power responsive

# Summer Event

13th July 2022

# Agenda

| | | |
|---|---|---|
| 11:30 | *30 min* | **Welcome & Introduction** |
| 12:00 | *55 mins* | **Session 1 – Policy, Regulation & ESO Update** |
| 12:55 | *60 mins* | **Lunch** |
| 13:55 | *1hr 25 mins* | **Session 2 - Creating a Smart & Flexible Network** |
| 15:20 | *20 mins* | ***Tea Break*** |
| 15:40 | *1hr 5mins* | **Session 3 – Evolving Flexibility Business Models** |
| 16:45 | *15 mins* | **Summary** |
| 17:00 | *3hrs* | **Drinks Reception & Networking** |

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Using your smartphone, please visit

# www.sli.do

Enter event code

# #flex

Please post any questions you would like to be considered by our speakers.

# Introduction

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**David Wildash**
Head of Markets

Session 1:

# Policy, Regulation & National Grid ESO Update


Department for Business, Energy & Industrial Strategy

**Sophie Boldon**
Head of Smart Energy

ofgem

**Flo Silver**
Senior Policy Lead

nationalgridESO

**Sarah Keay-Bright**
Market Strategy Manager

# Smart Systems and Flexibility

**Sophie Boldon, Head of Smart Energy**

**Department for Business, Energy & Industrial Strategy**

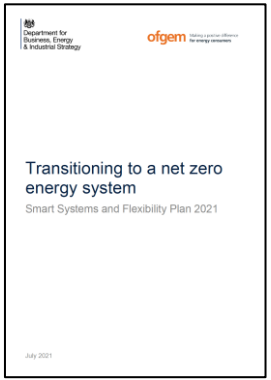
**13 July 2022**

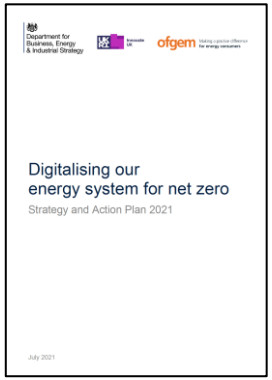
# The transition to a smarter more flexible system…

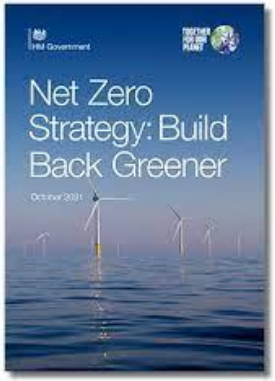
Smart Systems and Flexibility Plan; Energy Digitalisation Strategy

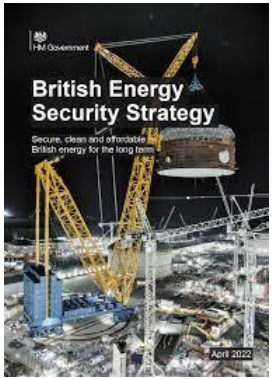
Net Zero Strategy

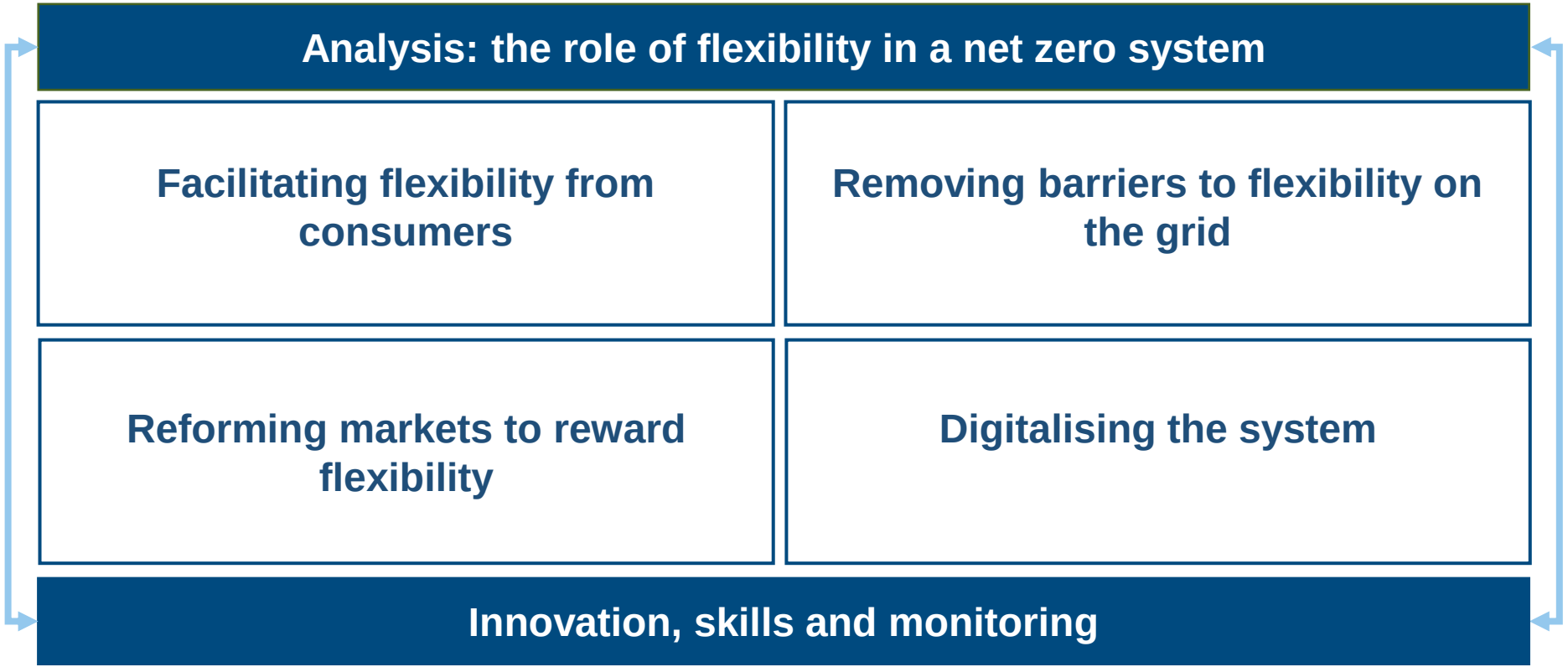
British Energy Security Strategy




Analysis: the role of flexibility in a net zero system
Facilitating flexibility from consumers
Removing barriers to flexibility on the grid
Reforming markets to reward flexibility
Digitalising the system
Innovation, skills and monitoring

# The Energy Security Bill

- Introduced into the House of Lords on Wednesday 6 July 2022
- Measures include:
  - Protections for consumers and the grid by placing requirements on energy smart appliances and the organisations who control them.
  - Clarifying electricity storage as a distinct subset of electricity generation.
  - Establishing a Future System Operator, an independent body with responsibilities in both the electricity and gas systems.
  - Reforming energy codes, overhauling the way that the technical and commercial rules of the energy system are governed.

https://www.gov.uk/government/publications/energy-security-bill-factsheets

**Questions:** energybill2021@beis.gov.uk

# Consultation: Delivering a smart and secure electricity system

- Includes proposals on:
  - Organisational compliance with the Network and Information System Regulations, using the Cyber Assessment Framework
  - Making time-of-use-tariff data openly available in a common format
  - Interoperability for larger domestic-scale energy smart appliances, including EV charge points, batteries, and heating appliances
  - Cyber security and grid stability requirements for smart heating appliances and batteries (similar to EV charge points)
  - Smart functionality for heat pumps, storage heaters and heat batteries
  - A licensing framework for organisations providing demand side response to domestic and small non-domestic consumers
- **Open until 28 September 2022 with stakeholder workshops planned over summer**
- **Questions: ssesconsultation@beis.gov.uk**

# £1bn Net Zero Innovation Portfolio

- Launched five competitions from the up to £65m Flexibility Innovation programme
  - £2m Automatic Asset Registration - *closed*
  - £11.4 V2X: bidirectional charging prototypes - *closed*
  - £1.8m Smart Meter System based Internet of Things Applications - *closed*
  - £1m Smart Meter Energy Data Repository - *closed*
  - **£9.15m Interoperable Demand Side Response: development and demonstration of energy smart appliances. *Deadline: 2pm, 29 July 2022***

- Longer Duration Energy Storage (LODES): up to £68m demonstration programme
  - Awarded £6.7m to 24 projects under Phase 1

**https://www.gov.uk/government/collections/net-zero-innovation-portfolio**

# The potential for large scale DSR

- Commitment in the Smart Systems and Flexibility Plan to "*support industry-led initiatives… to remove technical and cultural barriers to the increased participation of large consumers in DSR".*
- Testing stakeholders' views on extent of barriers to support large non-domestic DSR in the short and longer term, including consumer protection and engagement.
- Working with ESO and Ofgem to assess needs ahead of Winter 2022/23, and the contribution DSR can make.

**Questions: smartenergy@beis.gov.uk**

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# Unlocking Distribution Flexibility

## Towards System Optimisation

## July 13th 2022

July 2022

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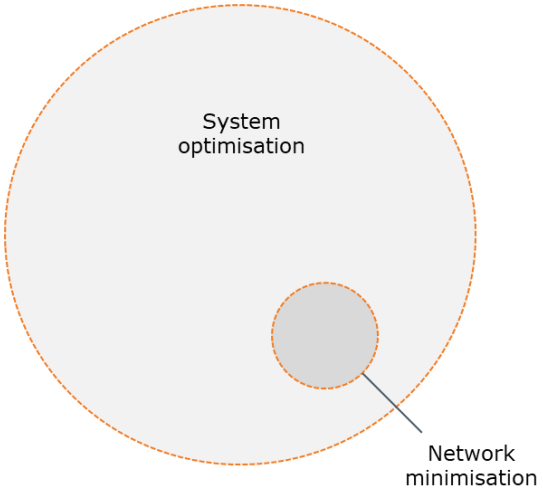


*Venn diagram of system optimisation and network minimisation*

Network Minimisation - flexibility markets to defer or mitigate network reinforcement, or to manage post fault network restoration.

These markets are innately **transient in time and geography**

System Optimisation – flexibility provides services simultaneously trading across multiple markets at both Distribution and Transmission, facilitating effective integration of intermittent renewable generation and smart low carbon tech.

By focusing on network minimisation, **uses of distribution may be inhibited**. DER flexibility has the potential to provide numerous services.

**Present Issues:** Flexibility from DER remains nascent, both in access to markets, liquidity, and coordination. Visibility is poor, control is patchy, contracts are long-winded, baselining is complicated. Performance risks are borne by buyers with no existing liability trading.

**Future vision:** DER have ready access across all markets, and locational signals determine the value of distribution flexibility across needs cases. DER can stack value, and can move between markets.

| Customer | Service | Type | Network/system |
|---|---|---|---|
| ESO | Ancillary Services | Balancing | System optimisation |
| ESO | Congestion management | Grid management | Network minimisation |
| ESO | Balancing mechanism | Balancing | System optimisation |
| BRP | Day ahead | Wholesale | System optimisation |
| BRP | Intraday | Wholesale | System optimisation |
| BRP | Portfolio self-balancing | Wholesale | System optimisation |
| BRP | Hedging/OTC | Adequacy | System optimisation |
| DNO | Congestion management | Grid management | Network minimisation |
| DNO | Restoration | Grid management | Network minimisation |

**Changes Required**: Distribution flexibility needs to integrate with wholesale markets and access and charging reforms. Product and service criteria should be simplified across all traders, with clear and coordinated timelines for gate closure across markets.

Exclusivity contracts should be used only where essential.

## Oversight and visibility

Ofgem ingest and regulate market participants.

Ofgem

BEIS maintain a policy view across market developments

BEIS

Investors and financiers have a clear appreciation of market developments and signals, allowing for increased investment in DERs.

Investors

## Secondary trading

Secondary trading enables market participants to trade obligations and service delivery in a trusted environment.

## Markets

We need to bring markets together and allow trades across them with a 'single source of truth' that makes flexibility needs and actions visible to buyers and sellers.

## Physical reality

DER representatives (load controllers) are able to easily access and assess network and market requirements. Common registration, security and authentication across the exchange increase liquidity across all markets.

Networks provide accurate and transparent data on requirements and network conditions, in an interoperable format.

## DER devices

**Common infrastructure and governance**

Trust

Rules, governance, dispute resolution

Transparency, visibility, level playing field



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ofgem Making a positive difference for energy consumers

**Ofgem is the Office of Gas and Electricity Markets. We are a non-ministerial government department and an independent National Regulatory Authority, recognised by EU Directives. Our role is to protect consumers now and in the future by working to deliver a greener, fairer energy system.**

**We do this by:**

- **working with Government, industry and consumer groups to deliver a net zero economy at the lowest cost to consumers.**
- **stamping out sharp and bad practice, ensuring fair treatment for all consumers, especially the vulnerable.**
- **enabling competition and innovation, which drives down prices and results in new products and services for consumers.**

www.ofgem.gov.uk

# NG ESO market reforms

## Implications for flexibility providers

Sarah Keay-Bright

Power Responsive Summer Event 2022

13th July 2022, London.

