



New York Road  
Shiremoor  
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NE27 0LP

14 August 2009

Dear Sir,

**“Operating the Electricity Transmission Networks in 2020”**

CE Electric UK is the licensed electricity distribution business for the north east, Yorkshire and parts of northern Lincolnshire, operating through its two licensed subsidiaries, NEDL and YEDL. We welcome the opportunity to take part in this most timely and important consultation. We would welcome the opportunity for further discussion of these issues both bilaterally and in the established wider industry groups.

We note that many of the questions are directed at generators and other potential providers of balancing and other services. We have confined our answers to those areas where there is a current or potential future interaction between transmission and distribution system operators, bearing in mind in particular the implications for system operation of greater amounts of distributed generation and other developments such as electric vehicles and domestic heat pumps.

Yours faithfully,

A handwritten signature in black ink that reads "Jon Bird".

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## Answers to Consultation Questions

### **Q9 Are there other developments which will change the way that electricity will be consumed in 2020 that we should consider?**

A Domestic heat pumps, both air source and ground source, are likely to be used in ever greater numbers. Whilst they reduce overall energy consumption, they will lead to an overall increase in domestic electricity usage and in particular add to peak demand. Because of the latter point, the spread of heat pumps is highly relevant to the issues discussed in the paper, and we might have expected to see this issue discussed in more detail in the paper. We estimate an increase in diversified maximum demand of 3kWe per premises. Offsetting this, because buildings only lose heat slowly, heat pumps could be enabled by IT or the use of smart meters to respond to signals to shut down for periods of up to half an hour to provide balancing or frequency response.

There is likely to be a greater use of air conditioning, particularly if temperatures rise as a result of global warming, and similar considerations apply as to heat pumps.

We agree that the recharging of electric vehicles will also add to electricity demand but, if this is largely confined to off-peak periods and enabled by smart technology, there could be a benefit in smoothing demand profiles. Changing patterns of working particularly in the recovery from recession could have a significant impact on daily and annual electricity demand. We should also not ignore the impact of smart metering and other energy efficiency measures on domestic, commercial and industrial demand, and conversely the possibility of domestic customers not responding to incentives to changing behaviour or taking the benefit in terms of increased comfort.

### **Q10 Do you share [NG's] view that distribution companies, suppliers, aggregators and [NG] will all value and compete for demand side services?**

A Demand side services (or, more accurately, active customer management, as this covers microgeneration and other distributed generation) can potentially provide a contribution at different times and over different timescales. At some times, eg at peak, requirements to reduce overall demand and reduce local system constraints may coincide. It may be possible to develop services that can use the same DSM more than once, but over different timescales and/or geographic scales. For example, domestic heat pumps and electric storage heating could generally be encouraged to move to off-peak times of day, but with the ability to constrain off segments of this demand for shorter periods to deal with distribution constraints or balancing needs.

In order to develop the market for DSM, a number of issues need to be resolved. We need to understand the costs and benefits for the different requirements, the ability for customers to respond to real time changes in incentives (probably through the use of smart technology) and the willingness of them to do so. An urgent debate is also needed on the best organisational framework to enable this. We can conceive of a situation where a party with access to a broad portfolio of controllable production and consumption might offer services to both distributors and GBSO. They might reasonably take the view that only a small proportion of their portfolio would be needed at any one time to resolve distribution constraints, and therefore take a view of the remaining resource available to

them to offer to GBSO. Of course, if the rewards available from GBSO are much greater than from the distributor, their logical response would be to offer all those services to GBSO.

**Q12 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?**

There are various ways electric vehicle charging could be organised. Given that most charging will take place at night, a simple Economy 7 time-of-day tariff might apply. We could anticipate using existing functionality to divide the mass of such customers into, say, four blocks, with start times staggered by half an hour. This approach is currently applied to night storage heaters. This would match the onset of EV charging to the decline in general domestic demand from midnight to 2 am. If smart meters with some forecasting ability were available, off-peak times or times of surplus wind could be sought out and utilised. But given that even peak-priced electricity would be significantly cheaper than petrol or diesel, there must be a question about whether customers would actively value the additional benefit of using off-peak power.

**Q13 Do you foresee a greater or lesser role from embedded and distributed generation than we have assumed?**

A Other commentators have had difficulty in including DG in their models, and so there is little to compare “Gone green” with. We see no reason to disagree with NG’s forecasts.

**Q17 Is National Grid's current view that 'low wind' events across Great Britain need to be considered when evaluating electricity operating margins reasonable?**

A We would agree with NG’s view.

**Q20 Are we correct to highlight the importance of wider European issues in electricity operating margin analysis?**

A Interconnector flows can have a significant impact on operating margin and so both commercial and weather-related events on the continent can be important.

**Q23 Are our assumptions regarding the level of electricity demand during the minimum demand periods reasonable?**

A Our own experience is that summer minimum demands have been getting lower and winter peaks getting spikier. Moreover maximum demand occurs for around a quarter of the time outside of the winter period. Daily load profiles have also been getting flatter. – i.e. the system problems could get worse.

**Q32 What criteria should National Grid use in developing any requirements for information regarding embedded generators? Are there other ways of obtaining this information?**

A In order to answer this question, it is necessary to establish who should be responsible for balancing the distribution networks. At one extreme, devolution of system operation at distribution level to a DSO might be an option, but would need a more sophisticated interface with National Grid at GSPs, i.e. export as well as import. It remains to be seen whether the financial flows available would make the DSO role worthwhile. At the other extreme, GBSO could develop

enhanced automatic interfaces to generators at all levels, to improve both speed and scope, i.e. to be able to scale up to direct significantly larger numbers of generators. Either of these extremes could be very complex to operate. An intermediate solution based on proportionality might be possible where the amount of information passed to GBSO should depend on the materiality of the generator. For example, the smart meter specification is likely to include a 'generator' register that will tell us gross export before on-site consumption, since this is required for the Renewable Obligation and the 'generator' tariff of FIT. This will allow latent demand to be assessed in planning timescales. However, if GBSO needs this in real-time, it will need to be built into the smart meter and central communications specification. But there may be a half-way house by rolling down Grid Code obligations for operational metering into Distribution Code to some level of embedded generation, again reporting direct to GBSO through a 'non-smart' communications route, with a copy to the relevant DNO so long as there is a method to reimburse DNOs for any cost incurred.

**Q33 Are there additional options that National Grid should consider to maintain a Black Start capability?**

A As DG masks gross network demand the black start pickup will become increasingly uncertain – it would be necessary to consider how to manage this risk. There will be a need to report gross demand to NG to determine black start requirements. In due course, smart metering should get DNOs and GBSO a better understanding of generation connected and running (not just exporting: the smart meter 'generator' register will tell us gross export before on-site consumption).