ELECTRON

The Future of Distributed Flexibility: COVER LETTER

10th May 2023

By e-mail to: flexibility@ofgem.gov.uk

Dear Flexibility Team,

Re: Call for Input Response on The Future of Distributed Flexibility

Thank you for the opportunity to respond to the above Call for Input.

As you know, Electron is an energy technology provider, developing software in support of locational energy and flexibility markets and market operators. We have participated in and contributed to many of the learnings you reference in introducing new distributed flexibility markets, and as such we have also experienced many of the market failures that you reference first hand. As such, we welcome this consultation and focus on scaling distributed flexibility.

At a high level, we are deeply supportive of Archetype 3, and the deliverables in your "Exchange" architecture approach, and believe this is the right direction and timing for the industry. However, we are concerned that a "single platform" approach for all deliverables, as set out, may look like the most elegant technical solution, but is terrifying from a delivery and execution perspective. Indeed we could point to no "good" examples of such a platform materializing in our sector.

We propose a slightly adapted model 3, with some shared, federated data import and export "pipes", as described and illustrated in our response below, and an architecture that promotes an ecosystem of competing market platforms and business models for customer engagement, discovery and enrollment in trading opportunities.

While the full realization of model 3 is quite a journey, we would urge you to take some quick wins.

Although there will not necessarily be a single "data pipe" in the future, especially if CER markets scale to incorporate non-metered IOT devices, there are some obvious places to start developing this pipe, particularly pointing to ESO's current workstream and the feasibility work that Arup and ESC are currently undertaking on a "Digital Spine".

You could then rapidly prove out the ecosystem model with some smaller third party platform integrations, before undertaking to scale this model to a broader ecosystem. This would deliver workable protypes of this model in 6-12 months and give comfort, as opposed to pause, to the large number of concurrent ESO, DSO, municipal, community etc market development workstreams.

We are excited to support this important work you are undertaking. If you would like to discuss any areas of our response further, please contact our Chief Commercial Officer, Chris Broadhurst, directly (chris.broadhurst@electron.net)

Yours sincerely

Joanna Hubbard

Chief Executive Officer

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CONSULTATION RESPONSE

Section 1

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

We agree with the services set out in your analysis. We expect the key services to be National (today) and Local (to come, post REMA and community energy reforms) balancing services, distribution-level constraint relief (emerging) and resilience services (to come). They will also provide greater resilience to the energy system, through their many and distributed nature, as well as lower overall cost of energy infrastructure.

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

We agree that, since CERs are amongst the most challenging assets to accommodate in flexibility markets due to their size, variety, ownership models, metering, ability to move about etc. However, some of these features will make it particularly challenging to value their services at all vs the complexity of inclusion. That might leave you with only a subset of CERs to develop a market around, which may present insufficient liquidity to make it worth the effort developing the market, unless you also consider DERs (in the sense that you defined them, i.e. commercial assets).

An example is the distinction between dispatchable power (in which a supplier or aggregator can guarantee the service) and non-dispatchable loads (whose participation in markets depends on consumer intervention). Availability-led markets (in which a buyer chiefly values the certainty of performance) will likely need to include dispatchable CERs and DERs to scale and so we would strongly urge for DERs not to be excluded from this enquiry.

Another point of distinction on the CER vs DER focus is that primacy rules between national and local markets will be felt more strongly for DERs vs CERs due to their potential size. In such cases, solving for DERs first is likely to bring most of the answer for CERs.

Section 2

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

Absolutely yes. We are excited about this much needed intervention and focus.

Of the missing markets and mechanisms you mention, the aspects that we feel to be most strongly missing are:

- Time and location based markets: this CFI does an excellent job of calling that out

- Incorporating the needs and value of non-network led markets (such as community energy or curtailment avoidance markets) to increase the value and scale of flexibility markets as a whole.

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

The accessibility and coordination of distributed flexibility markets will certainly require new, common and trusted data sets, such as common registration processes for actors, assets, permissions, markets etc and others currently being explored under the Digital Spine scope of work. We refer to these as **common data import pipes**.

