

Orion



UK flexibility market development



Innovate

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



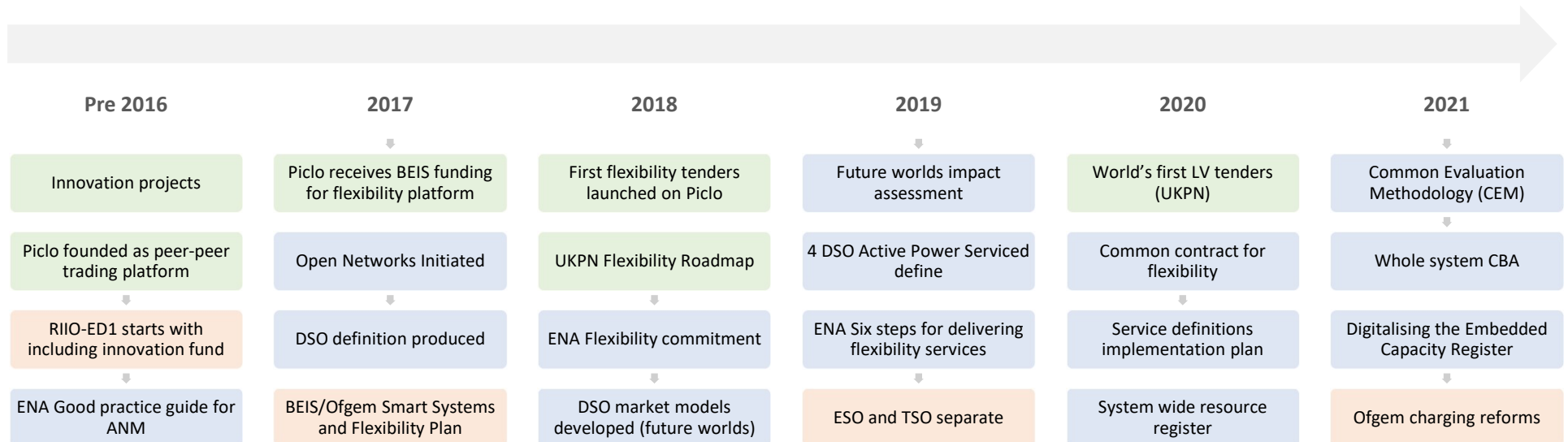
Align

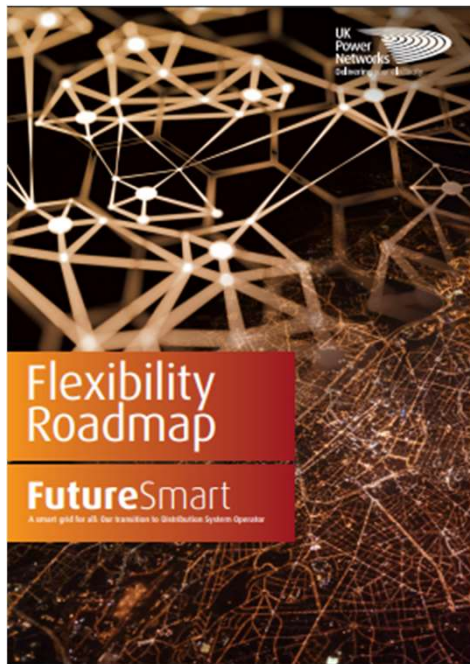
ENA Open Networks Project used to establish high level roadmap, engage with industry and establish best practice



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

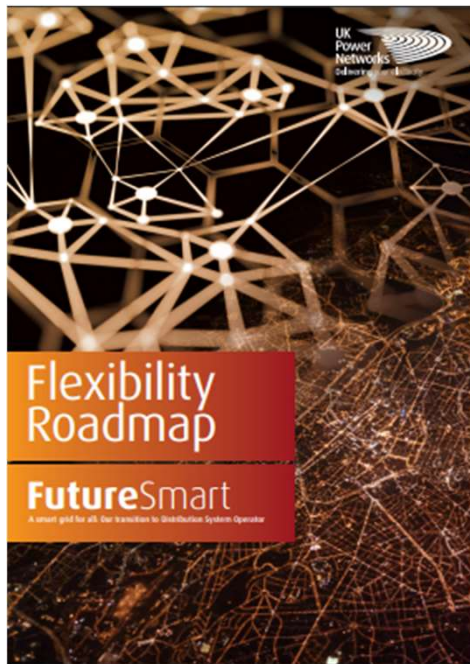


Table 9: Future LV flexibility needs and products

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 Commit to follow set load profiles Payments to operate appliances in restricted hours Generation turn up Vehicle to grid flexibility services Energy efficiency	Aggregated residential and commercial consumers with EVs, generation and/or battery storage Small scale generation connected at LV (including community energy) Commercial storage developers
LV voltage management	Demand turn down or generation turn up at specific location (typically winter peak)	Smart EV charging tariffs Demand turn up/down Generation turn up/down Vehicle to grid flexibility services Reactive power	Aggregated residential and commercial consumers with EVs, generation or in-home storage Small scale generation connected at LV (including community energy) 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

