NATIONAL GRID GAS PLC-UK

Moderator: Sue Hughes-Payne
May 16, 2018
5:07 am CT

Coordinator: Thank you for standing by. At this time all participants are in listen in only mode. After the presentation we will conduct a question and answer session. To ask a question you may press star followed by the number 1. This call is being recorded. If you have any objections, you may disconnect at this point.

Now I'll turn the meeting over to your host, (Amy Boast), you may begin.

(Amy Boast): Thank you. Welcome everyone and thank you for joining the Power Potential webinar. My name is Amy Boast and I'm the commercial lead for National Grid on the Power Potential project. We're in London today with our colleagues from UK Power Networks on the project.

At this time you're currently in listening mode and our plan is to go through the presentation. We'll open the lines for Q and A session. Unfortunately, due to some technical difficulties we won't be able to share the presentation over the WebEx link, but we have circulated the slides in a PDF to all of those who have signed up by the Eventbrite.

If you haven't received that document yet, please can you email the Dropbox and we'll get that to you as soon as possible. Equally that means our chat function is disabled for the webinar. So if any questions can be sent to box.powerpotential1@nationalgrid.com, we will pick them up through that method.

As a reminder the project email is Box.powerpotential1@nationalgrid.com. A transcript of the webinar will be available afterwards via our website.

So the purpose of today's webinar is to share an update on the commercial proposition for power potential, as well as addressing some of the common queries that we have received from interested participants. Presenting with me today is Tatiana from UK Power Networks. In the pack that we've circulated I'm now about to step through slide four.

This is just to give a reminder for those who may be unaware of what power potential is. It's a three-year network innovation competition project between National Grid and UK Power Networks. The demonstration project is seeking to access reactive and active power services and distribute energy resources connected to the distribution network to support the role of the system operator.

The trial will take place across grid supply points. These are Bolney, Ninfield, Sellindge and Cambridge North. If you're within or on the edge of the trial area, we're keen to hear from you so do contact us by the dot box and then we will confirm if you are eligible to participate.

As a reminder slide 5 sets out the timeline of the project across the three years. We are currently building our platform known as (DERMS) the Distributed

Energy Resources Management System, testing for which will commence in the summer ahead of our go live demonstration trial in 2019.

Slide 6 that is a bit of an in-depth timeline and in our last webinar at the end of March, we shared our latest updates on the commercial proposition and design on Power Potential trials. We have been discussing this with interested participants through one-to-ones while drafting our provider agreements for the service.

Today we will share the latest details on the commercial proposition which we'll invite your feedback on to a workshop later this month and through one-to-one's. We also intend to share draft copies of the provider agreement and the market procedure documents for the Power Potential services at the end of May and will run a two-week consultation on these terms.

We'll then finalise the contract terms and invite DER to sign on the Power Potential framework agreements towards the end of June onwards. I will recap this timeline at the end of the webinar as part of our next steps.

Moving on to slide 7, we'll now step through the updated commercial proposition. To start with the active power service, slide 8. Upon trial go live in 2019, we will launch our web portal to invite DER to bid freely to offer utilisation prices for both MW up and MW down services.

These prices will be assessed on a least cost basis and called upon in time of system need to support transmission constraint management and assist in balancing.

Our minded to position is to ask DER to submit price volume pairs in EFA blocks as this aligns to other markets they may be trading in. Slide 8 sets out

an example of the active power service process. Step one shows that DER will notify via our web portal of its MW capability and corresponding utilisation price for the EFA blocks for the following trading day that it wishes to participate in.

This submission will need to be done by 4:00 p.m. at the day ahead stage. At 4:00 p.m. step 2 shows that prices are locked in. On the settlement day, step 3 shows that the Great Britain (GB) System Operator may require a megawatt reduction in this region, so we'll select a set of least cost actions from the price stack presented.

Step four show that the DERMS will then send an instruction to relevant DER to adjust their MW set point when the active power service is required. When this action is no longer needed or at the end of the EFA block, the DERMS will send a cease instruction to the DER to return them to their planned operating level.

Utilisation payments will be paid at the £/MWh price submitted by that DER for every MW hour that they were instructed to deviate away from their planned operating level.

Moving on to slide 9, the approach of the reactive service trials are more in-depth but this is where the innovation of power potential lies. And we shared our current thinking on this in our last webinar. This outlined that the objectives for the reactive power potential trials are to:

- demonstrate proof of concept, i.e. prove the ability of distributed assets to resolve transmission voltage constraints
- to demonstrate proof of market, i.e. to establish the commercial viability of this approach.

