Open Networks Challenge Group

7th July 2022

Agenda

Item	Start	Finish	Time	Item	Presenter
1	14:00	14:05	5	**Welcome**	Maxine Frerk (Challenge Group Chair)
2	14:05	14:10	5	**Challenge Log** *Standing item, no challenges currently logged.*	Farina Farrier (Head of ON, ENA)
3	14:10	14:20	10	**Recent industry developments and ON impact** - Recent industry developments - Update on flexibility workstream activities	Andy Wainwright (Whole Energy System Chair)
4	14:20	15:00	40	**Overarching Common Framework for Flexibility (WS1A P0) and 2023 scope** - Seeking early input on draft framework and 2023 scope.	Avi Aithal (ON Technical Lead) Farina Farrier (Head of ON, ENA)
5	15:00	15:10	10	**Break**	
6	15:10	15:40	30	**Flexibility Products (WS1A P6)** - Seeking feedback on key aspects of Flexibility product definitions for alignment. Review material: Draft Active power products report	Avi Aithal (ON Technical Lead)
7	15:40	16:10	30	**Carbon reporting methodology (WS1A P7)** - Seeking feedback on proposed carbon reporting and forecasting methodology. Review material: Draft Carbon reporting and forecasting methodology	Sam Do (Product lead, UKPN)
8	16:10	16:20	10	**Break**	
9	16:20	16:35	15	**Mid-year progress update** - Overview of key progression to date against baseline	Farina Farrier (Head of ON, ENA) Avi Aithal (ON Technical Lead, ENA)
10	16:35	16:45	10	**Future Challenge Group session** - Future agenda and proposal for in-person meeting at ENA office in London	Avi Aithal (ON Technical Lead)
11	16:45	16:50	5	**AOB** - Upcoming ENA events & consultation	Maxine Frerk (Challenge Group Chair)

Challenge Log

Recent industry developments and ON impact

Recent industry developments and flexibility workstream activities

Andy Wainwright (Whole Energy System Chair)

Recent industry & flexibility developments

ESO

- Seminar on demand and distribution (20th Jul)
- Queue management webinar (27th Jul)
- Power Responsive conference (13th Jul)
- FES launching 18th Jul
- Net Zero Market Reform programme – assessment and conclusions publication

DSO

- T-D whole electricity coordination registers
- Future of local energy institutions and governance call for input
- RIIO-ED2 determinations
- REMA

Flexibility workstream developments

- Dispatch alignment recommendations (WS1A P3)
- CEM consultation outcome & next steps (WS1A P1)
- GB-wide Flexibility figures
- Flexibility Consultation & webinar

What are the industry development with the greatest impact on your organisation?
In addition to the above what other areas should ON keep informed of?

Overarching Common Framework for Flexibility (WS1A P0) and 2023 scope

Early input on draft framework and 2023 scope.

Farina Farrier (Head of ON, ENA)
Avi Aithal (ON Technical Lead)

Background

2017	2018	2019	2020	2021	2022	2023 & onwards
ED1						ED2
Foundational work for DSO	**Detailed modelling & independent assessment**	**Delivering stronger coordination and least regrets actions**				

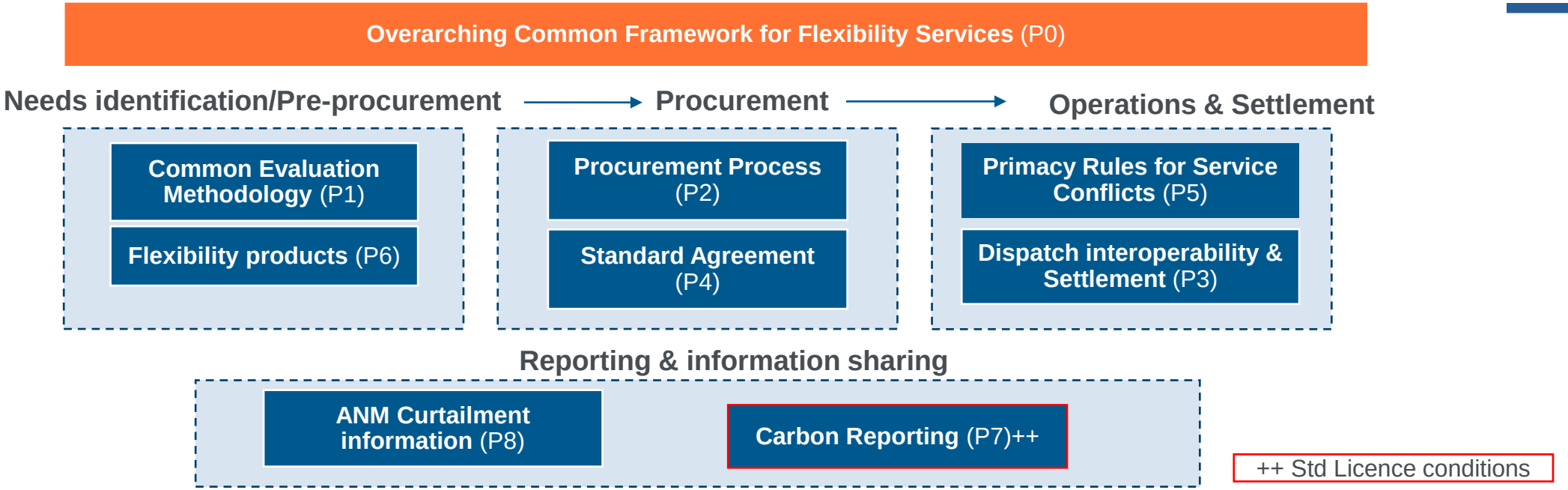
Key deliverables (As per action 3.2 and 3.3 of the Smart Systems Flexibility Plan)

