

## Power Potential Regional Market Advisory Panel

Venue: CMS Cameron McKenna, 78 Cannon St, London EC4N 6AF

<https://uknationalgrid.webex.com/meet/mike.robey> Tel: 020 7108 6317 Access code 596 779 226

11 December 2019

### Participants:

Panel Chair	Dame Fiona Woolf	Chair, Regional Market Advisory Panel
Panel Members	Alastair Martin	Flexitricity
	Fernando Morales	Highview Power
	Andrew Robbins	Innogy
	Chris Buckland	Lightsource BP
	Rickard von Poten	Lightsource BP
	Ian Larive	Low Carbon
	Sammy Blay	Reactive Technologies
	Dimitrios Agriostathis	Vattenfall
	Ned Ponsonby	Zenobe Energy
Representing National Grid ESO	Duncan Burt	Director of Operations
	Paul Lowbridge	Balancing & Revenue Services Manager
Representing UK Power Networks	Barry Hatton	Director of Asset Management
	Sul Alli	Director of Safety, Strategy & Support Services
	Ian Cameron	Head of Innovation and Customer Services
Power Potential project team attendees	Dr Biljana Stojkovska	Project Lead, National Grid ESO
	David Preston	Commercial Lead, National Grid ESO
	Dr Rita Shaw	Project Lead, UK Power Networks
	Kellie Dillon	DER Relationship Manager, UK Power Networks
	Mike Robey	RMAP Secretariat, National Grid ESO

### Notes and actions:

2	<p><u>Project overview – aims and current status</u></p> <p>BS: Voltage management is a major challenge to overcome in delivering zero carbon operation of the system in 2025.</p> <p>Three main challenges Power Potential seeks to address:</p> <ol style="list-style-type: none"> <li>1. Implementation and integration of an innovative new technology</li> <li>2. Close co-ordination across Transmission and Distribution interface</li> <li>3. Opening a reactive power market to distributed energy resources</li> </ol> <p>The technical solution architecture brings together what the transmission network has available, what it requires, what is available from distributed energy resources at what price and what the distribution network can cope with to enable procurement and delivery of a reactive power service.</p>
3	<p><u>Progress update:</u></p> <p>IC: Thank you for your patience and please accept our apologies for the delay. The challenges have been bigger than we anticipated (e.g. 1,400 signals to integrate). We have gathered a huge amount of learning, though recognise that we have not shared all of this with the RMAP panel. It's not just been about the software; also about our systems environments where we under-estimated the challenges with integration, firewalls and so on.</p> <p>The staged approach to pre-commissioning with Innogy has been so valuable and led to a</p>

change in the planned RTU logic and commissioning approach, which will be more straight-forward but has meant a two-week delay.

Although the project has followed DNP3, the finer details developed for Power Potential are brand new and a ground-breaking approach which will inform DNO-DER interactions more widely in the future.

The initial version of DERMS will go live on UK Power Network's system tomorrow, Thursday 12 December (*post-meeting note – this was delivered on 12<sup>th</sup> December*)

The new RTU logic arrives Friday 13 December (*post-meeting note – this was delivered 12<sup>th</sup> December*) and testing will be started before Christmas, enabling commissioning dates in January. The plan allows up to 2 days commissioning per site, plus a day's contingency per site. Clarified the stars on slide 11 are risks, and are milestones on slide 12.

- AR - noted the system upgrade milestones are also risks.
  - RS agreed that some new testing is still required, for example bringing in the NGENO PAS system ahead of the Wave 1 optional trials and Wave 2 commercial trials.
- FW - queried on the testing status of the optional technical trials version of DERMS.
  - RS confirmed that most elements had already passed testing within the mandatory technical trials version of DERMS.
- FW - queried the relationship with the system developer
  - SA confirmed daily stand-ups with the developer and highlighted the agile development approach (rather than waterfall approach) with a large amount of ongoing interaction with the developer.

The testing phase on UKPN's pre-production environment (a replica of the live environment) has been so crucial and unearthed so many issues compared to what emerged from testing on the cloud test environment, that preceded pre-production environment testing.

