



# Virtual Energy System

Powered by National Grid ESO

# Powering Wales Renewably

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D2.1 – Other Systems and Initiatives Investigation

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## Purpose of this document

This document aims to summarise the investigation into other systems and initiatives that may influence the direction of the Powering Wales Renewably (PWR) project.

## Contents

Purpose of this document.....	2
Contents .....	2
1. Overview .....	4
2. Open Networks Programme .....	5
3. Industry Datasets and Process Changes .....	6
3.1 Smart Optimisation Output (SOO) .....	6
3.2 Long Term Development Statement (LTDS) .....	6
3.3 Network Development Plan (NDP).....	6
3.4 Electricity Ten Year Statement (ETYS) .....	7
3.5 Whole System Coordination Register .....	7
3.6 Future Energy Scenarios (FES / DFES).....	7
3.7 Embedded Capacity Register (ECR) .....	8
3.8 Distributed Generation Connections Guide (DG Connections Guide) .....	8
4. Other Collaborative Initiatives .....	9
4.1 Local Area Energy Planning (LAEP) .....	9
4.2 Regional Development Programmes (RDP) .....	9
5. Digitalisation Guidance .....	10
5.1 Energy Data Taskforce .....	10
5.2 Energy Digitalisation Taskforce .....	11
5.3 The Energy System Digital Spine .....	12
5.4 Data Best Practice Guidance and Digitalisation Strategy .....	12
5.5 National Digital Twin programme .....	13
6. Digital Twin Initiatives.....	15
6.1 Virtual Energy System .....	15
6.2 National Digital Twin Programme - Isle of Wight .....	15
6.3 Gas System of the Future Digital Twin.....	15
6.4 EN-Twin-e .....	15
7. Potential Additional Information Sources.....	17
7.1 DataMapWales .....	17
7.2 Icebreaker One - Open Energy .....	17
7.3 Additional Data Repositories.....	18
8. Conclusion .....	19



## 1. Overview

The Powering Wales Renewably (PWR) project is not being delivered in isolation. Several systems and digitalisation initiatives have been identified that can be coordinated with to yield additional value and advance the energy sector's intelligent data sharing fabric. The following is not an exhaustive list of such initiatives and projects. However, it attempts to identify the most relevant projects in this arena. A more comprehensive list of systems and initiatives is being maintained, as a part of the PWR project, to ensure that project synergies are fully exploited, and any duplication is avoided.

## 2. Open Networks Programme

The Energy Networks Association (ENA), via its Open Networks Programme, has an ongoing programme of initiatives to transform the way the electricity industry operates. These initiatives, including data sharing, are aimed at improving the ability of the UK's electricity network to deliver the changes required for the energy transition. The initial series of workstreams have already resulted in changes to industry regulation and approach.

The series of workstreams from 2017-2022 was as follows:

- **WS1A: Flexibility Services**

This defined in the industry's approach to management of flexibility services, including the development of Primacy Rules, which manage conflicts between transmission and distribution operators.

- **WS1B: Whole Electricity System Planning and T/D Data Exchange**

This defined the development of the Network Options Assessment (NOA), Network Development Plans (NPD), Future Energy Scenarios (FES) and Distribution Future Energy Scenarios (DFES) and the Whole Electricity System Co-ordination Register.

- **WS2: Customer Information Provision and Connections**

This examined the publication of data that may influence the provision of connections, including the Embedded Capacity Register (ECR).

- **WS3: DSO Transition**

This stream examined the requirements for managing the electricity system, balancing supply and demand, as a more localised level.

- **WS4: Whole Energy Systems**

Looking at how electricity and gas systems interact, considering efficiencies across the whole system, to work towards net zero emissions. This included the shaping of the approach to Local Area Energy Planning (LAEP).

This series of workstreams became the basis of subsequent regulatory changes that are forming the foundations of work in the digitalisation of the UK electricity system.

