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NODES response to the Call for Input - The Future of Distributed Flexibility

Introduction

NODES is a provider, facilitator, and operator of independent marketplaces for a sustainable energy future where grid owners, producers and consumers of energy can trade decentralised flexibility and energy. NODES has established a proven flexibility trading platform in several countries and has developed its capabilities to meet the evolving market requirements. NODES have been part of successful trials with NGED (formerly WPD) where we showed how a close to real-time marketplace can be used to procure active power from CER and DSF in a competitive framework, where all asset types compete on a level playing field.

<https://nodesmarket.com/>

We welcome the opportunity to respond to this consultation – the NODES platform is a fully tested and functional system and capable of stimulating the market to access greater flexibility. We would be pleased to organise a demonstration to allow an appreciation of the system capabilities.

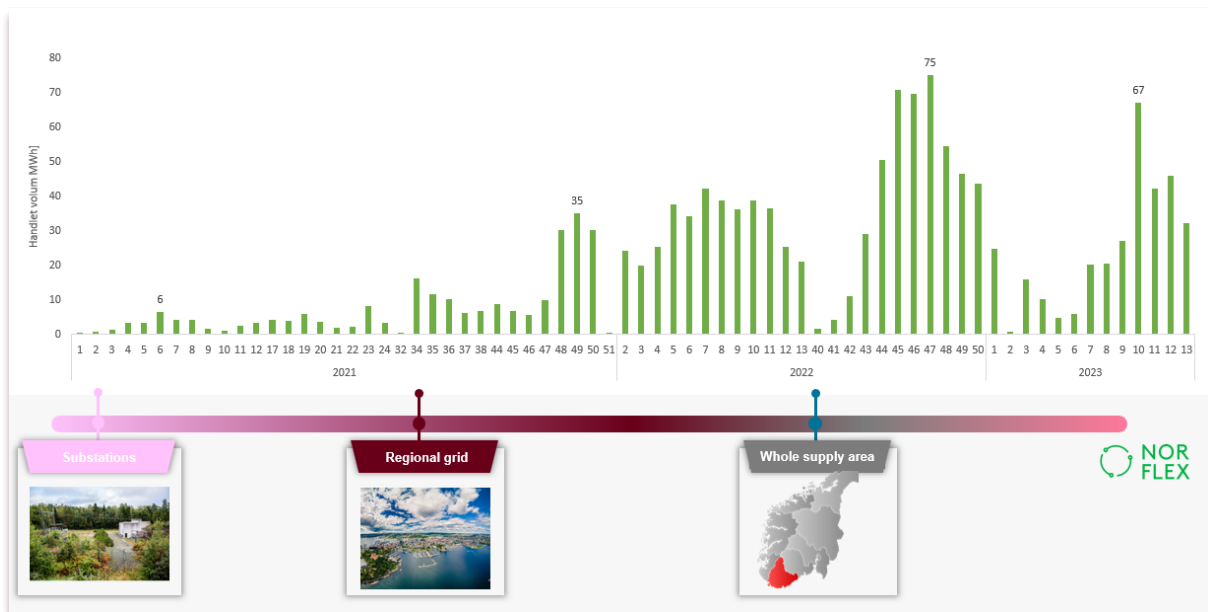
1. What do you think distributed flexibility could contribute to the energy system?

NODES strongly believes that accessing both DER and CER flexibility is essential to allow the continued growth of renewable energy assets in the UK increasing and assisting our trajectory towards de-carbonisation, including through electrification. In particular, distributed flexibility is of utmost importance in order to enable the grid to accommodate new consumption and generation patterns by solving bottlenecks quicker and cheaper than by building new grid elements, thus making the transition quicker and more affordable to the end consumer.

NODES has been able to prove the value of flexibility from larger scale trials, where we have secured flexibility to resolve/prevent congestion issues in the low and medium voltage levels of the grid. We have also enabled local flexibility to be offered into HV network and as a result enabled flexibility to be sold to the transmission system operators reserve markets. NODES would be pleased to provide further information on how this worked to Ofgem should they wish to understand more.

