

“Innovation and Transformation  
in the Energy Sector and  
impacts for Local Government.”

Virtual Net-Metering and Distributed Generation  
for Rural and Regional Communities

# Introduction

- About SEGRA
- Who am I and why am I talking to you?
- Two important principles:
  - Energy efficiency first
  - Market approach v socio-economic impact



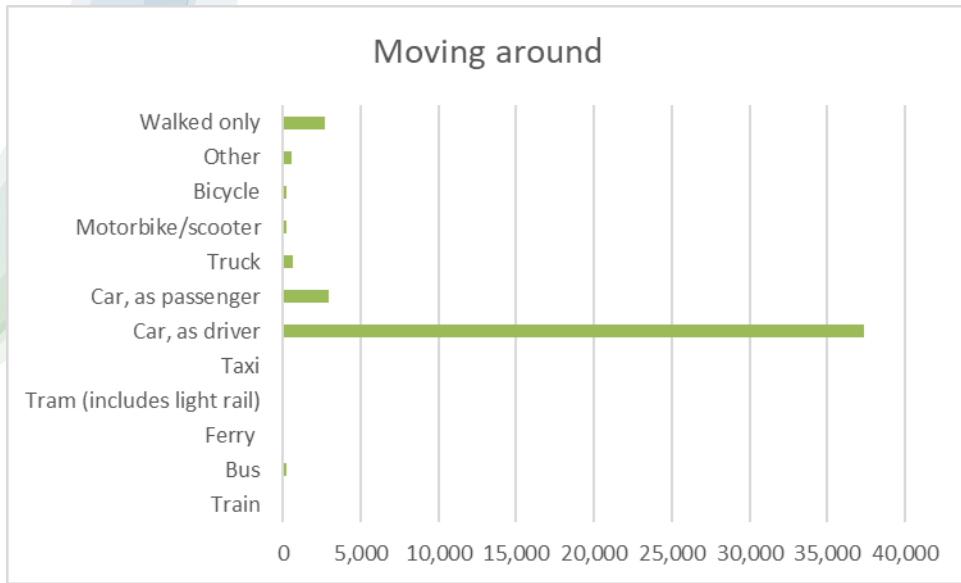
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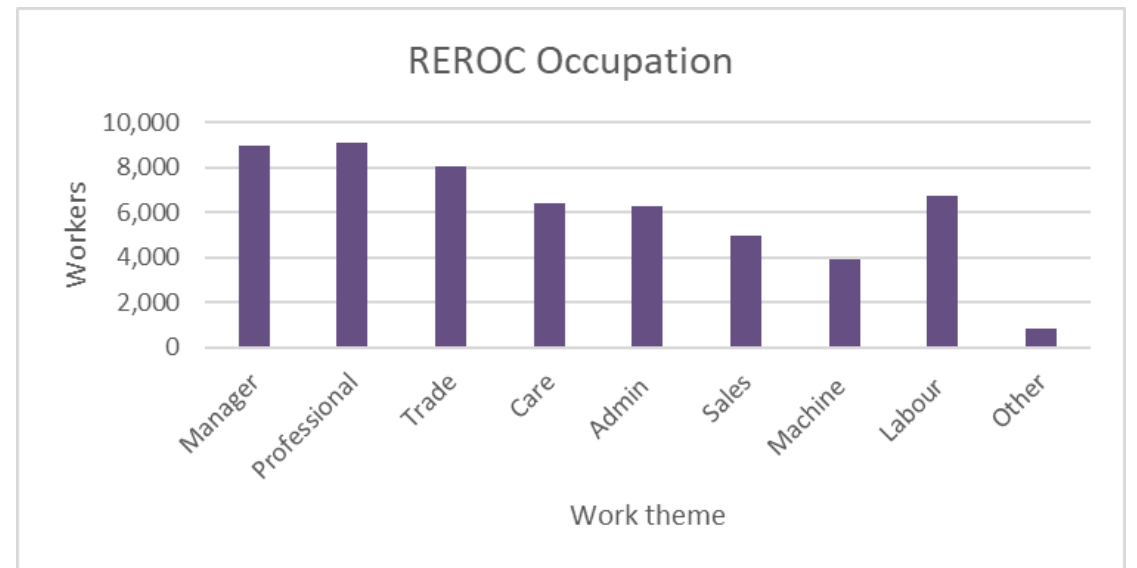
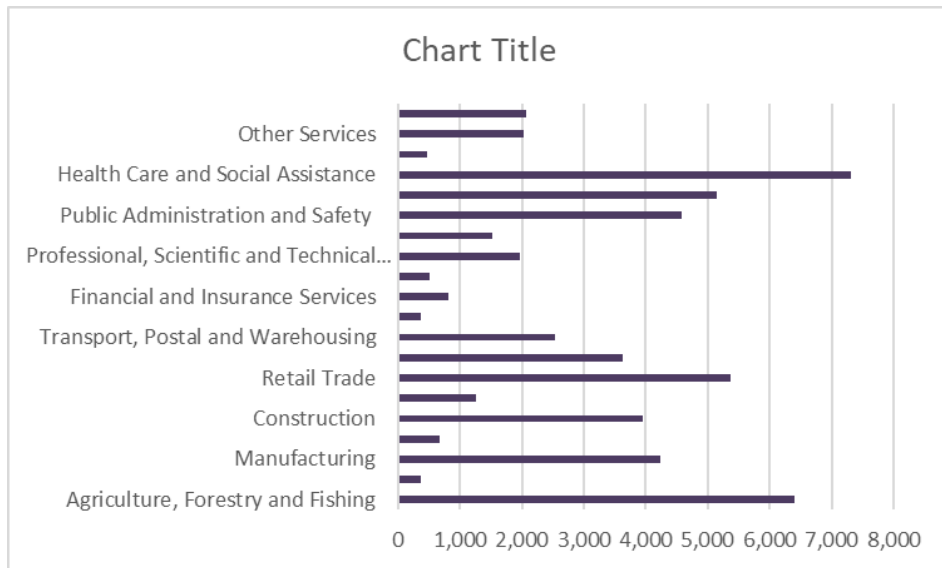


