

Smarter Network Storage

Funding mechanism: LCNF Tier 2

Funding amount: LCNF: £13.2m
UK Power Networks and partners: £5.5m
Overall: £18.7m

Status: Live
Start date: January 2013
End date: December 2016

Battery racks
as they will
appear inside
the SNS facility



Project concept/overview/challenge

The project is installing a 6MW/10MWh energy storage device on our network, where we are undertaking trials to improve the understanding of the economics of electrical energy storage. The learning gained will help improve cost effectiveness and provide a more sustainable, efficient and flexible way to reinforce electricity networks.

There are several challenges preventing the adoption of energy storage across distribution networks. Storage used for a single application, such as network support, is typically inefficient. Business models for maximising the value of storage are challenging to implement and evolution of regulatory frameworks is needed to better support adoption by DNOs.

Stakeholder benefits

- An alternative to traditional reinforcement.
- Reduces peak demand, reducing losses and improving asset utilisation.
- Cost effective balancing support to the electricity system.
- Saving in Carbon Dioxide emissions from displaced peak generation, estimated to be around 1.7k tonnes of CO₂.
- Validation of the business models and economics of storage when leveraged for full system value, resulting in building experience and encouraging adoption on a wider-scale.
- Support the development of the commercial environment for ESCOs, developers and investors.
- Identification of the key market, commercial and regulatory barriers to effective deployment.

What we are doing/deliverables

- Demonstrate how 6MW/10MWh of lithium-ion storage can be deployed on the distribution network to support security of supply.
- Trial the multi-purpose application of storage for a range of different system benefits to help maximise value e.g. investment deferral and ancillary services.
- Develop a new optimisation and control system and trial the commercial arrangements for shared use of energy storage.

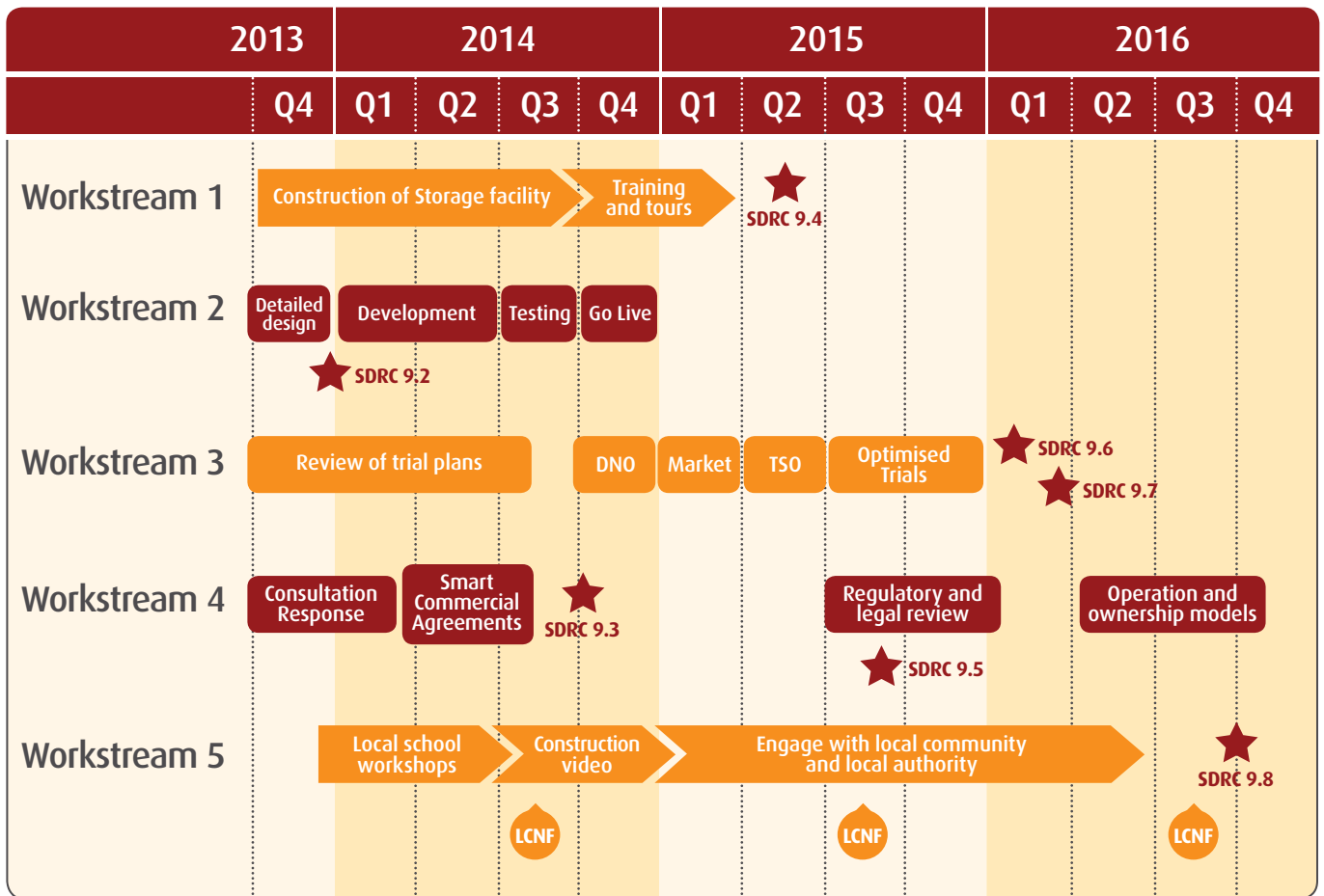
This project is trialling how energy storage could be used as an alternative to traditional network reinforcement and evaluating additional income that can be gained to maximise the value, making storage a more cost-effective alternative. In order to achieve these additional benefits, the storage will be used for a range of other system-wide services, to benefit other electricity system participants, and test both the technical and commercial aspects of these applications.

As shown in the diagram overleaf, trials will take place serving the DNO only; then serving those trading in the electricity market; then serving the transmission system (National Grid). Finally the project will aim to demonstrate how these can be combined.

Findings

- Securing planning consents for grid-scale storage at a DNO level requires significant resource efforts and a broad range of specialist work.
- The storage supply chain is immature and constantly evolving, therefore the key players in the industry change frequently, making it difficult to choose a supplier.
- There are five main business model structures for operating grid-scale storage for multi-purpose applications.
- There are a broad range of options for ownership and operation of grid-storage at a distribution level; there are currently limited signs of a market for specialist energy storage operators and/or developers.

Next steps



Partners