URL: <https://www.energynetworks.org/creating-tomorrows-networks/open-networks/>

From 2023 the focus areas for the Open Networks Programme became:

1. Network Operation
2. Market Development
3. Planning and Network Development/
4. Open Networks 2017 - 2022



### 3. Industry Datasets and Process Changes

In order to support the objectives of the Open Networks Programme, electricity network operators are being asked to make available more information to their various stakeholders. Some of this information may be required to be incorporated into an electricity network model.

#### 3.1 Smart Optimisation Output (SOO)

As part of the Smart Optimisation Output (SOO) initiative, Ofgem has published guidance, including the provision of a System Visualisation Interface.

Ofgem recommends that licence holders provide visualisations of (but not limited to) the following:

- Long Term Development Statements (LTDSs)
- Heat Maps
- Network Development Plans (NDPs)
- Distribution Future Energy Scenarios (DFES)
- Network Impact Assessments
- Data visualisation and digital tools
- Strategic network planning outputs
- Primary and secondary reinforcement data incl. the Load Index submission
- Load Related Expenditure (LRE) strategies and plans
- DSO strategies, Digitalisation Strategies and Action Plans
- flexibility strategies and procurement plans

Some of these have potential for inclusion by the Powering Wales Renewably project. These are investigated in more detail in the following entries.

#### 3.2 Long Term Development Statement (LTDS)

The Long Term Development Statement (LTDS) is a report of network and key parameters. They are provided to allow existing and potential customers to make an initial assessment of the capabilities of the electricity network and how it may be used.

The LTDS is a long-established framework for sharing electricity network information for stakeholders. It is required under Standard Licence Condition 25. It provides information for a two-year network development horizon and provides information on the network, mainly covering 33kV and above.

The LTDS network information has been published in a variety of ways by different electricity operators. However, there are initiatives to standardise publication format towards the use of the Common Information Model (CIM).

#### 3.3 Network Development Plan (NDP)

The Network Development Plan (NDP) is published in association with the Long-Term Development Statement (LTDS) to indicate the progression beyond the timeline of the LTDS. This is also required as a condition of the electricity distribution licence (Standard Condition 25b). It includes the following information:

- Description of portions of network where new connections can be made
- Description of portions of network where capacity is limited
- Information for other network and system operators
- Information and opportunities for flexibility / energy efficiency services

The information covers the network at 11kV and above, but does not include secondary transformers and substations. However, the information format and presentation are not yet standardised across the industry.

### 3.4 Electricity Ten Year Statement (ETYS)

The ESO's Electricity Ten Year Statement (ETYS), published annually, provides a view of how changes to the future system will impact the National Electricity Transmission System (NETS) for the next ten years. This is required under a transmission licence condition (C11). This uses data from Future Energy Scenarios (FES) to determine "problem" areas on the transmission network. These are assessed through the Network Options Assessment (NOA) process.

### 3.5 Whole System Coordination Register

The Whole System Coordination Register is intended to facilitate the coordination and cooperation between transmission licensees and electricity distributors to identify where actions taken by one transmission licensee or electricity distributor could have cross-network impacts (positive or negative). It is required as a standard transmission (D17) and distribution (7A) licence condition. It identifies actions and initiatives undertaken as a result of coordination and cooperation activities completed with other electricity network licensees. It is intended to facilitate efficient and economical operation of electricity distributors' and/or transmission operators' networks.

### 3.6 Future Energy Scenarios (FES / DFES)

Future Energy Scenarios (FES), and the equivalent distribution report - Distribution Future Energy Scenarios (DFES), are a suite of reports designed to identify portions of the networks where congestion is likely to occur as a result of the low carbon electricity transition. These are produced by transmission network operators (FES) and distribution network operators (DFES). These consider a range of standardised scenarios influenced by different low carbon technology uptake levels. The objective is to provide an indication of parts of the network that will encounter limitations in the future. However, the format and presentation of this information is not standardised across DNOs or between the ESO and the DNOs. The information can be found on each individual network operators' websites.

