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## PARLIAMENTARY BRIEFING

# Power Generation – Keeping the lights on to 2020

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23<sup>rd</sup> January 2013

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*This briefing covers: will current power capacity meet demand? how much new gas capacity is needed from now to 2020? how secure is the system and can we avoid power cuts?*

### Background

Over the last two decades, the UK's power sector has mainly consisted of a mix of coal, gas and nuclear power generation. However, to respond to the challenge of climate change and reducing air pollution from electricity generation, the UK's electricity generation mix is undergoing a period of rapid change. The Large Combustion Plant Directive will require a number of old coal fired power stations to close by 2015 whilst renewables are expected to provide approximately 30% of the UK's total electricity supply by 2020.

### Current Security of Supply - UK

There is currently a high level of spare generation capacity across the UK. Figures from DECC and Ofgem on de-rated capacity margins<sup>1</sup> indicate that the UK currently has a healthy capacity margin<sup>2</sup> of between 14 and 20%<sup>i</sup> (DECC and Ofgem's figures differ slightly).

### Current Security of Supply - Scotland

Scotland is a net exporter of electricity and has been for a number of years. In 2010, net exports to England and Northern Ireland accounted for 20.8% of total generation<sup>ii</sup>. Where power cuts have occurred in Scotland over recent years (for example during the winter 2011-12<sup>iii</sup>) these were caused by adverse weather which affected the electricity transmission and distribution systems. Fluctuating levels of output from wind turbines are managed by National Grid and were not responsible for power cuts during these periods. There are no recent examples of power cuts in Scotland being caused by a shortage of generation capacity.

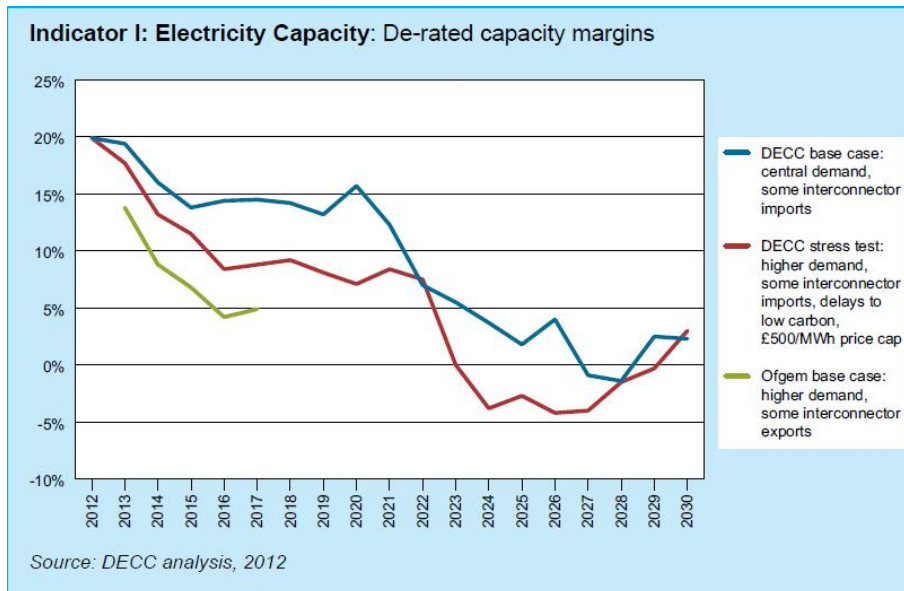
### How much new capacity is needed? 2012-2020

The graph below was included in DECC's Energy Security Strategy which was published in November 2012<sup>iv</sup> and shows assessments from Ofgem and DECC on electricity capacity margins.

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<sup>1</sup> That is, the excess of available generation over demand taking into account expected intermittency and outages.

<sup>2</sup> That is, excess capacity above peak demand levels.

