



ENERGY STORAGE SUMMIT
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*We create renewable technology solutions
to enable a sustainable energy future.*



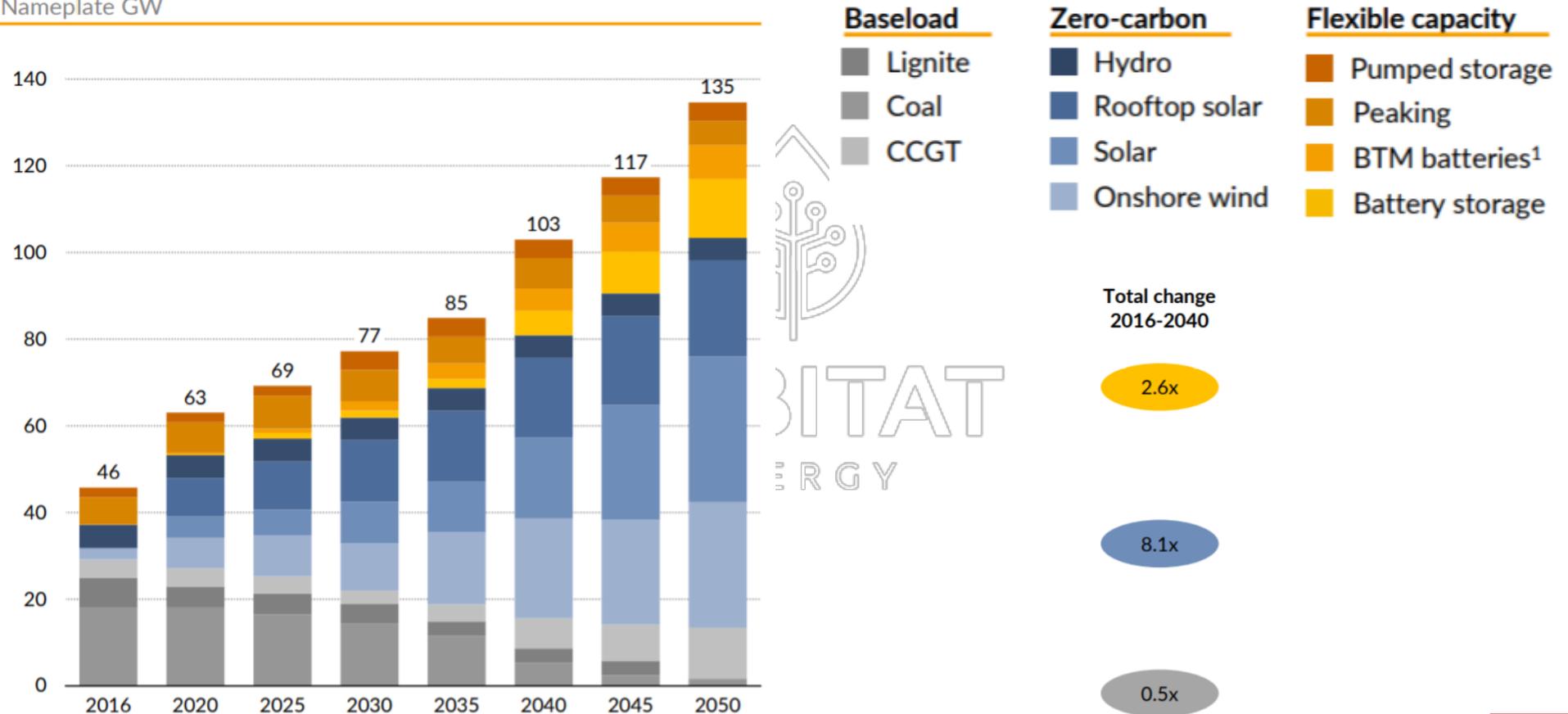
Yadlamalka Energy : the idea....

- Project led by Andrew Doman, South Australian, ex McKinsey Director, entrepreneur, and owner of Yadlamalka sheep station.
- Located at Neuroodla electricity substation, near Yadlamalka sheep station, north of Port Augusta, South Australia.
- Innovative renewable energy project adopting a breakthrough energy storage technology - Vanadium Flow Battery with Solar PV.



