

Survey Response – David Milborrow, Consultant

<p>Question 1: How do National Grid's observations align with your experience or modelling of wind generation?</p>	<p>NG quotes a standard deviation in the four-hour swings of wind output of 10%. Using actual data from the 2400 MW of wind power in western Denmark, I have derived exactly the same figure. This has been quoted in various places, including the paper recently completed for the World Wildlife Fund and available on their web site. My Estimate of the standard deviation of the one-hour swings is 10%.</p>
<p>Question 2: Are we correct in assuming that wind generation is controllable enough to assist in operating the networks?</p>	<p>Yes. This is not my specialist area but as far as I can see the discussion is accurate</p>
<p>Question 3: Should National Grid assume that Supercritical Coal generators will provide some flexibility in operation which will assist in operating the networks?</p>	<p>Yes</p>
<p>Question 4: Should we assume that Nuclear generators will continue to concentrate on base-load operation?</p>	<p>Yes. Quite apart from any technical considerations, nuclear generators will wish to maximise their generation in view of the capital-intensive nature of the technology.</p>
<p>Question 5: Is it likely that Carbon Capture plant will impose material restrictions on the operation of electricity generating plant?</p>	<p>Yes. In view of the embryonic nature of CC technology, there is likely to be an element of uncertainty.</p>
<p>Question 6: Are there other aspects of tidal or marine technologies that we should consider further at this stage?</p>	<p>No</p>
<p>Question 7: Are there other restrictions we should consider in developing a view on gas fired generator flexibility?</p>	<p>These paragraphs appear to be a succinct summary of the relevant technical and economic issues.</p>
<p>Question 8: What is your view of future electricity demand growth and how would you quantify any uncertainty around this?</p>	<p>Not my specialist area of expertise</p>
<p>Question 9: Are there other developments which will change the way that electricity will be consumed in 2020 that we should consider?</p>	<p>I identified a similar range of possibilities in my paper for the World Wildlife Fund, cited earlier.</p>
<p>Question 10: Do you share our view that distribution companies, suppliers, aggregators and ourselves will all value and compete for demand side services?</p>	<p>Yes</p>
<p>Question 11: Are our assumptions around the number of electric vehicles in 2020 reasonable?</p>	<p>Yes. In appendix 3 of my report to the World Wildlife Fund, I suggested that the electricity needs of all cars might be around 46 TWh (the supporting arithmetic is explained) NG is suggesting that roughly 10% of the fleet would demand 6 TWh. The estimates are of the same order with National Grid, perhaps, assuming a greater demand per vehicle.</p>
<p>Question 12: Is it valid to assume that electric vehicle charging will be co-ordinated via a smart grid or something similar and will react to price signals?</p>	<p>Yes. I identified a similar range of possibilities and drawbacks in my report for WWF. Would it be more realistic to assume that overnight charging is discouraged until well after the evening peak?</p>
<p>Question 13: Do you foresee a greater or lesser role from embedded and distributed generation than we have assumed?</p>	<p>Lesser</p>

Question 14: Is our anticipated improvement in wind forecasting performance at 4 hours ahead achievable?	Yes. Given the considerable research funding in the area of forecasting, plus promising results so far, this should be achievable.
Question 15: Do you have any views on our projected Short Term Operating Reserve requirement under 'Gone Green'?	The estimates of STOR in the consultation document are consistent with estimates I have made.
Question 16: Do you have any views on our projected volumes, prices and costs for STORR under 'Gone Green'?	Prices are difficult to predict, given the uncertainty in future fossil fuel prices.
Question 17: Is National Grid's current view that 'low wind' events across Great Britain need to be considered when evaluating electricity operating margins reasonable?	Yes. "Low wind" events need to be considered but, on the other hand, the data presented in the document confirms previous studies that the wind energy is not consistently "missing" during periods of peak demand. I see no reason to doubt the conclusions of the four independent studies cited in my WWF report that suggested that capacity credit of wind corresponds to about 40% of wind capacity at low penetration levels, falling to around 12% of wind capacity at the 40% penetration level.
Question 18: Are our generator availability assumptions reasonable for application to analysis of future operating margins?	Yes
Question 19: We would welcome comments from market participants on how they expect to manage periods of low wind generation output and whether this is an important consideration for them.	I am not a market participant.
Question 20: Are we correct to highlight the importance of wider European issues in electricity operating margin analysis?	Yes
Question 21: Are there further technical solutions for maintaining operating margins which we have not mentioned here?	Cannot think of any.
Question 22: Do you think National Grid's view of future operating margins is useful and do you have views on how this should be presented?	Yes
Question 23: Are our assumptions regarding the level of electricity demand during the minimum demand periods reasonable?	Yes
Question 24: Are our generation availability assumptions for minimum demand periods reasonable?	Yes
Question 25: Is our central assumption regarding wind generation bid prices related to ROCs reasonable?	Not my area of expertise
Question 26: Is it reasonable to assume that minimum demand periods will be managed using Interconnectors and Wind Generation in preference to the curtailment of Nuclear Generation?	Yes
Question 27: Do you agree with National Grid's view of increased balancing activity in the future due to variation in market length?	Yes

Question 28: Do you agree with National Grid's view that ramping effects will impact on operation of the networks?	Yes. NG's estimates of changed ramp rates with wind show a similar pattern to the estimates I derived from looking at the performance of the network in western Denmark. (Proceedings of the Institution of Civil Engineers, Energy. Vol 162, issue EN3, pp105-111.) I looked at the "net" changes (demand minus wind) for 26% wind energy -- the current level -- and 39% wind.
Question 29: Do you believe that a new approach is required in the development of System Operator to generation or demand control point interfaces for 2020?	Yes. Possibly. As the amount of wind on the system builds up, there will be plenty of time to assess the need for actions.
Question 30: Are there any specific factors which suggest that adequate flexibility will not be available to National Grid for use in operating the networks in 2020?	No
Question 32: What criteria should National Grid use in developing any requirements for information regarding embedded generators? Are there other ways of obtaining this information?	Not my area of expertise
Question 33: Are there additional options that National Grid should consider to maintain a Black Start capability?	Not my area of expertise
Question 34: Are we correct in assuming that new interconnectors will be able to meet some of our Balancing Services requirement?	Yes
Question 35: What is your view on the potential of electric vehicles to provide balancing and other energy services?	There is a significant potential, which is perhaps best exploited through "dynamic demand" principles, minimising the cost to the System Operator. "Smart Meter" technology, in this country, seems to be limited to providing information, rather than action -- but this could change.
Question 36: How much of the electricity demand in Great Britain do you think could be regarded as discretionary or deferrable and hence available for use as a Balancing Service or other energy service?	5%
Question 37: What specific actions should National Grid take to facilitate Balancing Services from demand-side providers while maintaining the required quality and volume of service?	Should be left solely to National Grid? Is there a case for concerted action with DNOs? Could this be managed by tariffs, rather than complex bidding processes?
Question 39: What are the prospects for the provision of Balancing Services from new OCGTs or other 'Back-Up' generation?	The system operator in western Denmark assumed that OGTs would play a part in "high wind" scenarios and this seems a logical assumption.
Question 40: Is our mapping of technology to Balancing Services reasonable?	Yes
Question 41: Is a statement of National Grid's view of its long term Balancing Services requirement useful to industry stakeholders?	Not an industry stakeholder
Question 42: What period should a long term Balancing Services Requirement statement cover?	3