Rules for market primacy, conflicts and stack-ability must be resolved off platform. Once set, **markets could be enforced by an ecosystem of platforms**. We see market coordination and operation (enabling price discover, liquidity, digital contracting etc) as something that an ecosystem of platforms should and could provide, and somewhere aggregators, platform providers and various community trading models compete create maximum value for participants. These competing business models will be key to bringing consumers and their assets into these markets; an elegant technical architecture will not be enough to entice them in. Although assets can choose to enter markets through various platforms, those platforms will be responsible for delivering those assets maximum value i.e. enabling stacking where possible.

We would be very happy to show you a demonstration of how we have accomplished this on ElectronConnect if you are concerned that it can only be done centrally.

As for dispute resolution, trust, governance and a data rich environment for meta-data analysis etc, this should be enforced by a set of **common data export standards and pipes.**

We were concerned that your statement “competing digital infrastructure would be self-defeating” in the context of market operation. In many industries it has been recognised that competition is the biggest accelerant to optimising software solutions, as the competing vendors each look to provide additionality within their spheres of expertise. In addition, vendor lock-in has negative consequences including limited agency to access best-in-class functionality, increased costs, etc.

This statement also seems to directly contradict National Grid ESO’s stated preference for competition everywhere. Given the rapidly evolving flexibility market landscape, and its various known and unknown unknowns, competition driving innovation will be key not only to developing a fit for purpose solution, but also to ensuring that it adapts quickly to future system needs as they appear. This concept is aligned to the ongoing work within NG ESO’s Open Balancing Program (OBP), where the aim is to facilitate competition everywhere, and allow services and products to ‘plug-in’ to the program.

Finally, because you explicitly mention *delivery* in the question, we believe an agile/ non-waterfall approach here is critical. Start small by focusing on the key data pipes that we know we need today and proving they can feed into a number of different market platforms that already exist, develop the export pipes for those platforms, and then scale.

We cannot possibly know the details or requirements of all future system needs, so we should not attempt to prescribe what the full functionality endpoint looks like today. We need to avoid attempting to dictate what a solution looks like before we can clearly define those requirements, and more over we should set the scene to allow a multiple vendor ‘learn as we go’ approach.

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

As mentioned in question 4, we can already be certain as to what **some of** the common data import and export pipes look like today. We can also encourage competition and innovation by delivering an architecture that enables an ecosystem of services to thrive. **Together, this architecture and data infrastructure would be huge accelerants for the inclusion of more CERs in distributed markets.**

However, in order to promote the ecosystem approach, we would suggest that the end vision should not focus on specific functionality, rather how the digital infrastructure can align with ongoing and future enabling work.

There is an important risk here that we also want to underline. **Certainty as to what is being finally delivered will actually pause, not accelerate enabling work if the industry is holding out for one big delivery in 2-4 years time**. On top of that, we have observed that past market platform deliveries have traded-off features/ functionality to ensure delivery budget/ timing, which thwarts other business models down the line.

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

We urge you not to think in terms of a single infrastructure that can be completed, but rather take the approach of a common set of data import and export pipes and establishing a technical architecture that can support a broader ecosystem of supporting services. As noted above, many existing systems are in place and work has begun across many other relevant aspects.

Taking this approach, we would advocate to start immediately and deliver incrementally. The first deliverable needs to be a really good understanding of distributed generation in the system, including both static data (e.g. what, where) and dynamic data (how it behaves). The second step needs to be to structure other shared data.

Then, we'd urge you to prove out an ecosystem of platforms and services interacting with that data within 6-12 months, starting by proving small integration before scaling to larger integrations.

In parallel you can set common data models for reporting/ revealing trading and other metadata, and mandate a single receiving/ processing party. These can easily be evolved as markets develop for little additional cost.

Section 3

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

Our vision is most closely aligned to your "Medium/ Exchange" vision, however with the additional specification that this is achieved through a Software Ecosystem and not a monolithic single platform.

