

## TIMESCALE



### Work Package 1:

Medium Voltage Direct Current Specification and Holistic Monitoring System

### Work Package 4:

Holistic Monitoring System Installation

**SDRC 1:** Publication of Holistic Monitoring System

**SRDC 3:** Commissioning of Holistic Monitoring System



### SRDC 7:

Publication of Operational Performance of MVDC converters

### Work Package 6:

Knowledge Dissemination continued

**April 2020**

**January 2016**

### Work Package 3:

Alternating Current (AC) System - Specification Tender and Installation

### Work Package 2:

MVDC Link - Design of Factory Acceptance Testing (FATs), Site Acceptance Testing (SATs) and Commissioning

**SRDC 2:** Publication of MVDC Technical Specification (TS)

**Work Package 5:** Cable Data Gathering and Analysis



### SRDC 4:

Factory Acceptance Testing (FATs) of MVDC Converters

**SRDC 6:** Publication of Holistic Monitoring System Data

**SRDC 8:** Effective Knowledge Dissemination

SRDC = Successful Delivery Reward Criteria



## ANGLE - DC

Operation AC to DC

## CONTACT US



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SP ENERGY NETWORKS



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## WHO ARE WE?

We are SP Energy Networks, part of the Iberdrola Group, leaders in sustainable innovation. As a Distribution and Transmission Network Operator we keep electricity flowing to homes and businesses throughout Central and Southern Scotland, North Wales, Merseyside, Cheshire and North Shropshire.

We do this through the network of overhead lines and underground cables which we own and maintain.

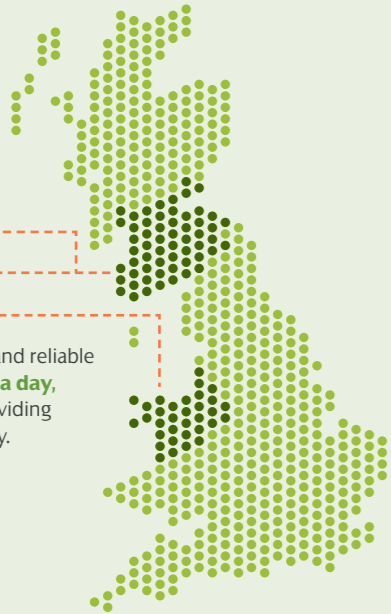
Our three regulated electricity licences are:

SP Transmission (SPT)

SP Distribution (SPD)

SP Manweb (SPM)

Our aim is to deliver a safe and reliable electricity supply **24 hours a day, 365 days a year** whilst providing exceptional value for money.

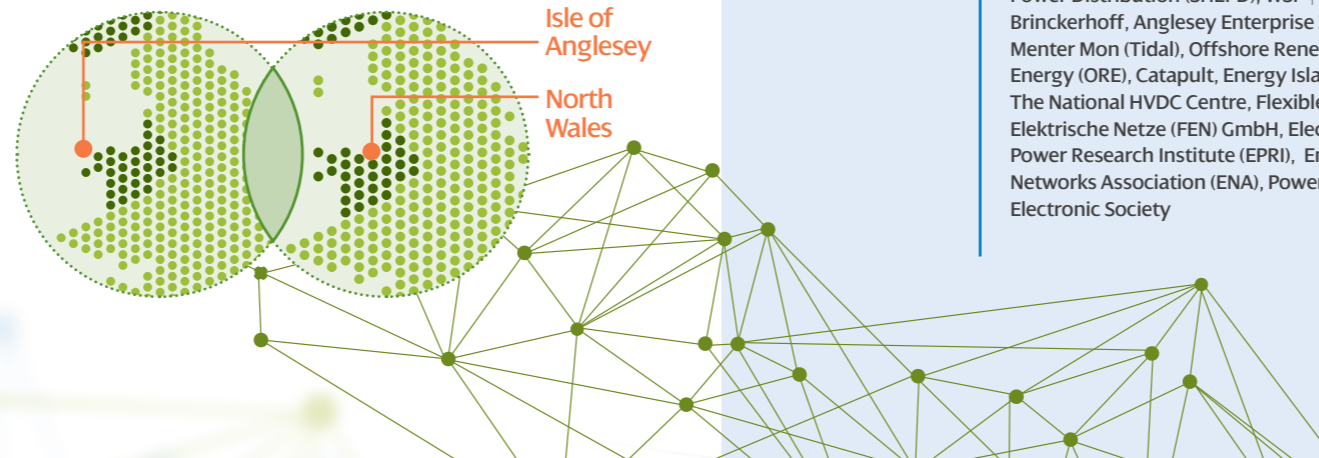


## ANGLE DC

Angle-DC is a smart and flexible method for reinforcing distribution networks. The project is creating a controllable bidirectional Direct Current (DC) link between two sections of our network, Isle of Anglesey and North Wales. Angle-DC is converting existing 33kV Alternating Current (AC) assets to DC.

This innovative project will adapt existing electronic technologies to build Medium Voltage DC (MVDC) link. This will smooth the way for the integration of increasing volumes of renewable generation and accommodate the growth of electricity demand. Angle-DC is building confidence in deploying MVDC technologies by other UK Distribution Network Operators and triggering the MVDC supply chain.

### LINK BETWEEN TWO SECTIONS



## PROJECT PARTNERS

Project Partners	GE Power Conversion
Academic Partners	Cardiff University
Project Supporters	Welsh Government, Isle of Anglesey County Council, Western Power Distribution (WPD), Scottish Hydro Electric Power Distribution (SHEPD), WSP   Parsons Brinckerhoff, Anglesey Enterprise Zone, Menter Mon (Tidal), Offshore Renewable Energy (ORE), Catapult, Energy Island, The National HVDC Centre, Flexible Elektrische Netze (FEN) GmbH, Electric Power Research Institute (EPRI), Energy Networks Association (ENA), Power Electronic Society

## BENEFITS FOR CUSTOMERS

- Increasing the capacity for load and generation connections. Reduced sleeving of Horizon Nuclear Power transfer via the parallel 33kV network.
- Enhanced power flow through an existing circuit to defer reinforcement which may be necessary for some connection requests.
- More precise control of the flow of power in the distribution circuit for improved efficiency to avoid naturally occurring AC overloads. This prevents the possibility of overload of the circuit, helping to reduce the number of faults.
- Control of voltage at either end of the distribution circuit to enhance the flow of electricity to customers.
- Control of reactive power flow at both ends of the distribution circuit.
- To lower losses and save wasted energy in the wider distribution network due to the improved voltage control.
- Rapid support to the system voltage during faults to enhance the electricity quality of supply to our customers.
- Fault level decoupling between distribution systems.
- Enables faster access to the network for renewable connections. This helps customers who wish to connect low carbon technologies such as wind turbines and photovoltaics to the network.

