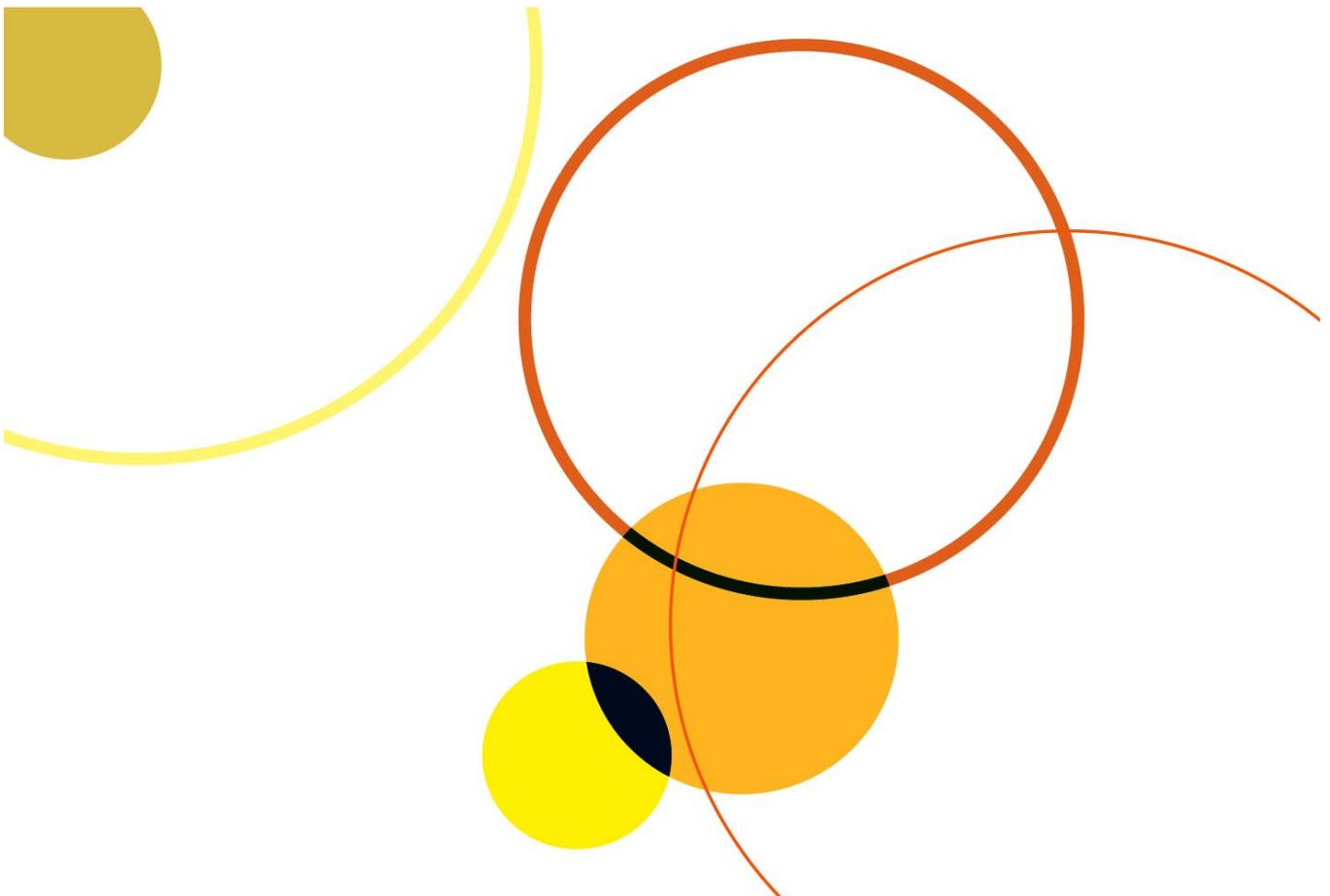


The impact of Brexit on the UK energy sector

An assessment of the risks and opportunities for electricity and gas in the UK

29 March 2016



1 Summary

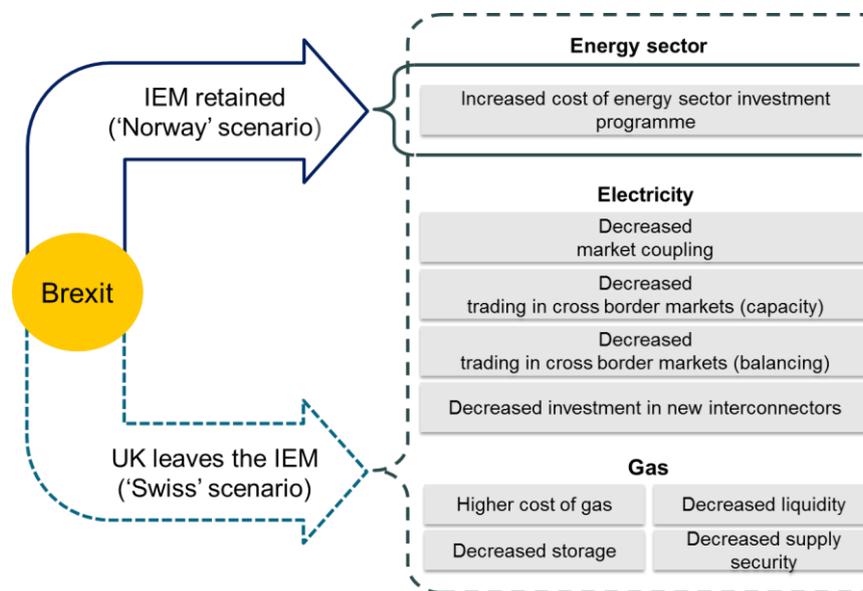
In the hotly contested Brexit debate, one thing is clear: Brexit will create economic uncertainty¹. This is because there a wide range of possible outcomes from post-Brexit negotiations leading to a number of regulatory and market options for the UK's relationship with the EU, with differing implications for investment and trade.

In the energy sector, possible post-Brexit arrangements range from continued membership of the Internal Energy Market (IEM), a scenario that is similar to the status quo (and similar to Norway's current arrangements, see Figure 1), to a new set of bilateral arrangements if the UK is excluded from the IEM (similar to arrangements in Switzerland).

From an investor's perspective, higher returns are required to compensate them for the risk of less favourable post-Brexit arrangements. This puts upwards pressure on the cost of financing, raising the cost of investment in the UK energy sector.

The scale of planned infrastructure investment in the electricity sector over the next decade means that even small increases in the cost of financing could have large consequences for total investment costs. Further upwards pressure on costs would result from the likely devaluation of the Pound, given the role imported goods and services play in UK energy supply.

Figure 1. The magnitude of impact depends on whether the Internal Energy Market (IEM) is retained



Source: Vivid Economics

Our assessment is that higher costs of investment in energy infrastructure is the most significant Brexit risk to the energy sector.

¹ The duration of this uncertainty is unclear. Negotiations could be concluded on the 2 year timeline suggested by Article 50 of the Treaty on the European Union or continue for a "decade or more" as suggested by the Government



