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The Future of Distributed Flexibility - Common Digital Energy Infrastructure

Thank you for the opportunity to provide our views regarding the development of distributed flexibility in Great Britain.

As rightly pointed out by Ofgem, there has been many initiatives in this space. Open Networks, regulatory incentives, innovation project and private investment are all focussed on unlocking the flexibility in Great Britain's energy system. GB is leading the way in terms of developing flexibility markets and we would encourage the regulator to continue work with key stakeholders to support this development rather than adopting a revolutionary approach that creates uncertainty and stops this forward momentum.

Whilst the Call for Input covers much ground, based on our experience we would encourage Ofgem to focus on:

1. Use of flexibility markets for long term reservation **and** short-term energy activation
2. Coordination between T-D system operators
3. Availability of grid topology data

From as far back as 2016, our experience from the enera initiative in Germany showed us that there is a need for both long-term and short-term flexibility procurement. The capacity reservations provide better visibility to system operators, more stable remuneration for flexibility providers and less incentives for gaming. But the energy activations closer to real-time are key for the least-cost dispatch of flexibilities and we see this as lacking in GB. Additionally, it's the link between the two markets that allows the maximisation of welfare.

Efficient congestion management and the balancing of the transmission grid requires optimisation and TSO-DSO coordination, which can be fully enabled through an auction-based procurement mechanism that maximises social welfare. Currently, there appears to be a lack of cooperation and/or coordination on this topic.

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To facilitate the mitigation and alleviation of grid congestions, the integration of a simplified view of the grid topology is crucial for maximising welfare and maintaining grid safety. This data needs to be made more readily available.

We believe that Ofgem should target these issues directly with the relevant regulated entities as a quick, achievable win that will deliver more flexibility procurement through organised markets.

About EPEX SPOT

EPEX SPOT operates a power exchange in Great Britain, Central Western Europe, the Nordic countries and Poland, providing a market place for companies to trade electricity. We facilitate trading in a transparent manner, according to public rules and publicise prices which serve as a benchmark for the wholesale and retail markets, as well as for the OTC market. In GB, EPEX SPOT has been active since 2000 and currently operates 4 daily auctions and a continuously traded market. There are over 100 companies actively trading across these markets to optimise their portfolios and manage their imbalance positions.

EPEX SPOT has carried out the design, specification, IT development, implementation and operation (including rulebook) of a local flexibility market and related post-trading activities for market-based congestion-management actions carried out by one German TSO (Tennet Germany) and two German DSOs (Avacon Netz and EWE Netz). The market was fully operational and operated by EPEX SPOT between February 2019 and June 2020.

EPEX SPOT's Localflex platform was originally developed as part of a project part-funded by the European Regional Development Fund in the UK. The flexibility market in Cornwall co-ordinated transmission and distribution flexibility procurement through grid-secure contracting. This end-to-end solution includes grid model import, DER registration and visibility, bid/offer/contract management, closed-gate auctions for flexible capacity and utilisation, multiple dashboards, and a settlement function. The flexibility market went live in summer 2019 with Western Power Distribution (WPD) and National Grid ESO (NGESO) procuring in a coordinated fashion.

EPEX SPOT is also connecting its continuous market system to the GOPACS platform in Netherlands, providing higher liquidity to the Dutch Grid Operators to manage congestion needs and an alternative marketplace for participants willing to send flexibility offers. For the Dutch Grid Operators it allows enhanced and more cost-efficient redispatch through access to a larger pool of liquidity

Since 2019, EPEX SPOT has built NGESO's frequency response auctions and currently operates those daily auctions enabling the ESO to procure dynamic Containment, Dynamic Regulation & Dynamic Moderation as part of their ancillary services products.

Section 1

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

We believe that the case to foster distributed flexibility is well established. It should be an important component of GB's energy system. Efficient flexibility market organisation at the distribution level could contribute to the alleviation of local network constraints on the system which would avoid costly network build out.

The absolute amount of distributed flexibility is likely to be small when looking at the TWh contribution that are being projected (for example CCC Report Delivering a reliable decarbonised power system- March 2023) but whilst the overall size is small, the value in having timely and localised markets will be extremely valuable. It is with this in mind that we support an evolutionary approach building on the work that has taken place over the past years.