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# ESO Market Roadmap https://www.nationalgrideso.com/research-publications/markets-roadmap

## New challenges require reform to our balancing services markets

**Operability**

- More variable and asynchronous generation
- Less dispatchable generation
- New connections further away from demand centres

**Markets**

- New sources of flexibility needing routes to market
- Transitioning to a decarbonised electricity system with lowest balancing costs

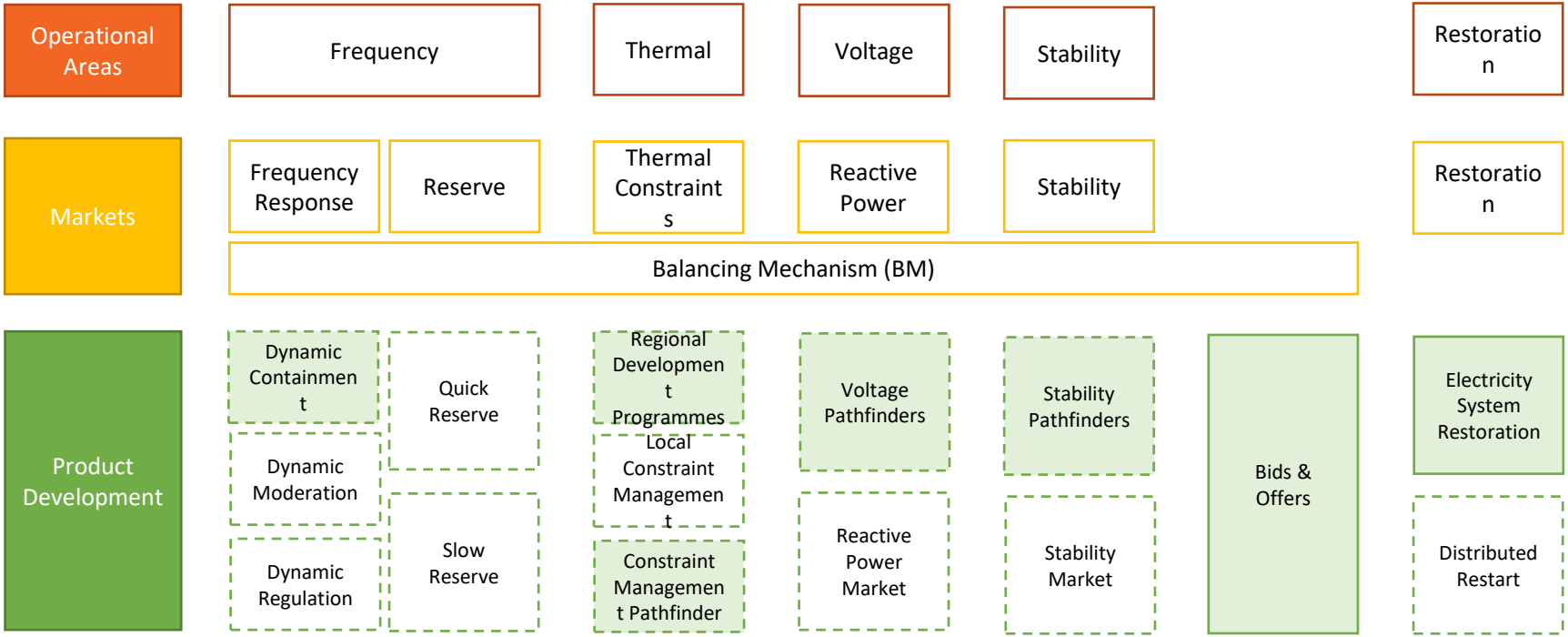
**Products**

- Standardising and rationalising our product suites
- Opportunities to share more and higher quality data

**We would highly value your feedback on our Market Roadmap process/product:**
**Stakeholder survey:** https://nationalgrideso.fra1.qualtrics.com/jfe/form/SV_1TdRdRiOgnG2MvQ

# We are adapting our products to operate the electricity system of the future.

Our new products aim to deliver: efficient dispatch; efficient investment and; value for money




Service Procured in 2021

Product is under development

Ke

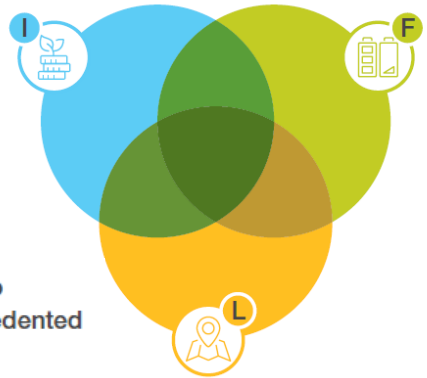
nationalgridESO

# We also published Phase 3 report for our Net Zero Market Reform programme

*ESO's Net Zero Market Reform programme is exploring holistically the changes to current GB electricity market design that will be required to achieve net zero*

## Case for Change: The Key Challenges

There is a need to manage dramatic energy imbalances with **flexible and firm technologies** across both supply and demand




There is a need to **invest** at unprecedented scale and pace

There is a need to incentivise assets to **locate** and **dispatch** where they can minimise whole system costs

## Case for change: Key emerging issues

The limitations of operating a high-renewables, flexible system under the current market arrangements have already emerged, leading to rising costs and operational issues. We have identified four key issues below:

**1. Constraint costs are rising at a dramatic rate**

**2. Balancing the network is becoming more challenging and requires increasing levels of inefficient redispatch**

**3. National pricing can sometimes send perverse incentives to flexible assets, that worsen constraints**

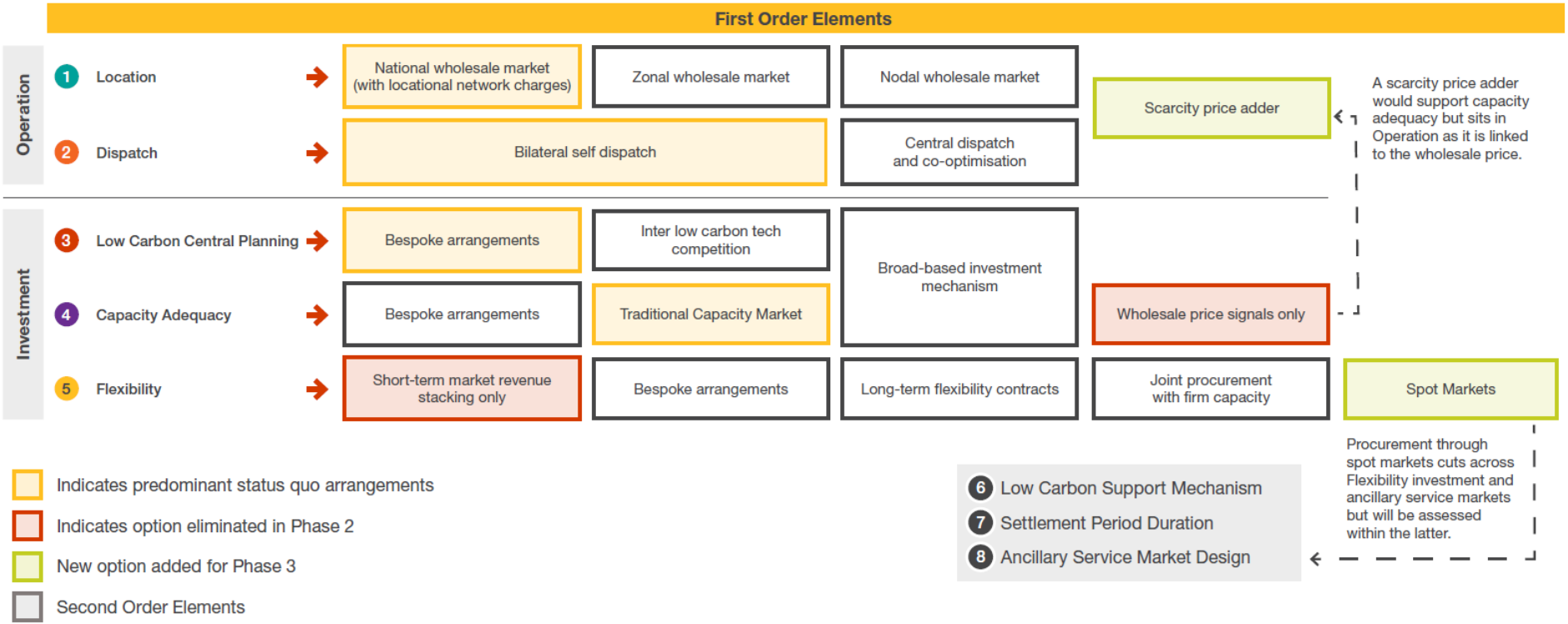
**4. Current market design does not unlock the full potential of flexibility from both supply and demand.**

ESO's latest NZMR report (Phase 3) can be found on our website.

# Net Zero Market Reform as part of the bigger picture

We aim to ensure our proposals for market reforms would provide an **enduring foundation for long-term net zero market design**

# Updated Assessment Framework



# In Phase 3, published May 2022, we assessed three options for improving locational signals in the GB electricity market

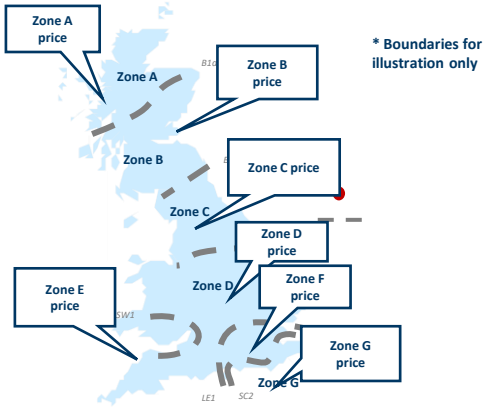
*Weaker locational signals* → *Stronger locational signals*

**Single national price and locational network charges**

*Uniform price clears across entire market*


**Zonal pricing**

*System divided into a small number of zones with individual prices*




* Boundaries for illustration only

**Nodal pricing**

*System divided into many "nodes" with individual prices*

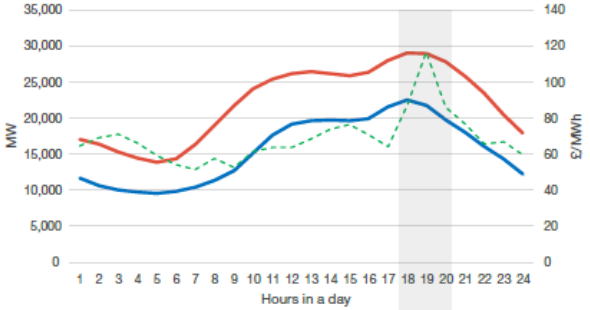
The results of the assessment (NZMR Phase 3) can be found on our website.

# Sharper, more accurate price signals with nodal pricing

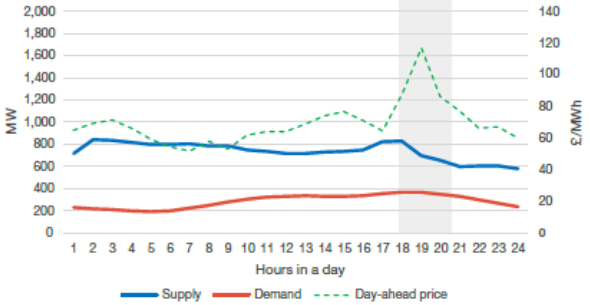
## National price signal

Demand in South receives muted incentive to reduce. Northern demand also incentivised to turn down despite surplus local supply.

**Location in South (Illustrative)**



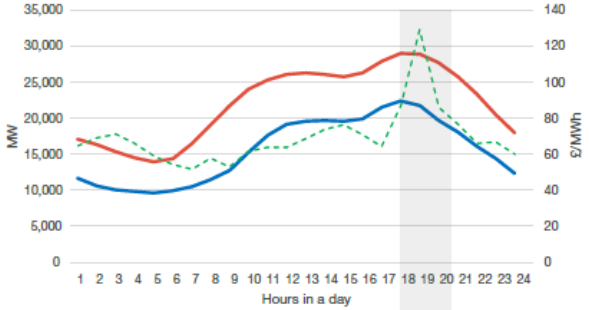

**Location in North (Illustrative)**



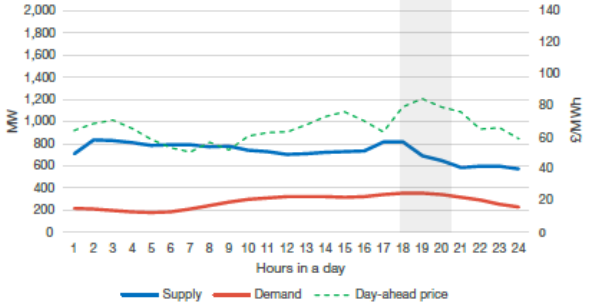

## Nodal price signal

Demand in South receives stronger incentive to reduce. Lower incentive for Northern demand reflecting surplus generation.

**Location in South (Illustrative)**




**Location in North (Illustrative)**



# Session 1:
# Q&A

Department for Business, Energy & Industrial Strategy

**Sophie Boldon**
Head of Smart Energy

ofgem

**Flo Silver**
Senior Policy Lead

nationalgridESO

**Sarah Keay-Bright**
Market Strategy Manager

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# Lunch

## Return at 13:55

Session 2:

# Creating a Smart & Flexible Network

**Farina Farrier**
Head of Open Networks

**Charon Balrey**
DSO Policy Manager

**Jim Cardwell**
Head of Policy & Development

**Keith Evans**
Flexibility Solutions Manager

**Ben Godfrey**
DSO Manager

**Alex Howard**
DSO Market Platform Product Manager

# ENA Open Networks Programme

## Creating a Smart & Flexible Network

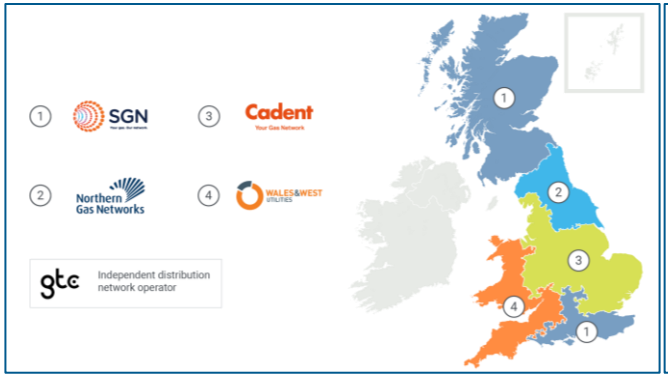
Farina Farrier
Head of Open Networks Programme

# Introduction to ENA

## The voice of the networks

- 29 million electricity customers
- 21.5 million gas customers
- 180,000 miles of gas network
- 519,304 miles of electricity network
- £60bn invested 2015-23

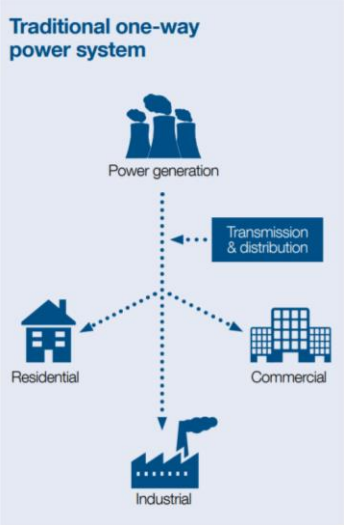


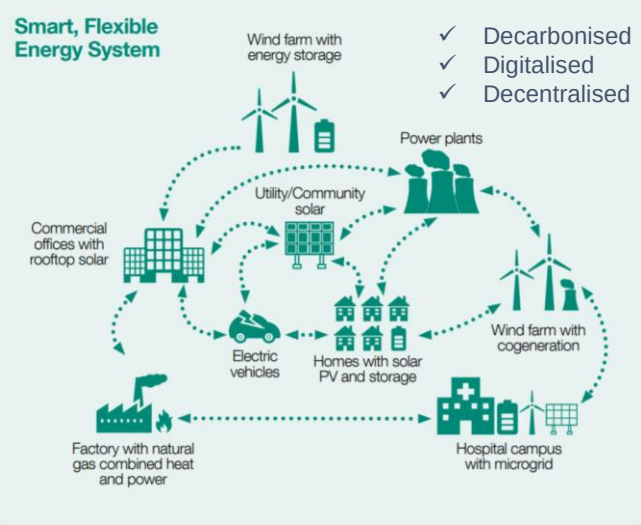



# Energy Landscape

The UK has world-leading climate change targets that require a fundamental change across the energy system.

Electricity Networks are facing unprecedented change as a result of **decarbonisation**, **digitisation** and **decentralisation**






## Net Zero

Decarbonised power system by 2035, underpinned by LCTs and flexibility.

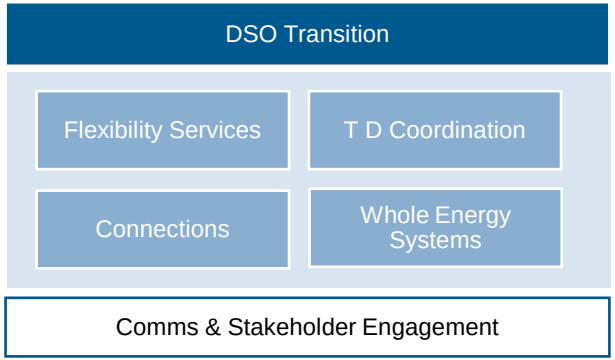
On behalf of it's members, ENA leads a number of areas of work to inform and implement the changes that are required to deliver Net Zero ready networks.