If Brexit results in exclusion from the IEM, the UK could also forgo the benefits from market integration initiatives, such as market coupling and cross-border balancing and capacity market integration. As this would only occur after both Brexit and leaving the IEM, these risks are inherently more uncertain than the risk to costs of energy infrastructure. Over the longer term (beyond 2020), these losses in value could have a knock-on impact of undermining the business case for further investment in interconnection between the UK and its neighbours. In total, the potential impacts resulting from exclusion from the IEM, but excluding Brexit impacts on the cost of investment, could be up to £500m per year by the early 2020s². However, placed in the context of overall energy costs, these cost increases would be relatively small.

Brexit would also result in some opportunities if it were the case that EU legislation constrained the UK to higher cost technology pathways. However, this is unlikely as the UK's domestic commitments to reducing emissions, coal closure and deploying renewables are similar or stronger than current and planned EU requirements.

Natural gas is less likely to face major cost implications due to Brexit in the nearer term. Over the longer term however, Brexit could increase exposure to supply security risks.

² Further information on the analysis is provided in the presentation prepared for National Grid, available at: <http://www.vivideconomics.com/publications/the-impact-of-brexit-on-the-uk-energy-sector>



2 Introduction

To date, reporting and commentary on the impact of Brexit on the UK energy sector has provided little of use to business and policy-makers. Debate has tended to either lack useful insight (“The only honest answer is 'we don't know' ”ⁱ) or conclude with unrealistic certainty (“Brexit means the lower energy bills they [industry] desperately need”ⁱⁱ).

