

# ESCRI-SA Meeting Minutes

**Meeting Name:** Knowledge Sharing Reference Group (KSRG), Meeting 1

**Date:** 6 February 2018

**Start Time:** 1:00 pm

**Finish Time:** 5:00 pm

**Location:** Pullman Adelaide, 16 Hindmarsh Square, Adelaide SA 5000

<b>Attendees:</b>	<b>Name</b>	<b>Affiliation</b>
	Rainer Korte	ElectraNet
	Hugo Klingenberg	ElectraNet
	Matthew Peake	ElectraNet
	Astra Dadzis	ElectraNet
	Paul Ebert	Advisian (KSRG Chair)
	Matthew Rowe	Advisian
	Barry Millar	AGL
	Simon Brooker	Clean Energy Finance Corporation
	Mark Wilson	AER
	Richard Webster	Government of South Australia
	Grant Cushion	Government of Victoria
	Tom Clark	Government of New South Wales
	Andrew Burnett	Government of Queensland
	Andrew Fraser (Virtual)	TasNetworks, representing Govt. of Tasmania
	Dan Sturrock	Australian Renewable Energy Agency
	Brendon Hampton	SA Power Networks
	Alex Lloyd	University of Adelaide
	Duncan MacKinnon	Australian Energy Council
	Claire Richards	AEMC
	Jessica Hunt	AEMO
	Stuart Richardson	Federal Government
<b>Apologies:</b>	Paul Knispel	Advisian
	Amy Kean	Government of New South Wales
	Eamonn McCabe	Government of Western Australia
	Karl Rodrigues	CSIRO
	Stuart Johnson	Energy Networks Australia

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No	Description	Presented by	Time
<b>Day 1 – Meeting at Pullman Adelaide, 16 Hindmarsh Square, Adelaide SA 5000</b>			
1	<b>Welcome by ElectraNet</b> <ul style="list-style-type: none"><li>Rainer Korte provided an overview of the SA transmission network and elaborated on the unique challenges it is facing.</li><li>These challenges are mainly related to managing a high penetration of intermittent generation sources within a weakly interconnection transmission network.</li></ul>	Rainer Korte	13:00 – 13:10
2	<b>Knowledge Sharing Reference Group (KSRG) – Introductions</b> <ul style="list-style-type: none"><li>The Chair introduced himself and the context and purpose of the KSRG.</li><li>Each KSRG member introduced themselves and their interest in batteries.</li><li>It was noted that the KSRG is a good forum for cross-pollination of ideas given the vast knowledge held by the members of the group.</li></ul>	Paul Ebert	13:10 – 13:30
3	<b>What is the KSRG – Terms of Reference</b> <ul style="list-style-type: none"><li>The KSRG Terms of Reference were outlined. No major questions were noted. The Chair highlighted what was expected of members and meeting communication protocols.</li></ul>	Paul Ebert	13:30 – 13:45
4	<b>ESCRI-SA Project Journey</b> <b>Phase 1 – Early Investigations and Business Case</b> <ul style="list-style-type: none"><li>The Chair presented the work undertaken during Phase 1 of the ESCRI-SA Project.</li><li>It was noted that the commercial structure is one of the most difficult parts of these emerging technologies/storage. There were some questions from the floor in regards to sources of revenue.</li></ul> <b>Phase 2 – Path to Financial Close</b> <ul style="list-style-type: none"><li>Rainer Korte presented on the work which went into getting the Project through to financial close.</li><li><i>Question regarding if wind speed is high during islanding:</i> The battery will not fill up exceptionally quickly, instead, the wind is curtailed. Given the parameters at the time (local load, wind speed etc.) there will be a predetermined capacity of the wind farm that will be tripped on entering islanding mode.</li><li><i>Question regarding revenue from islanding:</i> Customer benefit comes from</li></ul>	Paul Ebert  Rainer Korte	13:45 – 14:15  14:15 – 14:45

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the regulated service providing improved reliability in these cases. (A portion of cost of the battery sits in ElectraNet's regulated asset base – ElectraNet earns a regulated return on these services.)