1. Deliver a standardised approach across distribution networks to procure flexibility by 2023- through commonly defined flexibility services, common approaches to valuing flexibility, baselining methodologies, pre-qualification, dispatch and settlement, and monitoring requirements.
2. Develop and implement a set of primacy rules to resolve service conflicts between ESO and DNO procured flexibility by 2023
3. Enable greater participation of ANM enabled Flexible Connections through improved provision of curtailment information.
4. **Deliver a common framework for flexibility by 2023 that delivers alignment and standardisation across distribution flexibility services, and ESO balancing and ancillary services.**

Deliverable

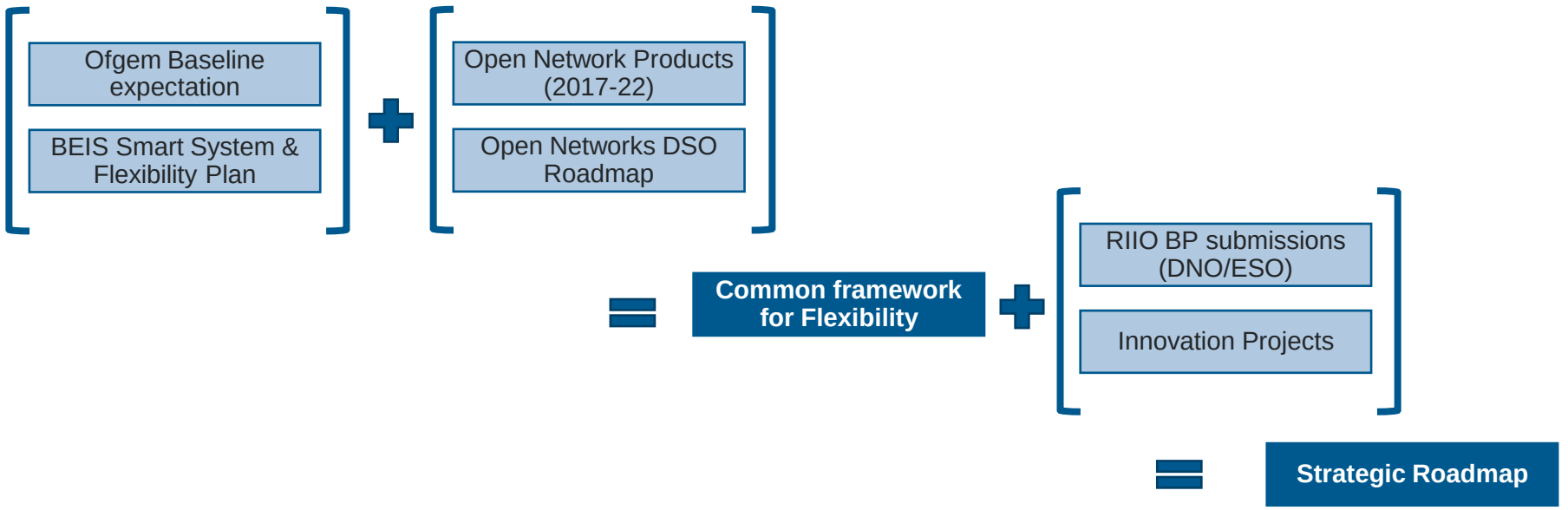
1. **Common framework for flexibility -** Integrate the various components of flexibility work (covered across multiple products) into a common framework for flexibility.
2. **Strategic flexibility Roadmap -** set out a clear strategic view of further development required to mature processes across key aspects of flexibility

