

European Network of Transmission System Operators for Electricity
Avenue de Cortenbergh 100
1000 Brussels
Belgium

9 May 2012

Call for Stakeholder Input in the development of the Demand Connection Code

EDF Energy welcomes the opportunity to respond to the call for evidence on the demand connection code.

In principle we agree with many of the issues and proposals that you set out in the call for evidence document. However, we do have two overriding concerns. Firstly, it is not clear to us that the issues set out in the call for evidence are necessarily issues that have to be overcome to support an internal energy market and address cross border issues. Second it is not clear that some of the proposals set out in the document are deliverable in practice without further legal obligations, for instance through European eco-appliance standards, which are defined through another process. Having expressed these governance concerns, we now respond to issues raised within the consultation as drafted.

We wish to respond to those parts of the document which make suggestions in relation to the facilitation of demand side response, and related frequency response. Our key points are:

- We agree that system frequency will become more costly to manage in future, and that new technologies will be needed. In Britain there are specific exacerbating factors, including the closure of the most quickly-responding type of fossil plant (drum boiler plant) and an increase in the largest spontaneous loss of generation.
- While there are alternative new technologies that could support GB system frequency in the case of future spontaneous generation losses, such as storage devices, fridges appear to represent the least-cost solution.
- Of the alternatives offered, we support mandation of the inclusion of frequency-sensitive operation within new domestic fridges; we do not believe this feature will otherwise arise due to the cost of setting up two manufacturing and supply chains per model of fridge, and difficulties of customer comprehension of the feature.
- Consumers need to be enabled to choose to programme their wet appliances to run against a received within-day tariff shape. Wet appliances as sold do not include this functionality. We would support mandation of basic functionality in this regard but due to the direct impact on consumer utilisation, its use should be voluntary linked with time of use tariffs. Demand side response capability will have a very significant

consumer benefit in relation to security of supply as peak street cable loadings rise with mass EV rollout, and as the TSO may face prolonged wind lulls.

Our more detailed response can be found below. If you have any queries on this response, please do not hesitate to contact my colleague Paul Mott on 0203 126 2314, or me.

Yours sincerely

A handwritten signature in black ink, appearing to be "Mark Cox", with a stylized, cursive script.

Mark Cox
Head of Transmission and Trading Arrangements

Attachment

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EDF Energy response

Demand-Side Frequency Response

EDF Energy agrees that increasing displacement of synchronous generation and the increasing levels of RES is a significant new challenge. This is reinforced in a British context with the connection of larger-sized nuclear units (1800MW) than in the past and changes are due to occur in the generation mix that will impact the system's resilience to respond in the required very fast, sub-ten second, timeframe.

A significant aspect for the future, is that although new large thermal plant is required under the British Grid Code to provide primary frequency response within 10 seconds, it does not tend to deliver this response *early on* within that 10 second period. The existing large thermal plant differs from all the new designs, in that the existing large thermal plant has a "governor valve" and a drum boiler. If frequency suddenly drops, this existing plant can provide good response within less than two seconds. All of this plant is set to close by about 2023, some before 2015. It is noteworthy that all pumped storage plant takes at least 10 seconds to start, in some cases 2 minutes. It is therefore almost entirely irrelevant in this instance of the early response to the rapid frequency drop following a LIF event. This is also true of all open-cycle gas turbine plant, all diesel plant, and voltage reduction.

It does appear that demand could play a least-cost role in solving this future problem. Fridges comprise an almost "base-load" demand in Britain of about 1.8 GW, taking this power level day and night alike. The cost of including a simple frequency sensor per fridge would be low. However, the cost of non-mandated operation is likely to be much more than this, due to low take up and manufacturers running two production lines.

There thus appears to be a significantly-positive cost-benefit from mandation of capability in the domestic sector. No food quality issues would arise. The simple model where the fridge only alters normal operation when frequency falls below a threshold of say 49.7 Hz seems simpler to define and encode, and to be quite certain of no food storage impact, than a more linear and complex frequency response model.

Mandation in the non-domestic sector may be more problematic, as operators of IT equipment need to carefully consider the temperature limits of their IT equipment to assess the safe possibilities for this technology in their IT equipment/server room chillers.

Demand Side Response (non-frequency)

The consultation also seeks views on more regular demand side response, unrelated to system frequency. This response would arise voluntarily where the consumer elected to operate a process or appliance in relation to time of day prices, delaying or avoiding operation at times of high price. This type of demand side response is "visible" to the

consumer and does affect the utility of the process or appliance in question, which is why it must be voluntary.

At the moment, a key facilitator for the effective provision of demand side response from prime domestic applications such as wet appliances and electric vehicles is missing. Wet appliances could operate within overnight or cheaper timeslots, to suit retail price profiles delivered through a smart meter. However, new washing machines with electronic controllers, and some new dishwashers, currently being sold, lack this facility - they are not "smart ready". If they are switched off during their cycle, and are re-energised, they will not re-commence operation. We understand that the lack of smart-readiness of the machine cannot be compensated-for externally to the appliance.

Wet appliances could readily be constructed so as to integrate the required technology (to be "smart-ready"). A policy lead does seem desirable to ensure the development and mandation of these smart appliance standards for wet appliances, EV chargers, and heat pumps. Mandation of the standards for new appliances would not force homeowners to use the technology but it would mean a tool is there if needed.

EDF Energy
May 2012