FlexForum session V 14-04-22 notes

When	0900 – 1200, Thursday 14 April 2022
Where	Virtual
Who	Shay Brazier (ReVolve Energy), John Campbell (Our Energy), Jason Christini-Crawford (Ecotricity), Glenn Coates (Aurora), Jenny Van der Merwe (Kāinga Ora), Terry Paddy (Cortexo), Eric Pyle (solarZero), ~~Buddhika Rajapakse (Mercury)~~ [apology], Tom Rose, (EVNex), Scott Scrimgeour (Wellington Electricity), ~~Quintin Tahau (Transpower)~~ [apology], James Tipping (Vector), Evie Trolove, (Orion), Glen Baxter (Ara Ake), Fiona Wiseman (Trustpower/Manawa) Facilitator: Geoff Sharples Secretariat: Craig Evans, Matt Smith

Session notes

Five topics were discussed:

1. High level requirements for responding to conditions (workplan topic B)
2. Narrative for flexibility needs (workplan topic A)
3. Workplan, engagement and communications planning
4. Practical requirements for transacting flexibility (workplan topic C)
5. Administration – governance, budget, and funding

Agenda overview

The group agreed the agenda after considering the workplan and actions from previous sessions.

The group noted that all members can add to the list of issues and barriers to integrating DER and using flexibility, eg, technical, practical, regulatory etc.

Item 1: High level requirements for responding to conditions (workplan topic B)

The group agreed that the following eight categories were a suitable starting point for a common terminology for the activities or services identified through developing the need cases (see page 7 of the pre-reading).[1]

- Peak shifting, long term congestion management
- Peak shifting, portfolio optimisation
- Peak shifting, generation capacity adequacy
- Demand adjustments, portfolio optimisation
- Demand adjustments, short term congestion management
- Demand adjustments, generation capacity adequacy
- Balancing services, frequency control
- Generation adjustments, short term congestion management

The group made suggestions regarding framing the services, including to clarify who would procure what, and that the time-scale for responses should reflect the planning horizon.

The group discussed the need cases, requesting an extra need case be developed to test that the eight services all cover all plausible scenarios. The extra case was the option to alter network design criteria to rely on flexibility to increase feeder utilisation, thereby reducing connection and infrastructure costs eg, with a new subdivision.

The group discussed similarity the extra need case shared with the *Peak shifting, long-term congestion management* service, with the load profile being managed using both profile management and contracted flexibility to keep peak demand below a specified limit.

The underlying question is whether network design standards need to change to reflect changes to traditional load and demand profiles. The decision is whether networks will be able to meet reliability requirements with the same size network or will require upsized network infrastructure.

The group agreed the high-level technical requirements for responses to network, system and market conditions were a suitable starting point for describing the

[1] The 8 categories were identified through the Flexible Energy Production, Demand and Storage-based Virtual Power Plants for Electricity Markets and Resilient DSO Operation (FEVER) project. See work package D1.2, Functional and operational requirements, at https://www.fever-h2020.eu/data/deliverables/FEVER_D1.2_-_Functional_and_operational_requirements.pdf

technical characteristics of the response ie, one of the eight categories or services (see pages 5 and 6 of the pre-reading).

The group agreed the high-level technical requirements provided some, but not all, the information required by a DER owner/flexibility supplier for decisions to invest in DER capability and supply flexibility. A DER owner/flexibility supplier needs further information including: payment/compensation for providing flexibility and reporting requirements.

Stakeholders will be asked to give feedback on the draft output following the webinar.

Item 2: Narrative for Flexibility needs (workplan topic A)

The group endorsed the draft output for workplan topic A on flexibility needs, with some comments:

- describe the attributes and characteristics of DER which enable flexibility, with practical examples. For example, solar PV with a smart inverter has the capability to shed load in response to a request
- various suggestions on phrasing.

Stakeholders will be asked to give feedback on the draft output following the webinar.

Item 3: Workplan, engagement and communications planning

The group agreed a webinar to be held on Wednesday 4 May from 1400-1515 to:

- to inform all stakeholders of the FlexForum, its goal and purpose
- request input from key stakeholders on the draft outputs of workplan topics A and B.

The group noted arrangements were underway and the webinar would be announced on 19 April to the people on the stakeholder contact list. The announcement would include a link to the FlexForum webpage.

4: Practical requirements for transacting flexibility (workplan topic C)

The group had an initial discussion of the practical requirements for transacting flexibility, starting with a perspective from Australia.

Scott Scrimgeour gave some brief context on the Wellington Electricity EV Connect roadmap project and introduced Bruce Thompson from Greensync who presented a perspective from Australia on integrating DER and using flexibility.