In achieving these aims, we have designed our trials in line with the following principals. Market efficiency, operational needs and continuous review of applicability to business as usual.

As this is an innovation project there is limited budget of approximately £700,000 available for service payments and so our current thinking is in line with this budget constraint.

Interested participants have also fed back to us the need to avoid incurring losses in the trial and this has been a key consideration in our thinking. As a reminder it is assumed that all DER who participates in these trials will have completed pre-qualification and testing in line with the project needs.

Slide 10 sets out the waves that we introduced you to in the previous webinar. These are wave 1 sets the fee for a fixed number of hours, wave 2, price discovery and wave 3 transition to business as usual.

Each wave has a different objective and corresponding commercial framework as a result. Wave 1 seeks to demonstrate the technical solution of power potential. I.e, that DER can provide support to both low and high voltage pre-fault scenarios while also informing the effectiveness of this support at the grid supply point.

We will do this by simulating and measuring voltage response following a rapid change or drop of the voltage on the transmission systems or by measuring effectiveness of DER delivery at the grid supply point through controlled utilisation.

DER will receive a fixed fee for a fixed number of hours for this wave. This removes uncertainty to trial participants and guarantees firm revenue while securing technical data for the project.

Wave 2 of the trials aims to establish the commercial viability of power potential through price discovery. We will do this by fixing the number of hours we run daily auctions for while applying the learning from Wave 1 and assessing bids in line with DER effectiveness.

The final wave of the trial is transition to business as usual. To prepare DER for current market conditions, where they will be exposed to competition with transmission connected generators participating in the mandatory market, we will fix the number of hours we run daily auctions for and assess bids against the cost of an alternative action that could be taken through the use of a transmission connected asset participating in the mandatory market. We will also consider DER effectiveness in these bids.

Slide 11 shows that wave 1 will havea maximum of £335,000 made available for payments. These payments will be made on a site-specific basis and will be made for availability only. As effectiveness of service delivery will be reduced during wave 1, no utilisation fee will be paid here, although utilisation is anticipated to be low during these hours.

The maximum payment available per site during wave 1 will between £18,000 to £20,000, subject to total number of trial participants. To ensure maximum technical data is captured for the project, both summer and winter network conditions need to be trialled and so wave 1 will be made of two windows - one in winter and one in summer. And will in total last up to 1850 hours.

Payments will be made proportionate to the number of hours each site isavailable during these hours as shown in the table on the slide. This shows that a DER who are available for 25% of the wave 1 hours will be able to recover 60% of the recovery payment for wave one.

Any DER whose availability in wave 1 is 80% or more will receive 100% of the recovery payment.

Moving on to slide 12, due to uncertainty on bid prices during this wave and the limited budget available, the project proposes to manage this risk by running competitive auctions for a minimum of 1800 market hours. Participants can submit bids into as many of the windows within these market hours as they wish.

We anticipate the competitive bids will enable the number of hours and hence total volume procured to be increased during the trial year. Availability volumes will be between 10 to 50 Mvar to be held across the grid supply points during market windows. Actual availability volumes will be determined at day ahead in line with system needs. Participants can bid freely for utilisation and availability during wave 2 and this will be assessed in a least cost basis and in line with DER effectiveness.

Whilst we expect availability to be flat across the day, utilisation volumes will fluctuate. To support DER in assessing their participation in the trial, historic utilisation profiles will be published on our website. Examples of this are shared on slide 13.

These show daily utilisation volumes on 1 Mvar of availability. This data is based on average data collected from April 2016 to April 2018. This data is not intended to be a forecast of utilisation requirements in 2019 as it is

uncertain how distribution utilisation will actually turn out. Actual utilisation during trials in 2019 will be in line with real time operational requirements.

Subject to the success of wave 1 demonstrating the technical value of the power potential reactive power service, wave 3 acts as the decision point to consider rolling the service out as business as usual and using power potential volumes to secure the system.

The objective of wave 3 is to prepare DER for the current market conditions where they will be exposed to competition with transmission connected assets participating in the mandatory market. We will do this by fixing the number of hours we run daily auctions for, whilst assessing bids against the transition market alternative with consideration of DER effectiveness.

Slide 15 shows a summary of these payment models. To recap wave 1 seeks to demonstrate proof of concept through use of technical trials and will be made up of two windows across 2019 to cover both summer and winter operating conditions.