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

Uncertain.

The logic is reasonable, but could it mean that the known issues for DER will not be addressed in a timely manner. This would potentially delay the development of the DER markets as DNOs struggle to prioritise developments.

We consider that CER would work in a similar way to DER. The assets would be aggregated and they would access the market via a supplier or aggregator. There may be different types of aggregators/suppliers but essentially the same model.

Section 2

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

Addressing the perceived market failures:

Market failure 1: imperfect information and information asymmetries

As a requirement, this seems relatively straightforward. By way of comparison, power exchanges are rules-based, transparent, fair and independent market-places where the publication of data is a key component of the market operation.

Currently, we observe that whilst there has been flexibility reserved in GB it is not particularly transparent regarding what has been used (and how it is valued) by the SOs. Procurement has been focussed on long term reservation and not near-term activation. We would argue there is value of flexibility in both markets and society welfare is maximised through optimisation across both timeframes.

Part of the difficulty appears to be a reluctance for System Operators to reveal a willingness to pay for flexibility. We do not envy them, as the question over fair value of flexibility can be a difficult one to answer, but the markets need to be transparent and allowed to work to provide the price signal. This then becomes a virtuous circle allowing more trust in the market and attracting new participants.

Market failure 2: oligopsony market coordination of operations and access

A key issue appears to be National Grid ESO and DNO coordination. We see primacy rules as a key topic to address. By allowing both entities to bid into markets with clear primacy rules further value can be uncovered in the market.

There are areas of market coordination that we do not think needs attention:

First, we do not expect a need for DNO to DNO coordination. It does not make sense for DNOs to need to coordinate across geographical areas.

Secondly, we do not think that there needs to be coordination between local congestion markets in the same area. We see some discussion on agnostic (or multiple market) approaches to procurement platforms by single DNOs. Experience of working in Europe has shown this approach creates a complex legal and governance arrangements between actors. We understand the initial attraction for DSOs (i.e. not having to pick winners through allowing competition between venues) but the European example was based on a mature, wholesale market that clearly established roles and responsibilities under an extensive regulatory and legislative framework. Within a nascent market, where the value for participants is unclear, we firmly support the approach working as a single market platform in each DNO area. The procurement approach and contract incentives can ensure innovation, delivery and security.

Third, we would expect better product standardisation and onboarding rules to allow suppliers and aggregators to better handle multiple sites/markets etc.

Finally, we don't understand why less liquidity is an issue. Smaller locational markets will have by design fewer sellers. However, allowing the ESO and DNOs to compete in the same market, we would expect more demand for flexibility.

Market failure 3: a structural lack of trust

We believe that roles and responsibilities should be reviewed with consideration made to independent market operators. We do not see much consideration of this role at this stage, mainly due to the limitations with the current flexibility procurement. Some of the complexity proposed in the archetypes appears because of the limited scope of existing procurement platforms. We consider many of the functions naturally fitting within the market operation role. An independent market operator bound by rules, neutrality and a strong reporting and surveillance function would resolve many of the issues of trust.

We acknowledge that pragmatism is important regarding the operating models. A step-wise approach to operating the markets based on organisational readiness/market acceptance could be feasible and allow for faster adoption. (i.e. independent operator to DSO, or DSO to independent operator). As such, EPEX SPOT would see itself as providing the platform and/or operating it on behalf of the relevant SO.

However, as an end-state, market operations should be independent. Otherwise, there will always be the conflict of asking the FSPs to play against SOs who also happen to be the rules-setters and the referees. This conflict in roles will always undermine trust in the market.

Drawing on our experience of market surveillance and engagement with the regulator, there is independent reporting and engagement between a power exchanges' market surveillance and Ofgem's enforcement team. This allows the regulator confidence that it has the investigatory means to address potential market abuse cases. Markets are monitored constantly by operators as a first line of defence that ensures. This is supplemented by the market surveillance team that has the tools to ensure that the markets are operating according to the rules and in line with the market fundamentals.

Market failure 4: contextual, market-specific issues

Generally, we are frustrated that the issues identified are seen as market failures. Market Operators should be able to handle these issues. The failure here is the lack of commitment to use markets properly. The current, long-term tenders with the SOs manually choosing who to contract with, is not sufficient to develop flexibility.

