

Schneider Electric response to Call for Input: The Future of Distributed Flexibility

Overview

Schneider Electric UK & I ("SE") welcomes the opportunity to respond to Ofgem's Call for Input on the Future of Distributed Flexibility. SE drives digital transformation by integrating world-leading process and energy technologies, endpoint to cloud connecting products, controls, software and services, across the entire lifecycle, enabling integrated company management, for homes, buildings, data centres, infrastructure, and industries.

SE is a recognized leader in flexibility solutions. Through a recent acquisition of AutoGrid and our residential Prosumer and commercial microgrid Solutions, SE offers flexibility solutions spanning residential, commercial, and industrial flexibility participants. SE also offers Grid Management Solutions such as ADMS and DERMS for real-time visibility and control of network operations, an essential component to enabling flexibility integration of low and medium voltage resources.

SE agrees that flexibility has the potential to unlock value across the energy value chain for consumers and producers of energy while enabling the advancement of grid operations. The energy transition, led by producers and consumers is only made possible if our electric grids can enable flexibility.

Enabling flexibility at scale and at pace requires thoughtful design of the new marketplace structures and integration with existing energy markets. Ofgem's approach to proposing new Archetypes reflects the degree of intentionality and coordination required to advance implementation at pace.

In considering the requirements for such a platform, functionalities at each stage of market chronology should be further prioritized for centralization. SE reflects that as the archetypes increase in scope, they do so across each category nearly equally without explicit consideration of which functions might be the most critical to centralize. A deeper understanding of the relative value will impact the implementation and governance approaches suggested below and should be the first course of action. Furthermore, there appear to remain open questions on the size and scope of the markets on the centralized platform. Design of a platform that permits the future integration of millions of assets and dozens of markets is an ambitious goal that risks long design and implementation timescales.

SE advocates for identifying the functionality that serves as a common denominator, permitting a set of no-regrets investments which allows a platform to be designed and implemented quickly, aiming to scale over time. Such functionality includes:

- **Shared registration criteria** for CERs to reduce burden to enter markets
- **Standardisation of data exchange between CERs and marketplaces**, including the requisite low voltage monitoring to form capacity constraint signals and enable settlement of higher granularity market products such as frequency control or voltage response
- **Coordination of market rules for products requiring physical dispatch** to ensure markets do not double count resource energy or capacity

General Feedback

1) Do you have any comments about the overall process of this consultation?

Schneider Electric ("SE") welcomes the consultation and the discussion surrounding Distributed Flexibility. Flexibility is critical to achieving decarbonisation targets goals, and leverages the benefits of 3D models: decarbonised, decentralised, and distributed energy resources. Decarbonisation can be achieved only with a flexible management system and planning of the integration of commercial and residential distributed energy resources (DER and CER).

2) Do you have any comments about its tone and content?

The tone and content of the document clearly recognise a need for a new approach to deploying flexibility at scale. Ofgem directly outline the challenges with business as usual and underpin the need to make significant changes to the methods previously used to create flexibility markets. SE appreciates the urgency communicated and the detailed information provided to assess pain points and use cases.

The rationale behind the limitation of scope to Consumer Energy Resources (CERs) only is not necessarily clear, as market rules and technical integration will have impacts to both CERs and larger DERs connected to low and medium voltage networks. Through SE's work as a global corporation, we see that the future energy system in many countries includes flexibility demand and production with a diverse energy mix, support by multiple different type of assets. The capacity of flexibility required for the balance of the system needs to have broad representation of capabilities.

The types of assets to be involved as a flexibility source should be extended to different types of segmentation. As an example, the sources of flexibility considered could be extended to technologies such as electro-intensive electricity processes, the management of industrial and commercial segments, the integration of microgrids, and long duration energy storage.

Additionally, in some cases, a better understanding of the assumptions of the assertions made regarding number of resources and number of markets would be useful. Ofgem indicates that there will be "hundreds of buy- and sell-side actors; millions of connection points; a dozen (or more) market products and all operating at increasing speed." While this may be true, the market platform should consider two important aspects:

1. How many devices it will *directly* interact with vs. those which will participate through aggregators
2. How many markets and of which type will sit on a centralised platform.

This Cfl lists both physical and financial markets alongside each other, but the rules which govern and coordinate these two types of markets are often different. Furthermore, we would find guidance regarding who the market operators will be useful. By not explicitly mentioning the DSO role, the Cfl maintains the ability for the market platform to welcome market operators of all kinds. However, the number and type of markets will need to drive platform requirements and should be considered early in the design stage before determining the approach to coordinating a number of 'unknown' markets.

3) Was it easy to read and understand? Or could it have been better written?

Yes. The document was well-written and easy to understand. SE appreciates the effort made by Ofgem and IBM to generate tables and diagrams to simplify the complexity of the existing flexibility, energy marketplaces, and design options for a common infrastructure.

4) Were its conclusions balanced?

SE found the conclusions balanced based on the information provided.

5) Did it make reasoned recommendations for improvement?

