Challenge Group

ENA Open Networks

1st March 2023

Agenda

Item	Start	Finish	Time	Item	Presenter
1	14:50	14:55	5	**Welcome, apologies and introductions** Greg Johnston (ESC) unavailable between 15:00 – 16:00 Gemma Stanley (Piclo) has sent apologies Flo Silver (Smarter Grid Solutions) has sent apologies, with Robert MacDonald attending as alternate.	Maxine Frerk (Challenge Group Chair)
2	14:55	15:05	10	**Recent industry developments and ON impact** Open discussion on industry developments and their potential impact on Open Networks	Maxine Frerk (Challenge Group Chair) & All
3	15:05	15:15	10	**Open Networks 2023 Scope** Overview of 2023 scope	Avi Aithal (Head of Open Networks, ENA)
5	15:15	15:35	20	**Standard Agreement**	Andy Rice (NG ESO) & Wendy Mantle (SPEN-D) (Technical working group Co-Leads)
6	15:35	15:55	20	**Primacy Rules**	Matt Watson (NG ED) & Stuart Fowler (NG ESO) (Technical working group Co-Leads)
7	15:55	16:05	10	**Break**	
8	16:05	16:25	20	**Implementation of DER Visibility**	Odilia Bertetti (Technical Working Group Lead, UKPN)
9	16:25	16:45	20	**Flexibility Products**	Laura Brown (NPg) & Guy Shapland (SPEN-D) (Technical working group Co-Leads)
10	16:45	16:50	5	**Agreeing next challenge group agenda** Overview of 2023 meeting dates	Avi Aithal (Head of Open Networks, ENA) & All
11	16:50	16:55	5	**Recent and upcoming ENA events**	Helen Jarva (ON Junior Project Manager, ENA)
12	16:55	17:00	5	**AOB**	Maxine Frerk (Challenge Group Chair)

Recent industry developments and ON impact

Open discussion on industry developments and their potential impact on Open Networks

Maxine Frerk (Challenge Group Chair)

Open Networks 2023 Scope

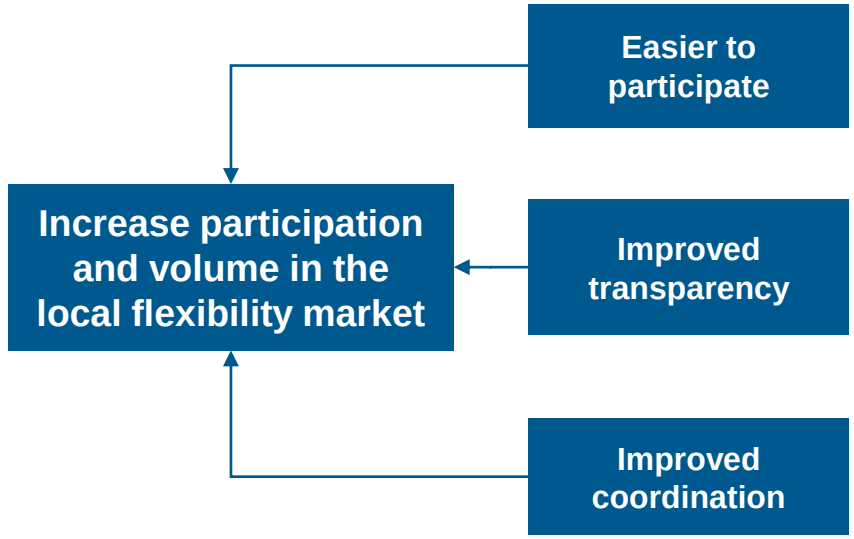
Avi Aithal (Head of Open Networks, ENA)

Open Networks 2023

In 2023, Open Networks is looking to demonstrate our ambition to address our stakeholders' concerns and refocus our activities around delivering tangible consistent changes to industry practices across the participating members, rather than stopping at recommendations for changes.

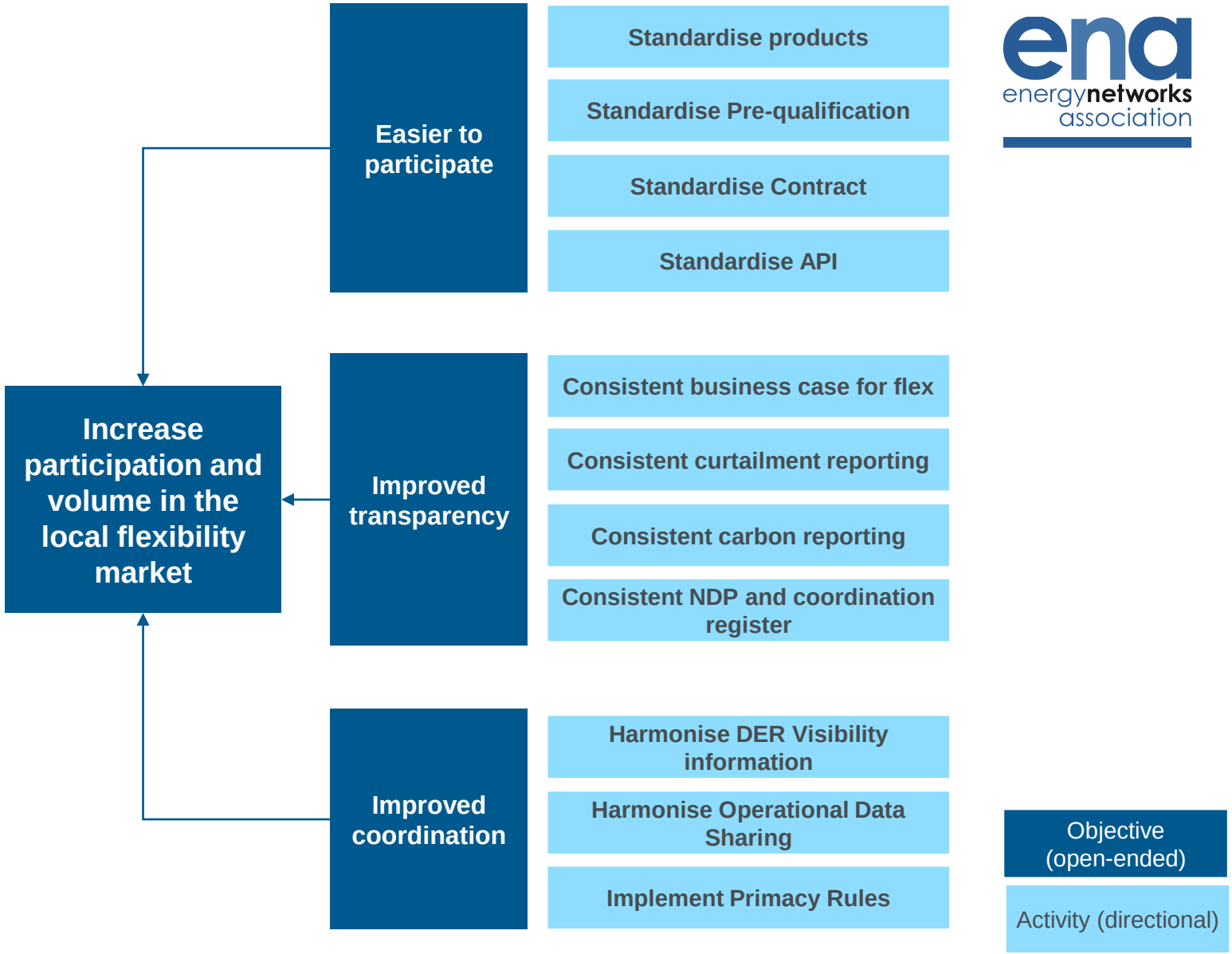
The focus of Open Networks will be to increase participation and volume in the local flexibility market. In line with the actions from the Smart system Flexibility plan, we will focus on:

- **Making it easier for flexibility service providers to participate in the flexibility market by standardising products, processes and contracts,**
- **Improving operational coordination between networks and companies to remove barriers to dispatch of services,**
- **Putting in measures to improve transparency of processes and decision-making.**



Open Networks 2023

- Programme objectives are delivered through a number of technical working groups.
- Individual areas have been scoped with specific measurable outcomes with clear success criteria and timelines for consistent implementation.
- These objectives will be delivered by consolidating the programme into three new workstreams aligned with the DSO roles as defined by Ofgem:
  - Planning and Network Development
  - Network Operation
  - Market Development



Planning and Network Development

Technical working group	Description	Outcome
Carbon Reporting	Support Ofgem's/BEIS' initiative to achieve common methodologies for carbon reporting and monitoring across DNOs by the 2023 reporting and refine them further in 2024 reporting cycle.	All DNOs report using the agreed methodology by Dec 2023 & 2024.
Network Development Plan and Co-ordination Register	Review and update the Network Development Plan (NDP) by 2023 and the Whole Electricity System Coordination Register Form of Statement as required by 2024.	All DNOs report using the agreed methodology by Dec 2023 & 2024.
DER Information	Implement plans for receiving consistent information from Distributed Energy Resources (DER) with appropriate governance by April 2024 (and/or trigger code modifications as appropriate).	All DNOs use consistent DER visibility specifications by Dec 2023.

Network Operation

Technical working group	Description	Outcome
Primacy Rules for Service Conflicts	Define and implement ‘Primacy Rules’, including processes and information flows for the ESO and the DNOs to manage service conflicts. (Iteration 1 in April 2023 and iteration 2 in October 2023).	All DNOs implement designed processes and information flows by Dec 2023.
Dispatch Systems Interoperability	Development API standards for dispatch system interoperability across ESO and DSO for the summer 2024 flexibility tender.	All DNOs adopt common dispatch specification by Dec 2023.
Operational Data Sharing	Facilitating sharing real-time operational and forecasting data between ESO and DNO (and non-network stakeholders).	80% of data shared between DSO-ESOs are harmonised by Mar 2024.

Market Development

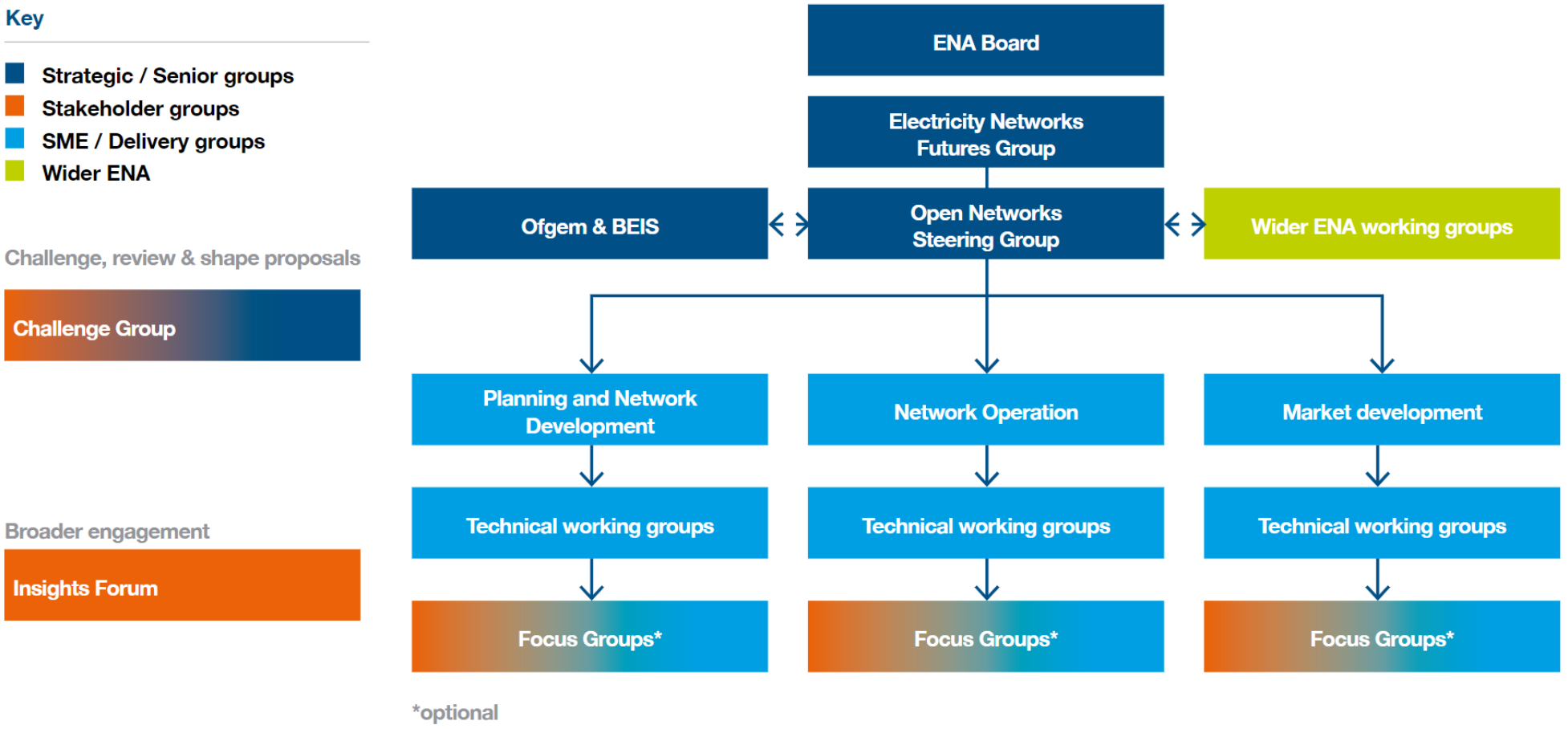
Technical working group	Description	Outcome
Standard Agreement	Improve existing Standard Agreement for procuring flexibility services across DSO and ESO by aligning the contract schedules for flexibility tenders beyond December 2023.	All DNOs using common T&Cs and schedule headings by Dec 2023
Procurement Process	Alignment of sign-up and pre-qualification processes for flexibility service procurement across DNOs by December 2023.	80% of common DPS and PQQ questions across DNOs by Dec 2023
Flexibility Products	Align DSO flexibility product definitions. At least 80% of tendered flexibility should be tendered through identical products by 2024.	80% of flex market-testing is with common products by Dec 2023

**We'll be looking to include work on the alignment of the flexibility services settlement processes*

Programme-level activities (ENA-led)

Technical working group	Description
Common Evaluation Methodology	Governance of Common Evaluation Methodology (CEM) (and tool) used to evaluate flexibility and traditional intervention options.
ANM Curtailment Information	Alignment of sign-up and pre-qualification processes for flexibility service procurement across DNOs by December 2023.
Baselining tool	Hosting the Baselining tool and tracking hits to the tool.
Strategic Roadmap for flexibility	Review the state of play of the industry, ON and innovation projects and update the roadmap to reflect the latest view.
Conflicts of Interest and Unintended Consequences (CoI) Register	Updating the heatmap and risk register for entries agreed to be tracked via Open Networks (in Dec 2022 publication).
Flex figures	Review and update flexibility figures for 2022/23 based on 2023 C31E submissions.

Open Networks 2023 Governance



Open Networks 2023 Governance

Under the **ENA board**, Electricity Networks Futures Group (ENFG) will be the group that holds the funding for the Open Networks programme but will delegate authority for the spend of that budget and the management and delivery of the programme to the Open Networks Steering Group.

The **ON Steering Group** is the key group with the responsibility to direct the delivery of the ON programme to time, cost, and quality. The ON Steering Group will be a small group with a single representative from each operator organisation including BEIS, and the ENA ON Team. Additionally, the Steering Group will also be attended by the ON Challenge Group Chair to provide the link to the Challenge Group.

