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BREXIT AND ENERGY: COST, SECURITY AND CLIMATE POLICY IMPLICATIONS

AUTHORS

Michael Grubb
Professor of International Energy and Climate Change Policy, UCL Institute of Sustainable Resources

Stephen Tindale
Director, Alvin Weinberg Foundation

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KEY POINTS

EU Member States currently have substantial freedom over national energy policies. Consequently, short-term impacts of a Brexit on energy would be limited, except for investment.

However, leaving the EU would greatly reduce the UK's influence in shaping European energy and climate change policy, terms of trade, and global climate negotiations.

The UK is a growing energy importer. Brexit need not imperil energy security, but maintaining it would become more expensive.

Of post-Brexit scenarios,

- EEA membership ("Norway") would preserve economic benefits but reduce net energy sovereignty – regulation without representation.
- In a Customs Union ("Turkey") the UK would not gain control over external trade relations. It could negotiate continued participation in the Internal Energy Market, but import dependence creates a weak negotiating position.
- A Free Trade Agreement ("Canada") would have no external trade benefit as the UK can only trade electricity with EU/EEA countries. For physical or geographic reasons any trade losses with the EU could not be offset by trade elsewhere.

The impact of Brexit would also depend on domestic political consequences, notably the government's subsequent environmental and energy policy preferences.

Introduction

This paper analyses the implications of Brexit for the UK's energy sector. Despite significant uncertainties, the experience of other non-EU countries and the UK's past role in EU discussions allow broad predictions of the consequences for UK energy operations and trade.

In the short term, the impact would be limited because EU rules (the *acquis communautaire*) would remain in place. Post-2020 effects would depend on the extent to which Brexit slowed down the construction of new electricity interconnectors (cables carrying electricity to and from Britain), and on the arrangements the UK negotiated with the rest of the EU. This paper considers the three main scenarios for the case of a Brexit: joining the European Economic Area (EEA, like Norway), entering into a Customs Union (like Turkey), or negotiating a Free Trade Agreement (FTA, like Canada).

The impact of Brexit on UK climate and energy policy would also depend on the referendum's domestic consequences. The Leave campaign appears significantly aligned with desire to weaken environmental policy. A substantial weakening could restrict the terms of energy trade, and would be inconsistent with UK legislation unless the government amended or repealed the 2008 Climate Change Act and repealed UK laws enacting EU legislation such as the Industrial Emissions Directive.

Economic, legal and political context

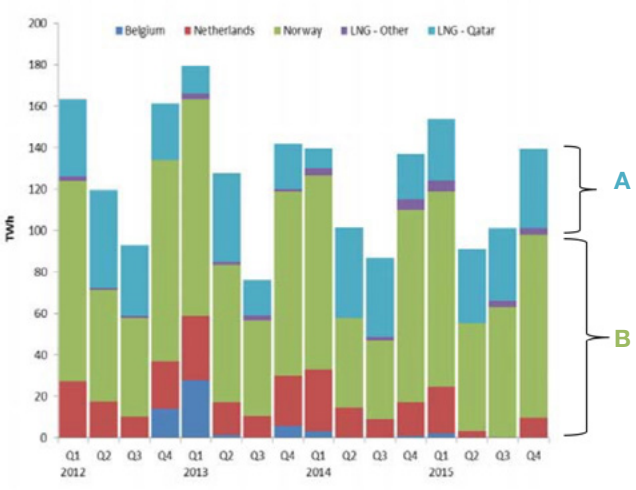
A. EU legal and policy context

The Lisbon Treaty confirms the choice of energy sources as a Member State prerogative. National governments are however required, in choosing energy sources, to respect environmental policies agreed at EU level. The 2014 *Third Energy Package* created an 'Internal Energy Market', thus including energy within the Single Market's 'four freedoms' (free movement of goods, persons, services and capital). The Agency for the Cooperation of Energy Regulators, currently chaired by the UK's Lord Mogg, helps to manage the shared competences between national and EU authorities. The UK's Balance of Competences Review (2014) shows almost unanimous endorsement of UK successes in the energy sector.[1] The EU is also in the midst of establishing an Energy Union to increase energy security and solidarity, integrating the Internal Energy Market, and delivering combined goals on efficiency, decarbonisation and innovation.

B. UK as energy importer

With the decline of North Sea oil and gas, the UK imports a growing percentage of its energy. It imports half of its gas; two-thirds of this transported through pipelines connecting to EU/EEA countries (Fig. 1). Electricity imports, currently about 6.5% of UK consumption,[2] are constrained by limited physical connections. However, this 'interconnector capacity' and trade is set to more than double to take advantage of lower wholesale prices on the continent. The UK National Grid estimates that electricity imports will save UK consumers around £500m a year during the 2020s.[3] Replacing trade with the Internal Energy Market by trade with other countries may be more costly for gas and impossible for electricity.

