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Dear Sir/madam,

RE: *Call for Input: The Future of Distributed Flexibility*

Please find below comments from SMS plc answering the questions set out in your **Call for Input: The Future of Distributed Flexibility**.

Section 1

1. **What do you think distributed flexibility could contribute to the energy system**?

   Distributed flexibility is central to the operation of the electricity system, both now, as things currently stand, and in view of how the electricity system will develop in the coming years.

   Distributed flexibility will be the central tool which will enable the switch between:
   a. The old model of a small number of very large generators modulating their output by various means to adjust to the behaviour of consumers, who use energy without having to consider how the system is managed, to
   b. The new model where many smaller renewable generators will generate as much power as they can, when and where they can, with as little regard to how consumers are consuming energy as they can afford, and a set of consumers who are actively adjusting how, when, and where they use energy.

   The ability for multiple smaller CER market participants to react to market signals right across the country will be more valuable than dispatching CER assets in a highly localised way. If each individual market participant can see all available market signals, reflecting both transmission level market conditions as well as their own particular local conditions, then the collective actions of CER actions will hopefully provide a strong part of the foundation on which to operate the electricity system.

CER assets must, therefore, have access to all parts of the electricity markets, at all time frames – from wholesale markets, to capacity, to the Balancing Mechanism, to balancing services.

2. Will a focus on CER flexibility also help enable other forms of flexibility, especially distributed flexibility?

Any new common digital energy infrastructure should not, in our view, be based on the notion of local markets. A proper functioning market for energy and energy services can deal with highly local issues as well as national issues. Properly functioning markets require deep levels of liquidity, and this will not be available around the majority of localised markets.

In market terms, liquidity is the ability of an asset or investment to be readily changed into cash, or the ability to buy or sell easily on a market. Once defined like this, a *measure* of how liquid a market is for a given asset can be how narrow or wide the spread of buy requests and sell requests are for that asset.

A new digital energy structure focused on allowing CER assets to deliver flexibility MUST demonstrate both:

- **liquidity** – inasmuch as contracts must be tradable and have the ability to be resold to some other third party so that they can hold the contract and deliver against it – and;
- **indicators of high levels of liquidity** – inasmuch as each market must encourage the regular trading of contracts between parties and to third parties, showing this by tight bid/offer spreads in each market.

As things stand, most contracts for flexibility are illiquid, although Capacity Market contracts are an exception which proves the rule. Most Balancing Services contracts consist of an obligation to deliver a quantity of power or energy in an agreed fashion within an agreed time window for an agreed price, with various penalty and service level clauses, etc. Most of them also include clauses which disallow any trading of the delivery obligations to a third party.

This means that most flexibility contracts are strictly illiquid. The market for them is strictly a primary market, governed and run by the buyer of the service.

Wholesale trading in the GB market is highly illiquid as well. According to data from Ofgem the average churn rate – the number of times a contract for delivery of a MWh is resold to a third party – has been less than a factor of 4 for the last 4 years. This rate should be much higher.

Individual CER assets should be able to enter and exit each market multiple times as use cases require, but very illiquid markets do not permit this. If there is no one to trade with, or if contracts are not allowed to be traded between counterparties, then CER flexibility becomes very inflexible.

If markets for CER are developed with the aim to encourage flexibility in such a way as to make those markets truly liquid, then this will without doubt encourage DER assets and providers into the markets as well.

Section 2

3. Is there a 'case for change' and a need for a common vision for distributed flexibility?

The piecemeal nature of the current market system makes navigating the market difficult, and actively participating in it even more difficult:

- The system is set up for incumbent players.
- This was so that they can engage in the markets and services they have been designed to serve.
- Each market and service segment has generally been designed independently of all other components.

We note that the current market consists of, and enables the further creation of, multiple separate markets operated by different parties at different locations. These parties – for instance TSOs and DNOs – can create their own market rules without a common vision, and which may not scale or be replicable in new locations if transplanted. This issue of non-coordination should be addressed by a common vision for distributed flexibility.

