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Dear Graham

Operating the Electricity Transmission Networks in 2020

Thank you for allowing us a few extra days to provide comments on this consultation. As a DNO, ENW does not have detailed information or opinions on all the issues in the consultation. Accordingly we have only commented on those questions where we do have the relevant experience or knowledge.

Question 8. What is your view of future electricity demand growth and how would you quantify any uncertainty around this?

Demand growth in both the short and long term is uncertain. In the short term we believe that demand growth is being tempered by lower economic activity during the recession and by increased awareness of energy bills and environmental issues by business and consumers. At the same time we still anticipate upward pressure on consumption from the domestic sector due to both changes in usage patterns and household numbers, although again tempered by the effects of the recession. However these effects are modest and the recession is temporary.

For more significant reductions in electricity demand in the next few years, investment is required. The ability of consumers, businesses and government to respond to government policies and to invest more significantly to reduce net demand is being affected by the recession, restricted access to finance and the availability of alternative technologies.

In the longer term we see upward pressure on electricity demand from the decarbonisation of heat, electrification of rail, and the growth of electric vehicles. However we do not currently have any indicative models of the scale of these changes, nor of the timescale in which they would come to bear.

We believe that the electricity supply industry should interact with the work of the Committee on Climate Change and their analysis of carbon budgets. This could provide a better understanding of this area and the associated uncertainties, and the role of electricity demand reduction within this.

Question 9. Are there other developments which will change the way that electricity will be consumed in 2020 that we should consider?

We are not aware of any dramatic changes that we would expect in the period up to 2020. We anticipate that the penetration of domestic scale DG and electric vehicles will start to be noticeable, although not at a stage where it has significant network impact. However in terms of DG this will depend on the efficacy of the feed-in tariffs to be introduced in 2010.

We anticipate that the flattening of the annual load profiles of demand will continue as more customers install air conditioning.

Question 10. Do you share our view that distribution companies, suppliers, aggregators and ourselves will all value and compete for demand side services?

Yes – we do see that all the parties above will benefit from demand side services, although we would expect that aggregators would be acting as agents for one or more parties.

We do not believe that the needs of Suppliers, NGET or DNOs will coincide, and there could well be competition for the demand adjustments that consumers can make. For example we foresee that demand reductions sought by a DNO for a particular group of customers in a defined geographic area could be needed when one or more suppliers of that group are long, and where the respective costs signals will be in conflict. Similarly we can see areas of our network where when Suppliers are short, and their customers reduce load, we then have to pull back generation.

We would prefer that these conflicts are resolved via market mechanisms, but we also accept and expect that this could lead to overall inefficient behaviour unless the arrangements are very carefully designed. It might be that more pragmatic rule-based approaches will be needed.

Question 11. Are our assumptions around the number of electric vehicles in 2020 reasonable?

We broadly share your views on the developments of electric vehicles, since they are based on the BERR/CENEX report, although we note that a 6 TWh annual demand involves a very pessimistic view of future efficiencies. It is difficult to make more precise assumptions at this early stage in the commercialisation of EVs and PHEVs. So

the uncertainty around this assumption needs to be acknowledged, and the base case reviewed in a few years time.

It should also be noted that the vehicle charging demand will be at LV; so consideration must be made of distribution losses between the vehicles and the transmission system.

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?

We do not believe that it is valid to assume that this will just happen, although we do believe it valid to assume that the technology and infrastructure can be deployed. We suspect that the growth of electric vehicles will be insufficient to drive forward capacity related prices such that industry players co-operate to develop the infrastructure out of shared economic interest. Instead we see that the development could be rather like smart meters in that although widely accepted as a “good thing”, there is a need for strategic action that is not precipitated by any market participants’ individual commercial needs.

Question 13. Do you foresee a greater or lesser role from embedded and distributed generation than we have assumed?

We generally agree with your analysis, save that the future penetration rates are likely to be critically determined in the first instance by the proposed feed-in tariffs. Until their size is known, and some experience of customer reaction is available, we cannot confirm a view of any numbers.

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?

Firstly we would like to make it clear that through the Grid Code data exchange, NGET does have visibility of DG; although we agree that NGET does not have real time visibility.

The criteria that should be used for assessing requirements are primarily economic. All information is available at a cost, and there needs to be a clear benefit in terms of system operation cost or risk before additional information is gathered. We accept that it will be hard to determine data collection costs in all cases. We also believe it will be necessary to factor in appropriate confidence about the reliability of information too. Data from end customers is characterized by high variability. In aggregate a lot of variability tends to cancel out, and as NGET knows well from forecasting, the ability to predict overall behaviour is usually straightforward. However we believe that as new activities emerge in the market we should exercise

caution in believing that early information from trials or early implementation will be representative of mass penetration in the long term.

We believe that an essential step in making such assessments should be the evaluation of carrying more reserve or capability by NGET.

Question 35. What is your view on the potential of electric vehicles to provide balancing and other energy services?

We have no reason to believe that this will be a significant possibility by 2020, although clearly there is the potential. Firstly it depends on a sufficiently smart infrastructure (as described in Q12 above). Secondly it would then depend critically on the cost and ability of the vehicle energy storage and conversion equipment to react appropriately— and included in this is any economic effect of shortening the service life of the vehicle power source such as the cycling and loss of life of batteries. Thirdly, there would be losses involved in battery storage. Without knowledge of these issues, it is hard to make predictions about the viability of such 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?

This is a good question and one that ENW has been investigating in a trial of demand side management for industrial and commercial customers. We have found that many such customers have a willingness to consider DSM, but that their enthusiasm is directly related to their view of the rewards available for demand side actions. Our initial assessment is based on quite limited data sets, but we believe that demand reductions of 10 to 15% are probably available from such customers on aggregate, where the exercise is on an infrequent basis and for a two- three hour duration. Of course we would expect different depths of reduction, used with different frequencies, to have very different commercial values from that which we have so far investigated. We believe that most of the energy reduction is deferred, rather than a discretionary absolute saving.

We have no current information on the appetite of domestic customers, either directly, or by proxy. However we believe that for domestic customers the use will be confined to appliances with deferrable loads – such as heating, washing and refrigeration. A future decarbonisation of domestic heating could give rise to significantly more scope for future domestic DSM.

A recent report for DECC indicated a potential level of discretionary load across the UK in the 9-17GW range¹. This is lower than might be available in some other

¹ <http://www.decc.gov.uk/en/content/cms/consultations/electricsecure/electricsecure.aspx>

countries because of weather and patterns of heating/cooling. However the report was not able to assess how much of the discretionary load would actually be delayed at different levels of financial incentive. Furthermore not all of the load may be on a suitable timescale for a balancing service. Also as mentioned previously, there could be competition between suppliers, DNOs and NGET for influence of any discretionary load.

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?

Much as in our answer to Q12, we do not believe that the necessary infrastructure will develop in response to a general perception of value in the market. We believe that it will be necessary to strategically design an approach to harness the demand side – and that as per Q32 it will be necessary to design in the costs of information collection and processing such that the true risks are fully understood.

Given the competition for demand side response (Q10) we believe that the industry needs to work together to develop the optimum demand side approach. We see this as an area where NGET can legitimately take a lead, and ENW would be delighted to help consider how this could be taken forward.

I hope these comments are useful and clear. Please do not hesitate to contact me should you have queries on any of the above.

Yours sincerely,

Mike Kay
Engineering and Planning Director