

# *Network Innovation Competition Full Submission*

## *Supplementary Answer Form*

Tick if this answer is Confidential: ☐

Tick if this answer has been provided verbally: ☐

Project code:	SPT EN 01	Question Number	28
Question date	05/09/2013	Answer date	09/09/2013
Submission section question relates to	Section 3.4		
Topic	Project business case		
Question	Please explain the calculation of the annual saving of £4m arising from reduced constraint costs.		
Notes on question			
Answer	<p>It should be noted that the £4m annual savings quoted applies only to the benefit of improved precision in knowledge of the operating point of the system in relation to true physical limit of the network. In assessing the overall benefit of the project, it should be noted that <u>there are significant benefits relating to risk-mitigations (as detailed in the business case)</u>, which should be not be overlooked.</p> <p>Due to the innovative nature of the VISOR project, the potential savings of reduced constraint costs can only be assessed based on published literature, despite the strong confidence and indication from the engineering experience. The calculation of the potential reduced constraint cost represents a conservative estimation of the VISOR benefits.</p> <p>The following figures were used in the calculations:</p> <p>1. Electricity generation cost: 4.3pence</p> <p><b>source: SKM, consultant studies commissioned by House of Lords</b></p> <p><a href="http://www.publications.parliament.uk/pa/ld200708/ldselect/ldconaf/195/19507.htm">http://www.publications.parliament.uk/pa/ld200708/ldselect/ldconaf/195/19507.htm</a></p> <p>2. Existing England-Scotland Transmission Boundary capacity: 2300MW</p> <p><b>Source: ENSG-2009 Report and 2012 updates</b></p> <p>3. 1% potential savings of the existing boundary capacity generated from</p>		

the improvement of data quality by using PMU data, typical of benefits reported from Hybrid State Estimation in more accurate knowledge of the true operating point of the system, ***the detail can be found in Appendix 15 and our previous answers to Q11.*** There is potentially a significant benefit through a better representation of the transient limit using PMU data, however a quantitative assessment of the benefit is system-specific and requires significant analysis, and the availability of PMU data.

The figure was used in the calculation, instead of a 50MW estimation, based on the confidence and evidence of the 1% improvement. Such a figure of 23MW is also in line with a simple comparison from the transmission network reinforcement planning: i.e. a 35% line impedance reduction with Series Compensation provides a 1100MW increase in boundary capability, therefore a 1% assumed benefit of 31MW can be expected to realised.

In summary, £4m constraint costs saving can be verified by different approaches and is a conservative estimation, representing high confidences.

The calculation procedure can be found at:

Cost of Electricity Generation	4.3p per kwh
Source: SKM, consultant studies commissioned by House of Lords <a href="http://www.publications.parliament.uk/pa/ld200708/ldselect/ldeconaf/195/19507.htm">http://www.publications.parliament.uk/pa/ld200708/ldselect/ldeconaf/195/19507.htm</a>	£43 per Mwh
Existing B6 (England-Scotland) Boundary capacity	2300 MW
1% potential savings	23 MW
1% is supported by the literature review regarding the improvement by using PMU data the details can be found in Appendix 15, and answers to Question 11	
50% active hours of the year	4380 Hours
<b>Saving Estimations</b>	<b>£4.33 million</b>

Attachments	
Verbal Clarifications  (Consultants )	