**SEGRA is a professional and inclusive network that provides relevant information, leadership and an annual conference to empower and promote rural, regional and remote communities.**





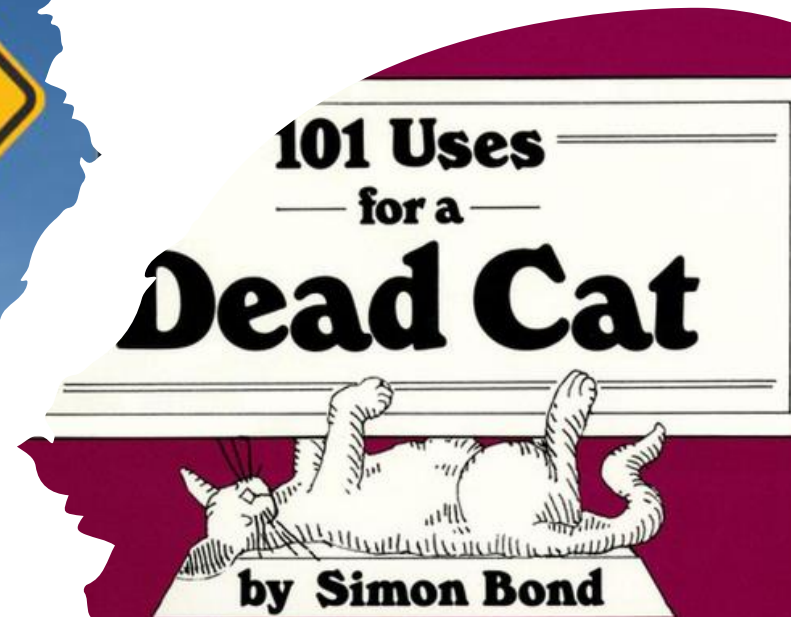
- 45,000 dwellings and about 110,000 people
- \$110 million p.a. on electricity (residential)
- \$110 million p.a. on fuel
- Double this for business?
- Probably about \$500 million p.a. on energy
- What if this was homemade?





