy_acc.pdf) [accessed 28 November 2017]

20 EU competence over the environment is provided for by Articles 191–193, [Treaty on the Functioning of the European Union](#)

with regional or worldwide environmental problems, in particular combating climate change.<sup>21</sup>

17. In addition, there is a separate legal and regulatory framework governing nuclear energy. This is covered in more detail in Chapter 9.

### **Post-Brexit policy opportunities**

18. Despite the UK's leading role in developing the EU's energy policy, witnesses highlighted changes that they would like to make to domestic energy policy once the UK is no longer constrained by EU membership. These included:
  - Changing the process through which changes are made to the rules governing the technical workings of the energy system (the Network Codes);<sup>22</sup>
  - Setting domestically-tailored renewable energy and energy efficiency targets,<sup>23</sup> supported by retail and supply-chain measures;<sup>24</sup>
  - Targeting support at specific generation technologies without State aid restrictions;<sup>25</sup>
  - Reconsidering the charging structure applied to electricity traded over interconnectors;<sup>26</sup>
  - Setting VAT levels to reflect energy as an essential item of household expenditure.<sup>27</sup>

These options for changing domestic energy policy in the long term are outside the scope of this inquiry, but we draw them to the Government's attention.

### *Conclusions: EU energy policy*

19. **UK and EU energy policies have become closely aligned over time, with the UK often leading the way in terms of market liberalisation. This alignment facilitates the efficient trade of energy, with benefits for energy security, affordability and decarbonisation.**
20. **Brexit presents opportunities to develop energy policies that support market conditions that are particular to the UK, after the initial transfer of legislation through the EU (Withdrawal) Bill.**

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21 [Treaty on the Functioning of the European Union](#)

22 Written evidence from Interconnector UK ([BES0007](#))

23 Written evidence from EEF and UK Steel ([BES0027](#))

24 Written evidence from Which? ([BES0016](#))

25 Written evidence from InterGen ([BES0017](#)) and NNWE ([BES0018](#))

26 Written evidence from SSE ([BES0012](#)), RWE ([BES0029](#)), ENGIE ([BES0040](#)) and E.ON UK plc ([BES0046](#))

27 Written evidence from NEA ([BES0058](#))

## CHAPTER 3: ENERGY SYSTEM FUNDAMENTALS

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### Energy security

21. In the words of Energy UK, “Energy is the backbone of our modern society and as such maintaining energy security is vital.”<sup>28</sup> Similarly, the British Ceramic Confederation told us: “Secure energy that businesses can rely on is fundamental to the functioning of any modern economy.”<sup>29</sup>
22. The Durham Energy Institute pointed out that “the UK cannot presently meet its own heat and power demands with existing indigenous supply”,<sup>30</sup> while National Energy Action (NEA) also noted the UK’s increasing reliance on energy imports.<sup>31</sup> The British Ceramic Confederation (BCC) argued that this increasing energy interdependence “only strengthens the importance of maintaining energy trade and strengthening energy interactions with neighbouring countries”.<sup>32</sup>
23. Energy UK were clear that, post-Brexit, “it is very unlikely that the ‘lights will go out’, as both gas and electricity will physically continue to flow on a commercial basis”.<sup>33</sup> But they also told us that “without a strong trade agreement or a type of membership that provides access to the Internal Energy Market ... it is likely we will be operating in a less efficient market”. Similarly, Georgina Wright, Research Assistant and Co-ordinator, Europe, at Chatham House, argued that “of course, energy trade between the UK and the EU 27, and the UK and third countries, would continue even in the event of no agreement. The key risk is around how efficient that trade would be.”<sup>34</sup> RWE concurred.<sup>35</sup>
24. The Durham Energy Institute concluded:
 

“Whatever the final detail of the EU exit terms the UK is likely to be more peripheral to EU energy markets which will mean higher prices and more unreliable supply. Also supply risks will increase around issues such as importing gas through subsea pipelines or electrical interconnectors linking the UK to other EU countries.”<sup>36</sup>
25. As an example of such risks, RWE cited the Security of Gas Supply Regulation, introduced by the EU in 2017.<sup>37</sup> They noted that, should the Regulation cease to apply in the UK post-Brexit: “The UK may miss out on the possibility of closely assessing supply risks, collaboratively developing preventative action plans and implementing emergency procedures with its interconnected EU neighbours.”<sup>38</sup> They added: “The UK would also not be able to rely on EU solidarity whereby EU states could interrupt gas supplies ... in order to free up gas to send to the UK.”

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28 Written evidence from Energy UK ([BES0024](#))

29 Written evidence from BCC ([BES0008](#))

30 Written evidence from Durham Energy Institute ([BES0013](#))

31 Written evidence from NEA ([BES0058](#))

32 Written evidence from BCC ([BES0008](#))

33 Written evidence from Energy UK ([BES0024](#))

34 [Q 2](#)

35 Written evidence from RWE ([BES0029](#))

36 Written evidence from Durham Energy Institute ([BES0013](#))

37 Council Regulation (EU) 2017/1938 of 25 October 2017 concerning measures to safeguard the security of gas supply and repealing Regulation (EU) No 994/2010 ([OJL 280/1](#), 28 October 2017)

38 Written evidence from RWE ([BES0029](#))

26. The Institution of Chemical Engineers *et al* argued that the impact of Brexit on energy security would be “manageable, provided agreements are reached on specific areas of collaboration and arrangements put in place to ensure the continued operation of wholesale gas and electricity markets”.<sup>39</sup> But, they cautioned: “This will not be a trivial task, and failure to reach agreement could jeopardise the UK’s energy security, particularly in the event of extreme winter weather requiring energy imports from the continent.”
27. Echoing this, Green Alliance stated: “Brexit can have severe long term implications for UK’s energy security if economically rational outcomes are not sought by both sides.”<sup>40</sup> Lesley Griffiths AM, Welsh Government Cabinet Secretary for Environment and Rural Affairs, agreed: “It will [be] important to ensure that some of the key priorities for the energy system, including moving to a low carbon energy system, ensuring energy is affordable and ensuring security of supply, are facilitated rather than impeded by any future relationship.”<sup>41</sup>
28. Richard Harrington MP, Minister for Energy and Industry, expressed confidence: “Because we have a very well-functioning, competitive and resilient energy system now ... with the technology and so many different sources of electricity and so many ways it can be adjusted in the short, medium and long term, I am not worried about security of supply.”<sup>42</sup> In its written evidence to the Committee, his Department also noted that “the Government has taken, and will continue to take, measures which mean that homes and businesses have the secure supplies of electricity they need”.<sup>43</sup>

*Conclusion: energy security*

29. **Post-Brexit, the UK may be more vulnerable to supply shortages in the event of extreme weather or unplanned generation outages. While we note the Minister’s confidence in future UK energy security, we urge the Government to set out the means by which it will work with the EU to anticipate and manage cross-continent supply shortages that will affect the UK.**

**Cost to consumers**

30. ENGIE warned that “a potential impact on affordability could ensue should trading arrangements and codes differ significantly”.<sup>44</sup> Similarly, Energy UK claimed that operating in a less efficient market “will have an impact on consumer bills”.<sup>45</sup> Ofgem reminded us that “the benefits of cooperating with our European neighbours and making use of cross border markets include ... a reduced need to procure capacity domestically (which would be at a significantly higher cost)”.<sup>46</sup> Malcolm Keay, Senior Research Fellow at the Oxford Institute for Energy Studies, commented: “We could import a lot more [liquefied natural gas] from anywhere in the world. All of that is outside the EU and is very flexible. The only issue might be price. It might cost more. It is as much a price as a security issue.”<sup>47</sup> As a result, National

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39 Written evidence from the Institution of Chemical Engineers *et al* (BES0023)

40 Written evidence from Green Alliance (BES0010)

41 Written evidence from Welsh Government (BES0056)

42 [Q 55](#)

43 Written evidence from BEIS (BES0049)

44 Written evidence from ENGIE (BES0040)

45 Written evidence from Energy UK (BES0024)

46 Written evidence from Ofgem (BES0025)

47 [Q 6](#)

Energy Action warned that “the UK leaving the EU could ... badly impact the people who struggle to keep their homes adequately warm”.<sup>48</sup>

31. Asked what assessment he had made of the impact of Brexit on consumers’ energy costs, the Minister responded: “I cannot attach cost to it because we do not know what the outcome of the negotiations will be.”<sup>49</sup> He continued: “I do not think there is a question of limited supply or a significant price change.”<sup>50</sup>

*Conclusion: cost to consumers*

32. **It is likely that the UK’s withdrawal from the EU will lead to less efficient energy trade, which could in turn increase the price paid by consumers for energy security. We call on the Government to conduct and publish an assessment of what impact leaving the Internal Energy Market would have on the price paid by consumers for their energy, and to take steps to mitigate this impact, particularly for financially vulnerable consumers.**

**Transition**

33. A number of witnesses underlined the importance of a transition period immediately following withdrawal. SSE told us: “The impact of the UK’s withdrawal from the EU for the UK’s energy security can be minimised through agreeing a transitional period, which avoids a cliff edge for business and allows the energy industry to prepare for an altered operating environment.”<sup>51</sup> National Grid contended that an implementation period “would allow an orderly process for all parties to change their regulatory frameworks, commercial contracts and IT systems”.<sup>52</sup> Lawrence Slade, Chief Executive of Energy UK, suggested that such a transition period should last for a minimum of two years.<sup>53</sup>
34. The CBI believed that a transitional arrangement “should replicate much of the economic relationship that is in place between the UK and the EU”.<sup>54</sup> Energy UK argued it should “ensure barrier free trade between the UK and the EU and the free movement of labour”,<sup>55</sup> while EEF and UK Steel argued for participation in the Internal Energy Market.<sup>56</sup> The key features of a post-Brexit transition period, and its basis in EU law, are discussed in more detail in the Committee’s recent report *Brexit: deal or no deal*.<sup>57</sup>

*Conclusion: transition*

35. **A transition period, during which the key elements of the current UK-EU energy relationship are maintained, is needed to allow time for the industry to adjust its working practices, contracts and IT systems, and thus ensure secure energy supplies continue to be available to consumers.**

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48 Written evidence from NEA ([BES0058](#))

49 [Q 56](#)

50 [Q 56](#)

51 Written evidence from SSE ([BES0012](#))

52 Written evidence from National Grid ([BES0043](#))

53 [Q 12](#); also written evidence from Energy UK ([BES0024](#))

54 Written evidence from CBI ([BES0019](#))

55 Written evidence from Energy UK ([BES0024](#))

56 Written evidence from EEF and UK Steel ([BES0027](#))

57 European Union Committee, *Brexit: deal or no deal* (7th Report Session 2017–19, HL Paper 46)

## CHAPTER 4: LABOUR IN THE ENERGY SECTOR

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### EU workers in the energy sector

36. According to Energy & Utility Skills, “Delivery of long-term energy security safely and effectively at a justifiable cost requires an exceptionally skilled and substantial workforce.”<sup>58</sup> Energy UK told us that EU/EEA employees made up 1-5% of the energy industry’s workforce.<sup>59</sup>
37. According to Centrica, rules on freedom of movement and changes to the UK’s immigration policy post-Brexit could “constrain the ability of energy companies to effectively source specialist workers, leading to a shortage of skilled workers available to complete new generation and/or energy infrastructure projects”.<sup>60</sup> Chatham House and the University of Exeter pointed out this could “result in higher construction costs and longer infrastructure construction times”.<sup>61</sup>
38. In this chapter, we outline the main concerns of the energy sector in respect of access to labour post-Brexit; for a more detailed assessment of the UK’s reliance on non-UK EU workers, see our report *Brexit: UK-EU movement of people*.<sup>62</sup>

### Energy engineers

39. Engineering roles were identified as being particularly reliant on EU labour.<sup>63</sup> For example, Energy UK cited “the smart meter roll out, the delivery of which requires a large number of skilled engineers, many of which we expected to recruit from EU member states”.<sup>64</sup>
40. Asked about the energy industry’s reliance on EU engineers, the Minister responded: “I am less concerned about that simply because, in a previous life, I saw the huge expansion of apprenticeship schemes in construction.”<sup>65</sup> Lawrence Slade, Chief Executive of Energy UK, was less sanguine: “Having access to an indigenous workforce of a skilled nature is obviously a good thing for the country, but it does not happen overnight.”<sup>66</sup> EDF Energy told us that “Whilst we are investing in skills development within the UK, we want to ensure that access to the best talent from the EU and beyond continues”.<sup>67</sup>

### Nuclear industry workforce

41. Within the energy sector, the nuclear industry is particularly reliant upon overseas labour. As EDF Energy stated: “The highest concentration of non-British nationals as a percentage of the total employed workforce is within

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58 Written evidence from Energy & Utility Skills ([BES0038](#))

59 Supplementary written evidence from Energy UK ([BES0050](#))

60 Written evidence from Centrica ([BES0031](#)); see also supplementary written evidence from EDF ([BES0054](#)).

61 Written evidence from Chatham House and University of Exeter ([BES0044](#))

62 European Union Committee, *Brexit: UK-EU movement of people* (14th Report, Session 2016–17, HL Paper 121)

63 [Q 13](#) (Lawrence Slade); see also supplementary written evidence from EDF Energy ([BES0054](#)).

64 Supplementary written evidence from Energy UK ([BES0050](#))

65 [Q 55](#)

66 [Q 13](#)

67 Supplementary written evidence from EDF Energy ([BES0054](#))

Nuclear New Build.”<sup>68</sup> Angela Hepworth, Corporate Policy and Regulation Director at EDF, provided some concrete detail:

“At the peak of the construction of Hinkley Point, we are going to need 1,400 steel fixers. At the moment, the total population of certified steel fixers in the UK is 2,700 so we would need more than half of the total steel-fixing population in the UK in order to meet the peak requirement for Hinkley Point.”<sup>69</sup>

42. The Institute of Mechanical Engineers agreed that “the nuclear sector relies heavily on skilled workers from Europe”,<sup>70</sup> as did the Centre for Nuclear Engineering at Imperial College London: “The free movement of skilled professionals within the nuclear industry is critical to its long-term success.”<sup>71</sup>

43. Discussing the construction of new nuclear plant, EDF Energy described “two primary factors drive the supply chain’s need for non-UK sources of skills and labour, niche/specialist skills and large volume requirements”.<sup>72</sup> Dr Jenifer Baxter, Head of Energy and Environment at the Institution of Mechanical Engineers, described another practical challenge:

“There is also an issue around security clearance. It has been relatively easy to have EU workers come in and have security clearance to the sites, but once we start looking further afield for people from other parts of the world it is much harder for the security clearance to be obtained, which means that bringing people on to site and training them up could take longer. This will bring delays to our current construction.”<sup>73</sup>

44. The Minister, Richard Harrington MP, acknowledged the nuclear industry’s concerns: “We have to make sure that we can bring the necessary people here, and it is a top priority for us.”<sup>74</sup> Katrina McLeay, Head of Safeguards and Delivery in the Euratom Exit Team at the Department for Business, Energy and Industrial Strategy (BEIS), added that “those issues and concerns have been flagged with the Home Office”.<sup>75</sup>

### *Skill level*

45. Witnesses were concerned that any new immigration policy should be flexible enough to meet the energy sector’s needs. For instance, Energy & Utility Skills told us that “any new immigration policy must avoid arbitrary distinctions between ‘higher’ and ‘lower’ skilled jobs, based on inaccurate criteria such as whether or not it requires a degree—this does not reflect the value of such roles to the sector”.<sup>76</sup> We heard from EDF Energy that “we are satisfied that the majority of our current employees would meet the existing UK Points Based System requirements. The same cannot be said for our supply chain workforce, most of whom would not meet the current entrance criteria.”<sup>77</sup> Similarly, Ms Hepworth was concerned that steel fixing, a key

68 Supplementary written evidence from EDF Energy ([BES0054](#))

69 [Q 35](#)

70 Written evidence from Institution of Mechanical Engineers ([BES0045](#))

71 Written evidence from Centre for Nuclear Engineering at Imperial College London ([BES0005](#)); see also written evidence from NIRO ([BES0009](#)), NNWE ([BES0018](#)) and Centrica ([BES0031](#)).

72 Written evidence from EDF Energy ([BES0033](#))

73 [Q 35](#)

74 [Q 55](#)

75 [Q 55](#)

76 Written evidence from Energy & Utility Skills ([BES0038](#))

77 Supplementary written evidence from EDF Energy ([BES0054](#))

skill for the construction of Hinkley Point, “does not meet the criteria for skilled employment under the UK’s points-based system”.<sup>78</sup>

46. Asked about what steps the Government will take to ensure that the UK has access to the EU workers needed to construct and maintain its energy system, the Minister told us: “I think the Government have always said they want the brightest and the best.”<sup>79</sup>

*Conclusions: EU workers in the energy sector*

47. **The energy industry is reliant on workers from the EU, in particular to fill its engineering roles. These workers are necessary for the construction and maintenance of a secure energy system. While we encourage the Government to pursue opportunities to train more workers domestically, this will take time, and continued access to EU workers will be needed in the meantime.**
48. **Dependence on EU workers is particularly acute in the nuclear energy sector. The evidence from EDF Energy is clear that without access to EU labour it will be difficult to complete construction of the new nuclear power facility at Hinkley Point.**
49. **We call on the Government to assess the workforce needs of the energy industry and ensure they are reflected in the post-Brexit immigration policy. Neither a simple extension of the current points-based system to EU workers, nor an exclusive focus on ‘high skilled’ workers, would address the industry’s concerns.**

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78 [Q 35](#)

79 [Q 55](#)

## CHAPTER 5: ENERGY TRADE

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### Value of energy trading

50. According to the Nuclear Industry Association (NIA), “Continued trade between the UK and the EU in electricity and gas will be vital for both parties, as will access to respective energy markets.”<sup>80</sup> Oil & Gas UK told us: “The UK Government should understand that any increase in the barriers to trade within the internal energy market will diminish our energy security as a country.”<sup>81</sup>
51. The Institution of Chemical Engineers *et al* noted that the UK was a net importer of gas, and argued that this trend was likely to continue: “It is therefore vital that the UK maintains connected [*sic*] to a robust global trading market in natural gas in order to ensure a diverse and resilient supply.”<sup>82</sup>
52. UK-EU electricity trading is particularly beneficial in facilitating renewable electricity generation. The Aldersgate Group contended: “Electricity will be the cornerstone of the UK’s future trading relationship because ... the decarbonisation of the EU and UK electricity grids through generation from renewable sources which are variable, can be made more efficient through crossborder trade.”<sup>83</sup>

### Internal Energy Market

#### Box 2: Internal Energy Market

The Internal Energy Market (IEM) in gas and electricity has a legal basis under Article 194 TFEU. It was designed to increase efficiency by introducing competitive forces into energy markets across the EU, thereby reducing prices and improving services to consumers; and to achieve greater interconnection of markets, which would reduce the need for reserve generation capacity, thus further reducing costs.