As effectiveness of service delivery will be reduced during wave 1, no utilisation fee will be paid. But up to £20,000 pounds will be recoverable proportionate to level of availability during wave 1 and subject to the number of trial participants. Wave 1 will be up to 1800 hours across the two windows with an approximate 90/10 split on availability and utilisation hours.

Wave 2 seeks to establish the commercial viability of this approach and will take place across two windows, following wave 1 windows, for at least 1800 hours. DER can bid in freely and successful bids will receive availability for the windows they are procured for and utilisation payments in line with any

utilisation delivered during these windows. The assessments of bids in wave 2 will consider effectiveness of DER.

Finally, subject to the success of wave 1, wave 3 acts as a decision point to use power potential volumes to secure the system. Utilisation and availability prices will be assessed against the cost of alternative actions from transmission assets and the frequency of these auctions will depend on system needs. A calendar of exact start and end dates of each wave will be communicated this summer.

Onto slide, 16; we are keen to hear to your views on the details outlined on the previous slides and we intend to arrange a workshop, as well as one-to-ones to get this feedback. We will confirm the dates to you shortly.

The next few slides aim to address a few common queries from interested DER. We've been asked queries related to the power factor range for interested participants, the impact participating in Power Potential might have on Distribution Use of Service (DUoS) charges as well as a few questions seeking clarity on our testing approach. I will now hand it over to my colleague Tatiana to respond these queries.

(Tatiana): Thank you very much Amy. I will start with power factor studies. Power factor studies were carried out for each site that provided us with a technical characteristics submissions spreadsheet.

The goal was to understand whether DER power factor range could be extended beyond what is prescribed in their connection agreement, so that the sites could bid large volumes of active power. One example where it might be valuable is for a PV Farm which at night has its all rated capacity available, which is equivalent to power factor equal zero.

The studies were performed based on the developed methodology and scenarios, using several assumptions. These along with the results will be shared with each site for which the study was conducted. If the DER accepts the new PF range, the Power factor in their connection agreement would need to be amended. It is estimated that around 1 working week will be required for UK Power Networks to prepare the amendment.

This new power factor range will be active for the trials and will revert to the pre-trials range when they are over. If Power Potential goes into business as usual, the DER will retain the new power factor.

Slide 20 covers the distribution use of system charges. The project team received very good question on the potential impact of the reactive power dispatch on the distribution use of system charges.

This charges are distribution network charges and are a part of your supplier's bill. In case you are not familiar with them and are interested to learn more, the full list of documents and the methodology for the South east area, that includes four Power Potential grid supply points, for 2019 can be found at the link on the slide.

Two types of charges were highlighted as the ones that might get affected by the reactive power dispatch; excess capacity charges and reactive power charges. A decision was made by the project not to apply these charges. They will be recorded as a project learning.

The next slides cover the DER technical requirements specification document that was developed by UK Power Networks. The document will be issued shortly after the webinar on the Power Potential website.

The document covers communications specification between DER and UK Power Networks, the summary of which was presented at the previous webinar, and DER testing procedure.

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Slide 22 provides a high level overview of the testing process. Most of it was presented at the previous webinar so this is just to recap. The testing will take place in the second half of 2018 and we do not expect it to take more than two or three working days. Date and procedures will be agreed between UK Power Networks and the customer to avoid or minimise disruption.

The next slide presents a summary of the DER testing procedure. It is broadly split into the initial desktop assessments and the DER commissioning tests. Initial desktop assessment confirms whether DER is within trial area, is either connected UK Power Networks distribution network or will be early in the trials period.

It also includes an evaluation of the DER technical characteristics spreadsheet and confirmation from the site that they have, or will have, by the start by the commissioning test a compliant control system.

Desktop simulation is carried out to investigate whether the DER power factor limits can be relaxed for the trial, and whether reactive power dispatch both in the standard and expanded power factor range do not violate P28 voltage step-change limits and statutory distribution network voltage limits.

DER commissioning tests will consist of Laboratory-based commissioning test (strongly advised), site-based commissioning test and DER performance test (both mandatory).

More information on what will be tested and how can be found in the document. The next slide presents the brief overview of the test logic that will be applied both in the lab- and site-based tests on the example of the lab testing.