# Challenges in engaging with Renewable Energy

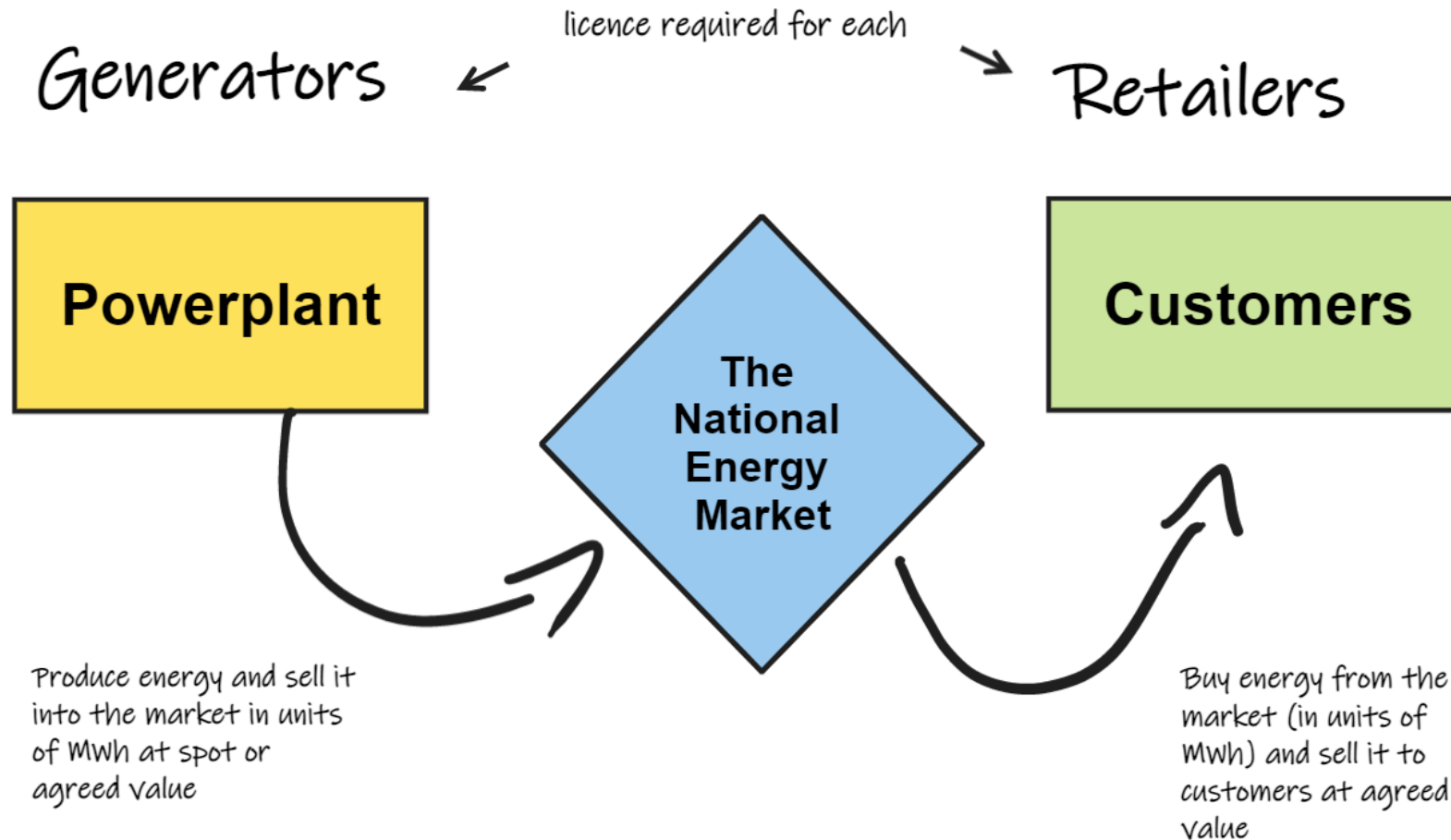
- There are a thousand ways to skin the cat.
- No 3 quotes are the same.
- Lots of advice from people selling things.
- Cheap Aussies!
- There's a lot of money involved in the big end of town.
- The distribution network is the poor cousin of transmission.



# Opportunity

- It is now possible to own and operate private power stations in the Distribution Network – in single locations and/or distributed
- Energy output can be sold at a fixed or wholesale price to a known entity via the National Energy Market – (requires both generator and retail licenses)
- The economics of solar + battery powerplants at mid-scale means that energy can be supplied for around 15c /kWh (Levelised Cost Of Energy sub 10c/kWh)
- You can pay yourself for energy instead of Shell/Origin/etc. This can be reconciled by a retailer and/or 3<sup>rd</sup> party provider.