### 3.7 Embedded Capacity Register (ECR)

The Embedded Capacity Register (ECR) is a register published by each DNO/IDNO on their websites consisting of site-specific data items for sites that are connected to the DNO/IDNO Party's Distribution System (or which are the subject of an accepted connection offer to be connected to the Distribution System), and which: (a) have an import capacity of 1 MW or more and are subject to a DSR Contract; and/or (b) have an export capacity of 1 MW or more.

This industry standardised report is produced monthly and is a Distribution Connection and Use of System Agreement (DCUSA) requirement, under change DCP 35C.

### 3.8 Distributed Generation Connections Guide (DG Connections Guide)

Information published to assist potential distributed generation (DG) providers to assess the capability of the network, in the area they are considering, to absorb the generated electricity. The provision of this information is a standard electricity distribution licence condition (25A). It is required to show network capabilities across the network operators' areas. However, the format and presentation of this information is not standardised across the industry. The information can be found on each individual network operators' websites.



## 4. Other Collaborative Initiatives

Other initiatives are being undertaken to improve the effective use of the UK energy networks.

### 4.1 Local Area Energy Planning (LAEP)

Local Area Energy Planning (LAEP) is a data driven and whole energy system, evidence-based approach that sets out to identify the most effective route for the local area to contribute towards meeting the national net zero target, as well as meeting its local net zero target.

The LAEP scope addresses electricity, heat, and gas networks, future potential for hydrogen, the built environment (industrial, domestic and commercial) its fabric and systems, flexibility, energy generation and storage, and providing energy to decarbonised transport, e.g. electricity to electric vehicles and charging infrastructure.

Actions to be addressed when developing the plan include: stakeholder engagement and a social process that considers both technical and non-technical evaluation, using robust cost inputs and standardised assumptions and data sets, multiple future scenarios / pathways, whole system approaches, spatial analysis (including zoning and data granularity), temporal analysis, network infrastructure impacts, and developing the plan through a credible and sustained approach to governance and delivery.

URL: <https://es.catapult.org.uk/tools-and-labs/local-area-energy-planning/>

### 4.2 Regional Development Programmes (RDP)

Regional Development Programmes (RDP) look across the whole electricity system to unlock more network capacity, reduce constraints and open new revenue streams for market participants.

An RDP is described as a project or study that considers the complex interactions between distribution and transmission networks in areas with large amounts of distributed energy resources (DERs). RDPs are designed to look at the whole electricity system and assess a variety of options to resolve specific network needs. These projects identify efficiencies for the whole electricity system and provide new tools and resources to manage system constraints – ultimately reducing costs for customers.

RDPs take a ‘design by doing’ method. This means they can consider various approaches including:

- traditional asset build solutions
- operational solutions
- the development of coordinated flexibility markets
- distribution system operation (DSO) solutions.

RDPs attempt to standardise the approach to their objective. A series of common principles have been defined to support the process.

URL: <https://www.nationalgrideso.com/research-and-publications/regional-development-programmes-rdps>

## 5. Digitalisation Guidance

In addition to the Open Networks programme, other digitisation initiatives have established guidance that has the potential to be useful to the Powering Wales Renewably (PWR) project.

### 5.1 Energy Data Taskforce

The Energy Data Taskforce (EDTF), commissioned by Government, Ofgem, and Innovate UK, set out five key recommendations that will modernise the UK energy system and drive it towards a net zero carbon future through an integrated data and digital strategy throughout the sector.

In its 2019 report, the EDTF identified that a staged approach needed to be taken to achieve a Modern, Digitalised Energy System in order to fill the data gaps and maximise data value:

- **Data Visibility:** Understanding the data that exists, the data that is missing, which datasets are important, and making it easier to access and understand data.
- **Infrastructure and Asset Visibility:** Revealing system assets and infrastructure, where they are located and their capabilities, to inform system planning and management.
- **Operational Optimisation:** Enabling operational data to be layered across the assets to support system optimisation and facilitating multiple actors to participate at all levels across the system.
- **Open Markets:** Achieving much better price discovery, through unlocking new markets, informed by time, location and service value data.
- **Agile Regulation:** Enabling regulators to adopt a much more agile and risk reflective approach to regulation of the sector, by giving them access to more and better data.

