ESO Technology Advisory Council

TAC-9

Date:	02/12/2022	**Location:**	Virtual
Start:	09:00	**End:**	12:30

All material from the meeting can be found on the ESO Technology Advisory Council website: https://www.nationalgrideso.com/who-we-are/stakeholder-groups/technology-advisory-council

Participants

Attendee	Organisation
Vernon Everitt (Chair)	Greater Manchester Combined Authority
Chris Dent	University of Edinburgh
Jo-Jo Hubbard	Electron
Simon Pearson	Independent
Fred Drewitt	Limejump
Andy Hadland	Independent
Alastair Martin	Flexitricity
Kate Garth	RWE Renewables
Melissa Stark	Accenture
David Sykes	Octopus Energy
Claudia Centazzo	Independent
Naomi Baker	Energy UK
Peter Stanley	Elexon
Jim McOmish	Scottish Power Energy Networks
Alex Waslin	BP
Shubhi Rajnish	ESO
David Bowman (Facilitator)	ESO

For specific agenda items

Attendee	Organisation
Joseph Donohoe	ESO

Richard Salmon	ESO
Gary White	ESO
Martin Cowan	ESO
Jim Needle	ESO
Mark Haigh	ESO
Nicola Williams	ESO
Nikhil Madani	ESO
Mark Limpkin	ESO
Cameron Shade	ESO
Manmohan Bisht	ESO
John Walsh	ESO
Daniel Delgado	ESO
Rohit Joshi	ESO
Bernie Dolan	ESO
Gareth Davies	ESO
Joshua Jones	ESO

Apologies

Attendee	Organisation
Teodora Kaneva	TechUK
Randolph Brazier	Energy Networks Association
Chris Kimmett	Reactive Technologies
Alvaro Sanchez Mirales	STEMY Energy
Judith Ward	Sustainability First
James Houlton	Amazon Web Services

Agenda

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1.	Welcome and introductions
2.	Minutes of last meeting and matters arising
3.	Feedback from the last meeting
4.	Data
5.	Open Balancing Platform

6.	RIIO-2 BP2 Draft Determinations
7.	Subgroups update
8.	Next meeting and calendar
9.	AOB

Discussion and details

#	Topics discussed
1.	**Welcome and introductions** • The chair welcomed everyone to the meeting. The chair noted that it was the second anniversary of the group and thanked everyone for their commitment to the TAC. • Jim McOmish (Head of Whole System and Market Development, Scottish Power Energy Networks) introduced himself. Jim will be taking over from Graham Campbell. The ESO and TAC thanks Graham for his contributions. • Alex Waslin introduced himself as a deputy for Anastasia Vaia for this meeting. • David Bowman announced he would be standing down as facilitator as he is moving to a new role outside of the ESO. The TAC thanked David for his contributions.
2.	**Minutes of last meeting and matters arising** • The minutes from the last meeting are out for circulation. Comments are requested by 9 December ahead of publication. • The chair informed the TAC that he had attended a meeting with Fintan Style (ESO Executive Director) and the chairs of the other ESO stakeholder groups. The discussion included ways of working and themes common to all the groups. The chairs agreed to maintain contact and may attend each other's meetings to ensure cross-learning.
3.	**Feedback from the last meeting** • The feedback received at the last meeting on the Balancing and Network Control programmes was summarised. • The Balancing Programme recently visited several system operators and related organisations in the United States, to learn more about the impact of market changes on their programmes.
4.	**Data** *Data Governance* • Nikhil Madani discussed the ESO's approach to data governance. • Based on previous TAC feedback, a "hub and spoke" model with data stewards is proposed. *Data landscape* • Nikhil talked through the BP-1 commitments, requirements for the Open Data platform, and the enduring solution that will be the Data & Analytics Platform (DAP) and Digital Engagement Platform (DEP) that will be delivered during BP-2. *Data & Analytics Platform (DAP)* • Mark Limpkin and John Walsh introduced the DAP. • They discussed the foundational capabilities and initial use cases, including a recently introduced inertia monitoring tool, and the future roadmap. *Digital Engagement Platform (DEP)*

- Joseph Donohoe introduced the DEP. The aim of the DEP is to make it easier to do business with the ESO.
- Joseph highlighted customer pain points and customer requirements, and how previous TAC feedback and helped shaped the ESO's discussions on links between the ESO website and the DEP, including the next steps in relation to this.
- DEP does two things 1) re-platforming of the website and 2) replacing the front door from the Open Data Portal and linking to DAP which is the back end.

