# Financial Year 24/25 Operational Data Sharing Report

Open Networks
March 2025 | Version 1.0

## DOCUMENT CONTROL

### Authorities

| Version | Issue Date | Authorisation | Comments |
|---|---|---|---|
| 1 | 15/01/2023 | e.g. Open Networks Steering group | |

### Related documents

| | |
|---|---|
| **Reference 1** | |
| **Reference 2** | |

### Change history

| Version | Description |
|---|---|
| | |

### Distribution

| |
|---|
| Published on ENA website |

TABLE OF CONTENTS

# Contents

Introduction 5
About ENA ..... 5
About Open Networks ..... 5
2023 Open Networks programme Workstreams ..... 6
Our members and associates ..... 6
ENA members ..... 6
ENA associates ..... 6
Executive Summary ..... 7
Operational Data Sharing TWG Remit ..... 7
FY 24/25 Plan ..... 8
Standardisation Workstream ..... 10
Dataset Identification and Scoping ..... 10
Dataset Prioritisation ..... 11
Data Intake Process & Triage ..... 14
Implementation Workstream ..... 17
Step by Step Approach to Implementation ..... 17
Guidelines for Implementation ..... 18
Risk Assessment (Probability/Impact Scoring) and relative mitigation ..... 20
Implementation Plan ..... 22
Dependencies ..... 23
Next steps…... ..... 24

Appendix 1 - Acronyms ........ 25

Appendix 2 – Standardised Framework for SGTs Active Power ........ 26

# Introduction

## About ENA

Energy Networks Association (ENA) represents the owners and operators of licences for the transmission and/or distribution of electricity in the UK and Ireland. Our members control and maintain the critical national infrastructure that delivers these vital services into customers' homes and businesses.

As the voice of the energy networks sector, ENA acts as a strategic focus and channel of communication for the industry. We promote interests and good standing of the industry and provide a forum of discussion among company members.

We help our members to:

- Create smart grids, ensuring our networks are prepared for more renewable generation than ever before, decentralised sources of energy, more electric vehicles and heat pumps. Learn more about our Open Networks Programme.
- Innovate. We're supporting over £450m of innovation investment to support customers, connections and more.
- Be safe. We bring our industry together to improve safety and reduce workforce and public injury.
- Manage our networks. We support our members manage, create and maintain a vast array of electricity codes, standards and regulations which supports the day-to-day operation of our energy networks.

Together, the energy networks are keeping your energy flowing, supporting our economy through jobs and investment and preparing for a net zero future.

## About Open Networks

Britain's energy landscape is changing, and new smart technologies are changing the way we interact with the energy system. Our Open Networks programme is transforming the way our energy networks operate. New smart technologies are challenging the traditional way we generate, consume and manage electricity, and the energy networks are making sure that these changes benefit everyone.

ENA's Open Networks programme is key to enabling the delivery of Net Zero by:

- opening local flexibility markets to demand response, renewable energy and new low-carbon technology and removing barriers to participation
- opening data to allow these flexible resources to identify the best locations to invest
- delivering efficiencies between the network companies to plan and operate secure efficient networks

We're helping transition to a smart, flexible system that connects large-scale energy generation right down to the solar panels and electric vehicles installed in homes, businesses and communities right across the country. This is often referred to as the smart grid.

The Open Networks programme has brought together the nine electricity grid operators in the UK and Ireland to work together to standardise customer experiences and align processes to make connecting to the networks as easy as possible and bring record amounts of renewable distributed energy resources, like wind and solar panels, to the local electricity grid.

The pace of change Open Networks is delivering is unprecedented in the industry, and to make sure the transformation of the networks becomes a reality, we have created three workstreams under Open Networks to progress the delivery of the smart grid.

### 2023 Open Networks programme Workstreams

- Network Operation
- Market Development
- Planning and Network Development

## Our members and associates

Membership of Energy Networks Association is open to all owners and operators of energy networks in the UK.

- Companies which operate smaller networks or are licence holders in the islands around the UK and Ireland can be associates of ENA too. This gives them access to the expertise and knowledge available through ENA.
- Companies and organisations with an interest in the UK transmission and distribution market are now able to directly benefit from the work of ENA through associate status.

### ENA members

### ENA associates

- Chubu
- EEA
- Guernsey Electricity Ltd
- Heathrow Airport
- Jersey Electricity
- Manx Electricity Authority
- Mutual Energy
- Network Rail
- TEPCO

## Executive Summary

The purpose of this report is to provide an in-depth overview of the Technical Working Group's (TWG) remit, responsibilities, and the strategic plan for the fiscal year 24/25. By examining these critical elements, the report aims to shed light on the importance and effectiveness of operational data sharing in achieving industry-wide standardisation.

Operational data sharing is a key element to ensure transmission-distribution collaboration, enabling organisations to enhance efficiency, ensure reliability, and foster information sharing. This report holds significant value as it captures the collaborative efforts of multiple stakeholders, System and Network Operators, in addressing the challenges and opportunities associated with operational data sharing. The insights gleaned from this analysis will not only benefit the participating organisations but also serve as a guide for other entities seeking to implement similar initiatives.

- Detailed Description of TWG's Role: This includes the responsibilities, goals, and key focus areas of the TWG in the operational data sharing initiative.
- Comprehensive Plan for FY 24/25: This plan outlines key milestones, deliverables, and specific activities for the fiscal year.
- Progress Evaluation: An evaluation of the progress of the plan, highlighting any adjustments made during the year and assessing the effectiveness of the implemented strategies.
- Progress Assurance: Assurance and presentation of the progress of delivery across different workstreams, including standardisation and implementation.

The scope of this report encompasses a thorough analysis of the operational data sharing framework. This includes the implementation of standardisation and harmonisation efforts and the governance mechanisms in place to ensure ongoing progress and accountability.

One of the notable findings of this report is the significant progress made in the standardisation of operational data sharing practices across various stakeholders. The TWG has effectively coordinated efforts to develop and implement a unified framework that enhances interoperability and data exchange among different systems. This standardisation is critical in ensuring seamless collaboration and improving the overall processes of transmission and distribution operations.

Another key finding is the successful implementation of a first principal structure for delivery able to demonstrate the practical benefits of operational data sharing.

