The Voice of the Networks

Energy Networks Association

# Open Networks Project Workstream 1A Product 6 Market Facilitation (Non-DSO Services) Interim Report

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Energy Networks Association

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# Document Control

## Authorities

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## Related Documents

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| **Reference 1** | |
| **Reference 2** | |

## Change History

| Version | Change Reference | Description |
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## Distribution

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# 1 Foreword

The ENA Open Networks Project is laying the foundations of the smart grid in the UK and is helping to inform similar developments in Ireland. It is a key initiative to deliver Government policy set out in the Ofgem and BEIS Smart Systems and Flexibility Plan, the Government's Industrial Strategy and the Clean Growth Plan, working in collaboration with Ofgem, BEIS, 10 of UK and Ireland's electricity network operators, and other key stakeholders.

Networks have a key role to play in helping facilitate the emerging flexibility market that will be a fundamental element of a successful smart grid. In addition to procuring ancillary services for network-related issues to mitigate the need for reinforcement they must ensure that non-network-related services, traded on a peer-to-peer basis, can flourish and contribute to the increasingly dynamic nature of a future energy system.

# 2 Introduction

## 2.1 About ENA and our members

Energy Networks Association (ENA) represents the "wires and pipes" transmission network operators in the UK and distribution network operators for gas and electricity in the UK and Ireland. Our members control and maintain the critical national infrastructure that delivers these vital services into customers' homes and businesses.

## 2.2 Background to Open Networks Project

In December 2016, Energy Networks Association (ENA) members gave their commitment to the Open Networks Project (ONP), a major collaboration that will transform the way that both local Distribution Networks and national Transmission Networks will operate and work for customers.

Launched in January 2017, ENA's ONP has started to lay the foundations of a smart energy grid in the UK.

The Open Networks Project has introduced real momentum into the development work required to enable the UK's energy networks to:

- Facilitate our customers' transition to a low carbon future, including the electrification of heat and transport.
- Address the challenges rising from the continued uptake of local generation.
- Evolve to be market enablers for a whole range of new smart energy technologies.
- Reduce costs to customers by contracting for flexibility services alongside investment in traditional and innovative network solutions.
- Play a key role in delivering overall lowest energy system costs for customers.

## 2.3 Purpose of this Document

Distribution networks are particularly aware that as market enablers for a whole range of new smart technologies they cannot simply focus on services where they are the principle beneficiary. As natural monopolies, networks have a duty to facilitate peer-to-peer trading of capacity, constraints and even energy for example, in their role as distribution network operators.

This document is an interim report by Product 6 from Workstream 1A of the ENA's Open Networks project detailing work to date and identified opportunities. Product 6 is working with a range of current innovation projects to establish how distribution network companies can best support non-DSO services and align/ utilise their proliferation with/for grid resilience.

# 3 Scope and Approach

## 3.1 Context

Peer-to-peer trading could utilise commercially sterilised capacity on the network through non-traditional methods and allow the value of that capacity to be discovered through market-based mechanisms. Current innovation projects are exploring the development of these new markets. By working with the project leaders in this area Product 6 is looking to gain valuable insight for networks so they can best support emerging endeavours. In addition to understanding the requirements of these new markets, incidental benefits of Product 6 could include visibility of network actions, identifying opportunities for concurrent value stacking and resolving challenges relating to value conflicts between market actors.

The likely impact of this Product's findings could mean new processes being introduced and IT/infrastructure changes being required to provide data for the facilitation of new markets and identification and management of potential conflicts. The project will align with the timescales of the TEF projects and the BEIS FleX and Power Forward projects in order to provide insight in to ED2. Due to the length of these projects the product is likely to continue in to 2021.

## 3.2 Background to Product 6

This product is a continuation of 2019 WS1A P1 and P6 as well as the work on the Industry Led Non-SCR Access Working Group (P1 & P2) on the exchange of capacity and curtailment obligations.

### 3.2.1 Flexibility Market Principles 2019

WS1A P1 2019 asserted that a principles-based approach to Flexibility Markets offers significant opportunities to enhance the confidence and satisfaction of participants, growing industry trust. Such an approach should provide certainty and consistency for Market Participants, as well as facilitating innovation and enhancing competitiveness. Early definition of fair principles for participants, based on engagement with the whole sector, can reduce the level of perceived conflict, support efficient operation of Markets as they develop, and help define where a more formal governance approach may be needed in the future. In addition, other stakeholders can benefit from assurances regarding the behaviour of participants as they focus on outcomes that embed good practice in the market. These principles were expanded for the Non-SCR work (3.2.3). The report is available here.