Our Approach

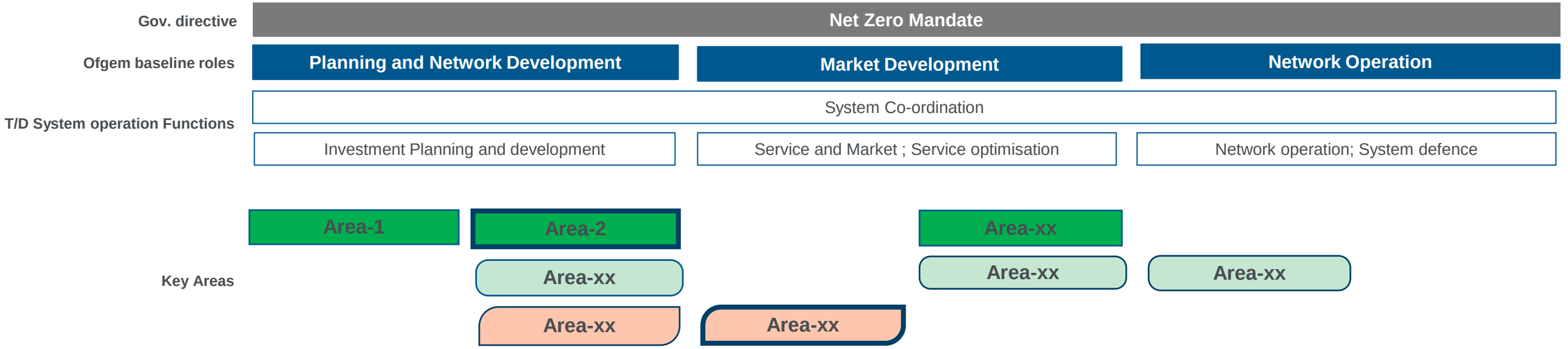


Our Approach

Overarching Common Framework for Flexibility Services (P0)



Framework for Flexibility



xx Status: **Mature**

xx Status: **Initiated/ WIP**

xx Status: **Not Initiated/ Planned**

xx Action identified in BEIS's SSFP

Distribution System Operation Roadmap

Strategic Flexibility Roadmap

	Key area	Activity under individual Area	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	
Planning and Network Development	Key Area-1	Activity-1												
		Activity-2												
	Key Area-2	Activity-1												
		Activity-2												
		.												
		.												
		Activity-yy												

In Development | Implementation to BaU | Continuous improvement

Example (WIP)

								Short term		Medium Term			Long term	
	Key area	Activities	2018	2019	2020	2021	2022	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
Planning and Network Development	Forecasting	**Network Visibility** and Monitoring											
		Advanced network Simulation & modelling capabilities											
		Use of Smart meter data/data-driven decisions											
		Planning processes											
	Optioneering	**Assessing Network needs**											
		Promoting Energy Efficiency											
		Valuing flexibility											
		Carbon intensity											
	Whole systems	**RDP scoping and delivery**											
		Development of assessment tools											
		Whole system optioneering											

Thinking ahead to 2023

2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 & onwards

ED1 | ED2

Foundational work for DSO

Detailed modelling & independent assessment

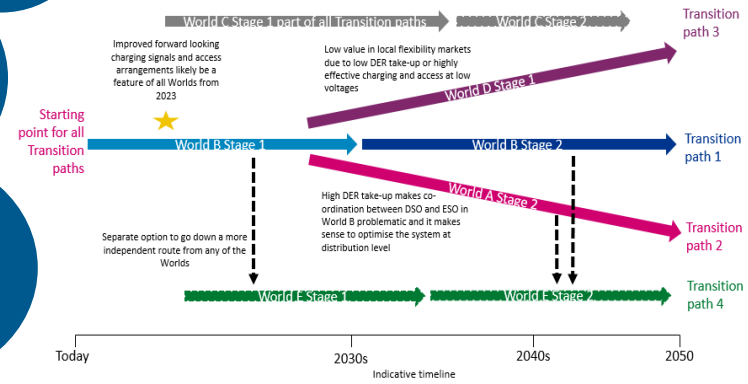
Delivering stronger coordination and least regrets actions

DSO Functions

Principle of neutral market facilitation

Commercial Principles paper 2017

Modelled 5 different Future Worlds with different attribution of roles and responsibilities for DSO Functions.