Flexibility services, and current markets in general, in their current form have typically not been designed with the providers of flexibility services in mind, but rather are designed:

- Firstly to fit the needs of system operator control rooms and;
- Secondly, if at all, to fit the capabilities of the assets and participants who may deliver those services.

Services are dispatched at MW scale, making active participation from individual CERs effectively impossible without aggregation by a third party:

- This is no bad thing, as aggregators allow the finessing of dispatch control that a grid needs as well as the capabilities to optimise flexibility asset over multiple markets.
- However, market signals are dulled at this level and can be difficult to both see and to react to.

Market data is slowly becoming freely available via data portals and APIs, but there are still market signals which are:

- opaque, such as the Imbalance price;
- commercially restricted, such as the intraday price details; or
- restricted to certain market participants, such as live balancing mechanism data.

This lack of transparency of market signals, particularly close to real time, makes participation of CERs in the market more difficult that it should be.

Because of these things, there is a strong need for a single, common vision for the use and management of distributed flexibility, for the presentation of transparent, live and historic market data, and for the optimised dispatch of CERs.

4. **What is your vision for how to accelerate the delivery of accessible, coordinated and trusted markets for distributed flexibility?**

The electricity system is balanced at multiple different duration timescales, from hours to minutes to seconds (and increasingly at even quicker timescales), and similarly at multiple different response speeds. Flexibility can be delivered or made available either as energy, in kWh over an agreed period, or as power, as kW.

For CER assets to be effective in a distributed flexibility market the value and capabilities of each individual asset must be understood. The asset's place in the market must be knowable by the asset owner and the asset operator.

Any new digital energy infrastructure which has at its centre the goal of allowing CER assets to bring their inherent flexibility to all appropriate markets MUST be focused as much on the capabilities of CER assets and the realistic risk/reward appetites of the owners of such assets as it is with the operation of the system as a whole.

Understanding what CER assets can realistically do and what they realistically cannot do should be central to designing a system to accommodate potentially millions of CER devices within existing and new markets, and to the task of optimising them over the same markets.

For instance, domestic hot water or space heating assets may realistically participate in the frequency response markets, in the Demand Flexibility Service, or could be active in load shifting over a settlement period or two in the wholesale markets. But the same assets probably would not be suited to a constraint management service at transmission or distribution level which required the delivery of energy over multiple hours.

All services and market opportunities could have industry-standard term sheets setting out the expectations on market participants in terms that market participants – and not gird operators – can interpret.

Such information may include, but is not limited to:

- **Dispatch information:**
    - **How many times** will I realistically be expected to dispatch my asset? – per hour/day/week/month.
    - **How long** can I realistically expect to be asked to deliver for during each dispatch? – an average and an expected range.
    - **How fast** will I be expected to respond to a dispatch instruction? – seconds, minutes, hours?
- **Stacking information:**
    - Which other services can I take part in at the same time as this one?

- Which ones will I be excluded from if I take part in this one?

- **Nature of service:**
  - kWh or kW?
  - Will I be delivering energy onto/taking energy from the system over some time range (an energy service - kWh)?
  - Or will I be making my power available to some other party to use as the need requires (a power service – kW)?

This sort of boilerplate information has been the general ask of most Industrial and Commercial (I&C) customers for the last decade when they initially assess whether to put their assets into market, and makes the task of understanding the potential revenues much easier to assess.

Naturally market information, such as prices and penalties, is also important for all CER market participants. This type of boilerplate information, however, if contained in one place, may make the stacking opportunities clear and may highlight any gaps in the market to be filled with new services. It also makes it clear where market value analysis does and does not need to be done.

5. Will certainty of an end vision help accelerate enabling work and make it cohesive?

Certainty of an end vision will certainly help to achieve a more cohesive market for all flexibility resources, but only when it is accompanied by a detailed understanding of what elements of the current system infrastructure that Ofgem is willing to modify, change, ignore, or fully replace.

