Presentation to the National Consumer Roundtable on Energy

Hobart 28 February 2019

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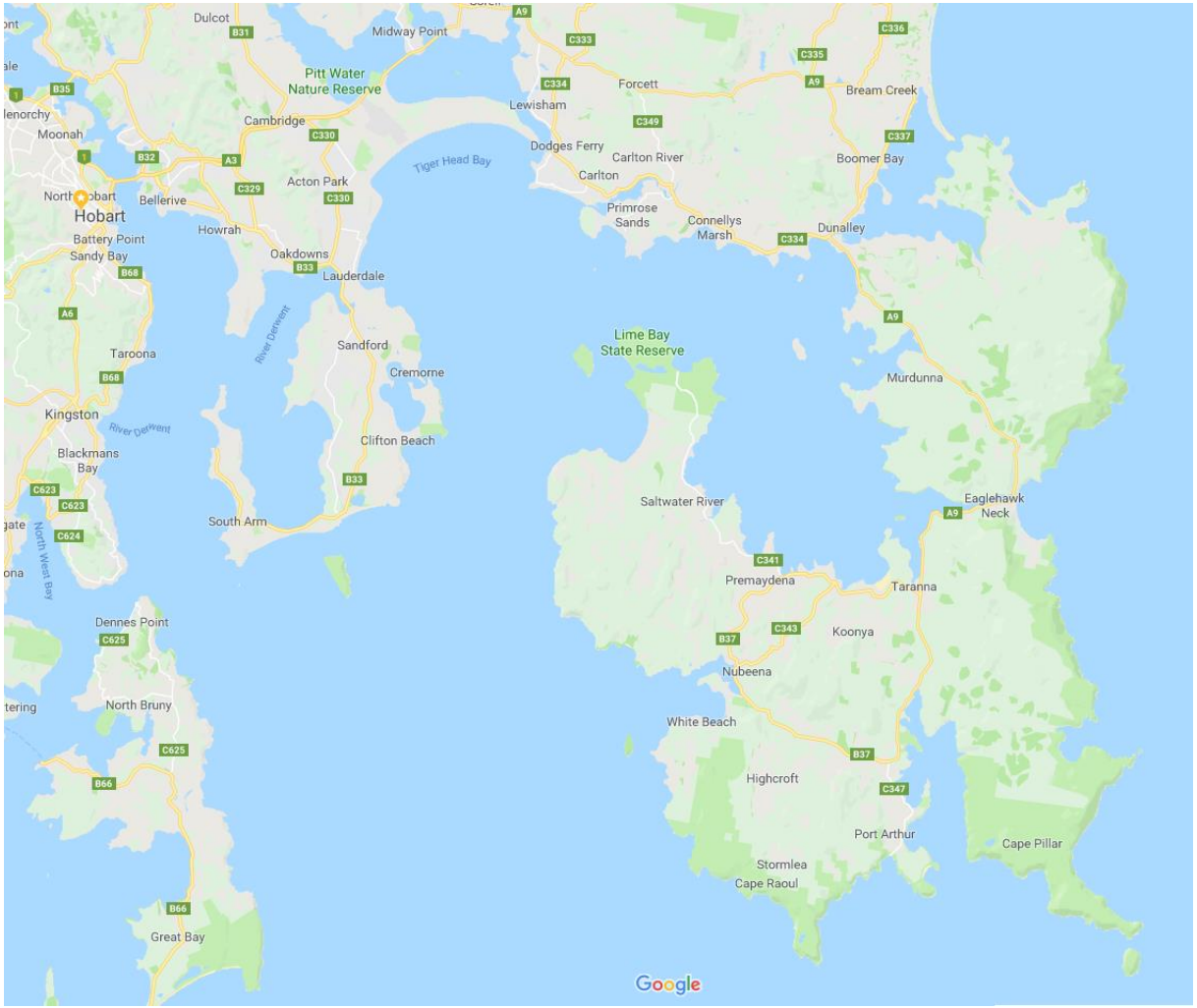
Challenges in developing a small residential microgrid

Jack Gilding
Backroad Connections Pty Ltd

SUPPORTED BY

Tasmanian Government

Location



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Context – the Tasman Peninsula

- Geographically distinct area
- Road access limited at Dunalley and Eaglehawk Neck
- About 2500 permanent residents, population can triple in summer
- Major tourist destinations:
  - Port Arthur Historic Site, Three Capes Walk
- Concerns about electricity reliability
- Concerns about emergency situations:
  - Dunalley fires 2013, Port Arthur Massacre 1996

