

YARRA ENERGY FOUNDATION



Community Batteries, the new kid on the block, ANU 31/8/21

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AGENDA

- YEF Introduction
- Brief overview of YESS
- The YESS Partnership
- The subnetwork issue
- Why shared energy storage is such a great idea
- AEMC's solar charge

"Connecting people to better
energy for a zero carbon
future."

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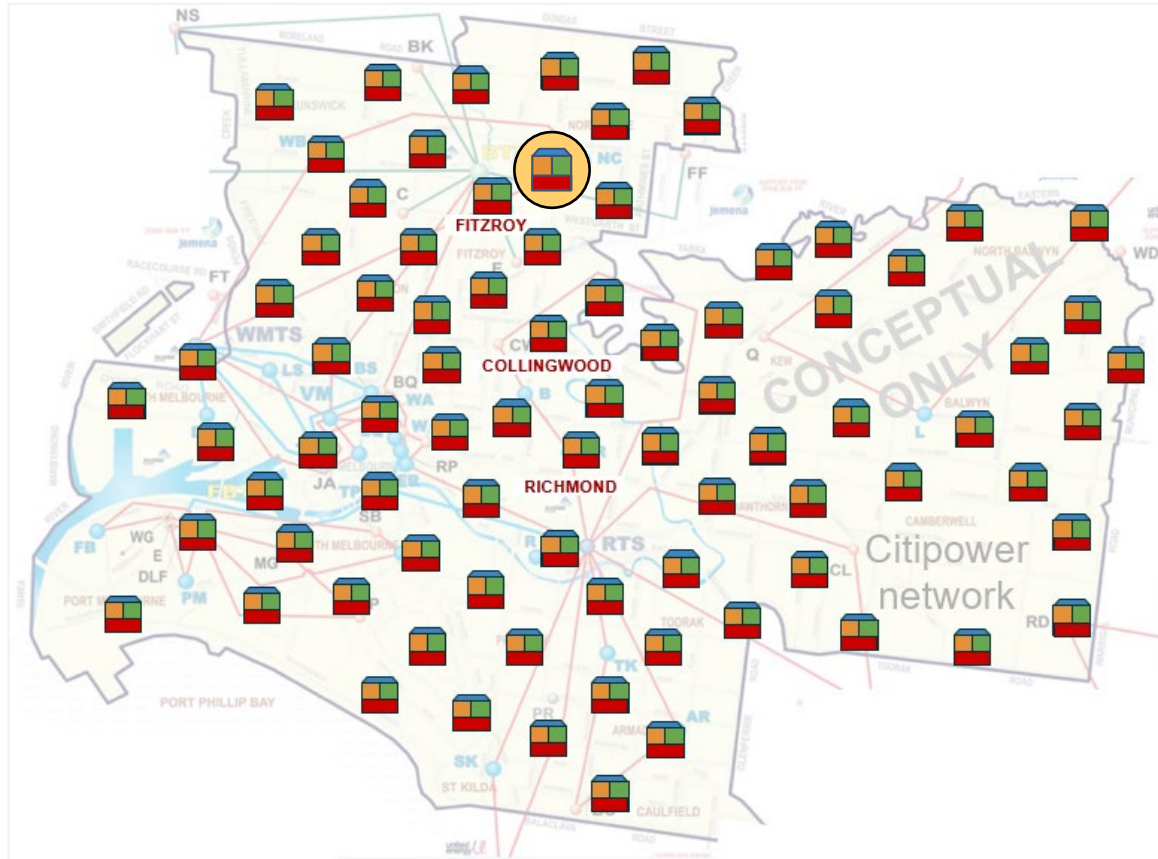


YESS Yarra Energy Storage Systems

a.k.a The Melbourne Solar Sponge



Yarra Energy Storage Systems



- A network of community batteries
- CitiPower network-wide deployment
- Third party ownership
 - Wholesale and retail investors
- Storage & supply for subscribers
- Citipower network support
- Electricity market trading

The YESS Partnership

Objective 1: To demonstrate the commercial viability of a network of YESS community batteries

