SP ENERGY NETWORKS

Wednesday 7th December 2022

SP Energy Networks
Preparing For Net Zero Conference
Whole Systems Approach

Thank you for joining - this session will start at 10:00.

Develop a network that is ready for Net Zero

Be a trusted partner for customers, communities and stakeholders

Ready our business for a digital and sustainable future

AGENDA – Whole Systems Approach

10:00 – Welcome, Housekeeping & Safety Contact

10:05 – Introduction to SPEN Design & Development Teams

10:20 – Innovation Projects in ED2

10:40 – Significant Code Review

11:00 – Flexibility

11:20 – SPEN ICE Plan 2022 Update

11:40 – Questions

12:00 - Close

Develop a network that is ready for Net Zero

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Housekeeping

Thank you for taking the time to attend today.

- *This session is being recorded.*
  - *please let Louise know if you are not comfortable with this and we will take your comments in the Chat section*

- *Please try and keep background noise to a minimum by using the mute button when you are not speaking.*

- *We are keen for this to be an interactive session as your feedback is important.*
  - *please raise your hand electronically or use the chat function if you would like to ask questions to the speakers*

We value your opinions, and we are keen to generate an open session with opportunities to hear your feedback.

Safety/Environmental Contact

PANEL OF INQUIRY | SAFETY | HEALTH | ENVIRONMENT | DOCUMENTATION

TECHNICAL
ScottishPower *Express*

Reference no.: EXP-11-XXX | Incident: XX | Date: 01/11/2022

Secondary Substation Earthing: High Risk Areas

Designers must ensure that the earth potential rise (EPR) in a new secondary substation during an HV fault will not lead to unsafe step and touch potentials for network operators or the public. Additionally, high or extremely high EPR must not be transferred to a customer's LV earthing terminal.

High Risk Areas

EART-03-003 (Technical specification for earthing and bonding at secondary substations) is intended to provide standard earthing design solutions to a large proportion of the new construction activities we undertake. However, there will be instances where it is important to initiate a full earthing design study via an earthing specialist contract partner.

High risk areas are defined in Section 16 of EART-03-003 and extra care should be taken in these circumstances. Some of the most dangerous situations can occur when LV and HV earthing systems are combined in ground mounted substation fed by overhead lines. This risk is further elevated when such substations supply customers with wet room areas, outdoor play areas, hazardous zones such as fuel stations or areas with livestock. The combination of high or extremely high EPR and higher risk factors for people with wet feet, combustion of flammable fuel or livestock can present a significant danger which should be addressed.

Secondary substations installed near existing substations at 33kV, 132kV or National Grid ESO sites can also be problematic. It's important to understand the implications of how a fault at these higher voltage substation can lead to EPR which impacts the safety of the earthing system in the new secondary substation. A new document providing design solutions is currently being written but in the meantime it is important to discuss directly with an earthing specialist.

Recommendations and action points

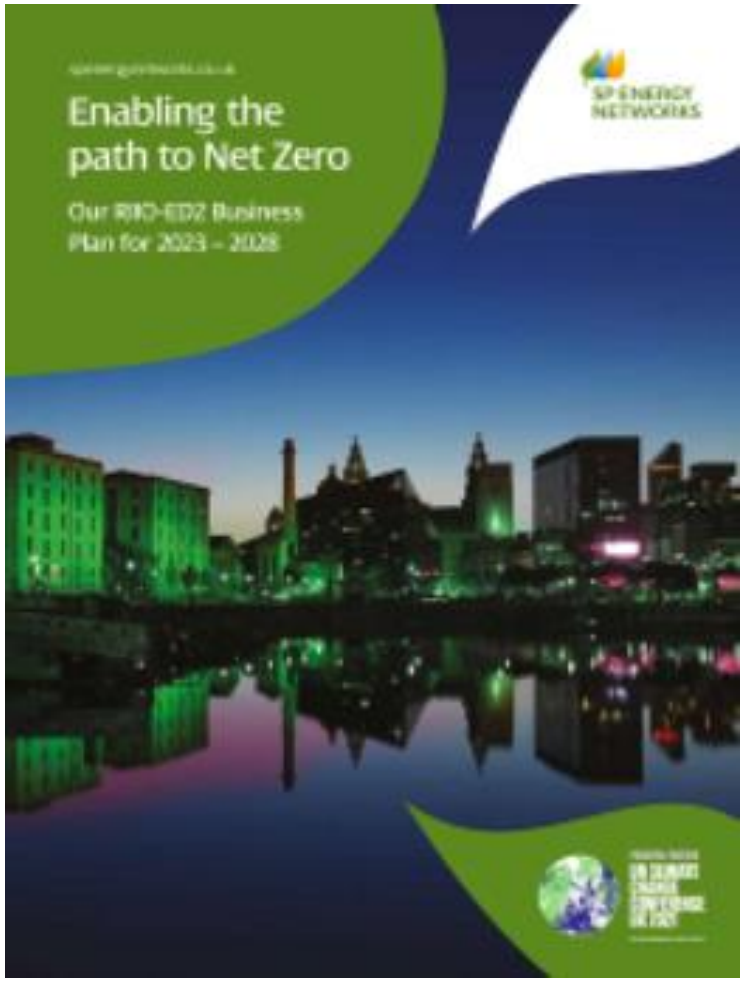
- Look out for network configurations with OHL feeding ground mounted substations and check if the HV/LV earthing systems are combined. Notify your local design team of any potential issues so that a full earthing study can be carried out.
- Ensure you are familiar with EART-03-003 and escalate any issues to the HV earthing sub group via the local representative for your area.
- Designers should ensure that standard earthing design assessments are recorded in accordance with section 18 of EART-03-003. A new template with a 4 step approach has been circulated to all SPEN designers and ICP's.
- Delivery project managers should ensure that all new substation installations are measured and recorded in accordance with section 17 of EART-03-003.

Originator: Neil Woodcock | Approved by: XX | Date: 01/11/2022

Internal Use

- Change from 1Ω rule for combine LV/HV earthing systems
- EART-03-003 – standardised designs
- High risk areas – Section 16 EART-03-003
  - Wet rooms
  - Fuel stations
  - Play areas
  - Livestock
  - Ground mounted substations fed via HV overhead lines
  - Other higher voltage substation sites
- Recommendations
  - HV earthing sub group
  - Recording of standardised design approach – Section 18 EART-03-003
  - Recording of new substation earthing installations – Section 17 EART-03-003

Business Update – Our RIIO-ED2 Business Plan



We've launched our RIIO-ED2 Business Plan, detailing the £3.3 billion worth of spending that's needed to ready the UK for an electric future.

Throughout the development of our plan our customers' voices were clear – we must be bold as we reimagine our network, support the UK's accelerated road to Net Zero, create a green recovery and stimulate more high-quality jobs. That's what we're committed to delivering.

This marks the next step in our proposals to invest £3 billion in our communities, delivering jobs, apprenticeships, economic benefits - and ultimately, making sure our country meets Net Zero.
All whilst keeping our portion of the bill broadly flat across the ED2 period, at 30p per day per household.