This system infrastructure includes wholesale markets, grid balancing services, and the system of codes and regulations governing the markets and participants. The system was designed and built for an energy landscape which no longer exists.
Adaptation to changing needs has come through the bolting-on of new components and through the slow and arduous process of modifying the existing and ever-growing base of regulations and rules.

A cohesive system should be designed with all its parts in mind, and should be conceived to address the current and future energy landscape, rather than to accommodate the landscape of the past.

Ofgem should be clear about whether it intends to retain the option to start from scratch with industry codes and regulations, and with current market structures, or whether a new digital energy infrastructure will simply build what currently exists into a digital environment.

Having a ‘Big Bang’ day, where all codes are simply replaced overnight with slimmed down versions, and new market rulebooks written, should be an option that Ofgem retains.

6. **When should a common digital energy infrastructure be in place? And therefore, when should development begin?**

A common digital energy infrastructure should be in place as soon as possible. Work should begin immediately.

The history of the industry shows that even relatively small changes to the energy environment take many years, and we do not have the time to spare before EVs and domestic heating are electrified and the need to enable flexibility from these parts of the system becomes overwhelming.

Section 3

7. **What should a common energy digital infrastructure look like, and why? Please consider the archetypes or develop your own proposition.**

A common digital energy infrastructure should be one in which:

- The actions of all parties can be tracked at all times, in which the actions of every participating asset are knowable and transparent;
- All contracts for the delivery of both energy and energy services are tradable between any two qualifying counterparties;
- Market information is transparent and free to access for all parties.

In this case, all 'good' actions are available to every party at all times, and all 'bad' actions are spotted and penalised.

- Good actions are those set of market opportunities which can be done in series or in parallel by a suitably qualified market participant. This could include being qualified to perform frequency services or trade electricity on the wholesale market.
- Bad actions are those actions which are done by a participant at the wrong time, in the wrong way, outside of the terms of a contract, or performed whilst unqualified. This may include under-delivery against a wholesale contract or stacking two or more services which are not permitted to be stacked.

Stacking over all timescales:

The market is currently managed over multiple timescales: seasons/months/weeks/days ahead, hours ahead, minute-by-minute, and second-by-second. CER assets within a common digital energy infrastructure should be able to see all opportunities at all timescales and participate in every service matching to their capabilities.

Wholesale markets:

A common digital energy infrastructure should be used to balance the system as much as possible within the wholesale markets, in order to reduce as much as possible the need for balancing services.

The flexibility inherent in CER assets at scale should be amply suited to such wholesale balancing. The differing needs of many millions of individual assets can be used to leverage the inherent flexibility in these assets, trading with generators, with suppliers, and with each other to balance supply and demand before real-time balancing services are required.

To do this, wholesale markets should be opened up.

- Forward markets should be transparent and exchange-based, rather than OTC, so all parties can see what positions are currently in place at what prices.
- Day Ahead markets should be easily accessible at low clip volumes.
- Intraday prices should be open to all so that live prices and liquidity indicators are visible and transparent to all.
- The Imbalance price should be:
    - Auditable
    - Clear to all parties how it is linking to the most liquid live market prices.

Contract types:

There is a strong case for setting out standard contract formats and Service Terms, which are comparable across all available service, as we set out in Question 4. Potential providers of Domestic CER services, as well as Industrial and Commercial DER services, often want to know as soon as possible the general information below:

- How long will each dispatch of my assets be – on average and over a distribution?
- How many times per hour/day/week/month will I be dispatched?
- How fast do I have to be able to react to a dispatch instruction?
- How much notice will I have to prepare to react to a dispatch instruction?
- How long can I expect to go between dispatch instructions?

These questions could be addressed up front, before any potential service provider examines whether it is worth assessing how much the service provision may be worth to them.

We recommend that all flexibility services include a “data sheet” covering the service expectations, in pro-forma terms which can be compared directly to every other services. This would help to clarify WHERE within the energy infrastructure each individual CER asset would be best placed.