Based on its findings, the Taskforce developed five recommendations for Government, Ofgem, and Innovate UK:

- **Recommendation 1: Digitalisation of the Energy System** – Government and Ofgem should direct the sector to adopt the principle of Digitalisation of the Energy System in the consumers' interest, using their range of existing legislative and regulatory measures as appropriate, in line with the supporting principles of 'New Data Needs', 'Continuous Improvement' and 'Digitalisation Strategies'.
- **Recommendation 2: Maximising the Value of Data** – Government and Ofgem should direct the sector to adopt the principle that Energy System Data should be Presumed Open, using their range of existing legislative and regulatory measures as appropriate, supported by requirements that data is 'Discoverable, Searchable, Understandable', with common 'Structures, Interfaces and Standards' and is 'Secure and Resilient'.
- **Recommendation 3: Visibility of Data** – A Data Catalogue should be established to provide visibility through standardised metadata of Energy System Datasets across Government, the regulator and industry. Government and Ofgem should mandate industry participation through regulatory and policy frameworks.

- Recommendation 4: Coordination of Asset Registration – An Asset Registration Strategy should be established to coordinate registration of energy assets, simplifying the experience for consumers through a user-friendly interface in order to increase registration compliance, improve the reliability of data and improve the efficiency of data collection.
- Recommendation 5: Visibility of Infrastructure and Assets – A unified Digital System Map of the Energy System should be established to increase visibility of the Energy System infrastructure and assets, enable optimisation of investment and inform the creation of new markets.

URL: <https://es.catapult.org.uk/report/energy-data-taskforce-report/>

Recommendation 5, particularly, provides a clear directive to undertake the development of a whole system electricity network model. PWR provides one such opportunity to attempt this, in a constrained trial area. Other recommendations, in the report, provide the enablers for the provision of such a model. The report includes a series of appendices that add guidance on the implementation of the recommendations. In particular, Appendix 6 addresses the need for standards to be applied to the data interchanges that will support a smart, flexible energy system.

## 5.2 Energy Digitalisation Taskforce

Following on from the Energy Data Taskforce, the Energy Digitalisation Taskforce (EDiT) was established by the Department for Business Energy and Industrial Strategy (BEIS), Ofgem and Innovate UK to deliver a set of actionable recommendations that challenge the status quo and help deliver the digitalised energy system needed to reach Net Zero.

It commissioned an independent report, around a single strategic aim of developing a modern, decarbonised digital energy system, which identified the following six high-level recommendations:

- RECOMMENDATION 1: Unlock value of customer actions and assets – Crucially building trust and delivering control through a Consumer Consent portal, delivering a seamless ability for assets to connect and benefit from system value by mandating all large customer energy assets to be energy enabled. Consumer protection will need to be enhanced to reflect different risks and smart meter data needs to be released for the public good.
- RECOMMENDATION 2: Deliver interoperability – The sector needs to deliver interoperability through the development and deployment of four Public Interest Digital Assets with particular focus on a ‘Digital Spine’ To ensure interoperability we can build on some existing assets but require Data Sharing Fabric, Data Catalogue and development of some limited but crucial Standards.
- RECOMMENDATION 3: Implement new digital governance approach and entities – Governance of new digital assets and actions will be important and need to be developed soon. Governance around public interest assets, interacting algorithms and opening up regulated assets to digital competition will be important. There also needs

to be a Digital Delivery Body established by Government to deliver the public interest assets quickly to be subsequently handed over to the sector.

