

## SUBMISSION FROM OFGEM

### Introduction

1. Ofgem is the Office of Gas and Electricity Markets, the independent economic regulator of Great Britain's gas and electricity markets. We work effectively with, but independently of, government, the energy industry and other stakeholders. We do so within a legal framework determined by the UK government and the European Union.
2. Our principal objective is to protect the interests of existing and future consumers. The interests of consumers are their interests taken as a whole, including (but not limited to) value for money, and their interests in the reduction of greenhouse gases and in the security of the supply of electricity.
3. Ofgem welcomes the opportunity to submit our views to the Committee on security of supply. In our submission we provide more detail on our capacity analysis and the work Ofgem is doing under the themes the Committee have identified on demand side response, the transmission network, distribution network and integration with Europe.

### Security of supply

4. Energy security in Great Britain is achieved primarily through the operation of liberalised markets. However, given the importance and complexity of energy security, a number of bodies are responsible for monitoring and ensuring security of supply. The UK Government sets overall policy on energy security. Ofgem is responsible for regulating the competitive wholesale and retail energy markets and for regulating the energy networks in Great Britain. National Grid, as the System Operator (SO) of the GB electricity system, is responsible for balancing the electricity system by ensuring that generation on the national electricity grid matches demand on a second-by-second basis. To do this, they buy and sell energy and procure a number of balancing services to ensure both the security and the quality of electricity supply across the GB Transmission System.
5. We first raised concerns over security of supply in our 2009 Project Discovery report<sup>1</sup>, highlighting the new challenges faced by our energy system by changes to the generation mix over the next 10-15 years.
6. Our report prompted the UK Government to place an obligation on us to produce an annual assessment of electricity security of supply (the Electricity Capacity Assessment). The purpose of our report is to illustrate the levels of security that could be delivered by the market alone and in turn to inform our and the government's decisions on security of supply. We delivered our latest report to the Secretary of State in June 2014<sup>2</sup>, looking at the period 2014/15 to 2018/19.

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<sup>1</sup> Project Discovery, Energy Market Scenarios, 2009 <https://www.ofgem.gov.uk/ofgem-publications/40361/discoveryscenarioscondocfinal.pdf>

<sup>2</sup> Electricity Capacity Assessment 2014, <https://www.ofgem.gov.uk/publications-and-updates/electricity-capacity-assessment-2014>

7. Our 2014 Electricity Capacity Assessment, showed that without new measures being introduced the risks to the security of our electricity supply would increase up to 2015/16 because of a fall in the level of generation capacity, before then showing an improvement in the later years of our analysis.
8. There have been a number of responses to the increased risks to security of supply. The UK Government put in place the Capacity Market as part of the wider Electricity Market Reform (EMR) programme to bring forward the capacity needed to ensure security of electricity supply. Ofgem has an enduring role in this scheme both as the regulator of National Grid, who administer the EMR policies, and, in future, as owner of the rulebook for the Capacity Market, which governs the technical aspects of the policy.
9. In addition, due to the increased uncertainty in the mid-decade period, (before the Capacity Market is in place) we have approved new tools that National Grid can use to help balance the electricity system and manage lower margins, ie the New Balancing Services (NBS). Having these new tools in place means that the risk of disconnections for consumers is lower for winter 2015/16. This is a substantial improvement for consumers, and will bring the risks lower than UK Government's reliability standard for secure supplies.
10. Our Capacity Assessment is based on National Grid's Future Energy Scenarios which cover four different views of the electricity market and their outlook for security of supply, affordability and sustainability. These scenarios are used as the starting point to assess the required volume to procure for the Capacity Market and the New Balancing Services.
11. Both Ofgem and National Grid look at capacity and system operability across GB as the system is operated and balanced at a GB level. At the same time, National Grid also conducts a number of localised studies such as those published recently<sup>3</sup> on the security of electricity supply in Scotland, System Operability and Black Start Capability. This type of study allows it to assess the localised challenges a part of the network is likely to encounter and the services it needs to maintain the system within agreed Security and Quality Supply Standards.

### **Investment in the GB onshore transmission network**

12. Ofgem regulates the monopoly companies that own and operate the transmission and distribution networks across GB. We seek to protect consumers' interests by regulating the companies through price controls where we set the maximum amount of revenue that they can recover from users. These arrangements also seek to incentivise the companies to improve efficiency (keeping costs down for consumers), innovate technically and to act in line with the interests of consumers and other stakeholders.
13. Investment in transmission infrastructure contributes to security of supply in three main ways. It allows the connection of new generation to replace ageing or retired power stations and new sources of generation which increase the diversity of our power supply. Investment in infrastructure also strengthens the capability of the system to

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<sup>3</sup> <http://www2.nationalgrid.com/UK/Services/Balancing-services/System-security/Transmission-Constraint-Management/Transmission-Constraint-Management-Information/>

securely transport electricity from where new generation is built to where demand is located. Extending the transmission system into new areas can also increase operational flexibility.