Based on the findings, the report offers several recommendations to further enhance operational data sharing initiatives. These include:

- Strengthening Stakeholder Engagement: Continuous collaboration and communication among stakeholders are essential to address emerging challenges and leverage opportunities for improvement.
- Enhancing Data Sharing Frameworks: Defining standard data-exchange formats and make data-sharing self-serve.
  - Defining Guidelines and clear implementation processes for data-exchange: Identifying the implementation framework, resources and risks associated with delivery.

## Operational Data Sharing Technical Working Group Remit

The Operational Data Sharing Technical Working Group (ODS TWG) plays a crucial role in terms of standardising and coordinating data sharing within operational timescales across network and system operators, as well as facilitating Transmission-Distribution data-sharing between organisations. This mandate underscores the group's significance in ensuring that operational data sharing is conducted in a consistent, reliable, and efficient manner, which is crucial for the optimisation of network operations and the achievement of industry-wide standardisation.

At the heart of the ODS TWG's remit lies a comprehensive set of responsibilities and goals designed to foster a robust framework for operational data sharing. The group is tasked with the following key objectives:

- Standardisation of Data Sharing: The primary responsibility of the ODS TWG is to establish and enforce standards for data sharing in operational and real-time timescales. This involves defining the data formats, protocols, and processes that network and system operators must adhere to when sharing data.
- Coordination of Data Sharing Efforts: The TWG serves as a common place for harmonisation for real-time data sharing initiatives, ensuring that efforts are aligned across different entities and that there is no duplication of work or definition of double standards.
- Guidelines for implementation: The ODS TWG aims to establish clear guidelines for the implementation of standardised operational data sharing practices.
- Recommendation on data procedures and data sharing practices: Implement standardised protocols for data exchanges, ensure clarity and consistency in data formats, and establish robust guidelines for secure and efficient data sharing across all operational levels.

## FY 24/25 Plan

Considering the initial complexity of defining a plan and the urgent need to begin standardising priority datasets for the entire industry, the technical working group has achieved the plan through successive approximation:

- **Short-Term Plan** (Apr-Jun 24): During this initial phase, the ODS TWG has been focussing on the design and validation of priority datasets that are crucial to the industry's operational efficiency. This involved a meticulous process of identifying key datasets that require immediate standardisation, followed by rigorous validation to ensure they meet the necessary criteria for data sharing. TWG collectively agreed to plan FY24/25 activities, using all the learnings and outcomes from previous piece of work. Indeed, all the findings and outcomes from previous years' work on Operational Data Sharing indicated that many of the existing data set are already quite well aligned and the effort required to further standardise existing datasets outweighed the benefits that industry organisations would gain. As a result, the technical working group emphasised the need to shift focus towards harmonising new datasets, considering that current and future code changes already address the immediate need for standardisation and already cover some of the existing gaps. Therefore, an additional need to focus on new datasets has been agreed to provide a higher value for the industry. The short-term plan's purpose was to address urgent industry needs by prioritising datasets based on their impact and necessity. This phase also paved the way to document the TWG's methodologies and criteria for dataset selection in future phases, ensuring transparency and clarity in the processes employed. As part of this phase, Super Grid Transformers (SGTs) Active and Reactive Power were identified as most urgent datasets to be standardised. By focusing on these essential, high-priority datasets, the ODS TWG aimed to lay a strong foundation for subsequent phases, ensuring that the most impactful areas are addressed early in the harmonisation process.

- **Long-Term Plan** (May 24 - Sep 24): Covered a detailed activity plan for the entire fiscal year, including dates and deliverables. The long-term plan process for data standardisation within the Operational Data Sharing Technical Working Group was a meticulously structured approach aimed at ensuring an orderly and systematic progression towards enhancing data sharing standards across the industry. This plan spans from May 2024 to March 2025, laying out detailed activities, timelines, and deliverables to be achieved within this period. The process began with the definition of priorities, which involved an in-depth discussion around dataset prioritisation to align industry needs with the strategic objectives of the ODS TWG. The prioritisation of datasets was anchored on several critical criteria. Firstly, the impact of the dataset on operational efficiency has been evaluated. Datasets that significantly influence daily operations and decision-making processes were given precedence. Secondly, the urgency of standardisation was assessed, with datasets that address immediate industry needs being prioritised. This ensures that the most critical gaps are addressed early, providing substantial value to the industry's data-sharing ecosystem. The prioritisation process emerged from a collective exercise that included participation from all organisations within the TWG, allowing each entity to contribute their insights and highlighting the diverse perspectives and needs across the industry. A high-level business case was developed for the prioritised datasets, justifying their selection based on their potential to enhance operational efficiencies and improve decision-making processes and allow organisations' Distribution Management Systems (DMS) to facilitate and bring efficiency to operations. This business case was essential for securing stakeholder buy-in and ensuring that the standardisation efforts are aligned with the broader strategic goals. The datasets were also categorised by voltage level to better identify priorities and address industry needs more effectively. This process allowed for a more granular approach to dataset standardisation, ensuring that the specific requirements of different segments of the industry were adequately catered to. Extra High-voltage datasets (400kV-33kV), which have a broader impact on the grid's stability and reliability, were given top priority. Medium and low-voltage datasets (>33kV), while also crucial, were addressed in subsequent phases based on their relative importance and the resources available. The long-term plan adopted a sprint-based approach, a methodology that facilitates iterative progress and continuous improvement. Each sprint length was agreed, and during these sprints specific datasets were targeted for standardisation. This approach allows the ODS TWG to maintain a steady pace of progress while regularly reassessing and refining their methods based on the learnings from previous sprints. At the end of each sprint, a comprehensive review is conducted to evaluate the outcomes against the set objectives. This review process is integral to the sprint-based approach, as it provides an opportunity to identify any bottlenecks or challenges encountered and develop strategies to address them in subsequent sprints.
- **Implementation Approach** (Oct 24 - Jan25): The ONP Steering Group had formally requested to include implementation recommendations , emphasising the need to incorporate clear and definitive implementation principles. This directive aimed to establish unambiguous guidelines for the execution of the standardised datasets, ensuring all stakeholders were aligned in their approach and objectives. The implementation of these datasets was not merely a technical challenge; it presented a multifaceted landscape due to processes and systems across the various organisations involved. Each participating entity brought to the table a unique set of capabilities, experiences, and technological infrastructures, thereby necessitating a tailored approach to ensure successful deployment. The Steering Group's request underlined the importance of inclusivity in the implementation principles, taking into account the varying developmental stages of the organisations. This factor necessitated a flexible, yet structured, set of guidelines that could cater to both ends of the spectrum. The challenge was further compounded by the fact that not all entities had access to

fundamental or underpinning enablers such as Inter-Control Centre Communications Protocols (ICCPs), which had been chosen as the preferred method for facilitating real-time data sharing. The absence of such fundamental tools in some organisations highlighted the need for an adaptable framework that could bridge these gaps. In response to the Steering Group's directive, plan aimed to lay down explicit steps for implementation, starting with a thorough assessment of each organisation's current state.