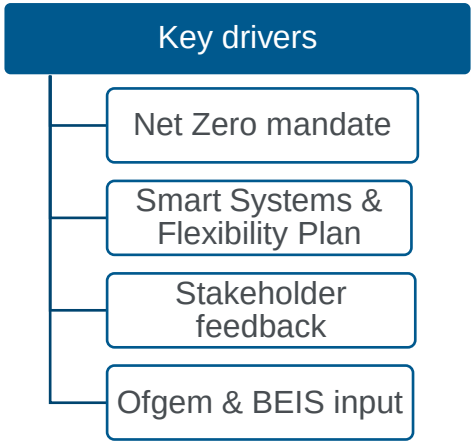
# Open Networks – Delivering a Smart Grid

Started in 2017, the Open Networks programme is working with the networks and industry to lead the **transition to a smart and flexible energy system** that will enable net zero.

- ✓ Opening local flexibility markets to demand response and renewable energy
- ✓ Helping customers connect faster
- ✓ Opening data to enable customers identify best locations to invest
- ✓ Delivering efficiencies between network companies to operate secure and efficient networks

FIVE YEARS ON
Energising the UK's transition to Net Zero networks




# Flexibility Markets in Great Britain

A recent report commissioned by pan-European trade association GEODE has shown that UK's electricity networks are leading in Europe for supporting and delivering local flexibility services.

National Markets

nationalgridESO

- Wholesale Energy Market
- Balancing and Ancillary Services
- Capacity Market

Local Markets used by DNOs

- Congestion management
- Reactive Power

Peer-to-Peer trading and other emerging services at trial stage


- Open Networks is looking at the interface between these markets.
- GB Energy Regulator leading reforms to improve price driven flexibility.

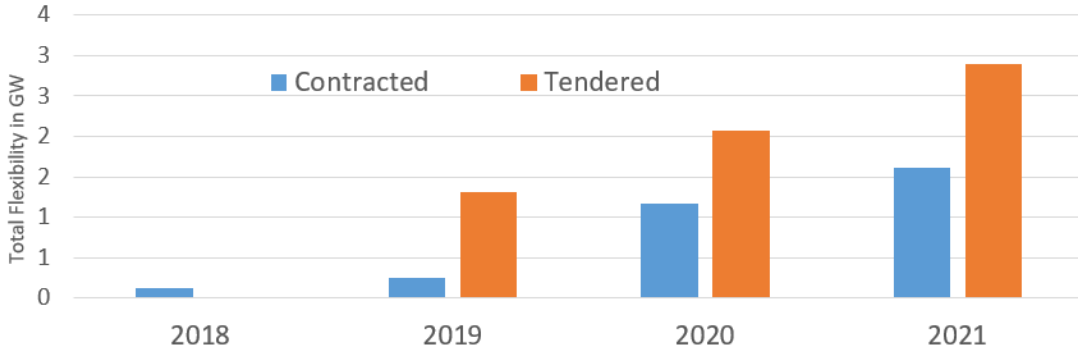
# Evolution of Local Flexibility Market in Great Britain

✓ **2.9GW of local flexibility services tendered in 2021.**

| DSO Flexibility Tenders | Sustain (MW) | Secure (MW) | Dynamic (MW) | Restore (MW) | Reactive Power (MVAr) (if applicable) |
|---|---|---|---|---|---|
| | Peak Capacity (MW) | Peak Capacity (MW) | Peak Capacity (MW) | Peak Capacity (MW) | Peak Capacity (MVAr) |
| Contracted for 2018 | 0 | 24 | 34 | 59 | 0 |
| Contracted for 2019 | 0 | 10 | 121 | 125 | 0 |
| Contracted for 2020 | 2 | 105 | 556 | 503 | 0 |
| Tendered for 2020 | 14 | 494 | 771 | 779 | 7 |
| Contracted for 2021 | 13 | 263 | 730 | 603 | 0 |
| Tendered for 2021 | 31 | 692 | 1203 | 955 | 9 |

**4 Real Power Products:**

- Sustain: Scheduled Constraint Management
- Secure: Pre-Fault Constraint Management
- Dynamic: Post-Fault Constraint Management
- Restore: Post-Fault Restoration




| | |
|---|---|
| % of Tender contracted in 2018 | n/a |
| % of Tender contracted in 2019 | 19.6% |
| % of Tender contracted in 2020 | 56.5% |
| % of Tender contracted in 2021* | 55.7% |

** Contracted to date, more expected over the remainder of 2021*

# Useful Links

- Programme Scope for 2022
- 2021 End of Year report
- Stakeholder events & supporting material
- DSO Roadmap
- Dissemination Forum applications

*We welcome feedback and your input*

*Opennetworks@energynetworks.org*

Click here to join our mailing list

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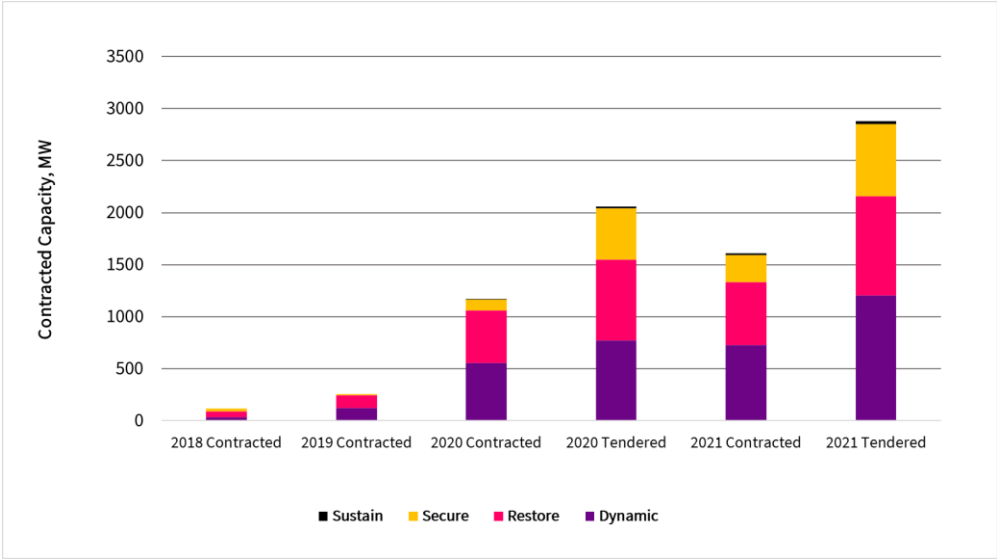
# Facilitating distributed flexibility

Charon Balrey
DSO Policy Manager

nationalgridESO

# Facilitating distributed flexibility


**Tendered and contracted DSO services continue to climb upwards in 2021**
Volumes of DSO services by service type, 2018 to 2021, MW
Source: Power Responsive Annual Report 2021

# Current activities


- ‘Enabling the DSO transition’ consultation
- ‘Operational visibility of DER’ consultation


**Providing Thought Leadership**

**Facilitating markets**

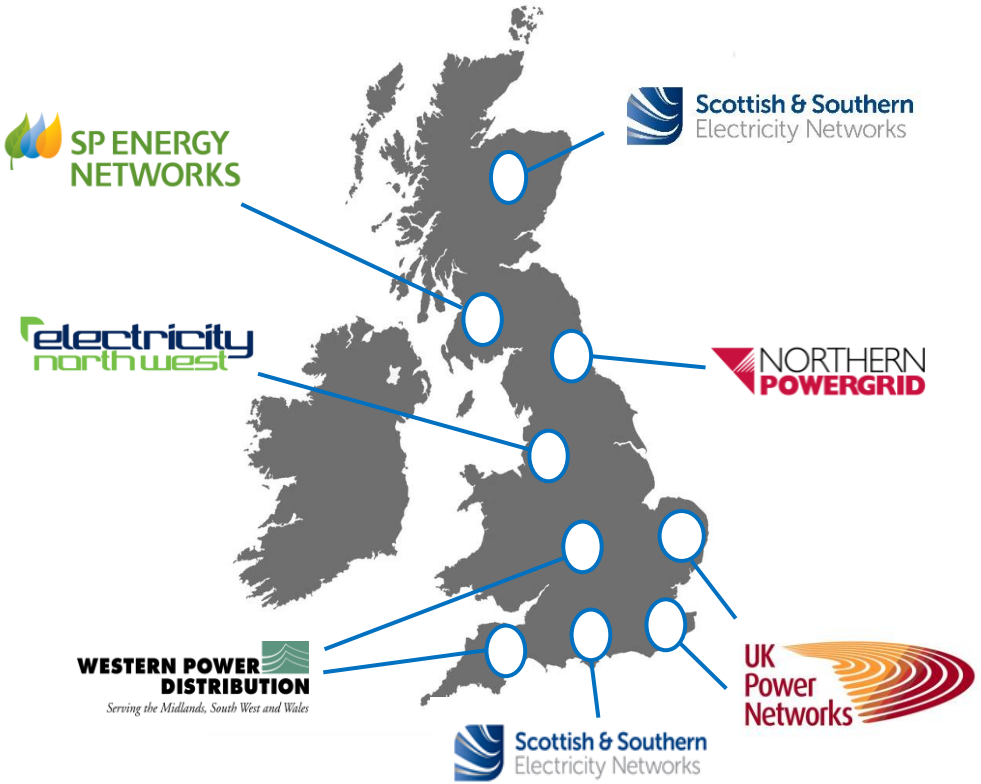
- New products
- LCM and RDPs
- Single Markets platform


**Enabling the DSO transition**


- Standard agreement for flexibility services
- Procurement visibility
- Primacy rules
- Aligning with RIIO-ED2 and policy directions

# Regional Development Programmes (RDP)

- RDPs are considering the use of flexibility services from DERs by developing coordinated markets, systems, processes and ways of working with distribution network operators (DNOs).
- By working together, network organisations are finding ways to ‘unlock’ more capacity through non-network solutions.
- RDPs are design by doing projects. They are informed by the ENA Open Networks project and in turn inform the project also.
- For example, primacy rules being developed through RDPs in South-West.



# Increased focus in our second Business Plan (from April 23) on facilitating distributed flexibility

- Facilitating market access for distributed flexibility
- Service co-ordination between markets
- Increased DER visibility in real-time operations
- Facilitating DSO

# Increasing value from flexibility

Power Responsive
London
13 July 2022

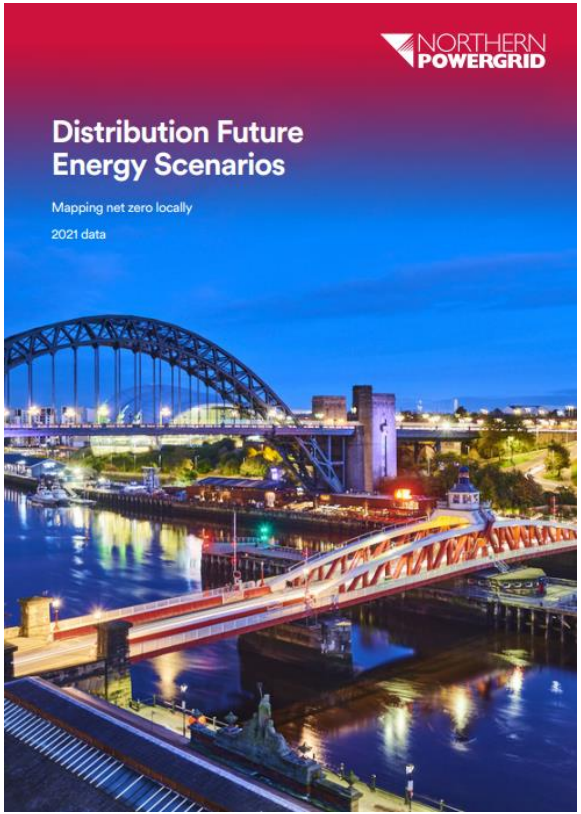
Jim Cardwell
Head of Policy Development

NORTHERN POWERGRID

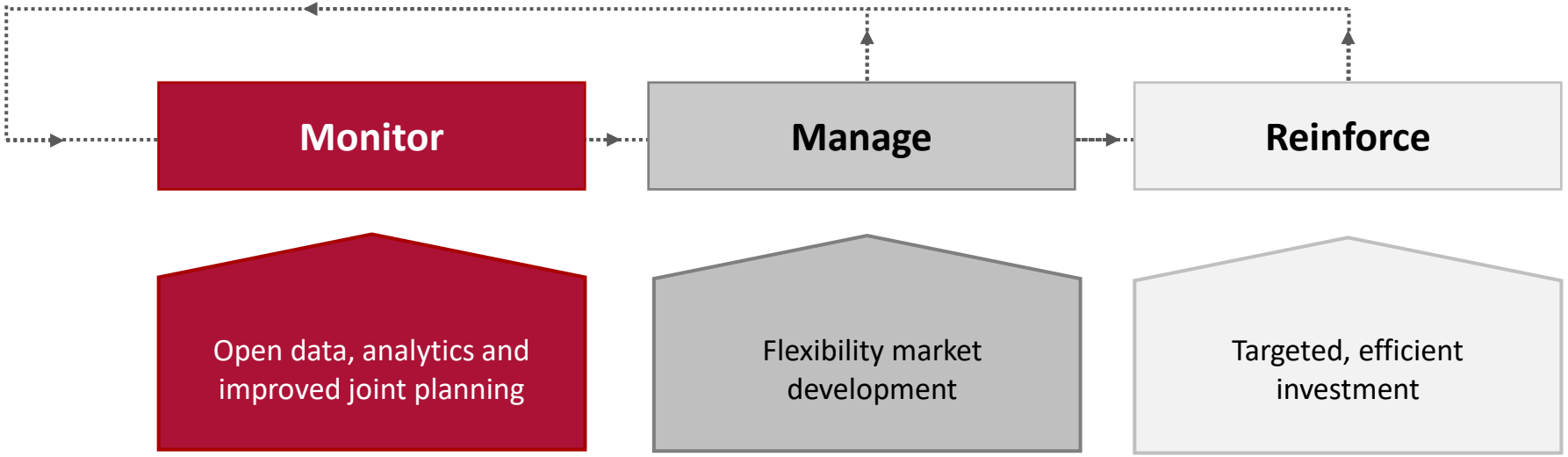
# Introducing Northern Powergrid


- Northern Powergrid is responsible for the **electricity distribution network** in the North East, Yorkshire and Northern Lincolnshire.
- We **move** electricity from where it's generated to homes and businesses.
- We are the enabler of a **net zero** society.
- Together with our fellow energy network operators, we must be on the **front foot of decarbonisation.**