Figure 1: UK Gas imports by origin



A Imports from outside Europe (principally Qatar)

B Imports through Single Energy Market (mainly Norway)

Source: UK Energy Trends 2015, HMG, Chart 4.5

C. Renewable energy

One reason for low continental wholesale prices is low carbon generation: nuclear reactors and most renewables, once built, cost little to operate. EU support for renewable energy amplifies this. Efforts to implement the UK target under the EU Renewables Directive have led to a surge in UK renewable electricity, rising to a quarter of generation in 2015.[4] Because of the dependence on variable wind or solar output, the benefits of two-way energy trade across interconnected systems increase with the degree of renewables. The UK's progress, combined with its nuclear ambitions, might see the UK trade electricity both ways in the 2020s. Development of the significant North Sea wind energy resource would amplify this further (see also note xvii).

D. Climate change

The UK has helped to drive the EU's approach to climate change. British opposition helped block a European carbon tax in the 1990s, but its support for other market-based approaches helped lead to the EU Emissions Trading System (which sets caps on CO2 emissions but allows companies to trade their emissions). The UK has frequently pushed a more ambitious stance internationally and helped to lead the European delegation at the successful Paris COP21 negotiations.

Short term impact of Brexit on UK energy

In the short term, the substantive impact of Brexit on UK energy operation and trade would be limited: the *acquis communautaire* would remain in place while exit negotiations took place.

However, the associated uncertainties would **raise the cost of investments**, at a time when large investments are planned, both to maintain security of supply and to meet domestic and international commitments to a cleaner energy system. We foresee **a loss of momentum in UK renewable energy deployment**, due to:

a) abating EU enforcement pressures on UK commitments to obtain 15% of overall energy from renewables by 2020 (which is more difficult than for electricity only; see note iv),– heat and transport lag, and the UK is amongst the few EU countries assessed as being not on track to its overall target.[4];

b) regulatory uncertainty for investors, likely affecting interconnector investments.

The medium term cost of Brexit (to 2020) would depend on the balance of these factors. Further wild cards are c) possible EU responses and d) new priorities in energy and environmental policies under a post-Brexit government.

After Brexit: the Medium- and long-term options

A. Scenarios

Were the UK to leave the EU, we expect three main options for economic relationships, the respective likelihood of which depend on political factors.

Access through the European Economic Area

Members of the European Economic Area (EEA) have to accept the 'four freedoms' including movement of labour. In return for access to the Single Market, EEA Members must implement EU rules and standards.

To avoid a 'race to the bottom' in terms of environmental standards, European EEA members are obliged to implement anti-pollution directives, including the Industrial Emissions Directive, and to take part in the EU Emissions Trading System. They also implement the Renewables Directive. Norway, for example, has a renewables target of 67.5% in 2020 (drawing on its high hydro capacity), along with a separate requirement to achieve 10% renewable energy in the transport sector in 2020.[6]

EEA members therefore need to follow European rules, but have no formal role in drawing them up and no vote in passing them. It is unlikely that the UK would be offered a differential treatment.

A Customs Union

The UK could negotiate a Customs Union, although this is usually considered a pre-accession option. As such, Turkey has had a Customs Union with the EU since 1995, imposing the Common Customs Tariff on goods imported from outside the EU. Turkey is encouraged to adopt EU regulatory standards for products and EU rules, including energy rules.

In April 2015 the Turkish grid was connected to Europe's continental grid, allowing free trading and sharing of electric power. Turkey is currently an electricity importer, but aims to become an exporter. Whether the EU will agree to import electricity from Turkey depends on the future relationship between the EU and the Turkish government. The EU could insist that any electricity imported from Turkey is generated in a way that meets the environmental acquis.

It is unclear whether as part of a Customs Union the UK could negotiate continued participation in the Internal Energy Market. If it could, this would probably require the UK to adopt or maintain material EU laws under the acquis.

A 'Free Trade Agreement'[7]

A free trade agreement would in principle restore UK sovereignty over trade relationships. But in terms of pipeline gas and electricity trade this would in practice be of little value since physical interconnections cannot extend outside the EU/EEA. The UK would very likely be outside the Internal Energy Market and its dependence on gas and electricity from the EU/EEA would give it little leverage in negotiating its terms of energy trade with the EU. This would not mean ceasing trade, in which both sides have a strong interest, but it would fundamentally change the ground rules, on economic, security and environmental dimensions. Even in the FTA case, the UK could still face pressures, if not obligations, to implement rules which it had had no role in formulating.

