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Operating the Electricity Transmission Networks in 2020
Initial Consultation

Dear Sir,

Thank you for the opportunity to comment on the initial consultation document "Operating the Electricity Transmission Networks in 2020". This response is provided on behalf of the RWE group of companies, including RWE Npower plc, RWE Supply and Trading GmbH and RWE Innogy.

The GB energy market faces a number of significant challenges over the period to 2020 in relation to the investment required to accommodate a major increase in the volume of renewable generation connected to the GB transmission system. One aspect of this is the operation of a transmission system that comprises a large volume of less predictable renewable generation, mostly based on output of wind farms. The consultation represents an opportunity to consider the challenges faced and to develop a blueprint that will enable National Grid and market participants to anticipate and overcome these challenges. Our answers to the specific questions raised in the consultation are included in the attachment to this letter. As a general point we believe that market based solutions are preferable to any administered solution. Market solutions have the capability of delivering flexible and innovative responses to the issues raised.

Furthermore we believe that it is important for National Grid in its role as system operator to provide appropriate initiatives that enable market participants to develop and deliver services within appropriate timescales. This should allow, for example, signals with appropriate investment lead times and services that enable users to earn adequate returns on any investment. We note that this may mean that National Grid should offer long term contracts that span more than one price control period. We believe that any further consultation should address the role of the system operator and market participants in delivering any enduring solutions to the issues raised.

If you wish to discuss any aspect of our response, please do not hesitate to contact me.

Yours faithfully,

By email

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Attachment 1: Answers to specific questions

Section 5. Developments in Electricity Generation and Demand

Question 1: How do National Grid's observations align with your experience or modelling of wind generation?
We concur with National grid that the output of wind farms is inherently variable and difficult to predict with any degree of accuracy. We also note that we would expect that increased capacity of wind to the system, its geographical dispersion and the economic incentives to balance should all help to improve forecast accuracy, though we would expect that variability will remain a persistent feature associated with GB system operation.

Question 2: Are we correct in assuming that wind generation is controllable enough to assist in operating the networks?
Given the current ROC-based incentive scheme we do not believe that there are sufficient economic incentives on parties to provide controllable generation that would assist in system operation. We would expect that conventional thermal generation will continue to play an important role in the provision of services to National Grid.

Question 3: Should National Grid assume that Supercritical Coal generators will provide some flexibility in operation which will assist in operating the networks?
We expect that supercritical coal generators would comply with the relevant Grid Code connection conditions, though we note that the technical availability of certain services may be constrained given the nature of the technology. The availability of flexibility from supercritical coal will depend on the prevailing economic incentives to provide ancillary services.

Question 4: Should we assume that Nuclear generators will continue to concentrate on base-load operation?
We support the assumption that nuclear generators will continue to operate as base load power stations.

Question 5: Is it likely that Carbon Capture plant will impose material restrictions on the operation of electricity generating plant?
We agree that at this stage it is difficult to envisage any specific restrictions on the delivery of system services arising from carbon capture plant. However we would note that until Carbon Capture plant is successfully demonstrated at a commercial scale it is difficult to assess fully the potential operational constraints. Factors such as the operating rules with or without capture, environmental (emissions) control arrangements and efficiency considerations may all impact operation.

Question 6: Are there other aspects of tidal or marine technologies that we should consider further at this stage?
None

Question 7: Are there other restrictions we should consider in developing a view on gas fired generator flexibility?
None

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Question 8: What is your view of future electricity demand growth and how would you quantify any uncertainty around this?
There are a number of differing ways that electricity use will evolve over the period to 2020. For example, there could be significant growth in the use of electric vehicles. Alternatively smart metering may reduce or smooth peak demand electricity consumption. We believe that the only way to model the uncertainties associated with demand growth is through scenario based analysis.

Question 8: What is your view of future electricity demand growth and how would you quantify any uncertainty around this?
There are a number of differing ways that electricity use will evolve over the period to 2020. Key factors could include the extent to which Smart Metering impacts on demand patterns particularly at the peak, the electrification of heat with ”zero carbon” houses” and the electrification of transport, particularly rail lines though the use of electric vehicles (and the associated demand management and storage potential) may have some impact. We believe that the only way to model the uncertainties associated with demand growth is through scenario based analysis.

Question 9: Are there other developments which will change the way that electricity will be consumed in 2020 that we should consider?
There may be potential for increased use of electricity for space heating and water heating purposes while, as noted above there may be significant possibility of increased demand management and energy storage through electric vehicles.