# Key questions to inform our scenario forecasting and planning

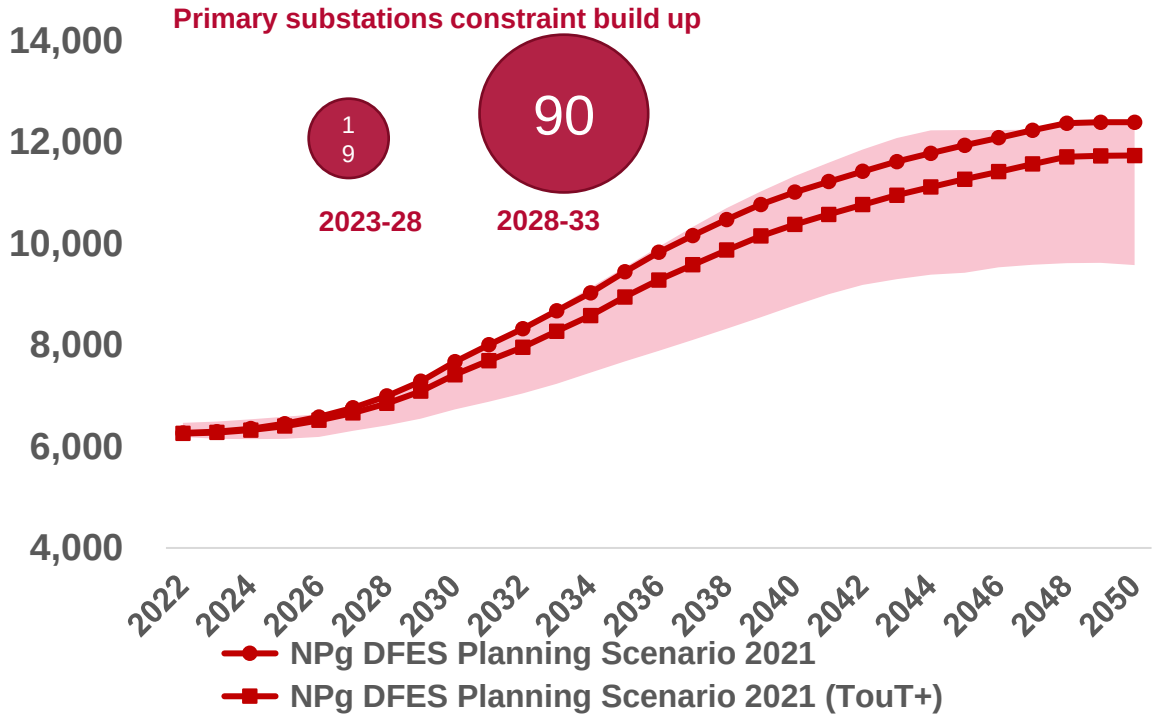
# A flexibility first approach keeps costs low for our customers




**Whole system value from Distribution System Operation (DSO)**

# Our need for flexibility is growing with network use

## Regional gross peak demand (MW)




## Flexibility network benefits during ED2 (2023-28)

**Price Driven Flexibility**
£113m saving enabled by uptake of ToU tariffs

**DNO-Contracted Flexibility**
£14.8m reinforcement deferred by use of flexibility services

**Network Flexibility**
£74m saving enabled by LV monitoring and Smart solutions

**Go Further, Faster**
Further £3.2m proposed to stimulate markets ahead of ED3

# Procuring for distribution flexibility services this summer

- Reinforcement deferral business case
- ‘Sustain’ active power services at 12 locations
- 2-year contracts from 1 Dec 2022
- Minimum 50kW
- Service windows and ceiling price by location
  - 7 locations at up to £300/MWh, others lower
- Registration and pre-qualification now open
- ITT open 18 Jul to 22 Aug 2022

https://www.flexiblepower.co.uk/location/northern-powergrid

# Learn more…

- Our flexibility services:

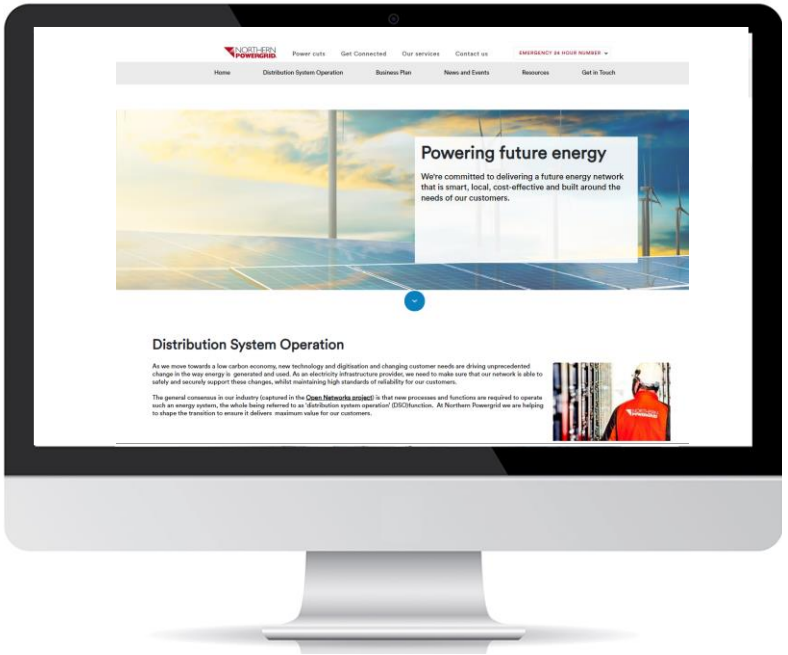
  https://www.northernpowergrid.com/DSO

- Our 2023-28 business plan:

  https://ed2plan.northernpowergrid.com/

- Email:

  flexibility@northernpowergrid.com



electricity north west

Bringing energy to your door

# Electricity North West Flexibility Services

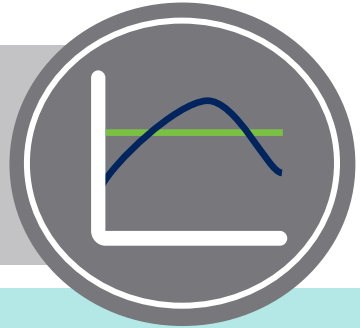
July 2022

Stay connected...

www.enwl.co.uk

# What are Flexibility Services?

When the demand for electricity is greater than the amount that we can provide, flexibility services are procured to alleviate constraints on our network during peak times



These services are provided by companies or individual customers who own assets in our region such as generators, battery storage and EV charge points that can generate more or use less electricity when required

This allows us to balance supply and demand, ensuring a safe and reliable supply of energy for our customers

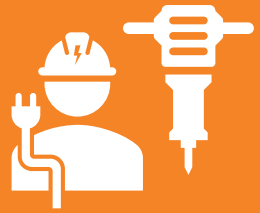
In return for providing extra capacity to the network, Flexibility providers will receive payment from the network

# What are the benefits?

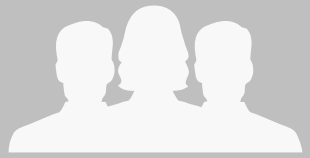
Utilises existing assets


Reduces $CO_2$ emissions


Reduction in supply interruptions

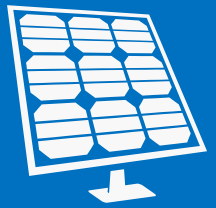


Less disruption

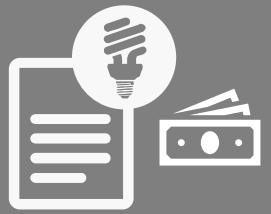


Supports community energy groups

Supports local businesses

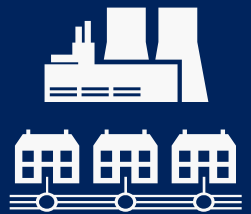
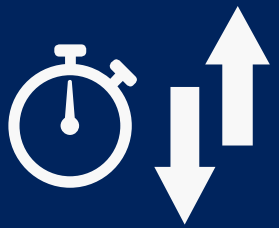


Encourages Low Carbon Technologies



Cheaper bills for customers

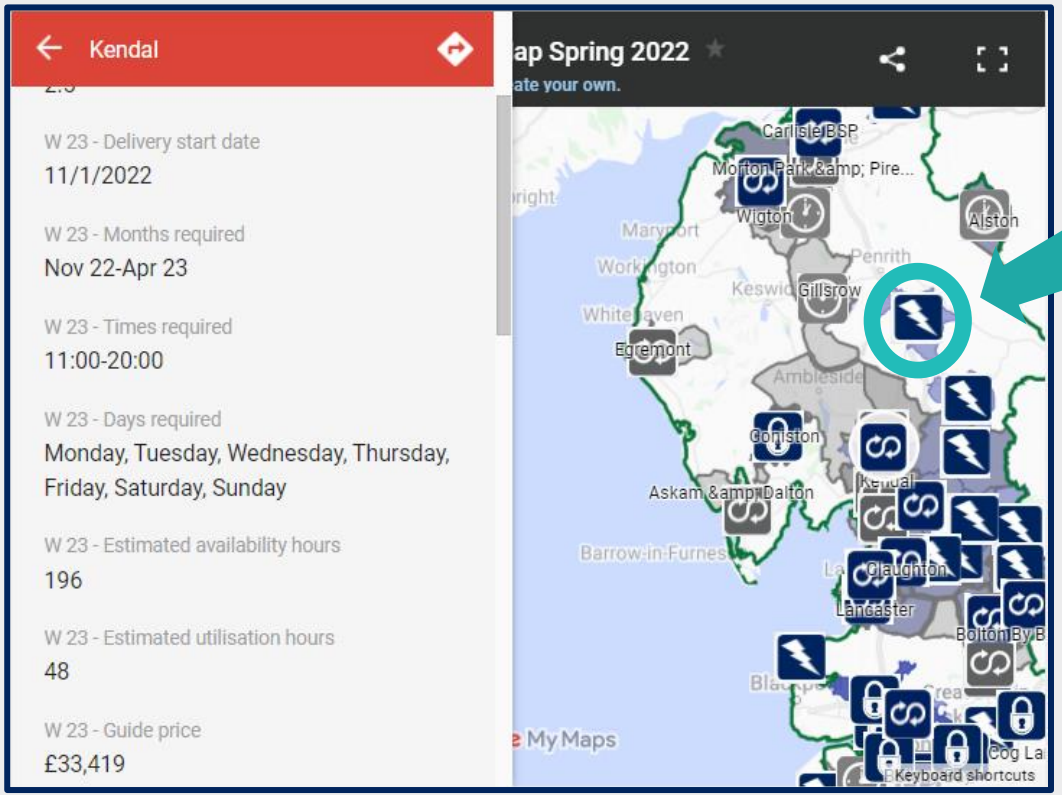
# Our flexibility tenders

| Location specific | Small entry requirements | Assets | Types of flexibility | Common products |
|---|---|---|---|---|
|  |   |  |  |  |
| We procure flexibility services as an alternative to reinforcement in areas where a constraint has been identified on the network | Our minimum capacity requirement is 50kW either from an individual asset or as part of an aggregated portfolio | • Industrial<br>• Commercial<br>• Aggregated domestic and non domestic portfolios | • Generation turn up/down<br>• Demand turn up/down<br>• Energy efficiency measures | We procure four common products (response types)<br>• Sustain<br>• Secure<br>• Dynamic<br>• Restore |

## Since 2018


Published
164
requirements
Carried out
10
tenders
Totalling
1500
MW of
requirements

# Flexibility requirements map




Select an icon to expand the details of each site requirement

You can find this map on our:

- Flexible Services homepage
- Current requirements page

The grey icons correlate to the information in the NDP, showing you whether a site is expected to require flexibility in the next **3-5** or **5-10** years.



54

# Developments and Commitments

We publish tenders twice per year in Spring and Autumn. Our Autumn 2022 tender will include opportunities to participate for the whole ED2 period 2023-2028.

We will be launching a consultation in the next few weeks asking stakeholders for their input into our current flexible services tenders and if/how we can improve them in future.

We will continue to utilise the ENA CEM tool to evaluate requirements for network investment; the value of flexible services; and subsequently any tender offers received. We are currently leading the development of a good practice guide.

We have developed a cost calculator for flexible services to assess their tender offers before submitting them to ensure that they are within the cost cap for the zone.


We will re-tender for the market platform(s) we use for Flexible Services Procurement, Dispatch, and Settlement on a regular basis through the course of ED2 to ensure market competition in this area.

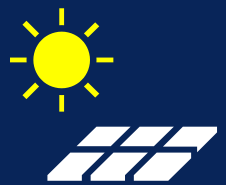
# Introducing our BiTraDER project

# BiTraDER

BiTraDER aims to investigate, develop and trial an innovative method for enabling flexibility providers to trade curtailment obligations bilaterally

Use of flexibility avoids expensive and carbon intensive reinforcement and is an increasingly important feature of network operations

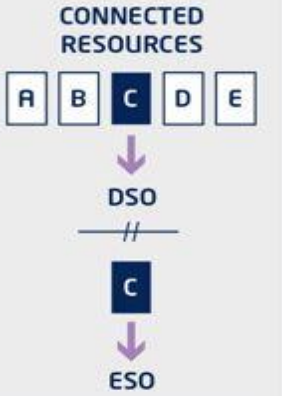
BiTraDER will boost acceptability of flexibility, while reducing the barriers for the uptake of Distributed Eneregy Resources (DER), introducing new sources of flexibility to the ESO by tackling issues of exclusivity



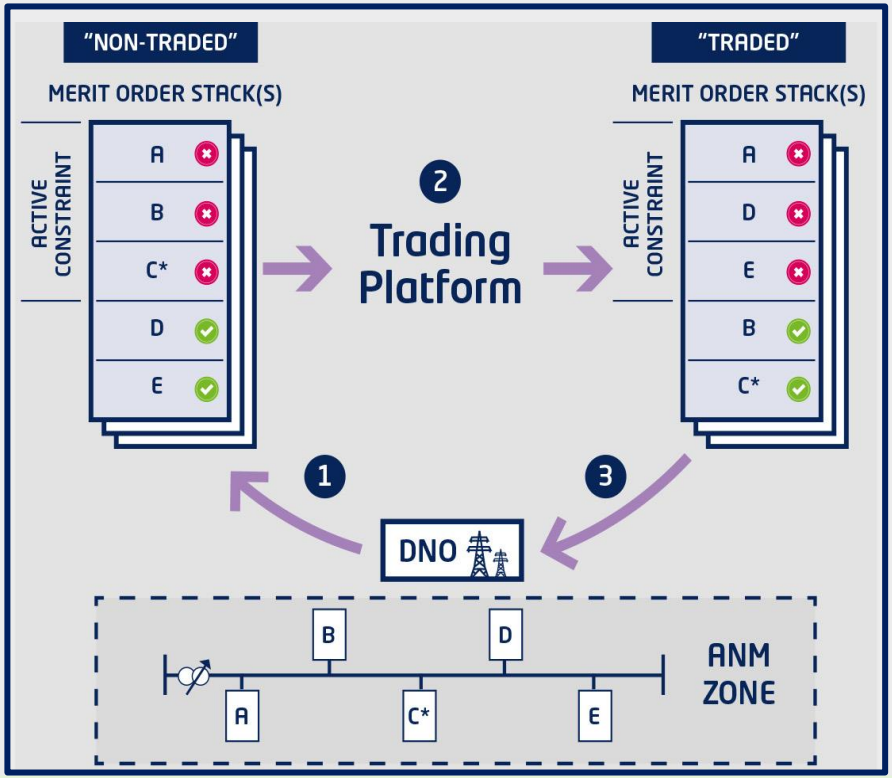
BiTraDER will enable DNOs to meet the challenge of net zero in supporting the uptake of flexibility and in particular Renewable Energy Sources (RES)

# BiTraDER

The BiTraDER Project will deliver a functional specification detailing the requirements for facilitating bilateral trading, including platform, market model, data requirements and interface.