14. We have approved funding for more than £2.9 billion investment in the Scottish transmission system which is currently under construction (as shown in table 1).

*Table 1: Major transmission investment being built in Scotland in 2009/10 prices*

<b>Project name</b>	<b>Additional capacity</b>	<b>Scheduled Delivery date</b>	<b>Cost (£m)</b>
Beaully Denny	1,200MW	2016	£690
Western HVDC	1,200MW	2017	£1,051
Kintyre Hunterston	270MW	2016	£174
Beaully Mossford	252MW	2015	£46
Caithness Moray	800MW	2018	£959
<b>Total</b>	<b>4,422MW</b>		<b>£2,920</b>

15. A further £2.5 billion investment in the Scottish transmission system could be needed to connect new generation under the current price control period, 2013-2021 (as shown in table 2). Large new Scottish transmission projects will be considered under the Strategic Wider Works arrangements, which allow SHE Transmission and SP Transmission to invest in additional transmission projects when more information is available about the project. This flexibility helps to manage uncertainty and ensure value for money for consumers by progressing large transmission projects at the most appropriate time.

*Table 2: Future potential projects*

<b>Project name</b>	<b>Reason for investment</b>	<b>Estimated cost (£m)</b>
East Coast upgrade	Increase in north south flows	£215
Western Isles link	New generation on Lewis	£700 to £900
Shetland Isles link	New generation on Shetland	£600
Orkney link	New generation on Orkney	£200
Dumfries Galloway	New generation in southwest Scotland	£230

Denny Wishaw	Increase in north south flows	£350
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16. The charges users pay to use the transmission network are designed to reflect how much the owners of the transmission system will have to invest in the network to accommodate that customer. This applies to generators who are transmitting power over the network and to demand customers who rely on the network to provide them with power. Generators pay roughly one quarter of these charges, while consumers meet three quarters of these costs through their electricity bills.
17. In 2010 we began a review of the transmission charging arrangements under Project TransmiT. Our aim was to consider whether and in what way transmission charging should respond to the increasing amounts of renewable generation on the system. We concluded that it was in the best interests of consumers to continue with a cost reflective system but we proposed changes to better reflect the way in which different users impact on the network, for example generators who transmit power intermittently. Without a signal to enable generators to account for the costs they impose on the system decisions would not be efficient leading to higher costs for GB consumers in the long term. The importance of a locational price signal in delivering efficient outcomes is seen on the demand side as well where some large energy users already respond to price signals and contribute to a more efficient energy system. For example, some customers change their consumption at winter peak times which reduces their transmission charges. This could avoid or defer costly investments in the transmission networks.

### **System planning**

18. In March 2015 we concluded the Integrated Transmission Planning and Regulation project (ITPR)<sup>4</sup> which considered whether the existing arrangements for planning and delivering the onshore, offshore and cross-border electricity transmission networks were fit for purpose. Our aim was to ensure that transmission is developed in an efficient, coordinated and economic manner, with the right investments made to protect existing and future consumers.
19. An efficient transmission system should help ensure an appropriate level of security of supply whilst protecting consumers from paying for capacity that is not needed.
20. Following ITPR the System Operator will be given additional responsibilities to identify the need for investment in the transmission network, and coordinate and develop investment options. This will include a new network options assessment process, which will assess options for reinforcing or extending the GB network and the economic impact of additional interconnector capacity.

### **Demand-side response and system flexibility**

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<sup>4</sup> Integrated Transmission Planning and Regulation project: final conclusions, <https://www.ofgem.gov.uk/publications-and-updates/integrated-transmission-planning-and-regulation-itpr-project-final-conclusions>

21. At present, demand is driven by fairly predictable consumption patterns and by the weather. Demand-side response (DSR) – consumers changing their consumption in response to a price signal - is already used by large customers to address problems at times of system stress, such as peak times, when potential demand could run ahead of supply.
22. In the coming years, however, domestic and small non-domestic customers could play a key role in increasing the resilience of the energy system by providing demand-side response. The smart meter roll-out, the electrification of heating and cooking, the uptake of electric vehicles and of microgeneration could represent an opportunity to better manage peak demand and therefore increase the resilience of the energy system.
23. Through DSR, consumers change their energy consumption, for example by lowering their heating, in response to a signal. There is therefore an opportunity for industry to offer products to incentivise consumers to shift or reduce their consumption in order to balance demand and supply during certain periods, such as peak times. This could deliver several benefits to the system and therefore to consumers: it will reduce the amount of generation capacity needed to meet demand, it will contribute to making the most of a diverse generation mix that includes renewable generation, and it will help avoid or defer investments in the transmission and distribution networks. Industry parties and consumers will benefit from reduced energy costs.
24. To realise the benefits of DSR, it is important that industry parties have the incentives to develop innovative products, and that consumers are willing to engage when required. Ofgem's work on system flexibility - which includes demand-side response, energy storage and distributed generation – aims at developing a strategy that clearly sets out what actions we intend to take to facilitate the use of flexibility sources in the energy system. We will publish our strategy in summer 2015.
25. Through the Smart Grid Forum we are examining the commercial and regulatory challenges to implementing a smart grid in Great Britain. Both these areas of work use learning generated by our Low Carbon Network Fund (LCN Fund).