Question 10: Do you share our view that distribution companies, suppliers, aggregators and ourselves will all value and compete for demand side services?
We are uncertain as to the role of distribution companies in the provision of demand side services. This would be a new role for DNOs requiring active network management. Furthermore, DNOs are unable under to provide such services under the terms of their current distribution licences. We believe that suppliers and their customers connected to the DNO networks should be the providers of demand side services.

Question 11: Are our assumptions around the number of electric vehicles in 2020 reasonable?
It is difficult to assess whether the assumed number of electric vehicles in 2020 is “reasonable”. The scenario as presented provides a plausible scenario for the development of this important element of demand growth.

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?
It would be logical to assume that recharging of electric vehicles will be determined by price signals which may be facilitated by smart grid technology. However, at least initially, it is likely that customers with charge their electric vehicles at home and overnight using “spare” capacity. It is feasible to charge electric vehicles through a normal 13 amp socket, although faster charging is possible through three-phase sockets. Smart metering is not a prerequisite for coordination of electric vehicle charging, simple switching or socket timing devices in conjunction with appropriate tariff incentives could facilitate vehicle charging.

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Question 13: Do you foresee a greater or lesser role from embedded and distributed generation than we have assumed?
The scenario as presented appears plausible given that it is the one that favours “green” technology.

Section 6. Reserve and Operating Margin

Question 14: Is our anticipated improvement in wind forecasting performance at 4 hours ahead achievable?
It is difficult to assess whether the improvement in wind forecasting performance if achievable. However, if the current economic signals are provided it would be expected that forecasts of wind output will improve in accuracy over time.

Question 15: Do you have any views on our projected Short Term Operating Reserve requirement under 'Gone Green'?
While it is difficult to predict the actual level of the requirement for short term operating reserve it is probable that there will be an increased requirement as a consequence of the scale and extent of intermittent generation connected to the transmission system. In this context it is important that National Grid provide clear and consistent indications of the likely level of the requirement over the period up to 2020 and that these are updated from time to time according to a clear timetable for such updates.

Question 16: Do you have any views on our projected volumes, prices and costs for STORR under 'Gone Green'?
The projections represent a plausible view of the volumes, prices and costs for STORR under a scenario with a significant volume of intermittent generation connected to the transmission system.

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?
We believe that it is appropriate to consider the effect of periods associated with low wind on the operation of the GB transmission system. In this context we believe that it is important to consider the regional effects of periods of low wind output particularly on a transmission system where there may be long standing constrained boundaries. For example periods of low wind could have a significant impact within Scotland.

Question 18: Are our generator availability assumptions reasonable for application to analysis of future operating margins?
The assumptions appear plausible.

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.
We would expect that periods of low wind generation would correspond with periods of high electricity prices. We would expect to respond to the market signals by scheduling available generation to take advantage of the opportunities that arise. We would also expect parties to hedge risks associated with periods of low wind output in the forward market with a corresponding effect on forward electricity prices. Market signals from electricity prices and National Grid contracting will encourage investment in flexible technologies that will address the issues for system operation.

Question 20: Are we correct to highlight the importance of wider European issues in electricity operating margin analysis?
We would expect that the commissioning of new interconnectors will ensure that the wider European market will have an increasing influence on the GB electricity market.

Question 21: Are there further technical solutions for maintaining operating margins which we have not mentioned here?
The extent to which forms of “electricity storage” develop under the “Gone Green” scenario will have an important influence on outcomes for operating margins.

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?
National Grid’s views on operating margins provide an important signal of likely outcomes under various different scenarios. These influence investment and plant closure decisions. Therefore we believe that it is important that National Grid continue to provide consistent and periodic views on the development of operating margins under a variety of scenarios in the GB market.

Question 23: Are our assumptions regarding the level of electricity demand during the minimum demand periods reasonable?
The assumptions appear plausible. However, appropriate time of day pricing should, if in place for a sufficient period, give incentives for consumers to shift demand to these periods or engender new uses of electricity - such as transport or heating - which have the effect of increasing minimum demand.

Question 24: Are our generation availability assumptions for minimum demand periods reasonable?
The assumptions appear plausible.

Question 25: Is our central assumption regarding wind generation bid prices related to ROCs reasonable?
The assumption appears sensible.

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?
We would expect that curtailment of nuclear generation would represent a last resort action under emergency conditions. Therefore we would expect all other options will be exercised prior to the acceptance of bids on nuclear stations. We would also expect that bids on nuclear stations would be the most expensive form of action and therefore we would expect that all other actions would be utilised for economic reasons prior to bids on nuclear stations.

Section 7. Operating the Networks

Question 27: Do you agree with National Grid's view of increased balancing activity in the future due to variation in market length?
In the absence of reform of cash out to introduce a sharper incentives to balance (e.g. through the introduction of a single marginal price) we would expect that the volume of intermittent to contribute to increased net imbalance volumes. Consequently further balancing activity will be required.