*C has exclusive contract with ESO. BiTraDER offers potential for C to provide flexibility to both ESO and DSO.




**Step:**

1. Merit order stock presented to commercially available trading platform.
2. Near real time trades based on new rules developed as part of BiTraDER.
3. Traded merit order stack presented back to DNO

# QUESTIONS & ANSWERS

**flexible.contracts@enwl.co.uk**

**www.enwl.co.uk/gonetzero**

**0800 195 4141**

facebook.com/ElectricityNorthWest

linkedin.com/company/electricity-north-west

@ElecNW_News

youtube.com/ElectricityNorthWest

Please contact us if you have any questions or would like to arrange a one-to-one meeting

# Building rich and deep flexibility markets

Ben Godfrey
DSO Manager
July 2022

WESTERN POWER DISTRIBUTION
*Serving the Midlands, South West and Wales*
westernpower.co.uk

# RIIO-ED1: Mobilising DSO

WESTERN POWER DISTRIBUTION
*Serving the Midlands, South West and Wales*

- First to move to annual update of distribution future energy scenarios (DFES) projections (2020).
- First to publish comprehensive report on customer behaviour assumptions for all DFES technologies (2021).
- First to publish Distribution Network Options Assessment (DNOA) and use the Common Evaluation Methodology tool to demonstrate the transparent approach to optioneering we are taking (2020).
- First to implement a self billing process through an online portal and Flexible Power (2019).
- First to design, build and operate a flexibility dispatch platform through Flexible Power (2019).
- First to publish Shaping Subtransmission reports outlining the network impact assessment using DFES forecasts (2016).
- First to publish a common information model (CIM) model of an entire licence area (2020).
- First to publish signposting data for informing flexibility markets through a digital user friendly flexibility map (2018).
- First to implement six monthly procurement cycles for flexibility (2019).
- First to implement secure, dynamic and restore flexibility products (2018).
- First to provide full and complete access to flexibility requirement data available via API (2021).
- First to publish an annual summary of flexibility actions, participation and outcomes (2019).
- First to have a functionally separate Distribution System Operator (2021).
- First to publish long term scenario forecasts (2015/16).
- First to adopt the ENA Standard Flexibility Agreement Versions (V1, V1.1 and V1.2) to contract with our flexibility providers (2020).

# Distribution Flexibility in ED2

## Significant benefits can be unlocked through distribution flexibility

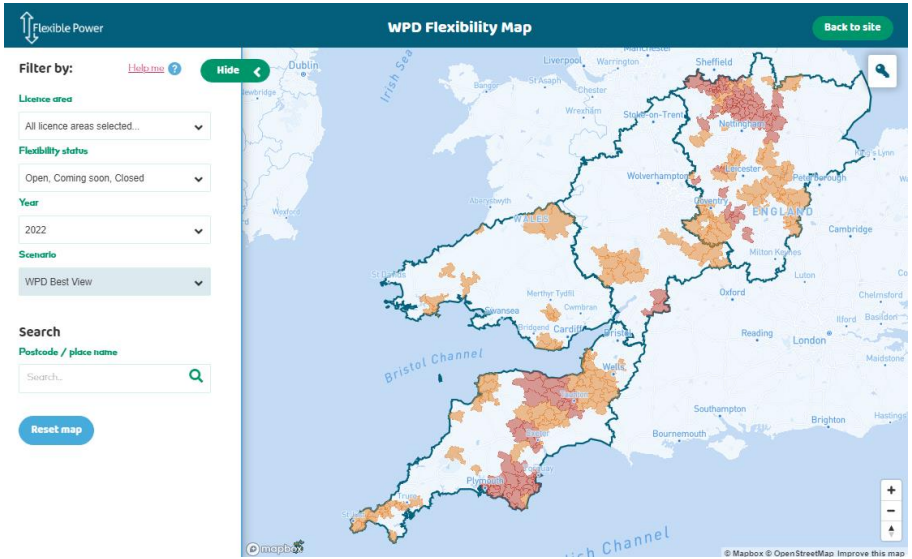
- Over £2.2bn of distribution network focussed benefit has been identified as part of RIIO-ED2 business plans between 2023-2028. £80m/yr flexibility market potential in 2028.

| DSO Savings | ENWL | NPG | SSEN | SPEN | UKPN | WPD | |
|---|---|---|---|---|---|---|---|
| Improved network visibility | 50 | 113 | | | 6 | 141 | ← LRE Annex |
| DSO flexibility | 17 | 14 | 36 | 36 | 410 | 94 | ← LRE Annex |
| Flexible Connections/Smart solutions | | 74 | 418 | 334 | 185 | 270 | ← SCR Narrative |
| **Total** | **67** | **201** | **454** | **370** | **601** | **505** | |

- Even greater benefits can be achieved through whole system coordination across all energy system actors

# Openness of system requirements

## Flexibility requirements




www.flexiblepower.co.uk

WPD's 2022 Cycle 2 tender opens 25th July and closes on 2nd September.

298MW across 47 locations
https://rfxxp.westernpower.co.uk/ECE

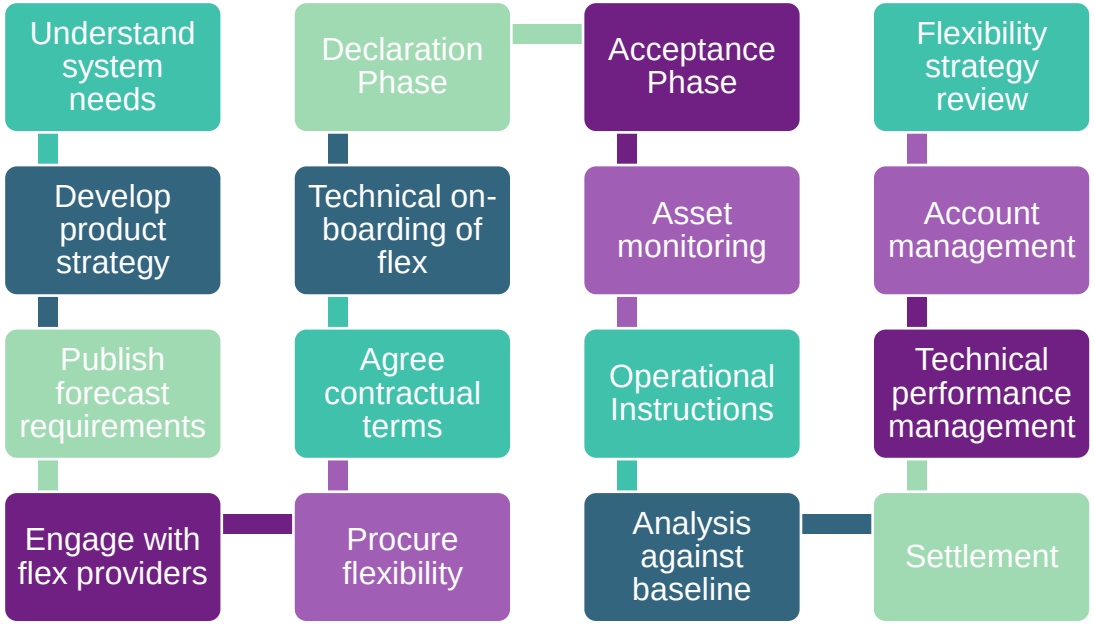
## Data Files

https://connecteddata.westernpower.co.uk

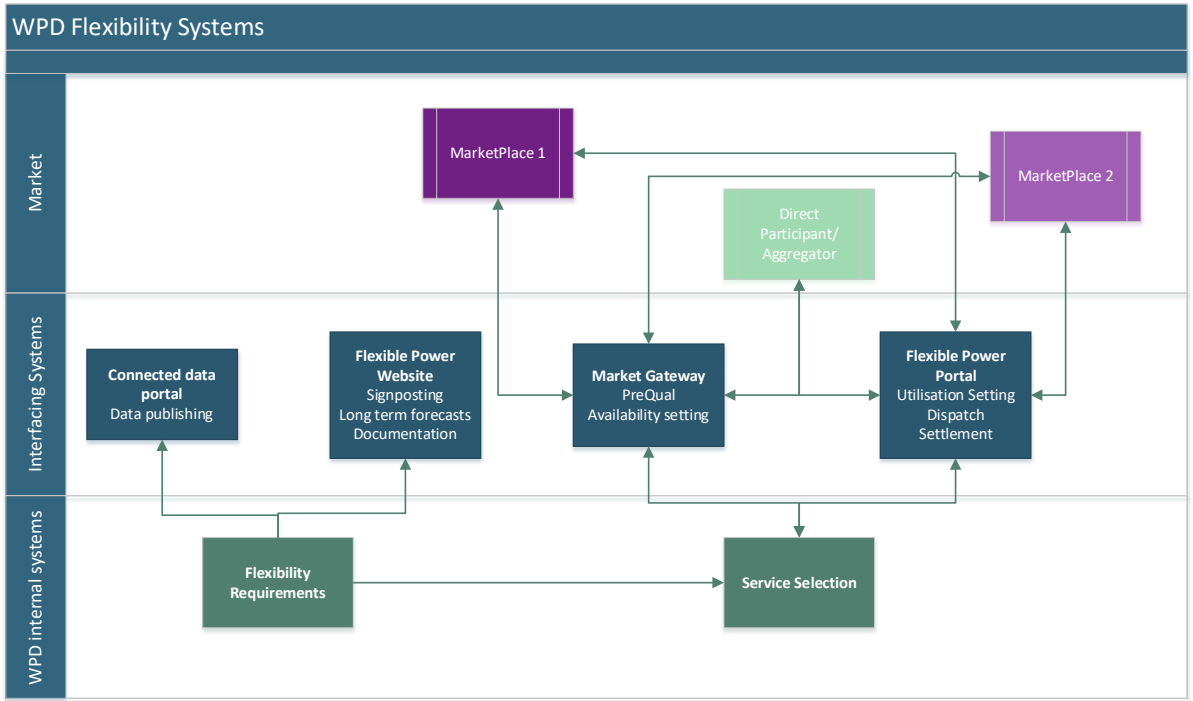
| Name | Format | Last Changed | Download | |
|---|---|---|---|---|
| CMZ Primary Substation | csv | 3 weeks ago | | Explore |
| CMZ Procurement Postcodes | csv | 3 weeks ago | | Explore |
| FSP Information - CMZ Information | csv | 3 weeks ago | | Explore |
| FSP Information - MW Profiles | csv | 3 weeks ago | | Explore |

# Delivering Flexibility Benefits

- Understanding the network requirements is just the first step in bringing forward flexibility
- DSOs are committed to using flexibility where available and economic
- DSOs will also have a large role in supporting distribution connected flexibility to access other markets
- Suppliers, aggregators, platforms and system operators will need to exchange data more frequently as the usage of flexibility increases



# Digitising DSO interfaces




- WPD has worked with Cornwall Local Energy Market, NODES & Piclo in accessing flexibility
- All routes have different propositions and capabilities (visibility, auctions, trades, exchanges)
- We will have standardised digital processes to enable full third party integration
- Commercial qualification, asset qualification, needs signposting, trade forming, secondary trading, baselining, settlement