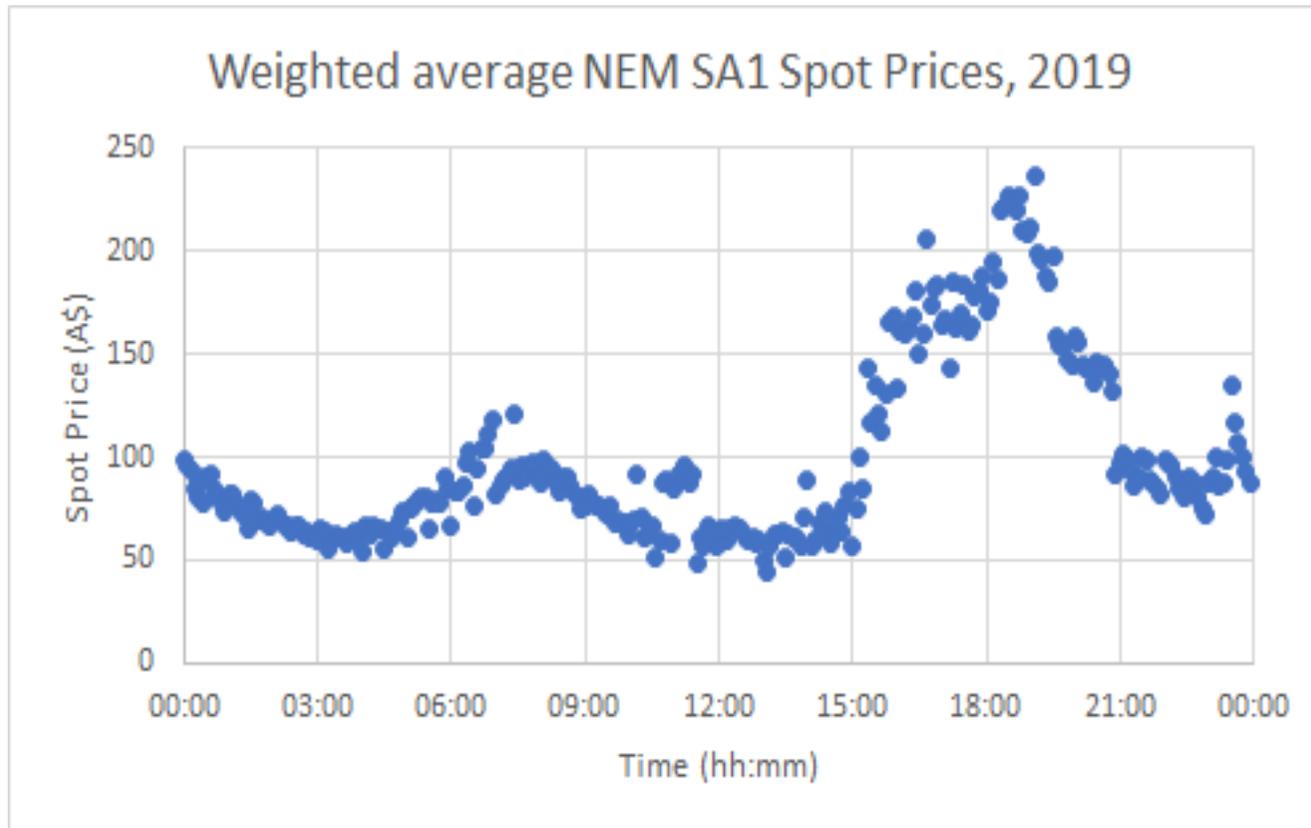
Australia's Energy System – 2050

NEM-wide capacity,
Nameplate GW

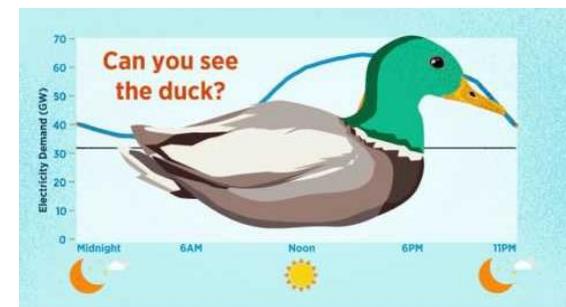


1) Behind-the-meter batteries linked to rooftop solar.