It is true that much of the impact of Brexit is difficult to predict: there is no precedent for withdrawing from the EU. This is particularly the case in the energy sector where the impact depends on whether the UK remains in the IEM. If Brexit occurs and the UK does remain in the IEM, arrangements for the energy sector could look broadly similar to the status quo, however leaving the IEM opens up a much wider range of possibilities, including the striking of bilateral agreements on particular issues.

It is clear that Brexit will result in a more uncertain investment climate in the near term. This is important because the period following the referendum coincides with a period of significant investment in the electricity sector. Brexit is likely to make this programme more expensive. Our analysis suggests that this is in fact the largest risk facing the energy sector in a post-Brexit scenario, regardless of precisely how negotiations unfold.

Additional risks to the electricity sector could occur if Brexit leads to exclusion from the IEM and the UK loses the opportunity for further integration with European markets. However these risks are smaller and less likely than the risk of increased cost of delivering the programme of electricity sector investment.

In comparison to the electricity sector, the potential impacts to the gas market are of a lower order, due to the historical size and influence of the UK market on trade of gas within the EU, and sunk investments in storage and security of supply. However, there could be impacts over the longer term, particularly if Brexit leads to UK exclusion from EU agreements on supply security.



3 Electricity

Investment needs in the UK's electricity sector will be higher over the next decade than over the last two decades, due to both capital stock upgrades and the UK's decarbonisation plans. Coal generation built during the 1960s is reaching the end of its life, with closure accelerated by EU air quality directives, and most of the UK's fleet of nuclear plant are due to close over the next decade. The low carbon transition is also pushing up investment requirements, as both nuclear and renewable energy are more capital intensive than the fossil fuel plant they replace.

The National Infrastructure Commission identifies around £14-19 billion investment per year in the electricity sector in the period to 2020ⁱⁱⁱ. This is three-quarters of total energy sector investment in this period, and 60 per cent of total UK infrastructure spending to 2020.

Increased cost of new investment - financing

The above cost estimates presume financing in a pre-Brexit investment climate. If the UK has to negotiate new terms following the referendum, investors will demand a higher rate of return to compensate for the greater risks, raising the cost of the investment programme.

Given the scale of planned investment, even a moderate change of 50 basis points to the cost of financing, sustained for multiple years, would raise costs significantly, possibly in the order of hundreds of millions of pounds. There is evidence that borrowing costs have already increased to some extent simply from the discussion and debate around Brexit³.

Rather than higher costs, uncertainty could lead to the deferral of investment until uncertainties resolve. However, this is unlikely to be an option for the large proportion of the planned investment that is required to improve security of supply margins. Around 50 per cent of electricity investment is in new capacity which, if delayed, could reduce supply security. It is possible that if this investment were delayed, the Government would need to explore alternative and more costly options to maintain supply security.

Increased cost of new investment - imports

Following Brexit, heightened concerns about poor outcomes are likely to reduce capital inflows and weaken the Pound. The Pound is particularly vulnerable due to the UK's high current account deficit, which is the largest among G20 countries as a percentage of GDP and is financed by foreign investment. The extent of the decline in the Pound is difficult to predict, with some estimates predicting a fall of up to 20 per cent against the US Dollar^{iv}. The Pound has already fallen by over 5 per cent since November when the UK's conditions for staying in the EU were published^v.

The devaluation of the Pound would increase the cost of imported equipment and services needed for much of the planned infrastructure investment. For example, companies located outside of the UK are responsible

³ While this fall is due to multiple factors, not least the announcement that the UK is unlikely to raise interest rates soon, they also reflect that foreign investors are concerned by Brexit.



for more than 50 per cent of expenditure associated with planning, building and running offshore wind projects^{vi}.

Import costs may also increase following Brexit due to restrictions on the movement of people limiting the ability to source skills, although this impact is more speculative at this stage.