# National Energy Market



## Responsible entities

Australian Energy  
Regulator

Australian Energy  
Market Operator

Australian Energy  
Market Commission

CURRENT SPOT PRICE

**-\$25.10** (MWh)

CURRENT DEMAND

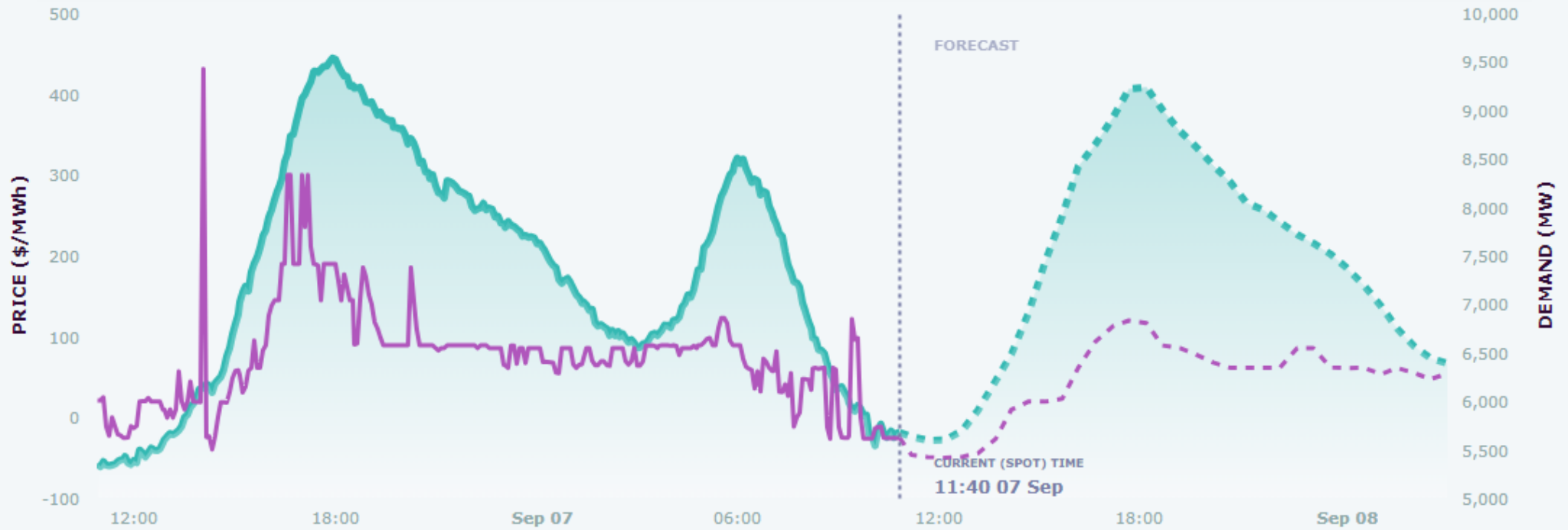
**5,680** (MW)

FORECAST PRICE (NEXT 30MIN)

**-\$46.14** (MWh)

FORECAST DEMAND (NEXT 30MIN)

**5,635** (MW)



# What's possible and what should you do?

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## What are you trying to do?

- Control / minimise cost?
- Reduce carbon intensity?
- Create carbon credits?
- Create a revenue stream?
- Be a responsible entity?

## What technology works best?

- Solar
- Wind
- Storage
- Demand control
- Microgrid

## Most applicable approach?

- Small-scale DER + Peer-to-peer trading / Virtual Net Metering
- Mid-scale – aggregated demand + market agreements