Members of the IEM include EU Member States, plus Norway, Iceland and Liechtenstein as parties to the European Economic Area (EEA) agreement. There are no participants from outside the EEA.

Source: *Treaty on the Functioning of the European Union* ; HM Government, *Review of the Balance of Competences between the United Kingdom and the European Union: Energy Report (2014)* p 42: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/332794/2902398\\_BoC\\_Energy\\_acc.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/332794/2902398_BoC_Energy_acc.pdf) [accessed 29 November 2017]

### Scope and effect

53. The Internal Energy Market (IEM) is outlined in Box 2. The Aldersgate Group commented that “there is broad consensus that membership of the IEM is beneficial to UK energy consumers, because harmonisation of markets improves efficiency and allows access to balancing services, which reduce costs”.<sup>84</sup> Ofgem agreed that “the greater integration which the IEM has created has promoted efficiency in trading power and gas through more robust price signals, increasing diversity of resources and improving our

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80 Written evidence from NIA ([BES0006](#))

81 Written evidence from Oil & Gas UK ([BES0047](#))

82 Written evidence from Institution of Chemical Engineers *et al* ([BES0023](#)); see also [Q 2](#) (Joseph Dutton).

83 Written evidence from Aldersgate Group ([BES0011](#))

84 Written evidence from Aldersgate Group ([BES0011](#))

security of supply”.<sup>85</sup> Phil Sheppard, Director of UK Systems Operation at National Grid, argued that the IEM “is leading to cheaper prices for consumers”.<sup>86</sup>

54. National Grid, citing analysis completed before the referendum, told us: “If the UK is to be excluded from the IEM, and if no other policy measures were put in place, there is a risk to the UK economy of up to £500m per annum by the early 2020s due to the loss of benefits of harmonised trading arrangements with the EU.”<sup>87</sup> According to the Aldersgate Group, “While alternative systems could be developed to facilitate cross-border trading, it seems inevitable that these would be less able to deliver security of supply, lowest prices and liquidity that the IEM currently delivers.”<sup>88</sup>
55. Witnesses highlighted a number of particularly valuable features of the IEM. One of these was market coupling, by which IEM participants use a shared algorithm to arrange cross-border electricity trades. The Aldersgate Group told us: “Market coupling is currently estimated to be worth £100m/year to the UK because, through interconnectors, it provides trading efficiencies which match supply and demand efficiently and thus lower intermarket and transaction costs.”<sup>89</sup> Energy UK argued that GB operators could be excluded from market coupling post-Brexit, “as there are no provisions in the texts for ‘third countries’”.<sup>90</sup> This was borne out by His Excellency Jean-Christophe Füg, Head of International Energy Affairs at the Swiss Federal Office of Energy, who told us that Switzerland was excluded from market coupling,<sup>91</sup> and as a result “trade between Switzerland and the rest of Europe is handled in a suboptimal way”.<sup>92</sup>
56. Another IEM benefit is information exchange. Ofgem told us:

“The REMIT Regulation provides Ofgem with access to data about market participants’ trading behaviour, which enables us to more effectively monitor the market. In the absence of the REMIT Regulation, we would need to seek alternative arrangements to access this data and to facilitate information sharing.”<sup>93</sup>

Energy UK also supported the maintenance of “a dedicated energy market integrity framework such as REMIT”,<sup>94</sup> while Mr Sheppard stated that if Regulations on market transparency were to fall away, “we would expect Ofgem to replace them, because visibility for trading across the interconnectors and within the UK is very important for keeping prices liquid and reducing the cost to consumers”.<sup>95</sup>

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85 Written evidence from Ofgem ([BES0025](#))

86 [Q 12](#); see also written evidence from SSE ([BES0012](#)) and Energy UK ([BES0024](#)).

87 Written evidence from National Grid ([BES0043](#))

88 Written evidence from Aldersgate Group ([BES0011](#))

89 Written evidence from Aldersgate Group ([BES0011](#))

90 Written evidence from Energy UK ([BES0024](#))

91 [Q 44](#)

92 [Q 46](#)

93 Written evidence from Ofgem ([BES0025](#)). REMIT is an EU regulation on wholesale energy market integrity and transparency. It creates a framework for identifying and penalising market abuse within the IEM.

94 Written evidence from Energy UK ([BES0024](#))

95 [Q 14](#)

57. Furthermore, Exxon Mobil noted the value of a ‘carve out’ from the Markets in Financial Instruments Directive (MiFID),<sup>96</sup> which exempts certain gas transactions from having to comply with financial regulation:

“If, after Brexit, the UK is deemed as a third country then continued UK based trading of gas may not benefit from this carve out ... Where a company has operations in both the UK and the EU it would be required to comply with these multiple financial regulatory regimes, adding complexity, cost and potential conflict to transacting business.”<sup>97</sup>

*Associated legislation*

58. Continuing participation in the IEM might, however, come at a price, and the British Ceramic Confederation was clear that “the UK must avoid having broader EU energy and climate legislation imposed as a consequence of maintaining non-discriminatory access to the IEM”.<sup>98</sup> SSE and the Energy Intensive Users Group (EIUG) agreed.<sup>99</sup>

59. Asked whether the UK would have to comply with EU standards in order to access the IEM, Malcolm Keay, Senior Research Fellow at the Oxford Institute for Energy Studies, answered:

“I do not think that we will have to. Countries such as Russia, for instance, export power to the European Union, but they do not necessarily have to take on the same obligations. Indeed, I would argue that there might be a case for the UK having more flexibility, because the market structures that suit you are very much dependent on the composition of your generating fleet, the geography and so on.”<sup>100</sup>

60. Conversely, Green Alliance told us: “Access to the IEM implies adopting the rules that govern the internal energy market and accepting the jurisdiction of the European Court of Justice.”<sup>101</sup> Georgina Wright, Research Assistant and Co-ordinator, Europe, at Chatham House, made a similar point:

“The EU has made clear in its negotiating principles that, in a future free trade agreement between the UK and EU, there would be ‘a level playing field in terms of competition and State Aid’ and that it ‘must encompass safeguards against unfair competitive advantages’. That assumes that standards would go beyond strictly energy and environment and could incorporate other standards, such as those on market and competition.”<sup>102</sup>

61. Energy UK agreed that rules on State aid in particular were likely to stay in place: “Realistically, whatever new trading relationship the UK has with the EU, there will be some requirements similar to existing EU State Aid rules.”<sup>103</sup> But they also felt that “there could be space to reform and be creative on how to support energy projects with environmental, social and economic values”.

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96 Council Directive 2014/65/EU of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU ([OJ L 173/349](#), 12 June 2014)

97 Written evidence from Exxon Mobil ([BES0032](#))

98 Written evidence from BCC ([BES0008](#))

99 Written evidence from SSE ([BES0012](#)) and EIUG ([BES0014](#)); see also written evidence from EEF and UK Steel ([BES0027](#)) and Oil & Gas UK ([BES0047](#)).

100 [Q 4](#)

101 Written evidence from Green Alliance ([BES0010](#)); see also written evidence from BCC ([BES0008](#)), Chatham House and University of Exeter ([BES0044](#)) and E.ON UK plc ([BES0046](#)).

102 [Q 4](#); also supplementary written evidence from Chatham House ([BES0053](#)).

103 Written evidence from Energy UK ([BES0024](#))

Citizens Advice, in contrast, argued that “while State Aid rules have clearly limited the discretion of British politicians, they have usually done so in ways which have been beneficial for UK energy consumers”.<sup>104</sup> EDF Energy told us: “We will welcome clarity over State Aid rules and the institutional arrangements for their application.”<sup>105</sup>

### *Future participation*

62. None of our witnesses expressed a desire to leave the IEM. Green Alliance stated: “The UK should seek to retain full access to the Internal Energy Market”;<sup>106</sup> New Nuclear Watch Europe (NNWE) argued that “The top priority in the negotiations is to keep the UK inside the EU Internal Energy Market”;<sup>107</sup> and Exxon Mobil told us that “the UK’s interests would be best served by remaining part of the IEM”.<sup>108</sup> EEF and UK Steel pointed out that “the UK is on track to implement initiatives under the Third Energy Package that require investment in areas such as new trading platforms and improved regional cooperation. This would be a wasted investment should the UK not participate in the IEM post-Brexit.”<sup>109</sup>
63. Energy UK, however, drew attention to Norway, which, as a non-EU participant in the IEM, “is required to implement most EU energy and environmental legislation, without being represented in the EU Council of Ministers and European Parliament”.<sup>110</sup> As a result, they asserted: “If full participation in the IEM is not accompanied by an acceptable level of influence, the UK will have to review the situation and if deemed necessary leave the IEM if the pros are outweighed by the cons.”<sup>111</sup> SSE, EEF and UK Steel, the Energy Institute and EDF Energy all agreed.<sup>112</sup>
64. The Minister informed us that “our top priority is to be as near as possible to the current arrangements ... Where there is such mutuality of interest I do not believe it is beyond the wit of those involved to work this out very quickly.”<sup>113</sup> He concluded: “It is our belief that there will be arrangements very comparable with the IEM, and we have picked up nothing to the contrary.”
65. SSE questioned the feasibility of the Government’s approach, identifying the challenge of “marrying the competing interests of retaining the benefits of the IEM with its own ‘red-lines’”.<sup>114</sup> RenewableUK went further: “The Government’s stance on the single market makes it unlikely that the UK could

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104 Written evidence from Citizens Advice ([BES0039](#))

105 Written evidence from EDF Energy ([BES0033](#)). We consider this issue in more detail in our forthcoming report on *Brexit: competition and State aid*.

106 Written evidence from Green Alliance ([BES0010](#))

107 Written evidence from NNWE ([BES0018](#))

108 Written evidence from Exxon Mobil ([BES0032](#)); see also written evidence from ADBA ([BES0004](#)), BCC ([BES0008](#)), Aldersgate Group ([BES0011](#)), Durham Energy Institute ([BES0013](#)), EIUG ([BES0014](#)), Which? ([BES0016](#)), CBI ([BES0019](#)), REA ([BES0020](#)), Energy UK ([BES0024](#)), Statkraft UK Ltd ([BES0026](#)), Energy Institute ([BES0028](#)), RWE ([BES0029](#)), EDF Energy ([BES0033](#)), ENGIE ([BES0040](#)), National Grid ([BES0043](#)), Scottish Government ([BES0057](#)), and supplementary written evidence from Chatham House ([BES0053](#)).

109 Written evidence from EEF and UK Steel ([BES0027](#))

110 Written evidence from Energy UK ([BES0024](#))

111 Written evidence from Energy UK ([BES0024](#))

112 Written evidence from SSE ([BES0012](#)), EEF and UK Steel ([BES0027](#)), Energy Institute ([BES0028](#)) and EDF Energy ([BES0033](#))

113 [QQ 54–57](#)

114 Written evidence from SSE ([BES0012](#)); see also written evidence from Energy UK ([BES0024](#)).

retain full membership of the Internal Energy Market”.<sup>115</sup> Centrica pointed out that “the IEM is subject to the European Court of Justice ... Until we have further clarity around the acceptability of the Government’s proposed dispute resolution body to Europe ... it is not possible to know whether the UK will remain an IEM participant on current terms.”<sup>116</sup>

66. RWE concluded: “The question as to whether the UK will be allowed to remain part of the IEM is really a political one.”<sup>117</sup>

### *Conclusions: Internal Energy Market*

67. **There is strong support across the energy industry for the UK to continue to participate in the Internal Energy Market (IEM) post-Brexit. We urge the Government to seek this outcome.**
68. **However, the Government’s negotiating position—in particular its intention to leave the Single Market and its rejection of any enduring role for the Court of Justice of the European Union (CJEU)—places significant political and institutional constraints on the UK’s ability to remain in the IEM.**
69. **It appears that the Government’s intention is to replicate current energy arrangements post-Brexit, but given the challenges outlined above we call on the Government to clarify its post-Brexit energy policy in the event that the UK no longer participates in the IEM.**
70. **In the course of negotiations, the Government must clarify the extent to which the UK will be required to continue to comply with EU energy, environment and competition legislation in order to continue trading energy with Member States.**

### **Interconnectors**

#### *Current levels of interconnection and the benefit case*

71. As the Energy Institute reminded us, “While the UK may be leaving the EU in political terms, the pipes and wires that connect us remain and we will continue to be joined in physical terms.”<sup>118</sup> Ian Graves, Director of European Business Development at National Grid, explained that “currently, we share 4 gigawatts of electricity interconnection with the EU”.<sup>119</sup> Green Alliance noted that these interconnectors “supply roughly 7 per cent of the UK’s electricity”.<sup>120</sup> They added: “Another 14 GW of capacity is either under pre-construction or at various planning stages, expected to become operational between 2019 and 2022.”
72. The UK relies still more heavily upon interconnectors in respect of gas. National Grid informed us that, in 2016, the UK “imported 46% of its gas via pipelines from the EU and Norway”.<sup>121</sup> The Oxford Institute of Energy

115 Written evidence from RenewableUK ([BES0030](#)); see also written evidence from REA ([BES0020](#)), RWE ([BES0029](#)), Centrica ([BES0031](#)), ENGIE ([BES0040](#)), Oil & Gas UK ([BES0047](#)), [Q 3](#) (Georgina Wright).

116 Written evidence from Centrica ([BES0031](#)); also written evidence from REA ([BES0020](#)), Chatham House and University of Exeter ([BES0044](#)), [Q 3](#) (Malcolm Keay).

117 Written evidence from RWE ([BES0029](#))

118 Written evidence from Energy Institute ([BES0028](#))

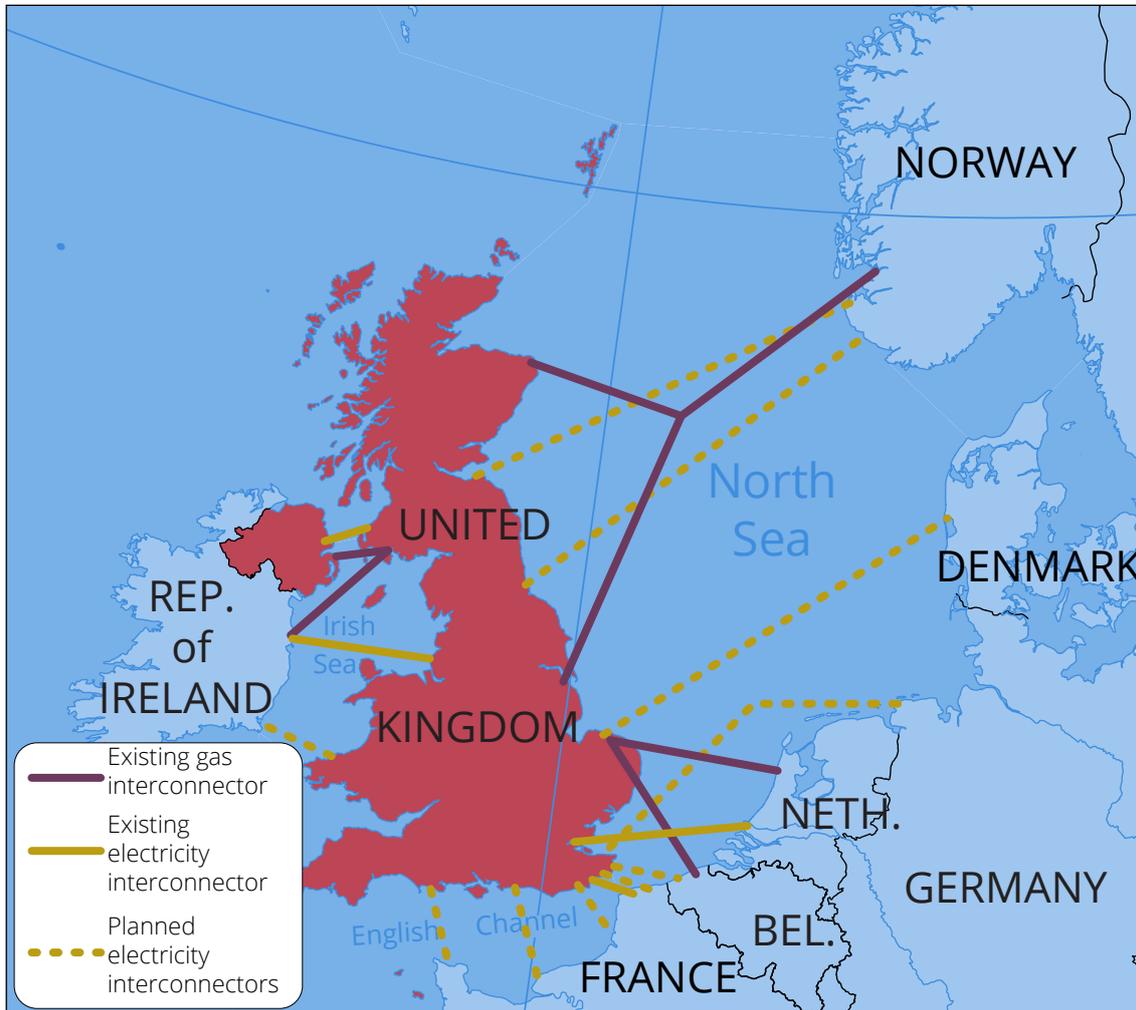
119 [Q 12](#)

120 Written evidence from Green Alliance ([BES0010](#))

121 Written evidence from National Grid ([BES0043](#))

Studies explained that the UK was linked to the EU by three pipelines—to Ireland, Belgium and the Netherlands.<sup>122</sup> The UK’s existing and planned interconnectors, for both electricity and gas, are illustrated in Figure 1.

**Figure 1: Map of UK gas and electricity interconnectors**<sup>123</sup>



73. Witnesses noted many benefits of interconnection with the EU. Welsh Government Cabinet Secretary Lesley Griffiths AM said that “interconnection between member states remains critical to ensure a secure and stable energy system”.<sup>124</sup> Green Alliance cited a National Grid estimate that the levels of electricity interconnection planned by 2022 “could meet 35 per cent of the UK’s peak electricity demand, making it an indispensable asset base for providing energy security”.<sup>125</sup>
74. The UK-EU interconnectors provide energy security benefits for the EU as well as the UK. The Institution of Chemical Engineers *et al* told us that interconnectors “are of mutual benefit to the UK and the other countries,

122 Written evidence from Oxford Institute for Energy Studies ([BES0001](#))

123 In this map, “planned” interconnectors include those approved by Ofgem as of 11 January 2018. Ofgem, ‘Electricity interconnectors’: <https://www.ofgem.gov.uk/electricity/transmission-networks/electricity-interconnectors> [accessed 11 January 2018]

124 Written evidence from Welsh Government ([BES0056](#)); also written evidence from ADBA ([BES0004](#)), Energy UK ([BES0024](#)) and Energy Institute ([BES0028](#)).