We're pleased Ofgem has recognised the strength of our plan by accepting 95% of the investment outlined and we will now review the detail to ensure it delivers for the customers and communities we serve.*

(*including uncertainty mechanisms)

Rachel Shorney
SPEN ICE Stakeholder Engagement Manager

SPEN Design & Development Teams

Develop a network that is ready for Net Zero

Be a trusted partner for customers, communities and stakeholders

Ready our business for a digital and sustainable future

SPD Organisational Structure

SP Distribution Design & Development Manager
Alistair Menzies

Head of Customer Design Over 5MW
Karl Watson

karl.watson@spenergynetworks.co.uk

Head of Customer Design West
Derek Jessamine

derek.jessamine@spenergynetworks.co.uk

Head of Customer Design East
To be confirmed

Customer Relationship Manager
Nicola Maxwell

nmaxwell@spenergynetworks.co.uk

Team being set up throughout December 2022

SPM Organisational Structure

SP Manweb Design & Development Manager
Sophie Sudworth

Head of Customer Design
Wales
Eugene Kenny

Eugene.Kenny@
spenergynetworks.co.uk

Head of Customer Design
Merseyside
Neil Woodcock

Neil.Woodcock@
spenergynetworks.co.uk

Head of Customer Design
Wirral & Cheshire
Ken Brassington

Ken.Brassington@
spenergynetworks.co.uk

Customer
Relationship
Manager

To Be Appointed

Team being set up throughout December 2022

SP ENERGY NETWORKS

Ralph Eyre-Walker, Innovation Lead, ED2 Team

Innovation Projects: ED2

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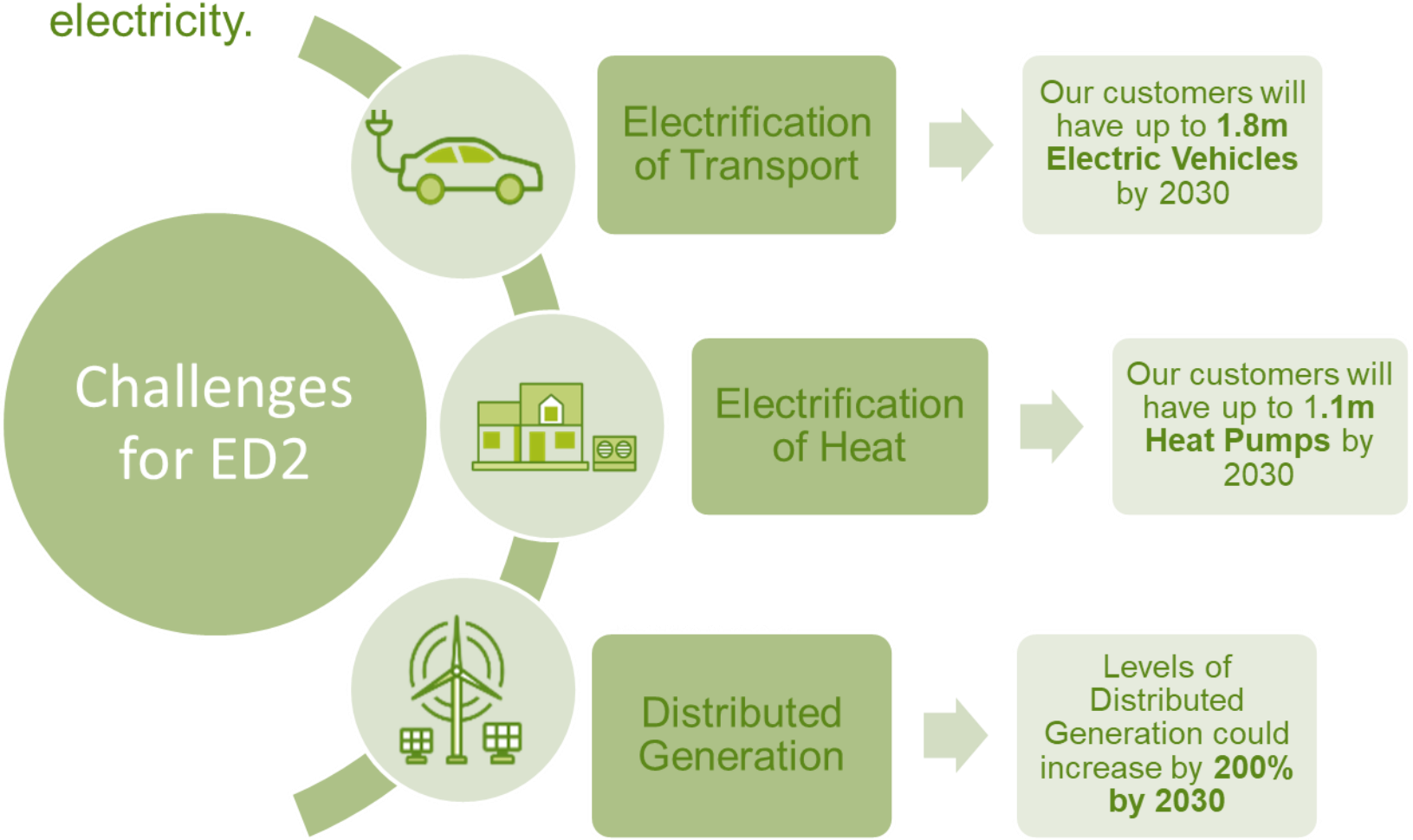
Innovation for the Net Zero transition

Innovation will help us facilitate the **Net Zero transition**, as society becomes increasingly reliant on electricity.



What does this mean?

Innovation has to be at the heart of a **Just Transition to a Net Zero** economy.

How are we doing this?

1) By delivering **award winning innovation**
2) By **embedding successful innovation** developed by us and other networks
3) By having a **strong culture and strategic focus** on innovation

Embedding Award Winning Innovations as Business As Usual

ED1 Track Record

Solution	ED1 Savings
Active Network Management	£18m
LV Monitoring	£1.8m
Novel Substation Solutions	£8.8m
SINE Post, EV-Up and NAVI	£0.9m
Sniffer Dogs for Oil Leak Location	£0.1m
Novel testing and installation techniques	£0.3m
LiDAR	£0.8m
Smart Lock Deployment	£0.7m

£31.3m savings to date

Delivering benefits from proven innovation in ED2

Solution	Number of deployments	ED2 Savings
STATCOM Solutions	1 ±7.5MVAr STATCOM 2 ±10MVAr STATCOM	£17.4m
Fault Level Management	38 Real Time Fault Level Monitors 3 Active Fault Level Management	£42.8m
Real Time Thermal Ratings with automation	1 Grid site (SPM)	£8.3m
Real Time Thermal Ratings/Monitoring	75 (as part of overall HV and LV Network Reinforcement Strategy)	15.2m
LV Monitoring	14,000 (as part of overall HV and LV Network Reinforcement Strategy)	
LV Engine	18 (as part of overall HV and LV Network Reinforcement Strategy)	
On load tap changers	19 (as part of overall HV and LV Network Reinforcement Strategy)	
Novel Transformer Bundings	122 total across SPM and SPD	£3.5m

£87.2m total embedded savings in RIIO-ED2

Awards (examples)

Best Innovation Award

Accelerating Renewable Connections (ARC) project – first trial of Active Network Management

