

## SUBMISSION FROM EDF ENERGY

### Key Messages

- EDF Energy is one of the largest generators within Scotland, operating over 2 GW of low carbon electricity generation capacity. We are committed to our future in Scotland, continuing to invest in the safe and reliable operation of our nuclear plants, as well as potential future construction of new wind generation on the mainland and islands of Scotland. EDF Energy supplies over 162,000 electricity and gas customers in Scotland, including the supply of electricity to the Scottish Government and we are committed to growing our customer base and to helping consumers improve their own energy efficiency
- Security of supply for Scotland is best managed as part of the integrated transmission connected system of Great Britain. System wide generation adequacy must be complemented by consideration of constraints on system operation, which typically affect different regions within the transmission system, differently depending on the network topology. We support the system operator and transmission system owners in undertaking these detailed studies and we recognise the importance of taking a holistic view of our electricity system to ensure that we find the right solutions to decarbonise electricity whilst ensuring security of supply and minimising the costs to customers.
- EDF Energy believes that the Electricity Market Reform (EMR) package, including the capacity market, provides the right framework to drive the transition to a decarbonised generation mix, whilst maintaining security of supply and minimising costs to consumers. We believe it is important for investor confidence that the momentum of EMR is maintained with minimal changes in the key mechanisms.

### About EDF Energy

EDF Energy is one of the UK's largest energy companies with activities throughout the energy chain. We provide 50% of the UK's low carbon generation. Our interests include nuclear, coal and gas-fired electricity generation, renewables, and energy supply to end users. We have over five million electricity and gas customer accounts in the UK, including both residential and business users.

EDF Energy is also one of the largest generators within Scotland producing low carbon electricity from the Hunterston (890MW) and Torness (1205MW) nuclear power stations and 212 MW of wind generation, representing 36% of Scottish electricity generation by volume in 2013. EDF Energy spends over £100m a year on its Scottish nuclear stations in staff costs, rates and investment, including maintenance and overhaul outages. Much of this goes back into the local community and we continue to engage with local suppliers.

EDF Energy also has a prominent position in the supply market, supplying 17% of Scottish electricity demand by volume in 2013 to customers including the Scottish Government. We have over 162,000 electricity and gas customers in Scotland, and we are committed to growing our customer base and to helping customers improve their own energy efficiency

EDF Energy continues to invest in the safe operation of its nuclear power stations, extending their lives where possible; this will enable Advanced Gas-Cooled Reactors (AGRs) such as Hunterston and Torness to continue to provide reliable low carbon generation capacity well into the 2020s.

We also plan to invest further in renewable generation in Scotland over the coming years, with 105 MW of onshore wind currently under construction, further demonstrating the commitment of EDF Energy to Scotland and utilising the good renewable resources that Scotland offers. There is additional potential capacity in our project pipeline, including the development of remote island wind with the Western Isles project.

As a major supplier and a major generator in Scotland and in the rest of Great Britain, EDF Energy is attuned to the needs of customers and we recognise the importance of taking a holistic view of our electricity system to ensure that we find the right solutions to decarbonise electricity whilst ensuring security of supply and minimising the costs to customers.

### **Ensuring Security of Supply**

We believe that it is essential to look at the electricity system in a holistic way and that the best way to ensure the security of supply for Scotland is to manage it as part of the integrated transmission connected system of Great Britain. This system must continue to have adequate capacity in both generation and transmission.

As the system operator, National Grid analyses generation and the transmission network through their Future Energy Scenarios (FES) and the Electricity Ten Year statement, which feed into DECC's policy considerations, including Electricity Market Reform (EMR). The conclusion of Ofgem's Integrated Transmission Planning and Regulation (ITPR) project has enhanced the role of the System Operator (SO) by giving it additional responsibilities to identify investment needs in the transmission network and develop options to meet those needs to ensure that they are met in an economic, efficient and coordinated way.

In its system security of supply analysis, National Grid considers Great Britain as a whole as well as on a national and on a regional basis. It focuses on ensuring that, not only is there adequate generation but also that the transmission network will work efficiently and effectively for all parts of Great Britain.

As a recent example of ensuring an appropriate level of electricity supply on a national level, National Grid, working with Scottish Power Electricity Networks and Scottish Hydro Electricity Transmission, awarded Peterhead CCGT a contract to offer voltage support from 1 April 2016 to 30 September 2017 to ensure security of supply until planned transmission works are complete. The contract was awarded through a competitive tender.

- **Supply and whether there is sufficient generation to meet demand, in particular to the end of the decade. *What role will new generation that is under construction, or has been consented play?* The Scottish Government aims to have a “largely decarbonised electricity system by 2030”. *What***

***does this mean in practice, and are there sufficient tools in place to bridge the move from fossil fuels to renewables?***

EDF Energy believes that the right policy measures are in place to ensure that there will be sufficient generation to meet demand to the end of this decade and beyond. We also believe that electricity generation must be largely decarbonised by 2030. This will require a diverse mix including nuclear, renewables and fossil fuel with CCS. Unabated gas-fired generation will also play a part in balancing the system but we see no place for unabated coal by the end of the 2020s.

The continuing growth of renewables in Scotland will play a key part in this, supported by its large natural resource base for renewable energy, the policy drive for greater penetration of renewables and the outstanding research and development skills within Scottish academia. EDF Energy has strong links with Scottish Universities across a range of low carbon energy related research development topics.

Decarbonisation is bringing with it a changing generation mix, presenting new challenges for the electricity system in Great Britain, requiring the delivery of new transmission infrastructure and management of the intermittent output of many renewable sources. The transmission network has to manage both those times when Scottish generation exceeds Scottish demand and power is exported to England and Wales and those times when the reverse is true and Scotland imports power from other parts of Great Britain.