Discussion

- How will you handle issues such as a compromised a dataset that has already published and potentially used? Will there be a communications process to inform users of this? Sometimes you don't realise there has been an issue until sometime after the data is published.
- Spotting and backfilling of problem or anomalous data can be aided by machine learning. It also needs to be considered as part of data governance strategy.
- To think about how you set up data governance forums, put yourself in the shoes of the users of this data, and consider what they are looking for from the data. It links back to the personas. This can help determine the representation on the governance forums from across the stakeholder community. Personas can help you determine who you are missing.
  - These are good points that the ESO will consider.
- Who will be allowed to curate data? It is difficult to set the boundaries on this. If restrictions are too strict, people will build logic outside of the platform. If they are too loose, you risk unintended consequences. Octopus and Limejump use a data build tool to govern this.
  - This is currently a challenge. We want to empower people and organisations to use our data, but we don't want them to manipulate it and do harm. We will consider the use of a data build tool.
- What are the underlying technology choices for each part of the DAP? Storage, compute, lake/warehouse, orchestration, data modelling?
  - To discuss in a follow-up call, due to the technical complexity involved.
- Transport for London (TfL) have been on a similar open data journey. There is also a London Data Store under the auspices of the Greater London Authority which takes TfL data and puts it alongside other data sets.
- There was positive feedback from various TAC members on the ESO's Open Data initiatives. TAC members are heavy users of the datasets.
- One piece of feedback is that the datasets need to be more stable. For example, if a column in a dataset is changed then this may be causing problems for people using APIs outside the ESO.
- How are external requirements captured? The ESO may not know how the data is being used externally.
  - We have been surveying a group of engaged users and the wider balancing service providers. We conducted a survey a few months ago which gave us a good data set. We have also been doing in-depth user research.
- The data also needs to complement ESO requests. For example, if the ESO requests a service that is only open to assets on a particular side of a constraint boundary, there should be data there for organisations to determine their eligibility.
- To help capture and prioritise internal data requirements, a two-tier system could be use. First you can have an open board that allows anyone to raise tickets based on the data they want to see, with sessions to discuss. Then you can have a closed session to do scoring, prioritisation and formally placing tickets onto the backlog. This can help provide both democracy and control.
  - In addition, the whole purpose of having a single version of the truth and a single consolidated data set is to make accessibility, searchability and governance easier.
- To help users analyse the data according to their needs, you need to consider how you design your KPI engine. It might be worth creating different foundational layers (such as time, location and other logic) and allow users to build their own KPIs on top of this. This can help avoid having a very large KPI engine that becomes messy.

