



smartEn
Smart Energy Europe

Local Flexibility Markets

smartEn Spotlight

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The fast deployment of decentralised energy resources is imposing a shift to a local approach in energy system management. Local flexibility markets (LFM) can play a key role ensuring that this change will be cost-effective and secure. LFM allow the use of flexibility at local level by distribution and transmission system operators (D/TSO). This means using flexibility from decentralised energy resources (DERs) to solve congestion management problems, minimise power outages and avoid grid expansions. With a holistic approach to the market design, these multiple benefits can be harnessed at the same time.

The European Electricity Directive, in Article 32, already recognises the importance of giving incentives to DSOs to create such markets. Nevertheless, at the moment of writing, there is no national or local regulatory framework that stands out as a perfect example to allow LFM to get out of their infancy-stage. France, Finland and Ireland have already introduced such frameworks, however they don't always contemplate all DERs and they have not been able to drive innovation yet¹. In Great Britain, the Netherlands and Norway instead the initiatives of national regulators, system operators and joint projects with market participants have created a positive environment to develop innovative marketplaces.

smartEn has identified three regulatory best practices in these countries that are conducive in developing frameworks to make the best use of local flexibilities.

Clear incentives to DSOs to include local flexibility in network development plans

The British regulator Ofgem, has been incentivising local flexibility markets since 2019, through the definition of the new price control framework for DSOs, RII0-ED2². As a result, Great Britain has the most developed DSO market in Europe, with 6 DSOs already procuring flexibility and commercial offers available in the market³.

The price control framework, which has been recently approved, defines DSOs' duties and revenues they can collect for the timeframe 2023-2028. This framework provides a **clear message to system operators to effectively use flexibility services as a non-wire alternative**. As specified by Ofgem's guidelines, DSOs must submit a business plan that prioritise the best use of existing network capacity by fully utilising flexibility technologies to manage changes in peak demand. DSOs are required to specify how they will facilitate dispatch of DERs and enhance coordination with TSO's flexibility products. Finally, DSOs' rules for procuring distributed flexibility services have to be fair, simple and transparent. This includes promoting coordination with third party platforms through APIs rather than proprietary systems. Ofgem has estimated that the use of demand-side flexibility will save customers up to £4.5 billion a year⁴ through reduced need for new generation and grid expansion.

¹ smartEn – The Implementation of the Electricity Market Design to drive demand-side flexibility (2022) <https://smarten.eu/report-the-implementation-of-the-electricity-market-design-2022-smarten-monitoring-report/>

² <https://www.ofgem.gov.uk/energy-policy-and-regulation/policy-and-regulatory-programmes/network-price-controls-2021-2028-riio-2/electricity-distribution-price-control-2023-2028-riio-ed2>

³ smartEn/Delta-EE – European Market Monitor for DSF 2021 <https://smarten.eu/report-european-countries-still-need-improvements-on-dsf-participation-to-help-meet-decarbonisation-and-electrification-targets/>

⁴ <https://www.ofgem.gov.uk/news-and-views/blog/investing-smarter-more-flexible-grid>

It is also worth highlighting that the incentive structures in the RII framework are based both on operational (OPEX) and capital expenditures (CAPEX) incurred by DSOs. The TOTEX approach encourages DSOs to use maintenance efforts to avoid replacement of assets and demand-side management to avoid installing new capacity.

The forward-looking approach of the British regulator has attracted new players, like EPEX SPOT, which recently announced the launch of the new Localflex platform and allowed the creation of innovative market platforms, like:

- NODES marketplace, which trialled the standardised market design for the activation of flexibility under the Intraflex project with Western Power Distribution.
- Piclo Flex, which supports the end-to-end process from flexibility procurement to operation and settlement of UK Power Networks, SP Energy Networks and Electricity North West, totalling over £56m worth of local flexibility contracts.

Harmonisation of flexibility services, baseline methodologies and flexibility registers at national level

Another positive example to facilitate initiatives from market players in the context of local flexibility procurement comes from Great Britain. The Energy Network Association (ENA), which gathers all British DSOs, developed the Open Networks programme to facilitate coordination between local- and transmission grid operators. This initiative led to the **definition of four standard services for flexibility procurement** (Sustain, Secure, Dynamic, Restore), which address different needs of the network operator from constraint management to restoration⁵.