The **ON Challenge Group** - chaired by an independent Chair, the ON Challenge group shape the direction of the programme, its priorities and the outcomes that it delivers by providing a more formal challenge function on behalf of the wider industry.

Ofgem and BEIS provide input into the ON Steering Group, specific workstreams and product teams where this is of particular value. The programme team liaise with Ofgem and BEIS on an ongoing basis to discuss progress and address any issues.

The **Insights Forum** has been setup alongside in 2022 for stakeholders wishing to engage more broadly with the programme.

Technical working groups will be formed from ENA member resources to develop key areas under in the different workstreams., which will be led by a Lead who will have accountability for delivery of their products in line with the scope and timescales set out in the PID.

For key working groups, Open Networks will facilitate **Focus Group** consisting of key industry stakeholders at key development stages for stakeholder to feed into the development of the subject area. These targeted Focus Groups will be facilitated by the Technical working group Leads.

Break

Standard Agreement

Andy Rice (NG ESO) & Wendy Mantle (SPEN-D)
(Technical working group Co-Leads)

Introduction

Review of 2022 deliverables for Standard Agreement Working group

- **Gap analysis**
- **Main focus – service based schedules**
  - Rational for moving to service based schedules for the Standard Agreement
  - Presented in 2 challenge groups in 2022
  - Consulted on schedule approach in August 2022

2023 Standard Agreement technical working group focus

Review of standard agreement focusing on

- Liabilities
- Domestic participation
    - access to site
    - Data protection – GDPR
- Cyber security
- Anti corruption and bribery
- Plus review of past industry feedback
- Collaboration with other ENA work groups (Procurement process + Primacy work)
- Further alignment of service based schedules

2023 Standard Agreement technical working group focus - continued

Review of standard agreement focusing on

Liabilities - We are looking at the alignment of liabilities focusing on values, services which may be a barrier to participation whilst providing the company with sufficient cover. The ask for this is your input to what this could look like

Domestic participation - With services participation seeing an increase from domestic assets we are looking at clauses that may hinder participation, these include access to site and data protection

Cyber security - With the increased focus on cyber security we are looking to develop standard clause taking account of each companies requirements

2023 Standard Agreement technical working group focus - continued

Review of standard agreement focusing on

- **Anti corruption and bribery –** Review of latest legislation and further standardisation across the organisations
- **Collaboration with other ENA work groups (Procurement process + Primacy work**)
  - As the output of other workgroup materialises we will be looking to reflect this were necessary in the Standard agreement.
- **Further alignment of service based schedules** -This will focus standardisation of content where applicable and allow for closer to real time procurement and moving toward a framework approach to contracting
- **Review industry feed back –** whilst working on the areas mentioned above we will consider feedback received that focus on these areas plus any new topics

Questions

We would now like to give you the opportunity to ask any questions or give feedback/suggestions relating to the proposed focus for 2023.

Primacy Rules

Matt Watson (NG ED) & Stuart Fowler (NG ESO)
(Technical working group Co-Leads)

Primacy Rules technical working group updates

The technical working group has been progressing with a focus on two core workstreams:

Rules Development Increment 1

- This increment has progressed work on development of Rules for the following Use Cases:
  - The new Regional Development Programmes (RDP) Transmission Constraint Management service (TCM) vs. DNO Flexibility Services (on different assets in same area).
  - A subset of Balancing Mechanism (BM) actions (covers constraint management, inertia management and voltage management) vs. DNO Flexibility Services (on different assets in the same area).
- Targeting approval ahead of ED2. Implementation will follow.

Ruled Development Increment 2

- Focussing on Short-Term Operating Reserve (STOR) vs. DNO ANM (on different assets in the same area).
- Much more complex, more options for conflict mitigation.
- Ran initial analysis last year. Now following up.

Initial Primacy Rules

A number of Primacy Rules were tested:

DNO primacy[1]	ESO primacy[1]	Joint primacy
RULE 1 • **STOR providers excluded (by the ESO)** from provision of the service if this coincides with **forecast ANM curtailment** activity in a given geographical area	**RULE 2** **DNO holds headroom** value in ANM Systems **to allow STOR to be provided**	**RULE 6** **The ESO would pay** the DNO (and therefore ANM customers or Flex providers) **to hold headroom on their ANM systems**
RULE 3 • Similar to the principles in rule 1, however, in this case, **information would be provided to the market for STOR providers to exclude themselves** from participation when ANM activity is forecast in the area		**RULE 7** **The STOR provider would pay** the DNO (and therefore ANM customers or Flex providers) **to hold headroom on the ANM systems**
RULE 4 • **ESO over-procures** to help counteract any non-delivery as a result of ANM pullback.		

Types of forecast for DNO has primacy rules	Types of headroom for ESO primacy and joint primacy rules[2]
i) Static forecast – if the DNO curtailment shows any potential for ANM activity, the rule would apply.	i) Static headroom – headroom always held in areas where ANM and STOR providers exist. This allows for simple systems, but means holding more headroom.
ii) Dynamic forecast – A threshold of curtailment would be agreed (as an example), above which the rule would apply.	ii) Dynamic headroom – headroom only held which equates to volume of STOR successful in Day Ahead (DA) auction. Requires more complex integration of systems

New Rule 8: ESO coordinates conflict avoidance I

The ESO decides day-ahead whether it is more economical to either 1) exclude all conflicting STOR units from merit order or 2) for the DNOs to hold headroom for the conflicting amount of capacity.

i) ESO does not consider differences and applies the same measure for all ANM areas

Benefits: Primacy will be decided on a daily basis so it is less likely that the same parties will be impacted continuously.

The ESO may also incorporate emissions into the decision-making.

ii) ESO considers regional differences and applies different measures per ANM area

Drawbacks: Further evaluation is needed on a daily basis (although probably relatively easy to implement)

More coordination is needed.

More difficult for the DNO to forecast ANM curtailment.

New Rule 9: STOR over procurement (not over dispatching)

The ESO over procures STOR capacity based on the foreseen curtailment risk. ESO coordinates real time with DNO to dispatch the STOR units with no conflict.

This rule is an improvement to rule 4 to avoid over dispatch.

Benefits:

- Easy to implement
- Compared to rule 4:
  - It reduces emissions
  - Increases reliability of not causing further imbalance.

Drawbacks:

- More coordination needed real time

New Rule 10: ESO coordinates conflict avoidance II

The ESO decides day-ahead whether it is more economical to either 1) over-procure STOR services or 2) for the DNOs to hold headroom for the conflicting amount of capacity.

i) ESO does not consider differences and applies the same measure for all ANM areas

ii) ESO considers regional differences and applies different measures per ANM area

Benefits:

- Primacy will be decided on a daily basis so it is less likely that the same parties will be impacted continuously.
- The ESO may also incorporate emissions into the decision-making.

Drawbacks:

- More complex to implement
- Further evaluation is needed on a daily basis (although probably relatively easy to implement)
- More coordination is needed.
- More difficult for the DNO to forecast ANM curtailment.

Next Steps

We are still working on the detailed analysis, but want to think about the best route deployment.

A few things are already apparent.

- Rule 3 is far more efficient in the new analysis and is now more effective than rule 2
- Rule 8 will always be more efficient than either

A few key questions arise on the implementation. Should we prioritise:

- Speed of deployment?
- Lowest overall costs
- Lease market impact
- A combination of the above?

Proposed Approach

- Once a rule has been selected we will then look to implement it. The time needed will depend on the rule
- We then need to move to the next use case(s).
- There are many more use cases that could be covered.
- Should we continue to use the current prioritisation process or should we adapt it?
- Equally how much analysis is needed for future use cases?
- The approach taken, and the resource available will impact how we roll out future use cases.

Any Questions?

- Do the new rules make sense?
- How should we prioritise implementation of the rules for the ANM vs STOR use case?
- How should we approach the development of new use cases?