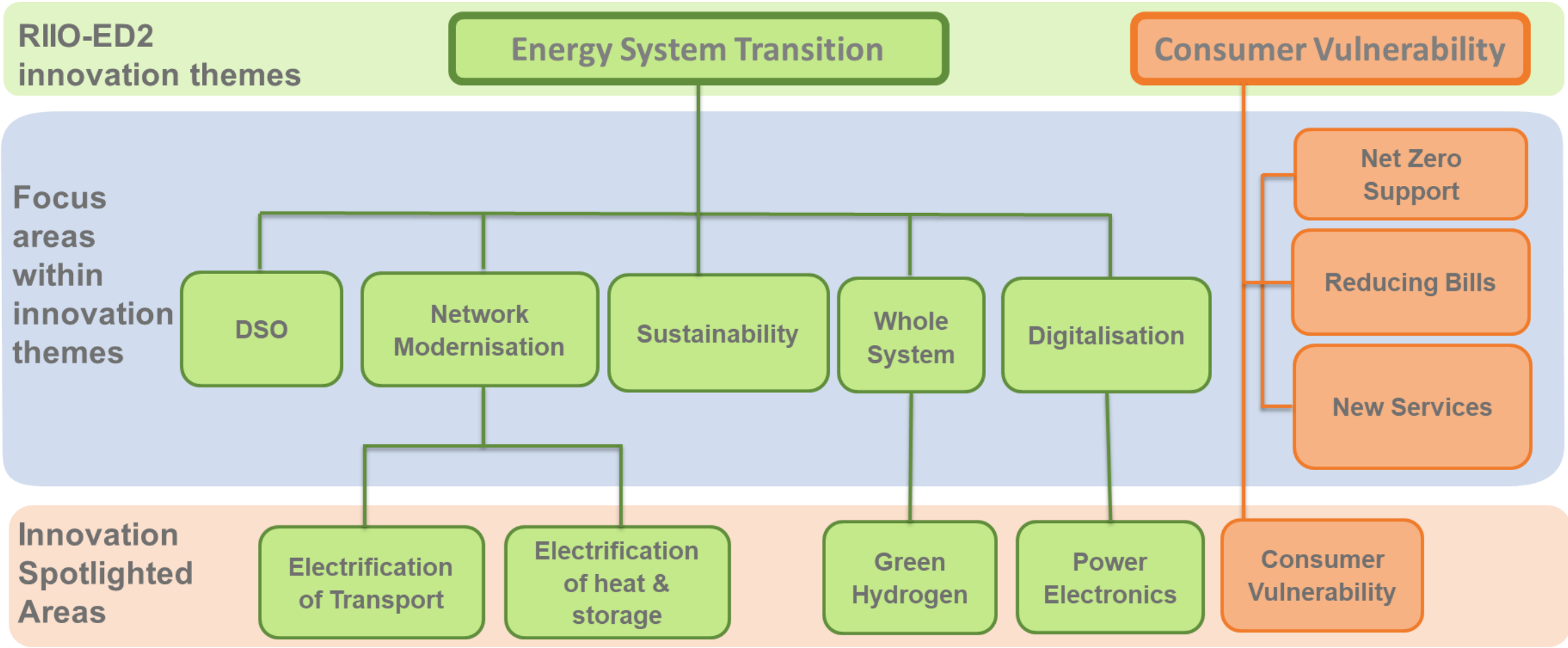
Scottish Green Energy Awards 2015

Best Electricity Network Improvement

Real Time Fault Level Monitoring

UK Energy Innovation Awards 2019

Our RIIO-ED2 Strategic Innovation Themes



Customers will benefit from a **greener energy system** while we keep **costs as low as possible**

Innovation funding in RIIO-ED2 – Final Determinations

SPEN NIA awarded as 0.5% total business revenue for three years with review in 2025 at the latest.

Relevant figures	
Allowance £m	11.1
Percentage of business revenue	0.5%
Length of award	Three years (to register projects)
Review scheduled	2025 latest

Details – Network Innovation Allowance Final Determinations

- Ofgem scored us favourably at both DD and FD – we met all five of the criteria they set out
- We have been awarded 0.5% of total business revenue as NIA. This is consistent with our RIIO-ED1 award.
- All networks have received a three-year NIA award, with further NIA to be reviewed in 2025 at the latest.
- Projects registered within the first three years of RIIO-ED2 can run to the end of RIIO-ED2 regardless of the outcome of the review (small change from DD when Ofgem stated project must be started within the first three years).

Strategic Innovation Fund (SIF)

- £450m total funding available - equivalent to Network Innovation Competition (NIC) in RIIO-ED1. To be increased if necessary.

Robert Matta
Lead Commercial Policy Analyst

Access Significant Code Review

Develop a network that is ready for Net Zero

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Ready our business for a digital and sustainable future

Introduction

Ofgem's Access Significant Code Review (Access SCR) will come into force on the 1st April 2023, changing the connection boundary and charging arrangements for our connecting customers.

Ofgem consider it will enable more LCT connections and allow DNOs to reinforce the network more strategically.

The decision will have significant impact on how we design, quote and manage connections, with large volumes of new connection applications anticipated following implementation.