South Australia Market Opportunity



- SA - highly dependent on renewable energy – solar / wind production
- Intermittent energy supply and black outs, leading to intraday electricity price volatility.
- Creates opportunities for medium duration storage technologies and market for arbitrage price differentials



Australia First : Yadlamalka Energy

- **Australia's first dispatchable solar energy plant.**
- 8 MWh vanadium flow battery (VFB) with a 6 MWp solar array services to the grid.
- Energy storage capacity of 4 hours (lithium < 1 hour).
- Revenue derived from battery time shifting energy arbitrage, grid stability services, and solar PV.
- \$5.7 million AUD funding received from ARENA, the Australian Renewable Energy Agency.
- Savings of 4,000 to 4,500 tonnes of carbon dioxide pa.
- Reduces SA intermittent energy problems and deliver strong economic infrastructure benefit.
- Knowledge Sharing programme designed with University of SA for public dissemination.



Australia First : ARENA project aims

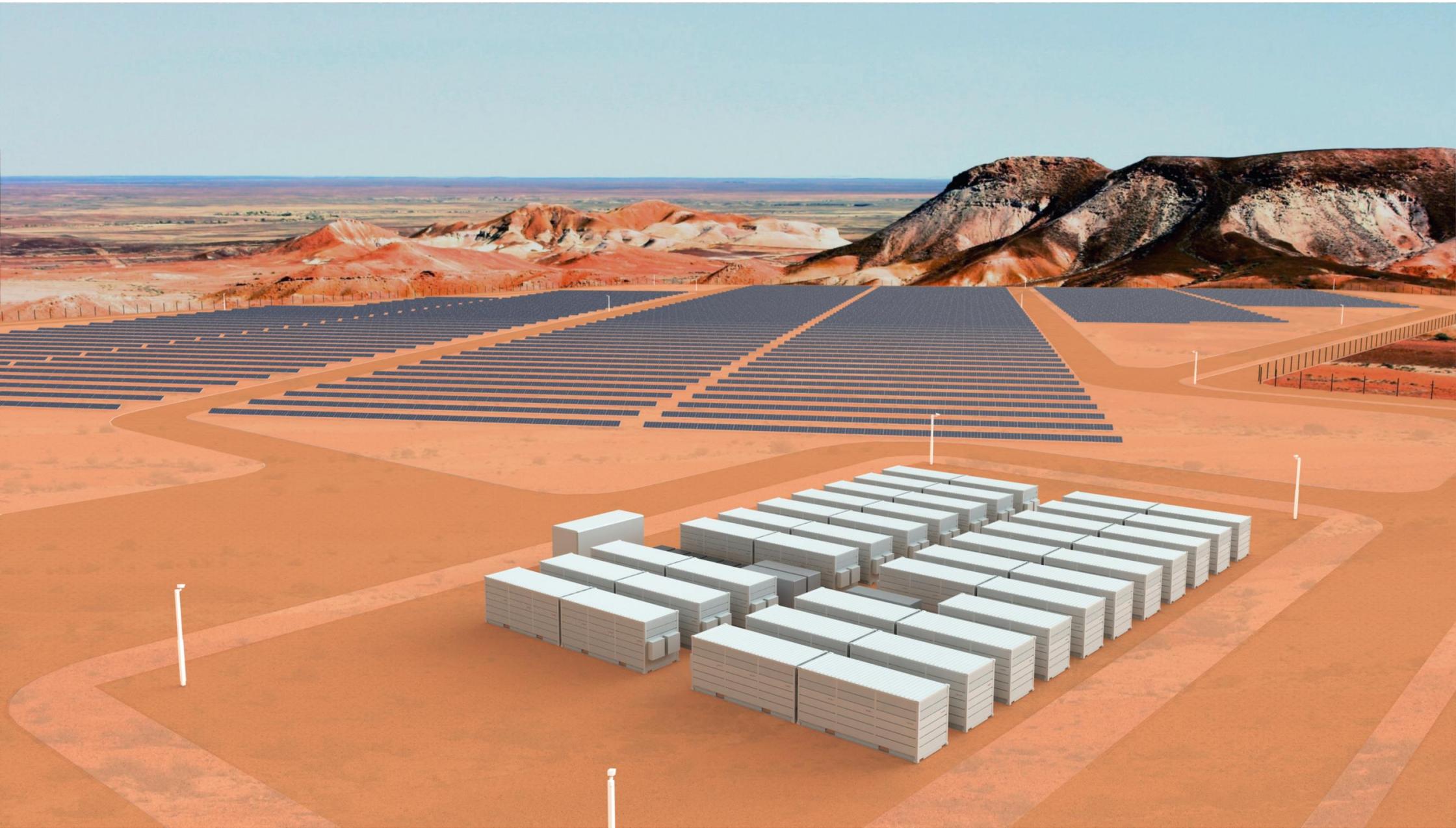
- Demonstrate the operational viability of a grid-connected VFB to prospective developers, regulators and investors.
- Support technical innovation: demonstrate participation in energy and FCAS markets and the feasibility for provision of other network support services.
- Commercialisation pathway.
- Industry development: support the development of VFB in Australia, including the potential to expand the existing Australian vanadium resource industry through the feasibility of use within VFBs linking producers of vanadium with prospective VFB end users.