125 Written evidence from Green Alliance ([BES0010](#))

providing resilience through increased flexibility and diversity of supply”.<sup>126</sup> Furthermore, BEIS explained that “electricity from the UK plays a crucial role in helping maintain security of supply in other European countries”.<sup>127</sup>

75. Another benefit of interconnection, as EEF and UK Steel noted, is that “the UK’s interconnectors allow us to access lower cost supplies”.<sup>128</sup> Ofgem agreed: “Interconnectors provide a route for spare capacity in neighbouring countries to deliver power for GB consumers. This can provide lower overall cost.”<sup>129</sup> National Grid estimated that “each 1 GW of new electricity interconnector capacity could reduce Britain’s wholesale power prices up to 1–2%”.<sup>130</sup>
76. In relation to electricity, interconnection also facilitates the expansion of renewable generation, an explicit target in the Government’s Clean Growth Strategy.<sup>131</sup> Joseph Dutton, Policy Adviser at E3G, pointed out that “it allows us to develop more electricity production from renewable resources. Interconnectors allow you to balance your system with other countries”.<sup>132</sup> Green Alliance agreed that “variable renewable energy will need a much larger dispatch area”,<sup>133</sup> and argued: “Electricity interconnectors between the UK and the EU will play a significant role in the coming years, in efficiently managing large renewable energy generation.” According to the Aldersgate Group, “for every additional 1 GW of interconnection ... the costs of meeting the UK’s emission reduction target would be reduced by £115 million per year”.<sup>134</sup>

#### *Brexit challenges to interconnection*

77. The Aldersgate Group highlighted that “the regulations that oversee trading through ... interconnectors are set through the IEM framework”.<sup>135</sup> The Anaerobic Digestion and Bioresources Association (ADBA) suggested that “UK negotiations over energy may destabilise interconnection projects which hinge on shared regulation”.<sup>136</sup> Energy UK therefore argued that “it will be important to ensure convergence of market rules is maintained to optimise the use of interconnectors”.<sup>137</sup>
78. Witnesses also argued that Brexit had introduced commercial uncertainties, which could impede interconnector developments. Ofgem stated: “The majority of projects are joint ventures between multiple companies [and] all require the cooperation of multiple governments, regulators and grid companies to be developed. Uncertainty on the future market arrangements could impact the development of this infrastructure.”<sup>138</sup> Centrica told us:

“Current legal arrangement are predicated on (for example) the definition of interconnector points between EU member states and

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126 Written evidence from Institution of Chemical Engineers *et al* ([BES0023](#))

127 Written evidence from BEIS ([BES0049](#))

128 Written evidence from EEF and UK Steel ([BES0027](#))

129 Written evidence from Ofgem ([BES0025](#))

130 Written evidence from National Grid ([BES0043](#))

131 HM Government, *The Clean Growth Strategy: Leading the way to a low carbon future* (October 2017): [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/651916/BEIS\\_The\\_Clean\\_Growth\\_online\\_12.10.17.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/651916/BEIS_The_Clean_Growth_online_12.10.17.pdf) [accessed 16 January 2018]

132 [Q 4](#)

133 Written evidence from Green Alliance ([BES0010](#))

134 Written evidence from Aldersgate Group ([BES0011](#))

135 Written evidence from Aldersgate Group ([BES0011](#)); see also written evidence from Green Alliance ([BES0010](#)).

136 Written evidence from ADBA ([BES0004](#))

137 Written evidence from Energy UK ([BES0024](#)); see also written evidence from IUK ([BES0007](#)).

138 Written evidence from Ofgem ([BES0025](#))

rely on continued UK access to various shared commercial ‘platforms’ established at the EU level. In the gas sector, for example, this includes a common capacity booking platform known as PRISMA. We need to ensure that in the event the UK becomes a third country (outside of the IEM) that existing definitions used in these contracts remain fit for purpose. Any legal uncertainty could drive inefficiency and potentially disrupt trading activity/supply.”<sup>139</sup>

### *Conclusions: interconnectors*

79. **The existing UK-EU interconnectors benefit all parties, by improving energy security, reducing cost, and facilitating decarbonisation.**
80. **Regulatory convergence on either side of the interconnectors helps to ensure they operate efficiently. The Government should seek to maintain this convergence and the UK’s enduring access to common trading platforms such as PRISMA.**
81. **We urge the Government to clarify as soon as possible what regulatory regime will apply to UK-EU interconnectors post-Brexit, in order to support the further development of the infrastructure, thus helping to maintain energy security and enabling the UK to meet its decarbonisation and international climate targets.**

### *Trade tariffs*

82. RWE claimed that “if UK is outside or partially excluded from IEM, we could see the re-introduction of explicit import and export transmission tariffs on power”.<sup>140</sup> EEF and UK Steel added that “should tariffs be imposed post-Brexit, this would result in a lower benefit to UK consumers, impacting the cost of achieving an equivalent level of security of supply”.<sup>141</sup>
83. The British Ceramic Confederation, on the other hand, believed that gas and electricity were “at lower risk of tariffs than many goods and services. The EU does not currently charge import duties on electricity and although it does have a tariff on imported gas (0.7%) it has chosen not to apply this in practice.”<sup>142</sup> The Energy Intensive Users Group concurred: “Neither commodity is at risk of exposure to tariffs of the sort that might affect some manufactured goods in the absence of a comprehensive UK-EU trade agreement.”<sup>143</sup>
84. Although tariffs on energy itself may be unlikely, the Energy Institute noted that its members “expressed concerns about tariffs being levied on critical goods and services for the energy sector, including those needed in the nuclear supply chain or power generation equipment”.<sup>144</sup> They added: “Such new tariffs are likely to create barriers for energy-related foreign direct investment and could lead to increased cost and delays in the construction of energy infrastructure, such as new power generation plants.”

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139 Written evidence from Centrica ([BES0031](#))

140 Written evidence from RWE ([BES0029](#))

141 Written evidence from EEF and UK Steel ([BES0027](#))

142 Written evidence from BCC ([BES0008](#))

143 Written evidence from EIUG ([BES0014](#)); see also written evidence from RWE ([BES0029](#)).

144 Written evidence from Energy Institute ([BES0028](#))

*Conclusion: trade tariffs*

85. **It is unlikely that tariffs will be applied to UK-EU trade in gas and electricity post-Brexit, even in the event of a 'no deal' scenario. However, the energy industry could be affected by tariffs on products used in the construction and maintenance of the energy system.**

## CHAPTER 6: INFLUENCE AND COOPERATION

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### UK-EU policy divergence

86. According to BEIS, “The UK has been a leading advocate for the development of the single market in energy and has heavily influenced the EU-wide rules, which draw on UK practice.”<sup>145</sup> Georgina Wright, Research Assistant and Co-ordinator, Europe, at Chatham House, agreed: “The UK was a key driver behind the creation of the internal energy market.”<sup>146</sup>
87. This will change following Brexit. The Institution of Chemical Engineers *et al* were concerned that the UK would “no longer have input into the EU policy- and decision-making process”,<sup>147</sup> while Joseph Dutton, Policy Adviser at E3G, suggested that “if you lose an influencing force such as the UK, which is one of the more pro-market actors within the European Union ... there could be a real rebalancing of power towards more state-centric and more interventionist policies”.<sup>148</sup> The Durham Energy Institute agreed, and added that “this will not favour the countries outside of the single market”.<sup>149</sup>
88. The Energy Intensive Users Group, on the other hand, said it was “hard to see why this liberalisation process should go into reverse after Brexit, even in the absence of UK support for it within the EU”,<sup>150</sup> and the Minister, Richard Harrington MP, saw “no evidence of de-liberalisation”.<sup>151</sup>
89. More broadly, several witnesses noted that, post-Brexit, “There are risks of a divergence in policy direction between the EU and domestic energy policy”.<sup>152</sup> The Renewable Energy Association (REA) indicated that such divergence could affect the UK’s ability to trade,<sup>153</sup> while Oil & Gas UK explained that divergence on issues such as technical specifications for gas “could impair connectivity”.<sup>154</sup>

### Maintaining influence

90. Oil & Gas UK argued that “the Government should prioritise ensuring that the UK can continue to formally influence policy, so that the industry is not at undue risk from changes to regulation”.<sup>155</sup> Paul Wheelhouse MSP, Scottish Government Minister for Business, Innovation and Energy, and Michael Russell MSP, Scottish Government Minister for UK Negotiations on Scotland’s Place in Europe, described “retaining influence over the content of EU energy and environmental policies” as one of their key areas of concern.<sup>156</sup>

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145 Written evidence from BEIS ([BES0049](#))

146 [Q 7](#); see also [Q 18](#) (Phil Sheppard), written evidence from Oxford Institute for Energy Studies ([BES0001](#)), Ofgem ([BES0025](#)), Statkraft UK Ltd ([BES0026](#)), Energy Institute ([BES0028](#)), EFET ([BES0035](#)).

147 Written evidence from Institution of Chemical Engineers *et al* ([BES0023](#))

148 [Q 9](#)

149 Written evidence from Durham Energy Institute ([BES0013](#))

150 Written evidence from EIUG ([BES0014](#))

151 [Q 54](#)

152 Written evidence from Which? ([BES0016](#)); see also written evidence from REA ([BES0020](#)), Statkraft UK Ltd ([BES0026](#)), National Grid ([BES0043](#)), Chatham House and University of Exeter ([BES0044](#)), [Q 7](#) (Georgina Wright).

153 Written evidence from REA ([BES0020](#))

154 Written evidence from Oil & Gas UK ([BES0047](#))

155 Written evidence from Oil & Gas UK ([BES0047](#))

156 Written evidence from Scottish Government ([BES0057](#))

91. Witnesses had mixed views on the likelihood of the UK retaining influence. Dan Monzani, Head of Energy Security at BEIS, commented: “I would expect us to be influential—partly because we have been for 20 years—by weight of our thought leadership and our leadership in the early liberalisation of our markets.”<sup>157</sup> SSE concurred: “The EU has benefited from the UK’s participation in these organisations and arguments should be clearly presented by the UK to allow this to continue.”<sup>158</sup>
92. Conversely, Malcolm Keay, Senior Research Fellow at the Oxford Institute for Energy Studies, was “a bit less optimistic” about UK influence: “As we will have removed ourselves ... everyone will be rather reluctant to listen to what we have to say, I am afraid.”<sup>159</sup> Ms Wright told us that there was “evidence to suggest that the UK has already gone from being a key political actor in this field to a technical consultant”.<sup>160</sup>

### *EU energy bodies*

93. SSE told us that “an acceptable level of influence would be the UK maintaining full membership of ENTSO-E, ENTSO-G with Ofgem maintaining a strong presence within the Agency for the Cooperation of Energy Regulators (ACER)”.<sup>161</sup> The CBI and Energy UK agreed.<sup>162</sup> The three bodies are described in Box 3.

### **Box 3: ACER, ENTSO-E and ENTSO-G**

ACER is the Agency for the Cooperation of European Regulators. It coordinates regional initiatives and monitors the functioning of ENTSO-E and ENTSO-G (see below). Its members are the energy regulators of each EU Member State, while non-EU countries can participate only in accordance with individual agreements concluded with the EU. Its missions and tasks are defined in the Regulation establishing an Agency for the Cooperation of Energy Regulators (EC 713/2009).<sup>163</sup>

ENTSO-E is the European Network of Transmission System Operators for Electricity. Its roles include drafting electricity network codes, contributing to their implementation and coordinating electricity Transmission System Operators (TSOs). It represents TSOs from 36 European countries. Its tasks are set out in the Regulation on conditions for access to the network for cross-border exchanges in electricity (EC 714/2009).<sup>164</sup>

157 [Q 64](#)

158 Written evidence from SSE ([BES0012](#))

159 [Q 8](#)

160 [Q 9](#)

161 Written evidence from SSE ([BES0012](#))

162 Written evidence from CBI ([BES0019](#)), Institution of Chemical Engineers *et al* ([BES0023](#)), and Energy UK ([BES0024](#))

163 Council Regulation (EC) No 713/2009 of 13 July 2009 establishing an Agency for the Cooperation of Energy Regulators, ([OJL 211/1](#), 14 August 2009)

164 Council Regulation (EC) No 714/2009 of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003 ([OJL 211/15](#), 14 August 2009)

ENTSO-G is the European Network of Transmission System Operators for Gas. Its roles include developing gas network codes, producing a network development plan, and publishing bi-annual gas supply outlooks. Its members include TSOs from 26 EU countries,<sup>165</sup> plus five observers from ‘EU affiliate countries’.<sup>166</sup> Its tasks are defined in the European Gas Regulation (EC 715/2009).<sup>167</sup>

Source: Agency for the Cooperation of Energy Regulators (ACER), ‘Mission & Objectives’: [https://www.acer.europa.eu/en/The\\_agency/Mission\\_and\\_Objectives/Pages/default.aspx](https://www.acer.europa.eu/en/The_agency/Mission_and_Objectives/Pages/default.aspx) [accessed 29 November 2017]; European network of transmission system operators for electricity (ENTSO-G), ‘Who is ENTSO-E?’: <https://www.entsoe.eu/about-entso-e/Pages/default.aspx> [accessed 29 November 2017]; ENTSOG, ‘Mission’: <https://www.entsoe.eu/mission> [accessed 29 November 2017]; ENTSOG, ‘Articles of Association of the International Non-Profit Association (AISBL)’, (Amendment - Approved by General Assembly on 22/10/14): [https://www.entsoe.eu/public/uploads/files/publications/Balancing/2010/LGT0207\\_1410207\\_Amendments%20to%20ENTSOG's%20AoA\\_EN\\_GA221014\\_clean.pdf](https://www.entsoe.eu/public/uploads/files/publications/Balancing/2010/LGT0207_1410207_Amendments%20to%20ENTSOG's%20AoA_EN_GA221014_clean.pdf) [accessed 13 December 2017]

94. The CBI saw enduring membership of these bodies as a way to “ensure that the UK maintains reasonable influence over the system, rules and regulations, and does not become a ‘rule-taker’”.<sup>168</sup> Phil Sheppard, Director of UK Systems Operation at National Grid, agreed: “Maintaining our influence on the network codes that implement a lot of the details at a fine level and making sure that we have operation and trading that is as frictionless as possible would be very helpful.”<sup>169</sup> According to Lawrence Slade, Chief Executive of Energy UK, “We need to make sure that we are still in the room having those discussions. If we had not been in the room when [past] discussions took place, the trading of energy might be a rather more expensive issue for us today.”<sup>170</sup> Similarly, RenewableUK told us: “Engagement with these bodies enables the most efficient use of the interconnectors, and decreases regulatory costs for those active across markets.”<sup>171</sup>
95. There are various options for such engagement. Mr Monzani told us: “When it comes to the exact mechanisms for how that influence is exercised, we should look for the best routes ... those may be membership, associate membership or observer status.”<sup>172</sup> Centrica set out some of the UK’s options:

“Currently ENTSO-E does have some non-EU members (such as Norway and Switzerland), but ENTSO-G does not. We believe the UK (National Grid) should seek to secure observer status at both ... In respect of ACER we understand that observer status may be dependent on adoption of IEM legislation. The UK Government should therefore have this requirement in mind when considering what model of IEM participation it will seek going forward, and how it will adopt updates and changes to the IEM *acquis*.”<sup>173</sup>

165 Malta and Cyprus are currently not members of ENTSO-G as they do not have gas systems.

166 ENTSO-G’s Articles of Association allow for observer TSOs from third party countries—candidates for EU accession, members of the Energy Community or EFTA: [https://www.entsoe.eu/public/uploads/files/publications/Balancing/2010/LGT0207\\_1410207\\_Amendments%20to%20ENTSOG's%20AoA\\_EN\\_GA221014\\_clean.pdf](https://www.entsoe.eu/public/uploads/files/publications/Balancing/2010/LGT0207_1410207_Amendments%20to%20ENTSOG's%20AoA_EN_GA221014_clean.pdf) [accessed 8 December 2017]. These countries currently include the Former Yugoslav Republic of Macedonia, Norway, Switzerland, Ukraine and Moldova: <https://www.entsoe.eu/members> [accessed 8 December 2017]

167 Council Regulation (EC) No 715/2009 of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005 (OJ L 211/36, 14 August 2009)

168 Written evidence from CBI (BES0019)

169 Q 18

170 Q 14

171 Written evidence from RenewableUK (BES0030)

172 Q 64

173 Written evidence from Centrica (BES0031)

Regarding ACER, Ofgem set out its own position: “Ofgem could seek formal Observer status as a third country although this would depend on the extent to which the UK agreed to apply the *acquis* of EU energy legislation. Informal observer status at working level may be possible via a Memorandum of Understanding between Ofgem and ACER.”<sup>174</sup>

96. His Excellency Jean-Christophe Füg, Head of International Energy Affairs at the Swiss Federal Office of Energy, cautioned that there were limits to the level of engagement possible for non-EU Member States. Despite being a member of ENTSO-E, Switzerland had been “excluded” from a working group on a subject with significant implications for Switzerland’s energy system;<sup>175</sup> and he characterised Switzerland’s interaction with ACER as “extremely limited”.<sup>176</sup>

### *Non-EU bodies*

97. Witnesses identified a number of non-EU organisations as means by which the UK might influence EU energy policy post-Brexit. Ofgem noted that it would “likely be able to continue to participate” in initiatives such as the North Sea Countries Offshore Grid Initiative.<sup>177</sup> As the National Grid, Mr Sheppard informed us:

“National Grid as a system operator is a shareholder in a company called Coreso. That is a collaboration of seven transmission system operators in the western part of Europe; it is a regional co-ordination council ... Part of our objective is to stay a member, and both influence and get operational day-to-day information.”<sup>178</sup>

98. Ambassador Füg again offered a note of caution: “We are observing one trend by which some institutions that were previously not under the aegis of the EU are likely, according to current drafts, to become institutionalised: that is, they may move from being independent institutions to being under the remit of the EU and EU legislation.”<sup>179</sup> Mr Sheppard acknowledged that this was indeed the case with Coreso.<sup>180</sup>

99. Mr Dutton emphasised the role of NGOs:

“The UK will have a really important role in the [business NGOs], of which there are lots in Brussels. It is important that the UK remains as active as possible in those ... If there was a formal shut-out from the decision-making process, that is a way the UK would still be able to exert some influence.”<sup>181</sup>

Centrica agreed: “We believe that the UK energy industry should also aim to leverage membership of key European trade bodies such as Eurelectric, Eurogas and EFET in order to express views regarding future rule changes to the IEM”.<sup>182</sup> Mr Slade told us: “You have a lot of influence on what goes on sitting round the board and committee tables in those groups. They

