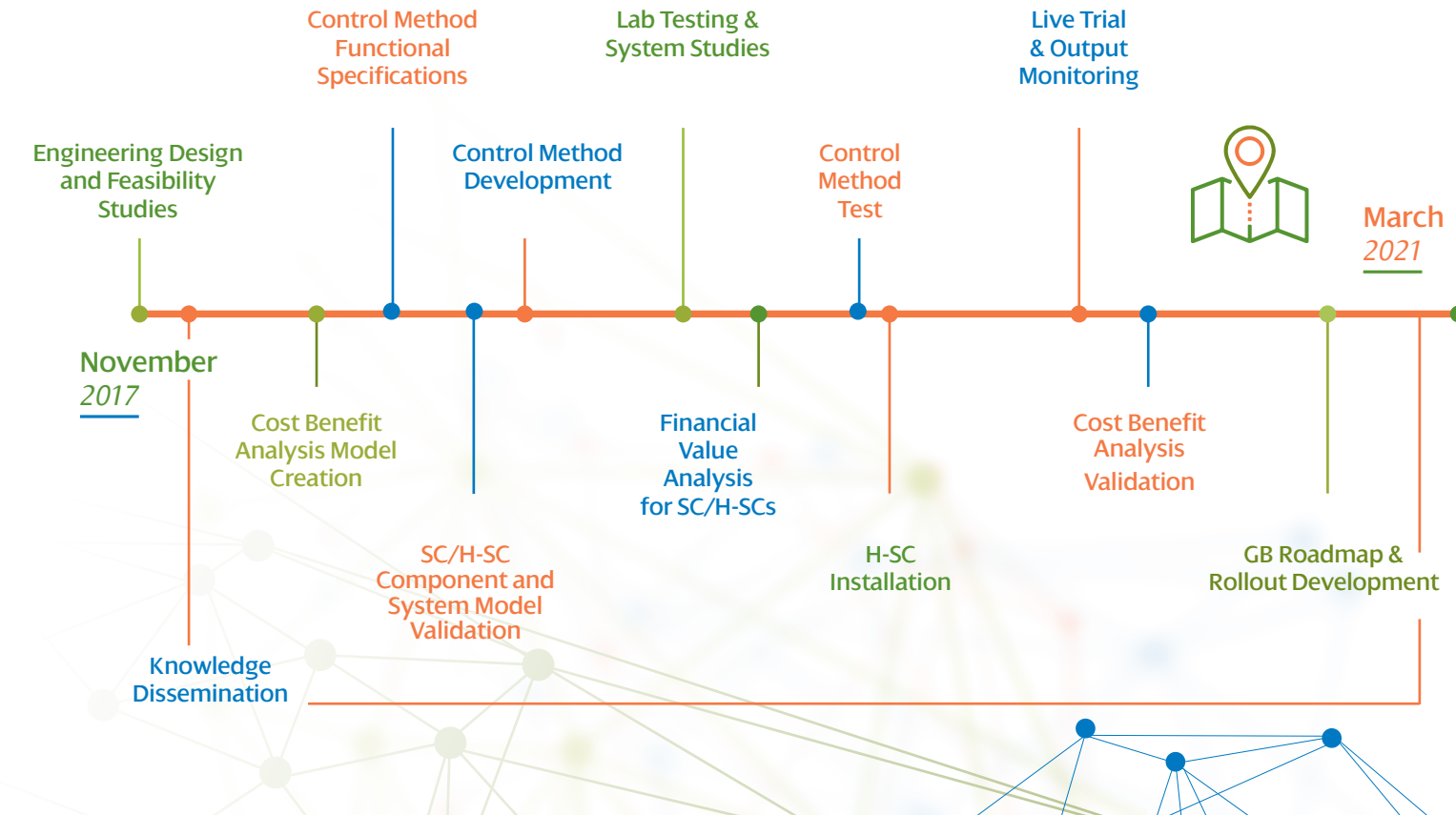


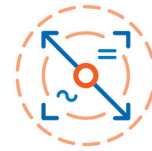
TIMESCALE



CONTACT US

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PHOENIX

System Security and Synchronous Condensers



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.

PHOENIX

The shift from energy generation in traditional thermal power plants to a new and more flexible energy landscape has created a number of challenges.

The roll-out of Synchronised Condensers will help create stability in the grid, reacting when extra power is needed and providing more control over voltage. However, there is a range of technical, commercial and engineering issues that have to be addressed first.

Phoenix is an innovative project which aims to overcome those issues by combining two technologies: Synchronous Condensers and Static Compensators. The result is a Hybrid-Synchronous Condenser. Issues linked to the progressive closure of synchronous generation plants in thermal power stations include:

• Reduced inertia

The closure of these large synchronous generating plants is reducing overall inertia within the GB network. Phoenix will demonstrate how inertia can be reintroduced.

• Limited voltage control

Voltage control is becoming limited as synchronous generating plant is used for this. Phoenix will provide more control over voltage in the network within its capability.

• Lower Short Circuit Level

Short circuit level is important as it is needed to operate protection correctly. The loss of large generating plant reduces short circuit level, meaning electrical protection may not operate.

By bringing two technologies together to create a Hybrid-Synchronous Condenser, the Phoenix project will provide a more stable system, reduce costs - bringing benefits to customers and aiding the move towards cleaner energy.

Phoenix will provide more control over voltage in the network within its capability.

BENEFITS FOR CUSTOMERS

- Enhance system stability, helping to reduce power cuts.
- Reduce the electricity network operating costs, effectively financially benefitting customers. The net present value of Phoenix has been estimated at around £42m.
- Release an additional capacity of 662MW to the electricity network. This will allow additional Distributed Energy Resources - such as photovoltaics and wind turbines - to be connected and flow through the network.
- Minimise carbon footprint and continue creating a sustainable network for our customers. Phoenix will enable a saving of just over 62k tonnes of carbon - equivalent to the electricity use of over 6,000 homes.
- Enable further development of the commercial mechanisms available to incentivise the roll out of Phoenix's technology. This will develop from system case studies and cost benefit analysis models.
- Aid the transition to a future GB transmission network that can benefit from clean energy resources without compromising the security and quality of supply to the customers.

- Carry out analysis on the impact of installing Synchronous Condensers at various locations and their impact on the performance of the UK electricity system. This is through collaboration with the UK System Operator.