- Think about the personas of different customers and stakeholders who use the data.
  - We are using personas now, but at a high-level. For example, academic researchers, and asset owners of balancing service providers. We will develop these further to get into more detail.
  - It will become easier in the future for customers to request datasets based on their individual needs through the publication of a data catalogue and the introduction of a more formal process for requesting datasets that will go into a triage process.
- You may find that other organisations use the data you provide and put it into their products and services. This is not something to fear but rather be aware of.
- How much of this data is going to be real-time? How much will users place on the reliance and "always-on" nature of the data, for example if they are using it to make commercial decisions.
  - On the support model - for our initial use cases we have a certain level of support that is required. As we progress through the use cases, this support will need to rise. We have moved to a DevOps structure so we can flex appropriate and do not need to keep revisiting the support structure.
  - One the real-time nature – we are doing testing about volumetrics and performance. With the current use cases we are not yet providing real-time data, the closest frequency we currently have is every five minutes.
  - In general, we are trying to adopt an "outside-in approach" – looking at what ESO might think of as "outside the box" but industry view as critical use cases. For the DAP, much of the capability has so far been internally focused, but we will increasingly need to think about how they are presented and their frequency for external consumption.
- Consider how to move the customer and stakeholder engagement away from traditional models. For example, can the systems do it themselves based on the how the data is being used? Or could there be community development, for example if one organisation develops a tool that is right for their business, would that be shared? Clearly there would be commercial sensitivities involved.
  - This is a good point. We are looking at how the system can "self-describe" what our data is doing and who is using it. For example, the Amazon shopping experience is very good at telling you what other people have bought based on what you are currently looking at. We have work about how we can let our customers know what their peers or those with similar personas have been looking at. The TAC feedback gives us confidence that this is the right approach.
  - Customers will be able to search through the data catalogue via the DEP. There will be some datasets that are not shareable, but we will see if there is a process that allows certain datasets to become shareable.
  - There is also a broader question – how we optimise what we do (not just in data but everything) with other network companies. As a related example, there is a lot of work about how service providers can offer products not just to the ESO but to other buyers at the same time.
- To help decide whether to visualisation and insight or access should be prioritised on the DEP – are the ESO tracking who is using the data? Many non-technical users are likely to prioritise visualisation and insight.
- It will be a difficult question to answer. It might help to think about different segments. For example, ensuring access to a solid open data set that people use on a day-to-day basis in real-time, but then periodically covering with trend analysis or insight that is derived from it, or visualising the most popular data. The ESO will also want to draw insight from the data for its own purposes.
  - The Data Portal is connected to Google Analytics. We do have statistics on how users are using the datasets, what they have subscribed to and what the popular ones are. We don't have personal information (eg name) collected at the moment. We have created a Power BI visualisation functionality for the top five data sets as an added benefit for our customers.
- TfL published a "Travel in London" report which takes data and puts into a digest. The core requirement is a rock solid core that set, particularly what is being used for real-time decision

making. Then think about tabular, graphical and visual form that can be put into a report. It is important to avoid drowning in the data.

- It is important to know who is asking for what with the data. For example, there might be a 50-50 split between people wanting APIs and insight, but with a big majority of one type of stakeholder wanting one type and another big majority the other. To help with this, you need to know what they want to do with the data and ask other questions such as such as whether they have existing assets connected and, if so, how big. It will be difficult to treat all requests as completely equal. To help with this, you could ask users what they want to do with the data when they sign up.
- The demand side is going to be extremely fragmented and diverse, far more so than the generation side. This means there will be users and personas that we did not have before. The ESO should ask them – what are you doing to want or do? They will come up with ideas that the ESO would never think of, and so the ESO should not try to have all the answers.
- TfL decided around 10 years ago to publish real-time data on bus locations. It was not known what users would do with the data, but what users have done is produce a range of products and allied it with other data sets
  - The ESO agree with these points. One of our core drivers is making the data available so that people can innovate with it.
- Need to remember that is not magic. Data should continue to be available and be improved, but other core processes also need to be. For example, efficient dispatch and working whole system.
- The ESO's work on data shows a lot about the culture of the organisation and its willingness to be open and transparent.

5. Open Balancing Platform

- Bernie provided an update on the Open Balancing Platform (OBP). The team are currently working towards Release 1 – bulk dispatch of small BMUs without breaking constraints. The target release is September 2023 with a contingency of a couple of months because we would like to deliver it before the Christmas freeze period.
- Benefits will include reduced skip rates, better economic decisions and reduced workload in the control room.
- The ESO does not have a production environment yet – it is coming soon. We will get into a cadence where we are releasing at the end of each programme increment (approximately every 12 weeks). We are currently in PI6 and are ahead of plan.
- We have created a product called "Service X" to ensure the platform is configurable. Service X is as different as possible to our existing services.
- The ESO is interested in ideas on how to establish a permanent technical library that is accessible to external stakeholders and can be kept up to date in an agile way.