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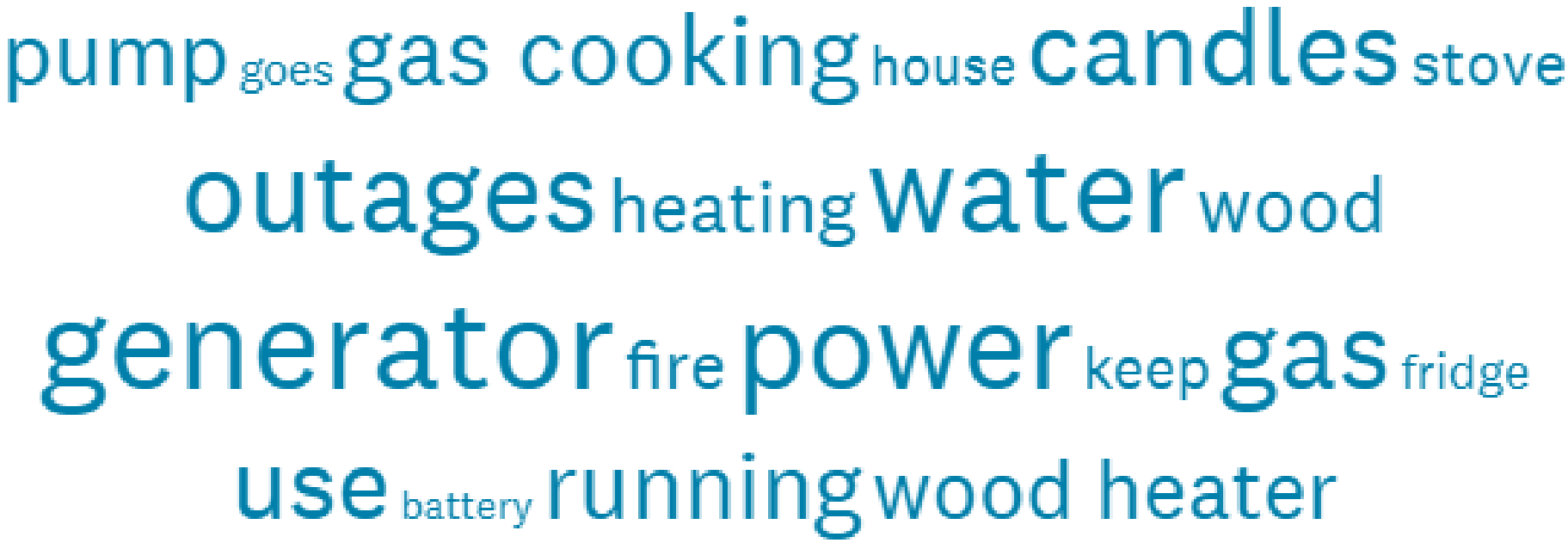
Electricity reliability

- Long feeders, geographical constraints
- Nubeena outages (over last five years)
  - 4.6 outages a year
  - average customer fault duration 3.4 hours
  - average fault duration 9.2 hours
- Implications
  - cost, inconvenience, lots of generators
  - major outage issues: health, telecommunications, fuel supply