- FW - It's important we capture all the learning on this.
- SB – For aggregators, our challenge is also integration. Will other DNOs learn from this project's experience?
  - RS stated that the project is sharing its learning through the ENAs Open Network's project. A joint UKPN-NGESO presentation at the Low Carbon Network Innovation Conference was very well attended with lots of interest in integration.
  - SA - Yes, we are sharing learning through Open Networks to ensure that the sector can learn from the project.

4 DER views / Q&A

Communication with DERs

- FW – Is the right level of communications in place?
- CB – We've been happy with the level of support from Kellie. We under-estimated the amount of legal work that would be required. Useful to have a broadsheet of weekly/monthly highlights and useful information to be able to share within own organisation.
- RvP – Kellie has done a fantastic job
- AR – Yes, a broadsheet of say a single page of bullet points on the project status would be very helpful for internal reporting.
  - **Action:** Project team to develop this and invite feedback from panel

members.

- FW – Updates therefore need to be sharable with those not familiar with the project
- CB - The project is experimental so we do understand trial issues will arise. We've needed to modify assets beyond their original intention and success in the project would mean building our future sites differently.
- SB – Yes, 100% it's essential for developers to understand the requirements at the design phase.
- IL – A fortnightly email would work well, providing updates on timelines, with a few bullet points to share internally.

Panel feedback

- TSO-DSO issues; how will this work, what are the sandpaper points? The supply chain can see the whole system opportunities
  - DB – Great respect between organisations and individually. There are historic challenges to overcome in making technical changes and not previously needing to negotiate on these points. Both partners have huge IT estates, creating challenges integrating.
  - SA – As we move to more digital and distributed systems, data exchange and integration are great challenges and culture change within the organisation and getting emotional buy-in too.
  - BH – The Future Energy Scenarios (FES) shows the scale of the future challenge, and this project and the learning from it really helps.
  - DB – We're both working together closely on the regional development programme, helping reduce costs.
  - SA – Also working through breaking down barriers internally to deliver new ways of operating for the future.
- AR – We really want to get our hands on a test version of the solution as soon as possible. We know IT doesn't survive customers, so the sooner we can test and feedback the better. That needs to be the next step; let real users get their hands on it.
- SB – In testing, what differences between asset types has there been?
- CB – In our initial testing we found we got just 50% of the output we expected within the 2 second time limit. Transformers will get hot and that may influence how long we can run the service for.
- RvP – We've found it difficult to access inverter capability information from manufacturers as we'll be using them for a function they weren't designed for.
- RvP – It would help if the project could give DER one more second of the response time, or even half a second.
  - BS – We'll share experience regularly during the optional technical trials.
- AM – Not surprised about the integration challenges; hard work upfront is normal. My concern is about operational deployment. Will the service be used?
  - DB – I agree this is important and we need to be aware, particularly in the early stages of the service to ensure the despatch team are aware and deploy the service.

5 Our commitment / the bigger picture

- DB – I've heard the feedback and want to echo Ian's opening comments. This is hard, but we've got to this point and we're confident. We have complete commitment to take this into trials, right into our control rooms.
- FW – No-one has questioned the partners' commitment and their working together.

