

## Energy Systems Catapult: Consultation Response

### Energy Networks Association (ENA) – Open Networks Project, Flexibility Consultation

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Energy Systems Catapult (ESC) was set up to accelerate the transformation of the UK's energy system and ensure UK businesses and consumers capture the opportunities of clean growth. The Catapult is an independent, not-for-profit centre of excellence that bridges the gap between industry, government, academia and research. We take a whole systems view of the energy sector, helping us to identify and address innovation priorities and market barriers, in order to decarbonise the energy system at the lowest cost.

ESC welcomes the ENA consultation on flexibility. We have responded to the questions with the exception of those relating to narrow commercial issues where we do not have the relevant knowledge and experience.

#### **Q1 – Do you agree with our proposals within this consultation paper and if not, please provide us with any rationale and alternative proposals?**

We are concerned that smaller customers do not get mentioned until Q17. Heat pumps and Electric Vehicles (EV) are a large part of anticipated load growth but will connect as individual loads on the LV network. The consultation focuses on procuring and operating flexibility. These are both important aspects managing demand, but the consultation is silent on the need to: monitor network flows/voltages, select appropriate control actions, communicate the selected actions, monitor the response delivered and provide settlement services.

Flexibility actions can have the effect of limiting national demand or could be actioned solely for this purpose. Limiting national demand in this way would lower the size of generation fleet required by GB and deliver considerable value to end customers. It is important that incentives to providers of flexibility recognise this value.

#### **Q2 – Would stakeholders see greater value in holding PQQ stages (1,2 in the associated presentation) at point A or point B in the timeline with rationale?**

#### **Q3 – Do you agree with the alignment of timing for procurements on the proposed cycle of 2 procurements per year and if not, why?**

This appears to be a reasonable approach for requirements that can be clearly identified with the required lead time. It will be important to retain the flexibility to act at short notice when

circumstances dictate. Recent experience with Covid has illustrated that long-term forecasts can be disrupted by events.

Additionally, these two cycles are related to DSO flexibility. It is also important to have a clear vision on how these cycles interact with ESO at transmission level in order to have a more coherent procurement process at different voltage levels.

**Q4 – Do you agree that implementation of these consistent parameters helps to remove barriers to entry?**

Adopting consistent parameters is helpful to flexibility providers, especially for those operating in multiple DNO areas. It is also worth noting that consistent parameters will facilitate the possibility of flexibility contracts being made available to third parties such as ESO. Indeed, the definition of these parameters may be improved by involving the ESO in their definition.

**Q5 – Should any other parameters be considered and if so, why?**

For small customers (especially domestic) it will be difficult to define a meaningful baseline capacity. In these cases, consideration could be given to agreeing a maximum load that will be taken when instructed. For example, a homeowner with an EV and Heat Pump could agree to limit their load, when instructed, to an average of 2kW for two hours.

**Q6 – At what point do you believe it is appropriate to standardise new products? For example, should we initiate standardisation early on limited experience, or allow more than 2-3 DNOs to develop and procure similar products before commencing standardisation?**

There are a range of reasons why DNOs may specify different things in demand side contracts, ranging from products seeking to do fundamentally different things (e.g. planned or emergency actions) to unnecessary differences caused by a failure to coordinate. It would seem sensible for the DNOs to consider standardisation from the outset. That way they can ensure that differences in approach are justified by what they are trying to achieve or different local circumstances. The starting point should be to standardise, unless there is a good reason not to.

**Q7 – Which new DSO services do you believe are ready for standardisation now, if any, and why?**

**Q8 – What input can you provide to help us prioritise non-DSO Service development:**

- **what do stakeholders want network operators to facilitate in the near term?**
- **how can network operators facilitate non-DSO services whilst ensuring system resilience?**
- **how do network operators create scalable interfaces that allow these markets to flourish?**

A potential starting point is to look at how the ESO has supported the markets and then ask what is different about the DSOs. Since the introduction of the New Electricity Trading Arrangements, the ESO (and its predecessors) have supported the market by providing information such as demand forecasts and zonal data on generation. The market has then operated quite independently of the ESO via the power exchange, brokered deals, and bilateral contracts. Finally, the ESO uses the Physical Notifications submitted by market participants to determine what interventions are required to keep flows within the capabilities of the power system. This separation between ESO and the market operators allows ESO to trade on the power exchange and enter bilateral contracts with trading parties.

Applying the same approach to DSO's would see them providing information to the market about demand forecasts and potential network constraints, allowing others to operate the markets and then intervening where necessary to resolve potential overloading of the network. If the local energy markets also have a role in limiting trades that cannot be supported by the power system, this will move us away from a regime where constraints are resolved by market participants selling flexibility services to the DSO into one where market splitting forces market participants to resolve constraints themselves.