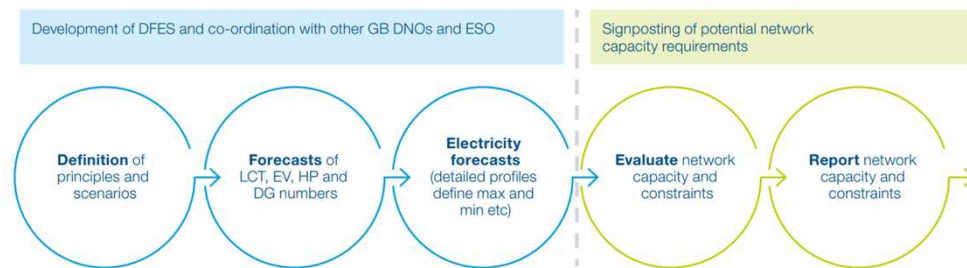
* Frequency is location specific defined at the point of procurement

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

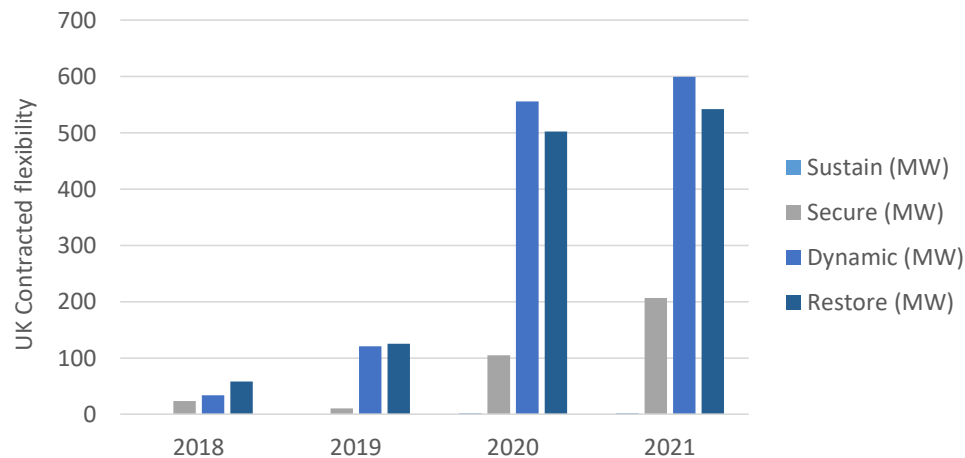
Source: ENA Open Network Project Active Power Services Implementation Plan

Contributing to the wider value stack

DNO process to identify future needs

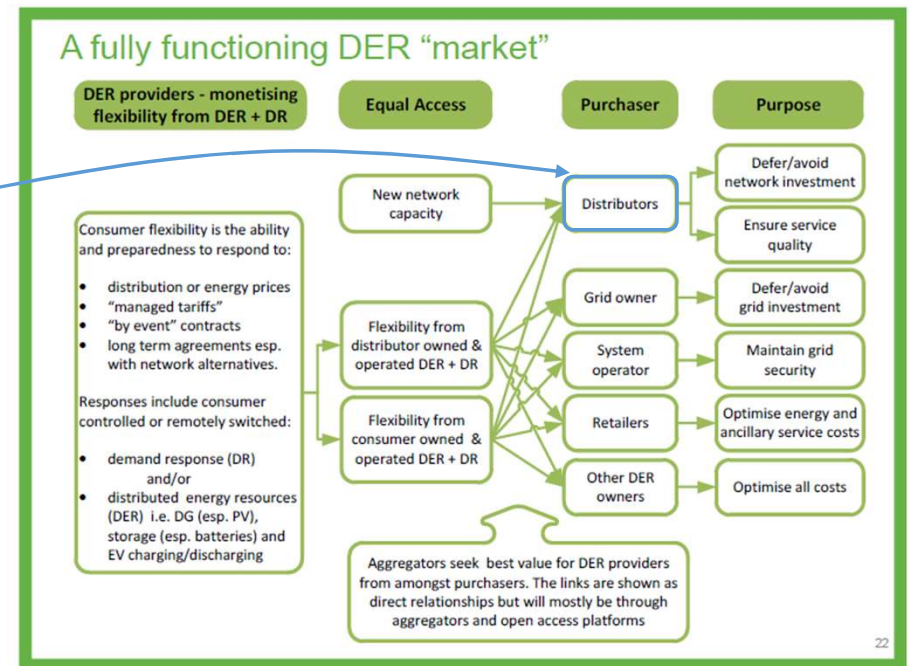


Source: ENA Open Network Project 2020 Year in Review



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

- Flexibility services
- Whole electricity systems planning
- Customer connections
- DSO transition
- Whole energy systems
- Communication and stakeholder engagement

DSO functions

1. System coordination
2. Network operation
3. Investment planning
4. Connection and connection rights
5. System deference and restoration
6. Service and market facilitation
7. Service optimisation
8. Charging

Market principles

1. Champion a level playing field
2. Ensure visibility and accessibility
3. Conduct procurement in an open and transparent manner
4. Provide clarity on the dispatch of services
5. Provide regular, consistent and transparent reporting
6. Work together toward whole energy system outcomes