Survey – electricity reliability



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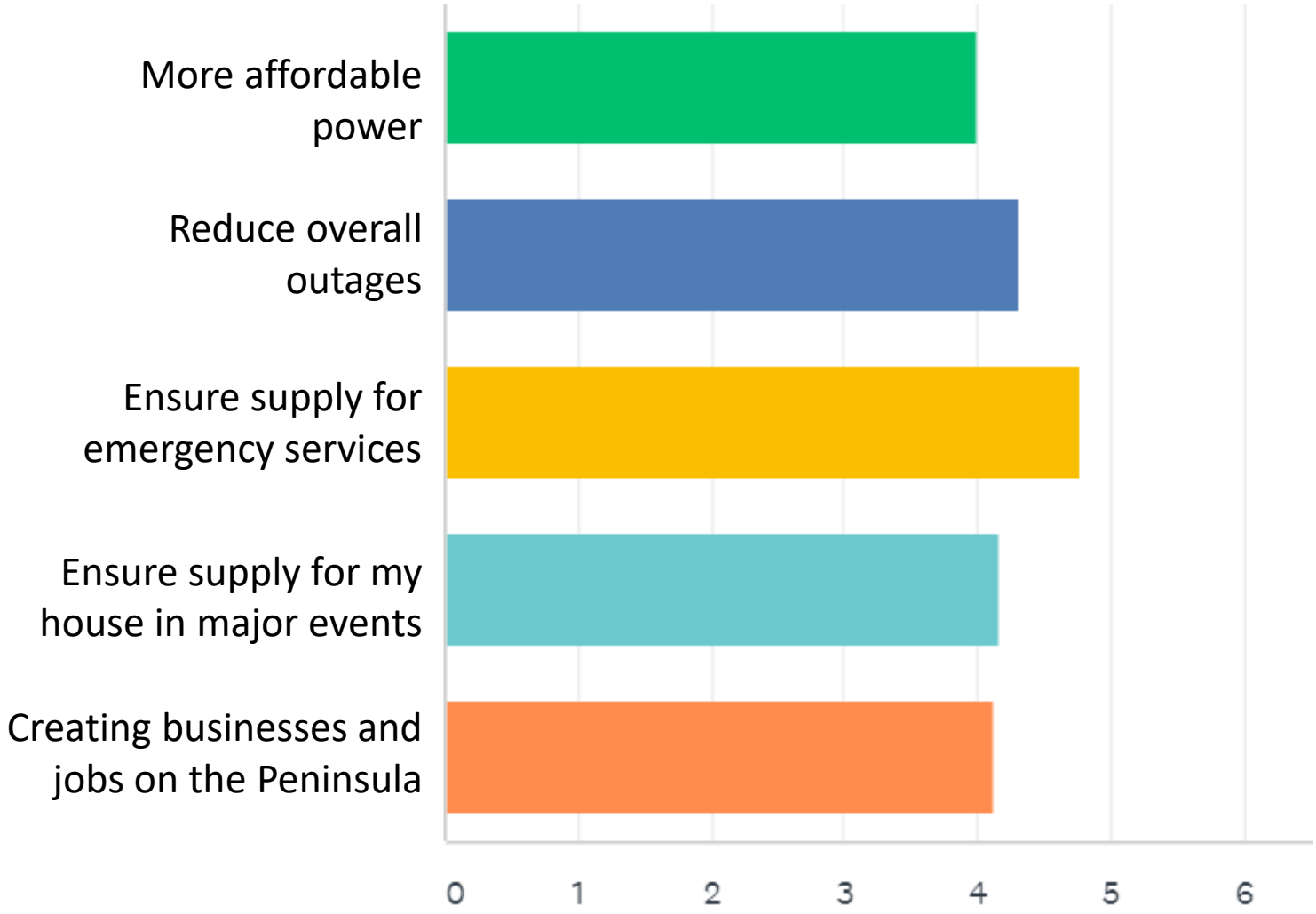
Survey – priorities for TPP



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The Residential Microgrid project

- Part of a project funded by the state government
- Five community residential units
- Objectives:
  - provide power for essential services during grid outages
  - reduce the cost of electricity for residents
  - test trading of locally generated energy between residents (peer-to-peer trading)