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

First, we would see the DNOs and National Grid ESO commit and be held to account to procure more flexibility. Flexibility is seen as a critical part of the energy mix in this country yet, there seems to be a lack of emphasis to procure flexibility for both the longer term (reservation) and particularly the near term (activation). We would like to see that procuring flexibility is the priority for these organisations and that the demand is not eroded through disconnections or connection delay.

Secondly, there is a lack of trust between the DNOs and National Grid ESO and we would like to see the regulator become more active and facilitate better cooperation within the space. Potentially, this could be through the Open Networks project that should be more empowered to take on some of the coordination roles and see that the participants have more ownership of its deliverables. DNOs or National Grid ESO should face consequences for the Open Networks project failing to deliver.

Thirdly, we would like to see faster deployment of energy management systems. These systems will help the SOs understand their demand (and value) for near term flexibility procurement. We see a lot of discussion on market design and not sufficient focus on what it would take to be an active participant to these markets.

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

We disagree with this concept. In fact, we'd disagree with the assertion that we are information rich in this space. We do not think there is enough information and experience to know which end vision is best.

Whilst we understand that there is hesitation to invest under uncertainty, the reality is that investment can be made if priorities are understood even if the outcome is not clearly defined. For example, the market coupling projects in Europe started as pilot projects in advance of a clear regulatory framework. However, the priorities were understood and the roles were sufficiently defined to deliver one of the cornerstones of the European energy market. The regulation has subsequently caught up and focussed on improvements to the market. However, if the outcome was defined ahead of any implementation, the huge social welfare gain already delivered through coupling would unlikely to ever have been achieved.

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

We do not have a strong view on this. We do not believe that this should be the limiting factor and there is danger that companies can delay efforts in this area until it is ready (or even defined).

As described in the previous answer, pilot projects can already be started and adapted as learnings and experience catch-up.

Section 3

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

We believe that there should be the freedom to innovate and develop markets for flexibility which would be more readily achievable in the Thin and Medium archetypes.

A competitive commercial model allows companies to compete to deliver the best solution, across value, design, user experience or time to delivery. The procurement process allows the SOs to shape their markets through leveraging the expertise of service providers. This approach also allows a competitive commercial tension to balance the competing needs of the control room, service delivery and end users.

The Medium approach appears a more balanced and achievable approach to a digital infrastructure although we don't particularly like the term "Flexibility Exchange".

In our view, exchanges are market-places that allows fair and orderly trading and transparent dissemination of price information based on being independent, private organisations. However, the current flexibility markets are very basic procurement platforms, that do not have a common rule book, and result in bespoke, bilateral contracts that lack any transparency over price formation and flexibility usage. We do not think that there should be a central infrastructure to address these short-comings.

The view of market-places is old-fashioned. Market places are not as siloed as described in this document. Market places (and their price indices), typically sit within a complex energy trading ecosystem where participants pull data from a variety of sources. This allows the market participants to optimise the use of their asset in the most economically advantageous way. The links between markets allow for

greater price discovery and more efficient risk management. We believe that these links can already exist and are facilitated by common interface standards without the need for an additional central layer.

However, there are areas of commonality that the Medium Archetype could help address.

- Asset registers:

- We do not particularly care about interfacing between a central asset registry or multiple registries. The mapping of the registries is possible for market platforms is relatively easy. However, we'd expect the assets not to need any further onboarding once they are registered. Part of the appeal of the Thin archetype is the directory that can help FSPs navigate around what is required with the various registers avoiding any duplication of efforts.
- We understand that onboarding complexity is created by signing-up DER assets to multiple registries. However, we do not think that it is particularly hard to have multiple directories referencing each other and across markets. However, there would need to be standards around the onboarding process and verification of the asset that each market could rely upon.
- One common idea is the single market platform as way of reducing the friction for FSPs. A common access point may have some advantages but hides the complexity that must be dealt with elsewhere and not necessarily to the advantage of FSPs. It could act as a limiting factor in the further development of markets and products. For example, any future development would require pre-approval by the other organisations that rely on the platforms and may not have the same objectives.