NODES's experience shows that by accessing flexibility via a marketplace, we can create transparent price signals which can be used to identify both flexibility availability and scarcity within the different layers of the grid as well as provide stronger investment signals for grid reinforcement and future assets that may provide flexibility.

From our experience, accessing flexibility for a DSO is not only a matter of having access to an appropriate tool, but also a matter of time. First, it takes time for the DSO to get used to and trust a new tool to be used in planning and operation. Second, as the market is to a large extent driven by the (usually, at the start, single) buyer, it takes time to attract a pool of flexibility providers that provide sufficient volumes. As an illustration, please find below the increasing volumes purchased by Agder Energi Nett (today Glitre Nett) over the last three years on NODES' market platform in the NorFlex project:



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

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

NODES believe that the case for change is clear – the accelerated growth in green technologies and the drive towards electrification of heat and transport will leave a capacity gap which can be adequately filled by distributed flexibility. However, whilst the need may not be overly visible today, the requirement to develop the market ahead of time is imperative if adequate liquidity is to be available once the need is there.

Taking our experience in the Nordics, NODES has been developing the market over the past 6 years. We have worked extensively with DSOs to help develop the tools and processes to develop a marketplace for flexibility. The expansion of EV's in Norway and the electrification of industry is creating a lot of constraint issues in the distribution network. The marketplace

is now starting to actively help resolve these constraints by enabling flexibility to be bought in a close to real time marketplace on a continuous basis. This market has been linked to the reserve market of the TSO and local flexibility has been used to address national issues.

Our marketplace in Sweden has been used to avoid blackouts in the city of Stockholm during cold winter days when demand has outstripped the ability to provide energy into the city. By utilising the established flexibility market assets have been used to adjust consumption levels in a downward regulation market close to real-time. This has also started to unlock sector coupling with power to heat assets engaging in the marketplace.

The ability for the market to enable distributed flexibility to contribute towards the new energy ecosystem is driven by starting early in the process, allowing the market design to develop and provide confidence to the flexibility providers and asset owners.

Having an independent body (e.g. Regional System Planner) that has statutory powers to ensure that the DNO transparently provides the size/ volume of flexibility required, the localisation of the needed flexibility and price signals is essential to stimulate the market trading. A common vision and a common set of operating principles are necessary for flexibility services providers (including aggregators) to be active throughout the country, rather than having to adapt to the requirements and setups of each individual DNO.

Moreover, coordinating local flexibility markets with traditional wholesale markets and ancillary services enables value stacking, unlocking further volumes by making the flexibility a bankable service and allowing liquidity to be shared between markets. Through several of our projects, NODES has coordinated local flexibility markets by:

- Creating a reservation market, where DNOs can “hedge” their flexibility needs by securing assets well in advance of their future requirement for either upward or downward regulation*
- Creating a close to real-time activation market for upward or downward regulation, where assets secured in the reservation market can compete against other assets to provide flexibility based on price, volume and location.*
- Integration to TSO mFRR¹ market(s) where local flexibility can be offered into the reserve market of the TSO after gate closure of the local activation market.*

We will also test, in the Canadian project PowerShare², TSO-DSO coordination through two different models, namely sequential markets, where the TSO access flexibility after the DSO (but allowing both to hedge), and coordinated markets, where they may hedge and activate the same flexibility resources at the same time. The DSO will be able to refuse the TSO access to flexibility in particular parts of the distribution grid if the grid cannot support the use of further flexibility.

¹ Manual Frequency Restoration Reserve, also known as tertiary reserve.

² [PowerShare – The First Fully Integrated Distribution System Operator. in North America](#)

Ideally, all markets of similar products (such as up/down regulation, which is common for spot, intraday, balancing, redispatching and local flexibility markets) could be coordinated. For sequential markets, FSP should be able to opt for their inactivated offers to be forwarded to the next market. For markets that are open in parallel, it should be possible for FSPs to access these through one market. In our opinion, the easiest would be to access through the local market, as this is the one that requires the most accurate locational information. From here, offers could be made available to other markets, as we have already experienced in NODES. Also, as many FSPs only have small volumes, through a local market platform their volumes could be bundled together in order to reach the minimum threshold to access other markets (wholesale, balancing). This has been experienced through our project NorFlex. We see no particular reason that coordination of several markets would not be possible, given that the products are sufficiently similar (up/down regulation, same or multiple time granularity one for another). Other dissimilarities, such as participation requirements, may to a large extent be dealt with through filtering the participants and/or offers where applicable.