- Currently no service for fast frequency response (FFR) exists in the market. The SA Government put a constraint on the Heywood Interconnector to limit the rate of change of frequency to no more than 3 Hz/s during an islanding event. If the rate of change of frequency is too high, the risk increases that the islanding event could lead to a black system event.
- *Question regarding battery impact on the interconnector.* With the battery injecting 30MW in a short space of time the 3 Hz/s rate of change of frequency constraints is reduced, which results in a market benefit.
- *Question: How does ElectraNet ensure regulated services are realised if AGL is taking control of the battery?* The energy required for regulated services to be delivered is accounted for by contractual charging limits on the battery – there will always be at least the required energy left in the battery by AGL.
- *Question regarding warranty of batteries being passed from suppliers.* ElectraNet guarantee certainty to AGL. ElectraNet is managing this risk with CPP (the EPC Contractor) signing up to an availability guarantee.
- Given the innovative and unique nature of this project involving the application of new technology at a grid scale, this has presented challenges both for the proponents and for its treatment under the existing electricity regulatory framework. The AER endorsed the amendment of ElectraNet's Network Capability Incentive Parameter Action Plan to include the prescribed capital cost component of the ESCRI project as part of the Network Capability Component of the Service Target Performance Incentive Scheme.
- *Brief discussion about the potential for ElectraNet or other network business to procure regulated battery services via a network support agreement.*
- *Note from the floor.* Taxpayers are paying for specific uses of the battery, but it's hard to see who benefits from these services such as opening additional capacity on the Heywood interconnector. The market benefits of relieving interconnector or other network constraints are routinely captured in regulated economic test assessments.
- If ARENA wasn't giving funding for this project, it would not have a positive NPV.
- Interesting that currently many large-scale battery projects are being proposed. However, it's expected that these large battery projects would still require financial assistance.
- There are large numbers of challenges in this space, many proposed projects will struggle with revenue. Many projects being listed currently are viable only because of the new energy they are supporting (such as

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pairing with a solar/wind project). It is difficult to forecast things such as revenue from arbitrage for the next 10 years making a purely market-facing battery difficult to analyse.

- Current rules make it difficult to register a battery. This project will assist with the learning of how market rules may need to adapt in future.
- It was very challenging to achieve financial close this project, in large part because of new ground that was being covered.

## 5 Project Status and Update

**Hugo Klingenberg** 14:45 – 15:15

- Hugo Klingenberg presented on the status of the Project.
- *Question regarding fire standards for Tesla/Neon battery.* We do not have access to the standards used for this other project.
- *Question regarding auxiliary load.* Auxiliary loads are generally supplied from the 33 kV connection point, with a standby generator on site as backup.
- There are many projects in renewables going towards modular units – just buy “off the shelf” and construct. However, inverters and other complex battery equipment are not at that level of development yet.
- *Question regarding fast frequency response.* The battery will form part of ElectraNet’s System Integrity Protection Scheme.
- *Note on private involvement in the regulated space:* Pre-pricing/ transparency of these fast frequency services would be needed to attract private companies to come in and engage in this market.
- Given this project connects to the grid, ElectraNet is required to show models of how it can support the voltage, charge, discharge etc. These models are very important for getting approval for development and connection.
- *Question to the group - Discussion surrounding other tests that might be appropriate during commissioning.* No additional testing suggested. Of note is that the islanding testing will be difficult given that the Wattle Point wind farm will be live and operating so a good time for islanding testing will need to be selected.
- *Question surrounding voltage levels of battery and wind farm.* There are no difficulties caused from the wind farm being on the 132 kV side and the batteries being on the 33 kV side.
- Wind farm control will be slave to the battery operation in islanding event.
- Projects like this (fast timeline) make industry think that you can go from project plan to energisation in 6 months. However, need to make sure industry goes back to make sure drawings are up to date and that corners are not missed due to the fastened timeline.
- *Question regarding if islanding aspect of the battery has added delay.* Although it might be complex, it hasn’t delayed any timelines. The

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difficulties of developing generator models for general connection to the grid is what was time-consuming. Testing of the islanding mode might be delayed.

- *Discussion surrounding ability to roll this same project out again and if the timeline would be different.* This project uses ABB inverters for example, and once the models for this equipment are developed it will be easier to get connection approval for the next project. Granted, the models will need to be applied to local conditions, but it will be a much more familiar process.
- *Question regarding knowledge sharing on these models.* The detail of these models is subject to rules requirements and generally confidential.

