

Clean Energy Summit 2018

Is Bigger Really Better (When it Comes to Batteries)?

1 August 2018

ARENA

About ARENA

Independent Board works to the ARENA Act 2012
Investment & market orientated Board, CEO and CFO

PURPOSE



Accelerate Australia's shift to a sustainable, affordable and reliable energy future

PORTFOLIO

\$1.14 billion funding committed to support **over 364 projects**

172 completed projects
+161 active projects (incl scholarships, fellowships)

PIPELINE

\$553m funding available to support innovative energy technologies

75 active projects in our pipeline

Knowledge Sharing | Collect, analyse, interpret and disseminate



Investment Priorities

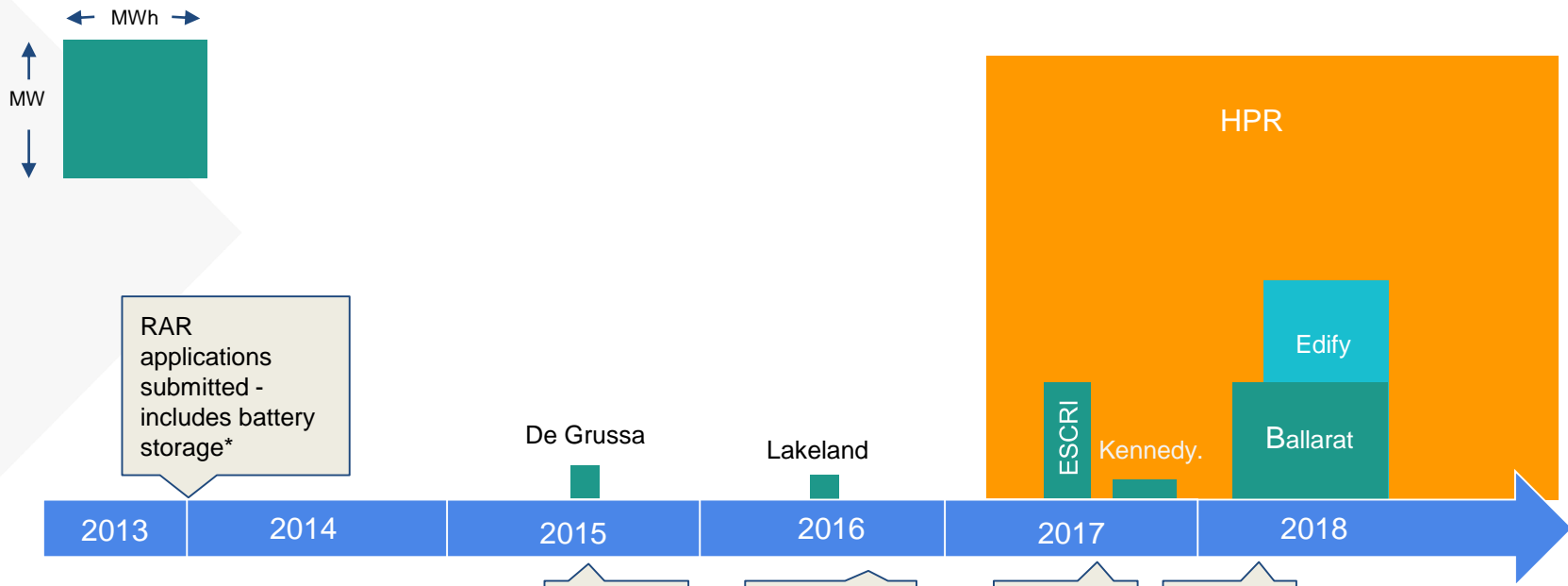
<p>1</p> <p>DELIVERING SECURE & RELIABLE ELECTRICITY</p> <p>Delivering affordable low emission electricity solutions that keep the lights on.</p> 	<p>2</p> <p>ACCELERATING SOLAR PV INNOVATION</p> <p>Making solar PV more efficient and affordable through research and development.</p> 	<p>3</p> <p>IMPROVING ENERGY PRODUCTIVITY</p> <p>Helping reduce energy cost and emissions in the transport, building and industry sectors.</p> 	<p>4</p> <p>EXPORTING RENEWABLE ENERGY</p> <p>Creating new, scalable export value chains in renewable energy.</p> 
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Alignment with ARENA Investment Priorities

Battery application	Relevance to system security and reliability	Technology Suitability	Urgent requirement?
Load shifting (wholesale market arbitrage)	✓	✓✓	-
T&D investment deferral	✗	✓	✗
Frequency control and stability	✓✓✓	✓✓✓	Not after Hornsdale
T&D – voltage support services	✓	✓	✗
Generation capacity adequacy	✓✓✓	✓✓	Capacity shortfalls Shift to dispatchable VRE
Back-up power – short term islanding	✓✓	✓✓	Maybe in niche scenarios
System Restart Ancillary Services (SRAS)	✓	✓	-

- Demonstrating how the business model can be improved through unlocking the value stack is of interest to ARENA

