



Ofgem Call for Input: The Future of Distributed Flexibility

Executive Summary

- Eaton is a global power management company with nearly 85,000 employees and a global turnover of \$20bn. Since 1911, Eaton has manufactured power management technologies for a range of energy intensive industries, including road transportation, aerospace, machinery, oil and gas and electrical infrastructure in commercial buildings. Our journey means that we have now evolved into an intelligent power management company, ideally placed to provide an informed view on the energy transition.
- Eaton welcomes Ofgem's decision to bring forward a consultation on a common vision for distributed flexibility, behind which it is critical for industry to unite to facilitate a flex-centric future.
- More households and businesses are starting to explore and engage with flexible technologies such as renewable energy generation, energy storage systems and EV charging infrastructure.

However, all too often, the UK's electricity market design structure acts as a barrier to investment.

- We accord fully with what Ofgem has already noted: that the UK's electricity market design is complex and opaque, thus acting as a barrier to consumer and commercial investments in distributed flexibility.
- Our submission sets out the policy and regulatory initiatives that will make flexibility assets and services more attractive to private investors to create an effective flexibility market. Amongst other things, this includes:
 - Standardisation and simplification of contracts for demand response, storage and flexibility.
 - Certainty of an 'end vision'.
 - The development of a common digital energy infrastructure.
- We believe that these recommendations will help the UK to align with the EU's work on electricity market design, as well as bolster the UK's readiness for the energy transition.

Section 1

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

Activating a fully-fledged system of distributed flexibility from buildings, electric vehicles and industry would result in substantive cost and carbon savings compared with a 'business as usual' (BAU) approach of limited distributed flexibility supported by fossil fuel generation. We can back up this assertion with data from two independent studies that we sponsored in 2022:

In Europe, we co-sponsored a report prepared by the international management consultancy DNV for the industry body Smart Energy Europe (smartEN). The model developed by DNV showed that in 2030, a pan-EU scenario of fully activated flexibility from buildings, electric vehicles and industry would deliver the following outcomes when compared with a BAU scenario:

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- 37.5 million tonnes less greenhouse gas emissions
- Saving of up to €29.1 bn on grid investments
- 15.5 TWh of avoided renewable curtailment
- €71 bn saved annually by consumers directly
- €2.7 bn saved annually in avoided peak generation capacity

The basis of the model and its full findings can be found here: [2030 Demand-Side Flexibility in the EU - Quantification of Benefits](#)

In the UK, we sponsored the 2022 iteration of an annual study to assess and compare the readiness of electricity markets in European countries for the energy transition. Conducted by the REA (the UK's largest trade association for renewable energy and clean technologies), the 2022 Energy Transition Readiness Index (ETRI) examined 13 countries and it showed how countries with flexibility markets that better deliver fair, transparent and simple access for all participants are making better progress in reaping the benefits of distributed flexibility. The UK's state of readiness compared poorly with countries that are further advanced in embedding flexibility into their energy systems, particularly the Nordic countries. To cite just one example, UK smart meter penetration, as reported in the survey, stood at around 45%, compared with Sweden (100%), Denmark (99%), Norway (98%) and Finland (97%) and in terms of regulatory readiness, the UK's score was '2' out of a possible '5'.

The full findings of the ETRI report can be found here: [eaton-210917_rea-etri-2022-en-us.pdf](#)

2. Will a focus on CER (Consumer Energy Resource) flexibility also help enable other forms of flexibility, especially distributed flexibility?

Largely, we agree that a focus on CER flexibility will help enable other forms of flexibility, but it is important to note that the contribution CERs make to distributed flexibility is quite different in nature to the contribution of DERs.

Unlike DERs, CER owners will use some of the electricity they produce, so when individuals, households or businesses invest in CERs they begin to both produce and consume electricity and their lifestyles or business needs govern their behaviour when it comes to energy flexibility. For example, if a 'prosumer' needs to drive their EV and it is out of charge, they are likely to charge the vehicle regardless of whether it makes more economic sense to charge overnight when electricity is cheaper (although Time of Use tariffs will act as incentive or deterrent). There is a behaviour change involved which should not be underestimated.

CERs and DERs are fundamentally different, although it is fair to say that for CERs, the need to clarify the rules of engagement with the grid will become more pressing, more quickly, because of the speed at which a large volume of CERs in the marketplace will accumulate.

Over the next few years many consumers will invest in assets such as EV chargers, solar panels and electric heating systems, particularly as they become cheaper and particularly if UK Government policy continues to encourage them to invest: the ban on the sale of new petrol and diesel vehicles will accelerate investment in EV chargers, for example. Business investments in DERs, in comparison, are larger, more costly, subject to more intense consideration and therefore likely to grow in volume at a slower pace.

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While a focus on CER flexibility is vital, it should be with a continuous eye on the 'bigger picture' because, as Ofgem has set out, only a holistic overhaul of the entire UK energy system can be truly transformative. In our work at Eaton, we see that big picture daily because we work with customers on both sides of the meter and we are developing products and services for both CERs and DERs.

Section 2

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

Yes, there is undoubtedly a case for change. Householders and businesses are picking up the pace towards net zero, spurred on by the energy crisis to examine technologies such as renewable energy generation, energy storage systems and EV charging infrastructure.

