LCN Fund Full Submission

Supplementary Answer Form

Tick if this answer is Confidential: ☐

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Project code:	Smarter Network Storage	Question Number	UKPN013
Question date	04 September 2012	Answer date	07 September 2012
Submission section question relates to	Section 2		
Topic	Project Description		
Question	Please explain why you have selected this size of battery to test the regulatory and commercial arrangements.		
Notes on question			
Answer	The storage was primarily sized to provide the capacity needed to meet demand seen in previous winters whilst providing sufficient future capacity to address future needs at Leighton Buzzard. The technical aspects of this are further described in the answer to UKPN012. This is however also a minimum size in order to test the regulatory and commercial arrangements in the GB, which is notable for its unique market and regulatory characteristics. A practical understanding of the ownership models and the associated economics is a vital part of the process for integration of storage into the future electricity system, as noted consistently in the reports referenced in Section 3 of the full submission. A major requirement is that storage assets must be of at least a size where their action is sufficiently significant to show feedback at the system control level. In this project, the battery turning from charge to discharge will cause a swing of 12MW, which is around the minimum order of magnitude for the TSO to be interested and able to incorporate it into genuine operations. Small unit sizes must be aggregated in order to be considered commercially viable. At small scales, such devices would have commercial operating and transaction costs which outweigh any value that might be achieved within the project. A battery of the magnitude of 6MW provides UK Power Networks with the ability to gain from the active network management of the constraint, and the system gains from accessibility to an alternative supply of ancillary		

services. This benefit feeds back to all customers.

A smaller size battery, in terms of power rating, would not have the same potential to defer the capacity constraint and therefore would not represent a genuine test of the economics and commercials of storage serving multiple purposes. The energy content of the battery (at 15 MWh) for 100% depth of discharge provides a reasonable energy capability to enable the plant to participate in a number of commercial transactions, such as STOR, Static and dynamic frequency and energy trading.

As an example, smaller installations such as UK Power Networks 200kW installation at Hemsby serve to provide useful technical learning but do not significantly develop the confidence in the use of storage by DNOs to completely replace conventional reinforcement. These projects also do not attempt to quantify or validate any cross-system benefits of storage and develop knowledge and experience of the IT platforms associated with shared operation of storage, meaning the methods, economics and viability necessary for roll out remains untested. This system also is sized for power and does not have sufficiently high energy storage rating to enable it to participate in energy markets.

It should also be noted that the future requirement for balancing and ancillary services will be more significant. Large scale deployment of renewable generation coupled with electrification of heat and transport will increase the level of reserve requirements across the system. The anticipated connection of larger generation assets will increase the normal in-feed loss risk and the largest credible in-feed loss risk increasing the requirements for frequency response, and suggesting that larger magnitudes of flexibility will need to be leveraged across the system.

The battery selected for the project incorporates an inverter that provides a ramp-up time to full power (excluding communication latency) of 20 ms which allows these types of services to be explored as part of the overall portfolio. This gives the SNS storage additional capabilities compared to other installations in being able to deliver such fast response services, e.g. frequency and dynamic voltage control. This additional value was a contributory factor in the selection of a battery over other storage technologies.

The choice of a battery is also appropriate in the testing of regulatory conditions as it does not necessarily fall in the category of generation and therefore opens examination of the regulatory requirements for both mid scale and larger scale installations. Future similar installations may be at the same scale, smaller, or larger, in which case some of the de minimis requirements of the DNO licence conditions may be examined in the light of learning from this project.

The GB market has a more advanced regulatory framework than other countries across the EU. In many countries in the EU and elsewhere, the ownership structure is such that the same company owns both the Distribution Network and the Supply business. In the UK, the market is more liberalised and so greater coordination between parties is required, requiring greater communication between parties in order to meet their respective needs without creating additional conflict. The SNS project therefore represents a unique opportunity to understand how the needs of different parts of the value chain can be met in a coordinated manner whilst

	validating the economics of system-wide flexibility.
Attachments	
Verbal Clarifications (Consultants)	