wpdflexiblepower@westernpower.co.uk

https://connecteddata.westernpower.co.uk

www.flexiblepower.co.uk/western-power-distribution

WESTERN POWER DISTRIBUTION

*Serving the Midlands, South West and Wales*

UK Power Networks
Delivering your electricity

# Flexibility Services

UK Power Networks

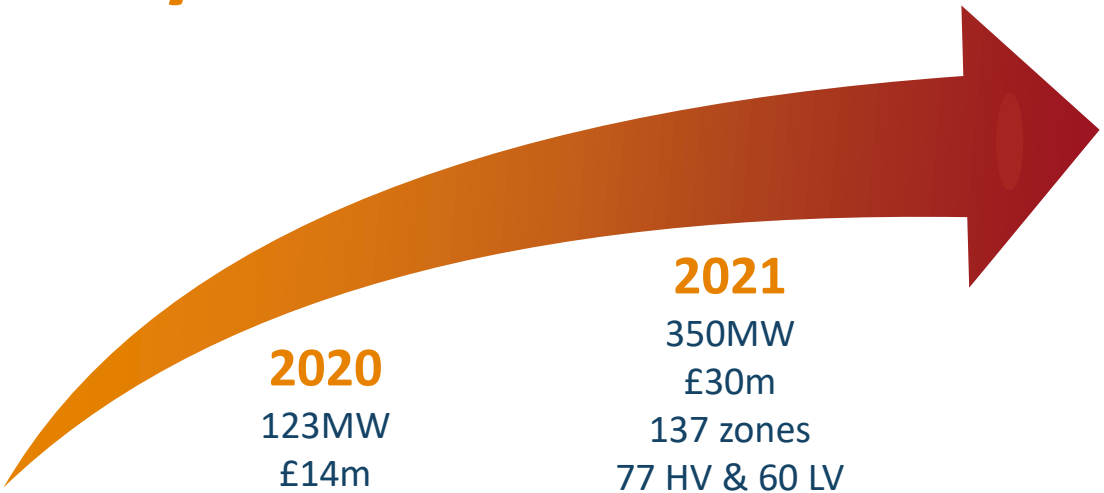
# About us

**8m homes and businesses**
29% of GB

**9.8GW Distributed Generation**
32% of GB

**16GW Peak Demand**

# The story so far…



**2019**
19.3MW
£0.5m
11 zones

**2020**
123MW
£14m
57 zones
42 HV & 15 LV

**2021**
350MW
£30m
137 zones
77 HV & 60 LV

**2022**
292MW
113 zones

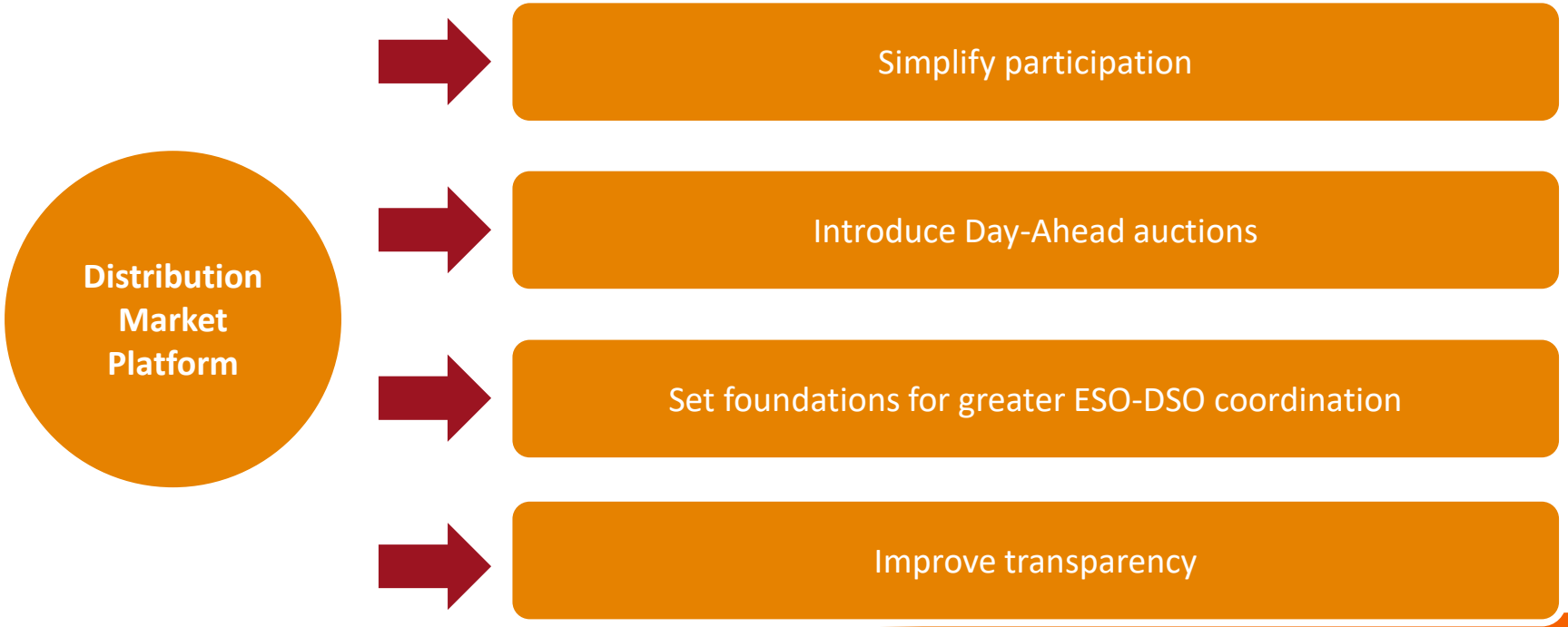
# ED2: A step change in flexibility

Release Transmission benefits of >£160m

Connect 1.2GW of DG with flexible connections and market-based curtailment

Defer >£400m of load-related reinforcement

# ED2: Our priorities



# What's next?

1. UKPN Flexibility Forum (28 July 2022)
2. Next flexibility procurement round kicks off (Q3 2022)
3. Launching the first independent DSO (April 2023)

Join our flexibility mailing list by emailing flexibility@ukpowernetworks.co.uk

UK Power Networks
Delivering your electricity

UK Power Networks
Delivering your electricity

# Thank you

**Join the mailing list:**

Email flexibility@ukpowernetworks.co.uk

**Visit our website:**

smartgrid.ukpowernetworks.co.uk/flexibility-hub

## Session 2:

# Q&A

**Farina Farrier**
Head of Open Networks

**Charon Balrey**
DSO Policy Manager

**Jim Cardwell**
Head of Policy & Development

**Keith Evans**
Flexibility Solutions Manager

**Ben Godfrey**
DSO Manager

**Alex Howard**
DSO Market Platform Product Manager

#powerresponsive

# Break

# Return at 13:40

Session 3:

# Evolving Flexibility Business Models

| | | | | |
|---|---|---|---|---|
| **Caroline Bragg**<br>Director of Policy & Research | **Ben Lock**<br>Partner | **Eddie Proffitt**<br>Technical Director | **Sebastian Blake**<br>Flexibility Markets Lead | **Valts Grintals**<br>Grid & Policy Lead |

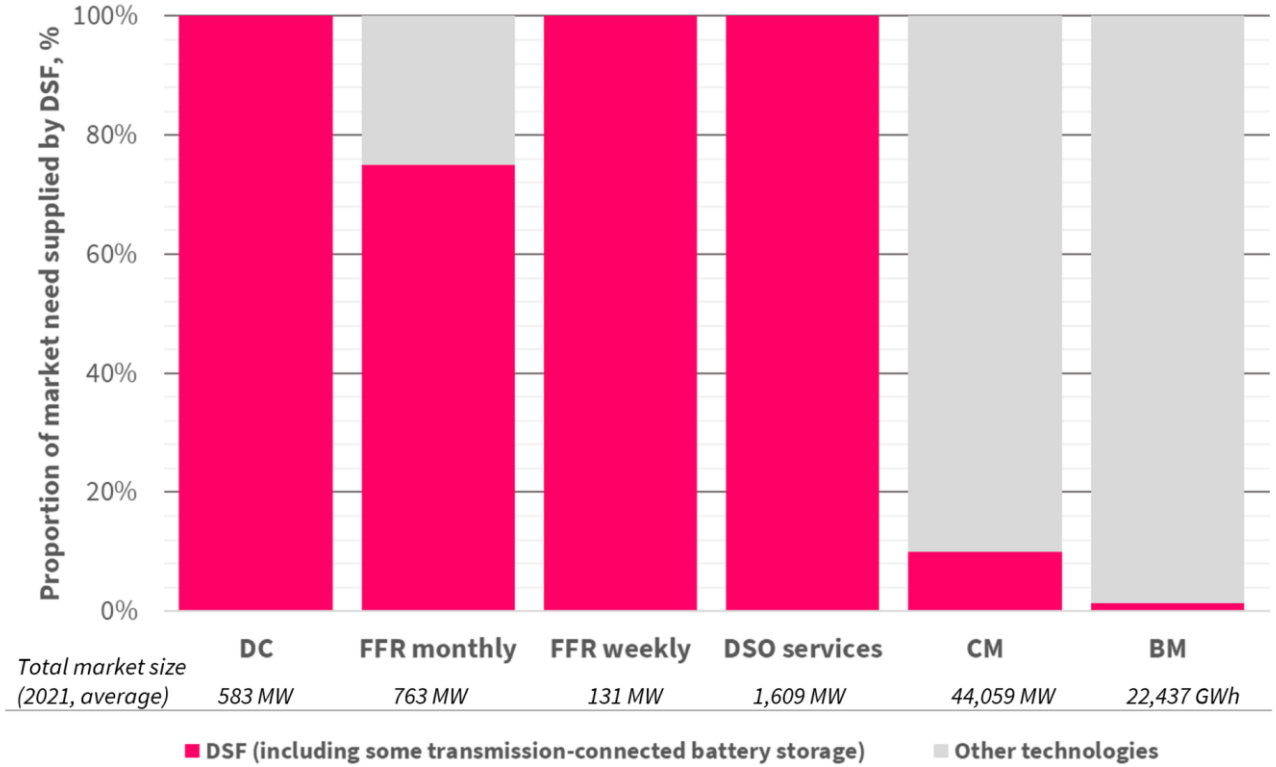
everoze

# The opportunities for Flexibility in 2022

Benjamin Lock

13th July 2022

# Flexibility is booming




everoze

# Flexibility is booming

1. Dynamic Containment
2. Dynamic revenue hopping
3. Generally supportive policy and regularly environment
4. High investor confidence

# But not everywhere

## I&C flexibility

- Struggling to access high-value services
- Innovative, site-specific approaches are key

## Domestic flexibility

- Flexibility tech becoming more common
- Challenging to make work commercially
- Regulatory changes unlocking the door to

## Distributed generation

- Thermal generation focussed on longer duration services
- Co-location of renewables and flexibility now common

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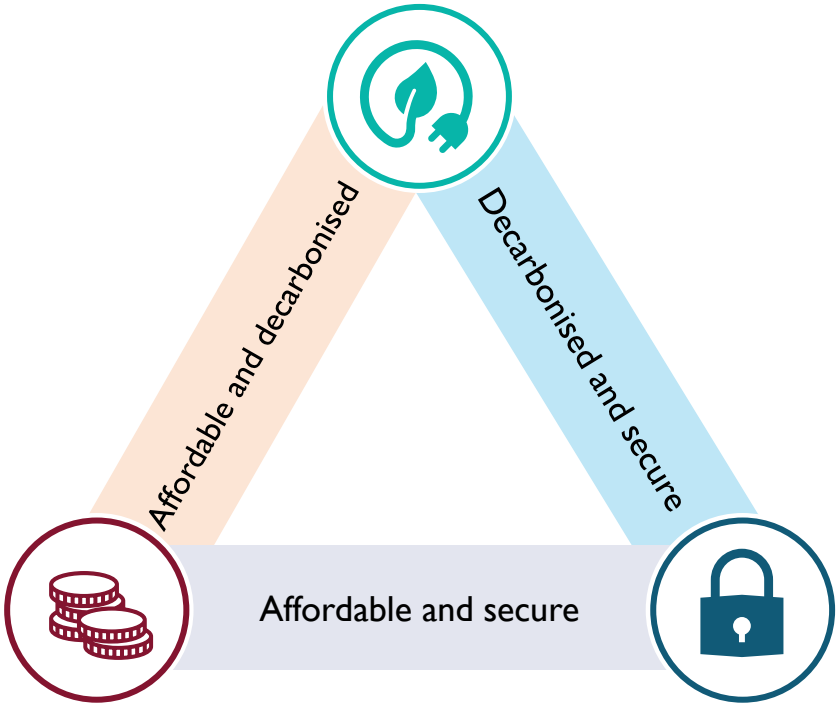
# Revisiting the energy trilemma

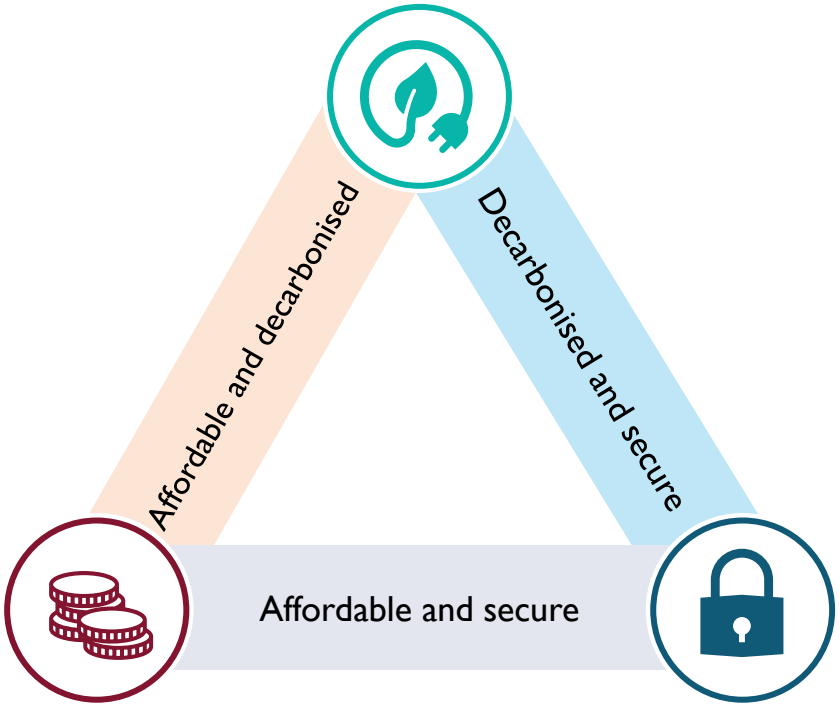



## Decarbonisation

- Managing inertia, frequency and voltage in a high renewables grid
- Replacing thermal technologies used to manage short term variability
- A green form of onsite backup
- Increasing renewables consumption

everoze

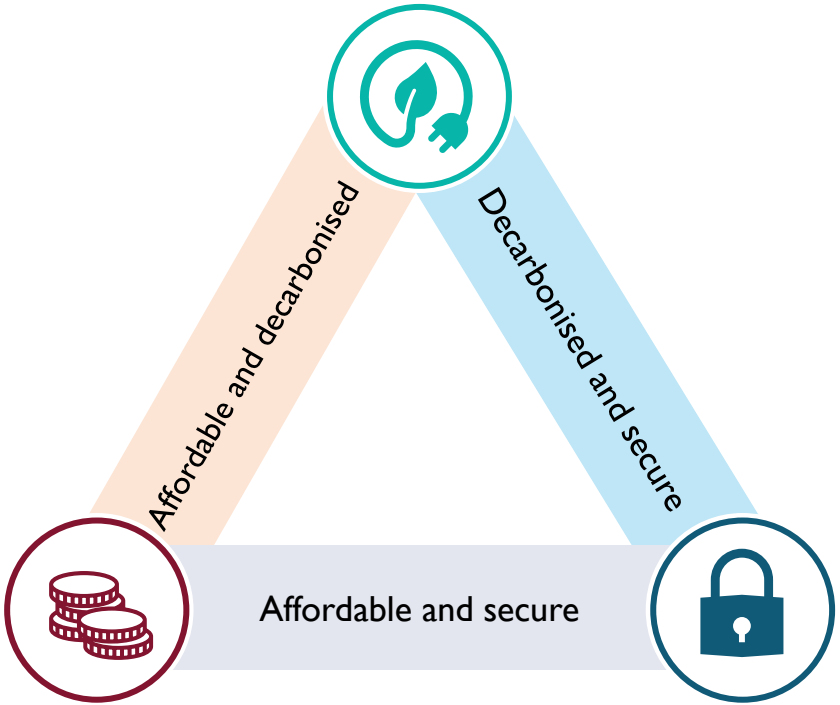
# Revisiting the energy trilemma




## Security of supply

- Essential to the day-to-day operational management of the electricity system
- Protects against seasonal variation
- Permits greater energy independence

# Revisiting the energy trilemma




## Affordability

- Smoothing peaks in demand and price
- Reducing the need for back up infrastructure
- Deferring and reducing network investment costs

everoze

# Promising developments

- The ESO's Net Zero Market Reform programme
- The rise of DSO services
- Regulatory reform to unlock new business models
- Targeted innovation