Access SCR Decision – Summary

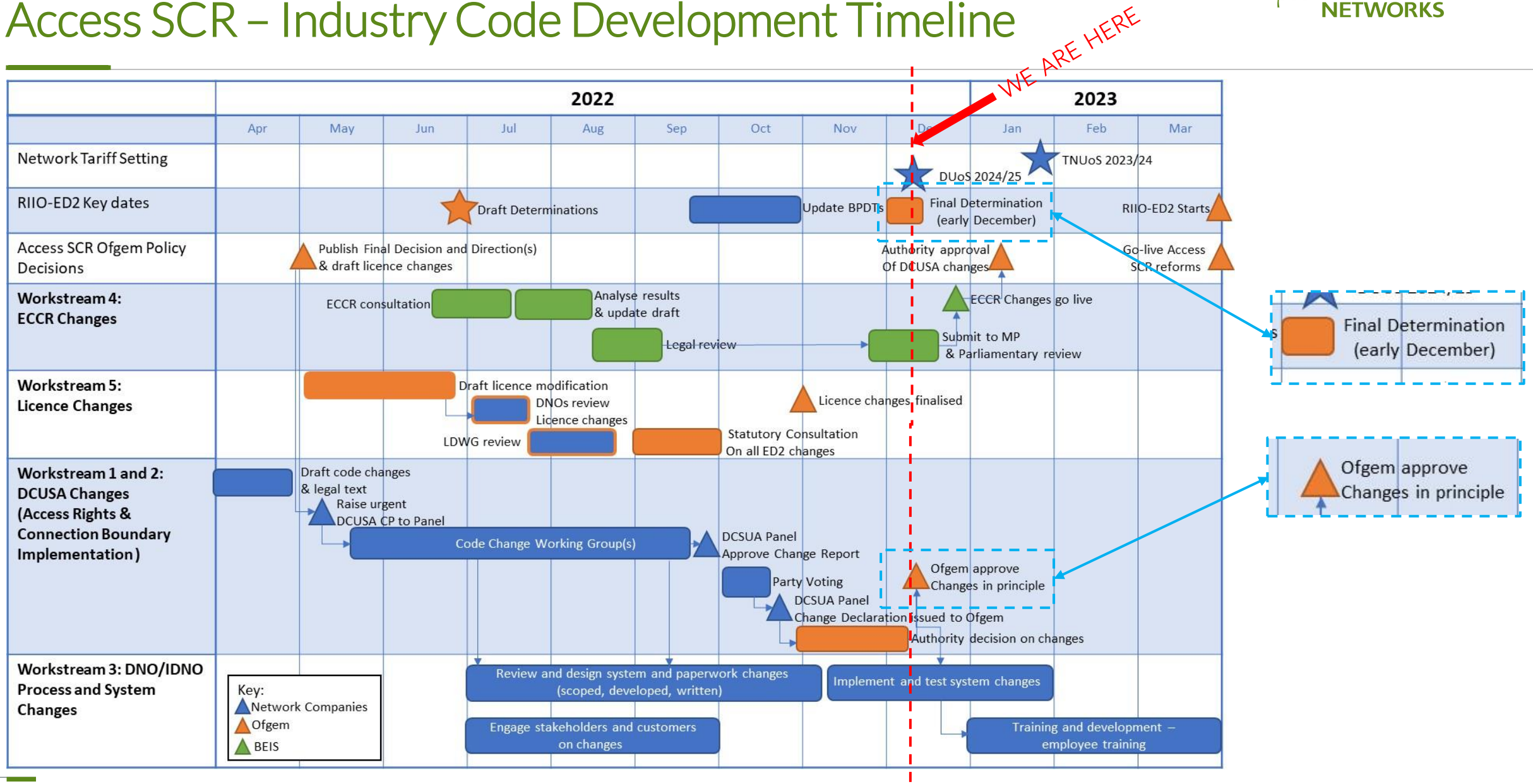
Connection Boundary

- **Demand Customers will not pay for upstream reinforcement.**
- **Generation Customers will only pay for reinforcement at the voltage level of their PoC**
- Retain and strengthen existing protections for bill payers:
  - Introducing a Demand High Cost Cap
  - Speculative developments definition refined
  - Treatment for 3 phase connections and voltage upgrades remains unchanged

Access Rights

- **Non-firm (curtailable) access arrangements** will be introduced for applicable users.
- Curtailable connections (e.g. ANM, LMS, Flexible) will have a limit on the level of curtailment set in the Connection Agreement,
- Curtailable connection will have a future date set where they will no longer be curtailed
- Curtailment as a result of constraints on the Transmission network will not be treated as curtailment on the Distribution networks

Access SCR – Industry Code Development Timeline



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Guy Shapland
Flexibility Lead, NP&R DSO

DSO Flexibility Services

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DSO

Flexibility Services: Guy Shapland

December 2022

SP ENERGY NETWORKS

What is DSO and why we need it

The DSO

DSO is a new function responsible for developing and operating the network and flexibility markets. It will use existing, updated, and new tools to do this. It will deliver three main roles:

1. Planning and network development to deliver capacity in a transparent manner, considering whole system outcomes and by impartially assessing all possible solutions such as flexibility.
2. Network operation to get more out of existing network and ensure wider system stability by coordinating with the ESO, making more use of real-time interventions, and sharing data.
3. Market development to support the growth of efficient, coordinated, and competitive flexibility markets through removing barriers, transparency, and data sharing.

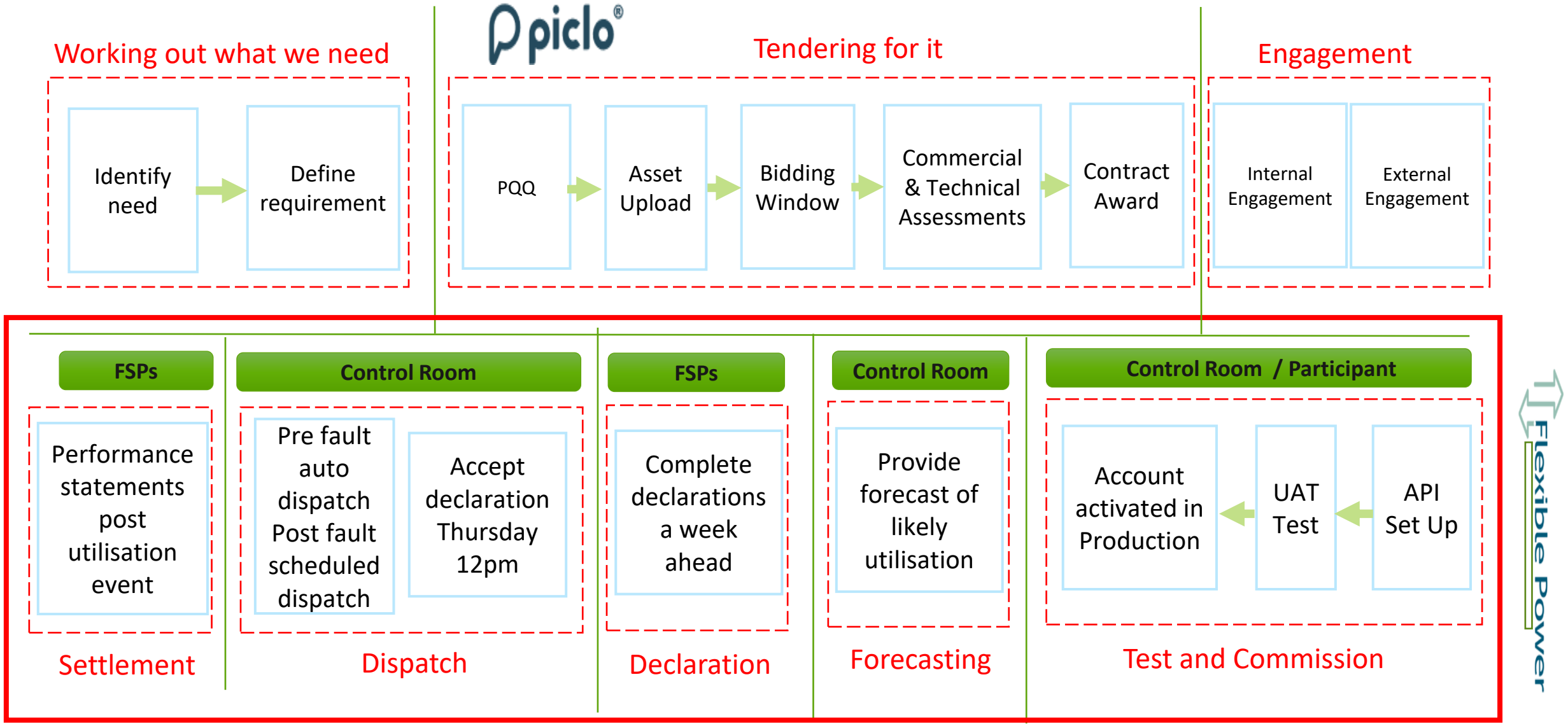
Flexibility services

Flexibility is about co-ordinating the 'capacity of the network' with 'customers varying electricity demand and generation activities over time' to maximise system utilisation. Offering flexibility is a key part of our DSO operation.