Though, ICCPs have been identified as a key technology to support the implementation of operational data sharing, from NESO's standpoint, delivering ICCPs to different organisations and areas simultaneously presents significant challenges. Equally, the initial rollout philosophy, which provided ICCP connections to areas with demonstrated issues, resulted in the fragmented nature of the technology landscape for ICCP implementation. The re-baselining effort was thus not just a reorganisation of the timeline but a strategic recalibration to ensure an adequate and fair deployment of data-sharing, accounting for potential discrepancies between the organisations' initial state in terms of technology readiness. Moreover, the implementation principles were designed to foster a collaborative environment, encouraging knowledge sharing and best practices among organisations. The complexity of the implementation space was also recognised in the project's risk management framework. The plan included comprehensive risk assessments, identifying potential hurdles and developing mitigation strategies tailored to the unique challenges faced by each organisation. This proactive approach to risk management aimed to anticipate and address issues before they could impede progress, thereby maintaining the momentum of the implementation efforts.

## Standardisation Workstream

The ODS TWG has embarked on a significant endeavour aimed at enhancing the standardisation of data sharing across the energy sector. This initiative is structured into distinct sub-workstreams, each with a critical role in the overall process: Identification & Scoping and Dataset Prioritisation.

The Identification & Scoping sub-workstream is a meticulous process that forms the backbone of the standardisation effort. It involves a comprehensive review and analysis of the datasets initially collected during earlier phases. The primary objective here is to ensure that these datasets align with the core mandate of the ODS TWG, which focuses on real-time and operational data. This sub-workstream not only catalogued the relevant datasets but also establishes clear directions for data exchange between NESO and the DNOs. Additionally, it involved introducing asset-specific datasets crucial for bilateral data exchanges, particularly at the Grid Supply Point (GSP) level. By providing precise definitions and clarifications, this sub-workstream ensures transparency and a clear rationale for the necessity of data sharing. To clarify, GSP data-sharing involves specific datasets that sourced from Transmission Owned assets (e.g. SGTs). Defining the data frameworks for these datasets has required a certain degree of Transmission Operators (TOs) collaboration, and this effort will continue to be necessary through the implementation phase.

On the other hand, Dataset Prioritisation addressed the complexities and varying priorities identified during the scoping phase. This sub-workstream was crucial in establishing a common priority framework despite differing perspectives between the NESO and DNOs.

### Dataset Identification and Scoping

The dataset identification and scoping activity within the Operational Data-sharing Technical Working Group (TWG) drew upon the dataset collection conducted during phase-1 by the NESO DER Visibility Programme. This initial dataset collection served as the foundation for further analysis and refinement.

The TWG meticulously reviewed the list of datasets, ensuring alignment with the mandate of the ODS TWG, which focused on real-time and operational data. As a result, certain datasets were deemed out of scope and excluded from further consideration.

To establish clear data-flow direction, the TWG identified the direction of data exchange between the NESO and DNOs. This determination was crucial in understanding the flow of information and optimising data sharing processes.

In addition to the existing datasets, the TWG recognised the need to incorporate additional asset-specific datasets. These datasets hold significant importance for bilateral data exchanges between the NESO and DNOs, particularly in defining power flows at the Grid Supply Point (GSP) level. These additions will facilitate the convergence of state estimation and Advanced Management System algorithms within the DNOs' Distribution Management Systems and NESO's Energy Management System at the transmission-distribution boundary.

To enhance clarity and understanding, the TWG provided additional data clarification for the identified datasets. This involved offering precise definitions and, importantly, providing data explainability. The rationale behind the necessity of data sharing was explicitly outlined, ensuring transparency and clarity.

During the progression of activities related to asset-specific datasets and data clarification, the TWG acknowledged the complexity of certain datasets. Recognising the need for accuracy, the TWG determined that further research and investigation were required to provide precise descriptions and rationale for these complex datasets.

As the TWG transitioned to the next phase, prioritisation, it became evident that defining a common priority was challenging. The priorities of NESO and DNOs regarding data sharing differed, necessitating careful consideration and collaboration to establish a mutually agreeable approach.

## Dataset Prioritisation

In light of the findings from the previous phase of data identification, which highlighted the complexity of datasets and challenges in achieving holistic data prioritisation, the TWG recognised the need to take decisive action. Understanding the importance of maintaining momentum and expediting standardisation efforts, the TWG made the strategic decision to establish short-term priorities to address the most urgent standardisation needs across the industry.

This prioritisation process builds upon the groundwork laid in the previous work on standardising active power for Super Grid Transformers (SGTs). By focusing on short-term priorities, the TWG aims to seize the low-hanging fruits and address pressing standardisation requirements promptly.

Agreeing on these short-term priorities serves multiple purposes. Firstly, it allows the TWG to efficiently allocate resources and efforts towards areas that require immediate attention, ensuring effective utilisation of available resources. Secondly, it enables the TWG to demonstrate tangible progress and deliver results in a timely manner, satisfying the industry's need for accelerated standardisation.

By prioritising these short-term goals, the TWG aims to achieve quick wins while laying the foundation for broader and more comprehensive standardisation efforts. This approach acknowledges the urgency of certain standardisation needs and ensures that the TWG can effectively address critical areas that require immediate attention.