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

Through our experience in developing flexibility markets in several countries, we have worked closely with both the DSOs and the Flexibility Providers in order to identify the challenges both parties have in not only accessing the marketplace, but also how to transact in the marketplace. For the majority of DSOs this is the first time they have engaged in a marketplace for actively buying flexibility by placing bids, historically it has been contracted services via tenders.

To accelerate the delivery of accessible flexibility there needs to be a coordinated effort between multiple parties. We need a standardised framework for market access enabling all participants to sign up to the same set of rules, this will help lower barriers to entry. We need to find the right price points which make it appealing for demand side flexibility to engage in the marketplace, and this may mean investing in the development of liquidity by paying higher prices for the flexibility initially in order to incentivise the sellers to enter into the market during the nascent stages of their businesses as liquidity is built. We also need to enable ease of access and increased automation.

Also, the DSO needs to have the right incentives to prefer purchasing flexibility when this is more efficient rather than investing in new assets. This will be driven by the investment in analytical and forecasting tools as well as a digital transformation of their grid, so they can optimise their need internally and then send the relevant signals to the marketplace.

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

For the investment to be made in developing the overall solution a clear direction of travel will need to be set to give market participants confidence that the decisions and investment they make to move in this direction and that these are aligned with the regulators view ,

however the end vision must to some extent be adaptable to take into account the learnings as the use of flexibility increases.

Our experience has also shown that we shouldn't wait for the end solution to be ready before we implement it. There are elements of the market that can be implemented sooner rather than later and we should focus on delivering these as part of the early stage, this will help build confidence in the direction of travel as well as highlight what works well and what doesn't along the way.

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

For the next round of RIIO but development/implementation in the next 12 months.

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

The thick archetype is very ambitious. It could be an ultimate goal, however having such a complex structure as a first aim would be very time-consuming and costly. Rather than setting up a fixed structure, we would suggest to define a path towards some of the features of the thick archetype, such as more extensive coordination of markets, with evaluations along the way. Most important would be to start with a structure (thin or middle) adapted to a few markets (both local and wholesale/ancillary) that could evolve and adapt to future needs, starting with the features of existing, well-functioning and proven markets.

Market engagement towards utilising and more importantly trusting and relying upon CER type flexibility needs time to allow the Buyers of system flexibility to have the confidence that it will work and be available as and when they require. NODES recommend having an end-vision for system archetype underpinned by regulatory amendments, but this must not delay the rapid deployment of flexible access.

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

Please see answer above.

Additionally, NODES took part in a flexibility trial (Intraflex³) with NGED (was WPD at the time) and evidence from this trial proved that there was greater competition between different flexibility assets as different assets bid in at different price points up to Gate Closure. As part of the Intraflex project it was also highlighted that by having a close to real

³ [Intraflex - NODES \(nodesmarket.com\)](https://nodesmarket.com)

time marketplace, the market was better aligned with the Balancing market, allowing buyers and sellers to better value flexibility and reduce price volatility.

As part of the Intraflex project we also found that by having simplicity in market design and participation was important for achieving market liquidity and it reduces barriers to entry and operational overheads, enabling greater participation.

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

The common digital energy infrastructure should be based on or built around existing infrastructure which can be interfaced with available market platforms. The infrastructure must be future-proof, i.e. ready to accommodate future platforms and needs as experience grows. Key to the new systems are to ensure that there is standardisation and complete integration of all aspects of the systems to allow for a fully fungible system to be established.

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

Transparency, interoperability, international communication standards, neutrality, market based optimisation and coordination of different markets, least regret choices enabling further development.

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

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