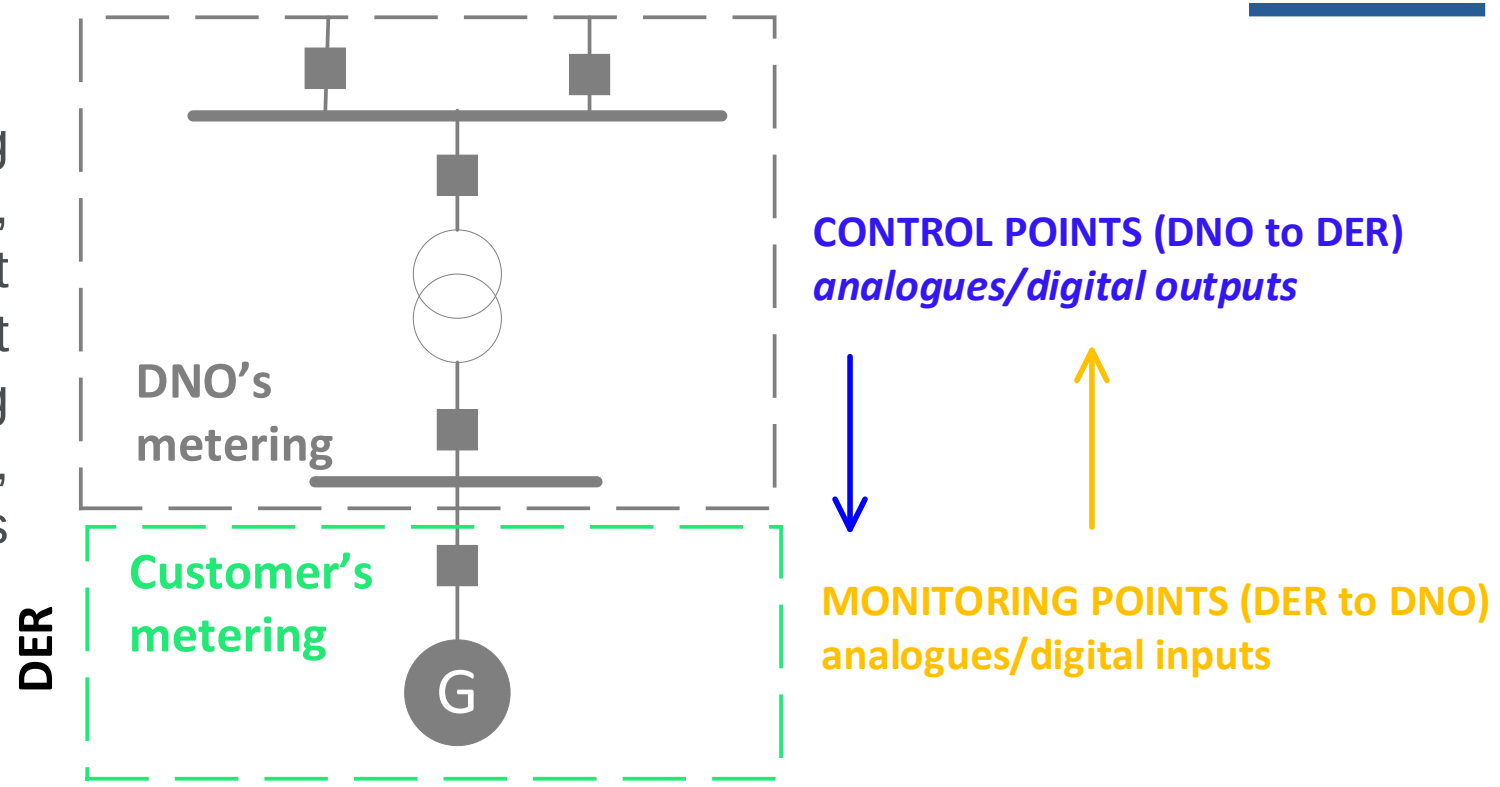
Break

Harmonisation of DNO-DER data exchange

Odilia Bertetti (Technical working group Lead, UKPN)

Context and scope

Currently, developers connecting DER across different regions of GB, are required to exchange different monitoring and control data sets at the connection interface depending on the DNO area the site falls into, or whether the customer is connecting to an IDNO.



The working group has been tasked with harmonising the DER monitoring and control requirements at the connection interface for DER connections across different DNOs.

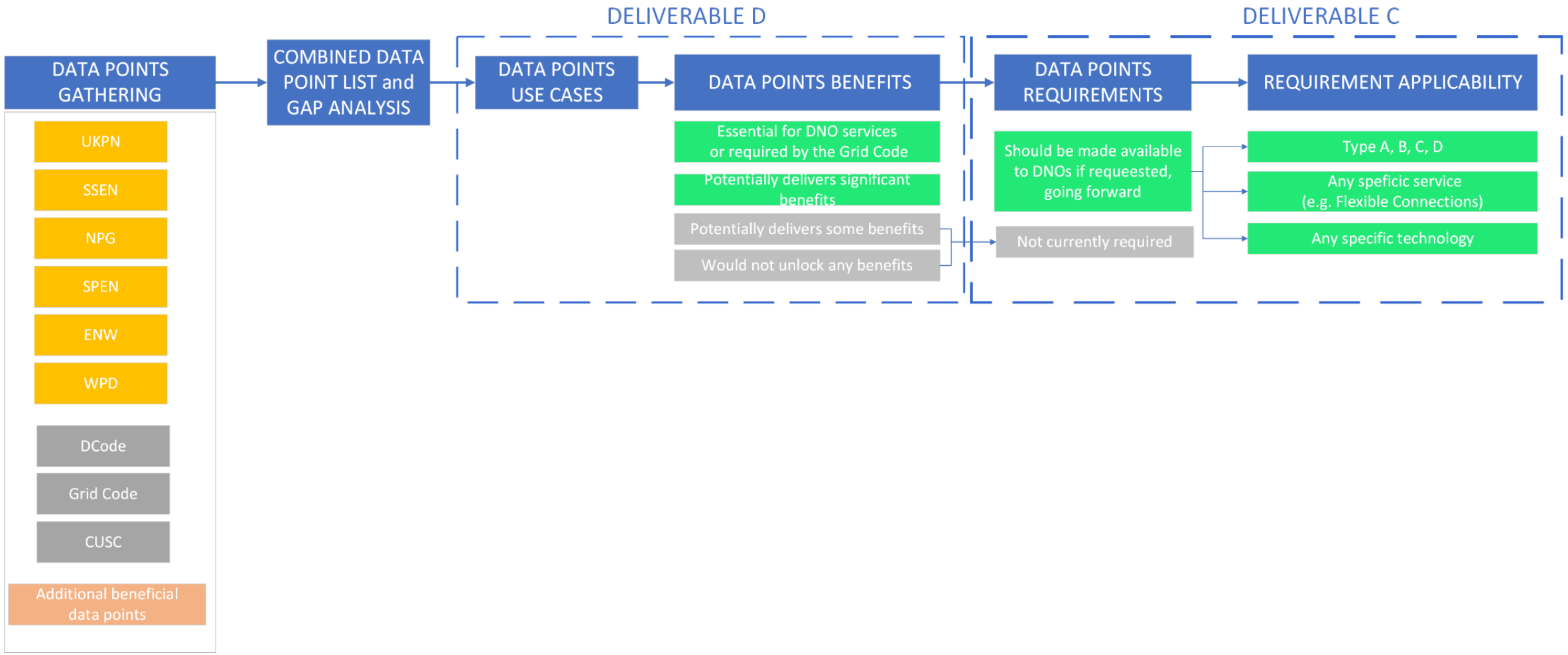
Data/DER in scope

- This refers to operational metering **data from customer's equipment** at the DER substation and exposed to the DNOs rather than data collected by the DNOs through their own equipment.
- The data in scope of ON22 WS1B P6 are **both metering points** (from DER to DNO) and **control points** (from DNO to DER).
- This refers data to be exchanged real time via SCADA rather than post event data.
- **DER Type**: Generation and Flexible Demand.
- **DER POC Voltage Level**: DERs that have a PoC voltage between 132kV kV bar at Grid Supply Points (GSP) and HV side of secondary substation
- **DER capacity**: anything connected from HV to EHV, the minimum capacity is driven by DNO specific practices (200 kW-500kW depending on the DNO)
- **DER Connection Date**: Applicable to DER connecting to the distribution network going forward