Objective 2: To deliver a roadmap and deployment schedule of YESS community batteries

YEF



Australian
National
University

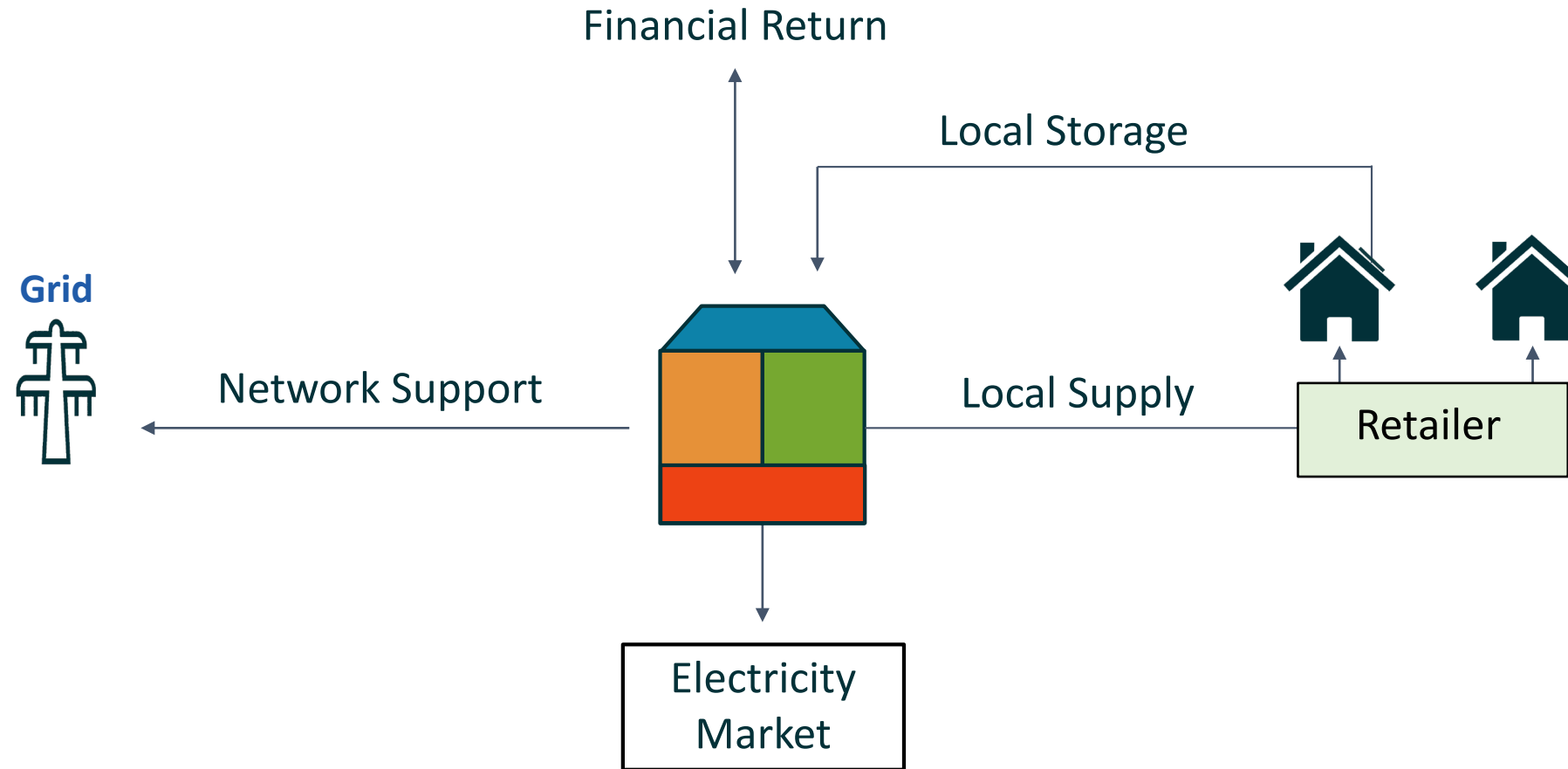


Battery Storage and
Grid Integration
Program

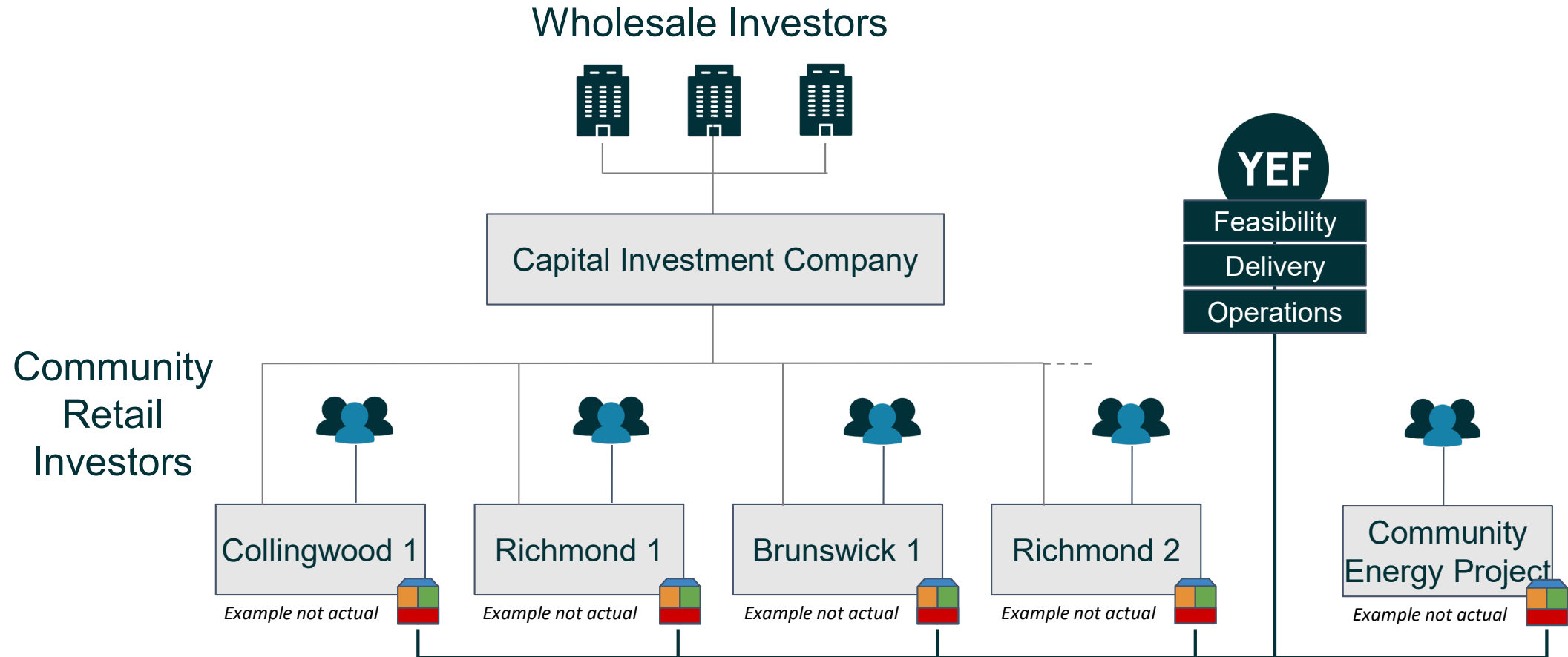


- **Project Management, Planning, Delivery**
- **Technical Validation, Planning, Data Access**
- **Software R&D, Planning, Advice, Research**
- **Trial Site Planning, Community Engagement**
- **Finance, Knowledge Sharing, Promotion**