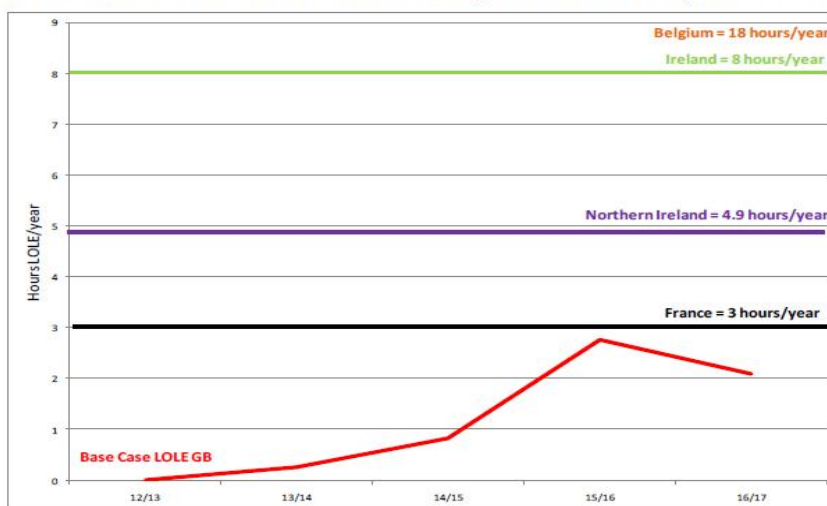


The UK is currently over supplied with generation capacity. Margins are expected to fall from now to 2016 as existing plants close, but remain healthy with a very low risk of disconnection. According to the Energy Security Strategy "A tightening of margins is to be expected in a competitive market with an over-supply of generation capacity."<sup>v</sup>

### How will UK/Scottish security of supply compare to other European Countries?

Looking ahead to 2015/16, capacity margins will be significantly lower than they are today, but, according to Ofgem, "the most likely implications are small, occasional shortfalls which could be dealt with by National Grid through demand-side action, with little or no impact on customers. The annual loss of supplies arising from transmission and distribution outages is typically more than three times this amount. The associated loss of load expectation (LOLE)<sup>3</sup> is within the reliability criteria used by neighbouring European countries including France, Ireland and Belgium." None of these countries are known to have problems with power failures. This is illustrated in the graph below which is taken from Ofgem's Electricity Capacity Assessment<sup>vi</sup>.

Figure A6.7 GB Base Case LOLE and Reliability standards set by other countries



<sup>3</sup> Loss of Load Expectation (LOLE), one of the key metrics used to measure the risk of a shortfall in electricity supply

## How much new build gas capacity is needed over the period to 2020?

DECC's modelling assumes a 10% capacity margin as the specified policy objective for the Capacity Market<sup>vii</sup>. DECC's base case modelling indicates that capacity margins are unlikely to dip below this level before 2020. In DECC's stress test and Ofgem's analysis, capacity margins are lower and fall below 10% before 2020. However, even in Ofgem's scenario the level of security of electricity supply anticipated in 2016/17 is comparable to capacity margins in 2005/6, a year in which there were no customer disconnections<sup>viii</sup>, and risks of supply not meeting demand are still low.

Figures from DECC and Ofgem suggests that whilst some new gas fired power generation may need to be built in second half of the decade, 3-4GW of new plant should be sufficient. Analysis also shows that measures to reduce electricity demand, demand side response, storage and interconnection capacity all have the potential to significantly reduce the amount of new generation required<sup>ix</sup>.

### Conclusion

The UK currently enjoys a surplus of electricity generation with correspondingly low levels of risk that supply will not be sufficient to meet demand. This level is expected to drop over the coming decade, but neither Ofgem nor DECC see a significant risk to supply in the short term.

To ensure some continued spare capacity, modelling by both DECC and Ofgem suggests that around 3-4GW of new gas generation capacity will be sufficient to maintain security of electricity supply to 2020. After 2020, more new capacity is likely to be required.

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<sup>i</sup> <http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/energy-security/7101-energy-security-strategy.pdf> and <http://www.ofgem.gov.uk/Markets/WhIMkts/monitoring-energy-security/elec-capacity-assessment/Documents1/Electricity%20Capacity%20Assessment%202012.pdf>

<sup>ii</sup> <http://www.scotland.gov.uk/Publications/2012/03/2818/4>

<sup>iii</sup> <http://www.bbc.co.uk/news/uk-scotland-16079849>

<sup>iv</sup> <http://www.decc.gov.uk/assets/decc/11/meeting-energy-demand/energy-security/7101-energy-security-strategy.pdf>

<sup>v</sup> *ibid*

<sup>vi</sup> <http://www.ofgem.gov.uk/Markets/WhIMkts/monitoring-energy-security/elec-capacity-assessment/Documents1/Electricity%20Capacity%20Assessment%202012.pdf> p87

<sup>vii</sup> <http://www.decc.gov.uk/assets/decc/11/policy-legislation/Energy%20Bill%202012/7103-energy-bill-capacity-market-impact-assessment.pdf>

<sup>viii</sup> <http://www.decc.gov.uk/assets/decc/11/policy-legislation/Energy%20Bill%202012/7103-energy-bill-capacity-market-impact-assessment.pdf>

<sup>ix</sup> <http://www.ofgem.gov.uk/Markets/WhIMkts/monitoring-energy-security/elec-capacity-assessment/Documents1/Electricity%20Capacity%20Assessment%202012.pdf> p86 and [http://assets.wwf.org.uk/downloads/positive\\_energy\\_glgh\\_technical\\_report.pdf](http://assets.wwf.org.uk/downloads/positive_energy_glgh_technical_report.pdf)