1. Why do we need it: Avoid or defer costly network upgrades and reinforcements with lower cost to the customer
2. How will it work: Customers will respond to network signals and turn demand or generation up or down during times of network constraint
3. Who can take part: Anyone who is connected to our network

DSO is the expanded set of capabilities, infrastructure, and activities we will deliver

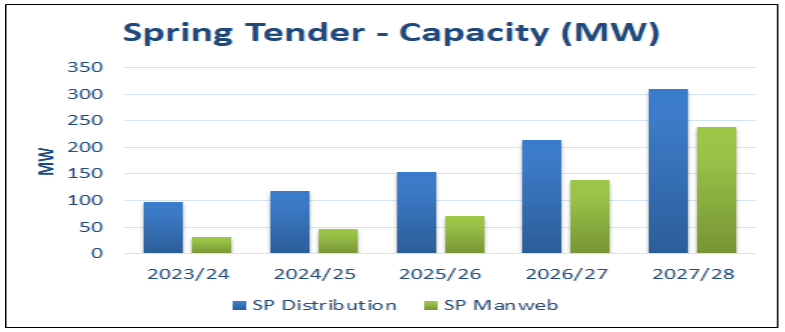
Flexibility Services: Process Overview

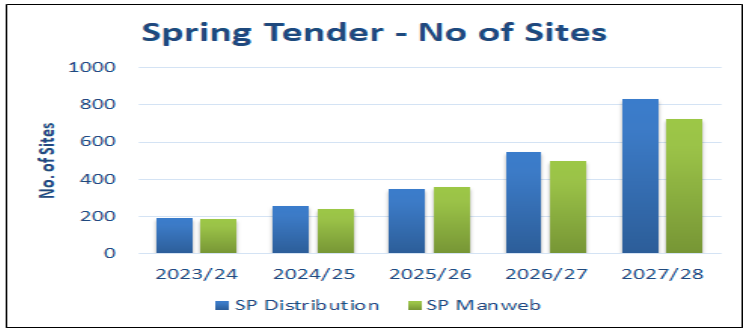


Flexibility Services Tenders

From an initial trial in Spring 2019, we have significantly increased the volume and scale of our Flexibility tenders:

Tenders	Spring 2019	Autumn 2019	Autumn 2020	Spring 2021
No. of Sites	3	10	1138	1554
Price Control Period	ED1	ED1	ED2 2023/28	ED2 2023 /28
MWs tendered	116	250	960	1420
MWs awarded	0	53.3	139.6	555





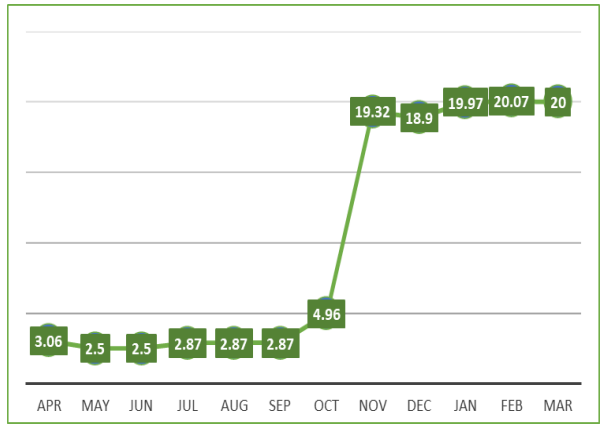
In RIIO-ED2 we are taking a range of measures to support the growth and use of efficient, coordinated and competitive flexibility markets.

2023/4 Flexibility Services Volumes

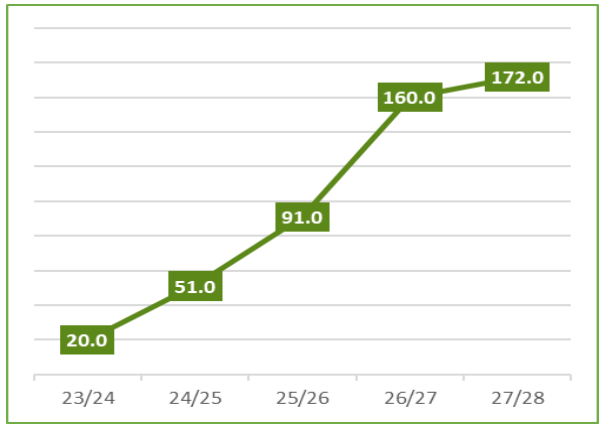
Current flexibility contract volumes and forecast utilisation could be managed manually until Q3 2023

Peak Capacity

April 23 – Mar24

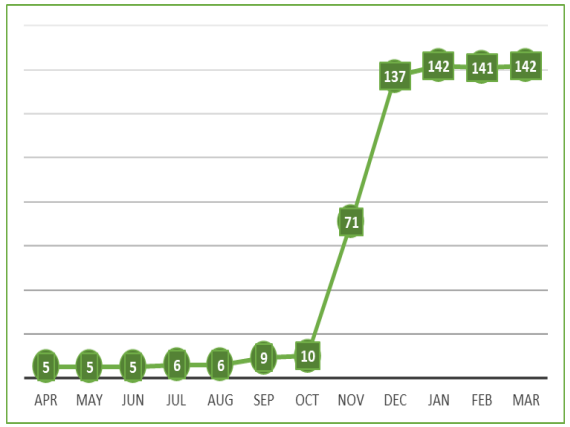


April 24 – Mar28

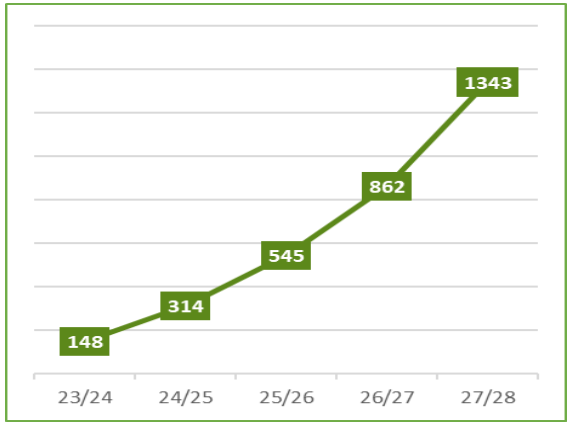


Locations

April 23 – Mar24



April 24 – Mar28



- All services are **pre fault**, scheduled in **advance,** meaning no **dispatch** signal required
- 2023 /24 **Total** capacity **120MW, Peak** Capacity **20MW** based on **100% utilisation** of services
- Initial **utilisation** of services is likely to be **low** however, accurate monthly **forecasts** will be required
- Flexibility services **operations** could be manged **manually** until November **2023** via email

From Q3 2023 increased Flexibility contract volumes will need to be supported by Flexibility IT Platforms

Flexibility Services: Secure Pre Fault

Secure Service is used to manage peak demand loading on the network

When	The Service is expected to be required on weekday evenings and may occur throughout the year due to the seasonal ratings of assets
Requirements	As these requirements are predictable, Secure requirements are declared each Thursday for the following week (commencing Monday). Payments consist of an **Arming Fee** which is created when the service is scheduled and a further utilisation payment awarded on delivery
Declaration	The week ahead declarations are scheduled to allow customers to participate in alternative services when not required for the Secure service
Payments	Arming payments are intended to provide certainty of income and should be representative of profit so that it is payable whether or not the event takes place. When armed the expectation is to utilise. Flexible Power will notify if conditions change and can still send dispatch if preferred.