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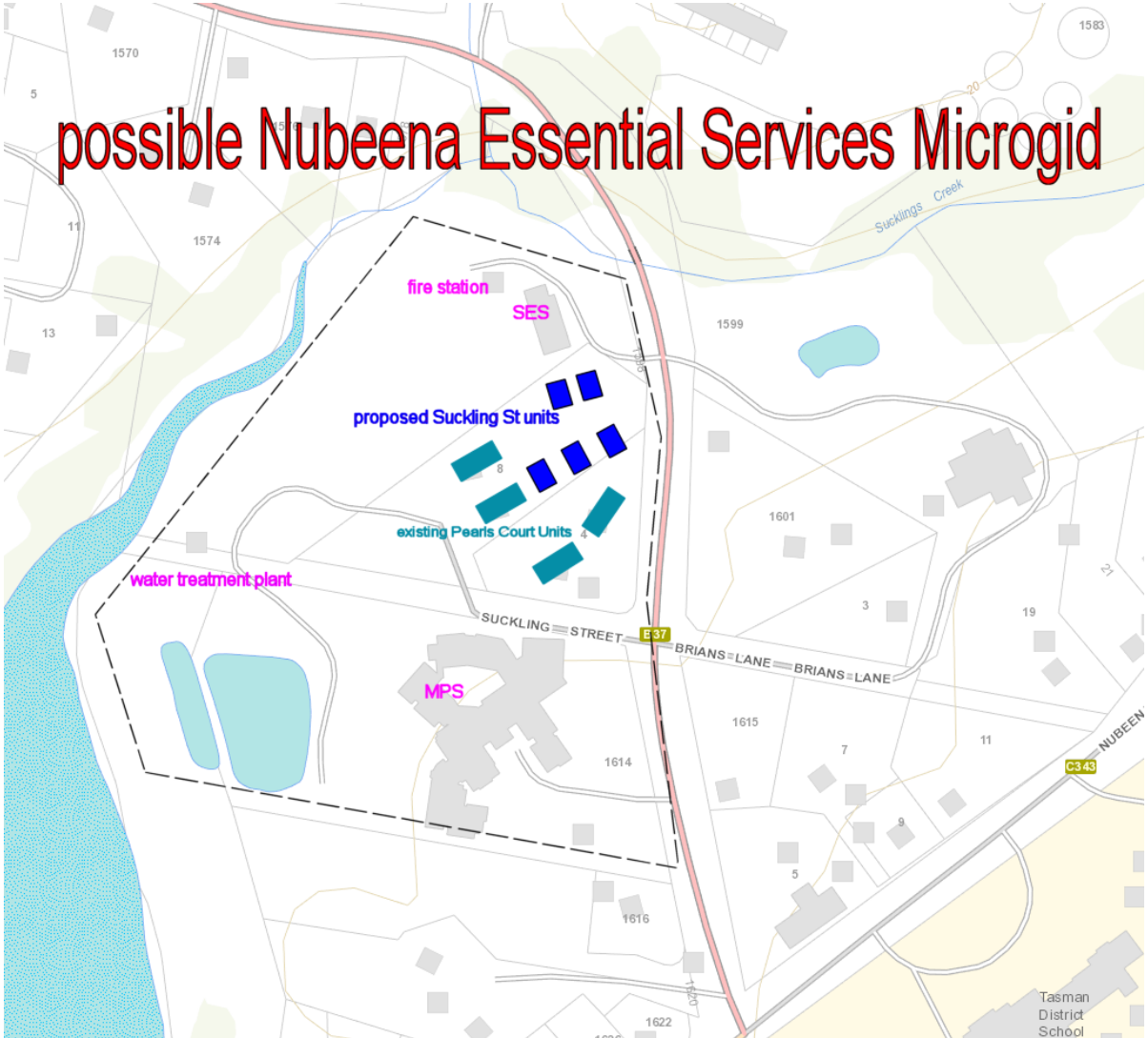
Context – Essential Services Microgrid



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Challenges

- Construction
- Technology
- Regulatory environment
- Business arrangements
- Consumer engagement

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Challenges – Construction

- The grant to TPP was first announced in February 2018. A year later the Tasman Council has still not signed a construction contract with the preferred builder.
- Until the Council signs a contract we cannot negotiate with the builder about integration of solar PV and the implications for wiring the buildings.
- Because of budget limitations, a prefab building approach will be used. This may make it harder to make changes to integrate the solar PV and the battery storage.