<b>6</b>	<b>Afternoon Tea</b>		<b>15:15 – 15:30</b>
<b>7</b>	<b>Knowledge Sharing Objectives &amp; Components</b>	<b>Paul Ebert</b>	<b>15:30 – 15:45</b>
	<ul style="list-style-type: none"> <li>• The Chair presented on the expectations around Knowledge Sharing.</li> <li>• Great learning will come from sharing experience, standards, regulation hurdles. Also, discussing the commercial side of the projects.</li> </ul>		
<b>8</b>	<b>Knowledge Sharing Portal description and update</b>	<b>Matthew Rowe</b>	<b>15:45 – 16:00</b>
	<ul style="list-style-type: none"> <li>• Matthew Rowe presented on the Knowledge Sharing Portal.</li> <li>• Suggestion that the six-month reports could potentially include information on how the battery operation has assisted the Heywood interconnector.</li> <li>• <i>Question regarding information provided on battery degradation and why 12 years was selected.</i> ESCRI started with 10, but was pushed out to improve benefits to the business case for AGL. Current degradation predictions assume max 250 cycles per year. Each year there will be a performance test which will test battery degradation.</li> <li>• <i>Question regarding if degradation would be viewable on portal.</i> Could be inferred from information such as current charge capacity, although will consider providing results of yearly performance tests.</li> <li>• Suggestion from committee that including pricing points could be useful.</li> <li>• <i>Question regarding information on how the asset is performing.</i> Six-monthly operational reports will be prepared as part of knowledge sharing.</li> </ul>		
<b>9</b>	<b>Questions and comments on Knowledge Sharing</b>	<b>All</b>	<b>16:00 – 16:30</b>
	<ul style="list-style-type: none"> <li>• One of the largest/most valuable learnings will be how the islanding operation performs. There will only be wind and solar with battery, in a no inertia environment.</li> </ul>		

- *Question - if there is a storm coming can the battery ignore market operation (AGL) to charge up for a weather event?* No, this is not part of the agreement with AGL. However, there has been a hierarchy list developed which ensures the important objectives are met in a given order.
- *Question regarding availability obligation.* It is measured and averaged over a year.
- *Question regarding compensation.* AGL is not compensated for the use of the battery for islanding. The main reason being that if the grid blacks out, there won't be an ability to provide market-facing services anyway.
- *Question regarding how site-based learning will be transferred.* Through milestone reports.
- Suggestion from committee that it would be good to get a cost breakdown of the project.
- Suggestion from committee that it would be interesting to see how the services that have been included in the battery contribute to the cost. E.g. how much extra did it cost to be able to include the islanding capability?
- Note from committee that it would be interesting to see the different costs for different battery types – e.g. what would it cost for a power-providing battery, a wind-farm supporting battery, a solar-farm supporting battery etc.
- *Question regarding economic benefits to project region.* The construction activity is contributing to the local region's economy. However, no capture of this economic benefit has been attempted.

<b>10</b>	<b>Site visit 1 – logistics for the day</b>	<b>Matthew Peake</b>	<b>16:30 – 16:45</b>
	<ul style="list-style-type: none"> <li>• Matthew Peake went through the logistics and safety issues for the Site Visit the following day.</li> </ul>		
<b>11</b>	<b>Other business</b>	<b>Paul Ebert</b>	<b>16:45 – 17:00</b>
	<ul style="list-style-type: none"> <li>• The Chair thanked the KSRG members for their attendance and noted the next meeting for Tuesday 8 May 2018.</li> </ul>		
<b>12</b>	<b>Day 1 close</b>	<b>Paul Ebert</b>	<b>17:00</b>

## Site Visit

Note: A visit by the Knowledge Sharing Reference Group to the Dalrymple construction site was undertaken on Wednesday 7 February 2018.

The Reference Group would like to thank Consolidated Power Projects (CPP), ABB and ElectraNet staff involved for their efforts in hosting what was a very enjoyable and informative visit.

-----end of minutes

Certified as a correct record of the ESCRI-SA Knowledge Sharing Reference Group Meeting of 6 February 2018.



27 March 2018

**Paul Ebert**

**Date**

KSRG Chair

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