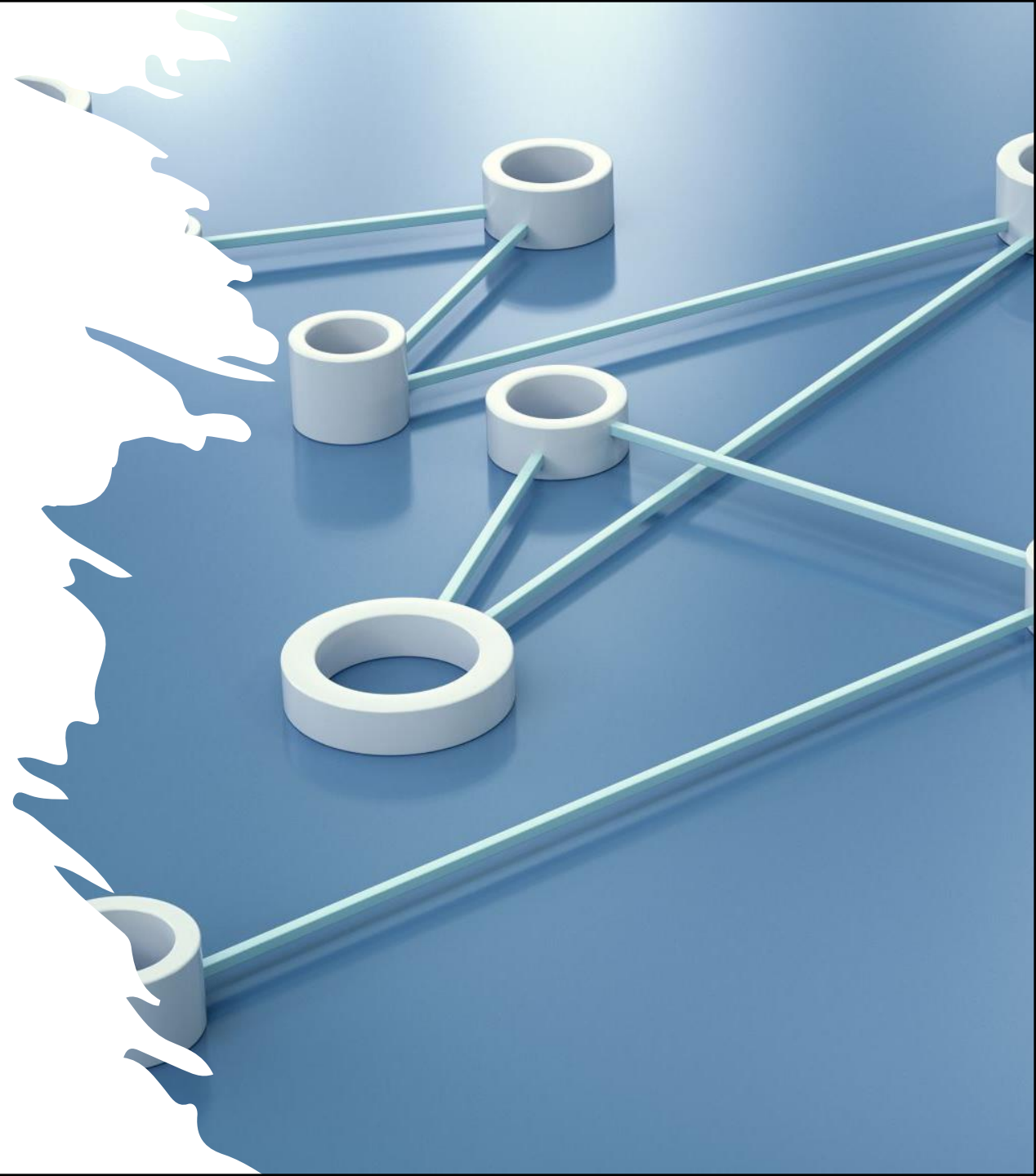
# Multiple small-scale solar systems - VPP

Mid-scale powerplant tied to demand - PPT

Owned asset optimised for market - offset

# A note about microgrids

- Similar to embedded networks (which are common)
- Can enable a return for investment in new network infrastructure
- Benefits from the intersection of business needs, physical location, land tenure and network characteristics.
- Would work well with Local Use Of Service (LUOS) charges in lieu of building/buying network or being HV customer
- In some circumstances, ideal for increasing DER and load capacity by treating grid as back-up supply