YESS Business Model



YESS Ownership Model





Value Proposition to Community Members



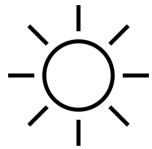
Value Proposition to Community Members

A Community Battery in your Neighbourhood

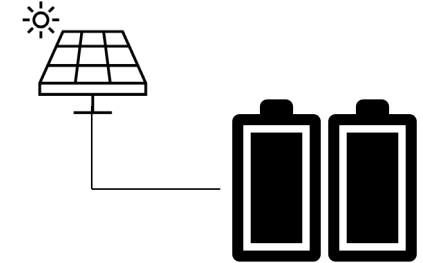
Enables more solar to be installed and exported

- ✓ **Open to everyone in the neighbourhood**
- ✓ **Sources local energy - displayed on your phone**
- ☞ **On cloudy days, still supplies energy and supports the local network**
- ✓ **No cost involved for all participants, even a discount**

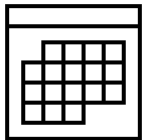
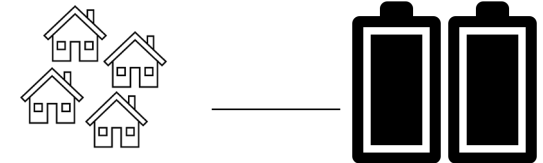
How it Works



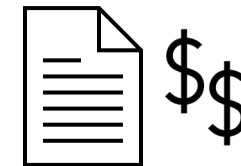
During the day, the battery charges from the local network. On cloudy days, it charges remotely at daytime when renewables are high in the grid



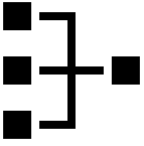



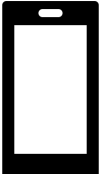
In the evening, the battery discharges to all community members



At the end of the month, subscribers receive a pro-rated discount for their evening consumption



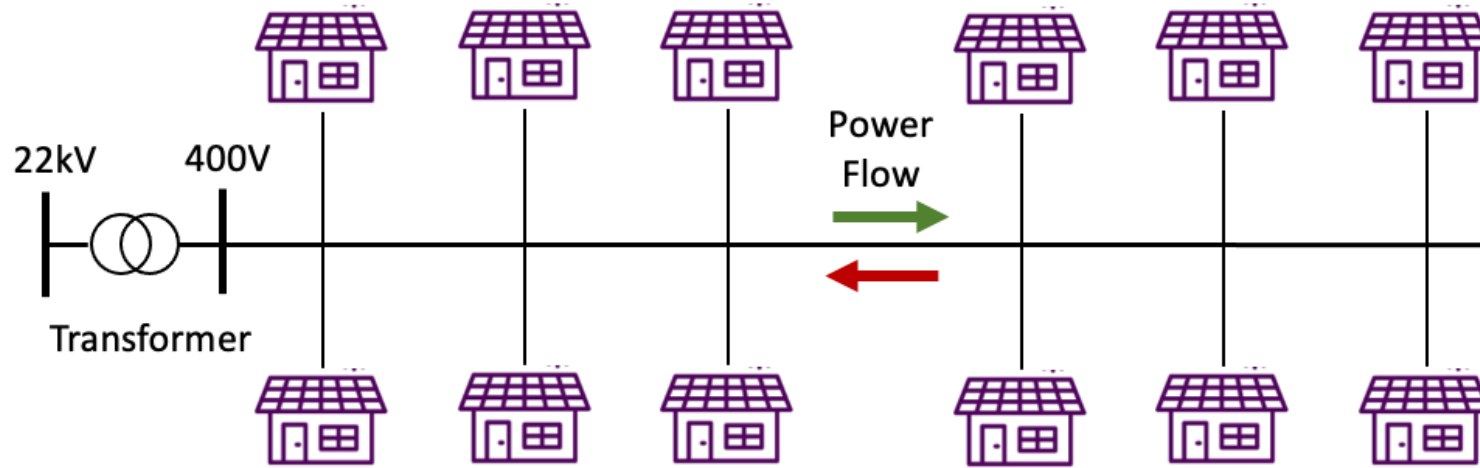
How to Subscribe

-  **Check that your property is connected to the same part of the network**
- 
 **Sign up to the battery through a participating retailer**