Flexibility Services: Pre Fault, Secure

Onboarding

FSP / WS&MD

FSP onboarded onto Flexible Power and API tests complete

- FSP creates account on Flexible Power
- FSP creates API
- API testing & commissioning

FSP / WS&MD

Pre Service checks with FSP

- FSP uploads asset parameters
- DSO uploads commercial parameters
- Service parameters confirmed

CS / WS&MD

Customer Service (CR, OP) informed of new flex location

- Interface meeting
- Email confirmation
- Flex register required

Dispatch

FSP / WS&MD/CS

Network Forecast of Likely Utilisation

- CS to provide forecast of likely utilisation to FSP
- PPM forecast update
- Flex budget updated

To be developed

FSP

Input week ahead declaration of availability

- Upload week ahead **availability** by **midnight Wednesday**
- Availability is in accordance with contracted values

Outage Planner

Review declaration and accept

- Review and accept availability by **12pm** every **Thursday**
- FSP receives confirmation of accepted declarations in Flexible Power

Arming initiated: 45% fee

FSP

Auto Scheduled Dispatch Signal

- Flexible Power automatically schedules a dispatch signal
- DNO has the ability to stop dispatch 15 mins before dispatch

Utilisation: 55% fee

Control Engineer

Execution

- Real time network assessment to establish if flexibility is still required
- DNO has the ability to initiate a 'Stop' signal 15 mins before dispatch if flex is no longer required

FSP / WS&MD

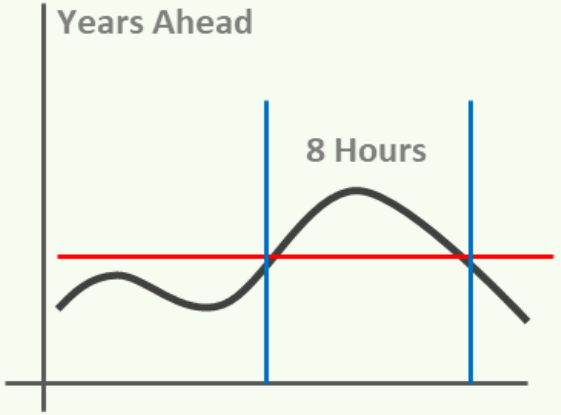
Settlement

- Performance and Financial reports generated
- 14 days to verify accuracy
- Invoice generated by Flexible Power
- Download invoice and send to Accounts

Flexibility Services: Pre Fault: Secure Scenarios

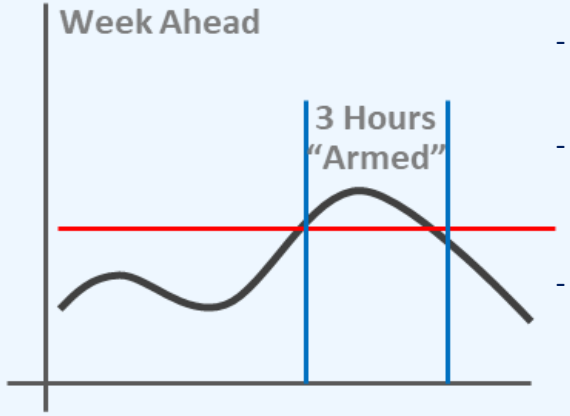
The Secure service is used to manage peak demand (pre-fault) loading on the network

Identifying Risk Periods



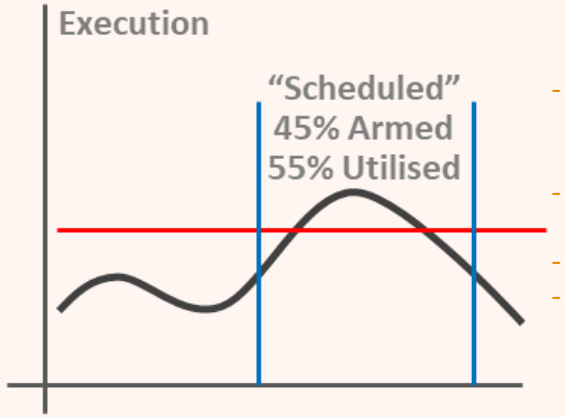
- Network modelling carried out by the **ENZ Model** months/years in advance
- Flex locations and constraints identified based on **DFES**
- Service windows and estimated '**Risk Hours**' determined.

Week Ahead Forecast



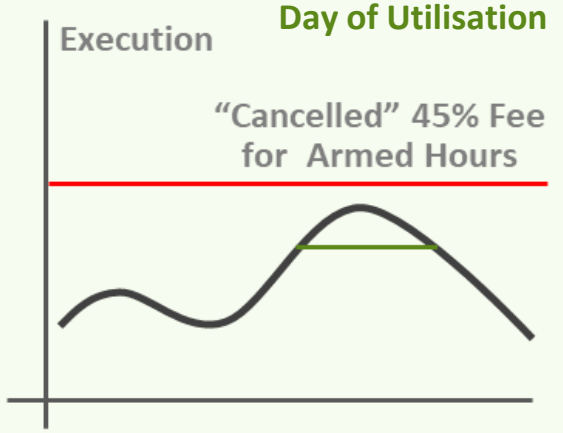
- Weekly look-ahead forecast shows *3 hour* capacity constraint
- FSP* uploads asset availability declaration for 8 hours into Flexible Power
- **Outage Planner** accepts declaration for *3 hour* constraint window

Week Ahead Declaration, Review & Acceptance



- Once declaration is accepted the Arming Fee is initiated.
- ***Flexible Power*** auto schedules a Constraint
- dispatch signal
- Arming & Utilisation fee is payable post-utilisation

Day of Utilisation



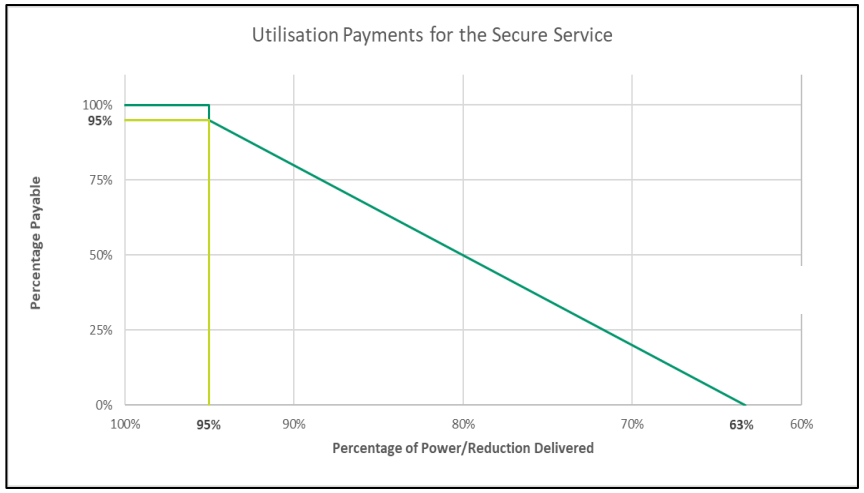
- Service is Armed and scheduled for auto dispatch
- Network loading shows undertaken and network need has gone
- Stop signal initiated, Arming fee still payable