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174 Written evidence from Ofgem ([BES0025](#))

175 [Q 49](#)

176 [Q 52](#)

177 Written evidence from Ofgem ([BES0025](#))

178 [Q 18](#)

179 [Q 44](#)

180 [Q 18](#)

181 [Q 8](#)

182 Written evidence from Centrica ([BES0031](#))

are, in the main, open to EU and non-EU members. There are options for Government but also for industry as to how we maintain our influence.”<sup>183</sup>

*Conclusions: maintaining influence*

100. **If the UK continues to participate in the IEM it will be obliged to comply with the relevant EU legislation. In this event it will be particularly important for the UK to maintain influence over EU energy policy post-Brexit, to maximise the efficiency of the UK-EU energy relationship and ensure energy trading works to the benefit of UK consumers.**
101. **There is strong support across the energy industry to maintain the UK’s membership of ENTSO-E, ENTSO-G and ACER, but full membership of ENTSO-G and ACER post-Brexit will not be possible unless the UK adopts the energy *acquis*. Furthermore, we caution that continued membership is no guarantee that the UK’s influence will be maintained at its current level.**
102. **There will be a role for businesses to influence EU energy policy post-Brexit through European NGOs and trade associations, and we urge the Department for Business, Energy and Industrial Strategy to encourage and facilitate businesses to make those connections.**
103. **Notwithstanding such measures, the UK’s influence on EU energy policy is likely to be severely constrained post-Brexit. The Government should conduct and publish a frank assessment of its potential degree of influence, taking particular note of the difficulties faced by other non-EU countries such as Switzerland and Norway.**

**Research and collaboration**

104. The Energy Institute stated:
 

“UK energy security is best assured through ongoing collaborative action with EU members, including participation in joint EU research and demonstration projects, collaboration on tackling climate change and development of renewable technology, interconnection infrastructure and grid standards.”<sup>184</sup>
105. The Durham Energy Institute explained that EU membership “acts to reduce barriers and risk for scientists, engineers and entrepreneurs whilst also acting to drive ideas through to full commercial deployment”.<sup>185</sup> By way of example, they noted that smart meters’ advanced functionality was “based on running demand response programmes. This is an area in which the UK largely relies on the EU to stimulate the appliance industry through common EU Standards.”
106. Witnesses also noted the value of such energy research collaboration to the EU. According to EDF Energy, “The UK and the EU benefit equally from shared access to facilities, material, people and data which are essential for developing cutting edge technology and innovation. The UK has a strong

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183 [Q 18](#)

184 Written evidence from Energy Institute ([BES0028](#))

185 Written evidence from Durham Energy Institute ([BES0013](#))

science base and track record of valued EU and international collaboration and contribution.”<sup>186</sup>

107. The Durham Energy Institute therefore concluded: “It is essential that mechanisms are put in place that allow UK research institutions and industry to continue to engage in collaborative pan-European research programmes and projects.”<sup>187</sup> The CBI agreed that there should be “a framework for ensuring further research, development and collaboration with our European neighbours after the UK has left the European Union”.<sup>188</sup>
108. In the field of research collaboration, according to Mr Dutton, “The big issue is obviously Horizon 2020 and what happens with that.”<sup>189</sup> Horizon 2020 is described in Box 4.

#### Box 4: Horizon 2020

Horizon 2020 is the financial instrument implementing the Innovation Union, an initiative aimed at securing Europe’s global competitiveness. It couples research and innovation to drive economic growth and create jobs. It will distribute nearly €80 billion between 2014 and 2020.

Within Horizon 2020, energy has been allocated €5.2 billion of the overall budget, with 85% reserved for renewables, energy efficiency, smart grids and storage.

Source: European Commission, ‘Horizon 2020: The EU Framework Programme for Research and Innovation’: <https://ec.europa.eu/programmes/horizon2020/> [accessed 29 November 2017]; ENERU, ‘Horizon 2020: Secure, Clean and efficient Energy’, Irina Gerashchenko, Lapland University of Applied Sciences, p 2: <http://eneru.eu/wp-content/uploads/2015/05/Horizon-2020-Secure-Clean-and-Efficient-Energy.pdf> [accessed 29 November 2017]

109. Witnesses provided specific examples of Horizon 2020-funded projects that the UK is involved in, including RealValue, an energy storage project powering 1,250 homes in the UK, Ireland, Germany and Latvia,<sup>190</sup> and “field trials of innovative new technologies such as residential Gas Absorption Heat Pumps and fuel cell microCHP technologies which stand to have an important role to play in enabling the UK to transition to lower carbon heating”.<sup>191</sup>
110. As BEIS told us, the UK is a major beneficiary of Horizon 2020 funding: “From the most recent results, UK organisations were allocated €63m (12%) from the available 2016 budget of €536m; were involved in 47% of the 106 projects supported; and are collaborating with 32 countries as a result.”<sup>192</sup> The Chancellor has guaranteed that any EU funding agreed prior to the point at which the UK leaves the EU, up until 2020, will be matched from central UK funds. This includes funding to universities participating in Horizon 2020.<sup>193</sup>

186 Written evidence from EDF Energy ([BES0033](#)); also written evidence from Energy UK ([BES0024](#)).

187 Written evidence from Durham Energy Institute ([BES0013](#))

188 Written evidence from CBI ([BES0019](#)); see also written evidence from Energy UK ([BES0024](#)).

189 [Q 10](#)

190 Written evidence from SSE ([BES0012](#))

191 Written evidence from Energy UK ([BES0024](#))

192 Written evidence from BEIS ([BES0049](#))

193 HM Treasury, Department for Exiting the European Union and The Rt Hon Philip Hammond MP, News story: ‘Further certainty on EU funding for hundreds of British projects’ (3 October 2016): <https://www.gov.uk/government/news/further-certainty-on-eu-funding-for-hundreds-of-british-projects> [accessed 8 December 2017]

111. The REA argued that “post-Brexit actions should be implemented to further facilitate not only funding for these projects but to maintain these relationships”.<sup>194</sup> According to the Institution of Chemical Engineers *et al*, “Some EU programmes may require the exchange of academics between institutions. Restrictions on the free movement of people as well as goods and services may make this more difficult in the future.”<sup>195</sup>
112. The Minister told us: “We want the framework for future collaboration that we have now.”<sup>196</sup> This confirms the approach set out in the Government’s White Paper, *The United Kingdom’s exit from and new partnership with the European Union*, which states: “As we exit the EU, we would welcome agreement to continue to collaborate with our European partners on major science, research and technology initiatives.”<sup>197</sup>

*Conclusions: research and collaboration*

113. **The EU provides not only energy research and development funding, but also collaboration opportunities that are of value to both the UK and the EU. We therefore support the ambition of both Government and industry to continue to collaborate with the EU on research initiatives post-Brexit.**
114. **We emphasise that such collaboration must involve preserving both programme participation—for example by continuing to contribute to Horizon 2020 and its successors—and rules around movement of people that allow research to continue.**

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194 Written evidence from REA ([BES0020](#))

195 Written evidence from Institution of Chemical Engineers *et al* ([BES0023](#))

196 [Q 60](#)

197 HM Government, *The United Kingdom’s exit from and new partnership with the European Union*, Cm 9417 (2017) p 59: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/589191/The\\_United\\_Kingdoms\\_exit\\_from\\_and\\_partnership\\_with\\_the\\_EU\\_Web.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/589191/The_United_Kingdoms_exit_from_and_partnership_with_the_EU_Web.pdf) [accessed 29 November 2017]

## CHAPTER 7: INVESTMENT

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### Scale and sources of energy investment

115. According to RenewableUK, “The UK needs to secure over £180bn of investment in our electricity system to 2020.”<sup>198</sup> The EU is a major source of energy investment, as Georgina Wright, Research Assistant and Co-ordinator, Europe, at Chatham House, told us: “The UK receives around €2.5 billion in energy loans and grants from the EU” each year.<sup>199</sup> Energy UK explained:
- “The EU has several routes to funding available for the energy sector offering financing opportunities worth billions of pounds, such as the European Energy Programme for Recovery, Connecting Europe Facility, Horizon 2020, Cohesion Fund or the European Investment Bank and the European Fund for Strategic Investment.”<sup>200</sup>
116. According to Centrica, “In so far as these projects help lower the costs of new generation investment and drive the uptake of energy efficiency, they have had an indirect impact on security of supply in the UK.”<sup>201</sup> Such funding is of particular importance to the devolved nations. As Welsh Government Cabinet Secretary Lesley Griffiths AM told us, “EU funding has been, and remains, central to Welsh Government’s pursuit of low carbon energy generation, carbon reduction and economic development goals”,<sup>202</sup> while Scottish Ministers Paul Wheelhouse MSP and Michael Russell MSP noted that “Scotland has benefited extensively from the European programmes for energy innovation and low carbon infrastructure funding”.<sup>203</sup>
117. Lawrence Slade, Chief Executive of Energy UK, told us: “If we are outside the EU, access to those funds will undoubtedly be reduced, if not totally withdrawn, depending on any future relationship.”<sup>204</sup> On the other hand, Malcolm Keay, Senior Research Fellow at the Oxford Institute for Energy Studies, did not believe that the sums involved were particularly significant: “These are useful sums of money, but, frankly, they are not critical. They would not prevent good projects going ahead.”<sup>205</sup> Robin McCormick, General Manager at the System Operator for Northern Ireland (SONI), echoed this view: “The vast majority of infrastructure in Northern Ireland is funded by consumers in Northern Ireland through the normal tariff process ... [European funding] is a minority element of the investment picture.”<sup>206</sup>
118. Conversely, Energy UK warned that “unless it is possible to find some form of continuation of access, then either the sector will be exposed to greater infrastructure investment costs or the UK Government will need to find mechanisms to replace those funding streams”.<sup>207</sup> According to the REA, “Although there are other finance streams which may be explored to fund

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198 Written evidence from RenewableUK ([BES0030](#))

199 [Q 10](#); see also written evidence from Energy Institute ([BES0028](#)) and supplementary written evidence from Chatham House ([BES0053](#)).

200 Written evidence from Energy UK ([BES0024](#))

201 Written evidence from Centrica ([BES0031](#))

202 Written evidence from Welsh Government ([BES0056](#))

203 Written evidence from Scottish Government ([BES0057](#))

204 [Q 19](#)

205 [Q 10](#)

206 [Q 31](#)

207 Written evidence from Energy UK ([BES0024](#))

energy infrastructure and research in the UK, including tax increases and the World Bank programmes, they are unlikely to reach the same level of funding as those from the EU.”<sup>208</sup>

119. Witnesses raised the significance of two EU funding streams in particular: the European Investment Bank and the Connecting Europe Facility (described in Boxes 5 and 6 respectively).

### *European Investment Bank*

#### **Box 5: European Investment Bank**

The European Investment Bank (EIB) is the world’s largest multilateral borrower and lender, providing finance and expertise for sustainable investment projects that contribute to EU policy objectives. More than 90% of its loans go to Member States, with the remainder of its funding going to over 150 non-EU states. Its annual lending in 2016 was over €76 billion.

Source: *European Investment Bank, ‘Some dates and figures’*: [http://www.eib.org/about/key\\_figures/index.htm](http://www.eib.org/about/key_figures/index.htm) [accessed 29 November 2017]

120. The British Ceramic Confederation claimed that “the most important individual source of finance for UK energy infrastructure is the European Investment Bank (EIB)”.<sup>209</sup> According to Centrica, “Since 2000, the EIB has provided loans of more than €37bn for UK energy infrastructure.”<sup>210</sup> The Aldersgate Group explained: “The EIB’s contribution has been significant because it can offer lower cost of capital, it has the track record of investment that ensures it has the expertise to evaluate projects and the reputation to ‘crowd-in’ private co-investors and lastly because it has large sums of money available.”<sup>211</sup> Kirsty Hamilton, Associate Fellow at Chatham House, noted the EIB’s utility for financing “very large deals, such as offshore wind”,<sup>212</sup> while E.ON UK commented: “As a non-commercial lender, the EIB can issue loans at lower interest rates than commercial lenders, which has proven valuable for financing projects utilising new technologies”.<sup>213</sup>
121. Welsh Cabinet Secretary Lesley Griffiths AM told us: “We strongly advocate the UK should continue to have a major role in the European Investment Bank”,<sup>214</sup> and Energy UK recommended that the Government “examine the potential to remain an associate member” of the EIB.<sup>215</sup> BEIS, on the other hand, stated only that “The long-term relationship between the UK and the European Investment Bank will need to be resolved in negotiations with the EU.”<sup>216</sup>
122. A number of witnesses referenced reports that “the EIB has effectively imposed a moratorium on new long term loans to the UK following Brexit”.<sup>217</sup> However, Ian Graves, Director of European Business Development at

208 Written evidence from REA ([BES0020](#))

209 Written evidence from BCC ([BES0008](#)); see also [Q 10](#) (Georgina Wright).

210 Written evidence from Centrica ([BES0031](#))

211 Written evidence from Aldersgate Group ([BES0011](#)); see also written evidence from Kirsty Hamilton ([BES0041](#)), E.ON UK plc ([BES0046](#)), and [Q 10](#) (Georgina Wright).

212 Written evidence from Kirsty Hamilton ([BES0041](#))

213 Written evidence from E.ON UK plc ([BES0046](#))

214 Written evidence from Welsh Government ([BES0056](#))

215 Written evidence from Energy UK ([BES0024](#))

216 Supplementary written evidence from BEIS ([BES0003](#))

217 Written evidence from Centrica ([BES0031](#)); see also written evidence from Aldersgate Group ([BES0011](#)) and REA ([BES0020](#)).

National Grid, told us that staff at the Treasury “very much described the European Investment Bank as part of their toolkit ... they have not seen that tool removed from their toolbox”.<sup>218</sup> In a debate in the House of Lords on 31 October 2017, Lord Bates, Minister of State in the Department for International Development, told the House:

“Following the triggering of Article 50, the EIB took the view that it wanted to undertake an additional level of due diligence to make sure that the UK would stand by its obligations after exiting the European Union. We believe we have confirmed that position by producing our position paper on privileges and immunities. We were delighted to see that the EIB, at its September meeting, had started to approve loans again for after that period.”<sup>219</sup>

### *Connecting Europe Facility and Projects of Common Interest*

#### **Box 6: Connecting Europe Facility and Projects of Common Interest**

The Connecting Europe Facility (CEF) is an EU funding instrument designed to promote growth, jobs and competitiveness through targeted infrastructure investment at European level. It supports the development of high performing, sustainable and efficiently interconnected trans-European networks in the fields of transport, energy and digital services. Through the CEF, a total budget of €5.35 billion is available for energy projects from 2014–20.

Projects of Common Interest (PCIs) are key infrastructure projects, especially cross-border projects, that link the energy systems of EU countries. They are intended to help the EU achieve its energy policy and climate objectives. The European Commission draws up a new list of PCIs every two years, and once selected they have access to funding from the CEF.

*Source: European Commission Innovation and Networks Executive Agency, ‘Connecting Europe Facility’: <https://ec.europa.eu/inea/en/connecting-europe-facility> [accessed 30 November 2017]; European Commission, ‘Energy: Projects of common interest’: <https://ec.europa.eu/energy/en/topics/infrastructure/projects-common-interest> [accessed 30 November 2017]*

123. The Oxford Institute of Energy Studies noted that the European Commission had identified 195 energy infrastructure PCIs, which were “seen as essential projects for completing the European internal energy market”.<sup>220</sup> According to New Nuclear Watch Europe:

“PCIs benefit from accelerated planning and permit granting, a single national authority for obtaining permits, improved regulatory conditions, lower administrative costs due to streamlined environmental assessment processes, increased public participation via consultations, and increased visibility to investors.”<sup>221</sup>

Alongside these non-financial benefits, National Grid informed us that PCI funding was “useful for private projects at a stage when they haven’t achieved final investment decisions”,<sup>222</sup> while Mr Graves described it as “a vital part of our development of a project.”<sup>223</sup>

218 [Q 19](#)

219 HL Deb, 31 October 2017, [col 1279](#)

220 Written evidence from Oxford Institute for Energy Studies ([BES0001](#))

221 Written evidence from NNWE ([BES0018](#))

222 Written evidence from National Grid ([BES0043](#))

223 [Q 19](#)

124. The REA highlighted that, through the PCI scheme, “The UK has received over €40 million for interconnector projects linking the UK to Norway and France, strengthening UK energy security”.<sup>224</sup> SSE noted that it had particular potential to benefit energy projects in the North Sea and a pumped storage hydro scheme in Scotland,<sup>225</sup> while Dr Owen Wilson, Chief Executive of Electricity Association of Ireland, underlined that “there are six current PCI projects affecting Northern Ireland of which two are in receipt or potentially in receipt of Connecting Europe Facility funding”.<sup>226</sup>
125. Brexit does not necessarily mean that the UK will no longer be able to participate in PCIs. As Silke Goldberg, Partner at Herbert Smith Freehills LLP, explained:
- “While, technically, projects of common interest apply to connections between two Member States ... to the extent that a projected interconnector has a positive impact on the European electricity or gas market, as the case may be, the status of PCI may be retained ... the interconnector from Israel to Cyprus into Greece—Israel clearly is not a member of the European Union—has received project of common interest status and, as such, it is eligible for the relevant funding.”<sup>227</sup>
126. This opens up the possibility that interconnectors involving the UK and Ireland might still be regarded as PCIs post-Brexit. Dr Wilson warned, however, that an interconnector between Ireland and France “would be more likely perhaps ... [to] receive EU funds than a GB/Republic of Ireland development.”<sup>228</sup>
127. The Minister informed us only that “the commitment made between companies and the Commission in respect of the CEF ... [will be] honoured in the post-exit period, under the government guarantee”.<sup>229</sup>

*Conclusion: scale and sources of energy investment*

128. **EU investment, particularly from the European Investment Bank and the Connecting Europe Facility, has been helpful in constructing and maintaining a secure energy system in the UK, in part through facilitating interconnection with other EU Member States. The UK’s ability to draw on those investment sources after it has left the EU is open to question. The Government should seek a settlement with the EU which allows it to continue to participate in transnational energy projects; it should also consider the non-financial benefits of the Projects of Common Interest scheme and how these could be replicated domestically if necessary.**

*Investor certainty*

129. Phil Sheppard, Director of UK Systems Operation at National Grid, pointed out that “the IEM provides a stable and clear framework for investment” in the energy system.<sup>230</sup> The Durham Energy Institute was therefore concerned that “a long drawn-out Brexit process with little clarity on the direction of

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224 Written evidence from REA ([BES0020](#))

225 Written evidence from SSE ([BES0012](#))

226 [Q 31](#)

227 [Q 31](#)

228 [Q 31](#)

229 [Q 59](#)

230 [Q 14](#); see also written evidence from NNWE ([BES0018](#)), and EEF and UK Steel ([BES0027](#)).

energy policy will have a significant impact on investments from the private sector”.<sup>231</sup> According to the REA, “such uncertainty could lead to a decrease in investment in energy projects and infrastructure due to the potential for increases in costs for skills, available workforce and other resources”.<sup>232</sup>

130. Statkraft set out the potential impact of uncertainty on energy security: “Instability and uncertainty around the future regulatory framework, and potential trading barriers, could increase the cost of generation and infrastructure projects and undermine their business case. This has the potential to negatively impact the UK’s energy security.”<sup>233</sup> E.ON UK agreed: “The largest Brexit related risk to energy security is the further erosion of investor confidence.”<sup>234</sup>
131. Witnesses differed on whether this loss of investor confidence was already having an impact. Ms Hamilton believed that it had “not necessarily translated through into less overall investment activity”.<sup>235</sup> Similarly, Chatham House told us in September 2017 that it was “too early to evaluate whether there has been an impact on UK project finance”.<sup>236</sup>
132. Energy UK, in contrast, told us: “Some parties have indicated that a risk premium on investment has appeared already due to the uncertainty on the direction of the Brexit negotiations.”<sup>237</sup> This was endorsed by Statkraft.<sup>238</sup> Dr Wilson stated: “I would confirm that the lack of certainty and clarity in relation to key aspects of Brexit is today impacting on investment decisions by operators in Northern Ireland.”<sup>239</sup> Scottish Ministers Paul Wheelhouse MSP and Michael Russell MSP told us: “We believe we are now seeing the early impacts of EU Exit on forward plans for infrastructure.”<sup>240</sup>
133. In response to these threats, the CBI told us that “clear signals and frameworks are needed to encourage sufficient investment in the UK’s energy infrastructure as the UK leaves the European Union”.<sup>241</sup> SSE agreed: “The UK Government can take action now to improve certainty and investor confidence in the UK energy system. This can be achieved by securing the outlook for policy mechanisms and tax arrangements that underpin energy investments.”<sup>242</sup> Policies on which witnesses requested clarity included the Clean Growth Strategy,<sup>243</sup> the Carbon Price Floor, the Capacity Market and

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231 Written evidence from Durham Energy Institute ([BES0013](#))

232 Written evidence from REA ([BES0020](#)), see also written evidence from ADBA ([BES0004](#)), Aldersgate Group ([BES0011](#)), Institution of Chemical Engineers *et al* ([BES0023](#)), Energy UK ([BES0024](#)), Oil & Gas UK ([BES0047](#)) and Scottish Government ([BES0057](#)), [Q 12](#) (Lawrence Slade).