-  **Download the app and start enjoying lower cost energy every evening**



The Subnetwork Problem

PV HOSTING CAPACITY LIMITS



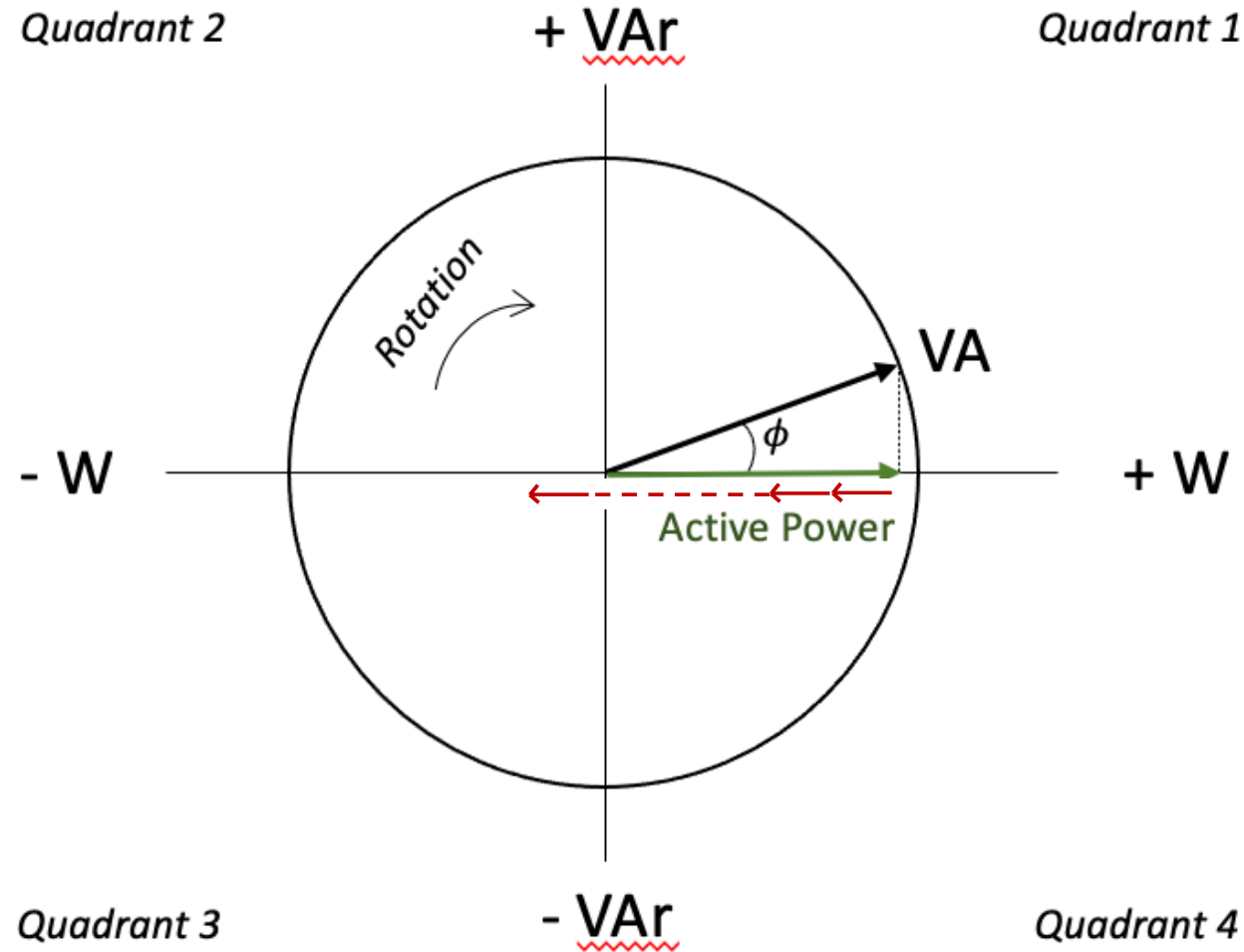
$$\Delta V \sim RI_A - XI_R^*$$



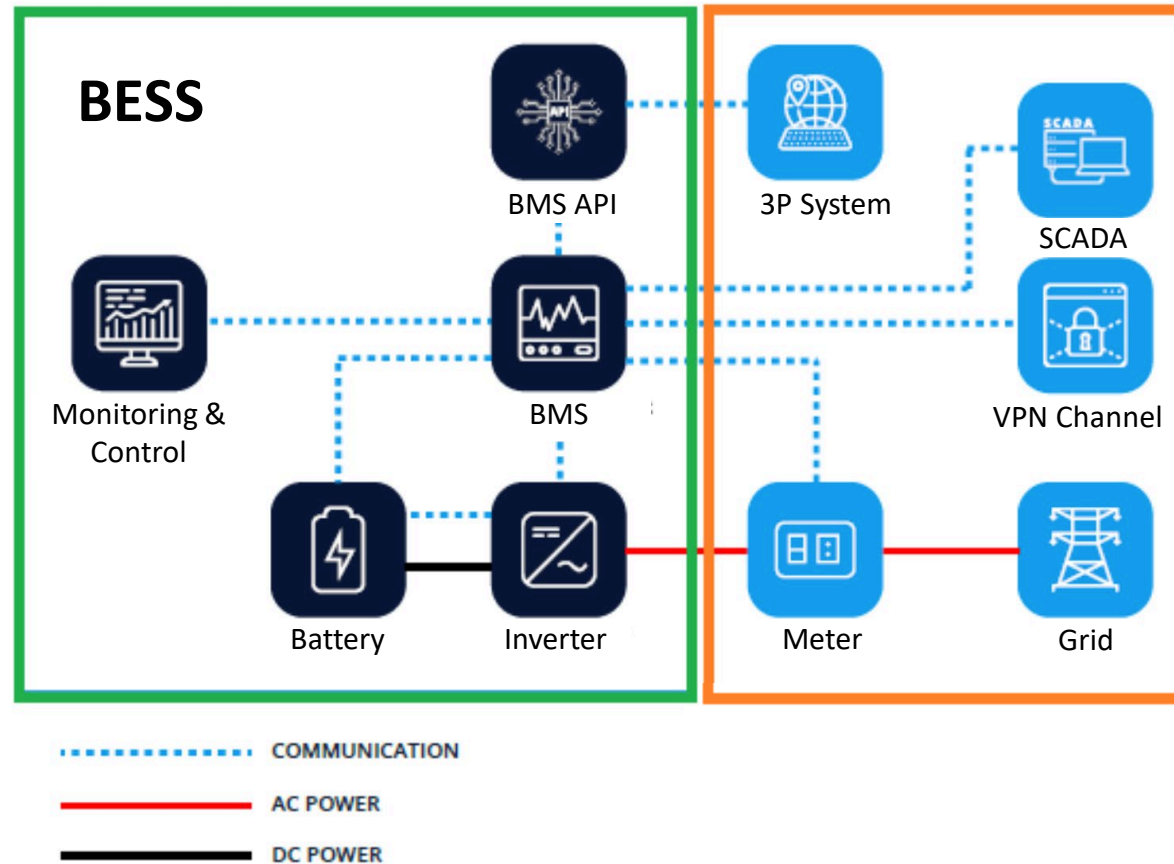
$$\Delta V = (R + jX) (I_A + jI_R)$$

Source: Monash University - Power Engineering

