

*LCN Fund Full Submission*

# *Supplementary Answer Form*

Tick if this answer is Confidential: ☐

Tick if this answer has been provided verbally: ☐

Project code:	Smarter Network Storage	Question Number	UKPN017
Question date	06 September 2012	Answer date	10 September 2012
Submission section question relates to	Section 4		
Topic	Evaluation Criteria		
Question	Please explain the assumptions behind the statement that 6MW storage capacity would provide annual CO <sub>2</sub> emissions savings of 1.7kTonnes of CO <sub>2</sub> . What conversion factor for kgCO <sub>2</sub> /kWh is being assumed and for how many hours per day/year is the battery assumed to be delivering 6MW of power to offset peaking generation?		
Notes on question			
Answer	<p>Our assumptions in this case are based exclusively on a published study conducted by Pöyry for DECC in April 2011 using the Zephyr modelling platform which is described further on page 16 of the full submission.</p> <p>The study modelled a scenario containing a hypothetical storage facility and compared it with a baseline scenario where no such facility existed. Carbon emissions savings result from the reduction in operating profiles and reduced curtailment observed in the modelled scenarios.</p> <p>The original study concerned a 7.2GW storage facility in the context of a single year (2030). For the purposes of the present analysis we have scaled down these figures to represent a 6MW facility as installed in the project, likewise, we assumed that 2030 is representative annual figure for any given year.</p> <p>Total emissions in the baseline scenario, without the storage, were 54.2Mt CO<sub>2</sub>, from a total of 202.6TWh generation (from emitting plants). Thus the baseline assumes a conversion factor of 0.2675 kgCO<sub>2</sub>/kWh.</p> <p>The scenario including storage, on the other hand, registered emissions of 52.2 Mt CO<sub>2</sub> from 200.4TWh of emitting generation, assuming a conversion</p>		

	<p>factor of 0.2605 kgCO<sub>2</sub>/kWh.</p> <p>These were taken as a proxy to determine the reduction in carbon emissions which can be achieved through using the storage facility as a peaking plant as opposed to the conventional peaking facilities.</p> <p>This difference of 2 Mt of CO<sub>2</sub> between the 2 scenarios was scaled down to represent the savings from 6MW of storage, to provide the savings at the project scale:</p> $2 \times 6 / 7200 \times 1000 = 1.7 \text{ k.t of CO}_2$ <p>This same process was also used to estimate the carbon savings for a GB roll-out of up to 2GW of storage, as shown in the Appendix G, Section 3 and equates to approximately 600 k.t of CO<sub>2</sub>.</p> <p>This benefit accumulates site-by-site, as increasing numbers of storage facilities are commissioned and offer services to market participants, and ultimately reach a critical mass at which a number of OCGT or CCGT plants are not renewed when it reaches end-of-life.</p>
Attachments	
Verbal Clarifications (Consultants )	