

# Indigo Power

## *Hybrid community batteries: A feasibility study into 'community power plants'*

*Power plants today...*



Source

*...and tomorrow?*



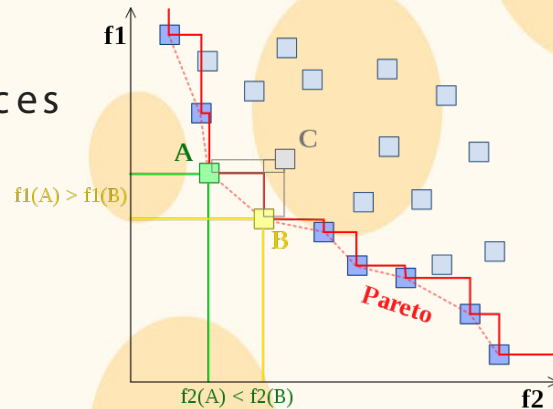
Nick Mason-Smith, 29 November 2023

This work is supported by the Australian Commonwealth *Regional and Remote Communities Reliability Fund - Microgrids*

# Competing objectives

What are we trying to do with neighbourhood batteries?

1. Provide local network support services
2. Provide energy resilience
3. Reduce emissions
4. Market participation



*What weights are we applying to these objectives?*

- *Different priorities lead to different configurations*
- A configuration is on the 'optimal front' if improvements in any one objective come at the expense of other objectives

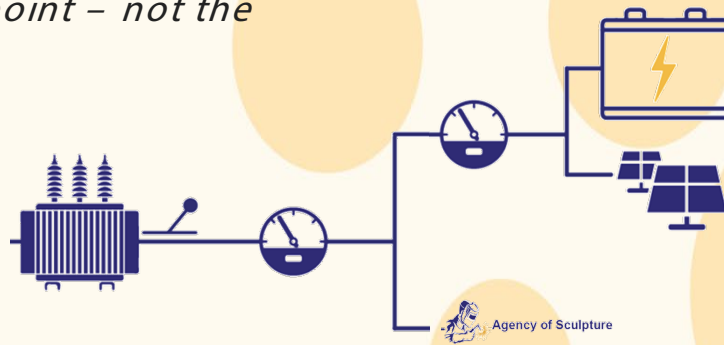
# Yack01

- Small load
- Standalone transformer
- Majority of energy exported in evening
- Participated in Project EDGE



*Behind-the-meter? Front-of-meter?*

→ *Solar-battery system sized for the connection point – not the load*



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# Community power plants



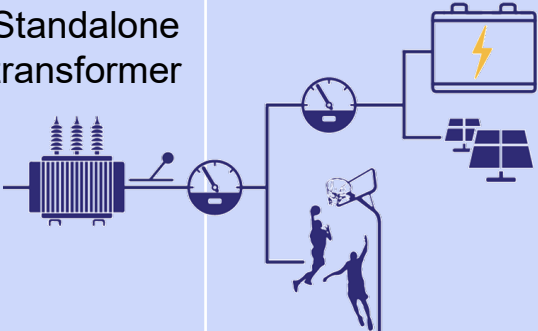




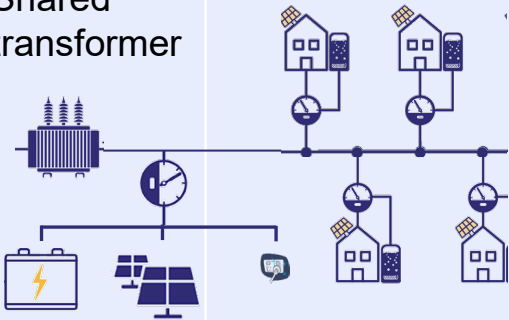




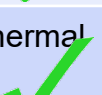

Project priorities:

- 1 & 2. Emissions reduction and resilience
3. Market participation
4. Network support

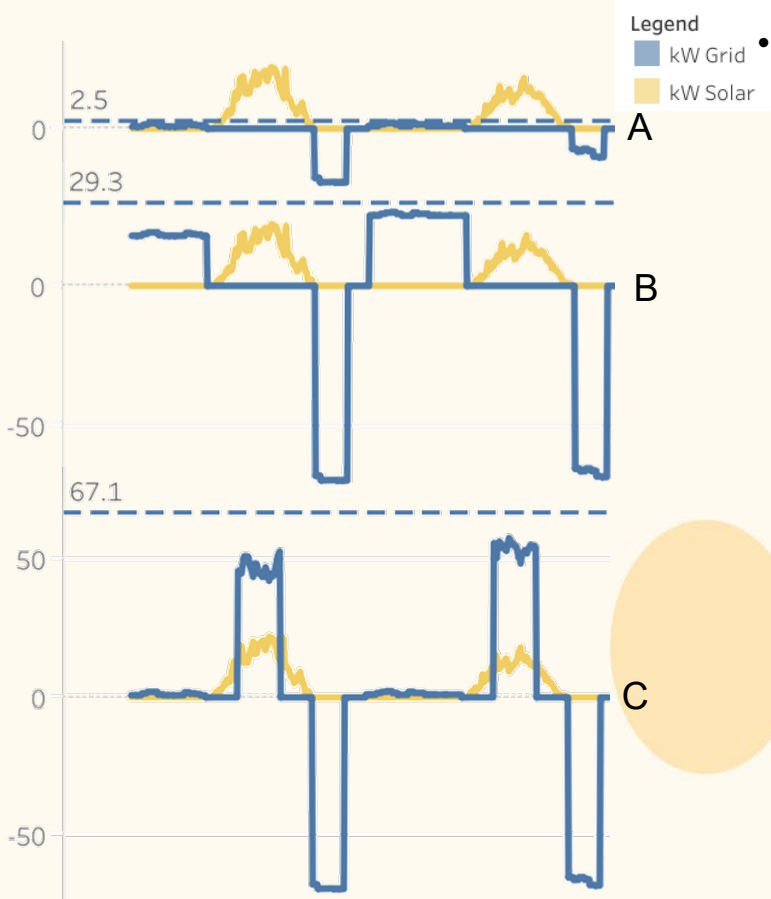
Sports stadiums & halls:

- Relief centres
- Low daytime usage
- Large roofs
- Large electrical connections
- Standalone transformer
- or shared LV network, adjacent to transformer

# Community power plant configurations

Configuration	Resilience	Emissions reduction	Markets	Local network support services
<p>Standalone transformer</p> 				<p>HV</p> 
<p>Shared transformer</p> 				<p>HV</p>  <p>LV Thermal</p>  <p>LV Voltage</p> 

# Retail contracts for CPPs



- On a standard retail contract, CPPs sit idle on cloudy days
- VPPs reduce asset owner autonomy
- Wholesale passthrough is uncertain
- Retailers want reduced market exposure
  - *Can everyone get what they want?*

Retail contract	Normalised net revenue*
Wholesale passthrough	100%
A	62%
B	81%
C	79%

- *ToUs can be refined further*

→ *Installing & commercialising a community power plant could be as simple as any other BtM battery*

\*Yack01 specs, Essential Energy 'LV Small Business Sun Soaker' network tariff, no FCAS. Assumptions in forthcoming report.

# Community Power Plants

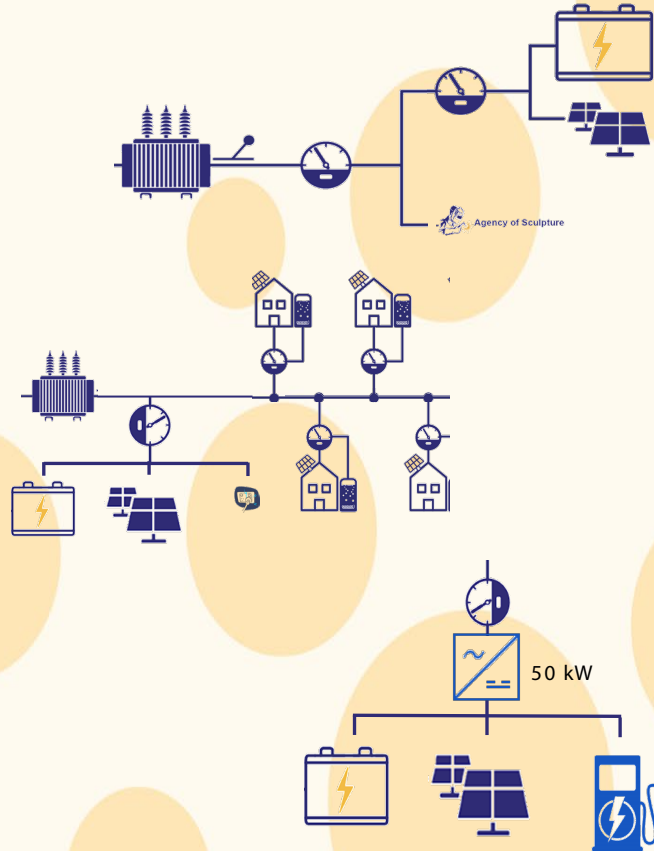
Aggregated community-scale batteries in North East Victoria



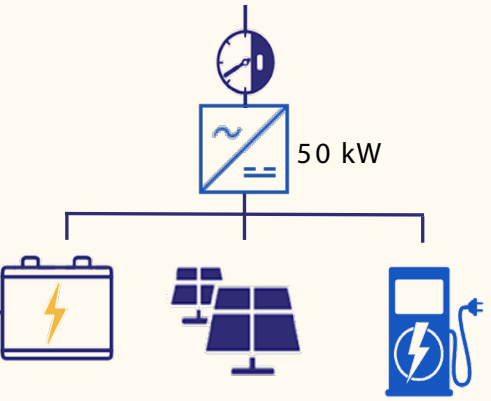
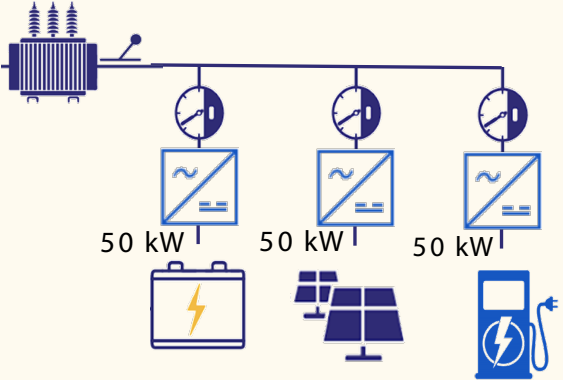
Created by DALL-E and inspired by Diane and Joel Schatz 'Visions of Ecotopia'

**Indigo Power**

# Thanks!



# DC Coupling



	AC Coupled	DC Coupled
Capacity	200 kW	100 kW
Normalised net revenue*	100%	97.5%
Battery eligible for storage-only tariffs	Yes	No

\*Assumptions in forthcoming report.