The consequences hinge particularly on the nature of the energy interconnections in an era of fundamental transformation in energy systems; we consider impacts on investment, trade, and security.

'Swiss Option'

A 'Swiss option' – a series of agreements on specific issues between the UK and the EU – is not in our view a possible scenario. It is resulting in gridlock with Switzerland, and EU institutions have made quite clear that this approach would not be on offer post-Brexit.[8]

B. Implications for energy investment, cost, security and trade

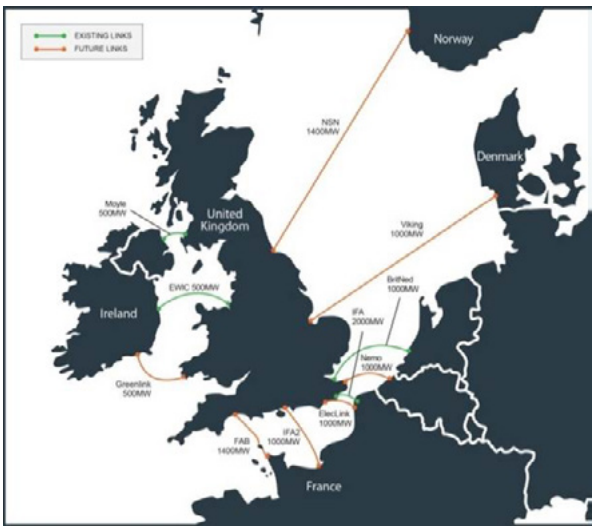
A recent report for National Grid concludes that leaving the Internal Energy Market would have minimal effects on gas trade in the UK, because markets are already well integrated, interconnectors are not congested, and the UK has diversified sources of supply, including Liquefied Natural Gas.

Electricity is a different matter. UK electricity trade benefits from low continental wholesale energy prices, not least due to continental subsidies for renewables. To enhance it, several new electricity interconnectors have been given regulatory approval (Fig. 2).[9] Secretary of State Amber Rudd stated that "over the next five years we intend to double our ability to import electricity […] these new connections alone could save British households nearly £12bn over the next two decades by driving down the price of electricity."[10] This is consistent with the National Grid calculations.

The government also foresees building extensive gas-generated, nuclear and offshore wind capacity, in order to become an electricity exporter over the long term.

As gains from trade are expected to rise with the physical capacity to trade, and increasing volumes of renewables, the National Grid study thus concludes that Brexit could put at risk benefits of 'up to £500m per year by the early 2020s".[11]

Figure 2. An Interconnected Island



Source: Ofgem

Note: the map shows the UK's electricity interconnectors already in operation (green) or approved (brown). Additional interconnector proposals are to be evaluated during 2016.

(i) Impacts of Brexit on interconnector investment

Interconnectors require bi-lateral agreements and significant levels of cooperation between the countries at either end. Brexit could slow down construction and raise the costs of new electricity interconnectors.[12] Particularly if outside the EEA, further UK interconnector investments would lose access to bespoke EU funds and compete against projects receiving EU support, such as new connections between Norway and Germany.[13] This, combined with higher investment costs due to regulatory uncertainty or less favourable terms, could reduce the UK interconnection capacity and hence benefits.

EU SUPPORT FOR INTERCONNECTORS

The European Commission has introduced measures to speed up the planning process. In 2011 it identified nine trans-European 'priority corridors' for new energy infrastructure, including North and Irish Sea offshore grids.

It also proposed three 'priority thematic areas': smart grids, electricity highways (transmission lines with significantly more capacity to transport power than existing high-voltage transmission grids) and cross-border carbon dioxide networks for carbon capture and storage.

The Commission has limited tools to encourage member-states to expand interconnection, but some funds are available for Projects of Common Interest (The EU Budget's Connecting Europe Facility has €5.85 billion available for energy infrastructure 2014-20).[14]

Ireland would probably construct an interconnector to France to maintain direct access to Internal Energy Market.[15] Ireland has developed integrated system operation between North and South. This might be in question if the North were outside the Internal Energy Market.