### 3.2.2 Facilitation of New Markets 2019

In the second half of 2019 WS1A P6 started to consider how networks could facilitate other markets (e.g. peer-to-peer trading platforms, capacity management, trading flexibility to take on or avoid constraints) in addition to directly procured DSO services. It looked at:

- Principles identified through WS1A P1 2019 and proposals established through the Industry-Led Access Working Group's work on exchange of access
- What data needs to be provided to facilitate new markets,
- What data needs to be sent to network operators after any action/trade is made

As defined in the second objective of Workstream 1A, DNOs have a clear role in facilitating those markets that are starting to emerge that are realising value from flexibility outside the remit of DSO services. There is a wealth of data openly available that system operators have already provided, but in order to facilitate new and emerging markets, and to help expand existing ones, this existing data may need to be processed in different ways, or additional specific data may be required. There is also a wealth of innovation underway (BEIS FleX Competition, Open Networks' TEF and Innovate UK's Project LEO) that is exploring potential new markets, but all of these projects are still at a very early stage. Considering this, the product took a view that it would focus on the potential datasets required to facilitate the broad range of existing initiatives, rather than run new trials that might detract from ongoing innovation. The report is available here.

### 3.2.3 Non-SCR Work

The Non-SCR Industry-led Access subgroup developed a set of principles and potential trading rules that could underpin the trading of curtailment obligations between generators in a LIFO (last in, first out) stack or the trading of 'Uncurtailed Capacity'. These have been tested at a high level in the market simulations as part of the LEO and TRANSITION projects. These are detailed below and apply to both trading scenarios above as generic principles for trading generally and sharing generally (e.g. rather than for trading curtailment). The principles are:

1. Transparent information sharing
2. Ability to maintain network continuity
3. Visibility of other potential trading parties, and
4. Transparent trading arrangements.

A summary of the principles can be viewed here as part of the Charging Future's paper on Access and Forward-looking Charges and the full report from the industry sub-group is here.

## 3.3 Methodology

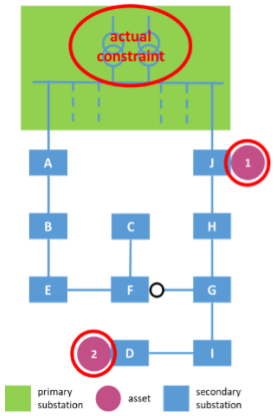
This product will test the principles/rules of engagement for market participants to trade energy locally or exchange capacity and curtailment obligations (as identified in 2019 by the Non-SCR group) within the context of the TEF projects, Project LEO and the BEIS FleX and Power Forward projects. It is focused on trading rather than sharing as the latter will be addressed by the SCR's work on Access. It will also test the market principles and data sets that were identified by 2019 WS1A P1 and P6 to enable neutral facilitation of these new markets both pre & post transaction to ensure there is no detrimental impact on the network. It is fair to say that many non-DSO services are still undefined, so the product expects some overlap between the projects and a blurring of what constitutes a DSO and non-DSO service. WS1A P6 will request quarterly updates from all of the projects mentioned in section 3.3.

### 3.3.1 Projects TRANSITION and LEO

As part of these innovation projects Origami identified services in a facilitated market from first principles for ESO / DNO / Market Actors. Services are a mix of trading, risk management and physical (energy and capacity). 26 new services were identified, and

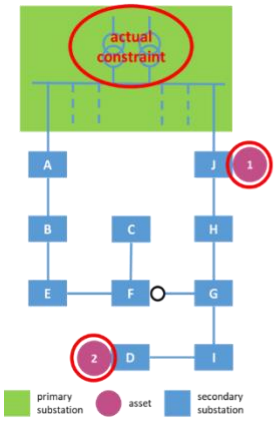
TRANSITION intends to trial 5 of those services, 2 of which relate specifically to non-DSO services or peer-to-peer (P2P) trading;

