Orion

# UK flexibility market development

## Innovate

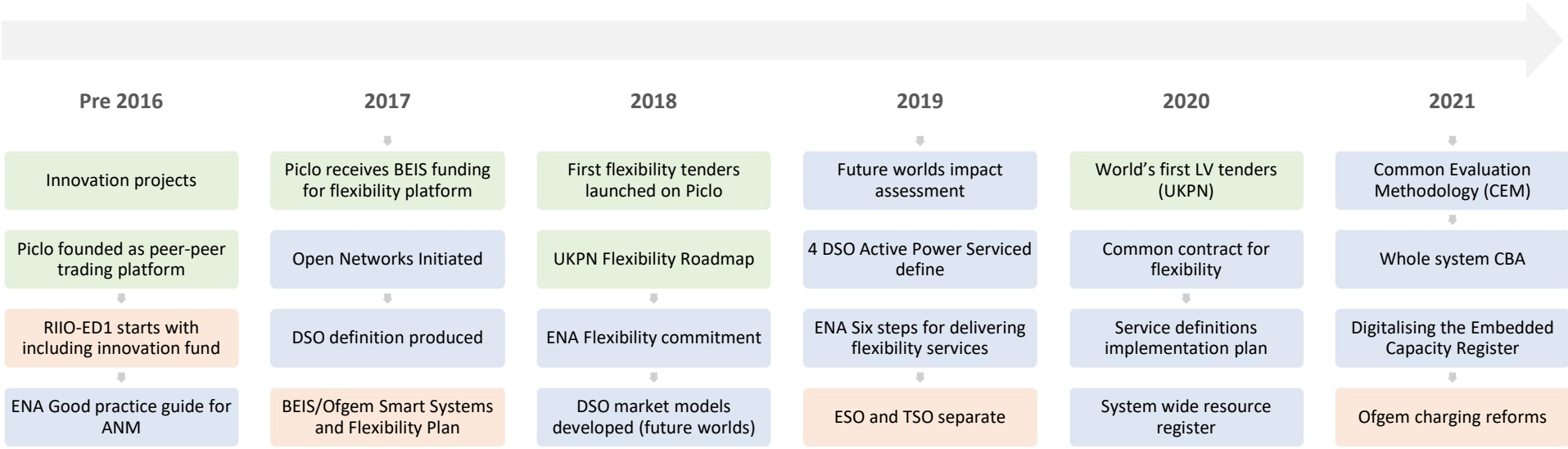
Networks led Individual and collaborative trials to develop new commercial arrangement and technical capabilities

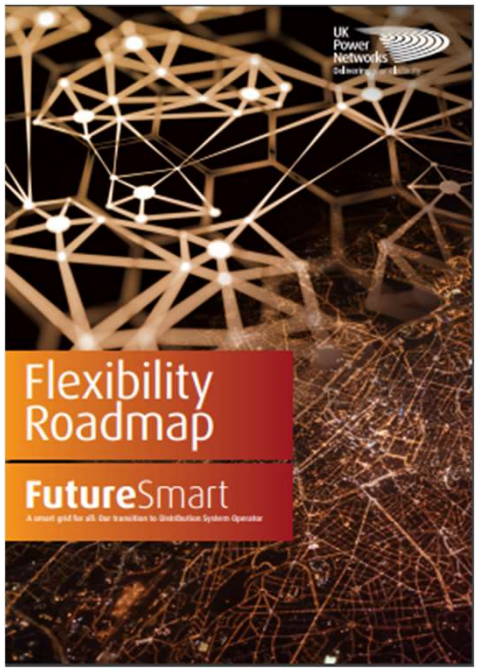
## Align

ENA Open Networks Project used to establish high level roadmap, engage with industry and establish best practice

## Regulate

Regulatory mechanisms evolved to incentivise flexibility (RIIO-ED2) and remove barriers (Significant Code Review)