However, all too often, they are dissuaded from investment by a UK market structure that acts as a barrier to investment. We accord fully with what Ofgem has already noted: that the UK's electricity market design is complex and opaque. It acts as a barrier to consumer and commercial investments in distributed flexibility.

There is an urgent need for a common digital vision for flexibility. Householders and businesses on the demand side must be able to see easily that they can save money, make money and reduce pressure on the grid by investing in the technologies that will allow them to access the benefits of flexibility. They need to be able to interact with the grid to do that: digital infrastructure, such as smart metering, must be in place.

We tend to agree with Ofgem's statement in Section 2 that 'we are information rich, but implementation poor' and we would add to that the need for urgency in delivery. Speed is of the essence.

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

We believe firmly that policies and regulations that makes flexibility assets and services attractive to investors will create an effective flexibility market. Private investment will propel and sustain the energy transition over the long term but for this to happen, regulatory certainty is a prerequisite.

Recent EU proposals, announced in March 2023, focus on creating stability through long-term contracts and giving consumers more transparency and choice: [Reform of the EU electricity market design \(europa.eu\)](#). It is highly relevant approach for Ofgem to consider the EU approach because energy systems are integrated across Europe and they will continue to be integrated throughout the energy transition and into the future. The EU proposals address both CER and DER.

Eaton is an intelligent power management company and we supply customers on both sides of the meter with products and services that are used across Europe and the world. This means we can see the importance of standardisation in delivering accessible, coordinated and trusted markets for distributed flexibility. Business customers very often need electricity for operations in more than one country and they need flexibility products that will work for them

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across borders. Although the UK is no longer a member of the EU, alignment will be an important aspect of the country's end vision for distributed flexibility, in our opinion.

Standardised and simplified contracts for demand response, storage and flexibility would undoubtedly improve system integration and efficiency. UK consumers and businesses need to be offered a range of flexibility products that are easy to understand and simple to use. Standardisation is key to this. It should be easy for those on the demand-side to make comparisons and select what is right for them. Such an approach would be of widespread benefit because it would make it easier for innovative companies to develop and offer the technologies, products and services that consumers need to participate in a fully flexible system.

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

Yes, we believe that certainty of an end-vision is vital to success, with the emphasis on certainty. As Ofgem has noted, we are now reaching an inflection point at which we need to pull together, converge accumulated knowledge on flexibility and focus on ensuring joined-up markets to create a co-ordinated end-state.

We would reiterate our point that there needs to be standardisation of easy-to-understand products. We feel this is the only way to gain momentum, the only way to help accelerate enabling work and make it cohesive. The current situation of high-friction market entry and burdensome processes is undoubtedly a barrier: we point again to the recent studies we supported that were commissioned by SmartEN and the REA (see detail in our response to Q1). Both these studies pointed to the importance of a certainty in terms of end vision.

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

Developing a common digital energy infrastructure for the UK is an urgent priority and development should begin as soon as possible. As an intelligent power management company, we know that the future of energy is digital and until the necessary infrastructure is rolled out, the energy transition cannot be fully realised. We have already pointed to the need for the smart meter rollout to proceed quickly to completion.

Section 3

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

Of the four archetypes that Ofgem has set out, we favour the 'thin' archetype for speed of implementation with a view to it acting as a step towards the 'medium' archetype. The medium archetype should be the goal.

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

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Speed of implementation is desirable, which is why we opted for the thin archetype to act as a stepping-stone to the medium archetype. A degree of independence would be another desirable facet of a common energy digital infrastructure.

In terms of feasibility, some existing market models can provide a framework to enable the growing volumes of CERs to trade energy and services. We recommend reference to the NODES market [Market Design - NODES \(nodesmarket.com\)](https://nodesmarket.com) and draw your attention to the Norflex pilot project that is set to conclude in April 2023 in Norway.

NorFlex is the flexibility market that NODES has been operating in the DSO Agder Energi Nett and Glitre Energi Nett grids in southern Norway. The market opened for trading in 2020 and the pilot is set to finish in April 2023. The goal is to demonstrate how flexibility can be used by the DSO to increase efficiency of grid operations, increase grid connection capacity and postpone grid investments. Eight different flexibility service providers are participating in the pilot, offering flexibility from more than 2,300 assets in industry, commercial buildings, batteries and homes. The minimum tradable quantity is 1 kW, allowing all assets to participate in the market on equal terms.

The Norflex pilot is detailed on page 27 of the REA's ETRI report: [eaton-210917_rea-etri-2022-en-us.pdf](#)

Section 4

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

For the sake of economy and speed, there may be elements of existing infrastructure that could be used as a base for moving forward. but overall, the change is so fundamental that there will have to be significant new build. This is how to lower the transactional costs.

We recognise the risks of indecision and delay in this, so would propose looking at the digital infrastructure of other 'many-to-many' markets that are already developed.

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

Digital technology will make it possible for consumers to participate in energy markets in a way they have never done before and this means they will take on much higher levels of risk. An important area for consideration when designing institutional delivery models, therefore, is some degree of protection for them. The products developed need to be easy to understand, delivery mechanisms.

Trust in the system will be vital and cybersecurity assurance will be critical. There will be matters of privacy and security in relation to the way that smart meters generate data about users and these must be addressed.

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

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Automated settlement will be important. There will be a lot of small transactions. A common digital infrastructure should set out with the ambition of lowering transaction costs.

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