- **Peak Management (DNO)** - reduce demand, increase generation or discharge energy storage to mitigate the effect of a forecast peak demand on a DNO asset
- **Constraint Management (DNO)** - reduce demand, increase generation or discharge energy storage to mitigate the effect of an unplanned network outage on a critical DNO asset
- **Short Term Operating Reserve (ESO)** - reduce demand, increase generation or discharge energy storage to deliver the service to the ESO which could cause issues for the DNO (highlights the need for conflict management)
- **Exceeding Maximum Import Capacity (MIC) or Maximum Export Capacity (MEC) (P2P)** – one site agrees to restrict the use of its import or export capacity so another site can increase its import or export capacity by the same amount




| Condition |
|---|
| Opportunity to transfer unused capacity |
| **Definition** |
| Planned trading of import and export capacity between two sites within the same (constrained) primary. Seller agrees to not to use import or export capacity traded so another buyer can. |
| **Key parameters** (to be confirmed by service requester) |
| • Notice period: Time of trade (subject to DNO system studies – in development)<br>• Duration: Subject to trade hours/days over a period.<br>• Type of assets: Generation, Demand or Storage as available |

- **Offsetting (P2P)** - increase demand at one site (within its MIC) prior to an equal level of increase in generation at another site (above its MEC) within a constrained network




| Definition |
|---|
| Planned change of generation or demand exceeding ASC (MIC/MAC) at one site prior to the opposite change in generation or demand at another site to create net zero effect on upstream constraint. Requires suitable communication to provide required failsafe. |
| **Key parameters** (to be confirmed by service requester) |
| • Notice period: Armed Week ahead or Day ahead<br>• Duration: At least 4 hours, could be few days.<br>• Type of assets: Generation and Demand (limited), but hybrid solutions may be suitable |

Initial trials will be held jointly with project LEO during 2020 and increase in complexity during 2021 and 2022. In addition, Origami is leading work to maximise the learnings to ON-P from all trials being conducted by TEF projects.

If you'd like to know more about these projects and find out how to get involved, please email futurenetworks@sse.com or view the following websites:

https://ssen-transition.com/

https://project-leo.co.uk/

### 3.3.2 TraDER

Led by Chaddenwych Services Ltd (trading as Electron). Project TraDER is the first of its kind to develop, integrate and scale a flexibility exchange that optimises renewable energy integration into the UK's changing energy markets. The flexibility exchange, operated by a neutral market facilitator, will enable price-driven collaborative trading of an energy resource on multiple markets in the same time period, with notification of commitments and trader self-dispatch to relevant parties. The 2-year project will first demonstrate a market on the Orkney islands, an area known for curtailment of their abundant renewable energy, before combining other markets for collaborative trading. UK partners: Energy Systems Catapult, Community Energy Scotland, EDF Energy Customers Ltd, CGI IT UK, Elexon Ltd.

Grant award: £1,604,264

If you'd like to know more about this project and find out how to get involved, please go to https://www.electron.org.uk/contact-us or view the following website:

https://www.electron.org.uk/trader

### 3.3.3 Piclo Flex

Led by Open Utility Ltd (trading as Piclo). The Piclo Exchange project aims to show how an open, transparent and neutral flexibility marketplace can play a crucial role in the decarbonisation of Great Britain's economy. Participants will be able to trade in primary and secondary flexibility markets at both a local and national level. The project is to be trialled in collaboration with UK Distribution Network Operators and National Grid ESO and is open to the 250+ flex providers registered on the Piclo platform.

Grant award: £561,727.06

If you'd like to know more about this project and find out how to get involved, please go to exchange@piclo.energy or view the following website:

https://picloflex.com/

### 3.3.4 ReFLEX

ReFLEX Orkney aims to help Orkney maximise the potential of its renewable energy production by using excess energy created here and reducing the reliance on electricity imported from the UK mainland. The project incorporates work across three energy vectors – electricity, transport and heat. At the heart of the project is the demonstration of flexible energy balancing technologies including batteries, EV chargers and heating systems. Affordable leasing options for new domestic and commercial batteries, electric vehicles and charging points will also be available. A bespoke electricity tariff is being introduced for ReFLEX customers and will be tailored to the needs of ReFLEX's innovative integrated energy system, which will use advanced software to balance demand and supply. The pioneering project is funded by UKRI and led locally by the European Marine Energy Centre, along with consortium partners Aquatera, Solo Energy, Community Energy Scotland, Heriot-Watt University and Orkney Islands Council.