233 Written evidence from Statkraft UK Ltd ([BES0026](#))

234 Written evidence from E.ON UK plc ([BES0046](#))

235 Written evidence from Kirsty Hamilton ([BES0041](#))

236 Supplementary written evidence from Chatham House ([BES0053](#))

237 Written evidence from Energy UK ([BES0024](#))

238 Written evidence from Statkraft UK Ltd ([BES0026](#))

239 [Q 27](#)

240 Written evidence from Scottish Government ([BES0057](#))

241 Written evidence from CBI ([BES0019](#))

242 Written evidence from SSE ([BES0012](#))

243 We note that this has since been published: HM Government, *The Clean Growth Strategy: Leading the way to a low carbon future* (October 2017):[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/651916/BEIS\\_The\\_Clean\\_Growth\\_online\\_12.10.17.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/651916/BEIS_The_Clean_Growth_online_12.10.17.pdf) [accessed 29 November 2017]

Contracts for Difference.<sup>244</sup> Mr Slade told us: “If you give the industry those clear commitments, it can go out and get funding.”<sup>245</sup>

*Conclusion: investor certainty*

134. **In the absence of an overarching and enduring EU framework, the energy industry needs to have as much certainty as possible regarding the future of UK energy policy, in order to support long-term investments in the energy system. Such investment supports energy security while keeping the cost to consumers as low as possible. The publication of the Clean Growth Strategy was a welcome step; the Government should also provide clarity regarding the future of the Carbon Price Floor, the Capacity Market and Contracts for Difference.**

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244 Written evidence from Aldersgate Group ([BES0011](#)), SSE ([BES0012](#)), Energy UK ([BES0024](#)), EDF Energy ([BES0033](#)) and E.ON UK plc ([BES0046](#))

245 [Q 20](#)

## CHAPTER 8: THE ISLAND OF IRELAND

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### Ireland's energy relationship with Great Britain

135. The island of Ireland is dependent on the flow of electricity and particularly of gas through the British market for its energy security. As the Aldersgate Group noted, “The island of Ireland’s only physical connections for gas and electricity to mainland Europe, are via the UK.”<sup>246</sup> The result, as Energy UK told us, is that “approximately 88% of the island of Ireland’s energy needs are imported and approximately 40% of the gas used on the island of Ireland is imported from GB”.<sup>247</sup> Thus, as the CBI told us, interconnectors between Great Britain to the island of Ireland play “an important role in security and affordability for both the Republic of Ireland and Northern Ireland”.<sup>248</sup>
136. SONI focused on electricity interconnection, describing it as “a key enabler for Ireland and indeed Northern Ireland (currently) to meet its renewable energy and climate change commitments”.<sup>249</sup> Andrew McCormick, Permanent Secretary of the Northern Irish Department for the Economy, made the further point that gas imports from the UK were vital to support electricity generation within Northern Ireland: “Security of electricity supply in Northern Ireland depends to a large extent on the supply of natural gas from Moffat in Scotland which provides 100% of our gas requirements.”<sup>250</sup> He added that “gas is the dominant fuel in the all-island SEM”, and “post UK exit of the EU, Northern Ireland will continue to source 100% of its gas from Great Britain”.<sup>251</sup>

### Integrated Single Electricity Market

137. SONI reminded us that the Single Electricity Market (SEM) had been an important achievement of cross-border cooperation since the Belfast/Good Friday Agreement:

“The SEM was launched post-Belfast Agreement in the spirit of cross border cooperation; it was well received in both political spheres and by industry. The development of the wholesale market was underpinned by legislation and was achieved through collaboration between two governments, two departments, two regulators and two system operators; and is an exemplary outcome of the peace-process.”<sup>252</sup>

Centrica agreed: “Energy has been an important example of the ‘peace dividend’ in Ireland.”<sup>253</sup>

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246 Written evidence from Aldersgate Group ([BES0011](#))

247 Written evidence from Energy UK ([BES0024](#))

248 Written evidence from CBI ([BES0019](#))

249 Written evidence from SONI ([BES0036](#))

250 Written evidence from Department for the Economy, Northern Ireland Executive ([BES0059](#))

251 Written evidence from Department for the Economy, Northern Ireland Executive ([BES0059](#))

252 Written evidence from SONI ([BES0036](#))

253 Written evidence from Centrica ([BES0031](#))

## Box 7: Integrated Single Electricity Market

Northern Ireland and the Republic of Ireland have shared a wholesale electricity market since 2007, known as the Single Electricity Market (SEM). It is a single market with a common set of rules, and is established by parallel legislation in Westminster and the Irish Parliament, underpinned by a Memorandum of Understanding between the two governments. A joint regulatory body, the SEM Committee, was established to oversee market arrangements.

The Integrated Single Electricity Market (I-SEM) is a new wholesale electricity market arrangement for Ireland and Northern Ireland. The new market arrangements are designed to integrate the all-island electricity market with European electricity markets, enabling the free flow of energy across borders, and to ensure the Market complies with the EU's Third Package. It is scheduled to go live in May 2018.

Witnesses referred to both the SEM and I-SEM, as reflected in their quoted evidence. We therefore use these terms interchangeably in this report.

*Source: Written evidence from Department for the Economy, Northern Ireland Executive (BES0059); Single Electricity Market Operator, 'I-SEM Project': <http://www.sem-o.com/iseem/Pages/Home.aspx> [accessed 29 November 2017]*

### *Value of the I-SEM*

138. RenewableUK urged that “continuation of the Single Electricity Market (SEM) on the island of Ireland should be a strong priority of the UK Government during the negotiations”.<sup>254</sup> Dr Owen Wilson, Chief Executive of Electricity Association of Ireland, noted that “the industry fully supports the continuation of the Single Electricity Market”,<sup>255</sup> while Dr Aoife Foley, Lecturer at Queen’s University Belfast, described it as “critical for the island of Ireland”.<sup>256</sup>
139. SSE argued that “larger, integrated electricity markets are beneficial for customers in Ireland and Northern Ireland, maintaining energy security and in efforts to meet decarbonisation targets”.<sup>257</sup> The Utility Regulator of Northern Ireland (UREGNI) told us: “If SEM cannot operate as a functional market post Brexit then this could have a range of repercussive social and economic aspects—including security of supply concerns and the potential for higher prices with consequential impacts on fuel poverty and manufacturing costs in NI.”<sup>258</sup> National Grid explained that a disruption to the I-SEM “could result in an expensive duplication of infrastructure and governance for both the EU and UK”.<sup>259</sup>
140. In its position paper on Northern Ireland and Ireland, the Government stated that “the new framework relevant to the energy market in Northern Ireland and Ireland should ... facilitate the continuation of a single electricity

254 Written evidence from RenewableUK (BES0030)

255 Q 22

256 Written evidence from Dr Aoife Foley (BES0042), see also written evidence from BCC (BES0008), Green Alliance (BES0010), Aldersgate Group (BES0011), SSE (BES0012), CBI (BES0019), REA (BES0020), Energy UK (BES0024), SONI (BES0036), National Grid (BES0043), UREGNI (BES0048), and Q 22 (Robin McCormick).

257 Written evidence from SSE (BES0012)

258 Written evidence from UREGNI (BES0048); see also written evidence from CBI (BES0019) and Centrica (BES0031).

259 Written evidence from National Grid (BES0043); see also written evidence from BCC (BES0008), REA (BES0020) and Q 29 (Dr Owen Wilson).

market covering Northern Ireland and Ireland”.<sup>260</sup> The CBI welcomed this commitment,<sup>261</sup> as did Robin McCormick, General Manager at SONI: “It is important and very helpful that the UK Government have indicated their support for the Single Electricity Market.”<sup>262</sup>

### *Challenges to maintaining the I-SEM*

141. The Aldersgate Group noted that “The SEM and its successor I-SEM are established by Irish and UK law, not EU law, and supported by NI and ROI policy. This means that even if there is a UK withdrawal from the EU IEM, legally this would not constitute a withdrawal from these arrangements.”<sup>263</sup> Silke Goldberg, Partner at Herbert Smith Freehills LLP, agreed: “From a purely legal perspective I do not see that the continuation of the SEM would be at risk.”<sup>264</sup>

142. However, Robin McCormick acknowledged that “we are in a political environment that is outside our sphere of influence”.<sup>265</sup> SONI highlighted the dependency of the I-SEM upon the wider EU Internal Energy Market: “If GB is not part of the IEM, onward trading [from Northern Ireland] with Europe will be extremely difficult (if not impossible).”<sup>266</sup> Ms Goldberg expanded the point, explaining that Northern Ireland, through the I-SEM:

“Is integrated with an EU country which will continue to be subject to EU regulations, such as network codes in particular that govern how electricity, and indeed gas, is allocated at interconnection points ... The way that is governed under the EU codes, should they no longer apply in the same way in the north of Ireland, will have an impact from an operational perspective.”<sup>267</sup>

Similarly, UREGNI argued that “If there is no access to the Internal Energy Market then it is possible that the [I-SEM] will not function”—for example without access to the EUPHEMIA algorithm.<sup>268</sup>

143. In the event that the UK does not continue to participate in the IEM post-Brexit, Chatham House and the University of Exeter noted that “Brexit negotiations will require a carefully managed energy solution that specifically addresses the SEM issue, to avoid the risk of reversing a decade of energy integration on the island”.<sup>269</sup> They proposed a number of options, including the designation of Northern Ireland as a special zone, “so that the all-Irish market continues to be subject to EU law”, or creating “a special status for SEM which, while compliant with EU law, would not subject Northern Ireland to the jurisdiction of the European Court of Justice”.<sup>270</sup>

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260 HM Government, *Northern Ireland and Ireland: Position Paper* (2017) p 23: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/638135/6.3703\\_DEXEU\\_Northern\\_Ireland\\_and\\_Ireland\\_INTERACTIVE.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/638135/6.3703_DEXEU_Northern_Ireland_and_Ireland_INTERACTIVE.pdf) [accessed 27 November 2017]

261 Written evidence from CBI ([BES0019](#))

262 [Q 26](#)

263 Written evidence from Aldersgate Group ([BES0011](#))

264 [Q 26](#)

265 [Q 31](#)

266 Written evidence from SONI ([BES0036](#))

267 [Q 22](#)

268 Written evidence from UREGNI ([BES0048](#)). EUPHEMIA is the day ahead pricing algorithm used throughout Europe. For more details, see: Single Electricity Market Operator, ‘EUPHEMIA’: <http://www.sem-o.com/MarketDevelopment/Pages/EUPHEMIA.aspx> [accessed 27 November 2017].

269 Written evidence from Chatham House and University of Exeter ([BES0044](#))

270 Written evidence from Chatham House and University of Exeter ([BES0044](#)); see also written evidence from Energy UK ([BES0024](#)) and RenewableUK ([BES0030](#)).

144. Joseph Dutton, Policy Adviser at E3G, argued that “a special case for Northern Ireland would require Westminster to devolve legal powers over energy, which are not currently devolved, to Northern Ireland”.<sup>271</sup> Ms Goldberg explained:

“The question would arise as to whether the Westminster Parliament would adopt the relevant legislation and transpose it with a view to it only being applicable in Northern Ireland, or indeed would there be further devolved powers in relation to the application of the relevant directives and regulations in the North of Ireland. That is very much a political question but from a legal/constitutional perspective that is the question that is of prime importance *vis-à-vis* the operational rules.”<sup>272</sup>

145. Ms Goldberg continued:

“There are a number of legal questions around, for example, the continued participation of some of the Northern Irish institutions in European institutions such as ENTSO-E ... *Prima facie*, as a non-EU Member State, a UK representative would not have immediate access to that and a special agreement would need to be made or found.”<sup>273</sup>

146. Robin McCormick identified a further challenge to maintaining the I-SEM, namely potential restrictions on the movement of workers: “I was in Belfast on Sunday, Dublin on Monday, London on Tuesday and I will be in Dublin on Wednesday. That is the way it works, so any restriction to that has some sort of impact, whether it is hassle, time or money, or all three.”<sup>274</sup>
147. The Minister, Richard Harrington MP, told us: “Whether we are in the EU or not in the EU, it is in the interests of both Northern Ireland and the Republic of Ireland to continue a shared electricity system ... We are held up in sorting this out only by the progress of the general talks in Europe.”<sup>275</sup> Dan Monzani, Head of Energy Security at BEIS, emphasised: “We see [the SEM] as of the first order of importance and are making a lot of efforts to maintain it.”<sup>276</sup>

*Conclusions: Integrated Single Electricity Market*

148. **The Integrated Single Electricity Market (I-SEM) will benefit both Northern Ireland and the Republic of Ireland in terms of energy security, decarbonisation and energy prices. We are encouraged that both the Government and the European Commission recognise its value and are seeking to preserve it.**
149. **The complexity of maintaining the I-SEM will increase significantly if the UK leaves the EU’s Internal Energy Market. The UK’s negotiators must therefore plan for this eventuality, for example by addressing how Northern Irish organisations would be able to interact with the IEM as a non-member, and by establishing a forum for dispute resolution.**
150. **If the outcome of the negotiations means that EU energy legislation will continue to apply in Northern Ireland, the Government will need**

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271 [Q 4](#); see also written evidence from SSE ([BES0012](#)).

272 [Q 27](#)

273 [Q 22](#)

274 [Q 25](#)

275 [Q 61](#)

276 [Q 61](#)

**to consider whether to devolve additional powers to the Northern Ireland Assembly.**

### **North-South interconnector**

151. As Robin McCormick told us, “The deadline for the I-SEM is May 2018 and for that to work properly across the island we need more infrastructure to link the northern transmission system with the southern transmission system.”<sup>277</sup> A new North-South interconnector has therefore been planned,<sup>278</sup> which, as the CBI noted, is required “to forestall an electricity supply deficit from December 2021”.<sup>279</sup> SONI described the interconnector as “by far the most economical solution to this potential shortfall”;<sup>280</sup> Centrica explained it was “estimated to bring cost and capacity savings of between €40–€60m each year from 2030”.<sup>281</sup> Speaking in September 2017, Robin McCormick noted: “We now have planning approval in the south and are waiting for planning approval in the north.”<sup>282</sup>
152. Energy UK explained that the interconnector had been “designated as a Project of Common Interest by the European Commission, because of its particular importance for the functioning of the Irish electricity system”.<sup>283</sup> Further to her explanation of PCI qualifying criteria (see paragraph 125), Ms Goldberg argued that, as the interconnector would directly benefit an EU Member State, “there are good arguments for PCI status and Connecting Europe Facility funding to be made available”.<sup>284</sup>

### *Conclusion: North-South interconnector*

153. **The construction of the North-South interconnector on the island of Ireland is vital for reducing consumer costs in both countries, and for maintaining energy security in Northern Ireland. The Government must satisfy itself that its construction is not at risk as a result of Brexit. If that cannot be established, the Government must underwrite its cost to provide investor certainty.**

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277 [Q 22](#)

278 Written evidence from Energy UK ([BES0024](#))

279 Written evidence from CBI ([BES0019](#))

280 Written evidence from SONI ([BES0036](#))

281 Written evidence from Centrica ([BES0031](#))

282 [Q 23](#)

283 Written evidence from Energy UK ([BES0024](#))

284 [Q 31](#)

## CHAPTER 9: EURATOM

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### Scope and role of Euratom

154. The nuclear power industry presents particular challenges in the context of Brexit. As EDF Energy told us: “Nuclear generation is a key component of the current and future energy mix in the UK. The UK’s eight nuclear power stations currently provide 20% of the UK’s electricity needs.”<sup>285</sup> Not only do nuclear power stations supply a significant amount of low-carbon electricity, but the continuity of that supply helps balance less predictable renewable sources, providing further assistance to the UK in meeting its decarbonisation objectives.
155. The UK’s use of nuclear energy is currently governed by the European Atomic Energy Community, also known as Euratom. Centrica explained that Euratom “provides for the transportation of nuclear fuel, waste and people amongst signatory member states”.<sup>286</sup> Angela Hepworth, Corporate Policy and Regulation Director at EDF, which is currently embarking on construction of the new Hinkley Point power station, underlined that “we very much rely on the provisions in the Euratom Treaty to enable us to operate our existing power stations and for the future construction and operation of Hinkley Point”.<sup>287</sup>

### Box 8: Euratom

The European Atomic Energy Community (Euratom) was established in 1957. The UK became a member in 1973. It was founded to contribute to the formation and development of Europe’s nuclear industries, to guarantee high safety standards and to prevent nuclear materials intended principally for civilian use from being diverted to military use. It has also signed a number of bilateral agreements with other countries on nuclear safety, safeguards and research.