Four-Quadrant Operation



Battery Energy Storage System BESS



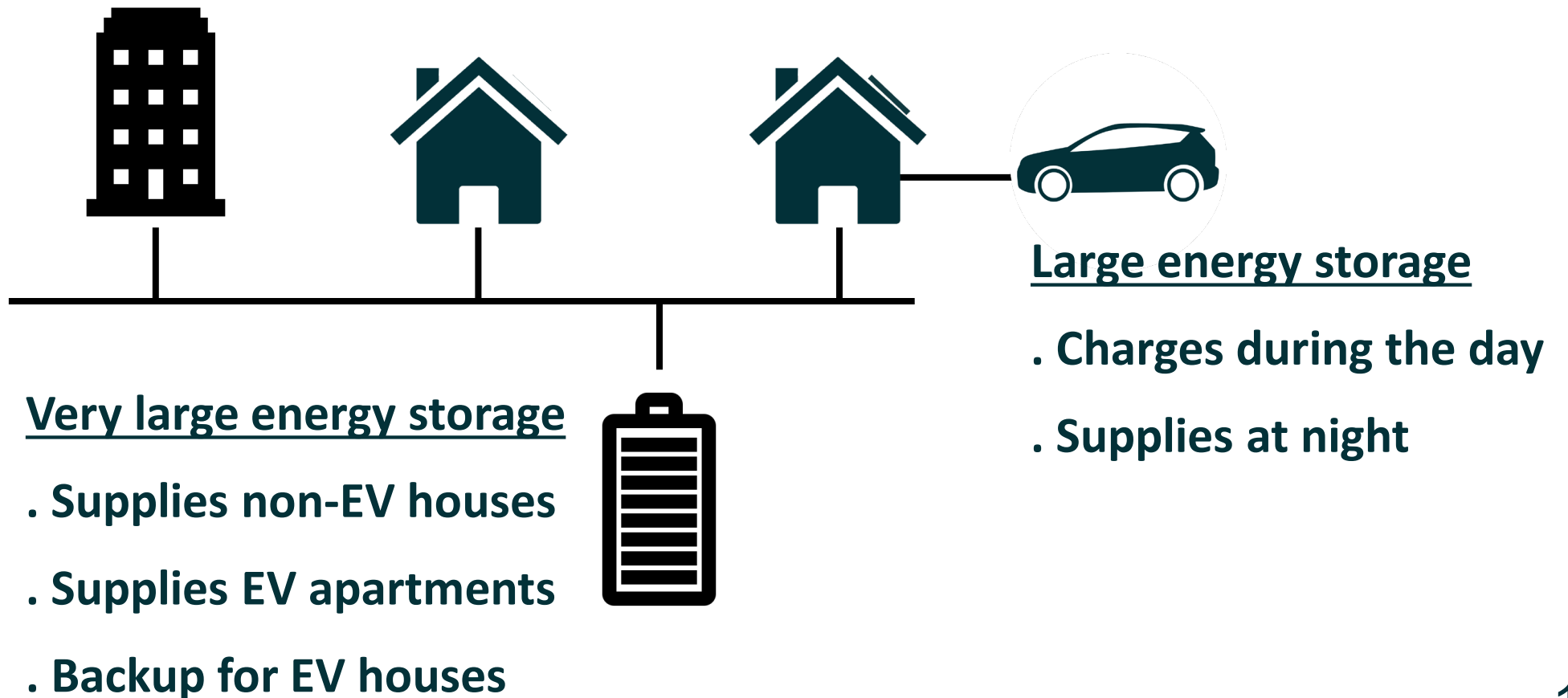


The Great Value of Community Batteries

Community Batteries Can...

- **Reduce ‘solar waste’** (removing export limitations)
- **Allow for more solar to be installed** (without network upgrades)
- **Reduce losses** (production near consumption)
- **Make renewable energy more affordable** (shared local storage)
- **Support the network** (as fossil fuel generators retire)
- **Bring more energy equity** (if available to everyone – solar or not)
- **Help build more trust in energy sector**

