

## Electricity Interconnection and Storage

### 1. 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?

Local authorities have little or no direct influence over the electricity market, connections or managing supply and demand. Local authorities have more influence over areas such as energy efficiency/housing, planning, health and issues around fuel poverty. These issues whilst not directly linked are affected by connectivity and market variations in electricity/heating costs.

However, there is potential in Cumbria for the county to make a significant contribution to increasing national energy security through nuclear new build at Moorside, and the potential for other large scale projects such as the Solway tidal lagoon and the extension to Walney offshore windfarm. Increasing generation and connections through these sources will have a significant impact on the domestic market.

A large percentage of Cumbria’s population is off the mains gas grid. A lot of housing, particularly in the most rural areas, relies on expensive and inefficient heating oil. The cost of heating oil is more volatile than gas, making budgeting utility costs more difficult and less predictable. Many Cumbrian homes use electricity to heat their homes which is also expensive and often less efficient. As a result the rates of fuel poverty in Cumbria are well above the national average.

Microgeneration is a potential growth sector for Cumbria. This sector could move further into the energy mainstream with the right support, offering consumers affordable, and cost-effective low carbon energy products.

Community scale generation can also reduce reliance on the grid and make rural communities less susceptible to price fluctuations and contribute to the achieving the right energy balance. As well as delivering economic benefits, this will give consumers and communities much greater opportunity to generate their own renewable heat and electricity, and play their own part in tackling climate change.

The Government has a Microgeneration Strategy – do the electricity market reform objectives support the objectives contained in the Microgeneration Strategy?

### 2. 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 operators and generators will be in the best position to offer feedback on this question on technical matters. From a Cumbrian perspective, sparsity means that storage at the community and domestic scale is the greatest hurdle but also the area for greatest growth opportunities. This links to a wider need to support microgeneration and local grids to promote more sustainable and secure supply to the most rural areas of the UK, as well as improved connections through the North West Connections Project with investment from the National Grid.

This supports the aims contained in Cumbria's Strategic Economic Plan that seeks to develop the low carbon economic sector in Cumbria. The SEP seeks to promote the most efficient and sustainable use of energy generation capabilities found in Cumbria's natural environment. Delivery will be enabled through investment in the following four work programmes:

- Energy excellence – delivering Cumbria's renewable energy potential through Britain's Energy Coast and locally led low carbon energy projects.
- Access and support for innovation – developing current and emerging entrepreneurship in clean technologies.
- Energy and resource efficiency – business advice to SMEs to reduce costs, consumption and to enable business to fully utilise low carbon technology and investment in energy efficiency programmes.
- Market development – promoting existing technologies and innovation both locally and through export.

Cumbria would look for support to these objectives through the electricity market reform process.

Support should also remain for large scale electricity storage projects, to continue the demonstrations which have been financed under the Low Carbon Network Fund, the DECC Innovation Fund and through other agencies. This is needed in the short term, in order to provide continuity of projects and to overcome the challenges of financing project investment when there are uncertain forecasts for the income streams accessible to electricity storage projects under present market conditions.

There are some barriers that could prevent cost-effective interconnection being realised, such as:

- The ability of increased interconnection to reduce energy costs, lowering bills for consumers at a national level.
- Whether or not new connections are an effective method by which to improve security of supply, and
- The overall economic impact on the UK of a greater degree of interconnection, opening new markets and promoting renewables and microgeneration.

There may also be local and project-scale barriers to the future delivery of new connections and storage facilities. Areas like Cumbria can be at a disadvantage due to the long distances to existing grid connections (although this will be improved following delivery of the North West Coast Connections project) but this provides an incentive to consider community scale decentralised generation.

Energy efficiency is a fundamental element in the progression towards a future low-carbon economy. Actions to increase energy efficiency can make a significant impact in squaring the circle between an increased demand for energy and environmental protection, ensuring a move towards a more sustainable energy future.

There is a strong business case for energy efficiency. It enables consumers to save costs, businesses improve their competitiveness and overall productivity. There are also opportunities to develop new businesses that enhance efficiency across regions and sectors.