Euratom is a distinct legal entity from the European Union, but the two bodies have a shared institutional framework. The Government accordingly decided, when introducing the European Union (Notification of Withdrawal) Bill in the House of Commons on 26 January 2017, that the Bill also would also provide for the UK to leave Euratom.

*Source: House of Lords Library, Leaving the European Union: Euratom, Research briefing, [LLN 2017/010](#), 23 February 2017*

156. The Nuclear Industry Association (NIA) told us that “the safety of the UK’s sites would not be affected by the UK government’s decision to leave Euratom—this is and always has been determined by UK legislation, regulation and regulatory policy and overseen by the Office for Nuclear Regulation”.<sup>288</sup> The Office for Nuclear Regulation (ONR) confirmed that their analysis “has not identified significant direct impact on nuclear safety as a result of UK withdrawal from Euratom”.<sup>289</sup> Thus there is no reason to believe that leaving Euratom will directly affect nuclear safety.

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285 Written evidence from EDF Energy ([BES0033](#)), see also written evidence from BCC ([BES0008](#)) and [Q 33](#) (Dr Jenifer Baxter).

286 Written evidence from Centrica ([BES0031](#))

287 [Q 33](#)

288 Written evidence from NIA ([BES0006](#))

289 Supplementary written evidence from ONR ([BES0055](#))

157. However, Euratom also underpins trade in nuclear materials, and Georgina Wright, Research Assistant and Co-ordinator, Europe, at Chatham House, identified a risk to the continuing operation of the UK's nuclear power stations: "If the UK were to leave the EU without an agreement, a new non-proliferation regime and new agreements with nuclear fuel suppliers, it would bring the UK's civil nuclear industry to a halt, because it would not be able to import fresh nuclear fuel."<sup>290</sup> According to Centrica, "Of all of the potential issues impacting UK security of supply, this would be the most material."<sup>291</sup> Ms Hepworth agreed: "We are going to need to negotiate a replacement agreement with Euratom covering things such as the ownership of nuclear material and our future trading relations with Europe in relation to nuclear materials."<sup>292</sup>
158. For the Government, Katrina McLeay, Head of Safeguards and Delivery in the Euratom Exit Team at BEIS, told us that "the key issues we have been looking at there are around the ownership of materials and equipment, and providing legal certainty about contracts that are in place. Those negotiations have been positive, broadly speaking."<sup>293</sup>

*Conclusion: scope and role of Euratom*

159. **The Euratom Treaty is currently vital to the functioning of nuclear energy generation in the UK. Failure to replace its provisions by the point of withdrawal could result in the UK being unable to import nuclear materials, and have severe consequences for the UK's energy security.**

**Safeguarding**

160. The Institute of Physics told us:

"[Article III of the international Treaty on the Non-Proliferation of Nuclear Weapons] requires signatories to ensure countries with which they trade comply with international safeguards ... Currently, the UK meets its safeguarding requirements through Euratom, as Euratom provides safeguarding inspections for more than 100 UK facilities (including non-power-producing nuclear facilities)."<sup>294</sup>

In 2014 here were "some 220 inspections, involving 1,000 person-days of Euratom effort".<sup>295</sup> The Institution of Chemical Engineers *et al* told us that "Equivalent arrangements will need to be made through the UK's Office of Nuclear Regulation [*sic*] (ONR) to report to the International Atomic Energy Authority (IAEA)".<sup>296</sup> According to Chatham House and the University of Exeter, "This is the most urgent task facing the UK in terms of nuclear policy."<sup>297</sup>

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290 [Q 2](#)

291 Written evidence from Centrica ([BES0031](#))

292 [Q 34](#)

293 [Q 62](#)

294 Written evidence from IOP ([BES0022](#))

295 Written evidence from IOP ([BES0022](#))

296 Written evidence from Institution of Chemical Engineers *et al* ([BES0023](#)), see also NIA ([BES0006](#)), Energy UK ([BES0024](#)), EDF Energy ([BES0033](#)) and [Q 34](#) (Angela Hepworth, Dr Mina Golshan).

297 Written evidence from Chatham House and University of Exeter ([BES0044](#))

161. The Institution of Mechanical Engineers highlighted the following key issues for establishing a UK Safeguards regime:

- Identifying and training personnel for inspection and accounting;
- Clarifying the status of previously installed monitoring equipment in plants such as Sellafield;
- Determining how the regime will be paid for;
- Gaining IAEA agreement that the regime meets the requirements of the Non-Proliferation Treaty.<sup>298</sup>

The Centre for Nuclear Engineering at Imperial College London also noted that “there is significant risk in the process of establishing and building a new bureaucracy to effectively manage this reporting and this risk is felt across industry”.<sup>299</sup>

162. The Government’s intention is to transfer safeguarding duties to the ONR through the Nuclear Safeguards Bill, introduced in the House of Commons in October 2017. BEIS explained that the Bill “will allow the UK to maintain international standards for nuclear safeguards, applied to civil nuclear material, in line with our commitments to the International Atomic Energy Agency (IAEA) and under international nuclear non-proliferation treaties”.<sup>300</sup> The Minister emphasised that “we are rushing this Bill through as quickly as we can ... precisely so that there is no drop whatsoever in the standards of safeguards”.<sup>301</sup> The joint report from the EU and UK Government on phase 1 of the Brexit negotiations also stated that the UK “is committed to a future regime that provides coverage and effectiveness equivalent to existing Euratom arrangements”.<sup>302</sup>

163. Taking on these additional responsibilities will require a significant expansion of the resources available to the ONR. Dr Mina Golshan, Deputy Chief Inspector at the ONR, told us: “We currently have 10 staff in our safeguards function ... We need another 12 to get to a level where we are able to provide the required reporting arrangements.”<sup>303</sup> The ONR underlined that “depending on their previous experience we estimate it will take between 12 and 24 months to fully train a new safeguards inspector”.<sup>304</sup> Dr Golshan concluded: “The biggest risk that I see [to establishing an IAEA-approved regime] is our ability to recruit.”<sup>305</sup>

164. The Institution of Mechanical Engineers commented that the ONR “is a UK regulator governed by the department of Work and Pensions. In order for the IAEA to consider them a suitable Safeguards Office they will need to demonstrate independence.”<sup>306</sup> The Minister told us: “the ONR is structured

298 Written evidence from Institution of Mechanical Engineers ([BES0045](#))

299 Written evidence from Centre for Nuclear Engineering at Imperial College London ([BES0005](#))

300 Written evidence from BEIS ([BES0049](#))

301 [Q 62](#)

302 European Commission, ‘Joint report from the negotiators of the European Union and the United Kingdom Government on progress during phase 1 of negotiations under Article 50 TEU on the United Kingdom’s orderly withdrawal from the European Union’, 8 December 2017 para 89: [https://ec.europa.eu/commission/sites/beta-political/files/joint\\_report.pdf](https://ec.europa.eu/commission/sites/beta-political/files/joint_report.pdf) [accessed 8 December 2017]

303 [Q 37](#)

304 Supplementary written evidence from ONR ([BES0055](#))

305 [Q 37](#)

306 Written evidence from Institution of Mechanical Engineers ([BES0045](#))

as an independent body—as many regulators are. It is not a wholly owned subsidiary of BEIS or any other department. It was set up specifically so that people would know that it was an independent regulator”.<sup>307</sup> Ms McLeay confirmed this: “As far as we are aware, the International Atomic Energy Agency is happy for the ONR to fulfil the role of the SSAC.”<sup>308</sup>

165. Ms McLeay emphasised that BEIS was “working very closely with the ONR to ensure that we meet our international obligations when we leave. We have made a commitment to reach Euratom standards.”<sup>309</sup> The Minister confirmed that the Government was seeking “to go for the full safeguarding regime”, and was confident “that we can get that done in the time necessary”. Dr Golshan, however, was less confident: “To seek to replicate Euratom standards arrangements by the end of March 2019 will be highly challenging and, while we would work towards that, we want a starting point that allows the UK to meet its obligations.”<sup>310</sup> Similarly, in its written evidence the ONR told us:

“Establishing a system that seeks to replicate all aspects of the current Euratom regime by March 2019 is unlikely to be achievable. A system that seeks to meet our international reporting obligations, and which can then be further developed over time is a more realistic starting point and is what we are aiming to achieve by March 2019.”<sup>311</sup>

### *Conclusions: safeguarding*

166. **In order to maintain energy security it will be crucial to establish a domestic safeguarding regime that satisfies International Atomic Energy Agency (IAEA) requirements by the time the UK leaves Euratom. We are encouraged that both the Government and the Office for Nuclear Regulation (ONR) recognise the urgency of this and have taken steps to do so.**
167. **Euratom’s safeguarding standards are higher than those required by the UK’s international obligations. It will be difficult for the Government to deliver on its commitment to maintain Euratom’s standards at the point of withdrawal. The first priority should therefore be to ensure compliance with the UK’s IAEA obligations.**
168. **It will be challenging for the ONR to recruit and train sufficient safeguarding inspectors by the time the UK withdraws from the Euratom Treaty. We urge the Government to provide any support possible and to consider what contingency measures may be required.**

### **Nuclear Cooperation Agreements**

169. The NIA explained that as part of Euratom, “the UK has access to a number of Nuclear Co-operation Agreements (NCAs) agreed on behalf of member states which has helped facilitate trade between the UK and a number of

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307 [Q 63](#). The DWP/ONR Framework document is available from: Office for Nuclear Regulation, ‘DWP/ONR Framework document’ (2016): <http://www.onr.org.uk/documents/2014/onr-dwp-framework.pdf> [accessed 9 January 2018]

308 [Q 63](#). A State System of Accounting for and Control of nuclear material (SSAC) is required in order to comply with the IAEA’s safeguards system.

309 [Q 62](#)

310 [Q 37](#)

311 Supplementary written evidence from ONR ([BES0055](#))

nuclear markets outside the EU”.<sup>312</sup> As Ms Hepworth noted, “If there is not a Nuclear Cooperation Agreement in place between the US and another country, it is illegal for somebody in the US to export nuclear material or even share nuclear information with that country.”<sup>313</sup>

170. Ms Hepworth noted that Euratom had nine NCAs at present: “Of those, the UK Government has identified four as top priority: the US, Canada, Japan and Australia.”<sup>314</sup> The NIA identified China, Kazakhstan and South Korea as other key nuclear markets,<sup>315</sup> while Centrica added South Africa, Ukraine and Uzbekistan.<sup>316</sup> Dr Jenifer Baxter, Head of Energy and Environment at the Institution of Mechanical Engineers, informed us that “the UK and Euratom do not require an NCA to actually trade with each other.”<sup>317</sup> She did, however, note that establishing an NCA with Euratom would provide “an opportunity to establish exactly how we are going to work with them in the future”.<sup>318</sup>

171. As the Institute of Physics pointed out, before concluding its own NCAs, the UK will have to make “new arrangements to comply with the non-proliferation treaty”.<sup>319</sup> Ms Hepworth agreed: “There is an interaction in the timescales for sorting out safeguards and being able to negotiate the Nuclear Cooperation Agreements.”<sup>320</sup> She continued:

“Each of those countries will have its own ratification process. For example, if we look at the United States ... the Nuclear Cooperation Agreement will have to be signed by the President. It will have to be laid before the House Committee on Foreign Affairs in the Senate and it will have to be laid before Congress. Each of those steps has a process and timescale associated with it.”<sup>321</sup>

### *Conclusions: Nuclear Cooperation Agreements*

172. **The UK will need to establish new Nuclear Cooperation Agreements (NCAs) in order to maintain its existing nuclear supply chains. The UK currently trades nuclear materials with many other countries: Government should prioritise developing new NCAs with those with which nuclear trade would otherwise be illegal, such as the US, Canada, Japan and Australia.**

173. **It is vital that the Government makes progress on developing new NCAs quickly. Given that these negotiations can only begin after the UK has satisfied the IAEA with regard to its safeguarding regime, it is essential for the Government to reach an agreement with the IAEA as soon as possible.**

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312 Written evidence from NIA ([BES0006](#))

313 [Q 34](#)

314 [Q 40](#)

315 Written evidence from NIA ([BES0006](#))

316 Written evidence from Centrica ([BES0031](#))

317 [Q 40](#)

318 [Q 40](#)

319 Written evidence from IOP ([BES0022](#))

320 [Q 40](#)

321 [Q 40](#)

### Nuclear common market

174. The NIA argued that the UK had benefited from “the common nuclear market created by the Euratom Treaty ... [which] allows for the movement of nuclear information, services, skills and goods”.<sup>322</sup> RWE agreed that “UK withdrawal from Euratom poses a severe risk to the free movement of goods and skills within the nuclear sector”.<sup>323</sup>
175. Illustrating this point, Chatham House and the University of Exeter noted: “Outside of Euratom, the UK would no longer be a member of the Euratom Supply Agency”,<sup>324</sup> without which, as the Institution of Mechanical Engineers explained, “the UK nuclear industry risks not being able to procure items from small PPE [personal protective equipment] kit to large complex parts in time and for reasonable cost”.<sup>325</sup> They added: “Manufacturing of parts for nuclear facilities is conducted across Europe, and new tariffs and procurement procedures could make this more costly.” Ms Hepworth gave the example of Hinkley Point: “Components for the fuel-handling system are due to come from the US and components for the nuclear steam supply system are due to come from Japan. We need the ability to move these components into the country in a timely way in order to be able to deliver the project.”<sup>326</sup> Dr Baxter agreed that: “having access to components that are manufactured in Europe is vital for the industry”.<sup>327</sup>

### *Conclusion: nuclear common market*

176. **The Government must ensure that its nuclear trade agreements allow the movement of nuclear material and equipment in a timely fashion and at reasonable cost.**

### Nuclear research and development

177. As the NIA told us, “Euratom also oversees a framework for international collaboration in nuclear R&D”.<sup>328</sup> Citing the 2017 Civil Nuclear R&D Landscape Survey, the Nuclear Innovation and Research Office (NIRO) informed us that “total funding for [civil] nuclear fusion and fission research [in 2015/16] was £217m, of which overseas funding contributed around £54m, or 25%. The majority of overseas funding originated from the EU (£47m).”<sup>329</sup> They continued:

“EU research funding enables investments in both UK expertise and facilities. It also gives the UK nuclear community access to data generated from EU research facilities that are not available in the UK ... The intangible benefits of the international collaboration include the nurturing and enhancement of the UK nuclear talent pipeline, the validation of UK research within the EU and International nuclear R&D community and UK influence on international R&D priorities and alignment with UK priorities.”<sup>330</sup>

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322 Written evidence from NIA ([BES0006](#))

323 Written evidence from RWE ([BES0029](#))

324 Written evidence from Chatham House and University of Exeter ([BES0044](#))

325 Written evidence from Institution of Mechanical Engineers ([BES0045](#))

326 [Q 41](#)

327 [Q 35](#)

328 Written evidence from NIA ([BES0006](#))

329 Written evidence from NIRO ([BES0009](#))

330 Written evidence from NIRO ([BES0009](#)); see also written evidence from EDF Energy ([BES0033](#)).

Chatham House and the University of Exeter believed, however, that “remaining part of Euratom’s research programme is possible, as demonstrated by Switzerland, which makes a financial contribution to take part in the EU and Euratom’s research programmes”.<sup>331</sup>

178. Witnesses identified a number of specific programmes of nuclear research to which they wished to retain access post-Brexit, including the 7th Framework Programme and Horizon 2020-Euratom programme (which pay approximately £6.7m per year to UK participants),<sup>332</sup> the Fusion 4 Energy programme (through which the UK supply chain has been awarded contracts worth €500m),<sup>333</sup> the Generation IV reactor programme,<sup>334</sup> and the EUROfusion consortium.<sup>335</sup> The Institute of Physics noted: “The UK does not have any of its own civil research reactors ... This makes UK access to European research reactors and the ability to access the results of the R&D that takes place there all the more important to nuclear fission research.”<sup>336</sup>
179. The Institute of Physics also claimed that “The UK is a world leader in nuclear fusion research and its continued involvement in EU projects is vital for this to continue”.<sup>337</sup> The key elements of this research, JET and ITER, are described in Box 9.

### *JET and ITER*

#### **Box 9: JET and ITER**

The Joint European Torus (JET), located at Culham, Oxfordshire, is Europe’s largest nuclear fusion device, enabling research into fusion power as an energy source. It is collectively used by more than 40 European laboratories. Its work is carried out within the framework of the EUROfusion Consortium, and it receives funding from the European Commission through the Euratom research and training programme.

JET’s successor will be ITER, the International Thermonuclear Experimental Reactor. It is currently under construction in France. Europe is funding nearly 46% of the construction costs, with the remaining costs being split between China, India, Japan, Korea, Russia and the US.