Question 28: Do you agree with National Grid's view that ramping effects will impact on operation of the networks?
We agree that ramping effects from new generation can have an impact on operation of the networks, particularly at a local level.

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?
We do not believe that a “new approach” is required to generation or demand control interfaces at this time. Rather we believe that the existing arrangements can be developed to accommodate the increased connection of intermittent generation. However, if an economic case can be made then automatic instructions to power stations may result in both more efficient system and market operation.

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?
We do not believe that there will be a shortage in flexible generation since we expect that the appropriate market signals will emerge and market participants will respond accordingly.

Question 31: The combined challenge of:
a) ensuring the networks are operated safely and securely against a background of generation variability; whilst
b) getting more from existing infrastructure;
suggests to us that control, communication and information systems have a greater part to play in controlling flows across the transmission networks.
Are there alternative approaches which should be considered?
We believe that the existing approaches can be adapted to meet the challenges outlined in this section.

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?
We believe that the transmission access arrangements for embedded generation require further consideration alongside the role of the distribution network operators. This should be linked to the role of more active management of distribution networks, exports from distribution networks, feed in tariffs and smart metering. The contractual relationships between National Grid, DNOs, embedded generation and demand side customers also require review to ensure there are consistent arrangements between those players connected to the transmission system and those connected to the distribution networks.

Question 33: Are there additional options that National Grid should consider to maintain a Black Start capability?
Existing market based solutions should be developed for the delivery of black start services.

Section 8. Balancing Services

Question 34: Are we correct in assuming that new interconnectors will be able to meet some of our Balancing Services requirement?
This assumption appears sensible in the “Gone Green” scenario.

Question 35: What is your view on the potential of electric vehicles to provide balancing and other energy services?
While there is potential for electric vehicles to provide balancing and other energy services such capability is unproven. We believe that the provision of services from such diverse and dispersed service providers will require new metering and billing technologies and active coordination of activities. This may be expensive to deliver in reasonable timescales when compared with other service providers such as, for example, pumped storage facilities. Therefore it is important that National Grid considers developing appropriate long term market signals that enable service providers to develop conventional balancing and other system services.

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?
Electricity demand is typically relatively inelastic in the short term and at current price levels and structures. Smart metering and associated economic incentives may encourage greater demand side participation, including deferral of demand, if final consumers are faced with appropriate price signals over a long enough time periods. There should be economic incentives to avoid consumption in periods of high electricity prices which smart metering would make possible.

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?
National Grid must ensure that the appropriate incentives are established to ensure that market participants are capable of delivering economic and efficient services.

Question 38: Are there further aspects of storage or other storage technologies we should consider when looking forward to 2020?
It may be worth considering the effects of the geographical dispersion of technologies given the potential for constraints on the GB transmission system.

Question 39: What are the prospects for the provision of Balancing Services from new OCGTs or other 'Back-Up' generation?
If there are appropriate long term signals then the market is capable of delivering appropriate OCGT or other back up generation facilities. It should be noted that unless new OCGT's operate for less than 500 hrs a year they will have to be built to comply with strict emissions standards and this could make the economics of low load factor plant more challenging.

Question 40: Is our mapping of technology to Balancing Services reasonable?
The mapping appears reasonable for the "Gone Green" scenario.

Question 41: Is a statement of National Grid's view of its long term Balancing Services requirement useful to industry stakeholders?
We believe that a long term view of the balancing services is important since it can provide a signal to the market of National Grid's long term balancing requirements. The statement should be established under a formal governance arrangement which allows stakeholder contributions together with a formal timescale for periodic revisions and updates.

Question 42: What period should a long term Balancing Services Requirement statement cover?
We believe that the statement should cover at least a 10-year time horizon. This horizon should enable parties to establish a view on the prospects for investment in new services.

Question 43: What changes to the current reserve products would better encourage the provision of reserve services?
We believe that the current reserve products provide a framework for the development and delivery of balancing services for the medium term. Further innovation in market based solutions may be required as the transmission system evolves in response to the connection of increasing volumes of intermittent capacity.

Question 44: What actions would ensure that procurement of reserve services does not impact adversely on the efficient operation of the wholesale energy markets?
It is clear that balancing services procured outside the balancing mechanism have an impact on the forward energy price through the "missing money" problem in price signals. For example, payments for availability may tend to reduce short term bid/offer prices where such payments allow an element of fixed costs to be recovered through this route. Further consideration of this problem in terms of the cash out arrangements is required.