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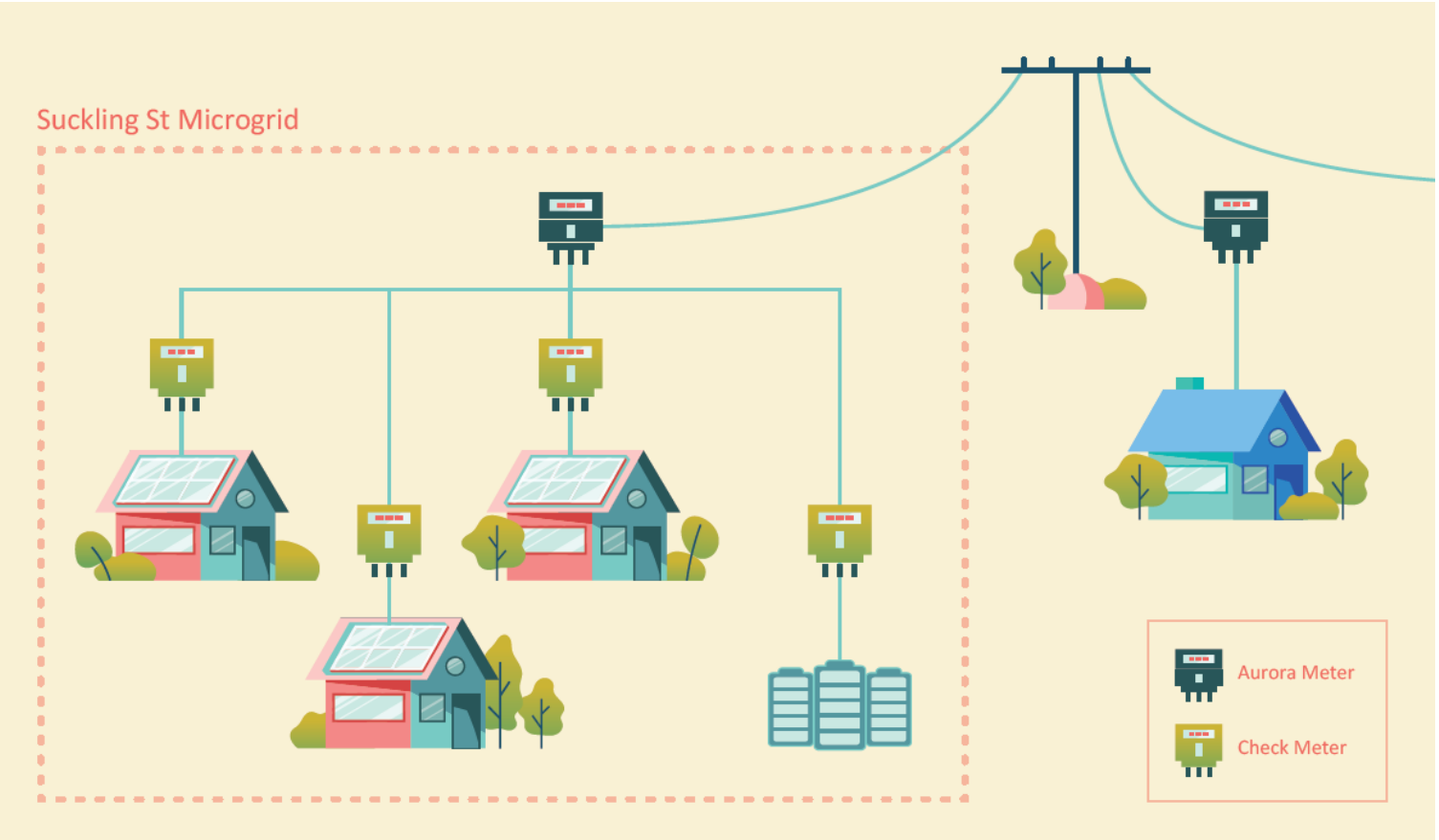
Challenges – Technology

- The preferred technical solution is each unit to have 5.5 kW of solar panels. A central battery storage consisting of three Tesla Powerwall 3 battery units – a total of 54kWh (useable) of storage.