A North Sea grid would enable the UK to better use North Sea resources and Scandinavian hydro storage capacity, including, in the longer term, using abandoned oil and gas platforms to convert electricity into storable hydrogen and synthetic gas.[16] A series of bilateral agreements, rather than a more integrated approach under the EU's Energy Union, would increase the cost of North Sea grid construction, thus increasing the cost of exploiting offshore wind resources.[17]

(ii) Energy security and Interconnection

Interconnectors improve energy security. Gas imports are a vital part of UK gas supplies, and electricity imports have helped to maintain supplies in recent winters of tight UK generating margins. Interconnectors are more reliable than almost any generating plant, and link us to countries with substantial generating surplus overall.

Brexit need not imperil energy security, but maintaining it would become more expensive. UK gas storage is minimal and declining. Mutual assistance to deal with possible supply shortages is an explicit element of the Gas Solidarity mechanism currently in final stages of negotiation in the EU.[18]

Under Energy Union proposals, countries could also pool electricity generating capacity regionally so that others could access it in emergency. At times of tight supply, after securing their own needs, EU countries would be obliged to help other Member States – in preference to non-EU states.

It is unclear whether EEA membership would enable countries to share in the solidarity mechanisms. They would almost certainly not be available if outside the EEA. The UK could then not benefit from regional electricity pooling and, to ensure security, would have to spend more on its own back-up capacity (and possibly, gas storage).

(iii) Impact of Brexit on electricity trade

If the UK stayed within the EEA it would remain part of the Internal Energy Market (IEM) and face no adverse consequences beyond the loss of influence and sovereignty implied by being an observer rather than a participant.

As noted, the UK could also seek to include IEM access as part of a Customs Union. It would have to accept at least some of the acquis (like renewables targets/governance and pollution control) in return, but the terms of energy trade would otherwise be unaffected. However, the detailed operation of electricity systems can significantly affect the extent of domestic versus traded electricity or create non-tariff barriers.

Outside a Customs Union, the terms and definitions of trade would itself be up for negotiation. It seems unlikely that the EU would be willing to see its own consumers effectively subsidizing cheap exports to a country that leaves the Internal Energy Market. In principle, the EU could impose a tariff on its electricity exports to any country outside the EEA, or define 'product standards' for trade based on how electricity is produced (source-based electricity trade).

Figure 3: Options after Brexit

	Contribution to gas and electricity security / solidary	Access to EU funds for interconnectors	Internal Energy Market	Control over external trade	Notes
EEA (European Economic Area - "Norway")	?	?	Yes	No	Requires sign-up to *acquis communautaire* including renewables targets, pollution control etc
Customs Union - ("Turkey")	No	No	?	No	Access to Internal Energy Market likely to be conditional on adopting at least the parts of *acquis* legislation material to energy costs
FTA (Free Trade Agreement – "Canada")	No	No	No	Yes – but no upsides for pipeline gas & electricity	Potential exposure to source-based electricity trade terms or equivalent tariffs

(iv) UK legislation post-Brexit

An important wild card in the debate is the next government's stance on environmental regulation. Vote Leave argues that "EU laws have increased the price of energy for families, businesses and public services"[19] Many of these regulations set environmental standards, which have been a key factor in the UK leaving behind its 1970s reputation as the 'dirty man of Europe'. The medium- and long-term impact of a Brexit on UK energy–related environmental policy would thus also depend on whether:

- whether UK law enacting key parts of the energy and climate acquis remained on the statute books;
- whether the 2008 Climate Change Act was weakened or repealed.

These are not foregone conclusions. Lower environmental standards would be hard to reconcile with an attempt to continue participating in the Internal Energy Market. Moreover the Climate Change Act requires the government to adopt legally binding carbon budgets fifteen years ahead, based on advice from a statutory advisory body.[20] Legally binding emission budgets already in UK legislation extend to 2027 and will soon be extended to 2032.

Conclusion

A House of Lords European Committee enquiry noted that "No country is an energy island. There are clear benefits to be derived from working within the EU on the energy challenge". Indeed the UK has been a leader in the development of the Internal Energy Market, and also in EU climate policy. But, as another UCL EI Policy Brief noted, "the UK is content with the economic benefits of the single market but not about the accompanying regulation"[21]

The economic and security benefits of energy trade in the EU are unambiguous, not least at a time of radical transformation and renewed investment. The UK is comfortable with the gains from trade, but less so with the policies required to secure adequate clean investment and a 'level playing field.'

Yet the two are largely inseparable.

The UK energy system would of course continue outside the EU, but it would depend on arrangements negotiated between Britain and the remaining EU countries. All the above scenarios involve an unusually clear trade-off between economic benefits and political appeal. The EEA option is economically and environmentally preferable but politically unattractive. An FTA is politically preferable but economically and environmentally unattractive. A Customs Union would be a compromise between these tensions.