Forgone benefits from market integration

In the event of Brexit, the failure of the UK to negotiate continued inclusion in the IEM, or alternatively a bilateral arrangement to integrate with its neighbours, would put at risk gains from trading electricity across borders. The value of market integration is grounded in gains from trade as buyers and sellers are connected in a larger combined market. Greater trade in electricity also increases competition, leading to lower prices and stimulating innovation^{vii}. These risks would materialise in wholesale markets, as well as balancing and capacity markets.

A lower value from trading electricity across borders may have a knock-on impact of undermining the business case for future investment in interconnection infrastructure between the UK and its neighbours. At the same time, given the substantial programme of investment in interconnection already at advanced stages, the benefits to the UK of further investment is unclear for the next decade or more.

In total, we estimate the potential foregone benefits from exclusion from the IEM and full market integration as up to £500m per year by the early 2020s.

Greater flexibility over technology choice

It is also possible that there may be some opportunities from Brexit if leaving the EU would free the UK from EU-wide constraints on its technology choices. For example, the Industrial Emissions Directive (IED) is driving the retirement of coal, and renewables targets could be incentivising a greater uptake of this technology compared to lower cost alternatives. However, UK domestic policy is proceeding at a similar or faster pace than the EU across these areas:

- The Government's commitment to closing coal fired power stations sets the UK on a course to retiring coal at a similar rate to that required by the IED, that is, completing the programme of retirement in the early-2020s.
- The UK's commitment to renewables extends beyond that required by the EU, having already allocated funding for the first 4 GW of offshore wind in the 2020s.

With regards to climate change legislation, the UK's carbon budgets are broadly consistent with that required by the EU 2030 package^{viii}, and the Government is now seeking to legislate a net-zero emissions commitment, which would have the impact of limiting technology choice beyond what is currently required by the EU.



4 Gas

Our assessment is that there are minimal risks for gas in the nearer term as a result of Brexit. The UK is fundamentally different to most other EU countries in that it has domestic production of gas, good connections to the LNG market and active hub trading. This means it is well placed to maintain liquidity, adequacy and supply security even in the event of a Brexit.

Nearer term risks

Unlike in the electricity sector, the UK would not risk missing out on a process of further integration of gas markets that might, in turn, result in lower prices. Gas markets are already well integrated between the UK and Europe, price differentials are small, and interconnection between the UK with Europe is not congested.

Short term adequacy through storage is also unlikely to be constrained as the UK has excess storage capacity. It would require a simultaneous loss of 60-70 per cent of gas sources to cause a supply interruption to domestic consumers.

Supply security is also unlikely to be compromised as the UK has a diversified source of supply with many import facilities, for example non-EU sources such as pipeline gas from Norway and LNG from Qatar. LNG capacity utilisation has been low for many years, and could act as an additional source of supply security^{ix}.

Even if some trading does shift to non-UK markets in the short term, the fact that the physical infrastructure is in place for trading across borders from the UK means this infrastructure is likely to continue to be used, and price divergences will be small.

Longer term risks

Although the UK currently has strong supply security, Brexit could increase exposure to supply security risks over the longer term. The UK could find itself excluded from EU ‘solidarity principles’ in which European nations agree to supply to their neighbours in the event of a gas supply crisis.

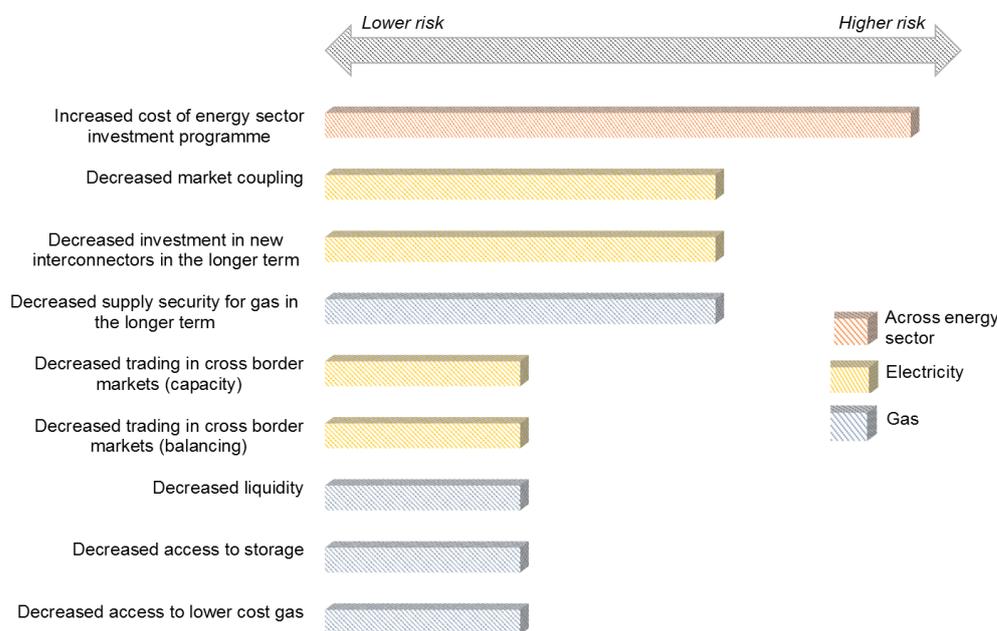
The UK gas market has historically been the most liquid in Europe. However a shift is underway towards continental markets such as the Title Transfer Facility (TTF), which took over as the most liquid market in Europe in 2015. Brexit could change expectations about where investment in future infrastructure is likely to occur, accelerating the shift in market share towards continental markets.



