Power Potential Final Showcase Event – 24 June 2021

Attendee questions unanswered during the session

Q. There was a slide which showed that with 25, 50, 75 % Power Potential increase till 2050, the economics became better. Would it be wise to also infer that greater the automation (AI / ML for controls) better is the system response and better is the economics? [*Dhiraj Krishna Kumar*]

A. From the Cost Benefit Analysis slides (also see the SDRC 9.5 report), we see that the replication studies demonstrate the expansion of the Power Potential project could save energy consumers over £96m by 2050 when rolled out to 19 transmission voltage zones within Great Britain. The increasing economic benefit is related to increasing DER participation adding more reactive resource to compete with the STATCOM alternative.

Correlation of DERMS benefits with artificial intelligence and machine learning initiatives was not studied as part of the project, but it is plausible. As part of the DSO Risk-Reward framework slides (please see the SDRC 9.7 report), we presented how an enhanced coordination DSO role can help NGESO access reactive capability in a more economic and efficient way. This enhanced coordination between NGESO and UKPN will be explored further through the RDP.

For example, during the project we noted that in future the utilisation factor, which was assumed in the day-ahead procurement assessment, could instead (in BAU) be learnt by DERMS, based on past utilisation of the service. The utilisation factor indicates the proportion of available reactive range, which is actually being dispatched. Machine learning could identify differences in utilisation factor by Grid Supply Point and time of day, to provide data so that the procurement decisions are efficient and create the greatest economic benefit.

Q. Do you see this scheme eventually being used for transient events at all system voltages? [*Robert Patton*]

A. Power Potential was trialled as a dynamic voltage service to the 400kV transmission system. Whilst UK Power Networks does assess new connections for transient voltage standards, and it does not experience major transient voltage issues requiring investment, it is conceivable that this could be used to support distribution networks in the future. UKPN is also exploring other innovative methods to address distribution network issues where there is a high DER penetration for example in the NIC innovation project Constellation."

Q. I believe there has been collaboration with other new initiatives/projects in the DNO areas w.r.t service stack ability i.e. where same DERs will be providing other services. [*Nnabuife (ESO), Dozie*].

A. UK Power Networks' flexibility hub provides further information on other stackable flexibility services for DER. It was one of the principles of Power Potential that services and revenue streams should be stackable where possible.

Specifically considering ESO-UKPN collaboration, Power Potential utilised the ICCP connection developed in the previous Kent Active System Management innovation project investigating enhanced coordination and forecasting for outage management in the south east. This link transfers SCADA information from NGESO to UK Power Networks control rooms.

Now as part of the joint Regional Development Programme (RDP) in the South East, we have co-ordinated on better connections planning and are now using the ICCP link to manage N-3 intertrip services, when there is significant generation power flow back to transmission. This coordinated procurement and dispatch approach will enhance systems coordination to manage network constraints and will resolve technical and economic complexities by optimising the dispatch of DER and mitigating service conflicts, while reducing overall system costs for consumers.

Q. What would be the earliest that this could be rolled out as a commercial product? [*Melanie Ellis*]

A. *(This question was partially addressed in the Looking Forward section).* From a UK Power Networks perspective, we plan to create our capabilities to support Power Potential as a commercial product as part of the extension of the Regional Development Programmes. This would be in our next regulatory period (2023-2028), but we do not have a precise timeframe.

National Grid ESO are considering Power Potential as part of the Regional Development Programme. The Future of Reactive reform work will also further look to explore and development a reactive market design that accessed reactive support from market - based solutions. Any relevant learning from the Power Potential trial will be shared with this project.

Q. Is there any plan from DNOs to use the DER reactive sources as well so it will maximise their commercial value and also benefit the whole-system, not only transmission? [*Pudjianto, Danny*]

A. UK Power Networks is developing the capability for DER to be used for voltage control for both distribution and transmission. While voltage management within statutory limits is not a major issue on our networks, UK Power Networks adopts a 'flexibility first' approach to our investment needs. This means we will test out if the market can offer a solution instead of necessarily delivering an asset-based solution.