Deliverables in scope

Ref	Deliverable	
Deliverable C	Harmonisation of DER operational monitoring and control requirements	Produce a list of operational data points to be made available if requested going forward, which may be differentiated based on capacity (type A-D), service provided and technology type, if applicable.
Deliverable D	Use Cases for the collection of DER operational Data Points	Justify the business needs for each of the DER operational data points through the definition of use cases which will provide clarity on how each of the collected data point will be used by DNOs and/or ESO.
Deliverable E	DER operational Data Points Technical Specification	Technical specification of the collected data points including communications protocol, data availability, tolerance, frequency of data capture etc.
Deliverable F	DNOs Gap Analysis and Implementation	Based on the recommended data points to be collected going forward, the product team will carry out a gap analysis and coast assessment on how these additional data points may affect DNO/customers. An implementation plan is going to be recommended

Approach taken to standardise DNO-DER data exchange



EREC G99

Monitoring	Applies to
Measured Customer Active Power	Type C/D
Measured Customer Reactive Power	Type C/D
Measured Customer Voltage	Type C/D
Measured Customer Current	Type C/D
Measured Customer Frequency	Type C/D
Power Quality	Type C/D
Frequency Sensitive Mode data	Type C/D
Export Blocking Signal	Type A, B
Generation CB Trip	N/A
Active Power Limit	Type B, C, D

Additional data points considered

	Operational Metering points
1	Electricity Storage State of Charge
2	Service contracted and Volume
3	Service being armed and Volume
4	Service being delivered and Volume

DNO specific requirements

Beside the data points mandated by industry codes, DNOs may agree the submission of additional interface data requirements with DER customers as part of their connection agreement to meet the relevant commercial and technical obligations required by the connection

Monitoring and Control Data Exchange DNOs Gap Analysis

DNO' s Gap Analysis - 1

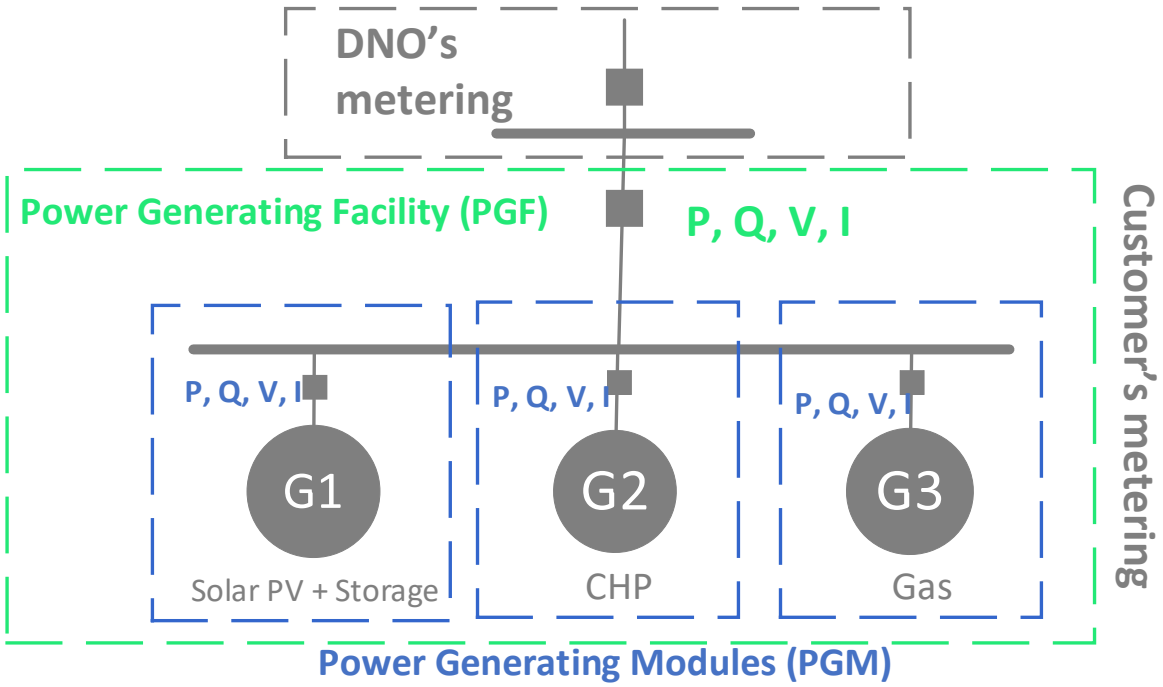
	ID	Data Point	Currently Collected						
			UKPN	SSEN	WPD	NPG	ENW	SPEN	G99
OPERATIONAL METERING POINTS									
Customer metering (net metering at the DER PoC)	M1	Measured Customer Active Power	Yes	Only Type C and D	No	Only Flex Connections	No	Type B, C, D	TYPE C/D
	M2	Measured Customer Reactive Power	Yes	Only Type C and D	No	Only Flex Connections	No	Type B, C, D	
	M3	Measured Customer Voltage	Yes	Only Type C and D	No	Only Flex Connections	No	No	
	M4	Measured Customer Current	Yes	No	No	No	No	No	
	M5	Measured Customer Frequency	No	Only Type C and D	No	No	No		
	M6	Power Quality	No	No	No	No	No	No	
Customer metering (metering from individual units)	M7	Power Park modules metering (MW, MVAr, Amps, Volts)	No	No	Yes[1]	No	No	Yes	No
	M8	Generation and demand metering (MW, MVAr, Amps, Volts)	No	No	No	No	No	No	No
	M9	Alternator MW and MVAr	No	Only Type B. CCGT technology	No		No	No	No
	M10	Unit/Station Transformer MW and MVAr	No	Only Type B. CCGT technology	No	No	No	No	No
	M11	Generator Transformer Tap Position Indication	No	Only Type B. CCGT technology	No	No	No	No	No
customer's CB status	M12	Customer generation/G99 CB	Yes	Only Type C and D	No	Yes	Yes	Yes	No
	M13	Customer CB status for flexible demand/generation	No	No	No	No	No	Yes	No
	M14	Customer Islanded Open & Close	No	No	No	No	Yes	No	No
	M15	Network Status Data	No	No	No	Yes	No	No	No
DER availability	M16	DER in service (0/1)	Yes	No	No	No	No	No	No
	M17	Installed Capacity in Service	Yes	No	No	No	No	No	No
	M18	Number of Connected generators	No	Only Wind/Tidal type C/D	No	No	No	No	No
	M19	Potential Power Available/ Real Available Capacity	No	Anything nonsynchronous (Large PS) type C/D	No	No	Yes	No	No
	M20	Reactive Available Capacity	No	No	No	No	Yes	No	No
	M21	State of Charge	No	No	No	No	No	No	No