5 Risk assessment and conclusion

Vivid Economics conducted an assessment of the major risks to the energy sector from Brexit from the perspective of its impact on net UK welfare. Compared to higher investment costs, risks associated with forgone integration benefits are of a lower order, as shown in Figure 2. This is largely because these risks are more uncertain, given that they rely on Brexit leading to both exclusion from the IEM and unsuccessful bilateral negotiations on market integration.

Figure 2. Risk profile of the energy sector in a Brexit scenario



Note: This assessment takes into account both the magnitude and likelihood of risks to the energy sector. Gas related risks are relevant over the longer term – i.e. beyond 2025.

Source: Vivid Economics

While it is true that the impact of Brexit is difficult to predict, there is a strong likelihood that economic uncertainty following a vote to leave the EU would push up costs. Given the scale of investments in the electricity sector at this time, small changes in the cost of financing could have larger consequences for the total investment cost. However, placed in the context of overall energy costs, these cost increases are likely to be small. This, rather than forgone benefits from market integration or risks to the cost or security of gas supplies, is the major near term risk to the energy sector from Brexit.

References

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- ⁱ <http://www.businessgreen.com/bg/blog-post/2450712/will-climate-sceptics-dreams-come-true-post-brexit>
- ⁱⁱ http://www.ukip.org/britain_after_brexit_manufacturing_capital_of_europe
- ⁱⁱⁱ <https://www.gov.uk/government/publications/national-infrastructure-pipeline-july-2015>
- ^{iv} <http://www.ft.com/fastft/2016/02/04/goldman-sachs-eyes-20-sterling-drop-on-brexit/>
- ^v While this fall is due to multiple factors, not least the announcement that the UK is unlikely to raise interest rates soon, they also reflect that foreign investors are concerned by Brexit.
- ^{vi} [http://www.bvgassociates.co.uk/Portals/0/publications/uk_offshore_content_report_november_2015%20\(1\).pdf](http://www.bvgassociates.co.uk/Portals/0/publications/uk_offshore_content_report_november_2015%20(1).pdf)
- ^{vii} For example, Newbery, Strbac and Viehoff (2015) The benefits of integrating European electricity markets. EPRG Working Paper 1504. <http://www.eprg.group.cam.ac.uk/wp-content/uploads/2015/02/EPRG-WP-1504.pdf>
- ^{viii} https://documents.theccc.org.uk/wp-content/uploads/2013/11/1784-CCC_SI-Report_Book_single_1a.pdf
- ^{ix} http://www.igu.org/sites/default/files/node-page-field_file/IGU%20-%20World%20LNG%20Report%20-%202014%20Edition.pdf

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Company Profile

Vivid Economics is a leading strategic economics consultancy with global reach. We strive to create lasting value for our clients, both in government and the private sector, and for society at large.

We are a premier consultant in the policy-commerce interface and resource- and environment-intensive sectors, where we advise on the most critical and complex policy and commercial questions facing clients around the world. The success we bring to our clients reflects a strong partnership culture, solid foundation of skills and analytical assets, and close cooperation with a large network of contacts across key organisations.