Evolution of Battery Storage Projects and ARENA's role



*Includes DeGrussa, Weipa, Lakeland

DeGrussa
Fin. Close

Lakeland
Fin. Close

ESCRI
Financial
Close

VIC
Batteries
Financial
Close

← ESCRI Feasibility Study →

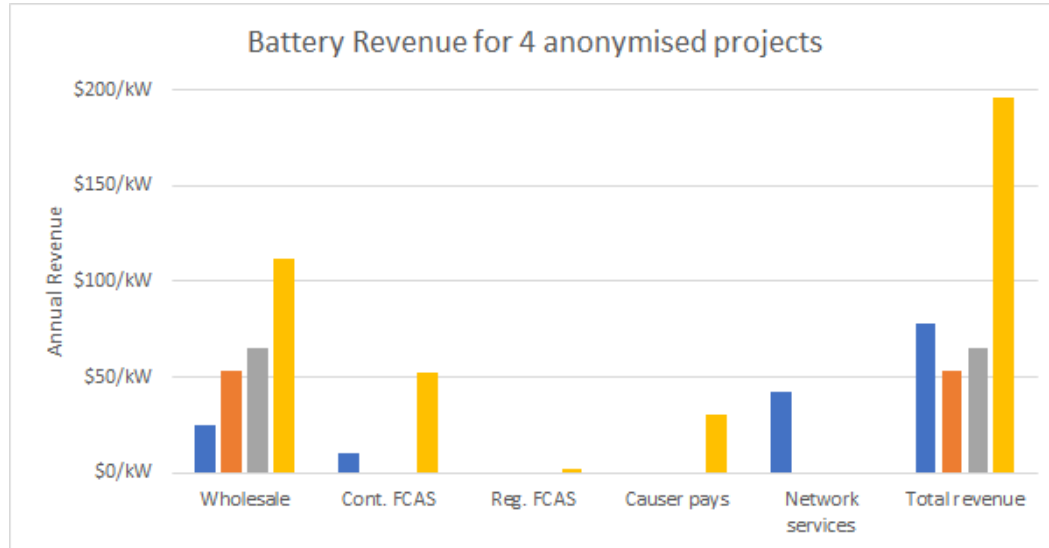
ARENA Projects - NEM Connected Batteries

Project	Battery size	Subsidy required	Proponent	Applications
Lakeland Operational	1.4MW / 5MWh	N/A	Conergy	<ul style="list-style-type: none"> - Paired with solar farm - Islanding - Wholesale
ESCRI (Dalrymple) Commissioning	30MW / 8MWh	\$12m	ElectraNet / AGL	<ul style="list-style-type: none"> - Wholesale + FCAS (contingency) - FFR, SPS - Islanding
Kennedy Energy Park Construction	2MW / 4MWh	N/A	Windlab	<ul style="list-style-type: none"> - Paired with wind and solar farm - Smoothing
Ballarat Construction	30MW / 30MWh	\$25m (co-funded with Vic gov)	Spotless / AusNet	<ul style="list-style-type: none"> - Located at terminal station - Wholesale + FCAS - Exploring network options
Gannawarra Construction	25MW / 50MWh	\$25m (co-funded with Vic gov)	Edify	<ul style="list-style-type: none"> - Paired with solar farm - Wholesale + FCAS



Capturing and banking required revenue is challenging

- Bankable revenue dominated by arbitrage
- Highly variable depending on project location and proponent
- 3 of these 4 projects were “banked” a Tier 1 gentailer

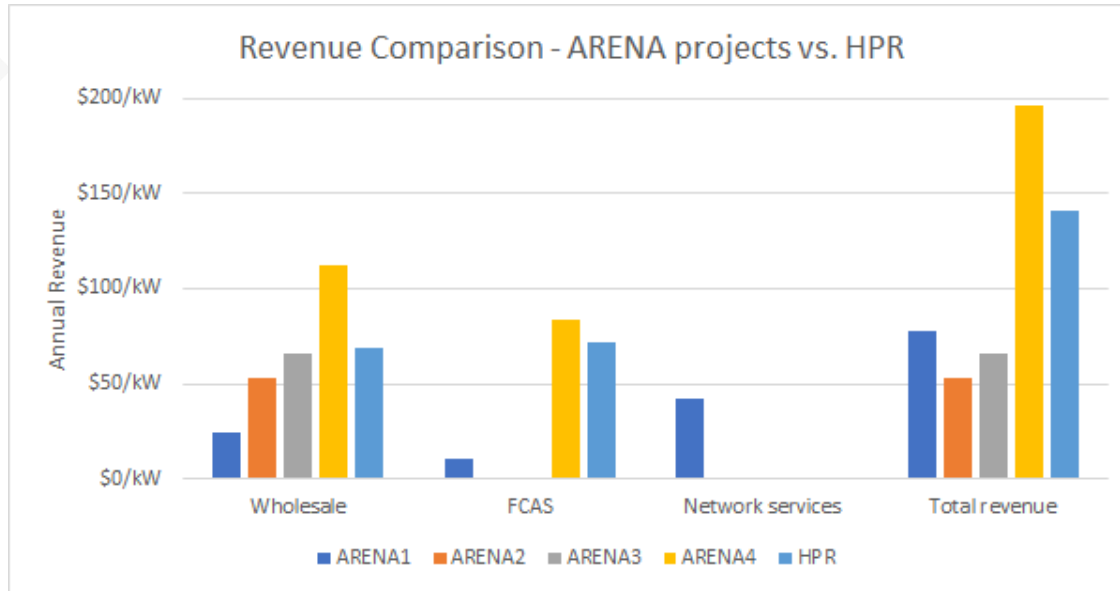


Highly variable views on revenue
(varies with state, but also with
proponent)



Comparison with Hornsdale Power Reserve (HPR)

- HPR financing benefited from long term capacity payment from SA Govt.
- Excluding this capacity payment shows that HPR realised revenue is at the upper end of projects supported by ARENA



Closing thoughts

- ARENA seeks to provide the smallest amount of taxpayer funds to deliver the maximum positive impact / industry development
- The sector has made significant progress:
 - project delivery
 - demonstration of services
 - informing regulatory changes
- Bankability remains a significant challenge, including unlocking new revenue streams
- Larger projects expected to require revenue support to attract project finance in medium term





Q&A

Thank-you

www.arena.gov.au



Australian Government
Australian Renewable
Energy Agency

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