

# LCN Fund Full Submission

## Supplementary Answer Form

Tick if this answer is Confidential: ☐

Tick if this answer has been provided verbally: ☒

Project code:	SNS	Question Number	UKPN034
Question date	27 September 2012	Answer date	02 October 2012
Submission section question relates to	Section 3		
Topic	Project Business Case		
Question	Please confirm the network capacity increase provided by the Base Case.		
Notes on question			
Answer	<p>The Leighton Buzzard primary substation chosen for the trial has constraints caused both by the 33kV overhead lines which feed the site, but also caused by the 33/11kV transformers at the site. Of these, the current constraint on the overhead lines will be reached first as load grows organically and new connections are provided.</p> <p>As such, the Base Case consists of installing a 3<sup>rd</sup> cable circuit in parallel with the two existing overhead line circuits, installing a 3<sup>rd</sup> transformer at the Leighton Buzzard substation, and associated switchgear modifications. This Base Case creates 35MVA of capacity. Please note, however, that the additional 35MVA is far in excess of the view that we have of current connections prospects in the foreseeable future, and thus represents assets which are being significantly under-utilised.</p> <p>Based on our current view of load growth, and due to the long lead time of this work, work was currently expected to start during the DPCR5 price control period and be commissioned during 2017. As with all investment planning within UK Power Networks, this date is kept under review. It can be brought forward by faster than expected connection activity, and can be delayed in response to depressed electricity usage during a recession. This uncertainty in the demand growth and profile will be exacerbated further in the future by the roll out of low carbon technologies and smart meters.</p> <p>This Base Case was formally defined in the 'Net benefits' tab of the Full</p>		

Submission Spreadsheet. The current estimated expenditure associated with the Base Case during the DPCR5 period was also declared as Direct Benefits in the Full Submission Spreadsheet, which would no longer be spent and would be transferred into the project bank account and form part of the Smarter Network Storage project.

On slide 6 of our second presentation to the Expert Panel, we presented a comparison of both the costs and capacity created by the Base Case and our proposed solution.

The first column represents the Base Case cost of £8.6m, discounted back to a base year of 2013 according to the profile of spend in the years running up to a 2017 commissioning date.

The second column represents the Smarter Network Storage LCNF project commencing in 2013. Any future income streams are discounted back to the base year of 2013.

This breakdown of costs in the second column was illustrated pictorially on slide 5 of our second presentation to the Expert Panel as a 'waterfall' chart.

The third column represents an investment strategy which would provide equivalent and indeed greater capacity than the Base Case. This is achieved by, firstly, discounting the costs in column 2 to align them to provide the capacity in 2017, like the Base Case, rather than in 2014. All future income streams, future cost reductions and future benefits are similarly discounted to commence at a later date, thus keeping a consistent basis. Secondly, a number of follow-on investments are costed in order to reinforce the site each time that it reaches its new firm capacity.

Based on our current view of connections activity and organic load growth, these additional investments would consist of expanding the energy capacity of the storage facility from 10MWh to 15MWh; then expanding both the rating and the energy capacity to 8MW/24MWh; and finally installing the 3<sup>rd</sup> cable circuit, 3<sup>rd</sup> transformer and associated switchgear modifications as originally envisaged in the Base Case. These investments are discounted back to estimated commissioning dates around 2020, around 2025 and around 2030 respectively.

Clearly since these latter investments are further in the future, the sensitivity to earlier than expected load growth or depressed electricity usage is greater. However, this does represent increased optionality going forward, and indeed is one of the key advantages of storage. For example, this investment route is more able to benefit from further new technologies becoming available; up-take in Demand Side Response alongside guaranteed capacity provided by storage; and to benefit from wider network re-configuration or revised load transfer arrangements implemented at a later date.

As such, the Smarter Network Storage approach is financially competitive with the Base Case, but offers greater optionality, reduced carbon emissions and greatly defers the disturbance to the public represented by the commissioning of a long 3<sup>rd</sup> cable circuit.

## Network capacity increase provided by the base case

	Base case		Proposal (6MW/10MWh)		Like-for-like comparison	
Capacity created	35MVA		6MVA		43MVA	
Investment plan	2017	£8.6m commission 3 <sup>rd</sup> cable & 3 <sup>rd</sup> trafo	2014	£12.0m commission 6MVA/10MVAh as part of LCNF	2017 ~2020 ~2025 ~2030	£12.0m commission 6MVA/10MVAh £2.0m expand to 6MVA/15MVAh £2.5m expand to 8MVA/24MVAh £8.6m commission 3 <sup>rd</sup> cable & 3 <sup>rd</sup> trafo
Present value of capital investments*	£7.2m		£12.0m		£14.0m	
First-of-a-kind costs*	-		£6.7m		£5.4m	
Total	£7.2m		£18.7m		£19.4m	
Future benefits*	-		£14.7m		£12.2m	
Net	£7.2m		£4.0m		£7.2m	

**Financially competitive, with greater optionality and less disturbance to the public**

Q&A references: UKPN0010, UKPN0021  
\* At a 7.2% discount rate

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Attachments

Verbal  
Clarifications  
(Consultants  
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