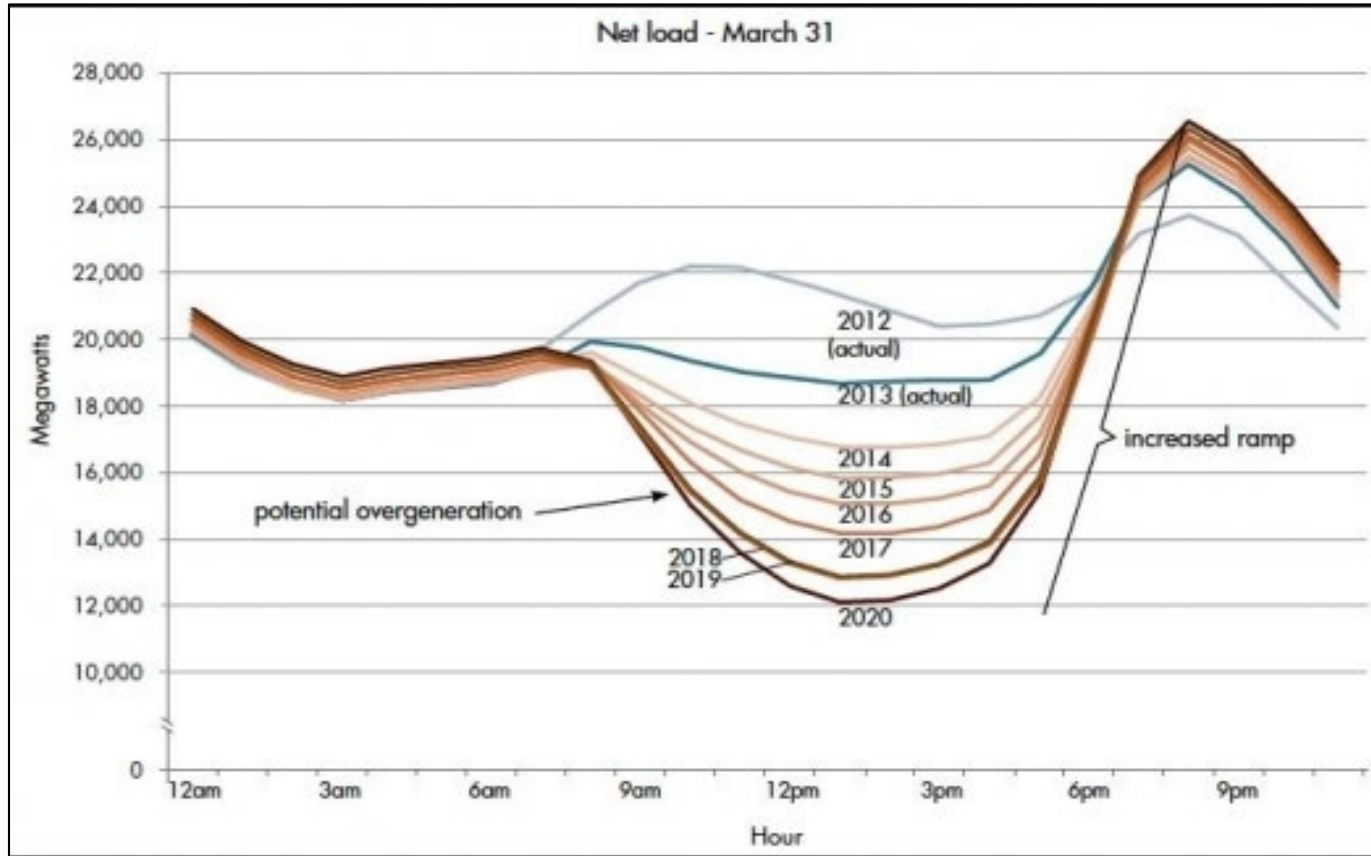
Community Batteries and Electric Vehicles





AEMC's Proposed Solar Charge

The Problematic Duck Curve



Reproduction of chart courtesy of US Department of Energy

AEMC Smart Solar Reforms

- **Obligations on power network businesses – AER has oversight.**
 - Support for 2-way energy flows
 - Performance framework and mandatory reporting.
- **Network businesses to offer a range of options**
 - A basic free service – to limit solar waste, save money and benefit the grid
 - Guaranteed free options until 2041
 - Paid plans to earn more for solar export at some times and less at others
- **No new pricing plans for existing customers before July 2025**
- **And,**

But export limit?

But export fees on distribution network solar farms?

Victorian energy minister said no export charging in Victoria

“There are also other things open to power network businesses to do to promote smart energy use, like encourage access to community batteries”

Source: <https://www.aemc.gov.au/news-centre/media-releases/smart-solar-reforms-will-inject-more-clean-energy-grid>

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