Independent assessment set out a pathway in the short term on a model of stronger coordination between DNOs and ESO and allows for future changes to roles and responsibilities to deliver the most effective mode.

DSO Transition

- Flexibility Services
- T D Coordination
- Connections
- Whole Energy Systems

Comms & Stakeholder Engagement

Key developments in 2022

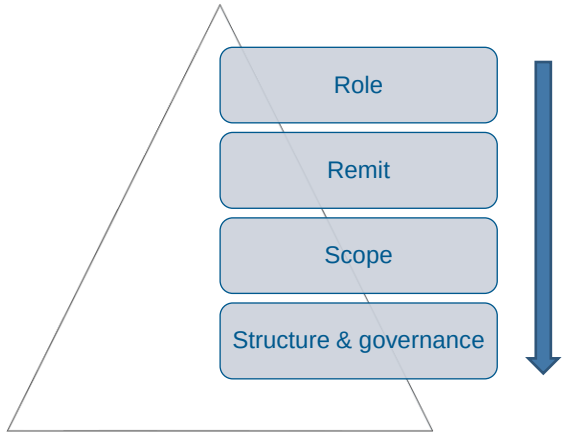
- Energy Security Strategy
- FSO governance
- CLASS
- Local energy governance
- SCR decision
- ED2 determinations
- REMA

?

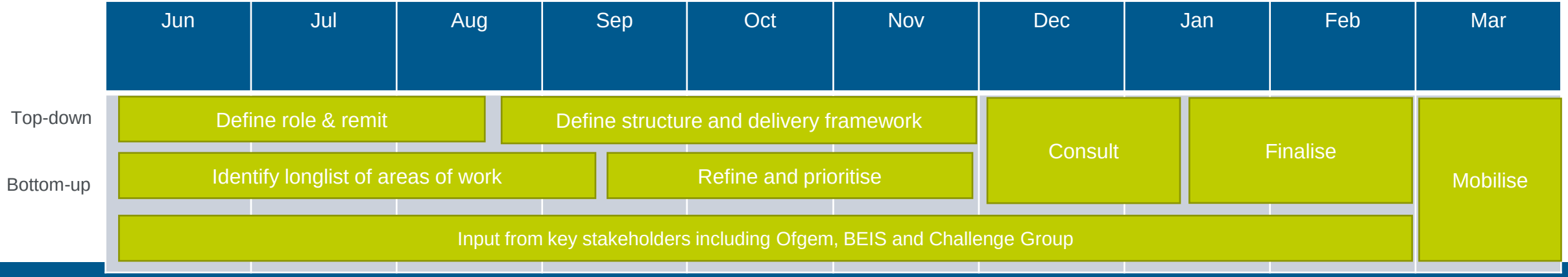
In light of recent key developments, what should the focus of Open Networks be in ED2?

Approach and timeline

Taking strategic top-down view of how Open Networks can deliver best outcomes for the industry.



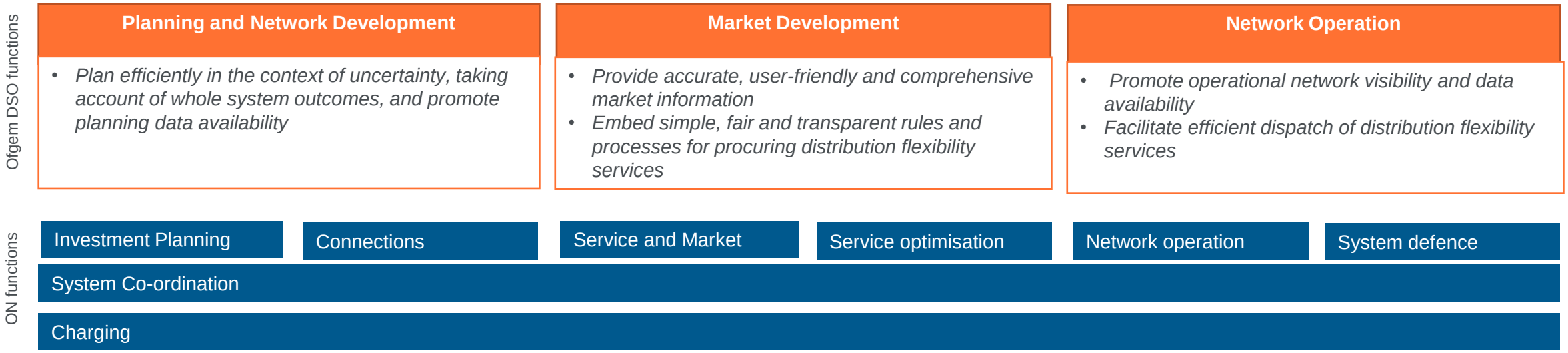
Need to supplement with a bottom-up approach to enable us to deliver on time.