- RECOMMENDATION 4: Adopt digital security measures – Digital security principles and interventions are crucial but need to be fit for digital purposes with particular focus on cascade impacts, zero trust principles and a sharing culture.
- RECOMMENDATION 5: Enable carbon monitoring and accounting – Carbon visibility sits at the heart of all we propose, but much greater carbon visibility and standardisation is required. We recommend that dynamic carbon monitoring is put in place, and an open carbon standard needs to be deployed economy wide.
- RECOMMENDATION 6: Embed a digitalisation culture – Digitalisation is not valued or understood in all parts of the energy sector, with not enough skills or value given to digital assets and activities. BEIS should employ a Chief Data Officer and importantly investors and the rating agencies need to value digital assets as well as their traditional value assessment for infrastructure.

URL: <https://es.catapult.org.uk/report/delivering-a-digitalised-energy-system/>

### 5.3 The Energy System Digital Spine

As part of the recommendations from the Energy Digitalisation Taskforce (EDiT) report, the ‘digital spine’ is an initiative to address the issues surrounding the exchange of energy system data in a secure and interoperable manner.

Arup, in partnership with the Energy Systems Catapult and the University of Bath, have been appointed by the Department for Energy Security and Net Zero (DESNZ) to undertake a six-month feasibility study, to assess viability. The study aims to establish the needs case for an energy system ‘digital spine’ and its benefits to establishing a smart, flexible, decarbonised energy system and the data infrastructure required to deliver it.

The energy system digital spine feasibility study is a sub-programme of DESNZ’s Flexibility Innovation Programme, which seeks to enable large-scale widespread electricity system flexibility through smart, flexible, secure, and accessible technologies and markets. The study will involve comprehensive stakeholder identification and engagement throughout. It will aim to establish the potential scope of a digital spine, the data infrastructure required to deliver it, and the use cases as well as the governance of the spine.

URL: <https://es.catapult.org.uk/project/digital-spine-feasibility-study/>

### 5.4 Data Best Practice Guidance and Digitalisation Strategy

In 2021, Ofgem outlined its first Digitalisation Strategy and Action Plan (DSAP). This provided the route for the implementation of Data Best Practice in RIIO-ED2.

Data Best Practice provided the following principles:

- a) Identify the roles of stakeholders of Data Assets.
- b) Use common terms within Data Assets, Metadata and supporting information.
- c) Describe data accurately using industry standard Metadata.

- d) Enable potential Data Users to understand Data Assets by providing supporting information.
- e) Make Data Assets discoverable for potential Data Users.
- f) Learn and deliver to the needs of current and prospective Data Users.
- g) Ensure data quality maintenance and improvement is prioritised by Data User needs.
- h) Ensure Data Assets are interoperable with Data Assets from other data and digital services.
- i) Protect Data Assets and systems in accordance with Security, Privacy and Resilience (SPaR) best practice.
- j) Store, archive and provide access to Data Assets in ways that ensure sustained benefits.
- k) Treat all Data Assets, their associated Metadata and Software Scripts used to process Data Assets as Presumed Open.

Ofgem's Data Best Practice Guidance and Digitalisation Strategy and Action Plan Guidance is currently being reviewed.

URL: <https://www.ofgem.gov.uk/publications/decision-data-best-practice-guidance-and-digitalisation-strategy-and-action-plan-guidance>

## 5.5 National Digital Twin programme

The National Digital Twin programme (NDTp) was established by the UK Government in 2018. It was run by The Centre for Digital Built Britain (CDBB). CDBB brought together representatives from industry, academia and government on a five-year mission to consider the wider effects of the digital agenda on society and the economy. It sought to deliver a smart digital economy for infrastructure and construction, and to transform the UK construction industry's approach to the way we plan, build, maintain and use our social and economic infrastructure for the future. Among its outputs were standards and learnings to be applied to future digital twin projects. The foundation of this work was in response to the National Infrastructure Commission's 2017 report 'Data for the Public Good'.

The "Data for Public Good" report can be found at:

<https://nic.org.uk/app/uploads/Data-for-the-Public-Good-NIC-Report.pdf>

The NDTp also sought to establish standards for the operation of digital twins. One such example being the "Gemini Principles". These nine foundational principles, in summary, are: public good, value creation, insight, security, openness, quality, federation, curation, and evolution.