# A future with nested microgrids?



Source: QFF Microgrids in Agriculture Final Report

# Optimising existing rural network

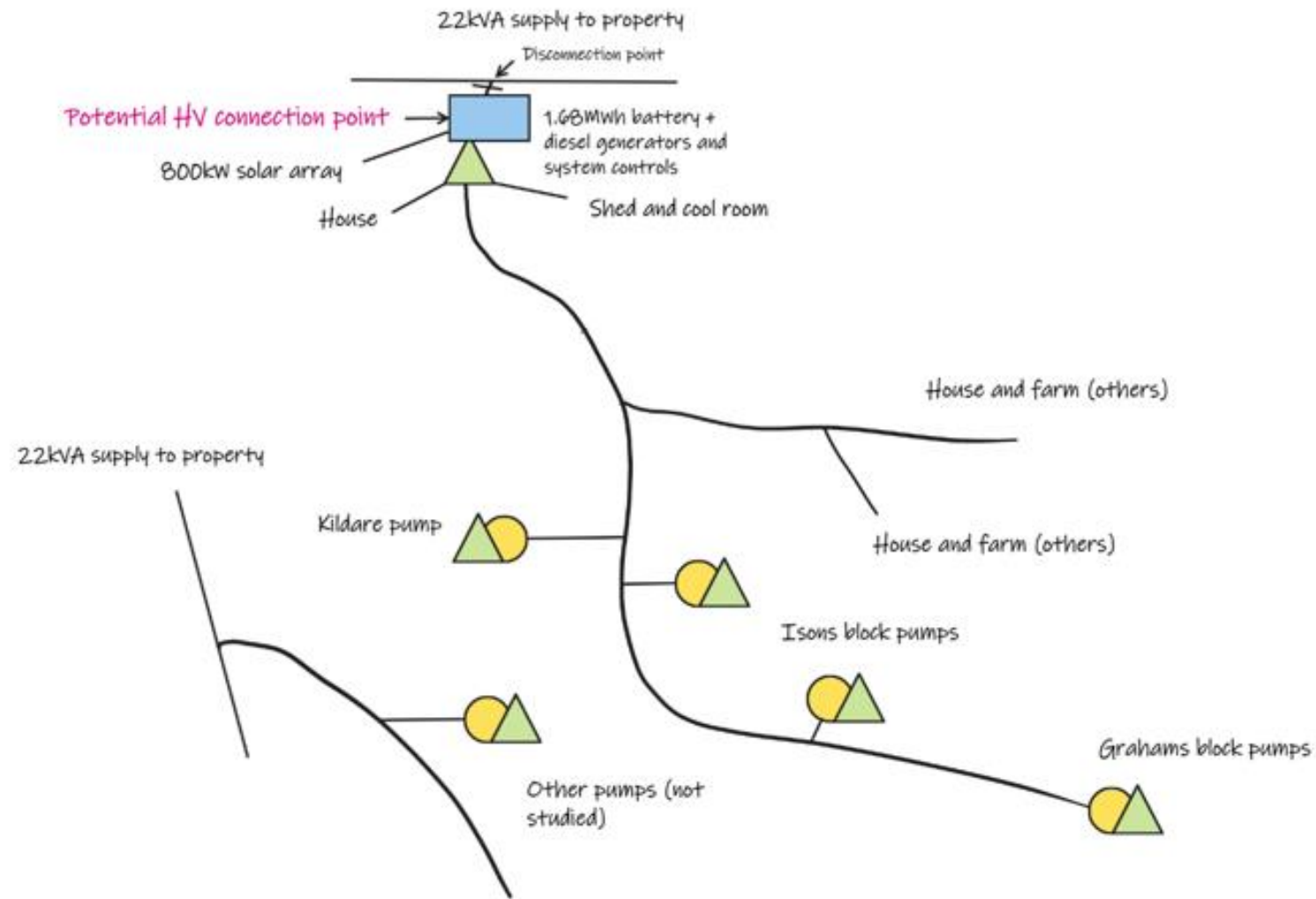


Figure 14 Conceptual network and load diagram



# Some notes on Procurement (esp. re mid-scale)

- Local Government Procurement Standards / practices are not really a neat fit with renewable project developments
- The design and approval process is iterative, lending itself to staged approaches
- 'Managing Contractor' mechanism is applicable
- Parts of the project are well suited to Councils – eg civils and project administration
- Office of Local Government – advice required
- T-corp offer good rates for finance but there is a serious process and limitations on the model they will back
- Not allowed to distort the market
- Not allowed to engage in 'contracts for difference' or merchant exposed models

# Engaging with large projects (and the REZ)

- There is a mismatch between what the community thinks and what the government and large providers think.
- Voluntary Planning Agreements can work well.
- There are good resources from the Clean Energy Council, Renewable Energy Alliance, Community Power Agency.

# Decarbonisation in the regions

- Agriculture is exposed!
  - Land use conflict
  - Carbon intensity and offsetting
  - Weak networks
  - Difficult economics around power fuels and immature solutions
- Freight
  - Will probably be largely electrified but there is a role for hydrogen
  - Works fine for back-to-base operations provided they have the network to recharge

# Decarbonisation in the regions

- Mining and construction (plant)
  - Already on to it!
  - Waiting for the larger players to sort.
  - Lots of commercial development at play eg Volvo 50t electric excavator
  - Able to go off-grid relatively easily
- Manufacturing
  - Hard to get off gas for process heat.
  - Electrification limited by network capacity.
  - Could be a role for bioenergy.

See RAI report to be released in October

# The future of energy

- Time of Use becomes really important = demand control
- Information is power – get a good understanding
- Connectivity and the IOT + AI – integration is key
- Non-grid energy distribution – eg EVs and hydrogen
  
- If we let the market solve this, we will just continue to be price-takers.
- Get upskilled, work out what's important, get active!