Thinking so far

- Aligning with Ofgem DSO functions

- Using baseline DSO expectations as starting point, informed by RIIO-ED2 Draft Decision



- Ability to deliver in an agile way, responding to changes - Common framework for flexibility and roadmap setting out areas for development.

Detailed session with Challenge Group in October to get input on potential areas and prioritisation.

Welcome further input between now and then.

Break

Flexibility Products (WS1A P6)

Seeking feedback on key aspects of Flexibility product definitions for alignment.

Review material: Active power products report

Avi Aithal (ON Technical Lead)

Introduction to Flexibility Products (WS1A P6)

Background

Under Open Networks in 2018 and 2022 product teams standardised the parameters for DNO procured active power flexibility products. To meet individual network and stakeholder needs there has been slightly variation between networks implementation of these standard products.

Scope

2022 work looks to identify the key areas of divergence and reasoning behind them, with a view to gaining stakeholder feedback on how to market these services in the future. Feedback will inform if and how definitions will be aligned, alongside an update of the flexibility product catalogue, and reviews of stackability and reactive power products.

Review of existing products

Agreed Active Power Product definitions	
Active Power Product	**Definition**
Sustain	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	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.
Dynamic	The Network Operator procures, ahead of time, the ability of a Service Provider to deliver an agreed change in output following a network abnormality.
Restore	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 and supply generation to support increased and faster load restoration under depleted network conditions.

Areas of divergence- summary

Parameter	SUSTAIN DNO interpretation	SECURE DNO interpretation	DYNAMIC DNO interpretation	RESTORE DNO interpretation
Network constraint	Pre-Fault	Pre-Fault / planned outage	Network abnormality	Network abnormality
Procurement timescale	Annual/Season	Annual/Season	Annual/Season	Annual/Season
Payment mech	Utilisation only	Availability & Utilisation	Availability & Utilisation / Utilisation only	Utilisation only
Availability Agreement period	Pre-determined	Year ahead / 2 weeks ahead / Week ahead	No availability / Week ahead / 2 weeks ahead	N/A No availability
Utilisation Instruction	Scheduled contract stage	Week ahead / Real time / Within day	Real time / Within day / day ahead	Real Time
Dispatch mechanism	Scheduled / Self dispatch	API - 15 mins / Phone / Email	API - 15 mins / Phone / Email	API / Phone / Email

Areas of divergence

Secure

- Point at which that availability is agreed, varying from 1 week ahead to the year ahead stage.
- Forecast availability and utilisation window. Availability agreed at the year-ahead stage can give higher revenue certainty to Providers and confidence in contractual availability for the DNO's. However, can also potentially exclude them from participating in other market opportunities as regular unavailability declarations can impact the DNO's confidence in these services.
- Timing of the utilisation instruction, varying from being issued in real time with up to 15 minutes ramping period, or earlier in the day notifying the provider of the utilisation window start time. These instructions can also vary between using an API interface, phone call or email.

Dynamic

- Some networks use Dynamic products as a close to real-time service to supplement the pre-fault products – Secure and Sustain - to meet market appetite for different market timeframes. The utilisation price can be varied monthly, and the volume is declared within-day. We are keen to understand industry views on using the same products in different timelines, or separately defining different products to achieve this.
- Similarly to the Secure service, there is also divergence on the timing of the utilisation instruction and the dispatch mechanism for issuing this instruction.

Points of discussion

- We are keen to understand whether industry would value the creation of a new product similar to a near real-time operating Dynamic service, whereby DNO's procure at the day ahead stage any further flexibility required to address a forecasted shortfall. This could also be used to manage any notices of unavailability from existing contracted Providers and would be a utilisation only product.

- Or use existing products in different timescales. We are keen to understand what the preferred approach might be.

- Either of these would address the deviation currently seen within the Dynamic product, and reflects the work undertaken in WS1A product 2, which looks to facilitate a move towards closer to real-time procurement through processes and prequalification requirements, and WS1A Product 4, which is looking to standardise the common contract for flexibility by moving towards a more framework style approach.