The TWG's decision to define short-term priorities reflects the commitment to expedite standardisation efforts and meet the urgent needs of the industry. By targeting specific areas, the TWG can make significant progress, demonstrating the value of standardisation and paving the way for further advancements in the future.

| Standardised Network Datasets | | | |
|---|---|---|---|
| **Datasets** | **Data Description** | **Data Rationale** | **Voltage [kV]** |
| **SGTs Active power** | *Active power flow assessed at the Transformer level.* | *Sharing the Active Power value, measured at the Transformer asset level will help to control active power flows across the network and make models to converge both on Transmission and Distribution side, as NMS and additional system rely on this data, as well as guarantee a higher degree of visibility of the whole network. This also refers and applies to data associated to Tertiary winding (if present).* | *400 – 275 – 132* |
| **SGTs Reactive power** | *Reactive power flow assessed at the Transformer level.* | *Sharing the Reactive Power value, measured at the Transformer asset level will help to control Voltage/reactive power flows across the network and make models to converge both on Transmission and Distribution side, as NMS and additional system rely on this data, as well as guarantee a higher degree of visibility of the whole network. This also refers and applies to data associated to Tertiary winding (if present).* | *400 – 275 – 132* |
| **SGTs Current** | *Current power flow assessed at the Transformer level.* | *Sharing the Current value, measured at the Transformer asset level will help to control current flows across the network and make models to converge both on Transmission and Distribution side, as NMS and additional system rely on this data, as well as guarantee a higher degree of visibility of the whole network. This also refers and applies to data associated to Tertiary winding (if present).* | *400 – 275 – 132* |
| **Limit Signals for DERs** | *Active, Reactive Power & Voltage set-point instructed by the DNO ANM system and enacted* | *These represent coordinated NESO/DNO or DNO direct instructions to DERs. Having visibility on these data will guarantee additional awareness on GSP* | *132 – 66 – 33* |

| | | | |
|---|---|---|---|
| | *by a specific DER. This applies to DERs operating under an ANM system and with a flexible connection scheme.* | *demand and how these changes over time. Equally, in the future, when DERs will participate to different services these data will allow the NESO to understand if a specific DER within a DNO constrain group is dispatchable or not.* | |
| **Circuit Breaker Status** | *Network Status Data - CB status across network.* | *By sharing the position for the CB and any other switching asset across the network, besides having an updated network model available, could help to model and understand the power flows across the network. Interest will be towards the CBs installed across the TD boundary, as they represent a key element enabling power flows/state estimations/NMS to converge and work correctly.* | *132 – 66 – 33* |
| **Transformers TAP changer position** | *Position, in terms of available steps for the TAP changer. (It should be clarified if the step change could be performed on-load/off-load conditions).* | *Sharing TAP changer position for Transmission and Distribution owned transmission will allow to better assess how voltage control could be performed, as well as what is the +/- steps which are still available. This will also open to a closer cooperation between Transmission and Distribution in terms of network operability.* | *132 – 66 – 33* |
| **Circuit Breaker Active power** | *Active power flow assessed at the CB level or any other switching component.* | *Sharing the Active Power value, measured at the CB or switching asset level will help to control active power flows across the network and make models to converge both on Transmission and Distribution side, as NMS and additional system rely on this data.* | *400 – 275 – 132 – 66 – 33* |
| **Circuit Breaker Reactive power** | *Reactive power flow assessed at the CB level or any other switching component.* | *Sharing the Reactive Power value, measured at the CB or switching asset level will help to control Reactive Power Flows across the network and make models to converge both on Transmission and Distribution side, as NMS and additional system rely on this data.* | *400 – 275 – 132 – 66 – 33* |
| **Busbar Voltage** | *Voltage measured at the busbar level.* | *Sharing the voltage value, measured at the bus bar level will help to control voltage across the network and make models to converge both on Transmission* | *400 – 275 – 132 – 66 – 33* |

| | | | |
|---|---|---|---|
| | | *and Distribution side, as NMS and additional system rely on this data. Sharing busbar voltage value imply sharing the voltage at which all the connected assets are operated (Transformers, CB, Reactors, ...).* | |
| **Circuit Breaker current** | *Current power flow assessed at the CB level or any other switching component.* | *Sharing the Current value, measured at the CB or switching asset level will help to control current flows across the network and make models to converge both on Transmission and Distribution side, as NMS and additional system rely on this data.* | *400 – 275 – 132 – 66 – 33* |
| **Transformer Active power** | *Active power flow assessed at the Transformer level.* | *Sharing the Active Power value, measured at the Transformer asset level will help to control active power flows across the network and make models to converge both on Transmission and Distribution side, as NMS and additional system rely on this data, as well as guarantee a higher degree of visibility of the whole network. This also refers and applies to data associated to Tertiary winding (if present)* | *66 – 33* |
| **Transformer Reactive power** | *Reactive power flow assessed at the Transformer level.* | *Sharing the Voltage value, measured at the Transformer asset level will help to control Voltage/reactive power flows across the network and make models to converge both on Transmission and Distribution side, as NMS and additional system rely on this data, as well as guarantee a higher degree of visibility of the whole network. This also refers and applies to data associated to Tertiary winding (if present).* | *66 – 33* |

*Table 1: List of standardised datasets.*

A clear example of a standardised data framework produced by ODS TWG could be appreciated in Appendix 2**.**

### Data Intake Process & Triage

To enhance the efficiency and reliability of power networks, it is crucial to establish a standardised data intake process for operational data. Such a setup ensures that data is consistently collected, processed, and utilised across different segments of the industry.

The importance of this process cannot be overstated; it allows for the seamless integration of new data, supports the optimisation of power flows, and helps in enhancing network operations and services.
ODS embodies the interim forum responsible for collecting industry real-time requirements for standardisation. By acting as the repository and coordinating entity for these requirements, ODS ensures that the data meets the specific needs of various stakeholders, creates industry data-sharing standards, and addresses the challenges associated with data accuracy, completeness, and coordination.

The ODS data intake process has been designed to be articulated in three different steps:

- **Submission of Data Standardisation Requests**: This is the initial step where data standardisation requests are submitted. These requests can come from various stakeholders who identify the need for standardising specific datasets.
- **Assessment and Prioritisation by the Technical Working Group** : Once the requests are submitted, the TWG assesses and prioritises them. This involves evaluating the importance and urgency of each request, considering factors such as industry needs, potential impact, and resource availability
- **Standardisation and Delivery of the Data**: After prioritisation, the TWG works on standardising the data. This includes defining data formats, ensuring consistency, and addressing any discrepancies. Once standardised, the data is delivered to the relevant stakeholders for use in operational processes.