Yes. The recommendations for improvement were well reasoned. SE agrees with the challenges outlined regarding market access and coordination, high transaction costs, limited access to information, and a lack of coordination. It is a sensible conclusion that a digital system is required to facilitate coordination in order to enable information provision, market access, and implement appropriate trust and governance structures.

6) Any further comments?

When considering flexibility markets and the options which exist for a digital backbone, defining the appropriate structure is best considered across a value/effort scale. Ofgem provides a strong case for the effort levels associated with each area of functionality, but the relative *value* of the different *core functions* is arguably absent. Stakeholder feedback on which core functions are the ones required from a digital platform or marketplace would be prudent to ensure that the platform design is not overweighting a function that, while relevant, is of lower priority to marketplace participants. For example, the trade-offs between 'time to deliver' and 'market coordination of operations' may be weighted differently by different participants, leading to a solution that is a combination of the functions of the 3 archetypes, rather than any single archetype.

Section 1: The imperative, potential, and challenges of flexibility**1) What do you think distributed flexibility could contribute to the energy system?**

Distributed flexibility can contribute significantly to the energy system stability and reliability, facilitating the integration of renewable energy sources.

One of the main advantages of distributed flexibility is its ability to help balance supply and demand in real-time, reducing the need for large-scale centralised power plants and transmission lines. Leveraging demand-side flexibility can lead to a more decentralised and resilient energy system that is better able to cope with locally-arising disruptions and outages. As stated in the CFI, distributed flexibility needs to involve not only CERs, but all types of flexibility resources including those owned by commercial and industrial customers.

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

A focus on consumer energy resource flexibility can help unlock the full potential of distributed flexibility by enabling more flexible and responsive energy consumption and production. Beginning with CER flexibility may allow market operators and Ofgem to solve harder challenges associated with incentive structures, data exchange, and market coordination. However, it may also delay incorporation of DER flexibility into flexibility markets as the challenges associated with CER integration are often harder than those associated with DER flexibility. Unique challenges arise with CERs given the challenges with managing smaller sized resources, predicting individual usage patterns, telemetry availability and data sharing, and remuneration and penalty structures

for individual asset owners and aggregators who participate on their behalf. DER flexibility, in contrast, historically follows existing market participation rules, have more aggressive participation requirements, and clearer remuneration structures.

In the design of a single platform focused on CER flexibility, care should be taken to ensure that the rules and standards are able to support all sizes and scales of Resources so duplicate work is not required to expand market participation.

Section 2: An Approach Pivot: The case for change

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

Yes, there is a case for change and a need for a common vision. The current centralised energy system is facing increasing challenges in terms of reliability, affordability, and sustainability. Distributed energy resources (DERs) offer a more flexible and decentralised approach to energy generation and consumption, which can help address these challenges.

However, the integration of DERs into the grid presents significant technical, regulatory, and market challenges. To date, the approach to enabling flexibility has enabled market participants to innovate independently on the required technologies and market constructs. While this approach permits new ideas to rapidly be tested in the marketplace, it introduces risks around deployment at scale and alignment on core principles.

To realise the full potential of DERs, a comprehensive and coordinated approach is needed that involves stakeholders from across the energy value chain, including utilities, technology providers, policymakers, and customers. This approach could clarify the expectation of all stakeholders. In particular, distribution system operators need to be involved to insure the reliability of the distribution network and stability. DSOs will be required to invest in technologies and platforms which enable the generation of data for the creation of market signals. The market platform cannot be considered independently of its data sources.

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

At their core, flexibility markets leverage CERs and DERs to alleviate system constraints, permitting more effective system balancing. To accelerate the delivery of flexibility markets, critical questions listed under Section 2.2 “Part 1: Accelerating Enablers” must be answered before a single digital layer can be defined, particularly related to *standardised market products* and *market stacking and primacy rules*, the foundational components of alleviating system constraints. Development of a common digital energy infrastructure without a core understanding of its functionality risks an overbuilt system with too much complexity. Using learnings from prior flexibility efforts, including innovation projects, ENA, and catapult activities, will help consolidate and determine the immediate areas for focus.

Building on the work done for the publication of this Cfl, Ofgem should continue to engage industry and stakeholders in a focused effort to define the required functionality, prioritise platform features, and outline a roadmap for delivery.

- **Define required functionality.** Ofgem indicates there are 6 DNOs and 17 existing markets. The nature of each market does not require management of all existing and all future markets on a centralised platform. Limiting the scope of the platform to the markets which require active coordination is critical to accelerating development and deployment.

- **Relative of features.** Market operators and market participants as core stakeholders should be further engaged to refine the core characteristics of the platform. Deployment of a centralised platform requires an understanding of what stakeholders require today to bid and leverage flexibility. Understanding the relative value of each of the selected *core values* is critical to defining functionality.
- **Delivery roadmap.** A shared development and implementation roadmap for flexibility markets and the coordination layer is critical to aligning development of the associated technologies. Additional investment is required to enable capabilities in low voltage monitoring, price and constraint forecasting, market bidding, and timelines need to be coordinated with the market platforms. Clarity on delivery timelines will help market participants prepare for new market rules and engagement methodologies.