The Government published the Energy Efficiency Strategy in April 2014. This strategy places energy efficiency at the heart of government policy and the long term energy and climate change plan for low carbon growth.

The strategy is designed to refocus efforts on energy efficiency, establishing a common framework and driving the necessary action to help the EU achieve its 20% energy saving target for 2020.

Energy efficiency needs greater recognition and investment as a way of reducing reliance on energy imports, reducing demand and maintaining a safe margin of reserve power. Currently the long term benefits of improved energy efficiency are often regarded as less certain. Consequently, energy efficiency is undervalued relative to other investment options.

Are the measures contained in the Microgeneration Strategy, Energy Efficiency Strategy and Electricity Market Reform mechanisms aligned and compatible?

### **3. 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?

The UK needs to change how we prepare for, and manage, uncertainties in the future patterns of generation and demand. We also need to better consider how we develop and bring forward new technologies, especially renewables. This will in turn require innovative approaches to new networks and connections taking a holistic view on future energy security.

In Cumbria it will be important to develop the major projects in new nuclear, tidal and offshore wind that will support increased national energy security. In tandem with this, support is needed for the microgeneration supply chain to ensure it is properly equipped to cope with any rise in demand, as well as creating and sustaining jobs in Cumbria and more widely across the UK.

Government has shown some commitment in previous annual energy statements to the roll out of a smart grid. A smarter local grid could facilitate connectivity for power from microgeneration. It will also provide better visibility across the network and the means to integrate distributed low carbon generation into a broader low carbon electricity system.

The first step to a smart grid is the installation of smart meters which are currently being rolled out across the country. Some companies have already trialled new ways of operating the network through the Low Carbon Network Fund which closed early in 2015. The Electricity Market Reform

process could seek to build on this work and maintain the continued stimulus to champion the development of local grids.

The Electricity Market Reform process does not appear to make explicit reference to support for community energy and local grid connection. The application and current models of feed in tariffs have not supported community scale decentralised power generation as they have either been applied to domestic or commercial scale generation.

Cumbria is particularly exposed to oil price volatility and many properties are heated using expensive and inefficient electric systems. Cumbria is well placed to benefit from a smarter approach to decentralised energy, generated, used and owned by householders, local businesses, community groups, housing associations and councils. A fixed feed-in tariff for all scales of generation would help to make this happen and give the market the certainty it requires.

To help increase the use and supply of renewable and low-carbon energy, government could recognise, through the reforms the responsibility on all communities to contribute to energy generation from renewable or low-carbon sources. National policy should have a positive approach to the promotion of energy from renewable and low-carbon sources. At a regional and local scale planning authorities should be encouraged to identify suitable areas for renewable and low-carbon energy sources and supporting infrastructure.

#### **4. 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?**

New technologies in the form of renewable energy systems are beginning to increase in terms of generation capacity. There is a growing consensus globally that the growth of low carbon energy generation is essential for a secure and sustainable energy future.

Countries that are moving most quickly towards lower carbon generation tend to frame their overall energy strategy around long term cuts to emissions. The UK has a legally binding set of carbon budgets in place driven by the Climate Change Act so should be well placed to put in place the right kind of long term energy policy.

Perhaps a key question therefore should be: 'What is the impact (or potential) of renewables and low carbon generation on energy security and supply?'

Energy security and diversification of the energy mix is a major policy driver for renewables and overall energy diversification. Use of renewables can also reduce fuel imports and insulate the economy to some extent from fossil fuel price rises and swings. This certainly increases energy security. However, concentrated growth of variable renewables such as wind and solar can make it harder to balance power systems without the right investment in new types of local grid connections. In line with this, Cumbria will benefit from the North West Coast Connections project to upgrade the existing network.

The low carbon energy sector in the UK is demonstrating its capacity to deliver cost reductions but only when the right policy frameworks are in place and enacted. Costs are decreasing and a portfolio of renewable energy technologies has become increasingly cost-competitive in a wider range of circumstances, particularly established technologies that have received initial support or where resources are favourable, technologies such as onshore wind. Economic barriers do remain in many cases. In general, costs need to be reduced further. Fossil fuel subsidies and the lack of a global price on carbon are significant barriers to the competitiveness of renewables.