The table below, shows the different challenges and opportunities associated with each single phase of the process.

| Data Intake Process | |
|---|---|
| **Triage Step** | **Challenges/Opportunities** |
| **Standardisation Request** | *Challenges:*<br>• *<u>Relevance</u> how the data request is relevant to ODS, how can standardising a specific dataset align with the TWG scope.*<br>• *<u>Data Request completeness and benefit case</u> main challenge is to get an exhaustive and complete outlook of what is the ask about, with specific data/ data quality requirements and rationale*<br>• *<u>Data coordination</u> coordinating multiple requests at the same time might be challenging and the process should be designed to cope with requests scale* |
| | *Opportunities:*<br>• *<u>Centralised data triaging</u> creating a single source of truth and a single POC for data triaging will define synergies*<br>• *<u>Efficient SMEs engagement</u> SMEs are not dragged in multiple forums or independent discussions, but effectively involved once an adequate number of datasets in their area of competence is accumulated*<br>• *<u>Cross-industry data assurance</u> teams requesting for standardisation are confident that the output captures issues and complexities encompassing different* |

| | |
|---|---|
| | *organisations' processes and ways of working, and potentially provide high-level guidelines for processes homologation* |
| **Backlog prioritisation** | *Challenges:*<br>• *Balancing Urgency and Value weighing the urgency of tasks against their value. It's easy to fall into the trap of prioritising datasets that seem urgent but may not provide significant benefit for the wider industry. A structured prioritisation approach can help mitigate this issue by ensuring that both urgency and value are considered*<br>• *Timelines aligning with timelines might be tricky. TWG must prioritise datasets based on the benefit they provide rather than the urgency for delivery. Equally one specific project or initiative might require standardisation of different priority operational datasets, therefore aligning timelines is crucial.*<br>• *Manage dependencies dependencies with other TWG should be managed properly, getting a clear visibility of what are the full range of dependencies of data standardisation. Standardisation of one dataset might have dependencies on* |
| | *Opportunities:*<br>• *Agreed practices this is an opportunity to define a clear guideline for prioritisation which industry-wide agreed*<br>• *Participated and enhanced Decision-Making the process behind prioritisation is assured by the essence and the structure of the TWG itself.*<br>• *Support from ONP coordination gaps in prioritisation can be assessed in coordination and with the support from other TWGs* |
| **Standardisation Delivery** | *Challenges:*<br>• *Data Availability, Quality and Consistency Ensuring that the data being standardised is Available, of high quality and consistent across different sources is a significant challenge. Variations in data formats, missing values, and discrepancies can hinder the standardisation process.*<br>• *Resource Availability and Allocation The standardisation process requires specialised skills and resources, including SMEs. Ensuring that these resources are available and adequately allocated can be challenging, especially when there are competing priorities and limited availability of key personnel.*<br>• *Stakeholder Engagement and Collaboration Successful standardisation requires active engagement and collaboration among various stakeholders, including different Organisations. Ensuring that all stakeholders are aligned and committed to the standardisation goals can be difficult.* |
| | *Opportunities:* |

| | |
|---|---|
| | • *<u>Standards dissemination</u> Going through the ODS Data Intake Process, standards can be easily disseminated across the organisation. This ensures that everyone is on the same page and follows the same guidelines, which helps in maintaining consistency and quality in data management and sharing.*<br>• *<u>Leverage learnings and past standardised frameworks</u> By leveraging learnings and past standardised frameworks, the ODS Data Intake Process can benefit from previous experiences and best practices. This helps in avoiding past mistakes, building on successful strategies, and ensuring that the process is efficient and effective.*<br>• *<u>Speed up the pace for delivery</u> The ODS Data Intake Process can help speed up the pace for delivery by streamlining the steps involved in data standardisation and sharing that have been already developed and tested.* |

*Table 2: Triage Process - Challenges & Opportunities.*

## Implementation Workstream

The Implementation Workstream is responsible for translating the strategic plans and standardisation efforts into actionable steps. This involves developing detailed guidelines for implementation, conducting risk assessments, and creating a high-level implementation plan. The workstream ensures that all necessary resources are allocated, dependencies are managed, and industry priorities are considered.

### Step by Step Approach to Implementation

The “Step-by-Step Conceptual Approach" provides a detailed roadmap for addressing the complex area of operational data sharing between NESO and DNOs. The step-by-step approach was deemed the only viable method to tackle this intricate task due to the multifaceted nature of the project, which involves numerous stakeholders, technical challenges, and the need for precise coordination.

The current situation reveals that decisions made by control rooms (NESO & DNO) are negatively impacted by the lack of real-time data visibility, leading to overly cautious measures and over-procurement of solutions. The goal is to enable data sharing that allows for more accurate and effective actions by both control rooms, informed by point-in-time data. This will enhance the efficiency of DNOs' ANM Schemes and state estimation tools.

The implementation approach is broken down into several key steps:

- Establish Governance Framework and Architectural Alignment: The first step involves setting up a governance framework and ensuring architectural alignment between NESO and DNOs. This includes defining roles, responsibilities, and processes for decision-making, as well as establishing a delivery model. Where possible existing governance bodies need to be used.
- Capture State of Maturity: This step involves assessing the current state of maturity within different organisations from a design perspective. This assessment helps in understanding the starting point for each involved parties.
- Define Use Cases: The next step is to define use cases, either within or outside of the ODS TWG (Operational Data Sharing Technical Working Group). This involves identifying specific scenarios and requirements for system operation, control, monitoring, and protection.

- Prioritise Use Cases and Data Sets: Once the use cases are defined, they need to be prioritised based on their criticality, impact, and alignment with project objectives. This step ensures that the most important and beneficial use cases are addressed first.
- Capture Technical and Real-World Blockers: This step involves identifying and addressing technical and real-world blockers faced by NESO and DNO SCADA teams and control rooms. It includes reworking processes to support interactions in BAU (Business As Usual) with current systems.
- Define Contractual Commitments and Launch: The final step involves defining contractual commitments between parties and planning for the live launch and post-live support. This includes establishing data-sharing agreements, procuring necessary hardware and software, and ensuring proper installation, configuration, testing, and training.