Further detail may be found at: <https://www.cdbb.cam.ac.uk/DFTG/GeminiPrinciples>

URL: <https://www.cdbb.cam.ac.uk/what-we-did/national-digital-twin-programme>

The initial phase of the National Digital Twin programme closed in 2022. However, the National Digital Twin Programme (NDTp) has been extended to support the Digital Twin hub, which provides a forum and information for implementers of digital twin projects.

URL: <https://digitaltwinhub.co.uk/ndtp/>



## 6. Digital Twin Initiatives

A number of “digital twin” projects and initiatives exist or have been considered. These may provide learning for Powering Wales Renewably (PWR). Significant examples of such projects include the following:

### 6.1 Virtual Energy System

In its own words, the Virtual Energy System (VirtualES) is an initiative to provide a real-time replica of our entire energy landscape that will work in parallel to our physical system. The Virtual Energy System is intended to improve simulation and forecasting abilities to support the long-term vision to operate a zero-carbon electricity system.

Key points relating to this programme are:

- Similar need for electricity network data to that of PWR
- VirtualES has given significant consideration to methods of collecting data to build network model
- Only looking at network down to 33kV level, at this stage
- Delivery timescale is beyond timeline for PWR project

URL: <https://www.nationalgrideso.com/future-energy/virtual-energy-system>

### 6.2 National Digital Twin Programme - Isle of Wight

Among the projects being investigated, under the direction of the current National Digital Twin Programme (NDTP), is the development of a digital twin of the Isle of Wight. This project is in its early stages. However, any provision of the electricity network data for that model would be from a single source, as the electricity network is entirely managed by Scottish and Southern Electricity Networks and there is no transmission network involved. As such, this is a much simpler energy network implementation than is proposed by the Powering Wales Renewably project.

URL: <https://digitaltwinhub.co.uk/ndtp/>

### 6.3 Gas System of the Future Digital Twin

Gas System of the Future Digital Twin project unified two SIF Discovery Phase projects (hydrogen production and gas network digital twins). The Alpha Phase aims to explore further the commercial, societal and operational benefits that could be derived from the deployment of a unified "gas system of the future" digital twin within a distribution network.

URL: <https://smarter.energynetworks.org/projects/10036957/>

### 6.4 EN-Twin-e

The EN-Twin-e project by SPEN completed the Discovery phase in association with the University of Strathclyde. It aimed to solve the issues associated with the absence of visualisation and simulation of the electricity transmission and distribution networks as a

complete system in real-time. This would assist in determining the full impacts and efficacy of using distribution connected assets to balance the national energy transmission system (NETS).

The idea of EN-twin-e was to develop a digital twin spanning transmission and distribution systems that could be used to provide a service to National Grid ESO to aid in decision making, when choosing which distributed energy resources to use when balancing the National Electricity Transmission System. It was hoped that this more complete view of the transmission and distribution networks would ensure the expected response is received at transmission without adversely impacting distribution. The project also sought to identify key functionalities and requirements of the Digital Twin.

URL: <https://smarter.energynetworks.org/projects/10025651/>

Learnings from this project are being considered as a part of PWR.

## 7. Potential Additional Information Sources

In addition to electricity network data, from the network operators, information to support the wider population of a network model to support the Powering Wales Renewably (PWR) project is potentially available from a number of sources.

### 7.1 DataMapWales

DataMapWales serves as a source for public sector data in Wales, providing a shared data platform to members of the public and public authorities. It provides a catalogued set of defined information sets. For example, “Pre-assessed areas for wind energy”.

DataMapWales datasets cover a variety of “topics”, other than just electricity. For example, “Built up Area by Population Size”. It also holds some electricity datasets, provided by National Grid Electricity Distribution.