Our DER technical requirements document specifies the communication protocol requirements and how to integrate DER control system with DERMS DER with a mobile test capability are welcome to use UK Power Networks lab for this stage of testing. The lab hosts simulated RTUs, simulated Distribution Management System PowerOn and will also later host DERMS for the end-to-end simulation. You would need to bring your control system (for example, it can be a test environment, pre-prod environment, a simulator) and be able to allocate technical resource for 1-2 days. We will check that signals sent from our RTU can be received and responded to by your control equipment.

Phase 1 test will include sending the signal (manually) through PowerOn and UKPN RTU to DER control system and observing the DER system actions.

Phase 2 will be end to end testing incorporating DERMS

As part of our lab testing we will work with DER to test the range of control systems in the trial so not all DER will have to bring their software to our lab.

For some DER we may need to complete an upgrade to the UKPN RTU on your site (at a cost to us) and this will be communicated in our 1:1s. Whilst we do not need DER to go offline to complete the upgrade, there will be disruption to the generator operation for the commissioning of the upgraded RTU. We'll aim to minimise any disruption and are keen to schedule this to coincide with the planned downtime where possible.

Now I will hand over back to Amy to present the pathway to participation

(Amy Boast): Thank you Tatiana. We're now going to talk through slide 26 for those looking at the PDF document. and this is our final slide of our presentation. It intends to show DER a pathway to participation and some key milestones for the DER over the months leading up to the trial and during.

The timeline includes project activity, DER activity, key decision points, confirmations to DER, pre-trial preparation activities, as well as payment flows.

Firstly, we have been discussing DER eligibility through the submission of technical characteristics submission spreadsheets in an attempt to understand technical eligibility with all interested trial participants as soon as possible upon the receipt of these submissions.

We have been working up the Power potential framework agreements and market procedure documents and will share the rest of these at the end of the month. The consultation on these documents will take place for two weeks, after which the final framework agreement market procedure will be published and DER will be invited to sign on to these terms.

This will allow us to understand interest levels in the trials and to determine a final maximum recovery payment for wave 1 participation. The market calendar for the trials will also be published at this time. Site works may then be necessary and in the autumn, we will offer lab testing to DER that would like to undertake it.

Site commissioning will then take place and all DER will receive confirmation following successful testing. Successful demonstration of service delivery will qualify DER to receive the wave 1 recovery payment. Web

interface testing will also be required and we invite DER to volunteer to participate in this.

Given this is an innovation project, prior to go live all-go, no-go criteria must be satisfied and in line with project governance. A decision will be taken to proceed with the trials fall back arrangements for providers in the event of a non-proceed decision will be provided for in our framework agreement.

Once in 2019 the trials will commence in line with the market calendar. Our current intent is for the first trial to commence mid Feb 2019, and this will be wave 1 winter. All settlement will be made 30 days after delivery and so payment for wave 1 will take place early May 2019, following an assessment of wave 1 availability, with up to ~60% of the recovery payment available here

Wave 2 will then commence and will likely consist of a week of competitive auctions, a week off, a week on, a week off. DER who's bids are successful will receive market revenues in line with their bid prices. Wave 1B will then take place during the summer and following an assessment of availability, up to ~40% of the recovery payment available here. Wave 2 competitive auctions will recommence and then a decision to proceed with wave 3 trials will be made and communicated to DER and commence at the agreed date

Thank you for listening. We're now going to open the line up to questions and answers and I've got several members of the project team with me here today. So I'm sure that we can answer those. Thank you.

Coordinator: Thank you. We will now begin the question and answer session. Participants if you'd like to ask a question over the phone, you may press star followed by the number one. Please unmute your phone to record your name clearly when

prompted. Your name is required to introduce your question. To withdraw or cancel your request you may press star followed by the number 2.

One moment please speakers as we wait for the first question. Participants to ask a question that is star followed by the number 1. Our first question comes from the line of (Nathan Evans), your line is now open.

(Caller1): Hi (Amy). Hi (Tatiana). I have a question regarding slide 8. You have identified that you'd like ether block submissions for utilization prices. Section three there's mention of megawatts reduction. I need to know that you're asking for operational levels in block five. Is that an ether block you're expecting to receive there?

(Amy Boast): Hi , yes I think it is operating level per settlement period. So we actually anticipate that you're megawatt output would vary within this settlement period and we'll just take the delta.

(Caller 1): Okay. Excellent. Thank you.

Coordinator: Thank you. That concludes today's conference. Thank you for participating. You may now disconnect.

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