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Re: Demand Side Balancing Reserve and Supplemental Balancing Reserve National Grid Consultation Response

This response is submitted by a group of leading developers of micro CHP (mCHP) in the UK. We consider that the proposed Demand Side Balancing Reserve presents an opportunity to reflect the system value of mCHP aggregators and provide necessary incentive for such applications. We would be happy to meet to discuss the potential of mCHP - and mCHP aggregators in particular - and its potential role under the Demand Side Balancing Reserve.

Overview

MCHP describes a diverse set of available technologies that generate heat and electricity simultaneously at the domestic level. MCHP presents a step change over existing gas fuelled heating solutions generating operational savings of up to 4.3p/kWh of heat generated compared to condensing boilers.

MCHP technologies are designed for different house types with varying heat demand and can generate significant part of a house's electricity demand[1]. MCHP can serve as a stand-alone solution for detached houses or operate in a modular fashion in a shared environment (e.g. social housing, block of flats, community heating).

[1] MCHP technologies have different technical and commercial specifications. Some mCHP systems are designed to follow heat load with an integral gas condensing boiler starting automatically when the heat from the mCHP module is insufficient, such as at peak times or when a lot of hot water is required. Other mCHP systems are designed to follow electricity demand or operate as base-load generators delivering electricity continuously.

If delivered at scale mCHP can generate significant benefits for the UKs energy system:

- mCHP naturally generates more power at times of peak electricity demand (e.g. evenings and winters) and so naturally reduces the need to operate, or maintain, fossil-fuelled peaking plants. At scale this would create substantial financial net benefits for the wider energy system estimated at 6.2p/kWh electricity generated[2].
- mCHP generates electricity close to demand, alleviating losses of electricity resulting from its transportation that represent circa 7% of all generated electricity.

This group of stakeholders has published a vision report outlining the strategic benefits of mCHP and setting out a commercialisation roadmap to deploy mCHP technologies at scale.

Creating the right regulatory environment for mCHP aggregators

MCHP is the most controllable domestic energy technology with significant potential to alleviate costs from setting up and operating generation and transmission infrastructure to supply electricity during peak periods. The balancing potential of mCHP is significant and can provide additional value in the management of more complex distribution networks and intermittent generation assets while facilitating a move towards a more localised power generation system.

The clustering of distributed mCHP units, controlled and operated by an aggregator, would allow power generation to be modulated up or down to provide balancing services. To enable the deployment of mCHP aggregators, regulatory frameworks must deliver an enabling effect, addressing the current rigidity of electricity prices and price signals (missing money issue).

The proposed Demand Side Balancing Reserve could provide a mechanism to achieve this; however its design should enable the balanced participation of mCHP aggregators. The main comments of this group of mCHP developers are summarised as follows:

- **Support confidence:** Compensation levels offered under Demand Side Balancing Reserve must be considered as a long term investment for the energy system. Therefore it is important to provide some long-term certainty and clarification of interaction with the capacity market.
- **Eligibility of aggregators:** It is noted that embedded (and behind the meter) generation can participate in the Demand Side Balancing Reserve. We expect that this would also include small-scale generation aggregators as a means of providing flexibility and reducing network strain. Eligibility of small generation aggregators should occur irrespective of whether electricity is consumed on-site or exported to the distribution network.

[2] Mott MacDonald (2004) 'System Integration of additional Micro-Generation'

Responses to relevant consultation questions

DSBR1: Do you agree with our proposed participation criteria?

Proposed participation criteria for Demand Side Balancing Reserve appear to be sound as they make provision for both demand response and behind-the-meter or embedded generation. As proposed, the scheme could attract the participation of a much broader scope of balancing service providers. Based on participation criteria, we consider that flexible small-scale generation aggregators - including mCHP aggregators - should be eligible to participate in the Demand Side Balancing Reserve.

Aggregators present an attractive application for mCHP which is a solution with power output that can be easily controlled. The clustering of distributed mCHP units, controlled and operated by a central entity, would allow power generation to be modulated up or down to provide balancing services and improve power quality. Such applications have already been implemented in Germany and the Netherlands. Industry players are interested in the application of aggregated mCHP models in the UK as well.

However, the regulatory framework in the UK does not currently allow investment in mCHP aggregators given that electricity prices cannot rise high enough to reflect the value of additional capacity at times of scarcity and reflect the value of flexibility (missing money issue). Policy incentives are important to send a signal for mCHP applications to operate during peak demand periods – in addition to their heat-led or electricity-led applications at the domestic level.

The Capacity Market may address this issue, but in the meantime services such as the Demand Side Balancing Reserve are key to drive relevant investment. To be effective, eligibility of mCHP aggregators in the Demand Side Balancing Reserve should occur irrespective of whether electricity generated is consumed on-site or exported to the distribution network. This makes sense, given the service's remit to alleviate grid strain and provide balancing support irrespective of the point where electricity is consumed.

DSBR2: Do you agree with our proposed product definition?

We generally agree with the proposed product definition. We are also in agreement with provisions to allow participation of providers of demand response (or embedded generation) that cannot operate for the whole duration of stress events. This is an arrangement that provides certainty for the participants that this service aspires to incentivise. This is also important for mCHP aggregators that may be typically available to operate during the 4pm to 6pm window when consumers are away from home.

In terms of the service duration (between November and February), we consider that there is merit in rendering this a year-round product. For instance, the majority of mCHP products are heat-led which signifies significant unused embedded generation capacity during

periods of low heat demand (e.g. summer) that could displace centralised generation creating substantial financial net benefits for the wider energy system.

DSBR3 Do you agree with our proposed payment arrangements? Do you have any views on the proposed level of set-up payment?

We consider that the intention to mainly incentivise based on avoided generation during periods of grid strain is generally in the right direction. However, we consider that the set-up fee of around £5-10 per kW per annum for those who make available demand reduction (or embedded generation) may not be adequate.

Payments based on avoided generation during stress periods can be rather improbable as a means of incentivising adequate investment. Therefore, more emphasis should be placed on increasing set-up fees as a means of establishing a fixed and more secure revenue stream for investors.

DSBR5 Do you agree with the proposed arrangements for despatch?

We agree that arrangements for dispatch need to be simple. Therefore the proposal that Demand Side Balancing Reserve is instructed by the System Operator via a smart phone or web-based application is generally n the right direction. Also certainty and ample is key to allow a diverse range of demand response and embedded generation solutions to participate effectively in the service.

DSBR6 Do you agree with our proposals on procurement?

We agree with the proposals on procurement. However we consider that some more certainty may be necessary in terms of planning beyond the conclusion of suggested service and their interaction with the currently designed capacity market.