URL: <https://datamap.gov.wales/>

### 7.2 Icebreaker One - Open Energy

Open Energy provides a Trust Framework for sharing energy data. Open Energy is described as an international programme, leading with the UK's energy data strategy. It aims to streamline data access and secure data sharing, while automating compliance processes. It is hoped that distribution network operators, startups, researchers, and stakeholders across industry will be able to drive efficiencies and innovation using the Open Energy approach. Open Energy is funded by public and private sector, and operated by Icebreaker One, an independent non-profit organisation.

Outcomes include Open Standards and Trust Framework(s):

1. A clear, trusted, impactful and detailed governance framework that enables government, businesses across sectors, consumers and third-party developers to understand the potential of open access to data.
2. Detailed descriptions of the application of the framework in practice, based on user needs and use cases.
3. Delivery of Search and Governance as industry-facing operational services that instil trust.

Open Energy holds a collection of datasets relating to different aspects of energy. It aims to provide reliable data and address licensing issues. As such, it is potentially a source of useful data to support PWR.

URL: <https://icebreakerone.org/open-energy-uk/>

### 7.3 Additional Data Repositories

The following is a summary list of additional repositories of data that may be useful to support the Powering Wales Renewably (PWR) project.

Repository Name	Organisation	Potentially Useful Information	URL	Notes
Nomis	Office for National Statistics	Demographic data	<a href="https://www.nomisweb.co.uk/">https://www.nomisweb.co.uk/</a>	
England and Wales Census Map	Office for National Statistics	Home heating types Renewable energy usage Population densities	<a href="https://www.ons.gov.uk/census/maps/">https://www.ons.gov.uk/census/maps/</a>	
StatsWales	Welsh Government	Demographic data	<a href="https://statswales.gov.wales/Catalogue">https://statswales.gov.wales/Catalogue</a>	
Solar Photovoltaics Deployment	Department for Energy Security and Net Zero	Solar PV Installations by Local Authority Area	<a href="https://www.gov.uk/government/statistics/solar-photovoltaics-deployment">https://www.gov.uk/government/statistics/solar-photovoltaics-deployment</a>	Includes installation counts and total capacity
Ordnance Survey Open Data	Ordnance Survey	General geographic data	<a href="https://osdatahub.os.uk/downloads/open">https://osdatahub.os.uk/downloads/open</a>	
Ordnance Survey Premium Data	Ordnance Survey	Detailed geographic information	<a href="https://www.ordnancesurvey.co.uk/">https://www.ordnancesurvey.co.uk/</a>	
MaGIC	Department for Environment, Food and Rural Affairs etc.	Environmentally sensitive areas	<a href="https://magic.defra.gov.uk/">https://magic.defra.gov.uk/</a>	

## 8. Conclusion

From the review of initiatives, it is clear that the Powering Wales Renewably Project scope put forward has not already been addressed. Specifically, no project has built an intelligent canonical electricity system model for complete regions of the British electricity system that require data inputs from multiple Operators' networks being subject to complex correlation. This presently unsatisfied scope is aligned with key recommendations of the Energy Data Taskforce, in particular, the provision of a Digital System Map of the Energy System.

A small-scale digital twin, for the Isle of Wight, has been initiated by the National Digital Twin Programme. A larger scale electricity system digital twin was proposed by SPEN, in its EN-Twin-e project. However, both examples only require that electricity network data is sourced from a single organisation.

A larger scale combined model of transmission and distribution networks, sourced from multiple providers, will be a common requirement for many future projects and to deliver a national digital twin of the British electricity system. Enabling work is also being undertaken, such as the publication of data by the Ice Breaker One initiatives.

This will be a fast-moving area of work. It will, therefore, be essential to maintain a view of the initiatives and systems that operate in this area. To that end, the Powering Wales Renewably (PWR) project will maintain communications with those projects and initiatives that have been identified as having a symbiotic relationship. In addition, the PWR team will keep a watching brief for additional projects, which may enter this arena, and build any necessary communication relationships. A central list of identified projects will, therefore, be maintained, to achieve this objective.