Discussion

- Confluence can be used as a technical library. It helps ensure there is a single version of the truth, and it can be shared with external parties. It is also good for versioning and for commenting.
  - We will consider this. We have used Confluence internally but have never done it externally.
- What is the latest view on technical requirements, for example how many units do we need to solve for?
  - For Release 1 we are assuming that the system will need to solve for 1,000 units within five minutes and ideally three minutes. In current testing we are seeing this performance. Within two to three years, we should be able to solve for 3,800 units.
- The ESO is open to sharing the algorithms so that people can test it on their own systems. We also want the algorithms to be more transparent to us, so that we understand it. Then we can share so that stakeholders understand why decisions were made.
- If you are solving to true optimality and a model world, then it does not matter what the solver algorithm is. But as soon as you introduce tolerances then you can get issues with transparency because the decision-making logic can be buried in the detail of the particular solver.

- Arenko had an optimiser that would print out of why it did certain things, which was extremely useful. As the algorithm is continually reoptimizing this provides a timestamp – this is what was being considered at this moment. This was produced in plaintext rather than in equations.
- Ask what other organisations are doing in different markets, for example in the Global Power System Transformation (GPST) Consortium or the California ISO. It may also be that the ESO is at the forefront of this.
  - We agree and have recently visited a number of organisations. We are trying to factor in the learnings from these visits into what we build.

6. RIIO-2 BP2

- Gareth Davies (Head of Regulation) and Dan Delgado (Planning and Consulting Manager) talked through the BP-2 timelines and Draft Determination headlines (published on 30 November).
- The Draft Determinations are positive for the ESO. First, Ofgem fully support our activities and IT investments. Second, they are willing to fund all the investment requested. And thirdly, Ofgem have agreed to fund 90% of the Network Innovation Allowance (NIA) pot we asked for.
- Ofgem have raised concerns about the level of cost increases for some of the IT investments. They have proposed setting out upfront "value for money" assessments and closer monitoring of our expenditure and process across IT investments. The ESO supports these.
- Will be looking at coming back to TAC to discuss some of the points raised.

Discussion

- TAC congratulated the ESO on achieving the full funding request.
- The proposed cost monitoring framework sounds like a pragmatic approach.
  - We agree, and we will work with Ofgem to further develop the cost monitoring framework. For example, getting the correct cadence and trying to build regulatory reporting into our internal reporting, rather than seeing it as separate.
- How does BP-2 interact with FSO?
  - FSO is separate. All FSO transition costs will be funded but not through the BP-2 mechanism. Ofgem's current thinking is that there will be a separate funding mechanism with a reputational incentive on the ESO. Ofgem will consult on this in January 2023.
- To help find benchmarks and define KPIs, consider asking the GPST Consortium.
  - This is a good idea and we will follow-up with our GPST representatives.
- How does funding model work?
  - The ESO has a cost-pass through model. What Ofgem says is that they support our investments and will allow us to recoup those costs. We can drive an operating profit through the way we work with National Grid group but also via the incentive scheme. In this, Ofgem set out what good looks like and what exceeding expectations looks like. There are also metrics in specific areas, such as balancing costs. Ofgem and an industry panel will assess our performance at the end of the two-year period, the result of which unlocks incentive revenue or a downside penalty.

7. Subgroups

- There have been no sub-group meetings since the last TAC.
- So far there have been four meetings of the *Control Room of the Future* sub-group. We will do some thinking internally to ensure we drive the best thinking from this group. Ideas from the TAC are welcome.

8. Next meeting

- 3 March 2023, 09:00 – 12:30.
- The ESO thanked all TAC members for their commitment over the last two years.
- Recognising that the original commitment was to March 2023, the ESO will consult with members about whether they wish to remain on the TAC.

- The ESO will also send a survey to ask for feedback on the TAC and draft an updated terms of reference to bring it up to date.
- Shubhi thanked all members and reiterated that the feedback has been very valuable for the ESO Executive Team.

9. AOB

- The chair thanked all members for their contributions, and thanked David for his contributions to TAC over the last two years.
- David thanked Vernon for this chairmanship and support, and all TAC members for their engagement and contributions.
- The chair wished everyone a Merry Christmas and a Happy New Year.