DNO's Gap Analysis - 2

Weather Data	M22	Wind Speed	No	Only Wind/Tidal type B/C/D	No	No	No	No	No
	M23	Wind Direction	No	Only Wind/Tidal type B/C/D	No	No	No	No	No
	M24	Irradiance	No	No	No	No	No	No	No
Control readbacks	M25	Active Power Upper Limit readback	Yes	Yes	No	No	Yes	No	No
	M26	Active Power Lower Limit readback	Yes	?	No	No	?	No	No
	M27	Reactive Power Upper Limit Readback	Yes	No	No	No	No	No	No
	M28	Reactive Power Lower Limit Readback	Yes	No	No	No	No	No	No
	M29	Target Voltage readback	Yes	No	No	No	No	No	No
	M30	Flexibility service request acknowledged	No	No	No	No	Yes	No	No
	M31	contractual setpoint/Export Blocking Signal readback	Yes	Only Type B, C, D	Yes	No?	Yes	No?	No
	M32	Open breaker control readback	Yes	No	Yes	No	No	No	No
	M33	Watchdog signal received	Yes	No	No	No	No	No	No
Mode of operation	M34	DER mode of operation/ frequency sensitive mode	Yes	Only Wind/Tidal Type D	No	No	No	No	Type C/D
Service Provision	M35	Service(s) contracted and volume	No	No	No	No	No	No	No
	M36	Service(s) being armed and volume	No	No	No	No	No	No	No
	M37	Service(s) actively delivered and volume							
CONTROL POINTS									
Analogues Control Points	C1	Active Power Upper limit	Yes	Yes	Yes	Yes	Yes	Yes	Type C/D
	C2	Active Power Lower Limit	Yes	No	Yes	Yes	Yes	No	Type C/D
	C3	Reactive Power Upper Limit	Yes	No	Yes	Yes	Yes	No	No
	C4	Reactive Power Lower Limit	Yes	No	Yes	Yes	?	No	No
	C5	Voltage Target	Yes	No	No	No	No	No	No
Digital Control Points	C6	Default safe value setpoint/Export Blocking Signal	Yes	Yes	Yes	Yes	Yes	?	No
	C7	DER Breakers Trip	Yes	No	Yes	Yes	Yes	Yes	No
	C8	Flexible demand/generation CB Trip	No	No	No	No	No	No	No
	C9	Curtailment instruction request e.g., ANM Flex Connections	No	No	No	No	ANM Flex Connection only	No	No
	C10	Flexibility service request	No	No	No	No	No	No	No
	C11	P, Q, V Service Enable	Yes	No	No	No	No	No	No
	C12	Watchdog signal received from the DER	Yes	No	No	No	No	No	No
	C13	Limit Breach	Yes	No	No	No	No	No	No

Monitoring and Control Data Exchange - Use Cases

Customer metering from individual flexible units/PGM



Data

- Metering from each Power Park module (P, Q, V, I)
- Separate metering for flexible generation and demand units (P, Q, V, I)

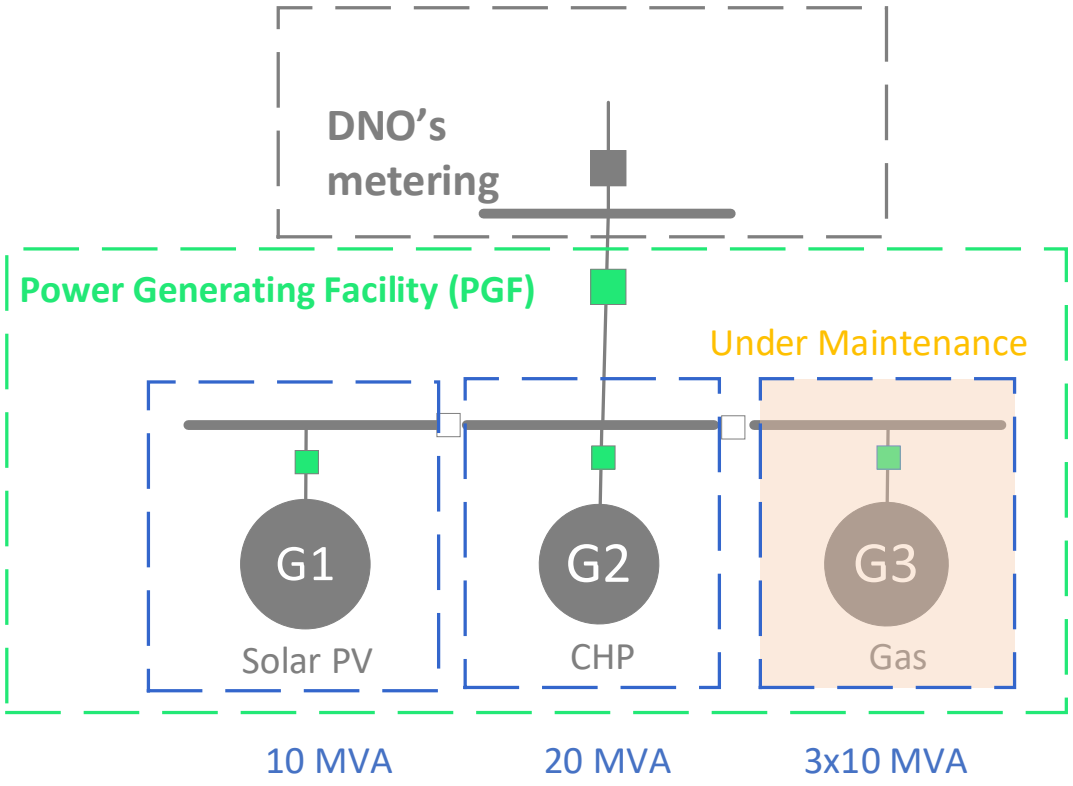
Use Cases

- Flexible Connections – managing site with multiple generators at different LIFO positions.
- Power Park modules providing different services for Service delivery/settlements.
- More accurate DNOs/ESO Operational Forecasting.
- Network Operation - visibility of pickup load/ swing after losing any unit.

Relevance of the data points

Could potentially deliver significant benefits.

DER Availability



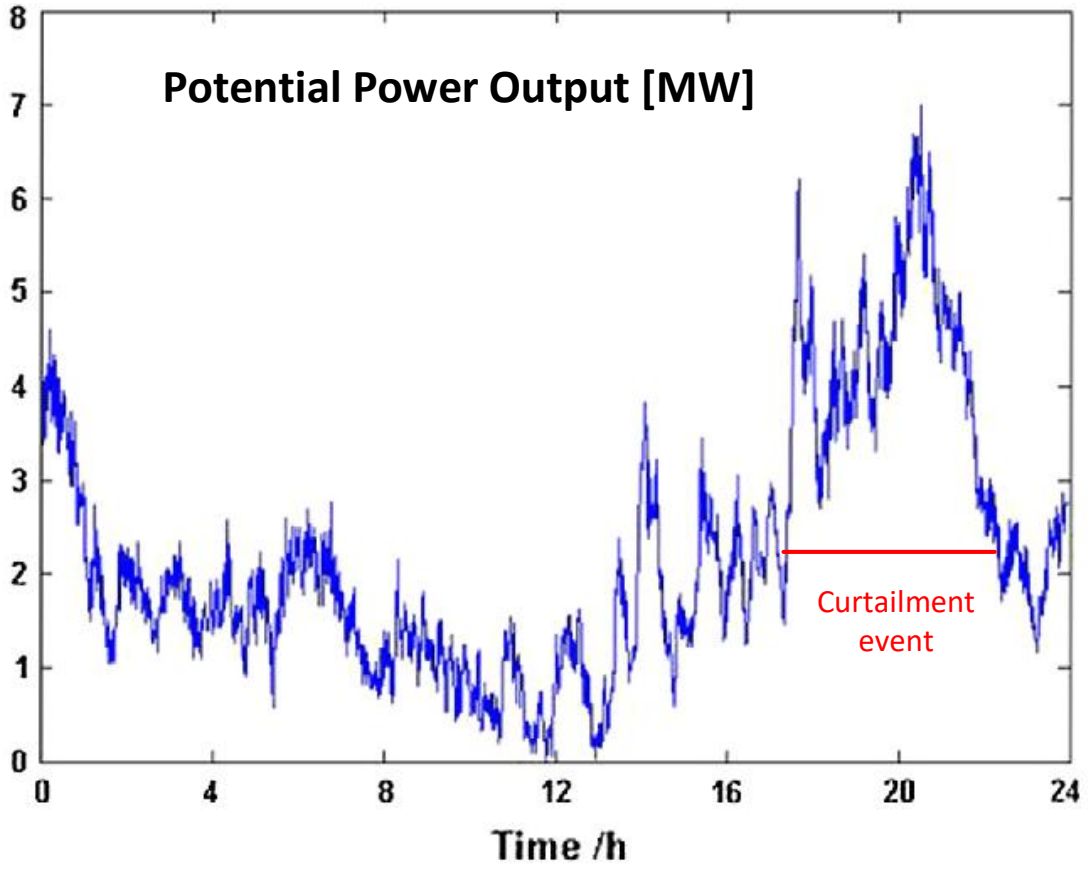
Total installed capacity: 60MVA
Total installed Capacity in service: 30MVA

Data
-Installed Capacity in Service [MW]

Use Case:
- Better modelling of the (real time) capacity that can be offered/controlled for different DNO/ ESO services.
- Better accuracy of DNOs/ESO operational forecasting
- Avoiding service conflicts.
- Flexible Connections - Optimise curtailment thresholds.