Australian Government
**Australian Renewable
Energy Agency**

ARENA

Yadlamalka Energy received funding from ARENA as part of ARENA's Advancing Renewables Program. The views expressed herein are not necessarily the views of the Australian Government, and the Australian Government does not accept responsibility for any information or advice contained herein.



Project Partners





Matt Harper
Chief Commercial Officer



HABITAT
ENERGY



Established 2020 (AIM:IES)

Merger of redT energy and Avalon Battery

14 Years of R&D Investment

Over £40 million spent on development to date

102 Employees

The most experienced team in flow batteries

50 Projects

Over 25 MWh installed or signed on five continents

73 Patents

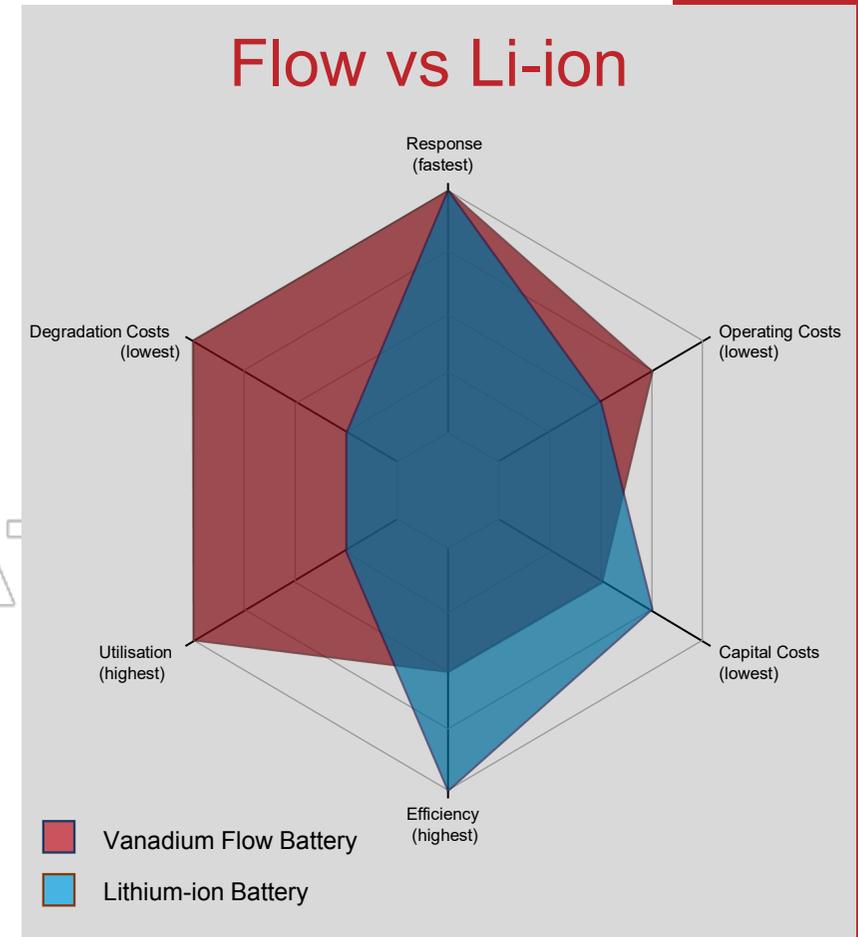
Granted or pending, plus trade secrets and know how

Worldwide Presence

Canada (technology, NA hub), UK (technology, sales), US (sales), China (manufacturing)