Insights from the presentation and discussion were:

- the Australian electricity sector has been working on how to integrate DER in a way which balances physical limits (of the infrastructure) and maximises value (to the DER owner and power system), focusing on solar PV
- the most important lesson from Australia is to not be complacent and to act early. Australia saw the PV wave coming yet didn't appreciate the scale and pace of PV uptake
- considerable time was spent talking without doing anything to prepare. Several Australian networks now face material reliability problems because operational, market and regulatory settings were not fit-for-purpose when – within about five years – the prevailing network and market fundamentals flipped from a summer peaking problem (due to air-conditioning load) to a summer low-negative load problem (due to massive solar production)
- the parallel for Aotearoa NZ is electric vehicles. We have about two years to act, or there will be Australian-type reliability problems
- significant resources have been committed in Australia to reacting to the situation, coordinated through the Energy Security Board, an independent body responsible for coordinating extensive changes to technical, market and regulatory settings
- the immediate focus is introducing the practical capability needed to manage physical consequences of solar PV on the system and market by requiring capability for remote disconnect / emergency management of solar PV. The extensive discussion of market-based mechanisms did not achieve any practical outcome in time to provide a solution
    - South Australia Power Networks (SAPN) now requires solar PV to have remote disconnection capability (respond to instructions via the internet). The requirement is through the customer agreement[2] and SAPN now offers customers with solar PV in designated export constrained areas the option of a fixed (1.5kW) export limit and a dynamic (up to 10kW per phase) limit which can be reduced in certain conditions[3]

[2] Note, the relationship between Australian distributors and customers is by a deemed contract between the distributor and customer for the distribution service. The retailer is not interposed

[3] More information on the SAPN requirements for connection of solar PV can be found here: https://www.sapowernetworks.com.au/data/310548/upcoming-changes-to-small-embedded-generation-connections/ and https://www.sapowernetworks.com.au/industry/flexible-exports/. A detailed explanation of the fixed versus flexible connection option is available here: https://www.sapowernetworks.com.au/industry/flexible-exports/fixed-v-flexible/

    - the requirement was developed through collaboration of SAPN, the state government, and the Australian Energy Market Operator to respond to system/market related issues, eg, negative market prices for extended period
- the next step in Australia is for network owners to provide information about network use by time and place through dynamic operating envelopes (DOEs) to enable retailers and market participants to optimise their energy portfolio risk[4]
- market integration of flexibility will follow once DER functionality (ie, communication capability) and DOEs (ie, signals on network conditions) provide the foundation for DER to participate in energy markets
- market integration is seen as a chicken and egg problem. There is not sufficient volume of flexibility to deliver grid services, but there is enough DER to cause network problems. DER/flexibility volume creates both potential value and potential risk. From a network design perspective, solutions need to give confidence it will deliver
- functionality and connectivity are increasing rapidly, particularly inverters, EVs, heat pumps etc – the key point is if it's not connected, you cannot use it. However, most DER in Australia is not flexible as it doesn't have the needed functionality and connectivity. Requirements are being imposed on new PV systems, but not existing PV systems/devices
- Greensync thinks it is important to avoid a false dichotomy between connection standards and market incentives. A minimum level of functionality and connectivity is needed for market integration and to transact flexibility. It is critical to have a link between the device and the market identifier (ie, ICP)
    - far better to achieve this without compulsion and mandates by providing and signalling the opportunity which makes investing in the capability worthwhile, remembering that people purchase DER for their personal benefit not to supply services to the electricity sector
    - the question is to identify when to prefer technical specifications and minimum standards and when to prefer outcomes

[4] Dynamic operating envelopes – very simplified – are a more sophisticated way for managing customer access to network capacity than the traditional approach of allocating a notional fixed amount of capacity to each connection (eg, based on ADMD). Dynamic operating envelopes vary import and export limits over time and location based on the available capacity of the local network or power system as a whole. More information is available in this Outcomes report by the Dynamic operating envelopes working group of the Distributed energy integration program: https://arena.gov.au/assets/2022/03/dynamic-operating-envelope-working-group-outcomes-report.pdf

    - prefer specifying outcomes over mandating standards. Standards can very easily end up being not fit-for-purpose, eg, preferring outcomes like connectivity mean software protocols can be updated over the internet
    - communication protocols like 2030.5 and openADR are being considered in Australia and Aotearoa NZ. Protocols can reflect assumptions about the operating environment, eg, 2030.5 is premised on the vertically integrated supply arrangements dominant in the US. As such it is not necessarily suited where retail and network activities are separate
    - questions about communication protocols are within scope of the EEA/EECA openADR project
- Australia saw extensive discussion of the different roles of participants and customer participation. The perspective is that most people want DER, but typically don't want to get much involved. Individual resources are not sufficient to deliver a service, requiring aggregation. Someone needs to do the aggregation. The key choice is to enable the transacting of flexibility.

5: Administration – governance, budget, and funding

The group heard an update on governance, budget and funding.

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