*FSP – *Flexibility Service Provider*

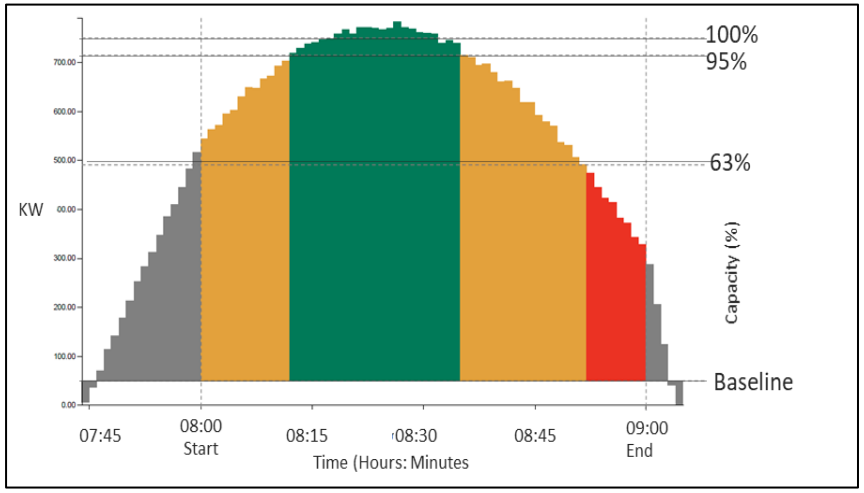
7-day Secure requirements should be predictable and are declared 4 days in advance.
*Payments include an **Arming Fee**, based on when the service is scheduled, and a **Utilisation Fee** settled after delivery*

Flexibility Services: Pre Fault, Secure, Payment Ratchet

Payment Ratchet

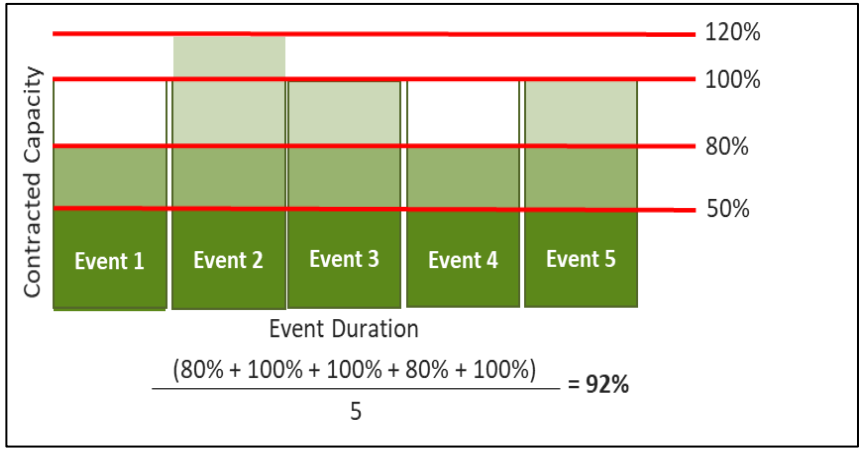


Performance Report



Ramp Up
Partial Payment
Full Payment
Partial Payment
No Payment

Volume Reconciliation



Flexible Power Post Utilisation Payment Mechanics

- Once declarations are accepted an 'Arming' fee is initiated
- Utilisation is measured via minute by minute metering data
- Flexible Power calculates the post utilisation charge
- If the full capacity for the required duration was provided (over 95%) the provider will received full arming and utilisation payment
- If partial capacity was provided (below 95%) the provider will receive partial arming and utilisation payment
- If the provided did not show up the 'Arming' payment will be cancelled
- Flexible Power reconciles weekly volumes

Flexibility Services Trials

We have conducted a number of trials to develop new markets

Demand Shift Trial

New Market Opportunities

Reactive Power Trial

Octopus Energy

- ~ 50% participation
- 2,500 direct customers
- 348 Smart tariff customers
- 3 events evening weekdays
- 3 events early weekend
- 20.2 MWh Total turn-up across trial

Conrad Energy

- 7.5 MW gas reciprocating
- Initial calculation 0.4 MVAr
- Reach 2.4 MVAr
- Reactive Power real value
- 5 weekdays trial
- Evening events

We are proactively developing new flexibility markets which are important to our customers who wish to participate, enabling us to accommodate decarbonisation more efficiently

Rachel Shorney
SPEN ICE Stakeholder Engagement Manager
Stuart Walker
SPEN Net Zero Engagement Manager

Incentive for Connections Engagement
ICE Plan Update November 2022

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Be a trusted partner for customers, communities and stakeholders

Ready our business for a digital and sustainable future

Action 1 Policy Documents

We committed to updating and publishing 4 policy documents this year. 11 have been done so far.

Equipment Register		29.04.22
New connections ICP approval	Asset – 01-015	02.08.22
General Spec Civil Substation	Sub - 03-017	30.06.22
Appendix 1 for above spec	Sub – 03-025	30.06.22
General Spec prefab substation	Sub - 03-041	05.04.22
SPEN install LV Internal Mains	Cab – 03-032	13.10.22
Authorisation process	OPSAF – 13-001	12.08.22
LV/HV Connection SPEN & ICP	Con – 04-002	01.07.22
Project completion	Con – 04-006	17.05.22
Declaration of test result 1 ph	Con – 09-001	17.06.22
Declaration of test result 3 ph	Con – 09-001	17.06.22

These can all be found here: https://www.spenergynetworks.co.uk/pages/documents.aspx

Action 2- Communication

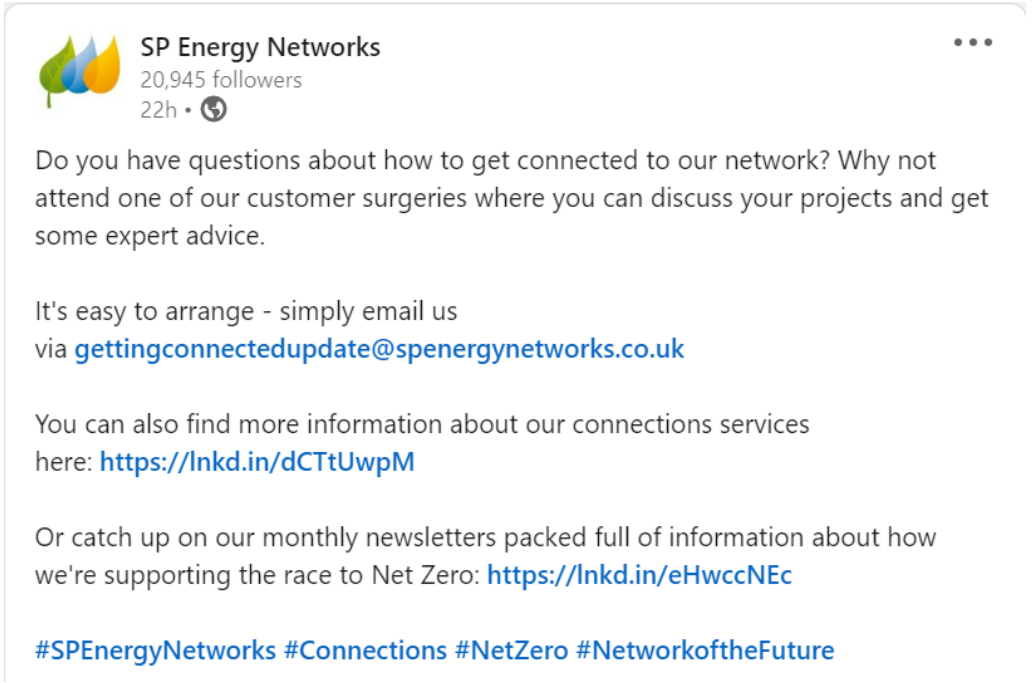
Date of Conference
Wednesday 15th June 2022
Wednesday 26th October (Postponed from 14th September)
Wednesday 7th December 2022
Wednesday 8th March 2023

Customer Surgeries

We continue to offer them to anyone who would like them and these are advertised on social media

Net Zero Conferences

We continued to host our Preparing for Net Zero Conferences each quarter.