Source: JET, ‘Europe’s largest fusions device: Funded and used in partnership’: <https://www.euro-fusion.org/jet/> [accessed 29 November 2017]; ITER, ‘What is ITER?’: <https://www.iter.org/proj/inafewlines> [accessed 30 November 2017]

180. The Centre for Nuclear Engineering at Imperial College London was “especially concerned with the long-standing future of UK leadership with the Joint European Torus (JET) and the capitalisation on the cluster of expertise that has been built by our partners with the Culham Centre for Fusion Energy”.<sup>338</sup> According to the NIA, “The UK Atomic Energy Authority receives £50m from Euratom each year to operate [JET] ... and employs 500 skilled workers. The current contract runs until the end of 2018, but

331 Written evidence from Chatham House and University of Exeter (BES0044)

332 Written evidence from NIRO (BES0009)

333 Written evidence from NIA (BES0006)

334 Written evidence from Centre for Nuclear Engineering at Imperial College London (BES0005)

335 Supplementary written evidence from Institution of Mechanical Engineers (BES0051)

336 Written evidence from IOP (BES0022)

337 Written evidence from IOP (BES0022); see also Q 34 (Angela Hepworth).

338 Written evidence from Centre for Nuclear Engineering at Imperial College London (BES0005)

it was expected to be extended to 2020.”<sup>339</sup> The Institute of Physics noted: “The UK has committed to funding its share of JET until 2020–21 but the EU still needs to agree to contribute its share of the funding for the project to continue beyond 2018.”<sup>340</sup> Asked whether, in the absence of continuing EU funding, the Government would continue to fund JET, potentially beyond 2020, the Minister replied: “Yes. I think that it is fair to say that.”<sup>341</sup>

181. The next stage of the fusion roadmap is ITER. As the Institute of Physics noted: “For the UK to continue to have involvement in ITER and remain a leader in nuclear fusion, a new multilateral cooperation agreement must be negotiated.”<sup>342</sup> The Durham Energy Institute noted that membership of Euratom was not a pre-requisite for involvement with ITER, but argued that it would “take time to build nation state level institutes to continue British participation in the project and this will be to our disadvantage”.<sup>343</sup>

### *Conclusions: nuclear research and development*

182. **The UK has benefited substantially from EU nuclear research programmes, contributing to its status as a world leader in nuclear research and development. It would be to the benefit of both the UK and the EU to maintain those research connections post-Brexit.**
183. **We welcome the Government’s commitment to continuing to fund nuclear research in the UK, whether or not EU funding is maintained. We recommend that the Government looks to maintain the post-Brexit viability of the Joint European Torus (JET), and ensures that the UK is able to participate in the International Thermonuclear Experimental Reactor (ITER) despite its withdrawal from Euratom.**

### *Future arrangements*

#### *Enduring membership*

184. A number of witnesses argued that “the best outcome for the nuclear industry in the UK and EU would be if the UK could remain within the Euratom Treaty”,<sup>344</sup> while the CBI asserted that “the benefits of the UK’s membership of Euratom should be maintained, whether through continued membership or new arrangements”.<sup>345</sup>
185. His Excellency Jean-Christophe Füg, Head of International Energy Affairs at the Swiss Federal Office of Energy, noted that Switzerland was “an associate country for Euratom research and training, including ITER and fusion”.<sup>346</sup> On that basis, the Institution of Mechanical Engineers suggested that becoming an associate member of Euratom could help to secure the continuation of the JET programme.<sup>347</sup> Ms Hepworth, on the other hand, argued that while continued engagement on research and development would be “very beneficial”, it would “not address the key things we are

339 Written evidence from NIA ([BES0006](#)); see also written evidence from NIRO ([BES0009](#)), [Q 10](#) (Georgina Wright), and [Q 42](#) (Dr Jenifer Baxter).

340 Written evidence from IOP ([BES0022](#))

341 [Q 60](#)

342 Written evidence from IOP ([BES0022](#))

343 Written evidence from Durham Energy Institute ([BES0013](#))

344 Written evidence from Energy UK ([BES0024](#)), see also written evidence from RWE ([BES0029](#)), EDF Energy ([BES0033](#)).

345 Written evidence from CBI ([BES0019](#))

346 [Q 48](#)

347 Written evidence from Institution of Mechanical Engineers ([BES0045](#))

concerned about around our ability to move fuel, components, information and personnel”.<sup>348</sup>

186. The Institution of Mechanical Engineers told us that “there could be options to negotiate different associations for different purposes”.<sup>349</sup> Energy UK concurred, stating “the Government should examine wider association possibilities”.<sup>350</sup> It appeared from the Minister’s answer that the Government’s position is not yet settled: “It is not as if there is a pre-prepared associate membership option that we could elect to take. I cannot say directly that we would seek associate membership, because there is no definition of that.”<sup>351</sup>

#### *Contingency arrangements*

187. Given the challenges we have outlined, there is a strong case for putting in place contingency arrangements. However, as Dr Baxter pointed out, “There is not a shared Plan B from the Government at the moment about what will happen.”<sup>352</sup>
188. The Institution of Mechanical Engineers told us: “It is essential that the UK develops a transitional framework that provides the same provision as Euratom before the deadline to leave both the EU and Euratom.”<sup>353</sup> Ms Hepworth agreed: “If it appears to the UK Government that they cannot get all this done in time, absolutely they need to be thinking about whether there needs to be any kind of transitional arrangement, and we would look for clarity on that sooner rather than later.”<sup>354</sup>

#### *Conclusion: future arrangements*

189. **A form of associate membership of Euratom could be a means of maintaining nuclear research and development collaboration with the EU but, in the form currently held by Switzerland, it would not address the issues raised by the UK’s departure that are critical to energy security.**
190. **The risk posed to the UK’s energy security if the safeguarding measures currently provided by Euratom are not replaced in time means that there is a distinct need to avoid a cliff-edge in relation to Euratom. It is therefore crucial for the Government to ensure that contingency arrangements are in place and ready to be activated if required. The Government should engage with industry regarding such arrangements as early as possible, in order to reduce commercial uncertainty.**
191. **We also note that the United Kingdom’s membership of Euratom is legally distinct from its EU membership, and that in the Prime Minister’s Article 50 notification letter of 29 March 2017 a separate notification was made in respect of the United Kingdom’s withdrawal from Euratom. This suggests that separate transitional arrangements may also be possible, if they are needed in order to mitigate the**

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348 [Q 43](#)

349 Supplementary written evidence from Institution of Mechanical Engineers ([BES0051](#))

350 Written evidence from Energy UK ([BES0024](#))

351 [Q 62](#)

352 [Q 43](#)

353 Written evidence from Institution of Mechanical Engineers ([BES0045](#))

354 [Q 34](#); see also written evidence from Institution of Chemical Engineers *et al* ([BES0023](#)), Energy UK ([BES0024](#)), RWE ([BES0029](#)), and Centrica ([BES0031](#)).

**risk of a cliff-edge. We therefore call on the Government to review and report to Parliament on the possibility of a Euratom-specific transition period separate from the wider Brexit process.**

## CHAPTER 10: ENERGY RELATIONSHIP MODELS

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### Norway-EU energy relationship

192. Energy UK told us that “currently the only option for full participation in the IEM is the EEA/EFTA model, the ‘Norway model’.”<sup>355</sup> Norway is a non-EU country, but maintains the ability to trade energy in the IEM through membership of the European Free Trade Association (EFTA) and the European Economic Area (EEA). According to RWE, “Norway is part of the European power market, but not part of the EU gas market. It is integrated in the Scandinavian power market ‘Nordpool’ and it is applying EU electricity legislation. Its gas sector is treated as a non-EU gas source, so EU legislation does not apply.”<sup>356</sup> Statkraft stated: “Our experience in Norway typifies that it is possible for a non-EU country to be fully integrated into the EU energy market, enjoying all the benefits that this provides.”<sup>357</sup>
193. According to Energy UK, although most aspects of the Norway-EU energy relationship would be satisfactory, “the main issue is around the influence the UK would have”.<sup>358</sup> Centrica commented: “It has, at best, only ‘soft’ influence over the development of new market rules which it will be bound by.”<sup>359</sup> Joseph Dutton, Policy Adviser at E3G, told us:
- “The view within the energy industry is that being part of the EEA works as a political compromise domestically but is not good for Norway’s energy sector. Being on the outside and trying to negotiate in when you do not have a formal role means that, essentially, you have to start with what the EU wants. Your interests come second.”<sup>360</sup>
194. We note that, as the REA pointed out, “In terms of the UK itself, there seems little political appetite for [a Norway-style agreement] given the requirement to accept the free movement of people and the jurisdiction of the European Court of Justice.”<sup>361</sup>

### *Conclusion: Norway-EU energy relationship*

195. **We note that the ‘Norway model’ would bring benefits to the UK in terms of energy security, but that it is contingent upon membership of the EEA and EFTA, which the Government has ruled out.**

### Switzerland-EU energy relationship

196. An alternative to EEA membership, as the REA told us, is the ‘Swiss model’: “The UK could gain access to the IEM through multiple bilateral treaties with the EU as Switzerland has achieved”.<sup>362</sup> Centrica pointed out that “Switzerland sits physically at the centre of the EU energy system and trades electricity extensively with its neighbouring countries”.<sup>363</sup> According to the Aldersgate Group, “Switzerland shares 40 interconnectors with the EU”.<sup>364</sup>

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355 Written evidence from Energy UK ([BES0024](#))

356 Written evidence from RWE ([BES0029](#))

357 Written evidence from Statkraft UK Ltd ([BES0026](#))

358 Written evidence from Energy UK ([BES0024](#)); see also written evidence from Institution of Chemical Engineers *et al* ([BES0023](#)).

359 Written evidence from Centrica ([BES0031](#))

360 [Q 3](#)

361 Written evidence from REA ([BES0020](#))

362 Written evidence from REA ([BES0020](#))

363 Written evidence from Centrica ([BES0031](#))

364 Written evidence from Aldersgate Group ([BES0011](#))

197. Nonetheless, as BEIS noted: “The terms of a Swiss-EU electricity agreement remain subject to further negotiation, including those which would regulate cross-border electricity trading, secure market access and attain membership in key technical rule making bodies in the EU.”<sup>365</sup> His Excellency Jean-Christophe Füg, Head of International Energy Affairs at the Swiss Federal Office of Energy, provided the example of Article 1.4 of the Capacity Allocation and Congestion Management Regulation (CACM),<sup>366</sup> “which specifically targets Switzerland. It states that Switzerland is excluded from this cross-border trade—this new mechanism, which is called market coupling—as long as we do not adopt EU legislation on electricity and as long as we have no bilateral agreement with the EU”.<sup>367</sup> EEF and UK Steel pointed out that “the net result is higher costs for consumers both sides of the Swiss borders than if efficient cross-border market trading took place”.<sup>368</sup>
198. Ambassador Füg further explained that although the Swiss tried to amend the drafting of the CACM, “all that was simply unsuccessful. The EU wants to have an internal electricity market as one coherent thing, and either you are in it and abide by the rules or you are not in it.”<sup>369</sup> For an exception to be made, “you have to have a very strong case that you as a country bring something to the internal electricity market that is indispensable to the functioning of the energy market”.<sup>370</sup>
199. Citizens Advice told us that the EU and Switzerland have yet “to establish a common institutional framework”.<sup>371</sup> Ambassador Füg explained that such a framework would settle “the absolutely crucial issues of the dispute settlement, of the mechanism whereby future *acquis* will be taken over or applied to the market access agreement, and of oversight over those particular agreements”.<sup>372</sup> He noted that, while “there may be some instances where from an electricity viewpoint, the exclusion of Switzerland simply does not make sense ... The reality is that since electricity has been tied to the institutional agreement, there is no scope for movement.”<sup>373</sup>
200. Energy UK noted that political rather than commercial or energy-related factors had impeded EU-Swiss negotiations: “In particular, discussions were suspended for some time following the 2014 Swiss referendum relating to freedom of movement.”<sup>374</sup> The European Federation of Energy Traders (EFET) told us it had “made the electricity sector of Switzerland vulnerable to external influences and to the politicisation of decisions, which would more rationally be based on technical and economic considerations”.<sup>375</sup>
201. Malcolm Keay, Senior Research Fellow at the Oxford Institute for Energy Studies, commented that the extended negotiations between Switzerland and the EU showed that “it will not be that easy to do your own special

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365 Written evidence from BEIS ([BES0049](#))

366 Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management ([OJ L 197/24](#), 25 July 2015)

367 [Q 44](#)

368 Written evidence from EEF and UK Steel ([BES0027](#))

369 [Q 46](#)

370 [Q 45](#)

371 Written evidence from Citizens Advice ([BES0039](#))

372 [Q 47](#)

373 [Q 45](#)

374 Written evidence from Energy UK ([BES0024](#)); see also written evidence from EEF and UK Steel ([BES0027](#)), Centrica ([BES0031](#)) and [Q 5](#) (Georgina Wright).

375 Written evidence from EFET ([BES0035](#))

deal”.<sup>376</sup> Furthermore, the REA told us: “Switzerland’s negotiations with the EU have proved very time consuming and costly, and there appears little desire to repeat this process at the EU level.”<sup>377</sup>

*Conclusion: Switzerland-EU energy relationship*

202. **The Swiss experience shows that mutual benefits and a history within the system are no guarantee of EU energy market access. While the Government appears confident that a post-Brexit energy relationship with the EU will favour the UK, we are concerned that this confidence is based on a misplaced expectation of pragmatism and that broader political considerations may affect the degree to which the UK can engage with the IEM post-Brexit.**

*Applicability to the UK*

203. As Dan Monzani, Head of Energy Security at BEIS, pointed out, “The size, geographical location and natural resources that different countries have affect their relationships cross-border.”<sup>378</sup> The Minister, Richard Harrington MP, highlighted three features unique to the UK: “The first is bulk—our size relative to the Swiss and, therefore, our importance to the Single Market. The second is history—the fact that we helped to form it. Thirdly, there is the fact that we are already in it, unlike the Swiss, who are not.”<sup>379</sup>
204. EEF and UK Steel agreed, and further noted that the UK’s “role as a transit country for electricity and gas ... should all give it greater weight in negotiations with the EU on the future relationship”.<sup>380</sup>
205. Ambassador Füeg struck a note of caution:

“I am not aware of the UK having anything that I would call a unique selling point; that is, something that you would bring to the Internal Energy Market, both electricity and gas, which in the countervailing scenario of you not bringing it to the market would put the Internal Energy Market in some sort of jeopardy.”<sup>381</sup>

A study requested by the European Parliament’s Committee on Industry, Research and Energy concluded: “With or without the UK, the EU will be able to complete its market, to achieve its climate and energy targets with feasible readjustments, and to maintain supply security.”<sup>382</sup>

*Conclusion: applicability to the UK*

206. **In order to improve its negotiating position, we urge the Government to assess what irreplaceable services the UK can offer the EU energy system.**

376 [Q 2](#)

377 Written evidence from REA ([BES0020](#))

378 [Q 64](#)

379 [Q 64](#)

380 Written evidence from EEF and UK Steel ([BES0027](#))

381 [Q 52](#)

382 Gustav Fredriksson *et al*, Impact of Brexit on the EU Energy System, European Parliament, Study for the ITRE Committee (November 2017) p 12: [http://www.europarl.europa.eu/RegData/etudes/STUD/2017/614181/IPOL\\_STU\(2017\)614181\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2017/614181/IPOL_STU(2017)614181_EN.pdf) [accessed 4 December 2017]

## SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

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### EU energy policy

1. UK and EU energy policies have become closely aligned over time, with the UK often leading the way in terms of market liberalisation. This alignment facilitates the efficient trade of energy, with benefits for energy security, affordability and decarbonisation. (Paragraph 19)
2. Brexit presents opportunities to develop energy policies that support market conditions that are particular to the UK, after the initial transfer of legislation through the EU (Withdrawal) Bill. (Paragraph 20)

### Energy system fundamentals

3. Post-Brexit, the UK may be more vulnerable to supply shortages in the event of extreme weather or unplanned generation outages. While we note the Minister's confidence in future UK energy security, we urge the Government to set out the means by which it will work with the EU to anticipate and manage cross-continent supply shortages that will affect the UK. (Paragraph 29)
4. It is likely that the UK's withdrawal from the EU will lead to less efficient energy trade, which could in turn increase the price paid by consumers for energy security. We call on the Government to conduct and publish an assessment of what impact leaving the Internal Energy Market would have on the price paid by consumers for their energy, and to take steps to mitigate this impact, particularly for financially vulnerable consumers. (Paragraph 32)
5. A transition period, during which the key elements of the current UK-EU energy relationship are maintained, is needed to allow time for the industry to adjust its working practices, contracts and IT systems, and thus ensure secure energy supplies continue to be available to consumers. (Paragraph 35)

### Labour in the energy sector

6. The energy industry is reliant on workers from the EU, in particular to fill its engineering roles. These workers are necessary for the construction and maintenance of a secure energy system. While we encourage the Government to pursue opportunities to train more workers domestically, this will take time, and continued access to EU workers will be needed in the meantime. (Paragraph 47)
7. Dependence on EU workers is particularly acute in the nuclear energy sector. The evidence from EDF Energy is clear that without access to EU labour it will be difficult to complete construction of the new nuclear power facility at Hinkley Point. (Paragraph 48)
8. We call on the Government to assess the workforce needs of the energy industry and ensure they are reflected in the post-Brexit immigration policy. Neither a simple extension of the current points-based system to EU workers, nor an exclusive focus on 'high skilled' workers, would address the industry's concerns. (Paragraph 49)

### Energy trade

9. There is strong support across the energy industry for the UK to continue to participate in the Internal Energy Market (IEM) post-Brexit. We urge the Government to seek this outcome. (Paragraph 67)
10. However, the Government's negotiating position—in particular its intention to leave the Single Market and its rejection of any enduring role for the Court of Justice of the European Union (CJEU)—places significant political and institutional constraints on the UK's ability to remain in the IEM. (Paragraph 68)
11. It appears that the Government's intention is to replicate current energy arrangements post-Brexit, but given the challenges outlined above we call on the Government to clarify its post-Brexit energy policy in the event that the UK no longer participates in the IEM. (Paragraph 69)
12. In the course of negotiations, the Government must clarify the extent to which the UK will be required to continue to comply with EU energy, environment and competition legislation in order to continue trading energy with Member States. (Paragraph 70)
13. The existing UK-EU interconnectors benefit all parties, by improving energy security, reducing cost, and facilitating decarbonisation. (Paragraph 79)
14. Regulatory convergence on either side of the interconnectors helps to ensure they operate efficiently. The Government should seek to maintain this convergence and the UK's enduring access to common trading platforms such as PRISMA. (Paragraph 80)
15. We urge the Government to clarify as soon as possible what regulatory regime will apply to UK-EU interconnectors post-Brexit, in order to support the further development of the infrastructure, thus helping to maintain energy security and enabling the UK to meet its decarbonisation and international climate targets. (Paragraph 81)
16. It is unlikely that tariffs will be applied to UK-EU trade in gas and electricity post-Brexit, even in the event of a 'no deal' scenario. However, the energy industry could be affected by tariffs on products used in the construction and maintenance of the energy system. (Paragraph 85)

### Influence and cooperation

17. If the UK continues to participate in the IEM it will be obliged to comply with the relevant EU legislation. In this event it will be particularly important for the UK to maintain influence over EU energy policy post-Brexit, to maximise the efficiency of the UK-EU energy relationship and ensure energy trading works to the benefit of UK consumers. (Paragraph 100)
18. There is strong support across the energy industry to maintain the UK's membership of ENTSO-E, ENTSO-G and ACER, but full membership of ENTSO-G and ACER post-Brexit will not be possible unless the UK adopts the energy *acquis*. Furthermore, we caution that continued membership is no guarantee that the UK's influence will be maintained at its current level. (Paragraph 101)
19. There will be a role for businesses to influence EU energy policy post-Brexit through European NGOs and trade associations, and we urge the

Department for Business, Energy and Industrial Strategy to encourage and facilitate businesses to make those connections. (Paragraph 102)