In any scenario, given the UK's energy dependence on the EU/EEA, the UK would be in a weak negotiating position. An honest admission that full independence comes at a price would offer a clearer debate. The energy sector illustrates how and why the choice is not really between EU or not, but – even outside it – between the economic, environmental and international benefits of integration versus the political attractions of separation.

Endnotes

1 M. Emerson (Ed), Britain's Future in Europe, Centre for European Policy Studies, Brussels, 2016.

2 In 2015, imports through the existing interconnectors (France and the Netherlands) were 22.275 TWh, compared to UK consumption of 337.7 TWh. In turn there were much smaller exports to Ireland.

3 During 2015, UK wholesale electricity prices averaged around €15/MWh – almost 40% - higher than prices in our biggest trading partners, France and the Netherlands. Source: APX Exchange. For future prospects see note xv.

4 During 2015, UK wholesale electricity prices averaged around €15/MWh (almost 40%) higher than prices in our biggest trading partners, France and the Netherlands. Source: APX Exchange. For future prospects see note xv.

5 The European Commission's 2015 progress report assesses most Member States (and the EU overall) to be on track for renewables targets, but the UK is one of a few which 'need to assess whether their policies and tools are sufficient and effective in meeting their renewable energy objectives.'

6 https://ec.europa.eu/energy/sites/ener/files/documents/dir_2009_0028_action_plan_norway__nreap.pdf

7 https://ec.europa.eu/energy/en/topics/renewable-energy/progress-reports

8 Eversheds, Seeing clearly: making sense of Brexit (2016: everheds.com) summarises the five categories of possible relationships following respective countries of successively lowered degrees of trade access as "Norway, Swiss, Turkey, South Korea, and WTO". The first two are explored for in David Buchan, Outsiders on the Inside: Swiss and Norwegian lessons for the UK (Centre for European Reform, London 2012). Buchan concludes that 'Norway's EEA arrangement has denuded the content of the country's political debate, whilst Switzerland's relationship with the EU has reached an institutional impasse'. Attempts by the UK to insist on such an approach, were the EU to consider it, would prolong the exit process and attendant costs.

9 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/357584/imports_exports_and_transfers_of_electricity.pdf

10 https://www.gov.uk/government/speeches/amber-rudds-speech-on-energy-benefits-of-staying-in-eu. Additional planned interconnectors include a further 3.4 GW to France, 1 GW to Belgium, 1 GW to Denmark and 500 MW to Ireland.

11 http://www.vivideconomics.com/publications/the-impact-of-brexit-on-the-uk-energy-sector. For trade alone, if an average 10GW of power were traded for 7000 hours/year at an average price difference of £7/MWh, for example, the value would be £490m. The study stresses that the impact on investment costs, and reduced interconnector capacity, would probably dominate the total costs.

12 https://www.gov.uk/government/speeches/amber-rudds-speech-on-energy-benefits-of-staying-in-eu

13 The Berlin government is actively planning two 1.4 GW interconnectors to Norway. One of them has been chosen by the Commission as a Project of Common Interest.

14 Stephen Tindale, 'Connecting Europe's energy systems', 2012. https://www.cer.org.uk/publications/archive/policy-brief/2012/connecting-europes-energy-systems

15 Irish Business and Employers Confederation (Irish CBI), Implications for UK-Irish electricity market integration in the event of a Brexit, workshop in Dublin, 2 March 2016

16 Dutch Energy Delta Institute (EDI). Connect North Sea oil and gas platforms to offshore wind farms to produce green gas, January 22, 2016 by Catrinus Jepma and Miralda van Schot

17 Goran Strbac, Rodrigo Moreno, Ioannis Konstantelos, Danny Pudjianto, Marko Aunedi, Strategic Development of North Sea Grid Infrastructure to Facilitate Least-Cost Decarbonisation, 2014

18 https://ec.europa.eu/energy/en/news/new-rules-boost-gas-supply-security-and-solidarity

19 http://www.voteleavetakecontrol.org/briefing_energy

20 The Government said in February 2016 that it would strengthen this legal commitment to net zero (any UK emissions offset by measures in other ountries financed by the UK). The Committee on Climate Change will advise on the year when the net zero commitment should be met.

21 https://www.ucl.ac.uk/european-institute/analysis-publications/britain-europe/EU_Single_Market_briefing_FINAL.pdf

BACKGROUND

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For further background on the topic of the briefing, see our Online Resource Area.
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Produced by:
UCL European Institute
16 Taviton Street
London WC1H 0BW

european.institute@ucl.ac.uk
www.ucl.ac.uk/european-institute
@UCL_EI

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