As Ofgem notes, “there is not currently a clear process to reconcile ... differences, integrate with other key actors, and actually deliver the increased flexibility market liquidity that is sought”. Solving these problems is at the centre of accelerating deployment.

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

Yes, a clear end vision is required to build alignment and gain commitment among stakeholders, enabling them to work together more effectively. It can provide a basis for communication and engagement with various stakeholders, including regulators, utilities, and customers, helping to build trust and support for the initiatives.

Flexibility is a complex and dynamic concept that requires ongoing adaptation and refinement to meet changing market conditions and customer needs. But this is necessary to maintain a flexible and adaptive approach that can respond to emerging challenges and opportunities.

The value chain involves different types of actors with their expertise, Software providers developing the applications and adapting to future requirements, distributed operators managing network infrastructure congestion, hardware manufacturers selling connected products, and aggregators managing the flexibility service contract.

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

A common digital energy infrastructure should involve the connection of various digital platforms, including communication networks, data management systems, and control systems, to enable the seamless exchange of data and energy flows across multiple stakeholders such as utilities, energy service providers, and customers.

One unique digital energy infrastructure will need time and collaboration between all stakeholders which seems a complicated goal, moreover, taking into consideration all legacy systems already in place for some actors. We think that a unique platform for asset and customer registration with a pricing mechanism and visibility of all DER assets could be feasible with clear interoperability mechanism between all various digital platforms from market participants.

Therefore, it's important to start the development process as soon as possible to ensure that the infrastructure is in place to support the growing demand for DERs in the coming years, driven by factors such as declining costs, technological advancements, and regulatory support.

Section 3: What the future could look like

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

A common digital energy infrastructure should be designed to enable a more flexible, efficient, and secure energy system and should be seen as a system of systems. We agree with the 3 identified core values of **information provision, market coordination of operations and access, and trust and governance.**

The common digital infrastructure functionality needs to begin with the primary users, the problems they are aiming to solve, and the impact of not solving the critical problems. Currently, the archetypes don't necessarily clearly distinguish or rank the functionality in terms of its importance to facilitating market delivery. Furthermore, understanding the nature of the markets (physical vs. financial) will be critical to defining data and governance.

We believe that the critical functions of a common digital infrastructure combine aspects of the medium and thick archetypes:

- **Market Exploration:** A shared market exploration platform with all available markets, historic pricing, and forecasted prices
- **Market Registration:** Common prequalification and visibility functionality to remove barriers to market participation and value stacking
- **Market Competition:** Market clearing functionality is dependent on the nature of the markets on the platform. If the coordination under consideration is that between ESO and DSO markets for physical asset dispatch, then coordinated clearing on a single platform would be beneficial to ensure rules are consistent and resources are appropriately dispatched. However, the assertion that 'new markets' from 'new buyers may enter onto the market introduce questions regarding the types of markets permitted for consideration.
- **Asset availability:** Asset availability should be shared between markets to give market operators visibility into what assets are available for participation in different markets. *This requires an understanding of hierarchical participation.*
- **Asset dispatch:** Dispatch is not required by a central platform unless required by operational timescales (e.g. some ancillary service products).
- **Verification and settlement:** Verification and settlement data are not required to be managed by a single platform. Entities could share data but independently manage verification and settlement claims. Users should follow standard measurement and verification processes for settlement purposes upstream with market operators and downstream with any third-party energy users or generators on site.

Furthermore, the infrastructure should include a range of different technologies and protocols that enable the seamless exchange of data and information between different stakeholders in the energy system. It should also be based on standard cloud architecture with cybersecure management of data and secure the exchanges between stakeholders.

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

Based on our analysis above and the different archetypes described in the document, our view is an exchange that leverages aspects of the medium and thick architectures to maximise coordination without assuming excessive control. However, we would iterate that the relative importance of the functionality should be considered with all market participants.

We agree with the feasibility assessment of the different models outlined by Ofgem and would ask Ofgem to consider selecting a certain number of core functionalities as no-regrets investments.

Section 4: Delivery Considerations

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

A digital energy infrastructure would likely benefit from being a new-build system to ensure the architecture is built using modern software architectures and will scale to incorporate the required data streams and new functionality. Furthermore, with the ongoing evolution of market design via REMA and other programs, existing platforms may be biased to support legacy market rules and technologies.

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

Ofgem has outlined many of the important areas of consideration in its evaluation of the benefits and risks of each model. We identify the following as primary areas for consideration:

- Delivery capabilities: Is the entity experienced and able to deliver a complex, digital platform?
- Delivery timelines: Can the entity use an approach that allows for functionality to be quickly released and tested with users?
- Incentive structure / Revenue Model: How is the entity incentivised to operate, maintain, and advance the platform? Will the revenue model incentivise continued advancement and investment into the platform? Is the entity a neutral third party provider or is their revenue model tied to platform capabilities (e.g. via transaction fees)

SE does not view a private entity as the best positioned approach for delivery, given the concerns regarding conflict of interest. A mandated central entity or consortium with the appropriate incentives to operate and maintain an advanced digital platform mimics other operational market structures in the energy sector, particularly the ESO / ISO structure.

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

No Comment