Relevance of the data points
Could potentially deliver considerable benefits

Potential Power Available



Data

Potential Power Available

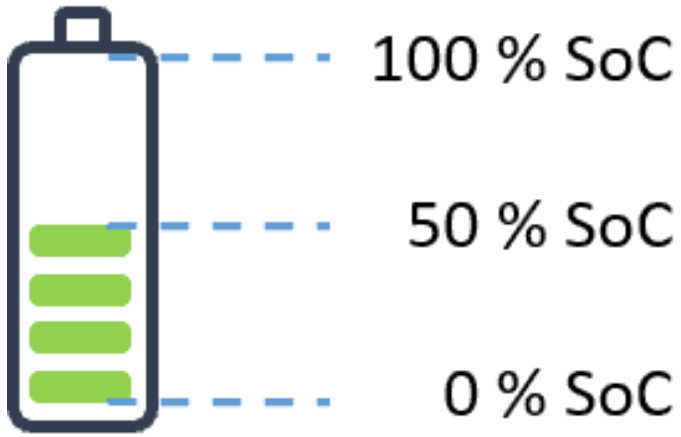
Use Case:

- Visibility of post-curtailment DER output.
- Real time network operation: visibility potential sudden MW volume increase seen on the network.
- Flexible connections - optimise curtailment thresholds.
- ESO ancillary and balancing service – visibility of sudden potential MW volume for system balancing.
- More accurate DNOs/ESO Operational Forecasting.

Relevance of the data points

Could potentially deliver considerable benefits

Electricity Storage State of Charge



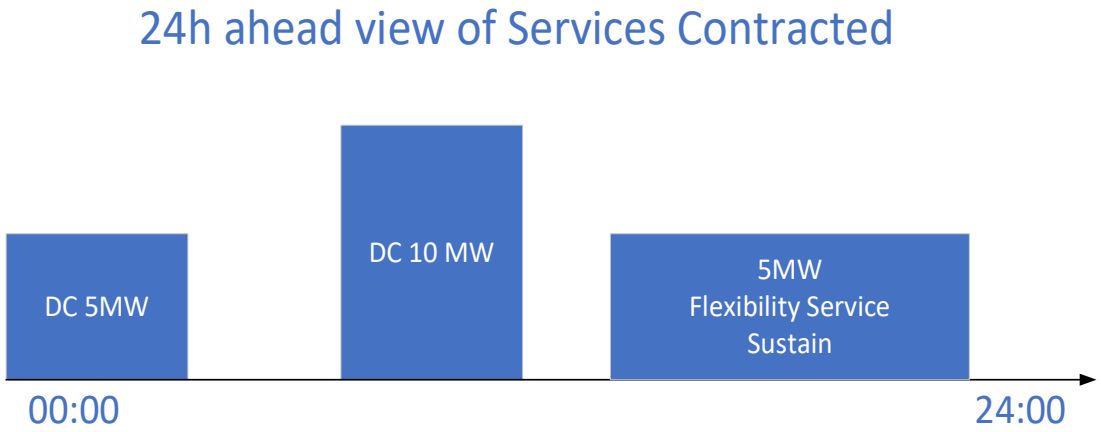
Data
Electricity Storage State of Charge

Use Case:

- Operational Forecasting – allow to better model storage operational behaviour. E.g. is SoC 0%, the storage site is not going to be exporting even if the electricity prices are forecasted to be high.
- DNO/ESO services – visibility of duration service can be provided for.

Relevance of the data points
Could potentially deliver considerable benefits

Services Provision



Data

- Service contracted and Volume
- Service being armed and Volume
- Service being delivered and volume

Use Case:

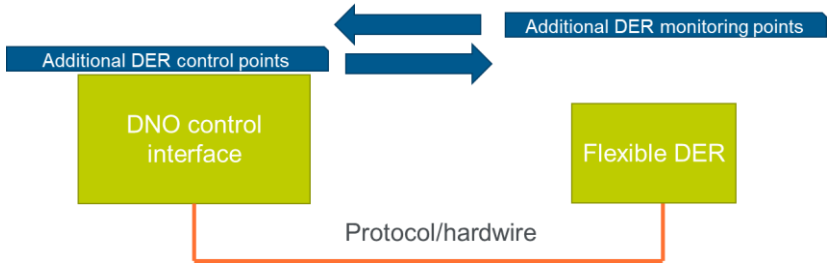
- Operational Forecasting – better modelling of generation output providing services to the ESO/DNO.
- Conflict Service Avoidance .
- Visibility of the volume that can be offered for post fault products (Dynamic/ Restore).

Relevance of the data points

Could potentially deliver considerable benefits

Recommendation on Data Points to be requested going forward to DERs

Output of deliverable C



Recommendation of data points to be collected going forward based on identified use cases.

Category	Data Point	New/existing in G99
Customer metering (Net metering at the DER PoC	Measured Customer Active Power	Existing requirement
	Measured Customer Reactive Power	Existing requirement
	Measured Customer Current	Existing requirement
	Measured Customer Voltage	Existing requirement
	Measured Customer Frequency	Existing requirement
	Power Quality	Existing requirement
Customer metering (Metering from individual units)	Metering from each Power Park module (P, Q, V, I)	New requirement
	Separate metering for flexible generation and demand units (P, Q, V, I)	New requirement
Customer's CB status	Customer generation/G99 CB	New requirement
	Customer CB status for each power generating modules?	New requirement
	Customer Islanded Open & Close	New requirement
	Network Status Data	New requirement
DER availability	Installed Capacity in Service	New requirement
	Potential Power Available	New requirement
	State of charge	New requirement
Readbacks	Active Power Upper Limit readback	New requirement
	Active Power Lower Limit readback	New requirement
	Reactive Power Upper Limit Readback	New requirement
	Reactive Power Lower Limit Readback	New requirement
	Target Voltage readback	New requirement
	Flexibility service request acknowledged	New requirement
	Contractual setpoint/Export Blocking Signal readback	New requirement
	Open breaker control readback	New requirement
	Watchdog signal received	New requirement
Service Provision (real time)	Service(s) contracted and volume	New requirement
	Service(s) being armed and volume	New requirement
	Service(s) actively delivered and volume	New requirement