A Software Ecosystem is composed of multiple systems (potentially that come from multiple vendors) that work together and co-evolve to form a cohesive end-to-end process. This is distinct from a

Monolithic Application, in which a single platform (most likely developed by a single vendor) attempts to provide all software functionality.

We believe an Ecosystem approach is the only feasible way forward for flexibility markets for the following two related reasons:

1. The requirements for different market operators will be similar but different, an ecosystem approach allows the optimal solution to be put in place for each step, and indeed to evolve over time as the underlying service requirements evolve; and
2. It unlocks a 'best-of-breed' approach, where we select the best solutions for each part of the workflow. This is the basis for competition, competition drives innovation and improvement, which in turn helps ensure the optimal solution however the landscape changes over time.

Error! Reference source not found. below shows the key steps in the end-to-end workflow for flexibility markets, and importantly the areas where multiple software providers are required are indicated by the symbol.

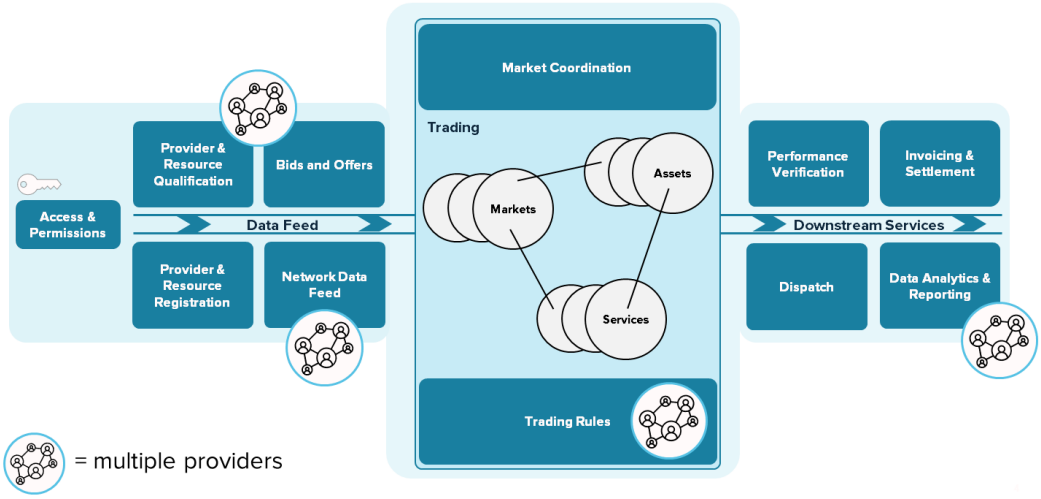

Figure 1: The different functionality elements of the flexibility market workflow, the aspects where value can be added by multiple providers is shown by the symbol.

These areas are not homogenous in terms of functionality requirement, meaning that the optimal solution will depend on aspects such as; the nature of organization (e.g. ESO or DSO). Required market trading arrangements (i.e. what is the flexibility market tying to solve, is it locational constraints, system balancing, asset-to-asset trading, etc.).

It is in these areas that allowing best-of-breed approach and competition is most important.

Given the above, the infrastructure should look to provide clarity in the following areas:

- How an Ecosystem approach can be facilitated – for example; the rules for co-evolution of software systems, best practice for parallel development (e.g. between multiple vendors) etc.
- The nature and frequency of information to be shared throughout the Ecosystem.
- Understanding 'what there should be one of, and what should there be multiple of': Where does 'multiple' provide additionality, where does it present barriers?

In addition, it should be noted that the concept of an Ecosystem approach is aligned with the UK government's 'Digital Spine' for the energy system. The 'Digital Spine' has been defined as "a thin layer of interaction and interoperability across all players which enables a minimal layer of operation critical data to be ingested, standardized and shared in near real time". What we suggest here builds on the concept of the 'Digital Spine' for flexibility markets.

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

The concepts outlined in the Archetype 3 (Medium or Exchange) show the most potential for rapidly unlocking scale in distributed flexibility markets, with the understanding that this is done using an ecosystem approach that drives innovation and facilitates a 'best in breed' approach to the specific functionality, rather than suggesting that this is developed by a single entity.