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@everozepartners

everoze

experts | evolving | energy

# I&C Flexibility – Developments and Opportunities

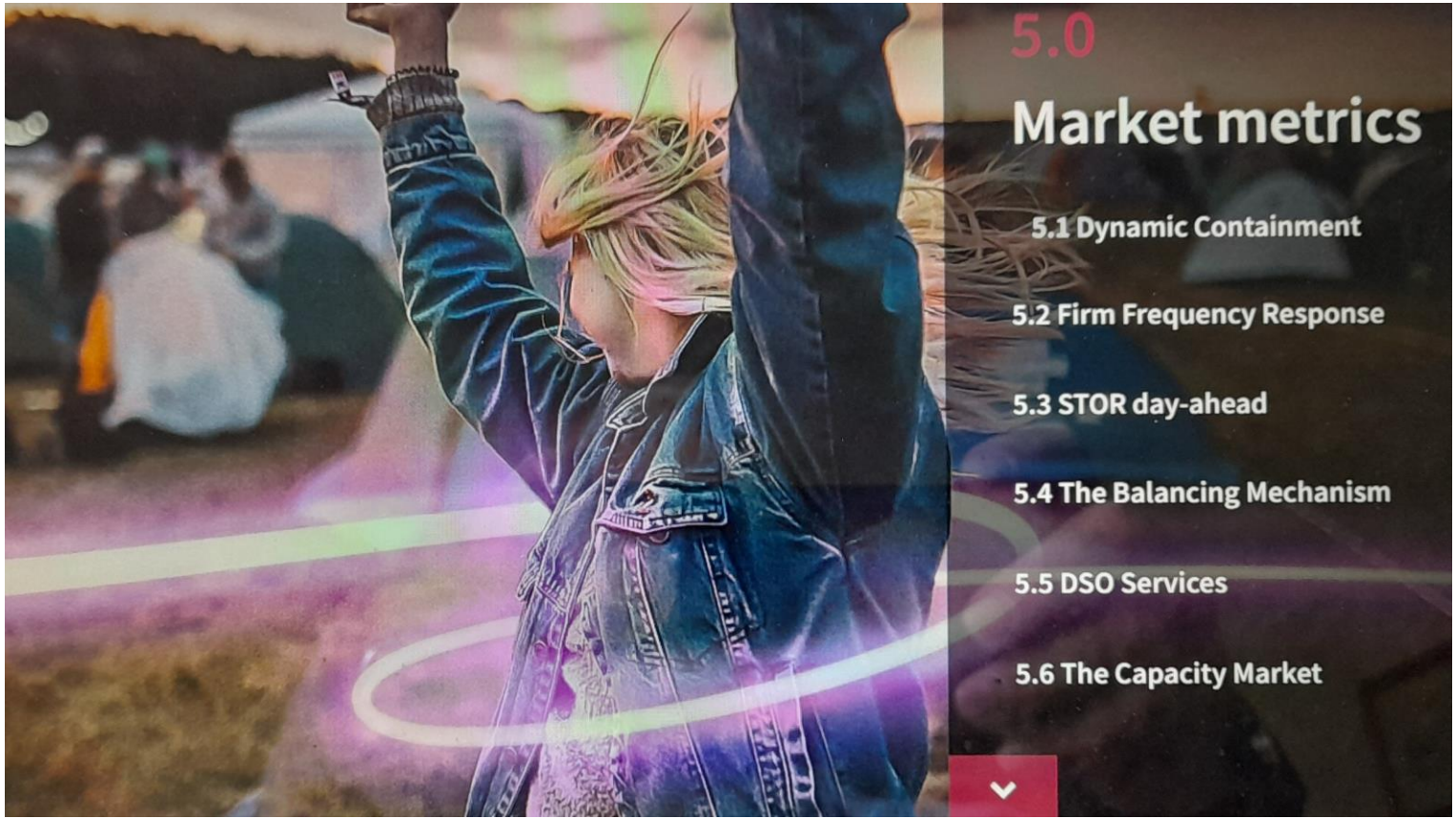
**Eddie Proffitt**

**Technical Director**

**Major Energy Users Council**

MAJOR ENERGY USERS' COUNCIL

# Where Are We Now? P/R Annual Report 2021



# Where Are We Now?

- 5.1 Dynamic Containment
  - **980MW** of batteries
- 5.2 Firm Frequency Response
  - Coming to the end of its life
- 5.3 STOR day-ahead
  - **1.7GW** , mainly gas fired generation
- 5.4 Balancing Mechanism
  - Very small amount of DSF
- 5.5 DSO schemes
  - Growing but through batteries and non-renewable generation
- 5.6 Capacity Market
  - Winter 2022/23 T-3 **zero** DSR, T-1 **154MW** DSR mostly batteries & **25MW true DSR**

# How Did We Get Here?

- June 2015 – first Power Responsive Summer Event
- Joint power Responsive/MEUC courses
  - February 2016 – 2 DSR training courses for I&C professional
  - May 2016 – 2 further DSR training courses
  - November 2017 – final 2 DSR training courses

A Clear indication of interest from I&C companies in DSR

- August 2016 – Enhanced Frequency response for 200MW won by 8 battery schemes

- October 2016 – Ofgem report,  I&C DSR Barriers and Potential.
- 3GW of demand reduction and 2GW of turn-up.

# What's Missing from the P/R 2021 Report?

- The most successful DSF product – **Triad Avoidance**
- Regularly delivered over 2.0GW of demand reduction
- Put under attack by Ofgem's Targeted Charging Review
- Will end in April 2023
- Also attacked by the Medium Combustion Plant Directive for using diesel stand-by generation.

- Despite both of the above it delivered **1.3GW** of reduction in 2021/22 and **1.7GW** the previous winter

- **What will replace this?**

# Opportunity

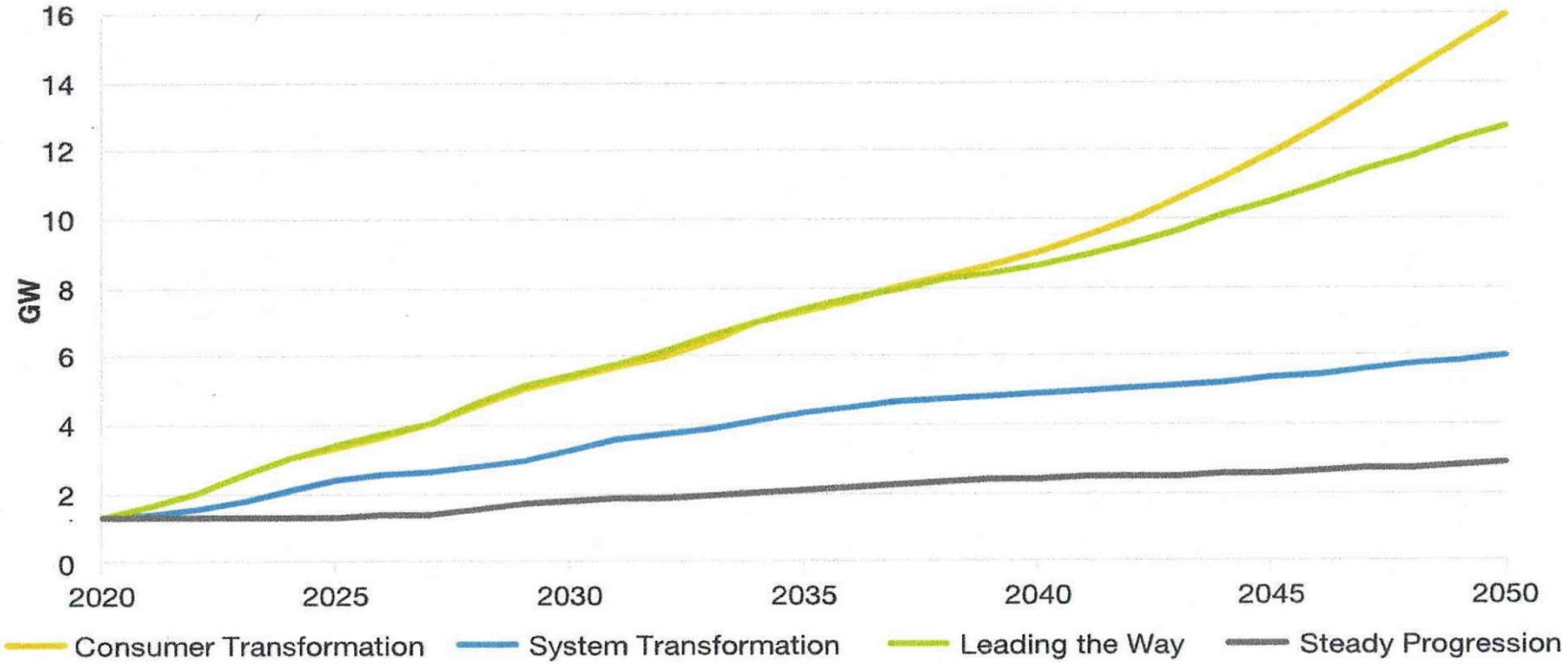
- There is a clear opportunity: -

- In total the ESO and MEUC together trained 127 energy professionals with over 100 companies eager to take part in DSF.

- And Triad Avoidance has demonstrated their willingness to respond with up to 2.5GW of response – more than any other DSF product.

# ESO – Future Energy Scenarios 2021

**Figure FL.9:** Industrial and commercial demand side response, total



# Developments

- The industrial and commercial sector currently use twice as much electricity as the domestic sector
- Can the ESO ignore the DSF potential from this sector and allow it to disappear?
- The ESO could develop a product to access significant volume of DSF from non-domestic consumers
- In addition to developing domestic DSF schemes you will hear about from the other panellists

# Developments

- Finally, hydrogen has been mentioned in the programme
- A personal view is we will not see serious volumes available within the next 5 years so at this stage can be ignored as a standby fuel to be used for DSF.
- Longer term I can see hydrogen used as a means of storing excess wind generation and used in converted gas fired stations to generate at periods of low wind.

# UK Grid prepares to pay firms cash to cut power use next winter - Bloomberg

- ***National Grid ESO sent a request to some firms, asking how much electricity demand they will be able to cut next winter to help keep the lights on and how much they would need to be paid to reduce operations***

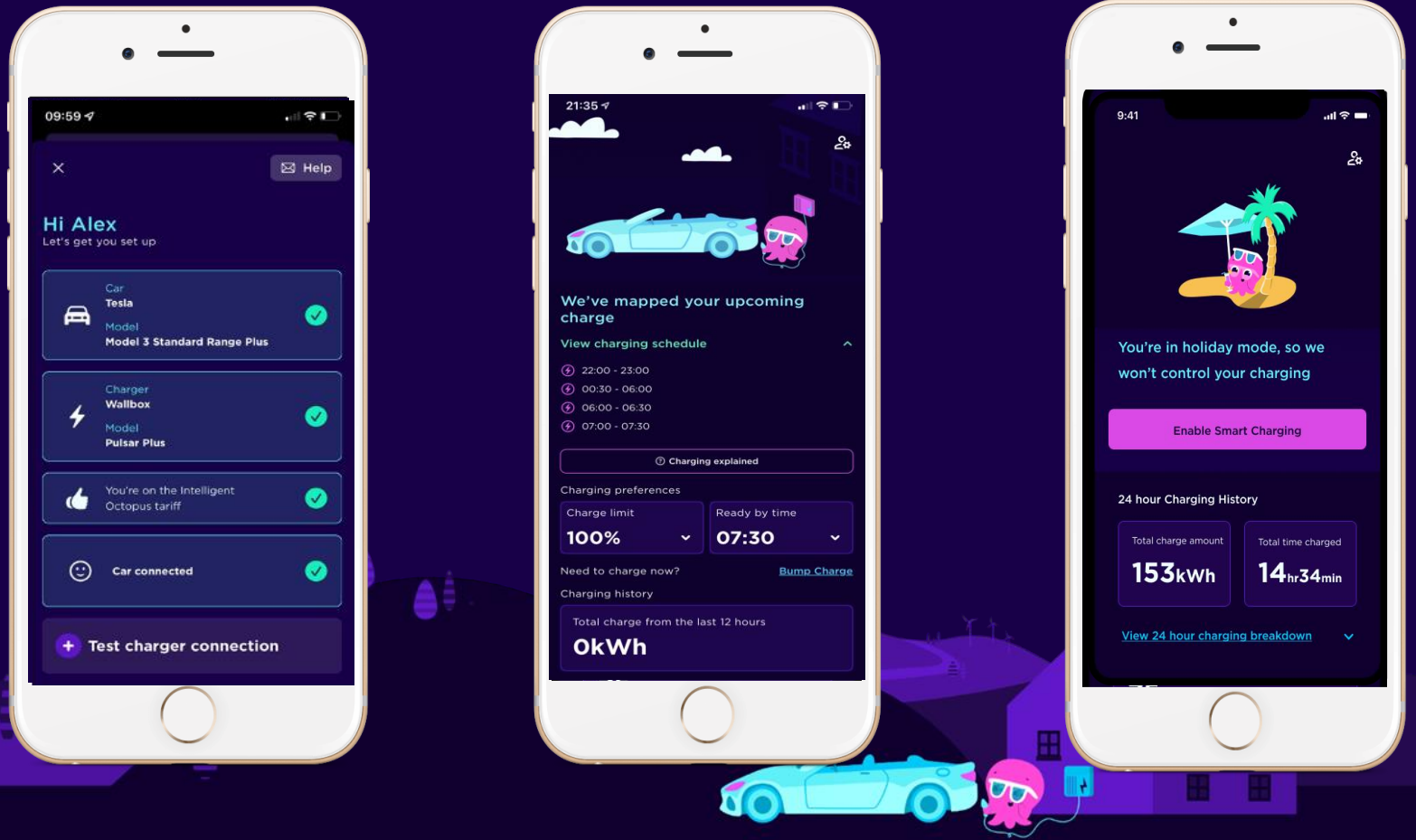
- ***National Grid floated a price range for potential payments, ranging from £100 a megawatt-hour to as high as £6,000, according to the document.***

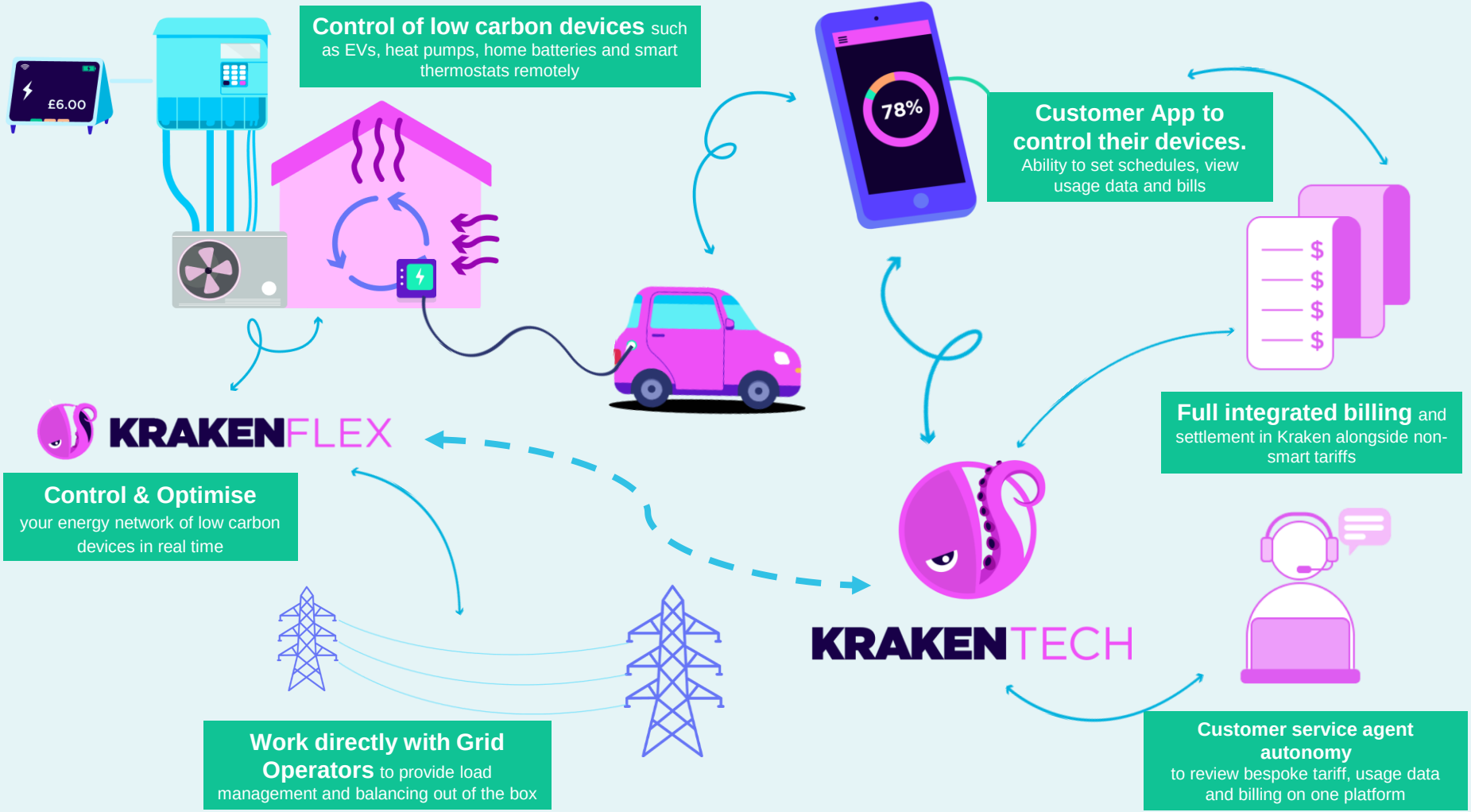
- ***National Grid declined to comment.***