Stakeholder questions

1. Are the four active power products clear and easy to understand?
2. What are the most important parameters to you in terms of distinguishing between products?
3. Do you view the current divergence between different DNO's interpretation of products, such as through availability and utilisation agreement periods, procurement timescales, and payment mechanics as a barrier to participation? If yes, would you prefer these to be defined as separate products for clarity?

Carbon reporting methodology (WS1A P7)

Discussion and input on methodology.

Review material: Carbon reporting and forecasting methodology

Sam Do (Product lead, UKPN)

Introduction to Carbon reporting methodology product (WS1A P7)

1. **The Smart Systems and Flexibility Plan** – Action 3.6 requires networks and system operators to have consistent methodologies for carbon reporting by 2023. Product team formed to deliver this objective.
2. **Policy intent** – increase transparency and consistency of carbon impact to inform future possible interventions to make consistent with net zero.
3. **Product scope** – consistent methodology for April 2023 C31E report submission and recommendations for future work
4. **Approach**
   - representatives from DSOs, ESO, BEIS, input from Ofgem
   - agreed scope, review of other methodologies, checked in with Ofgem/BEIS
   - Industry consultation and update

Carbon impacts of flexibility services

Out of P7 scope

Stage in flexibility life-cycle >	Investment decision	Procurement	Pre-dispatch	Dispatch	Post-dispatch	Decommission
Counterfactual emissions	Emissions from network solution	Alternative DERs contracted	Alternative DERs contracted	Alternative DERs dispatched	Alternative DERs dispatched	Network solution or alternative DER end-of-life emissions
Attribution to DSO flexibility service (first order effects)	Emissions from flexibility services	Embedded emissions from contracted DERs Indirect	Standby emissions – e.g. part loaded DER if required on hot-standby	Dispatch emissions - e.g. fuel combustion, reduced electricity consumption. Direct		End-of-life emissions from contracted DER Indirect
Consequential	Emissions from higher network losses due to higher grid utilisation	Change in wider market e.g. wholesale, balancing.	• BESS pre-charging. • Change in wider market e.g. wholesale, balancing.	• Ramp-up/down emissions. • Change in wider market e.g. wholesale, balancing.	• Energy efficiency rebound effect. • DSR payback.	Change in wider market e.g. wholesale, balancing. Consequential

Out of P7 scope

Background

Flexibility services can increase or reduce carbon emissions, categorised into

- **Direct impacts** e.g. fuel combustion – included
- **Consequential impacts** e.g. displacing grid generation, charging, payback – included
- **Indirect impacts** e.g. embedded emissions – recommend as part of future work in 2024
- **Counterfactual impacts** e.g. reinforcement – out of P7 scope

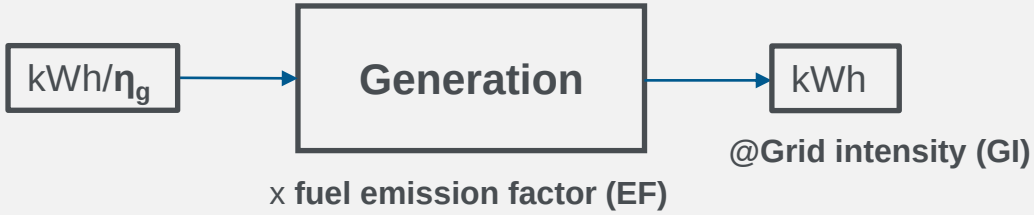
Flexibility services considered

- **Increase exports / reduce imports** – included
- **Reduce exports / increase imports** – planned for later this year
- **Flexible connection curtailment** – not a flexibility service, out of P7 scope

Summary of proposed methodology

- **Narrow reporting boundary (direct + consequential)**
  - Comparable with ESO
  - Data more standard and available
  - Achievable within Open Networks timetable
- **Consistent calculation methodology**
  - Standard assumptions per technology category
  - Centrally calculated by DSOs
  - Standard industry conversion factors
- **Consistent report format**
  - Distribution Flexibility Services Procurement Report
  - Table by technology showing energy and carbon impact
  - Narrative and charts