- Reporting Standards:

- We would expect that all markets places should already deliver robust and transparent reports on their transactions (and orders). These should be interrogatable by those with appropriate permissions. Whilst we see the appeal of more centralised reporting (such towards regulators or physical notifications to Elexon) the nature of these should be limited due to the complexity to reach agreement through a central approach.
- A directory approach (Thin archetype) would help companies navigate to organisations that they want to understand the options and history better. However, industry should try and avoid a central data warehouse could simply a data dump that for the user is unnavigable.
- the regulator could help to coalesce industry around a set of data standards (e.g. API) which SOs and market operators could adhere to. The common standards would then reduce the friction for FSPs/DER to access the relevant data.
- We also observe that good data practice has a commercial value. Organisations will evolve to offer these services where there is a demand (and commercial value to do so).

Commented [HW1]: We said that there is some advantage for the market coordination role between the ESO and DNO markets - but not between DNOs nor between Market Platforms in the same area

Commented [HW2R1]: I wonder if we want to push this? It feels like the SMP.

- Market coordination:
 - o This can already happen in the existing market-places although the primacy rules should be set centrally at an organisation such as Open Networks. The coordination should be executed through the clearing algorithm at the market-place.
 - o Suppliers position physically. could be simplified via a better reporting / acknowledgement via Elexon.

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

We are not entirely sure that an archetype is entirely needed to be defined. Throughout our response we have highlighted the areas that we think are most desirable (and those that are not).

However, we recognise that there is a need to provide more clarity over roles and responsibilities.

In that sense, the medium archetype seems to strike a good balance between efficiencies and complexity – with the caveats already mentioned.

The Thick archetype looks a lot like a central dispatch -active-reactive optimal power flows across all voltage levels with all products mixed up (so-called "co-optimized"). This is not a market and could mean FSPs do not participate in markets most beneficial for them. The feasibility around such a centralised design and build of such an archetype is also extremely challenging. We would have concerns that this is a revolutionary approach, that would kick the legs from under all the existing developments in this space.

Section 4

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

The use of industry standards, specifically CIM, is highly recommended as it provides an established and internationally recognised framework for modelling and exchanging power system information, establishing a common language and supporting interoperability.

Extending and working with existing standards is key to facilitate interoperability between systems. This can be done at different functional or technical levels:

- Information models: (IEC TC57 CIM) for an alignment on terminology and object definition
- Model serialization format (JSON, XML, binary ...)
- API protocols (REST, SOAP, RPC ...)
- Other industrial standard protocols (IEEE 2030.5, IEC 61850, OpenADR, DNP3, MODBUS ...)
- Security

Commercial investments have been made in these systems and these should be built upon rather than reinventing the wheel. For example, our local flexibility market platform has extended its information model for APIs based on:

- The CIM for grid model data exchange
- The European style market profile (ESMP) documents published by the ENTSO-E and also based on CIM (IEC 62325) for buy/sell flexibility order exchange
- We also use secured REST JSON APIs for supporting the exchange of the above data models

This follows an objective to harmonise the interfaces offered and exposed to market participants across the overall energy market landscape.

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

We would look for Ofgem to give guidelines but allow industry to do the implementation and obviously make regulated organisations accountable for delivery. Inspiration can be taken from market coupling projects in GB and Europe. These complex projects that involved system operators and market platform operators (power exchanges) which required cooperation nationally and internationally and facilitated the allowed geographical optimisation of energy and cross border capacity allocation and congestion management. For the sake of this paper we'll call this horizontal coupling. We would argue that the flexibility markets require vertical coupling (i.e. through the voltage levels) to manage local congestion management but require similar levels of cooperation between organisations. This is key to maximising the societal welfare.

The market coupling project were initiated via several pilot projects (although they were not known as such until the after the application of the regulation). The projects preceded the regulation based on the clear guidelines and ability to recover costs that were linked to the implementation of the project. The freedom to negotiate between parties on the roles and responsibilities as opposed to an overly prescriptive regulatory model allowed the projects to proceed faster and be more accountable to each other.

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

A few ideas in no particular order: Fairness, pre-financing, clarity over process, ability to escalate issues, reporting requirements, timeliness, trustworthiness.