# Intelligent Octopus

July 2022

# Intelligent Octopus - ultimate simplicity for users






**Control of low carbon devices** such as EVs, heat pumps, home batteries and smart thermostats remotely

**Customer App to control their devices.**
Ability to set schedules, view usage data and bills

**Full integrated billing** and settlement in Kraken alongside non-smart tariffs

KRAKENFLEX

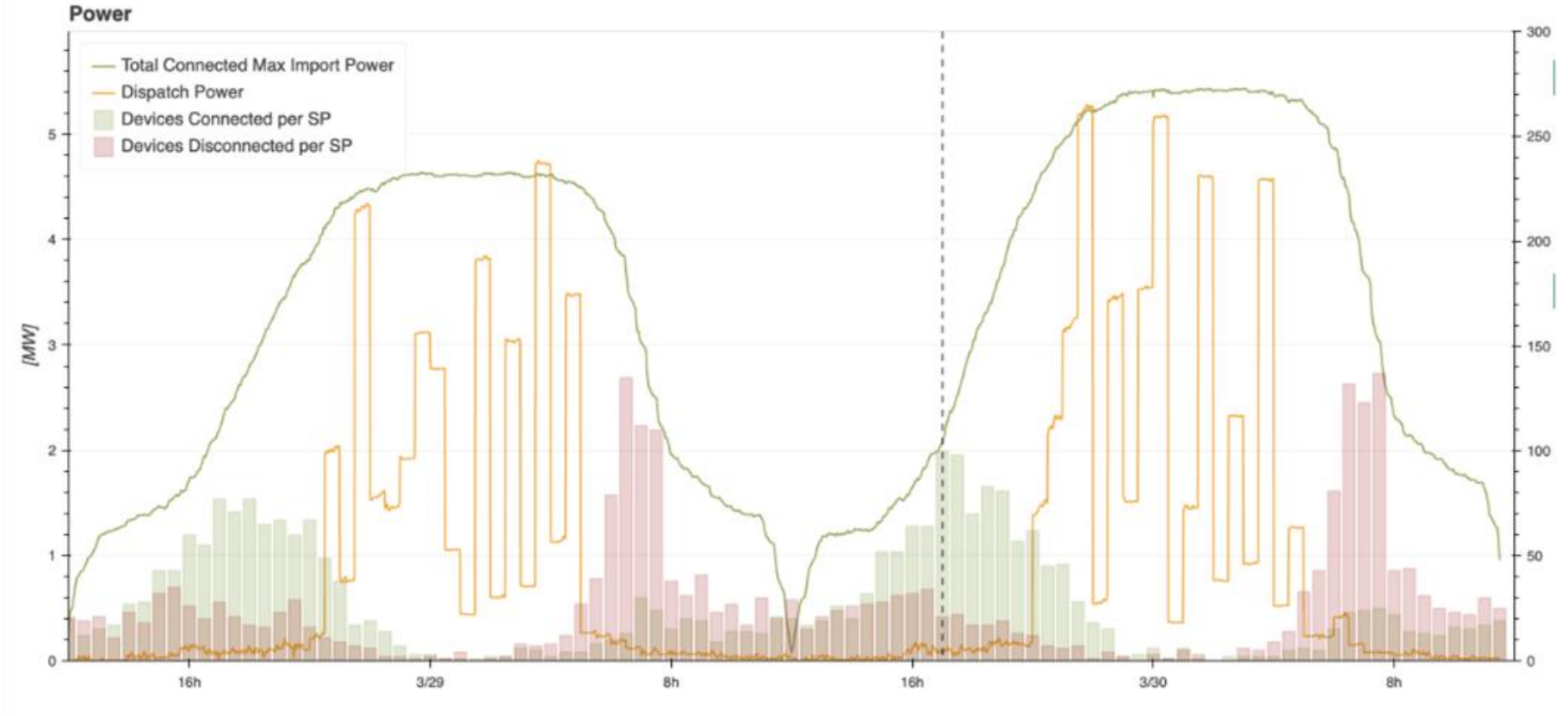
**Control & Optimise**
your energy network of low carbon devices in real time

KRAKENTECH

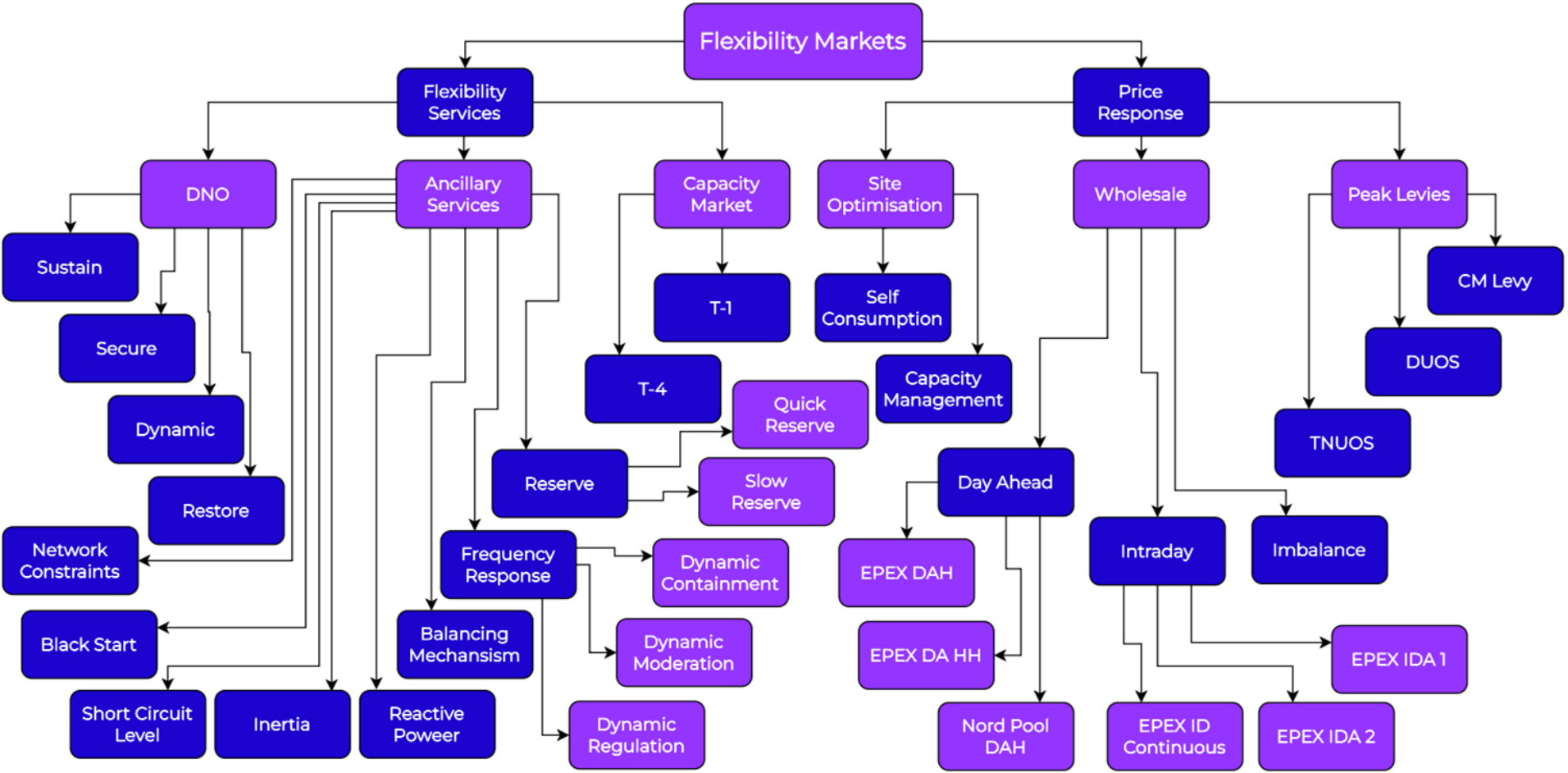
**Work directly with Grid Operators** to provide load management and balancing out of the box

**Customer service agent autonomy**
to review bespoke tariff, usage data and billing on one platform

# Dispatch Profile



# Market Landscape



KALUZA

# Flex Markets Enabling Better Business Models

Valts Grintals
13th July 2022

# *A platform accelerating a sustainable, affordable and resilient energy transition*

## Kaluza Energy Retail

Kaluza is transforming the energy retail experience to pave the way for decarbonised energy

## Kaluza Flex

Our intelligent platform is connecting customers and their homes to the energy system and facilitating decarbonisation at a customer level

# Kaluza Flex Product

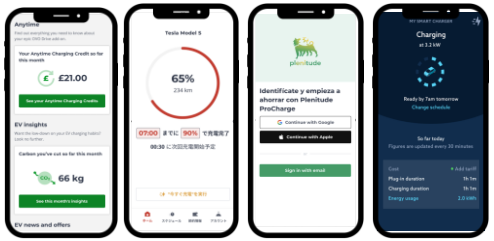

Type-of-use

Net-Zero Tech Discount

Subscription

Flex Rewards

Propositions




Flex Operations Console (interface and APIs)

End-Consumer App: (white-label and APIs)

Flexible & Dynamic Trading

leap.

NODES

ELECTRON

Home Generation / Battery

sonnen

POWERVAULT

Renewable Generation

Flex Market Integrations and Operational APIs

Device Integrations and APIs

EVSE

bp pulse

INDRA

Ohme

The Intelligent EV Charger

SO Markets

WESTERN POWER DISTRIBUTION

UK Power Networks

Imbalance Optimisation

energy

EDF

CHUBU Electric Power

agl

Auto and HVAC OEMs

DAIKIN

STELLANTIS

HYUNDAI

NISSAN

Dimplex

# Engaging the end consumer


**>40%** of

EV drivers are missing out on smart charging because of lack of EVSE

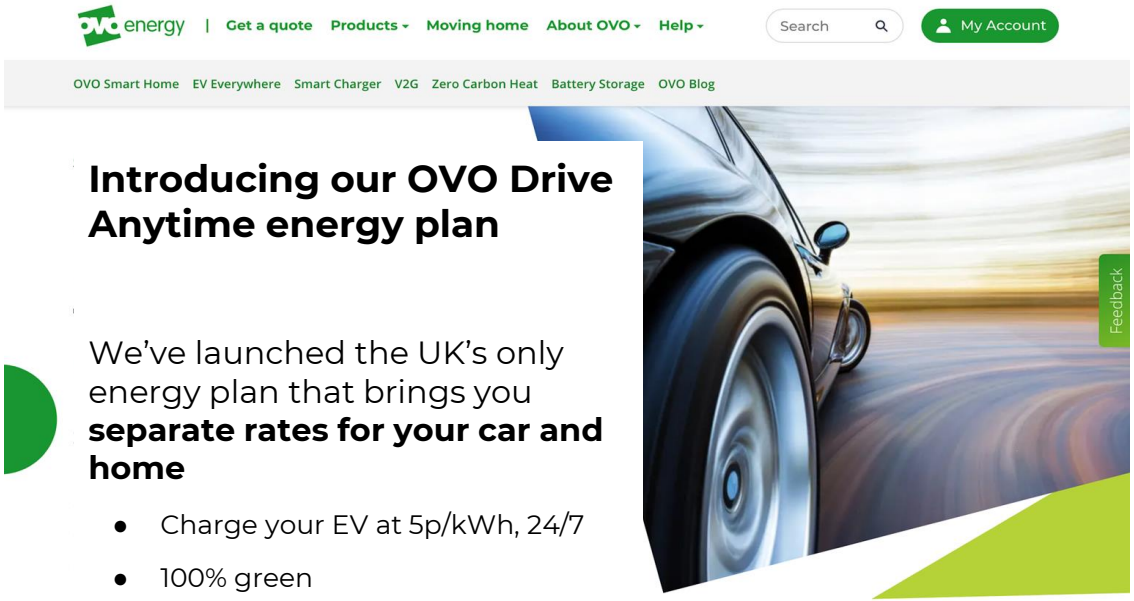
**<half**

have a TOU tariff to allow even basic value to be captured

Only **3/10**

have a dedicated EV tariff with their energy provider

# Drive Anytime



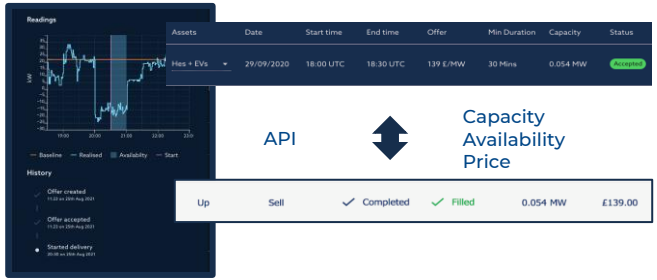

## Introducing our OVO Drive Anytime energy plan

We've launched the UK's only energy plan that brings you **separate rates for your car and home**

- Charge your EV at 5p/kWh, 24/7
- 100% green
- Works with OVO Smart Chargers and directly with compatible EVs

## OUTCOMES SO FAR

- **50% signup rate** from marketing to OVO Energy customer base
- **76.7% reduction in smart charging overrides** vs previous prop
- **Unlocking opportunities for local DSR value + COGs**



# Unlocking the full potential of residential flexibility

**We are only scratching the surface and more needs to be done to realise the full potential of residential flexibility**

- Data and visibility
- Clear future market vision
- Focused stakeholder engagement
- Market access rationalisation
- Standardisation

## Session 3:

# Q&A

**Caroline Bragg**
Director of Policy & Research

**Ben Lock**
Partner

**Eddie Proffitt**
Technical Director

**Sebastian Blake**
Flexibility Markets Lead

**Valts Grintals**
Grid & Policy Lead

#powerresponsive

# Reflections and Summary

nationalgridESO

**Kyle Martin**
**National Grid ESO**

power responsive

# Drinks Reception & Networking