Calculation methodology



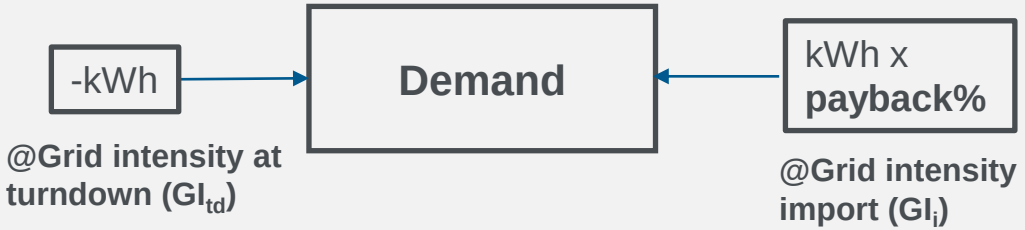
For **generation export**, the carbon impact is:

- combustion of the fuel (direct) = + **kWh/η_g x EF**
- displacing grid generation at export (consequential) = - **kWh x GI**

For bioenergy, report on both inclusive and exclusive of CO2 released during combustion.

For **storage export**, the carbon impact is:

- carbon intensity of the input energy (consequential) = + **kWh/η_s x GI_i** (if from grid), **(kWh/η_s)/η_g x EF** (if from generator)
- displacing grid generation at export (consequential) = - **kWh x GI_e**



For **demand reduction**, the carbon impact is:

- reduced grid imports during the turn-down (direct)= - **kWh x GI_{td}**
- increase in grid imports during “payback” or load shift (consequential) = + **kWh x payback% x GI_i**

*kWh is the dispatched energy, η is efficiency, GI includes losses

Proposed data sources

Factor type	Source	Notes
Fuel emission factors	BEIS/Defra	CO_2e, Gross CV. Updated annually.
Efficiency	BEIS Electricity Generation Costs 2020 – [A] Coal – DUKES – [B] BEIS Storage Costs and Assumptions 2018 – [C]	The DUKES report is updated annually, however the others are one-off reports.
Grid intensity	Green Book data tables	Average of consumption long-run marginal factors, use most recently updated value rather than forecasts (2021 at time of writing). Irregularly updated.
Payback%	Low Carbon London report	From a one-off innovation trial. Assume 21% for reduction services, based on the average of trial events. Assume 100% for load shifting solutions.

Distribution Flexibility Services Procurement Report

- **Table** – in following format showing energy and carbon impact, accompanying narrative, chart encouraged.
- **Data template** – recommend inclusion of carbon impact per dispatch and technology subcategories
- **Metrics** – dispatch intensity = total carbon impact divided by total energy delivered

LC31 Technology Category	Requested energy (MWh)	Delivered energy (MWh)	Direct carbon impact (kgCO2e)	Consequential carbon impact (kgCO2e)
Fossil – Gas				
Demand				
Stored Energy				
…				
…Total				

Recommendations for further work

Implementation

- Revision post consultation by Q4 2022
- Addition of Demand Turn Up / Generation Turn Down services by Q4 2022
- Reconvene product team to make updates, corrections and issue clarifications ahead of April 2023 report submission in Q1 2023

Potential future work (2023 and 2024+)

- Review stakeholder feedback post Distribution Flexibility Services Procurement Report publication
- Enduring governance on carbon reporting methodology
- Inclusion of indirect carbon impacts for more complete carbon impact
- Work with providers to incorporate asset specific information or calculations to increase accuracy
- Sensitivity analysis in reporting
- Review of technology categorisations to keep up with market and technology developments
- Investigate treatment of energy efficiency carbon impacts as DSOs implement programmes
- Review whether accurate forecasting of carbon impacts is possible
- Evaluate source and use of granular grid intensity time series data to improve accuracy

Stakeholder questions

1. Do you agree with the reporting boundary adopted – direct and some consequential impacts, whilst indirect impacts recommended to be reviewed as part of future work?
2. Do you agree with the proposed carbon impact calculation formula?
3. Do you agree with the data sources used? If not, do you have alternative data source recommendations?
4. If time-series grid intensity factors were used, what assumptions should we make on the timing of storage charging and demand payback?
5. Please provide any additional comments or feedback.