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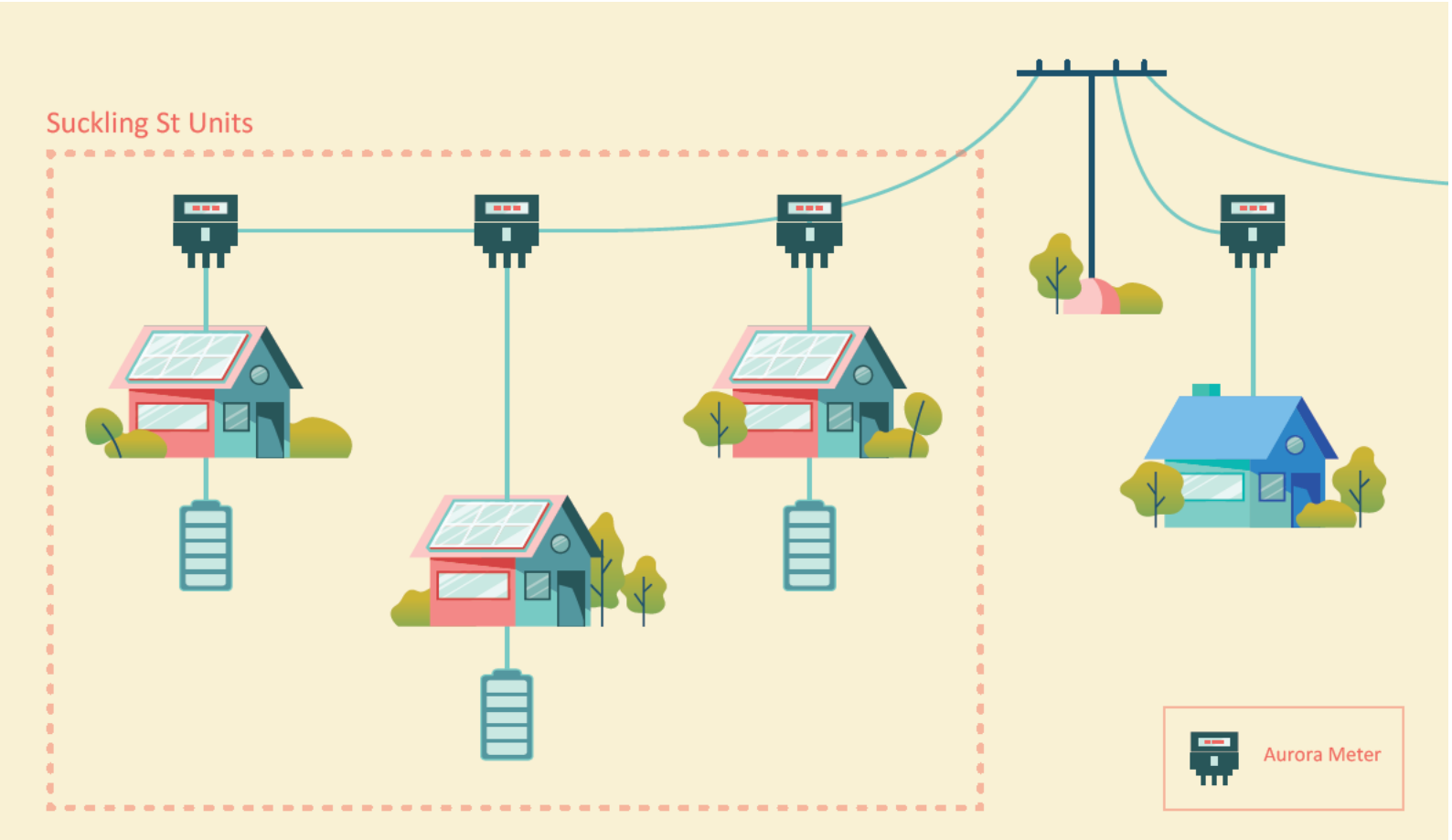
Fallback technology solution

- Individual batteries and solar on each unit avoids need for embedded network
  - (but prevents peer to peer trading)



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Challenges – Regulatory environment

- A microgrid will require operating as an embedded network.
- At the moment Tasmania has excluded itself from the AER's Exempt Selling framework, but this may change.
- State electricity concessions: Currently paid through Aurora Energy and are not available to customers in an embedded network.
- Metering requirements.

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Challenges – Business arrangements

- Limited options for retailer partner
- Microgrid requires an embedded network
- Complicates choice of energy supply arrangements
- Tariff structures:
  - network tariff > embedded network tariff > resident tariff
- Sharing the benefit