	<p>Just keen now in reaching the trials and sharing learning.</p> <ul style="list-style-type: none"> <li>○ DB – The RMAP panel are the way finders.</li> <li>● FW – it’s good to hear no problems with communications.</li> </ul>
6	<p><u>Review previous meeting actions</u></p> <p><u>Action 6 – Synchronous plant participation:</u> This has not progressed as it was too expensive for the site to participate. The panel noted that maintaining the level playing field (of financial opportunity from participating) was important.</p> <ul style="list-style-type: none"> <li>● FM – Do we have the cost in £/Mvar? Synchronous plant should perhaps receive more as their capability is greater.</li> <li>● AR – This shouldn’t be necessary as it would be addressed by them being more likely to be successful in the auctions.</li> </ul> <p><u>Action 7 – DER request to receive market information</u></p> <p>DP – NGESO are looking into this and how to maximise the learning from the commercial trials. Wave 2 is an artificial market, just amongst trial participants for 15 weeks / 1,800 hours with a budget of £350k allocated. We’re reviewing how to maximise the learning and clearly don’t want to burn the budget in the first week. So, we’re developing scenarios for wave 2, perhaps not 1,800 hours, and working around the available budget. We need to report back to RMAP on this and with what market information will be shared.</p> <ul style="list-style-type: none"> <li>● AR – Will you look at reaction time? For example, compared to thermal plant. A faster service is worth more, so pay more?</li> <li>● DP – Our budget is fixed. Could you consider bidding on a cost+ basis, rather than bidding in a way trying to guess NGESO’s ceiling price?</li> <li>● NP- Feedback will be valuable to inform a fair market. It would be useful to know how fast the budget is being burnt. <ul style="list-style-type: none"> <li>○ BS – the wave 2 trial will compare the trial service against network infrastructure options and the wave 3 trial will also compare trial service pricing against transmission plant. Wave 3 trials are most relevant to the questions being raised.</li> </ul> </li> <li>● AR – But wave 2 also prepares DER for the wave 3 market, so we need to learn to be commercially realistic during wave 2. Wave 2 is to get us towards a competitive price. <ul style="list-style-type: none"> <li>○ DP – We will review and discuss this more internally and bring back to RMAP.</li> <li>○ BS - Wave 2 does not secure the system.</li> </ul> </li> <li>● IL – So there’s not much benefit in running wave 2 for too long? Better to get to wave 3 sooner? <ul style="list-style-type: none"> <li>○ BS – We could blend some wave 3 dates within the wave 2 period, possibly.</li> </ul> </li> <li>● NP – What is the wave 3 budget. <ul style="list-style-type: none"> <li>○ DP – Wave 3 is funded from business as usual as competing with wider market.</li> </ul> </li> <li>● NP – The issue will be about competing with the mandatory price for reactive power in the wave 3 trials.</li> <li>● AR – So that’s why we need to prove our effectiveness compared to thermal plant. We need to demonstrate we are overall a cheaper option, even if the service price might be higher.</li> <li>● NP – Can NGESO be transparent about Dungeness and Shoreham reactive power actions. <ul style="list-style-type: none"> <li>○ PL – Noted this request and NGESO are working through this.</li> <li>○ SA – We will come back with commercial design for wave 2 and wave 3.</li> <li>○ <b>Action:</b> NGESO to present commercial design for wave 2 and wave 3 of the trials.</li> </ul> </li> </ul>

8

AoB

- SB – Reactive power is used as a voltage management tool. What other tools are used?
  - BS – We currently have:
    - Statcoms, SVCs and shunt reactors.
    - Transmission connected assets.
  - And we're developing two new approaches:
    - This Power Potential service.
    - The Mersey ring pathfinder.
- SB – Is voltage management only provided through reactive power?
  - BS – It could also be provided by curtailing MW, but generally want to avoid that and also by switching out circuits.
- SB – In Australia the asset costs are onerous. Is this because of voltage issues or other factors?
  - BS – For inertia (stability) purposes mainly.
  - DP – We also have a Stability Pathfinder on inertia here too.
- FW noted there are 5 separate systems in Australia, with just West Australia currently looking at market based solutions, and therefore are interested in learning from Power Potential.
- FM – And I understand National Grid are also looking into Virtual Synchronous Machines.

Next meeting

- NP – Hold next meeting when you can provide answers to the commercial questions.
  - SA – Encourage all to feedback commercial questions to NGENSO.
  - **Action:** All to share commercial questions with NGENSO.
- NP – Can NGENSO provide a paper in advance of the next meeting?
  - PL – Yes, we'll take this forward.
  - **Action:** NGENSO to circulate commercial paper before next meeting.
- FW – Scheduling the next RMAP meeting:
  - If on plan, schedule for soon after the Mandatory Technical Trials have taken place (early February).
  - **Action:** Mike to schedule.