The changing generation mix brings new challenges for the System Operator, including the maintenance of safe frequency and voltage levels through procurement of services to provide reactive power, frequency response, voltage control and inertia. These services are currently being procured by the System Operator in a satisfactory way with attention being given to regional and national needs as well as the system as a whole.

The cost consequences of intermittency include three significant elements: intermittent generation requires increased transmission infrastructure; it requires back up capacity for when it is not running; and, as the penetration of intermittent generation increases in the longer run, there will be an increasing cost arising from the curtailment of generation when the volume of intermittent and “must run” generation exceeds demand. Developments in electricity storage and smart grids may help to mitigate these costs although this is, as yet, unproven.

We believe that there is an increasingly strong understanding of the longer term challenges arising from decarbonisation. Many of the tools are already in place, including Electricity Market Reform to drive the necessary generation investment. However, there is a continuing need for further research and development to find cost-effective solutions to the technical challenges of system operation and of managing the consequences of intermittency.

- ***How predictable peak demand is at present, and how is this likely to change in the coming decade. In particular, what impact will the development of demand side response have? What could be done to improve developments in this area?***

It is necessary to have a long term view of expected peak demand to ensure that there will be adequate capacity to meet it. The many different macroeconomic and technical factors affecting demand have always made this a challenging task and we expect it to remain so. In particular, peak demands have fallen in recent years and it is important to understand the extent to which this is driven by macroeconomic factors and the extent to which it arises from improved energy efficiency. The growth in various forms of distributed generation has also made it more difficult to identify the underlying level of electricity demand. The most challenging times to meet demand will increasingly come when there is a combination of high demand and a low contribution from intermittent generation.

EDF Energy believes that the development of demand side response (DSR) will be beneficial to the extent that it proves a lower cost means of ensuring that demand is met. There are a number of different mechanisms that will support DSR: transitional arrangements for the EMR capacity market will start in 2016; National Grid's Demand Side Balancing Reserve will operate until 2018 and existing mechanisms such as triad avoidance and Short Term Operating Reserve (STOR) contracts continue in operation. The rollout of smart meters may provide new opportunities in future for customers to provide DSR.

EDF Energy recognises DSR, smart grids, energy storage and improvements in customers' energy efficiency as key areas for our research and development effort. Nevertheless, we recognise that there is uncertainty about the speed at which such developments will have a direct impact on the requirement for generation capacity.

**A number of new transmission network projects are currently under construction or being planned. *What role will these have in securing electricity supplies, and where should future investment be directed? What role might the distribution network, and a single European electricity market play in securing supplies?***

EDF Energy welcomes the development of transmission projects such as the Western HVDC project and the Beaulieu-Denny reinforcement that will both enhance security of supply in Scotland and improve the utilisation of Scottish renewable generation. Further transmission and distribution reinforcement, including connections to the Scottish islands, should be undertaken as necessary, subject to ensuring that this development is economically justified.

EDF Energy supports the further development of the European internal market through increased interconnection with other systems where this brings economic benefits. In general, we believe that incremental increases in interconnection between Great Britain and its closest neighbours are more likely to be beneficial than large interconnectors to more distant markets. Appraisal of proposals for new interconnection must also consider the point at which they connect to the transmission system in Great Britain and the consequent impacts on the system. Interconnection has the potential to improve security of supply but interconnectors can not be guaranteed to deliver when needed if, for example, the neighbouring system is under stress at the same time as Great Britain.

We note the continuing growth of distributed generation so that, for example, the North of Scotland distribution area is frequently a net exporter on to the transmission

network. We believe that there is a need for increased visibility to the system operator of generation that is “embedded” in the distribution network so that the system-wide impacts of this generation are fully understood.

- **A number of significant changes to the electricity market have recently been finalised and are being put in place to ensure competition and cost reflective prices for consumers. *Are policies such as the Capacity Mechanism under Electricity Market Reform adequate, and what other long term signals might be necessary to ensure security of supply?***

EDF Energy believes that Electricity Market Reform (EMR) package provides the right framework to drive the transition to a decarbonised generation mix, whilst maintaining security of supply and minimising costs to consumers. We welcome the broad consensus across political parties in support for EMR and we believe it is important for investor confidence that the momentum of EMR is maintained with minimal changes in the key mechanisms.

Within EMR, we believe that the Capacity Market provides the right mechanism to ensure that there will be adequate capacity on the system at the lowest cost to customers. Through competitive auctions, it procures capacity on a technology neutral basis from new and existing generators, demand side providers and interconnectors. The Capacity Market will provide a secure revenue stream to support the investment that EDF Energy is making to continue the safe and reliable operation of its nuclear power stations, including Hunterston and Torness. In addition, National Grid’s Supplemental Balancing Reserve and Demand Side Balancing Reserve provide interim measures to ensure security of supply before the start of the first delivery year of the Capacity Market in October 2018.

Other important elements of the EMR package are the Carbon Price Floor, which supports decarbonisation by ensuring that generators pay a proper price for their carbon emissions and the Contract for Difference (CfD) which directly supports investment in new low carbon generation. We note that 47% of the volume of contracts in the February 2015 auction for the first CfD allocation round was awarded to projects in Scotland. The UK Government has provided a signal of the funds available to support investment in low carbon generation through the Levy Control Framework up to 2020/21; early clarity on the Levy Control Framework for subsequent years would help renewable developers to plan future project pipelines.

**EDF Energy**

**May 2015**