consultancy engineering business environment

ACE Evidence: Electricity Interconnection and Storage

ACE response to the:

National Infrastructure Commission Call for Evidence

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About ACE

As the leading business association in the sector, ACE represents the interests of professional consultancy and engineering companies large and small in the UK. Many of our member companies have gained international recognition and acclaim and employ over 250,000 staff worldwide.

ACE members are at the heart of delivering, maintaining and upgrading our buildings, structures and infrastructure. They provide specialist services to a diverse range of sectors including water, transportation, housing and energy.

The ACE membership acts as the bridge between consultants, engineers and the wider construction sector who make an estimated contribution of £15bn to the nation's economy with the wider construction market contributing a further £90bn.

ACE's powerful representation and lobbying to government, major clients, the media and other key stakeholders, enables it to promote the critical contribution that engineers and consultants make to the nation's developing infrastructure.

Through our publications, market intelligence, events and networking, business guidance and personal contact, we provide a cohesive approach and direction for our members and the wider industry. In recognising the dynamics of our industry, we support and encourage our members in all aspects of their business, helping them to optimise performance and embrace opportunity.

Our fundamental purposes are to promote the worth of our industry and to give voice to our members. We do so with passion and vision, support and commitment, integrity and professionalism.

Further information

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For this response, ACE has drawn heavily on its report, Electricity Market Reform: Generating Results, published in July 2014.[1]

Q1. What changes may need to be made to the electricity market to ensure that supply and demand are balanced, whilst minimising cost to consumers, over the long-term?

- What role can changes to the market framework play to incentivise this outcome:
- Is there a need for an independent system operator (SO)? How could the incentives faced by the SO be set to minimise long-run balancing costs?
- Is there a need to further reform the "balancing market" and which market participants are responsible for imbalances?
- To what extent can demand-side management measures and embedded generation be used to increase the flexibility of the electricity system?

On tariffs, ACE found that rises continue to be of concern with the average dual fuel household bill rising from £1,057 in 2011 to £1,232 in 2012. These rises have been against a backdrop of low wage rate growth, employment uncertainty, and a general lack in consumer confidence, fuelling affordability concerns.

ACE's research found little evidence of regional pricing by the 'big six' companies, however, when analysing the differences between tariffs. In addition, it was also found that the benefits of switching are relatively limited over time, with direct debit customers being the main beneficiaries. Looking at the rationale behind price changes, our research found that the price reductions felt by consumers for direct debit tariffs are as a result of company's pricing policies and not simply inflationary changes.

ACE also found that over time there has been a shift towards short term, 'spot' trading with increased volatility and cost owing to the higher price that can be demanded on a short term transaction. These costs have then been passed onto consumers with little explanation from the energy companies or the regulator as to why increases in this kind of activity have been allowed to occur. Policy makers can no longer ignore such a shift, given the implications this has for affordability. As such, intervention is required to encourage more competitive, longer term trading on an open and transparent market.

There is also an increasingly vague view as to what the energy mix in the UK will be, creating uncertainty and holding back the investment the country needs. Whilst in theory, with the government remaining technologically neutral, competition should be encouraged. In reality it has created a situation where only the most certain of projects (those with the lowest financial, political and planning risk) progress, with all others prevented from progressing while investors continue to seek the right signals.

[1] *Electricity Market Reform: Generating Results* (2014), Association for Consultancy and Engineering, http://www.acenet.co.uk/electricity-market-reform-generating-results/746/12/1/8

Our research also considered the Consolidated Segmental Statements of energy companies and found that the costs and earnings of the generation arms of companies vary more significantly than that of their supply businesses. Economies of scale and efficiency are generally cited in favour of vertical integration in the energy sector, yet the analysis in this report called into question whether the actual benefit is passed through the system to the consumer.

In some circumstances the results even suggest that costs move in opposite directions for the different divisions of energy companies (e.g. generation and retail/supply), demonstrating that pricing signals are not efficient and the system is not responding to them as would be expected. Part of the reason behind this may be that companies are responding to media pressures and attempting to control costs at one end of the system. This, however, fundamentally undermines price and investment signals within the market.

The analysis also calculated the 'earnings' premium that is applied as prices pass through the system. That is to say that if generators charge more to suppliers, suppliers in turn charge more to consumers. For every extra £1 a generator earns in profit, a supplier is also able to make an extra £0.57p, making a total increase for consumers of £1.57. Given that more than 'base' costs are passed onto consumers the case for vertical integration and the efficiencies it brings within the market appears uncertain.

The correlation between generators' and suppliers' weighted average costs shows that as the former's average costs increase the latter's average costs do not change significantly. This suggests two possible scenarios, the first being that the average weighted cost of generators has no bearing on suppliers' average costs. Alternatively, supply businesses are able to hedge prices forward so effectively that they can absorb variations in generators weighted costs with little effect on their own. The second scenario is, however, questionable given the shift towards short term spot trading where it is more difficult to offset cost volatility.

The ACE report suggests a way forward which attempts to balance the needs identified within the EMR framework, including:

- The need for a policy which will secure a reasonable baseload and invest in solutions which can 'store' energy;
- The need to address capacity issues without radically reforming policy again and therefore increasingly delay and uncertainty which is a major problem for investors;
- Ways to improve and implement effective competition in the generation market by creating a secure base that lowers costs and allows technologies to compete where appropriate;
- The need for increased transparency within the market, allowing the retail side to access and buy from a number of sources.