The Flow Battery Alternative

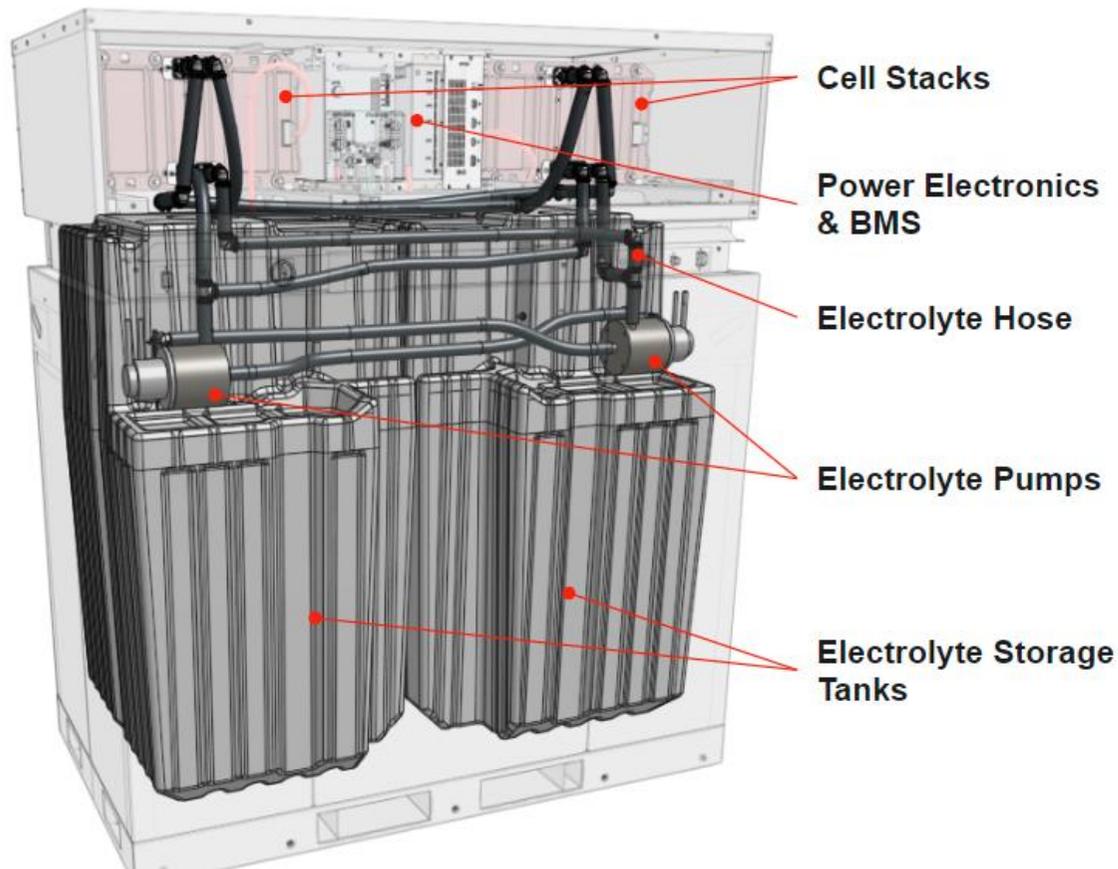
- **Fast Response** – Sub-second response times, suitable for FCAS
- **Compelling Economics** – Superior Levelised Cost of Storage (LCOS)
- **High Utilisation** – Can perform multiple cycles per day, 100% DoD
- **No Degradation** – Does not degrade with use, low cost per cycle
- **Sustainable Materials** – No conflict minerals; easily recyclable
- **Factory Built** – Standardized product drives price down and quality up
- **Australian Heritage** – Patented in 1989 at University of New South Wales



The Result - Energy storage superior to and complementary with lithium systems

Our Technology

Durable • Reliable • Economical • Proven



Vanadium



- **Available** – Element 23, readily available and more abundant in the Earth's crust than copper. Accessible reserves in Australia, South Africa, United States, Canada, Russia.
- **Reusable** – Virtually unlimited working life. 97% proven recovery rate from used electrolyte.
- **Safe** – Electrolyte is ~70% water, non-flammable with no risk of thermal runaway