Grant award £14,092,611

If you'd like to know more about this project and find out how to get involved, please email: info@reflexorkney.co.uk

# 4 Next Steps

Clearly the current circumstances have impinged on some project activity but WS1A P6 is keen to use the remainder of 2020 to identify quick wins in the development of understanding on non-DSO services. WS1A P6 is aware that the timeline for the projects mentioned in the previous section extend way beyond the end of this year so some of the learning that can be derived from their activities will not be evident until 2021 or 2022. Nevertheless, innovation in this area is gathering pace so WS1A P6 needs to start assessing how networks can best facilitate these emerging markets. Priority will be given to questions such as;

- which non-DSO services are starting to develop?
- what do DNOs need to facilitate in the near term?
- how do DNOs facilitate these transactions whilst ensuring system resilience?
- how do DNOs create scalable interfaces that allow these markets to flourish?

In the second half of 2020 there are three key initiatives that WS1A P6 will be focusing on to start to answer those questions.

## 4.1 Market Simulations

Basic Market Rules (BMR) were drafted, tested and iterated through five 'Market Rules Simulations' held during 2019. BMR considered all five TRANSITION services (see 3.3.1). Scenarios addressed specific individual issues, including; asset approval, service delivery, failures to deliver, communications issues, and penalties. BMR addressed the following areas:

- Approval of transactions
- Exceeding Authorised Supply Capacity
- Testing and approval of flexibility
- Availability and changes to availability
- Triggering of services
- Conflict Management
- Failure to deliver
- Measurements
- Data and data issues
- Service delivery
- Settlement and dispute resolution
- Penalties

BMR will continue to be iterated during 2020 in collaboration with SSEN and WS1A P6 as well as FUSION who are trialling the Universal Smart Energy Framework (USEF). Trials will consider BMR and Origami would welcome input from any reports or learnings to improve the BMR. Members of WS1A P6 will have the opportunity to be involved in further BMR developments throughout the remainder of 2020.

## 4.2 REA Proposal

The REA were involved in the Non-SCR work throughout 2019 and WS1A has extended the invitation to be part of Product 6 in 2020.

Whilst the innovation projects have some way to go in terms of tangible trials of peer-to-peer trading the REA have a number of landfill gas generation members who have capacity that is not being utilised to its fullest extent. This capacity has, in recent years, been subject to attempts by DNOs to rescind their capacity allowance on the basis of non-utilisation so it can be reallocated to new connections.

Product 6 is currently considering a proposal to trial the trading of this capacity on a flexibility platform to ascertain whether it could facilitate new connections or a more efficient use of available network capacity by allowing 3rd parties to make use of the capacity at a market-determined price.

During the second half of 2020 WS1A P6 intends to work with the REA to scope out a project trialling this functionality. It will work with a platform to ensure that sufficient network detail was made available to allow 3rd parties to determine whether they were on the same part of the grid and whether they could avail themselves of this spare capacity if purchased. In the interim, during the trial, there would be no further attempts made by the DNOs to claw back capacity.

## 4.3 Product Services Report

This report has been commissioned jointly by TRANSITION and FUSION projects, led by Origami to address these issues. It develops the ON-P WS1A standardisation work and considers the TRANSITION report, services in a facilitated market which identified 80 services that could exist in a future facilitated market. This report was developed beyond the initial scope of TRANSITION and FUSION as an early indicator of possible development paths to stimulate further Open Networks discussion and aid standardisation across the GB flexibility marketplace. It is not intended that TRANSITION or FUSION would develop this Product Catalogue further but that it is considered by WS1A P3 (active power services), WS1A P5 (new DSO services) and WS1A P6 (market facilitation – Non-DSO services). The report identified the following non-DSO services:

Contracts for Differences (for third parties benefit)
Demand Turn Up (for third parties benefit)
Exceeding MIC / MEC (for third parties benefit)
Financial or physical options
Offsetting (for third party benefit)
Portfolio Balancing
Power Purchase Agreements
Trade ESO / DSO Contracts
Trade ESO / DSO Obligations
Trade LIFO Stack Position
Virtual Power Plant (for third parties benefit)
Virtual Power Purchase Agreements
Weather Products (for third parties benefit)
Wholesale Trading
Within Gate Closure Balancing (for third parties benefit)

WS1A P6 will be looking for opportunities to observe the development of these non-DSO services to see how they can best be facilitated in the future. This may occur as part of trials by the projects

already mentioned in this paper or they may be addressed by new innovation projects. If it is the latter, we would be keen to hear from project leads so we can support their activities.