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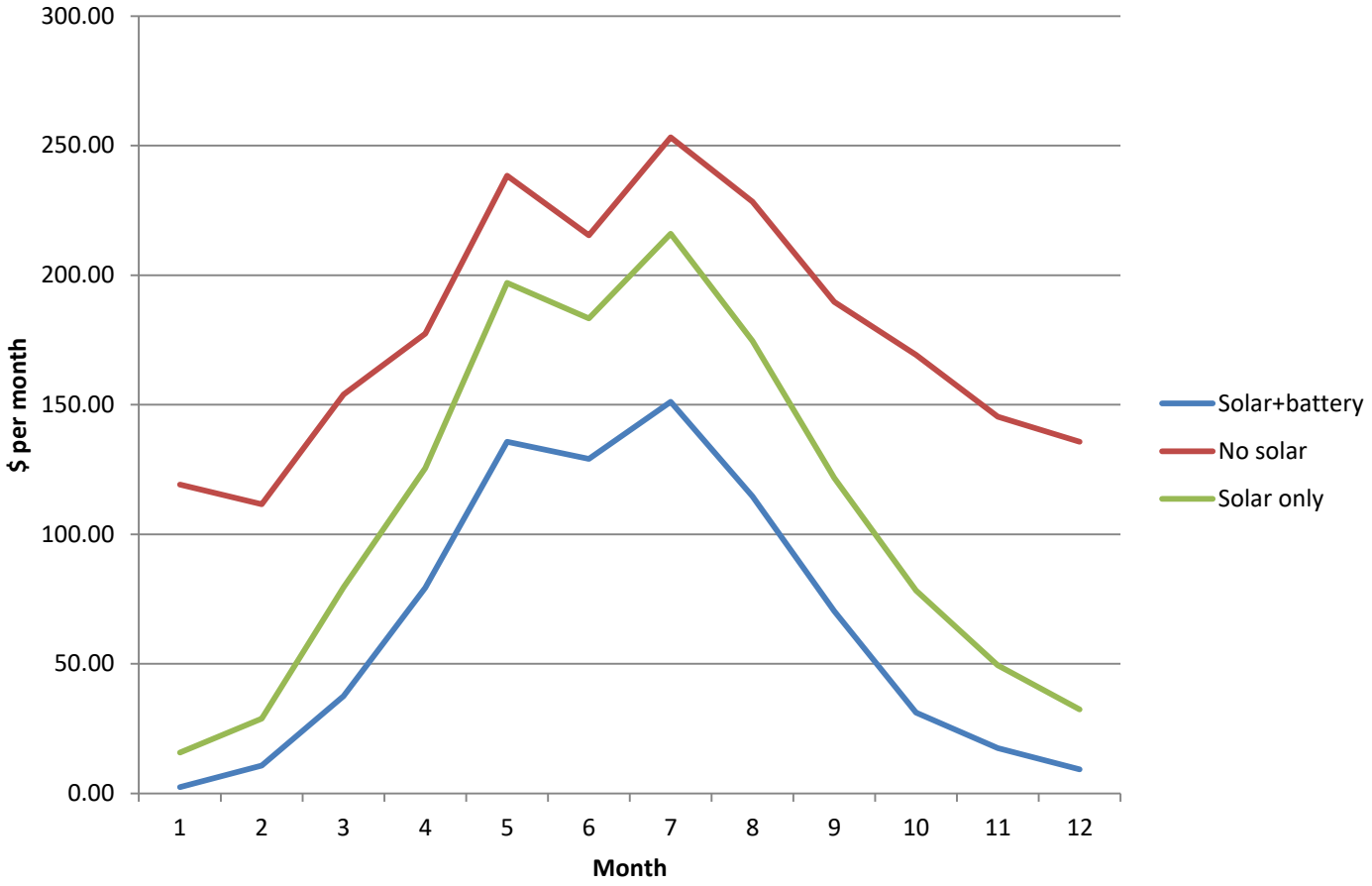
Sharing the benefit



Modelled monthly costs per dwelling

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Challenges – Consumer engagement

- Need to inform prospective tenants before they choose to apply to Council
- What information do tenants need?
  - Operation of emergency power
  - Managing their energy consumption

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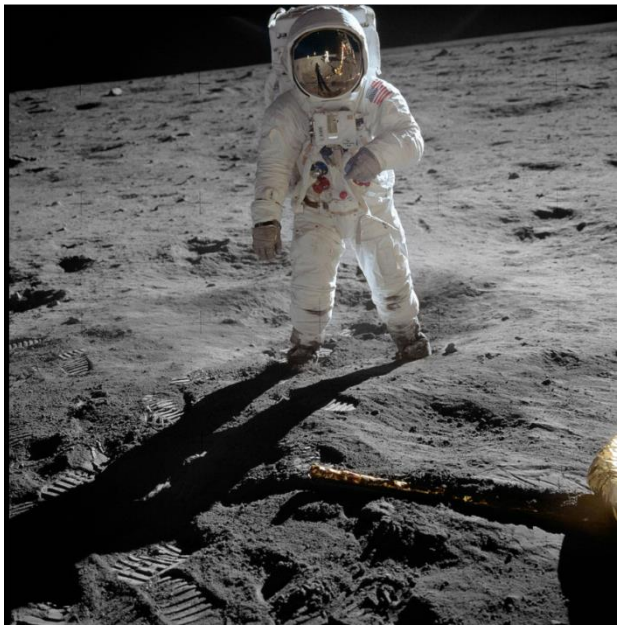
Why do we do chose to do these things?

"We choose to go to the moon in this decade and do the other things, not because they are easy, but because they are hard" JFK, 12 September 1962

Moon landing: 20 July 1969



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