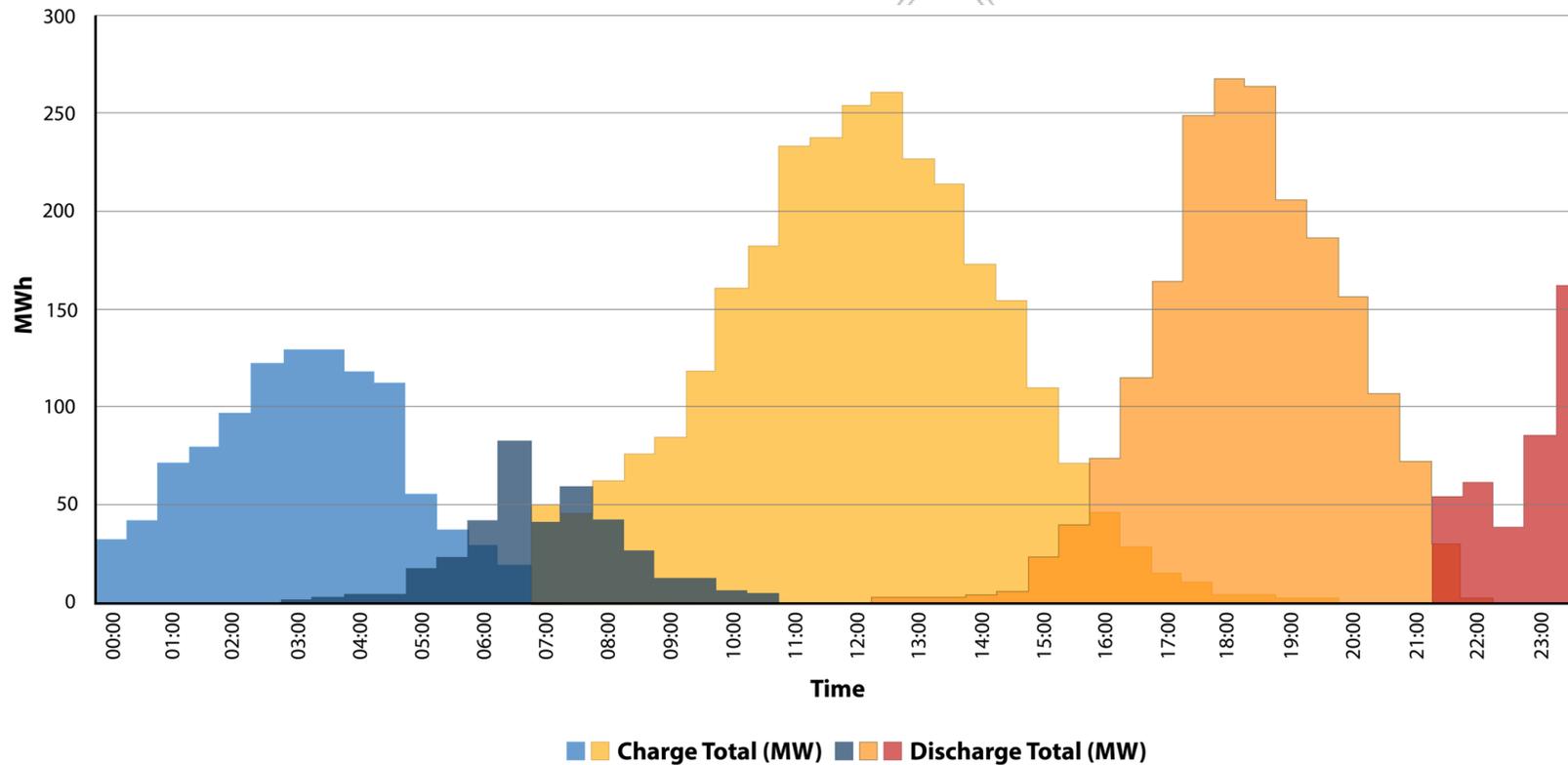
'Stacking' Cycles for Maximum Returns

■ High throughput application – 2+ cycles per day, 24/7 battery utilisation

Cycle 1: Charge from low-cost excess solar during day. Discharge into evening peak