**Q9 – What challenges are flexibility providers currently facing in respect of baseline requirements?**

The use of baselines based on historic performance are problematic. For example, they can create a perverse incentive to flex demand to set an artificially high base line, in order to deliver additional demand response when called. Alternatively, for customers providing space heating, consumption will vary with external temperature, making a baseline difficult to establish. There are two alternatives to using baselines. For larger customers, a similar approach could be used to the transmission system where connected parties are required to provide Physical Notifications that are used in place of baselines. For smaller customers, it would be less burdensome for demand reduction contracts to be framed in terms of the maximum load that can be taken during a period, rather than specifying the change in load that will be taken. For example, a household with an EV could agree to limit their consumption over the peak to an average of 2kW. In effect they are agreeing not to charge their EV over the peak, but the contract is one that can be easily verified for any customer with a smart meter.

**Q10 – Open Networks Project will consider if differing DER types such as demand turn up, storage, generation etc should be subject to different methodologies. Do you feel this would be a fair outcome for providers or, would a simple one-size fits all approach encourage more participation?**

It is difficult to comment ahead of the work on methodologies being completed. One approach would be to start on the basis of one-size fits all and to only deviate from this when there is a compelling reason to do so.

**Q11 – Are there any other key aspects Open Networks should consider when investigating potential methodologies?**

While baselines have been discussed in terms of their use for settlement, Physical Notifications on the transmission system are also used for predicting network flows. In a world with far more active customers managing their demand in response to multiple factors, how will the DSOs predict the flows on their networks and plan the interventions that will be needed to maintain security?

**Q12 – Please provide feedback on the proposed future activity for consideration and which of these activities should be prioritised in any future scheduled development work in the Open Networks Project?**

The issue of nested constraints pulling in opposite directions has always existed. A common example was for a low merit power station to be constrained on manage a local constraint exacerbating a wider export constraint on the transmission system. Such conflicts must be resolved bottom up – often there is only one way of resolving the local issue, while there are generally multiple options for managing wider system constraints. Where this happens within the remit of a single system operator, this is resolved internally, and a single instruction is issued to the flexibility provider. In reality, the ESO and DSOs are operating different parts of the same network so they must recognise that nested constraints can pull in opposite directions and devise a mechanism for managing this before market participants are given conflicting instructions.

**Q13 – Under the current arrangements to do you receive sufficient information, in the right format, and at the right time to be able to manage your curtailment risk effectively?**

**Q14 – Are there barriers preventing customers with assets with Flexible Connections (ANM) providing flexibility services to the ESO or DSO today?**

**Q15 – How could DNOs better enable customers with Flexible Connections (ANM) to use Flexibility Services to mitigate the current and future curtailment?**

Customers with Flexible Connections have generally entered into this agreement to get a connection either for lower cost or more quickly than would otherwise have been the case. Hence, it would be wrong for this arrangement to then expose the DSO to additional costs. However, if another market player agrees to provide the flexibility required to secure the system on a commercial basis, there is no reason why this should not happen, with the costs being paid by the party with the flexible connection.

**Q16 – Please provide feedback on the identified barriers and proposed recommendations and which of these recommendations should be prioritised in any future scheduled development work in the Open Networks Project?**

The distinction between transmission and distribution is arbitrary, as demonstrated by the fact that the 132kV system is considered as distribution in England and Wales, but transmission in Scotland. Hence, if there is a conflict between a 132kV constraint and a 400kV constraint in England, it requires coordination between the DSO and ESO, while in Scotland it is an internal matter for the ESO. Service

providers need the ESO and DSOs to cooperate such that their actions mimic those of a single System Operator, and do not issue conflicting instructions. If this is infeasible, then that points to the current arrangements being a barrier to the efficient operation of the system as a single entity. Turning to the providers of services, it should be recognised that the SO function (as executed by the ESO and DSOs) has a duty to resolve any balancing issues at the lowest cost. Hence, services should be priced so that the provider is indifferent to how the SO chooses to utilise the product, e.g. whether a load is planned to be off load to manage a network constraint or held available to curtail to provide standing reserve or frequency response.

If both conditions were met, the provider could make all its services available continuously and the coordinated SO function could select them as required.

**Q17 – Do you have any ideas on how we might better engage and encourage participation of residential flexibility in flexibility service provision? Can you identify any barriers that might currently exist, along with potential solutions?**

It is important to recognise that the savings available to domestic users are not sufficient to encourage significant lifestyle changes or drive regular engagement in the management of EV charging or heat pumps. It is more likely that progress will be made by suppliers developing a proposition along the lines of: *"I can offer you cheaper energy if you let me sort the detail of when your EV is charged/your heat pump runs. I can give you the following assurances that this will not cause you discomfort/inconvenience etc"*. Essentially, we need to offer domestic customers a solution that saves them money without impacting their lifestyle.

In order to enhance flexibility service provisions, networks companies need to move towards a modern and digitalised environment in order to fill the data gaps and maximise data value; according to Energy Data Task Force (EDTF) recommendations this could be done by digitalisation of the energy systems, increasing data visibility and accessibility, coordination of asset registration, and visibility of infrastructure.

**Q18 – Do you have any ideas on how we might better engage and encourage feedback and input from stakeholders (including non-traditional energy market participants)?**

There is no alternative to seeking out new stakeholders with every consultation. It is very likely that some of the organisations who will play a key role in the delivery of net zero do not exist yet.