ENA has also launched in April 2022 a baselining verification online tool that aims at helping flexibility providers to determine their baseline to participate in flexibility markets. The tool uses **five standard baseline methodologies** that have been defined following the baseline methodology assessment conducted by ENA and DNV⁶. Flexibility providers can use this tool to calculate their baseline and, after a flexibility event, to verify their actual demand or generation profile against the baseline. This tool facilitates a standard and transparent decision-making process across DSOs. Moreover, each British DSO uses an Embedded Capacity Register (sometimes referred as Flexibility Resources Register) based on a common format defined by ENA.

Finally, ENA is working on a standard agreement for flexibility services to increase alignment with TSO methods of flexibility procurement and allow more participation of aggregators, in particular with smaller assets. These are good examples of initiatives led by system operators with the involvement of all relevant stakeholders to harmonise services at national level and it could be of example for other initiatives.

Joint DSO/TSO flexibility procurement

GOPACS

⁵ <https://www.energynetworks.org/industry-hub/resource-library/open-networks-2020-ws1a-p3-final-implementation-plan.pdf>

⁶ <https://www.energynetworks.org/industry-hub/resource-library/open-networks-2020-ws1a-p7-baselining-assessment-report.pdf>

An effective LFM relies on the **strong cooperation between system operators and fosters joint procurement of flexibility**. When TSOs and DSOs jointly procure flexibility, they are able to solve issues in the grid more effectively while facilitating market parties to participate in different markets. An example of positive collaboration can be observed in The Netherlands, where the TSO TenneT and six DSOs created the GOPACS platform. The initiative was driven by the interest of system operators to decrease costs for congestion management and attract more flexibility providers to the market. The GOPACS platform is intended to solve congestion in a certain area of the grid without increasing congestion in another area. GOPACS is an intermediary platform, connected with an already established market platform (e.g., a platform for intraday trading). At the moment it is interfaced with the intraday market from ETPA (Energy Trade Platform Amsterdam), but agreements with other market players like EPEX SPOT are ongoing.

The GOPACS initiative was possible thanks to the Dutch market-based approach to congestion management. In principles it could be replicated in all Member States, except the ones that are limited by regulated redispatch (e.g., Germany). The project encouraged the Dutch system operators to create a new framework for DSO congestion management in the Electricity Network Code. The new code was recently approved⁷ and contains the following provisions that facilitate coordinated procurement of flexibility:

- Coordinated measures between DSOs and TSO that can use each other's options for their redispatch needs. The code does not specify if these measures are limited to information sharing or extended to joint procurement.
- Direct communication between SOs: once a local congestion is identified, all operators provide support to the DSO of the affected congestion area.
- Introduction of the Congestion Management Service Provider (CSP): an aggregator for capacities smaller than 1 MW. They have to establish a BRP agreement, which can limit the participation of independent aggregators.
- Possibility of procurement by DSOs of long-term capacity products based on availability and/or activation fees. These are bilateral agreements resulting from a market-based tendering process.

NorFlex

Another key factor for the successful design of local flexibility markets is the **interoperability between markets, which allows flexibility providers to benefit from value stacking** (the possibility of bundling multiple value streams from different grid services). The principle is simple: non-activated bids in local congestion management markets are forwarded to TSO markets with similar requirements (e.g., mFRR and RR) as long as they do not create additional congestions in the local grid.

So far, this approach has been adopted only in Norway, within the NorFlex project. In January 2022, 3 MW of flexibility available from the NODES platform have been transacted in Statnett's mFRR market. This has been possible thanks to an exception guaranteed by the TSO Statnett to lower the minimum bid size to 1 MW for the procurement of mFRR. This

⁷ <https://wetten.overheid.nl/BWBR0037940/2022-04-05>

example shows how regulatory sandboxes can speed up innovation, but a full regulatory framework would be necessary to guarantee interoperability across markets (i.e., changing the license conditions of DSOs to allow them to participate in different markets within their daily operations). The Norflex project, which includes aggregators like Entelios and Tibber, has also proven how aggregated local flexibility can be traded through market platforms, like NODES, not only by industrial loads but also domestic assets like EV smart chargers.

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