This report proposes that five Generation Investment Vehicles (GIVs) with a combined value of £8bn are created to ensure that in the short to medium term project finance is secured. In order to secure medium to long term investment to 'lock' long term cleaner energy into the UK's generation system, this report also proposes that three Tidal GIVs (TGIVs) with a combined value of £21bn be created.

These vehicles could be used to finance for any type and combination of projects, for example:

- Six CCGT plants at an approximate cost of £3bn (providing approx. 7,500MW).
- Eight waste to energy plants at an approximate cost of £4bn (providing approx. 575MW).
- £21bn of funds towards the building of tidal/lagoon assets (providing approx. 2,000MW to 3,000MW).
- A £1bn fund for community projects, where money would be raised via crowd sourced funding.

The three £7bn TGIVs for example could finance:

- The roll out of either smaller tidal schemes or more economically the construction of a Severn Barrage (with a target price of 16% below the current £25bn estimated cost) to lock in lower cost long term electricity not only for this generation but also the next few.

Introducing a secure supply has to be accompanied by increased transparency and ultimately improved competition within that part of the market where competition for variable electricity demand takes place.

This paper proposes a Priority Auction Mechanism (PAM) where:

- A new structure of two open market traded exchanges where government has to purchase 50% of the capacity put forward in the first round, 75% in the second round, and all remaining capacity then having to compete OTC.
- The first round of purchasing will be on contracts longer than 24 months, while the second will see providers enjoy contracts of longer than 12 months' duration. This will have the dual impact of providing certainty of revenue for generators and encourage future investment whilst also encouraging a transparent and efficient pricing mechanism for the electricity market.

Q2. What are the barriers to the deployment of energy storage capacity?

- Are there specific market failures/barriers that prevent investment in energy storage that are not faced by other 'balancing' technologies? How might these be overcome?

- What is the most appropriate scale for future energy storage technologies in the UK? (i.e. transmission network scale, the distributed network or the domestic scale.)

The biggest barrier to the development and deployment of energy storage capacity is often the siloed way that infrastructure more broadly is considered, both at government and industry level. ACE's main recommendation in this area would be that future projects need to be considered much more in the round and questions as to whether there are possible energy storage angles must be asked and answered.

There is a significant need in the UK for substantial new infrastructure in the coming years, from housing, rail projects, road investment, and new water storage facilities. Government and industry must ensure that it works together to enable these schemes to adequately consider the possibility of incorporating energy storage techniques into their design and construction.

With the scale of housing required by the UK to meet demand, for instance, consideration should be given to incorporating technologies that allow for the charging of electric vehicles, as well as the ability for them to act as battery storage that can be used to supply power back to the house at various times. This will encourage take up through reduced bills, assist in meeting our climate change targets, and reduce reliance on the grid.

Additionally, there are plans for new reservoirs to be built, especially in areas of the country that experience water shortages at certain times of the year such as London and the South East. It is possible that this infrastructure can also be fitted with technology that allows for storage of energy that can be deployed at peak times when required then replenished during off peak times.

ACE's members are often at the forefront of innovations such as those mentioned above and others, and are keen to incorporate new thinking on projects they are asked to work on. The key barrier though is often a reluctance to consider the projects beyond their specific purpose, an attitude that should be resisted in the future if our infrastructure is to be fit for purpose.

Q3. What level of electricity interconnection is likely to be in the best interests of consumers?

- Is there a case for building interconnection out to a greater capacity or more rapidly than the current 'cap and floor' regime would allow beyond 2020? If so, why do you think the current arrangements are not sufficient to incentivise this investment?

- Are there specific market failures/barriers that prevent investment in electricity interconnection that are not faced by other 'balancing' technologies? How might these be overcome?

ACE does not have any comment to make on these questions.

Q4. What can the UK learn from international best practice in terms of dealing with changes in energy technology when planning to balance supply and demand?

ACE's research into the international market found that the UK sits around 40 per cent above the IEA median for energy prices excluding taxation, and over 10 per cent when they are included.[2] This is important as a key component when comparing the UK with other global energy markets is price, and particularly the relationship between the amount being charged and the taxation being levied on top.

When the amount of taxation is benchmarked against the other IEA members, the UK is found to be leveraging only 5 per cent in taxation, well below the IEA median of 24 per cent. This perhaps indicates that the UK might not be proactive enough in reallocating resources from market which are inefficiently accounting for the effects of climate change, pollution, and volatile prices towards a more stable and sustainable long term solution.

Electricity prices in the UK on the open market (not including taxation) are some of the highest amongst the countries analysed. This is likely to be due to a lack of strategic planning as no one company considers investment in the UK as a whole at the macroeconomic level. As such, any investment outcome from the sector will favour individual companies' investment strategies and not one that is efficient for the UK as a whole.

ACE's research found that countries with higher energy taxation are often better insulated from rises in wholesale energy prices. We concluded that this was probably due to their improved ability to promote new technologies and a broader energy mix through better redistribution of capital via subsidies, tax breaks, or other funding mechanisms.

[2] *International Domestic Energy Prices* (2015), Department for Energy and Climate Change, https://www.gov.uk/government/statistical-data-sets/international-domestic-energy-prices