Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: EVOLUTION

Tick if this answer has been provided verbally: ☐

Project code	SPD/EN/01	Question Number	20
Question date	1 September 2015	Answer date	3 September 2015
Submission section question relates to	Various		
Topic	Business planning		
Question	Please provide further explanation for how this method would be factored into future business planning and what impact it might have on costs.		
Notes on question			
Answer	To roll the Distribution System Operator (DSO) model out in future business plans, the GB System Operator (SO) and Distribution Network Operators (DNOs) will have to work together to utilise the full potential of the existing infrastructure and use the support from flexible balancing resources when necessary. The SO/DSO collaboration will entail appropriate algorithms, the exchange of data through agreed processes and will be supported by a regulatory framework. The first step of rolling out the DSO model has already been initiated as between ourselves and National Grid we have identified 15 of the 80 Grid Supply Points (GSPs) in the SP Distribution licence area that are congested with distributed generation and export more energy than they import making them ideal candidates for the DSO model. EVOLUTION will help plan the roll out of the DSO model by assessing the regulatory framework, demarcating the SO and DSO observability areas and appraising the current SO and DSO infrastructure including measurement devices and communication networks. The data exchange between the SO and DSO will need to be suitable and secure to allow the model to be adopted and EVOLUTION will identify what needs installed or upgraded to ensure the roll out of the DSO model. One of the most important outcomes of EVOLUTION will be the design of appropriate reward criteria for the use of balancing services to ensure generation, demand side and storage resources want to be part of the DSO model. Another key learning from EVOLUTION will be to understand how the DNO, by performing the DSO role, would expect to receive compensation commensurate with the value of the service		

	it is providing as the market facilitator. The DSO model will lead to more efficient balancing of local systems minimising the need for unnecessary network reinforcement and outages. This will allow the DNO and Transmission Owner (TO) to focus investment where it is needed most. The DNOs and TOs will also benefit from the improved analysis and forecasting of the DSO model because of the regulatory incentives for reduced carbon impact, increased utilisation and efficiency of the network without significantly increasing risk to supply. The DSO model also gives the DNO greater controllability, visibility and information for the assets connected to the distribution system. The GB System Operator will benefit from the DSO model due to the increased number of participants in the balancing market providing additional levers for the SO to manage the system. This will ultimately reduce risks to system operation by ensuring a higher degree of controllability. National Grid in their role as GB System Operator do not have visibility of actions taken by existing Active Network Management (ANM) schemes connected to the distribution network. Currently the SO has direct contractual relationships with large embedded generators connected to the distribution network. These have a BEGA or BELLA contractual arrangement governed by the Connection Use of System Code (CUSC) that allows National Grid to reduce or cease the output at a generation site. When the SO instructs a BEGA or BELLA contracted generator to reduce its export, the ANM systems of the schemes not BEGA or BELLA contracted see available network capacity and release it to those connected under the Grid Supply Point (GSP). This inefficiency leads to the SO taking additional actions and paying unnecessarily for that service. This is just one example of the type of issue that can occur when National Grid bypasses the distribution network control to carry out actions bilaterally. EVOLUTION will remove this inefficiency by allowing generation customers to provide the same services and duties as required under the BEGA and BELLA agreements however their interface will be with the DSO as a single contracting party. The DSO will hold a separate balancing and settlements obligation with the SO. Operating a local balancing market will allow improved visibility of the local conditions therefore leading to more accurate forecasting. The enhanced local forecasting should eliminate some of the expensive contingency measures a centralised GB System Operator requires to procure. An additional benefit of proving the DSO concept through EVOLUTION, will be that the SO will contract with a limited number of DSOs, reducing the inevitable complexity and challenge of developing single centralised systems to communicate with vastly increased numbers of smaller sites. In 2013/2014, National Grid reported £339.9m in constraint payments (£52.4m for constraint management and £287.5m for system rebalancing). Further breakdown of these figures show that £90.1m was reported to alleviate network issues associated with the Scottish Transmission boundary B6, more than double the previous year. The Elexon report referenced in the submission identified that the use of flexible resources under a targeted GSP would equate to approximately 7% saving on constraint and system balancing payments. Based upon the 2013/2014 data, this would equate to a saving of £6.3m per annum based upon the £90.1m reported to alleviate network problems associated with the Scottish Transmission Boundary B6. Most distributed energy resources are prohibited from directly participating

	in the balancing services market due to their lack of scale and the high cost of participating in the balancing mechanism. Incorporating the DSO model at the GSP allows for aggregation of smaller units and the cost burden of enrolling as a Balancing Mechanism Unit (BMU) to be borne initially by the DNO and then socialised across market participants over time. This represents the removal of a significant barrier to market entry making a stronger business case for distributed energy resources to participate. The DSO model will increase the prospect for more low cost, accelerated connections for distributed generation that are subject to technical network constraints. The creation of a local balancing market will provide more options to generators when the DSO is managing outages. This will benefit the generation customers and increase production from low carbon technologies. The DSO method will facilitate further growth in the connection of renewable generation and create an economic led market for energy storage and demand side response services at a distribution level as part of the UK's long term commitment to reducing the emission of greenhouse gasses and meeting EU 2020 renewables directive. A DSO controlled local balancing mechanism will reduce connection costs in areas of intermittent network constraint, typically caused by correlated distributed generation. Applying local balancing between generation, demand and energy storage under a GSP will provide a cost efficient solution to maintaining a fit for purpose electrical system without the need for significant investment in new infrastructure. The DSO model will also address growing market issues; currently incentives for renewable generation are provided on a flat structure regardless of local demand and needs. This is creating issues with inappropriate siting of large scale wind and solar farms that require considerable capital investments to accommodate. A local balancing market with accurate long term forecasting could be used to address some of the demand and supply conflicts that are occurring in some geographic areas and incentivise arrangements that support appropriate installations of generators, storage and demand.
Attachments	