DSO flexibility needs and products summary

| Flexibility Products | | Reinforcement Deferral | Planned Maintenance | Unplanned Interruptions | |
|---|---|---|---|---|---|
| | | | | Pre-Fault Response | Post-Fault Response |
| **Value Drivers** | | The present value of deferring capital expenditure | Managing unplanned interruption risk during planned maintenance | Customer Interruption (CI) and Minutes Lost (CML) incentives | Avoided cost of temporary generation and potentially CMLs |
| **2023 Flexibility Potential (MW)** | | 206 | Available to eligible DER capacity | | |
| **High-Level Requirements** | **Location Specific** | Yes | | | |
| | **Response Time** | 30 mins maximum | | <10 mins preferred, 30 mins maximum | |
| | **Response Duration** | Full availability window – case dependent. Pro-rated payment if available for part of window | | 3 hours. Pro-rated payment if available for part of window | |
| | **DER Type** | Generation, Storage and Load Reduction | | | Generation and Storage |
| **Contracting Principles** | **Procurement Type** | Competitive tenders or administratively set prices if low liquidity | | Framework agreement. Optional updating of pricing through contract | |
| | **Procurement Lead Time** | 6 months ahead and 18 months ahead | Case specific 1–12 months | DER applies if eligible | |
| | **Payment** | Availability and Utilisation | | Utilisation only | |
| | **Contract Term** | 1–4 years | Monthly or seasonal | Framework agreement | |

*Source: UK Power Networks Flexibility Roadmap*

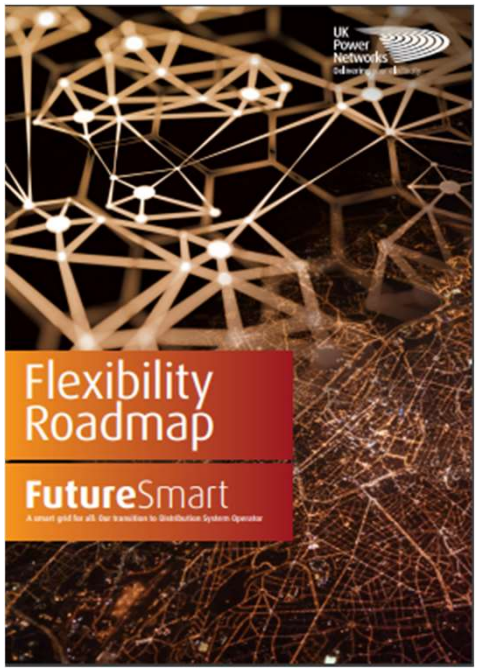
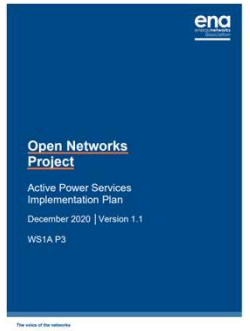



**Table 9:** Future LV flexibility needs and products

| Reinforcement need | Our flexibility requirements | Flexibility products or services | Potential providers |
|---|---|---|---|
| **LV substation/ circuits reinforcement** | Demand turn down or generation turn up at specific location | Smart EV charging tariffs<br>Commit to follow set load profiles<br>Payments to operate appliances in restricted hours<br>Generation turn up<br>Vehicle to grid flexibility services<br>Energy efficiency | Aggregated residential and commercial consumers with EVs, generation and/or battery storage<br>Small scale generation connected at LV (including community energy)<br>Commercial storage developers |
| **LV voltage management** | Demand turn down or generation turn up at specific location (typically winter peak) | Smart EV charging tariffs<br>Demand turn up/down<br>Generation turn up/down<br>Vehicle to grid flexibility services<br>Reactive power | Aggregated residential and commercial consumers with EVs, generation or in-home storage<br>Small scale generation connected at LV (including community energy)<br>Commercial storage developers |
| **LV losses** | Generally demand turn down or generation turn up at specific locations | Similar to LV voltage management | |

*Source: UK Power Networks Flexibility Roadmap*

# Active Power Service Specification




### Sustain (LV)
The Network Operator procures, ahead of time, a pre-agreed change in input or output over a defined time period to prevent a network going beyond its firm capacity.