20. Notwithstanding such measures, the UK's influence on EU energy policy is likely to be severely constrained post-Brexit. The Government should conduct and publish a frank assessment of its potential degree of influence, taking particular note of the difficulties faced by other non-EU countries such as Switzerland and Norway. (Paragraph 103)
21. The EU provides not only energy research and development funding, but also collaboration opportunities that are of value to both the UK and the EU. We therefore support the ambition of both Government and industry to continue to collaborate with the EU on research initiatives post-Brexit. (Paragraph 113)
22. We emphasise that such collaboration must involve preserving both programme participation—for example by continuing to contribute to Horizon 2020 and its successors—and rules around movement of people that allow research to continue. (Paragraph 114)

### **Investment**

23. EU investment, particularly from the European Investment Bank and the Connecting Europe Facility, has been helpful in constructing and maintaining a secure energy system in the UK, in part through facilitating interconnection with other EU Member States. The UK's ability to draw on those investment sources after it has left the EU is open to question. The Government should seek a settlement with the EU which allows it to continue to participate in transnational energy projects; it should also consider the non-financial benefits of the Projects of Common Interest scheme and how these could be replicated domestically if necessary. (Paragraph 128)
24. In the absence of an overarching and enduring EU framework, the energy industry needs to have as much certainty as possible regarding the future of UK energy policy, in order to support long-term investments in the energy system. Such investment supports energy security while keeping the cost to consumers as low as possible. The publication of the Clean Growth Strategy was a welcome step; the Government should also provide clarity regarding the future of the Carbon Price Floor, the Capacity Market and Contracts for Difference. (Paragraph 134)

### **The island of Ireland**

25. The Integrated Single Electricity Market (I-SEM) will benefit both Northern Ireland and the Republic of Ireland in terms of energy security, decarbonisation and energy prices. We are encouraged that both the Government and the European Commission recognise its value and are seeking to preserve it. (Paragraph 148)
26. The complexity of maintaining the I-SEM will increase significantly if the UK leaves the EU's Internal Energy Market. The UK's negotiators must therefore plan for this eventuality, for example by addressing how Northern Irish organisations would be able to interact with the IEM as a non-member, and by establishing a forum for dispute resolution. (Paragraph 149)
27. If the outcome of the negotiations means that EU energy legislation will continue to apply in Northern Ireland, the Government will need to consider

whether to devolve additional powers to the Northern Ireland Assembly. (Paragraph 150)

28. The construction of the North-South interconnector on the island of Ireland is vital for reducing consumer costs in both countries, and for maintaining energy security in Northern Ireland. The Government must satisfy itself that its construction is not at risk as a result of Brexit. If that cannot be established, the Government must underwrite its cost to provide investor certainty. (Paragraph 153)

### **Euratom**

29. The Euratom Treaty is currently vital to the functioning of nuclear energy generation in the UK. Failure to replace its provisions by the point of withdrawal could result in the UK being unable to import nuclear materials, and have severe consequences for the UK's energy security. (Paragraph 159)
30. In order to maintain energy security it will be crucial to establish a domestic safeguarding regime that satisfies International Atomic Energy Agency (IAEA) requirements by the time the UK leaves Euratom. We are encouraged that both the Government and the Office for Nuclear Regulation (ONR) recognise the urgency of this and have taken steps to do so. (Paragraph 166)
31. Euratom's safeguarding standards are higher than those required by the UK's international obligations. It will be difficult for the Government to deliver on its commitment to maintain Euratom's standards at the point of withdrawal. The first priority should therefore be to ensure compliance with the UK's IAEA obligations. (Paragraph 167)
32. It will be challenging for the ONR to recruit and train sufficient safeguarding inspectors by the time the UK withdraws from the Euratom Treaty. We urge the Government to provide any support possible and to consider what contingency measures may be required. (Paragraph 168)
33. The UK will need to establish new Nuclear Cooperation Agreements (NCAs) in order to maintain its existing nuclear supply chains. The UK currently trades nuclear materials with many other countries: Government should prioritise developing new NCAs with those with which nuclear trade would otherwise be illegal, such as the US, Canada, Japan and Australia. (Paragraph 172)
34. It is vital that the Government makes progress on developing new NCAs quickly. Given that these negotiations can only begin after the UK has satisfied the IAEA with regard to its safeguarding regime, it is essential for the Government to reach an agreement with the IAEA as soon as possible. (Paragraph 173)
35. The Government must ensure that its nuclear trade agreements allow the movement of nuclear material and equipment in a timely fashion and at reasonable cost. (Paragraph 176)
36. The UK has benefited substantially from EU nuclear research programmes, contributing to its status as a world leader in nuclear research and development. It would be to the benefit of both the UK and the EU to maintain those research connections post-Brexit. (Paragraph 182)

37. We welcome the Government's commitment to continuing to fund nuclear research in the UK, whether or not EU funding is maintained. We recommend that the Government looks to maintain the post-Brexit viability of the Joint European Torus (JET), and ensures that the UK is able to participate in the International Thermonuclear Experimental Reactor (ITER) despite its withdrawal from Euratom. (Paragraph 183)
38. A form of associate membership of Euratom could be a means of maintaining nuclear research and development collaboration with the EU but, in the form currently held by Switzerland, it would not address the issues raised by the UK's departure that are critical to energy security. (Paragraph 189)
39. The risk posed to the UK's energy security if the safeguarding measures currently provided by Euratom are not replaced in time means that there is a distinct need to avoid a cliff-edge in relation to Euratom. It is therefore crucial for the Government to ensure that contingency arrangements are in place and ready to be activated if required. The Government should engage with industry regarding such arrangements as early as possible, in order to reduce commercial uncertainty. (Paragraph 190)
40. We also note that the United Kingdom's membership of Euratom is legally distinct from its EU membership, and that in the Prime Minister's Article 50 notification letter of 29 March 2017 a separate notification was made in respect of the United Kingdom's withdrawal from Euratom. This suggests that separate transitional arrangements may also be possible, if they are needed in order to mitigate the risk of a cliff-edge. We therefore call on the Government to review and report to Parliament on the possibility of a Euratom-specific transition period separate from the wider Brexit process. (Paragraph 191)

### **Energy relationship models**

41. We note that the 'Norway model' would bring benefits to the UK in terms of energy security, but that it is contingent upon membership of the EEA and EFTA, which the Government has ruled out. (Paragraph 195)
42. The Swiss experience shows that mutual benefits and a history within the system are no guarantee of EU energy market access. While the Government appears confident that a post-Brexit energy relationship with the EU will favour the UK, we are concerned that this confidence is based on a misplaced expectation of pragmatism and that broader political considerations may affect the degree to which the UK can engage with the IEM post-Brexit. (Paragraph 202)
43. In order to improve its negotiating position, we urge the Government to assess what irreplaceable services the UK can offer the EU energy system. (Paragraph 206)

## APPENDIX 1: LIST OF MEMBERS AND DECLARATIONS OF INTEREST

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### Members

Lord Curry of Kirkharle  
 Viscount Hanworth  
 Lord Krebs  
 Duke of Montrose  
 Lord Rooker  
 Lord Selkirk of Douglas  
 Baroness Sheehan  
 The Earl of Stair  
 Lord Teverson (Chairman)  
 Viscount Ullswater  
 Baroness Wilcox  
 Lord Young of Norwood Green

### Declarations of interest

Lord Curry of Kirkharle  
*Trustee, Clinton Devon Estates*  
*Solar panel electricity generation*

Viscount Hanworth  
*No relevant interests to declare*

Lord Krebs  
*Former Member, Climate Change Committee (interest ceased 31 January 2017)*  
*Chair, Adaptation Sub-Committee, Committee on Climate Change (interest ceased 31 January 2017)*  
*Member, Advisory Board of the Energy and Climate Intelligence Unit (ECIU)*

Duke of Montrose  
*Landowner with small forestry interest*  
*Major shareholder in small hydroelectric generator*

Lord Rooker  
*Director, Ludlow Hydro Co-operative Ltd (a registered co-op with a function to operate community-owned hydro-energy on the River Teme)*

Lord Selkirk of Douglas  
*An interest in a small family company as a Director with a specific interest in one or two wind turbines*  
*Diversified investment portfolio in McInroy & Wood Income Fund, managed by third party*

Baroness Sheehan  
*No relevant interests to declare*

The Earl of Stair  
*Potential income from wind farm development*  
*Income from RHI payments for biomass production and heat production*

Lord Teverson  
*Trustee, Regen SW*  
*Trustee, Green Purposes Company*  
*Board Member, Marine Management Organisation*  
*Member, Aldersgate Group*

Viscount Ullswater

*Salaried Trustee of a landed estate in Cumbria, which receives income from wind turbines*

Baroness Wilcox

*President, National Consumer Federation*

Lord Young of Norwood Green

*An interest in hydraulic fracturing, but no paid involvement*

The following Members of the European Union Select Committee attended the meeting at which the report was approved:

Baroness Armstrong of Hill Top

Lord Boswell of Aynho (Chairman)

Baroness Brown of Cambridge

Lord Cromwell

Baroness Falkner of Margravine

Lord Jay of Ewelme

The Earl of Kinnoull

Lord Liddle

Baroness Neville-Rolfe

Lord Selkirk of Douglas

Lord Teverson

Baroness Verma

Lord Whitty

Baroness Wilcox

During consideration of the report the following Members declared an interest:

Baroness Brown of Cambridge

*Membership of Committee on Climate Change*

*Non-executive Director, Offshore Renewable Energy Catapult*

*BP Share Ownership*

*Chair, Adaptation Sub-Committee of the Committee Climate Change*

Baroness Neville-Rolfe DBE CMG

*Minister of State for Energy and Intellectual Property 2016*

*Non-executive Director, Capita plc*

Lord Whitty

*Trustee, EAGA Charitable Trust (Fuel Poverty)*

*Member, Advisory Committee, New Energy Action (NEA)*

A full list of Member's interests can be found in the Register of Lords' Interests: <http://www.parliament.uk/mps-lords-and-offices/standards-and-interests/register-of-lords-interests/>

## APPENDIX 2: LIST OF WITNESSES

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Evidence is published online at [www.parliament.uk/brexit-energy-security-inquiry-lords](http://www.parliament.uk/brexit-energy-security-inquiry-lords) and available for inspection at the Parliamentary Archives (020 7219 3074).

Evidence received by the Committee is listed below in chronological order of oral evidence session and in alphabetical order. Those witnesses marked with \*\* gave both oral evidence and written evidence. Those marked with \* gave oral evidence and did not submit any written evidence. All other witnesses submitted written evidence only.

### Oral evidence in chronological order

*	Joseph Dutton, E3G	<a href="#">QQ 1–20</a>
**	Georgina Wright, Chatham House	<a href="#">QQ 1–20</a>
**	Malcolm Keay, Oxford Institute for Energy Studies	<a href="#">QQ 1–20</a>
**	Lawrence Slade, Energy UK	<a href="#">QQ 1–20</a>
**	Phil Sheppard, National Grid	<a href="#">QQ 1–20</a>
**	Ian Graves, National Grid	<a href="#">QQ 1–20</a>
*	Silke Goldberg, Herbert Smith Freehills LLP	<a href="#">QQ 21–43</a>
**	Robin McCormick, SONI	<a href="#">QQ 21–43</a>
*	Dr Owen Wilson, Electricity Association of Ireland	<a href="#">QQ 21–43</a>
**	Dr Jenifer Baxter, Institution of Mechanical Engineers	<a href="#">QQ 21–43</a>
**	Dr Mina Golshan, Office for Nuclear Regulation	<a href="#">QQ 21–43</a>
**	Angela Hepworth, EDF Energy	<a href="#">QQ 21–43</a>
*	His Excellency Jean-Christophe Füg, Ambassador, Head of International Energy Affairs at the Swiss Federal Office of Energy	<a href="#">QQ 44–53</a>
**	Richard Harrington MP, Minister for Energy and Industry, BEIS	<a href="#">QQ 54–64</a>
**	Dan Monzani, BEIS	<a href="#">QQ 54–64</a>
**	Katrina McLeay, BEIS	<a href="#">QQ 54–64</a>

### Alphabetical list of all witnesses

Aldersgate Group	<a href="#">BES0011</a>
Anaerobic Digestion and Bioresources Association (ADBA)	<a href="#">BES0004</a>
British Ceramic Confederation (BCC)	<a href="#">BES0008</a>
Confederation of British Industry (CBI)	<a href="#">BES0019</a>
Centre for Nuclear Engineering, Imperial College London	<a href="#">BES0005</a>
Centrica	<a href="#">BES0031</a>

**	Chatham House and University of Exeter ( <a href="#">QQ 1–20</a> )	<a href="#">BES0044</a> <a href="#">BES0053</a>
	Citizens Advice	<a href="#">BES0039</a>
**	Department for Business, Energy and Industrial Strategy (BEIS) ( <a href="#">QQ 54–64</a> )	<a href="#">BES0049</a> <a href="#">BES0003</a>
	Department for the Economy, Northern Ireland Executive	<a href="#">BES0059</a>
	Durham Energy Institute, Durham University	<a href="#">BES0013</a>
*	Joseph Dutton, E3G ( <a href="#">QQ 1–20</a> )	
	E.ON UK plc	<a href="#">BES0046</a>
**	EDF Energy ( <a href="#">QQ 21–43</a> )	<a href="#">BES0033</a>
	EEF and UK Steel	<a href="#">BES0027</a>
	Energy & Utility Skills	<a href="#">BES0038</a>
	Energy Institute	<a href="#">BES0028</a>
	Energy Intensive Users Group (EIUG)	<a href="#">BES0014</a>
**	Energy UK ( <a href="#">QQ 1–20</a> )	<a href="#">BES0024</a> <a href="#">BES0050</a>
	ENGIE	<a href="#">BES0040</a>
	European Federation of Energy Traders (EFET)	<a href="#">BES0035</a>
	ExxonMobil	<a href="#">BES0032</a>
	Dr Aoife Foley, Queen’s University Belfast	<a href="#">BES0042</a>
*	His Excellency Jean-Christophe Füg, Ambassador, Head of International Energy Affairs at the Swiss Federal Office of Energy (SFOE) ( <a href="#">QQ 44–53</a> )	
*	Silke Goldberg, Herbert Smith Freehills LLP ( <a href="#">QQ 21–43</a> )	
	Green Alliance	<a href="#">BES0010</a>
	Kirsty Hamilton, Chatham House	<a href="#">BES0041</a>
	Institute of Physics (IOP)	<a href="#">BES0022</a>
	The Energy Institute, Institution of Chemical Engineers Energy Centre and the Royal Academy of Engineering	<a href="#">BES0023</a>
**	Institution of Mechanical Engineers ( <a href="#">QQ 21–43</a> )	<a href="#">BES0045</a> <a href="#">BES0051</a>
	Interconnector UK	<a href="#">BES0007</a>
	InterGen	<a href="#">BES0017</a>
	Twe Hoon Kim	<a href="#">BES0034</a>
	Major Energy Users’ Council & Others	<a href="#">BES0037</a>
	National Energy Action (NEA)	<a href="#">BES0058</a>

**	National Grid ( <a href="#">QQ 1-20</a> )	<a href="#">BES0043</a>
	New Nuclear Watch Europe (NNWE)	<a href="#">BES0018</a>
	Nuclear Industry Association (NIA)	<a href="#">BES0006</a>
	Nuclear Innovation and Research Office (NIRO)	<a href="#">BES0009</a>
	Ofgem	<a href="#">BES0025</a>
	Oil & Gas UK	<a href="#">BES0047</a>
**	Office for Nuclear Regulation ( <a href="#">QQ 21-43</a> )	<a href="#">BES0055</a>
**	Oxford Institute for Energy Studies ( <a href="#">QQ 1-20</a> )	<a href="#">BES0001</a>
	Renewable Energy Association	<a href="#">BES0020</a>
	RenewableUK	<a href="#">BES0030</a>
	Research Councils UK	<a href="#">BES0021</a>
	RWE	<a href="#">BES0029</a>
	Scottish Government	<a href="#">BES0057</a>
**	SONI ( <a href="#">QQ 21-43</a> )	<a href="#">BES0036</a>
	SSE	<a href="#">BES0012</a>
	Statkraft UK Ltd	<a href="#">BES0026</a>
	Storengy UK Ltd	<a href="#">BES0015</a>
	UK Petroleum Industry Association	<a href="#">BES0002</a>
	UREGNI	<a href="#">BES0048</a>
	Welsh Government	<a href="#">BES0056</a>
	Which?	<a href="#">BES0016</a>
*	Dr Owen Wilson, Electricity Association of Ireland ( <a href="#">QQ 21-43</a> )	

**APPENDIX 3: GLOSSARY**

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ACER	Agency for the Cooperation of Energy Regulators
ADBA	Anaerobic Digestion and Bioresources Association
AM	Assembly Member
BEIS	Department for Business, Energy and Industrial Strategy
CACM	Capacity Allocation and Congestion Management Regulation
CBI	Confederation of British Industry
CEF	Connecting Europe Facility
CJEU	Court of Justice of the European Union
E.ON	An energy company
E3G	Third Generation Environmentalism, a consultancy and think tank
EDF Energy	An energy company, owned by Électricité de France
EEA	European Economic Area
EEF	The Manufacturers' Organisation (formerly the Engineering Employers' Federation)
EFET	European Federation of Energy Traders
EFTA	European Free Trade Association
EIB	European Investment Bank
ENGIE	An energy and services organisation
ENTSO-E	European Network of Transmission System Operators for Electricity
ENTSO-G	European Network of Transmission System Operators for Gas
EU ETS	European Union Emissions Trading Scheme (or EU Emissions Trading System)
EUPHEMIA	Pan-European Hybrid Electricity Market Integration Algorithm
GW	Gigawatt
IAEA	International Atomic Energy Agency
IEM	Internal Energy Market
I-SEM	Integrated Single Electricity Market
ITER	International Thermonuclear Experimental Reactor
ITRE	European Parliament Committee on Industry, Research and Energy
JET	Joint European Torus
microCHP	Micro Combined Heat and Power

MiFID	Markets in Financial Instruments Directive
MP	Member of Parliament
MSP	Member of the Scottish Parliament
NCA	Nuclear Cooperation Agreement
NGO	Non-Governmental Organisation
NIA	Nuclear Industry Association
NIRO	Nuclear Innovation and Research Office
Ofgem	Office of Gas and Electricity Markets
ONR	Office for Nuclear Regulation
PCIs	Projects of Common Interest
PPE	Personal Protective Equipment
PRISMA	A European gas capacity trading platform
REA	Renewable Energy Association
REMIT	Regulation on Wholesale Energy Market Integrity and Transparency
RWE	An energy company, formerly known as Rheinisch-Westfälisches Elektrizitätswerk AG
SEM	Single Electricity Market
SONI	System Operator of Northern Ireland
SSAC	State System of Accounting for and Control of Nuclear Material
SSE	An energy company, formerly known as Scottish and Southern Energy
TFEU	Treaty on the Functioning of the European Union
TSO	Transmission System Operator
UREGNI	Utility Regulator of Northern Ireland