Cycle 2: Charge from low-cost overnight power. Discharge into morning peak

Cycle 2+: Performing NEM ancillary services such as FCAS

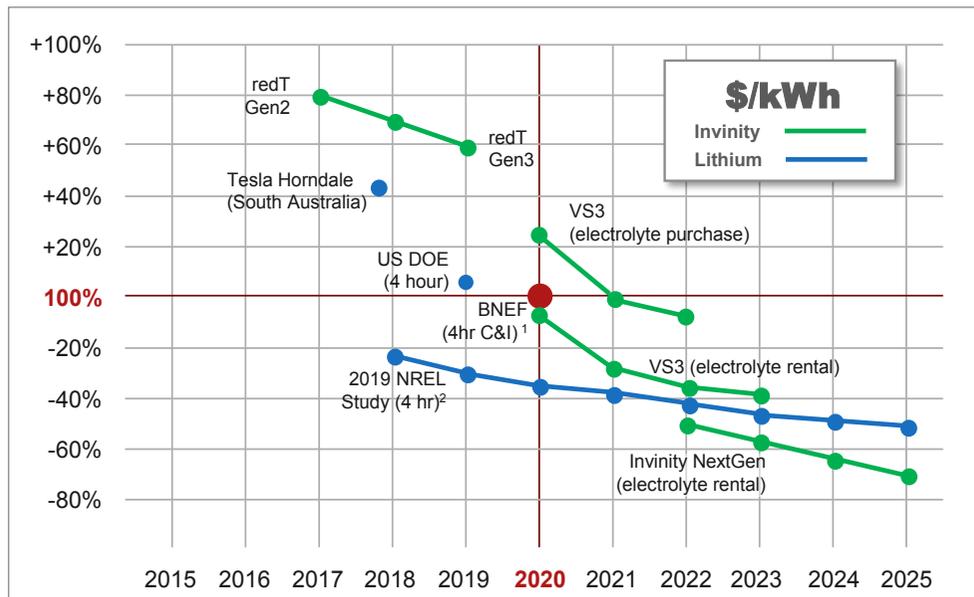


Storage Cost Metrics

\$/kWh is a frequent comparison where Invinity is on par with lithium for behind-the-meter, commercial and industrial projects.

Invinity's next-generation will target lower-cost grid-scale applications, with a **lower initial cost** than lithium from launch.

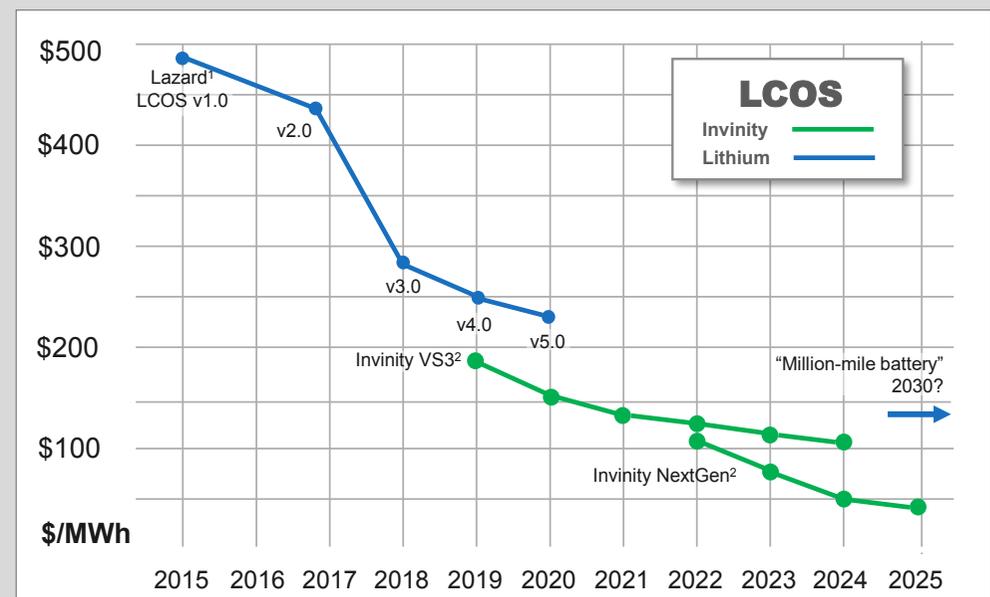
Relative to BloombergNEF 2020 for lithium in Commercial & Industrial applications



¹Figures normalized to 2020 C&I Lithium CapEx at 100% per BloombergNEF Reference 2020
²Cost Projections for Utility-Scale Battery Storage National Renewable Energy Laboratory of the U.S. Department of Energy [NREL/TP-6A20-73222] June 2019

But as the storage industry matures, asset owners are **focusing on total cost of energy delivery**: the “Levelized Cost of Storage”.

Invinity's LCOS is 50% below lithium today, with a clear path to a 70% advantage by 2022 for high-throughput storage projects.



¹Lazard Levelized Cost of Storage 1.0 (2015), 2.0 (2016), 3.0 (2017), 4.0 (2018) and 5.0 (2019) <https://www.lazard.com/perspective/lcoe2019>; data are for peaker plant replacement / wholesale 4-hour storage
²Management and strategic partner analysis, 2018 to 2020

Flow Battery Use Cases