Under the LCN Fund Second Tier, two Scottish projects have secured funding towards projects totalling over £15m expenditure. Scottish Power's project "Accelerating Renewable Connections" is a collaboration with Community Energy Scotland, Smarter Grid Solutions and the University of Strathclyde which aims to reduce the time taken and cost to connect distributed generation. DNOs also receive funding for smaller-scale innovation projects through an innovation allowance in the price control. SSE used funding to support the development of the Orkney Energy Storage Park which has led to the installation of a battery to support the Active Network Management system and help reduce constraints on the network.

26. Alongside traditional forms of transmission-connected generation, recent years have seen the dramatic growth of smaller-scale generation connected at distribution level. Following the introduction of the Feed in Tariff (FIT) scheme 2010, Scotland now has a significant amount of distributed generation providing a potentially valuable source of energy to assist in maintaining security of supply and helping to decarbonise the energy sector.

Table 3 shows the capacity of renewable generation connected under the FIT scheme as of December 2014. This represents 328.2MW of generation.

<b>Technology</b>	<b>Total installed capacity</b>
Anaerobic digestion	2.9MW
Hydro	53.2MW
Photovoltaic	150.1MW
Wind	122 MW
<b>Total</b>	<b>328.2MW</b>

Source: Central FIT Register, December 2014

## **The Single European Energy Market and the role of interconnectors**

27. The UK and other EU member states are committed to establishing a single European energy market to reap the benefits of trade in terms of lower prices and better security. Ofgem is playing our part to establish a common set of market rules to facilitate cross-border trade. We have also developed a regulatory regime to support greater interconnection capacity.
28. Electricity interconnectors - physical links with other countries – can increase security of supply through strengthening the transmission system and increasing potential supply sources. This is enhanced further when connecting to systems that have significantly different energy mixes which can help to balance the intermittency of GB renewable energy sources (ie wind).
29. There are currently four interconnectors between GB and Europe, providing 4GW of electricity capacity. This represents around 5% of Britain’s electricity supply. We recognised that interconnection between GB and other markets was limited and have developed a regulated regime to encourage projects to come forward called the ‘cap and floor’ regime. Through this approach, if developers’ revenues exceed the cap, then revenue above the cap is returned to consumers. If their revenues fall below the floor then consumers top up revenues to the level of the floor. Consumer gains and costs are passed on through network charges.
30. In 2014, five projects applied for cap and floor regulation in our first application window. We have issued a minded-to decision to approve four of these projects representing an additional 4.8GW of capacity, one interconnector to Norway, one to Denmark and two additional connections to France.<sup>5</sup>
31. Combined with two earlier projects, the interconnector projects currently being progressed represent a substantial increase in GB electricity interconnector capacity. These projects and those already in operation could increase GB’s interconnector capacity from 4GW to slightly under 11GW.
32. The regime is ongoing and we intend to open a second application window in 2015 for future projects that wish to be considered for the cap and floor regime.

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<sup>5</sup> In March 2015 we made a decision to grant a cap and floor in principle to the NSN project to Norway. We also consulted on a minded-to position to grant a cap and floor regime to the FAB Link, IFA2 and Viking Link projects, but not to the Greenlink project.

## **Conclusion**

33. Even over the relatively short time horizon of our capacity analysis, there is significant uncertainty over the security of supply outlook across GB. In this submission we have sought to explain the action that Ofgem has taken to provide National Grid with the tools to manage these risks in the short term, while the UK Government's Capacity Market is designed to address security of supply risks in the medium-term and beyond. We have also set out how we promote security of supply through our economic regulation of the electricity networks, and through our forward looking projects such the network innovation competitions and on DSR, the flexibility project.
34. While no electricity system anywhere in the world can give a 100 per cent guarantee we are confident that National Grid has the right tools to keep the lights on for GB consumers. However, given the tighter margins at this time there is no room for complacency. We will be happy to provide any further information to the Committee on our role and our analysis of security of supply across GB.