The step-by-step approach is essential for several reasons. Firstly, it provides a clear and structured roadmap that helps in managing the complexity of the project. Each step builds on the previous one, ensuring that all aspects of the project are addressed systematically. Secondly, it allows for continuous monitoring and adjustment, enabling the project to adapt to any changes or challenges that arise. Lastly, it ensures that all stakeholders are aligned and committed to the project's goals, which is crucial for successful implementation.

### Guidelines for Implementation

After having defined and agreed on a principle approach to delivery, the TWG focused on Guidelines for Implementation, which provide a comprehensive framework for executing a complex implementation effort. The structure of the guidelines is meticulously designed to ensure a systematic and coordinated approach, addressing various aspects of the project from governance to post-live support. Here is a summary of the key steps and sub-activities involved in the implementation plan:

- Establish Governance Framework and Delivery Model:
- **Governance Framework**: Define roles, responsibilities, and processes for decision-making. Establish a project-team structure, timelines, and resource allocation. Determine high-level options for the delivery model, whether it be in-house development, outsourcing, or a combination of both.
  - **Key Activities**: Role & Responsibility matrix, Preliminary RACI, Stakeholders Map, and Governance coordination between different organisational entities.
- High-Level Delivery Model Definition & Optioneering:
- **Delivery Option Assessment**: Evaluate different delivery options and establish performance metrics and reporting mechanisms.
  - **Key Activities/Deliverables**: Delivery option assessment, Performance metrics, and Reporting mechanisms.
- Key Enablers Definition:
- **Identify and Document Enablers**: Specify the desired capabilities, performance criteria, and operational constraints for major enablers (such as ICCPs).
  - **Key Activities/Deliverables**: As-is Architectural Map, Actors Map, and Gap analysis.
- Real-Time and Operational Use-Cases Definition:
- **Define Use-Cases**: Identify specific scenarios and requirements for system operation, control, monitoring, and protection.
  - **Key Activities/Deliverables**: Use-Case catalogue, Functional and non-functional requirement chart, and Stakeholder interviews.
- Real-Time and Operational Use-Cases Prioritisation:
- **Prioritise Use-Cases**: Evaluate use-cases based on their criticality, impact, and alignment with project objectives.

- **Key Activities/Deliverables**: Prioritisation Framework, Strategic Prioritization report, and CBA assumptions documentation.
- Solutionisation:
  - **Develop Solution Architecture**: Specify the hardware, software, data, communication protocols, and integration requirements.
  - **Key Activities/Deliverables**: Whole System Architecture, Data quality & reliability requirements book, and Integration requirement document.
- Contractual Commitments and Live-Launch:
  - **Establish Agreements**: Develop contractual and data-sharing agreements between partners. Plan and execute the live launch of the project, including installation, testing, commissioning, and handover.
  - **Key Activities/Deliverables**: Data-sharing contract framework, Procurement of required hardware and software, and Training manuals.
- Post-Live Support and Issue Resolution:
- **Support Guidelines**: Establish post-live support guidelines to support issue resolution.
  - **Key Activities/Deliverables**: Issue resolution support, Training materials, and post-live support guidelines.

Key activities are then summarised the table below:

| Guidelines for implementation | |
|---|---|
| **Step** | **Key Activities** |
| **Establish Governance Framework and Delivery Model** | *Role & Responsibility matrix, Preliminary RACI, Stakeholders Map, Governance coordination* |
| **High-Level Delivery Model Definition and Optioneering** | *Delivery option assessment, Performance metrics, Reporting mechanisms* |
| **Key Enablers Definition** | *As-is Architectural Map, Actors Map, Gap analysis* |
| **Real-Time and Operational Use-Cases Definition** | *Use-Case catalogue, Functional and non-functional requirement chart, Stakeholder interviews* |
| **Real-Time and Operational Use-Cases Prioritisation** | *Prioritisation Framework, Strategic Prioritisation report, CBA assumptions documentation* |
| **Solutionisation** | *Whole System Architecture, Data quality & reliability requirements book, Integration requirement document* |
| **Contractual Commitments and Live-Launch** | *Data-sharing contract framework, Procurement of required hardware and software, Training manuals.* |

| | |
|---|---|
| **Post-Live Support and Issue Resolution** | *Issue resolution support, Training materials, Post-live support guidelines.* |

*Table 3: Guidelines for Implementation - Key activities associated per each of the different workstreams.*

### Risk Assessment (Probability/Impact Scoring) and relative mitigation

After having defined all the major guidelines regarding implementation, the TWG proceeded with a specific impact assessment activity.

The impact assessment process is designed to systematically evaluate the potential risks that could affect the project's success. This process involves the following steps:

- **Risk Identification**: Each organisation involved in the project was asked to identify potential risks. These risks are then documented and categorised based on their nature and potential impact on the project.
- **Scoring System**: The identified risks are assessed using a scoring system that evaluates both the probability (likelihood) and impact (severity) of each risk.

The scoring scale is as follows:

| Scale | Probability | Description |
|---|---|---|
| 1 | *Very Unlikely* | *Has not happened before or is not expected to happen* |
| 2 | *Unlikely* | *Rarely Happens* |
| 3 | *Feasible* | *Possible but uncommon* |
| 4 | *Likely* | *Has occurred before, expected to occur again* |
| 5 | *Very Likely* | *Occurs frequently or occurrence appears imminent* |

*Table 4: Probability terms of reference.*

| Scale | Probability | Description |
|---|---|---|
| 1 | *Low Impact* | *Minimal loss, delay, inconvenience, or interruption.* |
| 2 | *Low/Medium Impact* | *Minor loss, delay, inconvenience, or interruption.* |
| 3 | *Medium Impact* | *Significant waste of time and resources, impact on operational efficiency, output, and quality.* |

| | | |
|---|---|---|
| 4 | *High Impact* | *Major impact on costs and objectives, serious impact on output and/or quality.* |
| 5 | *Very High Impact* | *Critical impact on overall achievement of objectives, critical impact on costs and/or reputation.* |

*Table 5: Impact terms of reference.*

And the approach that was taken to run the Impact assessment was based on two fundamental pillars:

- **Collective Exercise**: Each organization participates in a collective exercise to prioritise the identified risks. This involves discussing and agreeing on the probability and impact scores for each risk. The product of the probability and impact scores (P*I) is then calculated to determine the overall risk score.
    - **Risk Prioritisation**: Risks are prioritized based on their overall risk score (P*I). Risks with a score of 20 or higher are considered major risks and require immediate attention and mitigation strategies.

| Risk assessment | | | | |
|---|---|---|---|---|
| **Risk Description** | **Probability [ P ]** | **Impact [ I ]** | **P * I** | **Mitigation Strategies** |
| **Unclear roles and responsibilities** | *4* | *4* | *16* | *Establish a clear role and responsibility matrix, preliminary RACI, and stakeholders map.* |
| **Limited resources and resource constraints** | *4* | *5* | *20* | *Secure resources in advance, plan activities with adequate contingency, and engage stakeholders early.* |
| **Unrealistic timelines** | *5* | *5* | *25* | *Ensure timelines are realistic, incorporate contingency, and engage stakeholders to resolve concerns.* |
| **Stakeholders' unavailability** | *5* | *5* | *25* | *Secure stakeholders' buy-in, book their availability in advance, and provide clear priorities.* |
| **Project complexity underestimation** | *4* | *4* | *16* | *Conduct thorough project planning, define high-level project roles, and allocate resources appropriately.* |

| | | | | |
|---|---|---|---|---|
| **Ineffective governance structure** | *3* | *4* | *12* | *Establish a robust governance framework, conduct regular governance meetings, and involve the right people.* |
| **Data quality and reliability issues** | *4* | *4* | *16* | *Define clear data quality and reliability requirements and ensure alignment with stakeholders.* |
| **Delays in procurement** | *4* | *5* | *20* | *Plan procurement activities in advance, coordinate with stakeholders, and manage dependencies effectively.* |

*Table 6: Major risks and identified mitigation actions.*

### Implementation Plan

The ODS High-level Implementation Plan outlines a high-level strategy for enhancing data sharing of standardised datasets. The plan is structured around various workstreams and sub-workstreams, each with specific dependencies and resource requirements. Here is a detailed summary of the key concepts, assumptions, resource profiles, and indicative timelines:

The implementation plan is built on several critical assumptions:

- **Implementation Scope**: The actual implementation sits outside the ODS TWG (Technical Working Group). The timeline provided is purely indicative and subject to change based on resource availability and project priorities.
- **Resource Availability**: The availability of specific resources might be required across different projects and initiatives. Experts' availability may be limited during specific time windows, such as control room engineers being less available during winter periods due to high demand and adverse weather conditions
- **Prioritisation and Dependencies**: The chart serves to assess cross-TWGs or initiative dependencies, facilitating a prioritisation exercise. Prioritisation should consider the impact on resources required for delivery
- **Commitment to Timelines**: DNOs NESO cannot commit to specific timelines before understanding priorities and dependencies.
- **Resource Mirroring**: Resources required and captured in the plan are mirrored between NESO and DNOs (Distribution Network Operators). The assumption is that resources are not full-time, and the exact rate will be determined
- **Additional Resources**: Additional resources will be required if data quality is inadequate. Once the detailed plan is defined, a specific RACI (Responsible, Accountable, Consulted, Informed) for each workstream needs to be determined to calculate the exact involvement for each resource/specialist
- **TO Support**: Transmission Operator support might be required for SGTs (Super Grid Transformers) and GSP (Grid Supply Point) data.

The implementation plan identifies the following resource profiles required for data sharing of standardised datasets:

- **SCADA Engineer**: Responsible for Supervisory Control and Data Acquisition systems
- **Project Manager (PM)**: Oversees the project execution and ensures alignment with the plan
- **Control Room Engineer**: Manages control room operations and ensures system stability

- **Network Architecture Engineer**: Designs and maintains the network architecture
- **System Architecture Engineer**: Develops and maintains the system architecture
    - **Test Lead**: Leads testing activities to ensure system functionality and reliability
    - **Procurement Lead**: Manages procurement activities and vendor relationships
    - **Contract Lead**: Oversees contract management and compliance
    - **Legal Lead**: Provides legal support and ensures regulatory compliance
    - **ANM Engineer**: Manages Active Network Management systems
    - **Primacy Lead**: Ensures primacy concepts and rules are incorporated
- **NMS Lead**: Oversees Network Management Systems
- **Asset Manager**: Manages assets and ensures their optimal utilisation
    - **RTU Specialist/Field Engineer**: Handles Remote Terminal Units and field operations

### Dependencies

| Dependencies List | |
|---|---|
| **Key Dependencies** | **Description** |
| **Resource Availability and Allocation** | *Availability of specific resources is crucial across different projects and initiatives. Control room engineers might be less available during winter periods due to high demand and adverse weather conditions. Resources required for the project are mirrored between NESO and DNOs. The assumption is that resources are not full-time, and the exact rate will be determined.* |
| **Prioritisation and Dependencies** | *The implementation plan serves to assess cross-TWGs or initiative dependencies, facilitating a prioritisation exercise. Prioritisation should consider the impact on resources required for delivery. DNOs and NESO cannot commit to specific timelines before understanding priorities and dependencies.* |
| **Transmission Operator Support** | *Transmission Operator support will be required for SGTs and GSP data.* |
| **Governance Framework** | *Establishing a governance framework to define roles, responsibilities, and processes for decision-making is essential. This includes defining a high-level project timeline, project team structure, and resource allocation. Clear roles and responsibilities should be established, and regular calls should be organised to provide updates on governance and its structure.* |
| **Stakeholder Engagement** | *Identifying and engaging key stakeholders is critical. This includes securing SMEs and stakeholders' buy-in adequately in advance and ensuring their availability for workshops or crucial activities. It is recommended to avoid demand peak season/rain season for complex tasks that require their support.* |
| **Data Quality and Reliability** | *Additional resources will be required if data quality is inadequate. Once the detail plan is defined, a specific RACI for each workstream needs to be determined to* |

| | |
|---|---|
| | *calculate the exact involvement for each resource/specialist. Defining data-quality and data-reliability requirements based on the standard for data-sharing is crucial.* |
| **Integration with Existing Systems** | *Defining integration requirements with existing or new systems is necessary to ensure seamless data sharing and system functionality.* |
| **Testing and Validation** | *Defining testing and validation requirements for the solution, including developing a detailed solution architecture and design that addresses the prioritized use-cases.* |
| **Contractual and Legal Aspects** | *Establishing contractual data-sharing agreements and ensuring legal, financial, and technical aspects are addressed in the agreement.* |
| **Industry Coordination** | *Aligning and harmonising different initiatives in the data-sharing space, including coordination with other industry initiatives and TWGs.* |

*Table 7: Major dependencies*

## Next steps

To ensure the successful implementation of the key recommendations and to build on the progress made so far, the following next steps have been identified.