Section 4

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

Development work has already begun on multiple relevant aspects, for example ESO's Single Market Platform (SMP) for provider registration, bids and offers (as used in the recent DFS trials). These systems in many cases are fit for purpose, relatively proven in use as BAU today, and market participants are familiar with how they work. We need to build on this work, making improvements where they are needed, rather than attempting to start from scratch.

The Digital Infrastructure should focus on identifying which aspects of the changing energy system landscape will impact each of these existing systems, how we may need to adapt them, and identify where new systems are required within the ecosystem approach.

This is a combination of evolving existing infrastructure and new build: enhance the existing systems where they have shown to be effective, fill the gaps with new-build solutions.

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

When considering the delivery model for any project, context is important. In energy, this is renewable technology like solar and its zero marginal cost of production, of which flexibility is a feature.

Much like the how the internet and its underlying infrastructure drove the marginal cost of distributing information to zero, and in doing so gave rise to a new digital economy; so too will renewable technology and its zero marginal cost of energy – with the right infrastructure – give rise to a new digital energy economy.

To design the right delivery mode for critical infrastructure like the internet or renewable energy, understanding how and where value is created is a key consideration.

With the advent of the internet, value no longer accrued to those who controlled the supply and distribution of information (e.g. the printing press) - this was no longer the hardest problem to solve. Instead, through a shared network of computers and common digital infrastructure (the internet), there was a paradigm shift – value shifted from supply, to demand.

In zero marginal cost systems like the internet and renewable energy, the winners are those that can attract the most customers (I.e. generate the most demand) by delivering the most compelling service continuously, and at scale. This concept has been coined aggregation theory, and explains the rise of companies like Google, Amazon, Netflix etc.

We feel this is an important comparison to make when considering delivery models, because it spotlights the critical role digital infrastructure has to play (and also the roles it should not play) in fostering competition, innovation, and ultimately in maximising value to customers.

Using entertainment as an example, through standardisation of protocols & data flows (HTTP, TCP/ICP etc), we saw a new ecosystem emerge - cloud computing - and with it the fall of Blockbuster, and the rise of Netflix. Over time, we've also seen the rise of many other competing services and ecosystems to challenge Netflix - all the result of innovation, driven by competition and powered by a set of common standards.

This duplication of services is a key driver for value creation for the end customer, which means – in the context of a common digital infrastructure – clear lines should be drawn between non-discretionary functionalities that have to exist and should not be duplicated, and those discretionary or value-add services which can maximise benefit to customers through continuous competition and innovation (as outlined in Figure 1 above)

In other words, if optimising for entertainment at home was the goal, then when designing institutional delivery models the objective would be to focus on the design and delivery of common protocols and data flows on which such a service could be built; not to attempt to build the home entertainment service itself.

This is the area where we would encourage the most scrutiny when designing the institutional delivery model – excellence in protocol and standards, with an open, ecosystem led approach to platform and service design. Taking this approach, a new mandated consortium (open banking) or tendered and licenced (DCC) delivery model could be well suited. With a tighter scope, slower pace in delivery becomes less of a risk. Instead, the consideration is between (on the upside) value for money and clear accountability, vs technical expertise and longevity through adapatability; and (on the downside) technoractic decision making and coordination challenges, vs administrative burden and technical lock-in.

On balance, and assuming a focus on standardisation of protocols and data, we would advocate for the tendered and licensed model. This delivers value for money and at pace, with clear accountability. Technical lock-in is a risk, but is minimised through a tighter remit and clear focus on data as infrastructure, rather than full service design.

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

For the common data import and export pipes, or “data as infrastructure”, an accepted rate of return has been adopted elsewhere (DCC, FSO) and seems appropriate for this function.

The competing ecosystem of market platforms and customer services should be private and profit seeking to maximize innovation and competition at this important stage of market development.

There may well be other shared services that need to attach to these common data pipes (e.g. an Elexon type cross platform settlement role) that could be subject to bespoke industry arrangements.