### Secure (HV)
The Network Operator procures, ahead of time, the ability to access a pre-agreed change in Service Provider input or output based on network conditions close to real-time. The Network Operator procures, ahead of time, the ability of a Service

### Dynamic
Provider to deliver an agreed change in output following a network abnormality. Following a loss of supply, the Network Operator instructs a provider to either remain off supply, or to reconnect with lower demand, or to reconnect

### Restore
Restore and supply generation to support increased and faster load restoration under depleted network conditions.

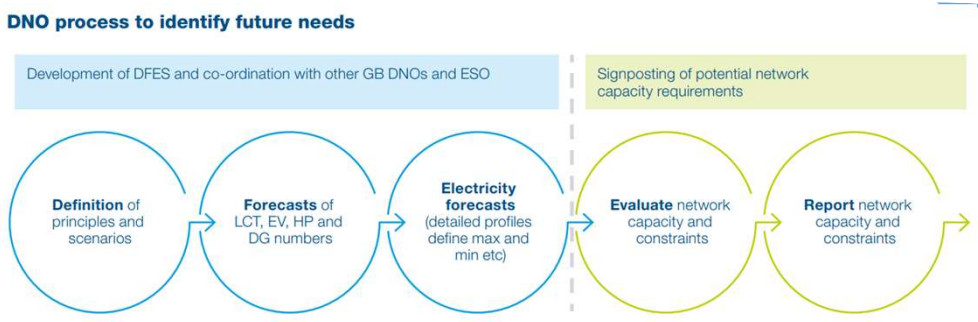
| Service Parameter | DNO Flexibility Products | | | | |
|---|---|---|---|---|---|
| | Sustain | Secure (Scheduled) | Secure (Dispatched) | Dynamic | Restore |
| When required? | Scheduled forecast overload | Pre- fault / peak shaving | | Network abnormality / planned outage | Network Abnormality |
| Risk to Network | Low | Medium | | High | High |
| Utilisation Certainty | High | High | | Low | Low |
| Frequency of Use* | High | Medium | | Low | Low |
| Minimum Flexible Capacity | 0-50kW | | | | |
| Minimum Utilisation Duration Capability | 30 mins | | | | |
| Minimum Utilisation | 15 - 30 mins | | | | |
| Maximum Ramping Period | N/A | N/A | <15 mins | <15 mins | <15 mins |
| Availability Agreement Period | N/A | Contract stage | Week ahead | Contract stage if applicable | Contract stage if applicable |
| Utilisation Instruction Notification Period | Scheduled in advance** | Contract stage | Real Time | Real Time | Real Time |

* Frequency is location specific defined at the point of procurement

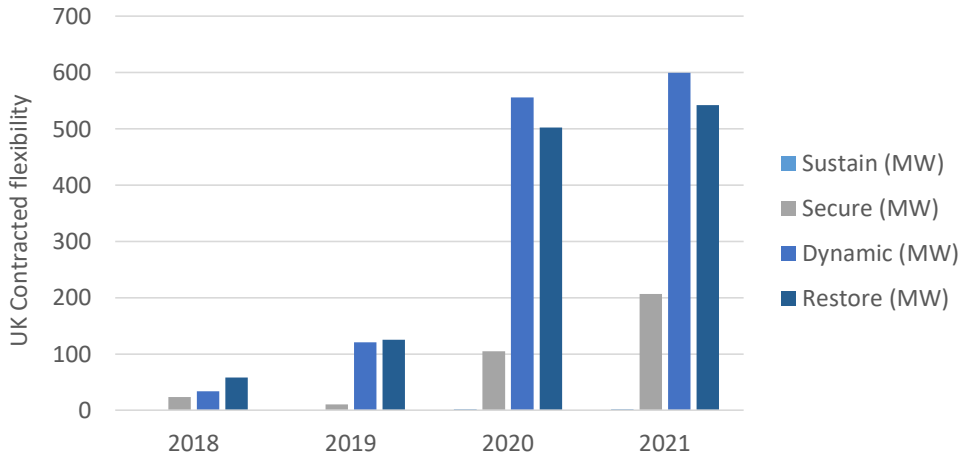
** Utilisation requirements may differ to schedule and be instructed in real time