Impact on DERs/DNOs and implementation plan

Additional Cost on the DNOs to facilitate data exchange

	DNO cost - CAPEX
1	**Development/ Upgrade of the system making use of the data** Data point exchange by itself has generally no benefits unless it is ingested and made use of by a system e.g. ANM, designed to meet certain use cases. There is a cost associated with enhancing the system with capabilities that allows it to make use of the data. As an example, Potential Power Available could be used by ANM to optimise curtailment threshold and minimise curtailment. DNO's ANM systems don't currently have the capability to do so meaning that the system needs to be enhanced as part of software releases driven by business requirements. The development/upgrade of systems is considered to be the biggest cost contributor; however the cost is primarily driven by business requirements (e.g. need to decrease curtailment) rather than to facilitate the actual data exchange.
2	**Upgrade the DNO interface to read the additional i/o from the customer** This applies to DNOs making use of protocol interface. Any new signal requires a 4-20mA current loop to be configured. Beside the work required form customer side, the DNO also needs upgrade its system to be able to read the data point, upgrading the interface with termination boxes etc.
3	**Capacity on Communication infrastructure / FEPs (front End Processing) cost.** The more data points are collected and exposed to the central DMS system the higher the number of FEPs that will need to be installed. A new pair of FEPs can accommodate up to 25'000 new data points. Some DNOs make use of the data point locally (due to local ANM solution) rather than centrally, so they will not be impacted by this cost item.
4	**Storage of data / bigger servers** Higher number of data points collected (both from DNO and customer site) calls for bigger storage and servers' volume. Some DNOs wouldn't store all data point collected from the customer site hence are not affected by this cost item.
5	**Additional input Cards in the RTU** Each RTU is able to read a limited number of data points based on the card capability. The higher number of data points, the higher the number of RTU cards required. However, as this requirement applies to new sites going forward rather than retrospectively, the RTU should be sized to include all data point exchange requirement.
	DNO cost - OPEX
6	**PI operational cost to maintain the additional data points** Beside the additional storage capacity required to store the data points provided by the customer (cost included in the CAPEX,) there is usually a yearly operational cost to store data into the historian.

Additional Cost on DER customers to facilitate the Data Exchange

	DER cost - CAPEX
1	**DER- DNO Multicore fibre cables to be commissioned** This applies to DERs in DNOs area using a hardwire interface. The more data points to be exchanged with the customer, the more multicore fibre need to be commissioned in the interface between the DNO and the customer. This includes 2xcores for each of the current loops, plus termination, optical interface, interface box, Isolation. Material + labor. This cost will be passed down to DER customers. Alternatively, the DNO may decide to commission a separate DNP3 link for additional data points, which also come with an additional cost. DNOs using protocol interface instead can facilitate the exchange of unlimited number of data points transfer with the same protocol link, and only requires the i/o point to be configured.
2	**Configuration in the control system** instead of collecting data points directly from field devices, some data points needs to be processed and calculated and hence require configuration into DER control system. The cost associated to it is related to time and configuration resources. An example of this is the Potential power available data point, which takes as an input weather conditions, capacity in service, power curve and others to produce an output.
3	**Data points Aggregator interface** Depending on the number of additional data points collected and exposed to the DNO, the customer may need to install an equipment to aggregate the data collected across the customer site to a single control interface. This is an extra box which normally hosts a more sophisticated control system.
4	**Additional sensors** Sensors to collect the data point specified in Deliverable C should already be installed at the customer site so this is not expect this to be a major cost contributor.
	DER Cost - OPEX
5	**Data Operation and maintenance** Operational cost to maintain additional data points, which includes fixing faulty analogues, boundary equipment to be maintained etc. The cost should however not be accounted if the data is already available, as exchanging the data with DNO does not increase OPEX cost.

Implementation Plan

Engagement with DER customer/ manufacturer

- Appreciation of state of the art DER control system, understand current capabilities
- Understand the impact of these additional data point on customers
- Use this to inform cost impact on DER customers.

DNO-specific CBA

- CBA should be use-case driven
- Using DNO specific cost and benefits to derive whether or not data point is beneficial
- Go / no go decision to standardise data sharing between DNO-DER through Grid Code Mod.

Standardise market data exchange across industry

- working closely with WS1A P3 and other applicable industry working groups drive a common industry wide data exchange route for market data.

Questions:

- Are the additional data points (captured in Slide 17) already collected on site?
- Would they require new sensors/ measurement devices to be installed?
- Would they require processing devices to be installed to produce requested data point(e.g. potential power available)?
- Would they require a data aggregator to be installed to pass these data to the DNO' RTU?
- If these data are not collected yet, are these additional data point expected to increase O&M cost?
- Is there any additional impact we should be looking at?

Flexibility Products

Laura Brown (NPg) & Guy Shapland (SPEN-D)

(Technical working group Co-Leads)

Flexibility Products

- ENA ON have developed four distinct, standardised Distribution Flexibility Market Products

Product	DNO Requirement	Payment and Dispatch Structure
Sustain	To manage an ongoing requirement to reduce peak demand	Typically, dispatch is scheduled well in advance for a fixed fee
Secure	To manage peak demand on the network, usually weekday evenings	Predominantly paid based on utilisation, but with some use of availability payments also. Timing of dispatch varies by DNO (e.g. WPD dispatch one week ahead while UKPN dispatch in real time)
Dynamic	To support the network during fault conditions, often during maintenance work	Typically dispatched at short notice with low availability payments and high utilisation payments
Restore	To support the network during faults that occur as a result of equipment failure	Typically dispatched at short notice with low availability payments and high utilisation payments

Table 1: summary of DNO flexibility services procured

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

Flexibility Products

Discussion today

- How these products are utilised within the Network Companies is broadly identical with a few deviations of the product definition
- There is deviation in the way UKPN treat their dynamic product. UKPN do not seek availability under this product, instead compensating for utilisation only. They have implemented the Dynamic product as a close to real-time service in order to supplement their pre-fault products – Secure and Sustain - to meet market appetite for different market timeframes.
- UKPN also implement their Secure product differently, in that availability is agreed a year-ahead. This gives a higher revenue certainty to providers, and confidence in contractual availability for the DNOs.
- In the 2022 consultation, Consultees gave a clear steer to converge on product definition.
- The Technical Working group (previously product group) has committed in 2023 to establishing a route for alignment for any divergence between products, within the scope of P6, reengaging with stakeholders to ensure we are on track.

Questions for the Challenge Group

Question 1. Is there anyone directly effected by these differences? If yes, what is the impact?

Question 2. 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?

Question 3. We are proposing to investigate in detail the challenges and propose a solution. This is potentially the 'splitting' of the name of the products. Would this give any cause for concern?

Question 4. Is there anything of note that you would like to bring to our attention in the time that we have got left?

Agreeing the next Challenge Group agenda

Avi Aithal (Head of Open Networks, ENA)

The next Challenge Group agenda

At our next meeting on 04 May we're looking to seek your feedback and early input on:

- Primacy Rules – Iteration 2 Rules
- Dispatch Systems Interoperability – Development of a common API specification
- Procurement Processes – Pre-qualification standardisation proposal
- Settlement Process
- A framework for measuring success of Open Networks work, based on the outcomes committed to in the 2023 Launch Document

Recent and upcoming ENA events

Helen Jarva (ON Junior Project Manager, ENA)

Recent and upcoming ENA events

Open Networks 2023 Launch Webinar

21 February 2023

Presentation slides and a recording of the webinar are available online.

Open Networks Insights Forum

23 March 2023, 10:00 – 13:00

The first 2023 Open Networks Insights Forum (previously known as Dissemination Forum). Sign up online to join the Forum and be notified of future meetings.

Safety, Health and Environment (SHE) Management Conference

24 – 25 May 2023

The 32nd annual SHE Management Conference will take place 24-25 May 2023 at Croke Park, Dublin and is hosted by ESB Networks. Delegate bookings are expected to open early 2023.

AOB

Useful Links

ON 2023 launch document

2023 Detailed work plan

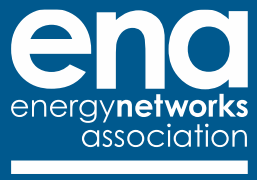
2023 Strategic Roadmap for Flexibility

Stakeholder events

We welcome feedback and your input

Opennetworks@energynetworks.org

Click here to join our mailing list



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The voice of the networks