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Piclo Response to Terna Consultation: Pilot project for TSO-DSO coordination

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Terna Consultation - Pilot Project for TSO-DSO coordination for the management of distributed flexibility resources

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Response

TSO-DSO coordination is an essential component of competitive, accessible and efficient energy markets, meaning its development is becoming increasingly important for delivering a cost-effective net zero. Despite this, TSO-DSO coordination remains in an early stage of development across flexibility markets in Europe and so it is exciting to see Terna's ambitious proposal. We would be delighted to support this project, which highlights the important role TSO-DSO coordination will play in building a smart, flexible energy system and has the potential to accelerate the understanding, systems and capabilities required for its development.

Piclo is a leading independent flexibility marketplace that facilitates DSO flexibility markets in countries including the UK, Portugal, Lithuania, Ireland and the US. In Italy, we are working closely with E-Distribuzione on project EDGE, developing a globally leading, fully automated end-to-end DSO flexibility marketplace. More recently, Piclo has been selected by the UK TSO, National Grid ESO, to facilitate a new Local Constraint Market. This market aims to reduce transmission level constraint costs through widening access to all types of flexibility, including distribution-connected, through Piclo Flex. TSO-DSO coordination is essential to the success of this business-as-usual market and Piclo is taking an active, iterative approach to its development in this outside of a pilot application. We are keen to contribute to building market understanding of TSO-DSO coordination as we develop our platform functionality, experiences and confidence in the facilitation of this critical area of flexibility markets.

TSO-DSO coordination

Flexibility is needed to decarbonise electricity grids, however, to be a cost-effective solution the services procured and utilised must be open to all types of assets, sizes and market participants, easily accessible and with the potential for revenue stacking. Distribution-connected flexibility, therefore, has a key role in system operation with the ability to reduce constraints at both the transmission and distribution level, bring down costs, expedite decarbonisation and contribute to system security.

There are many possible pathways to developing TSO-DSO coordination, however, what the vision is for TSO-DSO coordination must be agreed upon collectively by the market, including elements such as: efficient, simple, inclusive, collaborative, secure, scalable, interoperable and transparent - for instance, we believe that the success of TSO-DSO coordination rests upon open, public, non-proprietary developments, including for market-clearing algorithms and communication infrastructure such as open-APIs. Consequently, the wide scope for TSO-DSO coordination will need to be developed

iteratively and in coordination with the wider market. Arguably, this coordination should not be thought of as TSO-DSO exclusively, but as TSO-DSO-FSP coordination, which more accurately reflects the critical position Flexibility Service Providers will play and their centrality to the design and outcomes of this market coordination.
Highlighted below in Image 1 is one example of how TSO-DSO coordination could iteratively be developed, beginning with foundation-level developments such as visibility and progressing towards more advanced levels of optimisation including joint procurement and market synthesis. Following this, we highlight its application to a real-world case study of TSO-DSO coordination being developed in the UK with Piclo Flex.

Image 1: Iterative approach to TSO-DSO coordination

Case study: UK TSO-DSO coordination: Local Constraint Market

To date, progress in the development of coordinated TSO-DSO markets has been limited to theoretical and academic focuses or within small-scale pilots or innovation trials. However, more recently Piclo Flex was selected by National Grid ESO to facilitate its new Local Constraint Market (LCM), providing the opportunity to develop a coordinated market across National Grid ESO and the impacted DSOs within a business-as-usual market.

In Scotland, there are large volumes of wind generation and further growth is expected. As a result, the Scottish-Anglo border has the highest constraint costs in GB and leading to National Grid ESO curtailing wind generation at high costs to consumers through the Balancing Mechanism. The aim of the LCM is therefore to reduce some of the most expensive system operation costs by harnessing lower cost flexibility from distributed energy resources. The new market will provide an alternative source of flexibility in addition to the Balancing Mechanism, inviting bids from a wide range of assets to respond at times of peak north-south energy flow, including distributed connected EVs, batteries and pumped hydro stations. The Piclo Flex platform will manage the end-to-end flexibility process for the LCM, including the operation of a day-ahead and intra-day market and the facilitation of bidding, dispatch, settlement and payment for flexibility services.

The initial focus of the LCM in Scotland means it impacts two UK DSOs: SP Energy Networks (SPEN) and Scottish and Southern Electricity Networks (SSEN). Consequently, coordination between National Grid ESO and SPEN and SSEN is key to the success of these markets and the impact on the distribution grid from distributed-connected assets providing services to solve transmission-level constraints, as well as the participation of assets in both DSO's local flexibility markets and the LCM must be considered.

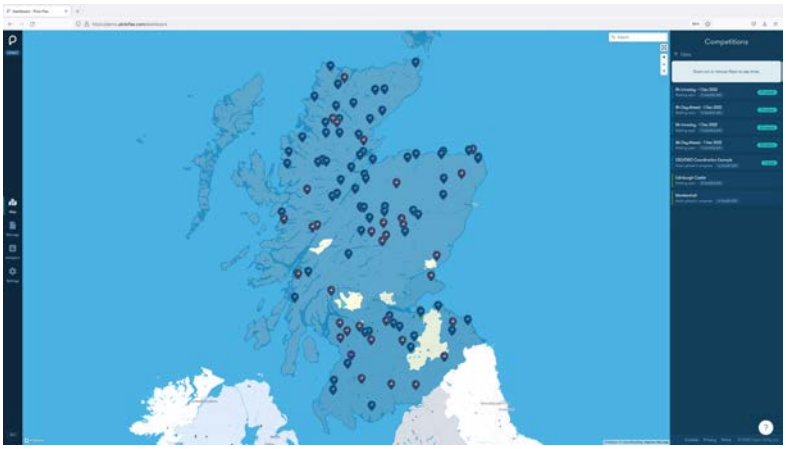
The approach being taken to the development of TSO-DSO coordination in the Local Constraint Market is one of practicality and iteration. Initially, Piclo Flex will operate by facilitating the exchange of information required across the three System Operators, to ensure there are no detrimental impacts on the networks. Primarily, visibility and communication of the following information will be centred around asset availability and dispatch including:

- DNO visibility of available assets.
- DNO access to review units and update GSPs.
- DNO control of available assets i.e. ability to request for assets not to be instructed if they present a network issue.
- Reporting of instructed units will be sent to the relevant DNOs ahead of any activation. This will typically be forwarded immediately after the 1-hour acceptance cut-off
- It is recommended that all visibility and control is to take place at the weekend ahead stage i.e. after the service-week deadline for submitting unit availability, but before the first instruction window of the week.

More information is available within the Local Constraint Market service terms, which are currently under review. After the market has been established, the scope for further improving and optimising the approach to TSO-DSO coordination will increase as learnings, experience and confidence between those involved grow.

Image 2 below shows a visualisation of the Local Constraint Market, adopting a "swiss-cheese" approach to excluding certain areas in Scotland where assets may not participate in either the day-ahead or intra-day market. The platform can be configured to exclude certain areas on a day-ahead basis based on the TSO's own control room decisions on competition boundaries or as a result of data provided by the DSOs that highlight areas of constraint on the distribution network that prevent distribution assets from participating in TSO markets. We would be happy to provide Terna with a demonstration of the Local Constraint Market on Piclo Flex.

Image 2: Piclo Flex Local Constraint Market visualisation

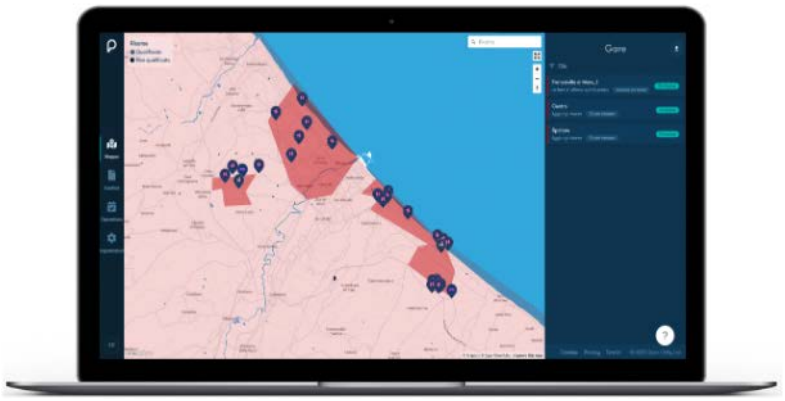


Piclo is keen to contribute to building market understanding of TSO-DSO coordination as we develop our platform functionality, experiences and confidence in the facilitation of this critical area of flexibility markets. We would be happy to offer support to Terna as a supporter of the project with advice and insights

Annex 1: About Piclo

Piclo develops software to make electricity grids smart, flexible and sustainable. Piclo is playing an integral role in supporting electricity networks' to better access and value flexibility resources, integrating low-carbon technologies and reducing long-term network infrastructure costs for consumers. Piclo has been deeply involved with the UK energy transition across networks, generation and retail over the past 6 years, and operates Piclo Flex, an independent flexibility marketplace that is active across the UK, Europe and the US.

Piclo Flex is an end-to-end marketplace that facilitates the procurement, operations and dispatch of short and long-term flexibility needs, with full suite automation optionality via open Application Programme Interfaces (APIs). We provide an integrated "marketplace-as-a-service" to help our SO clients deliver on their flexibility requirements. We are a customer-centric and experienced team and work in partnership with our clients to deliver a scalable and cost-effective solution.



DSO markets: Piclo currently supports three UK DSOs with their business-as-usual flexibility procurement: UK Power Networks, SP Energy Networks and Electricity North West alongside National Grid in the US, ESO in Lithuania and E-Redes in Portugal. Over £55million of local flexibility contracts have been awarded via Piclo since launching our commercial service in 2019. Volumes are continuing to grow year on year, with 667MW of capacity procured across multiple product types.

Piclo in Italy: Piclo Flex is supporting E-Distribuzione's Project EDGE. The System Operator E-distribuzione (E-D) will adopt Piclo Flex as the independent marketplace for DSO flexibility services, providing end-to-end services enabling the procurement, operations and settlement of flexibility services. The market will enable the active management of the distribution network using third-party flexibility assets such as generators, battery storage, demand-side response and electric vehicle smart charging.

TSO markets: Piclo supports the UK TSO's newly established Local Constraint Market to help manage increasingly constrained transmission boundaries and reduce costs to consumers. The Piclo Flex platform will manage the end-to-end flexibility process for National Grid ESO, including operating a day-ahead and intra-day market and facilitating the dispatch, settlement and payment for flexibility services at the transmission level. The project will establish the basis upon which TSO-DSO coordination will function.