*Source: ENA Open Network Project Active Power Services Implementation Plan*

# Contributing to the wider value stack

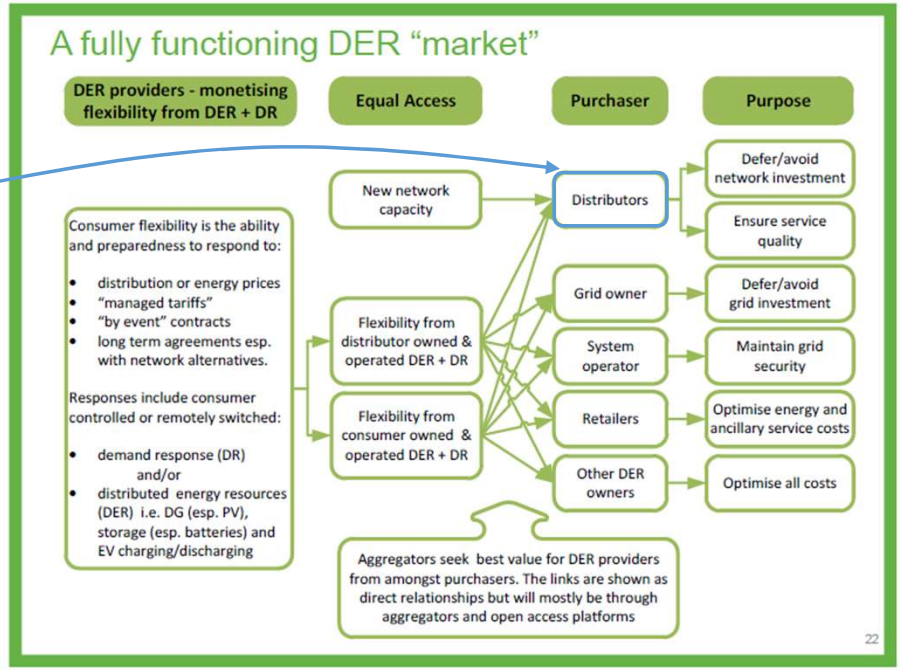



*Source: ENA Open Network Project 2020 Year in Review*




*Source: https://www.energynetworks.org/assets/images/CONSOLIDATED%20Flex%20Figures%202021%20Feb.zip*

Figure 20 – IPAG's framework for a fully functioning DER market




*Source: Sapere Distributed Energy Resources – Understanding the potential*

# Open Networks Project – Focus Areas

| Workstreams | DSO functions | Market principles |
|---|---|---|
| • Flexibility services | 1. System coordination | 1. Champion a level playing field |
| • Whole electricity systems planning | 2. Network operation | 2. Ensure visibility and accessibility |
| • Customer connections | 3. Investment planning | 3. Conduct procurement in an open and transparent manner |
| • DSO transition | 4. Connection and connection rights | 4. Provide clarity on the dispatch of services |
| • Whole energy systems | 5. System deference and restoration | 5. Provide regular, consistent and transparent reporting |
| • Communication and stakeholder engagement | 6. Service and market facilitation | 6. Work together toward whole energy system outcomes |
| | 7. Service optimisation | |
| | 8. Charging | |

*Source: ENA Open Network Project*