Code modification:

The process for modifying industry codes should be dramatically sped up and opened up to more parties. Governing codes should either be replaced with new and updated versions, or there should be changes to the time required to update governance codes.

For instance the BSC modification **P344** was raised on 01 June 2016. This was a modification which resulted in the creation of Virtual Lead Parties (VLPs) and the opening up of the Balancing Mechanism to aggregators and CERs in general.

To get more assets into VLPs and to increase the scope of what VLPs could do, a whole series of modifications followed, with some dead ends and some not yet completed: P344 → P355 → P375 → P376 →P379 → P415 → P444

To date, as of May 2023 this chain of modifications which is nearly seven years long is not yet complete, with VLPs still not having full access to all Balancing Mechanism and Wholesale Market options.

Such long timescales in the opening up of markets will hinder progress towards net-zero if all future changes and updates to market take so long.

8. **What is your view on the desirability and feasibility of the archetypes or your own alternative proposition?**

National Grid ESO are considering a centralised database of Meter Point Administration Numbers (MPANs) as a way to facilitate the operation of the Demand Flexibility Service (DFS). In this service, customers can sign up with only one DFS provider at a time. Duplication of customer MPANs is difficult to manage, because of customers who sign up to multiple providers at the same time by accident or on purpose.

A digital MPAN register which can be queried by any provider is generally seen as a useful tool.

A digital register of all CER assets would doubtless prove more useful, as it could be used to ensure that customers and assets were allocated to the correct service units, that they were not double counted between providers, and that they were stacked correctly in the markets.

We have no strong views on whether a **MEDIUM** or a **THICK** market model would be best, however both are preferable to a **THIN** model. If work is to be carried out, and if change is to happen, it is not worth the effort just to settle for the THIN model.

The **MEDIUM** model only works if issues with true market liquidity are corrected, as set out in our answer to Question 2 above. An exchange platform on which very little can be exchanged between counterparties is not particularly useful.

The **THICK** model would be attractive only in the case where Ofgem retained the option – and perhaps executed it – to rip up the current sets of rules and regulations and start again fundamentally from scratch. A market in which transport and heating is electrified, and which is powered in the main by renewables, is a fundamentally different market than the one NETA and BETTA were designed to serve.

Section 4

9. **Should a common digital energy infrastructure be new-build, or should it buildout from existing infrastructure?**

   If Ofgem engages on work towards a common digital energy infrastructure then it should do so with the view that it should be a NEW infrastructure.

   The current market is a series of markets built upon earlier markets, and for the servicing of an energy structure that soon will be unrecognisable.

   Ofgem has the opportunity to start from scratch to build an energy infrastructure based on the flexibility of vast numbers of assets to accommodate a generation fleet vastly different in character to the one serviced by NETA when it was put in place.

10. **What are the important areas for consideration when designing institutional delivery models for a common digital energy infrastructure?**

    The chief comment we wish to make here is that markets need time to emerge, and an energy system in which domestic flex assets will potentially be highly integrated is no exception.

    Standards such as the PAS 1878/1879 standards will definitely be helpful in the long run but should not be mandated in the early years of market development. The application of standards, rules, and regulations should be contingent on the markets being standardised and regulated. The standards and regulations should be as flexible as the assets delivering in to the markets.

    If there is a high level of responsiveness in how standards and regulations are applied, augmented, and modified then the market for CER services will grow much faster than it would under a strict regime of governance.

11. **What are the important areas for consideration when designing financial delivery models for a common digital energy infrastructure?**

    Other than the comments we have set out in the questions above, the most important component upon which a common digital energy infrastructure should be built is transparency.

    - Transparency of market prices – energy prices and energy services prices – as well as the ready accessibility of historic price data to all parties.
    - Transparency of contracts – so that all parties can see who is providing which services, and what those service terms are for all parties.
    - Transparency of data – so that all parties can be equally informed of the state of all markets at all times.