- Progress standardisation effort: it is essential to acknowledge that while high & medium-priority datasets have been successfully addressed, there remains significant work to be done with lower-priority operational datasets. Additionally, it is crucial to anticipate and prepare for potential new needs for data standardisation, particularly for specific and niche use-cases. This proactive approach will ensure comprehensive coverage and adaptability to evolving requirements.
    - Develop System Integration Requirements: system integration is critical for seamless data sharing and functionality. Defining clear integration requirements for existing and new systems will help in achieving interoperability and efficient data flow. Pilot projects or other data-sharing initiatives already happening in the space can be employed to test integration approaches and refine processes before full-scale implementation process.
- Promote Industry Coordination: aligning and harmonising different initiatives within the data-sharing space is crucial. Coordination with other industry initiatives and TWGs will help in avoiding duplication of efforts and fostering synergies. Establishing regular communication channels and collaborative platforms will facilitate information exchange and joint problem-solving across Open Networks.
    - Build on Harmonisation Principles: the harmonisation principles tested with two operational datasets should be further refined and expanded. Developing a comprehensive standardisation framework based on these principles will ensure consistency and reliability in data sharing practices. standardisation framework. Continuous improvement mechanisms should be embedded to adapt the framework as needed.

## Appendix 1 - Acronyms

This section provides a concise repository of key abbreviations essential to navigate this technical document, as well as enhance reader comprehension by providing clear definitions.

| Acronyms Table | |
|---|---|
| **Abbreviation** | **Description** |
| **ANM** | *Active Network Management* |
| **BAU** | *Business as usual* |
| **CB** | *Circuit Breaker* |
| **CBA** | *Cost Benefit Analysis* |
| **DERs** | *Distributed Energy Resources* |
| **DMS** | *Disitribution Management System* |
| **DNO** | *Disitribution Network Operator* |
| **ENA** | *Energy Network Association* |
| **ENTSO-E** | *European Network of Transmission System Operators for Electricity* |
| **GSP** | *Grid Supply Point* |
| **ICCP** | *Inter-Control Centre Communications Protocol* |
| **MW** | *Megawatt* |
| **NESO** | *National Energy System Operator* |
| **NMS** | *Network Management System* |
| **ODS** | *Operational Data Sharing* |
| **ONP** | *Open Networks Programme* |
| **PM** | *Project Manager* |

| | |
|---|---|
| **POC** | *Point of contact* |
| **RACI** | *Responsible, Accountable, Consulted, and Informed* |
| **RTU** | *Remote terminal unit* |
| **SCADA** | *Supervisory Control and Data Acquisition* |
| **SGT** | *Super Grid Transformer* |
| **SME** | *Subject Matter Expert* |
| **TD** | *Transmission-Distribution* |
| **TO** | *Transmission Operator* |
| **TWG** | *Technical Working Group* |

*Table 8: Acronyms.*

## Appendix 2 – Standardised Framework for SGTs Active Power

| Attribute | Description | Comments |
|---|---|---|
| Data variable name | **X_SGT1_**P*** | *[Network]_[GSP name]_[SGT number]_**P** is an example convention*<br><br>*Align with ICCP tagging standard from ENTSO-E* |
| Data Name | *Active Power at *DNOtag_SiteName_L_SGTx_**P*** | *DNOtag_SiteName_L_SGTx_**P***<br><br>*where:*<br><br>*-DNOtag is the name of the DNO*<br><br>*-SiteName is a 4 letter code, nationally agreed which identifies the GSP*<br><br>*-L is a letter which identifies the voltage level (ENTSO-E)*<br><br>*-SGTx SGT asset number (1,2,3..,n)* |

| | | |
|---|---|---|
| Flow direction | *Defined by the sign and the agreed convention* | |
| Description | *This is the active power flow (either forward or reverse) at the substation's SCADA system.* | |
| **Unit** | *MW* | |
| **Precision** | *1 decimal places* | |
| **Value type** | *This provides clarity on how this data point has been generated. The options are:*<br>*• Measured – from an RTU owned by the organisation*<br>*• Calculated – you can calculate from known measurement*<br>*• Forecast – e.g. data could be received as "this is tomorrow's value, and this is today's value"*<br>*• Estimated – estimate from power system analysis, e.g. from state estimations and load flow*<br>*• Monitored – if data is received from a third party (outside of the organisation)* | |
| **Accuracy** | *This provides the accuracy of the data value, either underpinned by accuracy of the metering or through error analysis of calculations.* | |
| **Latency** | *The resolution of real-time telemetry data* | *10 seconds – standard for ICCP links* |
| **Exchange Frequency** | *This indicates the frequency of telemetry signals, or more generally data exchanges. This could be from seconds (operation) to monthly (for planning)* | |
| **Site** | *Name of the GSP site where the SGT is situated* | |
| **Source system** | *The system which is the source of the data (usually SCADA)* | |

| | | |
|---|---|---|
| **Target system** | *The system which is the destination of the data (usually another SCADA)* | |
| **Upper limit** | *Upper limit of the measurement gives a reasonability interval to interpret the measure (if known)* | |
| **Lower limit** | *Lower limit of the measurement gives a reasonability interval to interpret the measure (if known)* | |
| **Equipment owner** | *The owner of the equipment (TO or DNO)* | |
| **Data exchange channel** | *The method that the data is being transferred on* | |

*Table 9: SGTs Active Power framework.*

**Visit our website to find out more about [Open Networks]**

**Energy Networks Association**
4 More London Riverside
London SE1 2AU
t. +44 (0)20 7706 5100

w. energynetworks.org
@EnergyNetworks



Energy Networks Association Limited is a company registered in England & Wales No. 04832301
Registered office: 4 More London Riverside, London, SE1 2AU