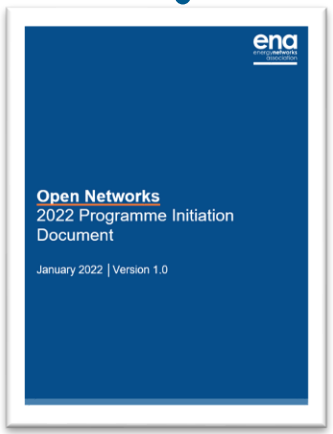
Break

Mid-year progress update

Farina Farrier (Head of ON, ENA)
Avi Aithal (ON Technical Lead, ENA)

Overview

Q1 | Q2 | Q3 | Q4



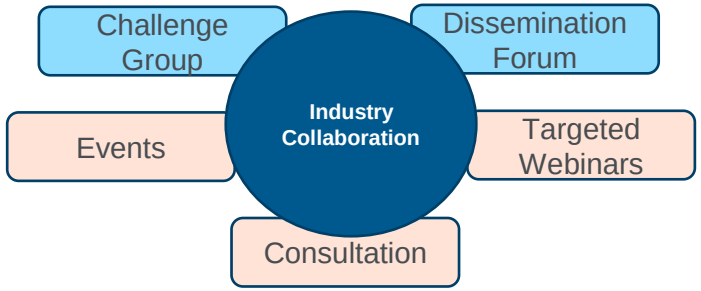
Launched ambitious delivery plan

24 focus areas with over 117 deliverables

Addressing actions in Smart System Plan

Developing recommendations

- ✓ Implemented enhanced governance to enable closer industry collaboration



- ✓ 46 of 117 deliverables completed – key outcomes on next slide

Implementation

- ❑ Take on industry views and turn recommendations into firm plans for implementation
- ❑ Setting the scope and delivery framework for Open Networks in 2023 and beyond.

Key highlights from H1 2022

Accessible and efficient markets for local flexibility

Push towards real time operation

Steps to improve interoperability and real time flex service procurements

Mitigate DNO-ESO service conflicts

First iteration of Primacy Rules

Improve Transparency

Increasing operational data sharing

Delivering on commitments to share more operational and curtailment data

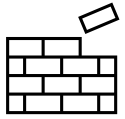
Improved accuracy for Flex Service Providers

Baselining tool to help FSPs to follow a common approach to measure flexibility delivered

Efficient coordination across T-D boundaries

Standardised Network Development Plans

Standardised across GB for the first annual publication, facilitating stakeholder use.



Improved forecast scenarios

Alignment of FES and DFES building blocks

Whole system approach

Whole System co-ordination registers

Standardised co-ordination registers to facilitate stakeholder use.

Increasing whole systems analysis

Promoting use of Whole Systems CBA tool

Key focus areas for H2 2022

Implementation

Delivering change

Improved services
- *Alignment of existing products*
- *Launch of new potential products*
- *Ongoing testing and implementation of primacy rules*

Improved processes
- *Pre-qualification, dispatch interoperability, contract schedules*

Improved transparency & coordination
- *Lowering ECR threshold to 50kW, with common API for data access*
- *Sharing of further operational datasets*

Whole systems approach
- *Best practice for networks to support local energy planning*

Continued development
- *Support industry roll out of key tools - CEM, WS CBA, Baselining tool*

Strategic oversight

Common framework for flexibility
Bringing together different elements of flexibility into a single framework

Strategic Roadmap
Setting out strategic roadmap to contextualize the progress in the industry and guide further development

Continued industry engagement
Via consultation, Challenge Group, Dissemination Forum, webinars and events

Reflect on key Regulatory/policy developments
- *ED2 determinations*
- *FSO & Local energy governance*
- *REMA*

Plans for 2023

2023 Open Networks Programme scope
- *Review programme objectives*
- *Setting the scope and delivery framework for 2023, informed by roadmap, stakeholder and Challenge Group input*

Future Challenge Group session

Future agenda and in-person proposal

Avi Aithal (ON Technical Lead)

Future Challenge Group session

Proposal 3rd Nov meeting is moved to 20th Oct and held in-person at the ENA office in London for a deep dive on the 2023 scope, with an opportunity to interact over lunch with ENA with the Open Networks Steering Group.

01 Sep	03 Nov
Inputs on • Implementation of steps towards real time flex procurement (P2) • Existing settlement process for flex services (P3) • Roll out Primacy rules/ second iteration priorities (P5) • Improvements to Standard agreement (P4)	Inputs on • 2023 scope discussion • Stackability/ product definition/ reactive power (P6) • Common template for curtailment report (P8)

Product	Description
WS2 P1	ECR
WS2 P2	Queue Management
WS2 P3	Interactivity
WS3 P1	DSO Roadmap
WS3 P2	CoI & UC
WS4 P4	Local Whole System Optioneering Service
WS2 P2	Shaping LAEP

AOB

Useful Links

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

We welcome feedback and your input

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