Action 2- Communication

Stakeholder Newsletters

We have continued to produce monthly newsletters to give a regular update on the work we are doing to facilitate Net Zero and to help customers understand the improvements we are implementing to make connections simpler and more efficient.

All newsletters are available here:

https://www.spenergynetworks.co.uk/pages/stakeholder_newsletters.aspx

Action 2- Customer Relationship Manager

www.spenergynetworks.co.uk/pages/connections_contact_us

Details of how to contact our Connections team are detailed below. Printable contact lists are available for SPD and SPM. Our full contact us page is also available.

View the printable contact list for the SP Distribution licence area

View the printable contact list for the SP Manweb licence area

SP Distribution
Customer Relationship Manager

Nicola Maxwell

nmaxwell@
spenergynetworks.co.uk

SP Manweb
Customer Relationship Manager

To Be Appointed

Action 3 - Customer Contact

Customer Engagement Focus Groups

We will continue to host our 'Customer Engagement Focus Group' to discuss and review any ongoing proposed website modifications prior to publication

Customer Engagement Focus Group
Wednesday 3rd August
Wednesday 8th February 2023

August session we discussed iDentify and the Design Self Service Tool

Please let us know if there are specific topics you wish for us to cover at our February session

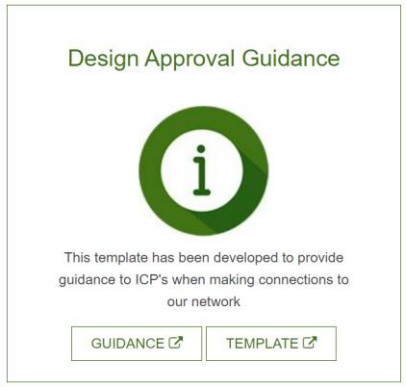
Action 4 – ICP/IDNO

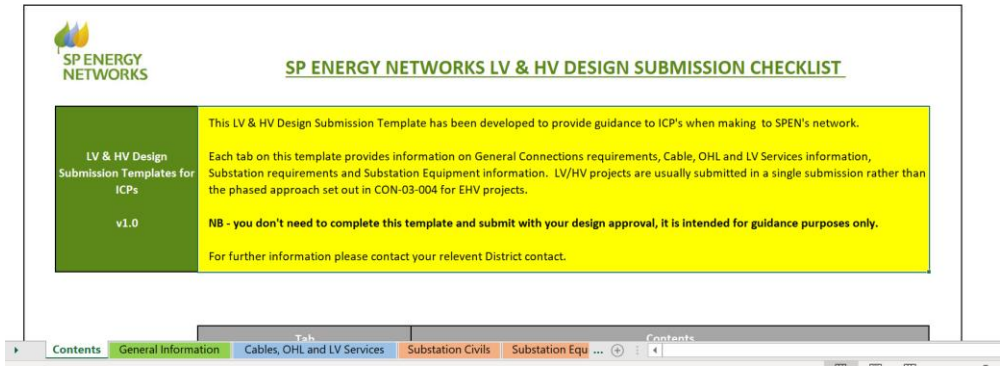
Design Approval Guidance

As part of this year's ICE actions we've committed to develop design approval guidance for our ICP customers.

The aim is to be more explicit in identifying the information we require and to provide supporting documents and guidance to assist you in preparing your design approval submission.

This should lead to a more consistent approach from SP Energy Networks designers in both SPD and SPM licence areas and help you to submit designs which are more likely to gain approval at the first attempt.





https://www.spenergynetworks.co.uk/pages/information_for_icps_and_idnos.aspx

Action 4 – ICP/IDNO

RAdAR Working Group.

We have hosted 2 Workshops this year, will a further 2 planned for next year.

Radar Meetings
Wednesday 17th August 2022
Thursday 13th October 2022
Wednesday 11th January 2023
Wednesday 29th March 2023

We have now gone live with the 7 changes that we committed to delivering:

- Upload enhancements – speed, file size and multiple drop
- POC Register Improvement - SLC15 Expiry Dates visibility
- Search functionality improvements
- Land rights flexibility added
- Increased duration before Timing Out
- Hyperlink to latest minimum info requirements on application form
- Ability to reject a POC Acceptance if documentation missing

RAdAR changes
now Live!
20+ new application
Additional File Size Being Used

Action 4 – ICP/IDNO

ICP Safety Seminar: Thursday 16th February 2023

Key areas for Possible Focus at next Workshop

- Need more traction with manufacturers and Installers
- Look to benchmark with other DNO's / IDNO's and ICP's
- Need to work together to raise awareness of the improvements within the industry
- Lobbying all manufacturers to gain their support and commitment

- SPEN and GTC looking for ither IDNO's and ICP's to share the delivery of this workshop
  - Is this something you want to get involved in?

Action 8 – Partnership

Action 8 - We will continue to share the learnings and best practice from our Net Zero Knowledge Forum with our wider base of community partners, academic institutions and local government bodies.

We will disseminate all learnings at our quarterly Preparing for Net Zero Conferences and on our website

Action 8 - We are currently Creating a Optioneering and Decision making model for the Net Zero Community.

- Tirage Filter to Focus on Key LCT tools aligned with Building Architype and specific project
- Dynamix LCT Scoring Matrix – which incorporates a full suite of climate, social and commercial elements
- Year on Year Utility investment map to allow Customer alignment of plans
- Individual LCT Playbooks that outline all the key information regarding each technology
- Model to create an overall 10 year + Climate master plan

Action 9- Preparing for DSO & Action 10- Project Charge

Action 9 Preparing for DSO

At our Preparing for Net Zero Conference in October 2022, we had Smarter Grid solutions presenting on Active Network Management. A further update will be done at our March conference on Wednesday 8th March 2023.

Action 10 Project Charge

There will be an update at our Preparing for Net Zero Conferences in the afternoon session at 14:00

Dates for the diary

Dates for the diary

Wednesday 8th February- Customer Contact Focus Group

Thursday 16th February – ICP/ IDNO Safety Seminar

February/ March TBC- ICP Design Template Webinar

Wednesday 8th March - Preparing for Net Zero Conference

Please register for our next events at:

spenergynetworks.co.uk/stakeholderevents

Thank you for your time today.

Your feedback has been useful and we will incorporate your comments when planning our next engagements.

Please register as a stakeholder if your would like to receive further updates from us:

spenergynetworks.co.uk/register