

CONSORT

Bruny Island Battery Trial

Overview of the Bruny Island Battery Trial

Paul Scott -- ANU

2016 AESA Update on Energy Storage Projects



Australian
National
University



UNIVERSITY of
TASMANIA



THE UNIVERSITY OF
SYDNEY

ARENA



Australian Government
Australian Renewable
Energy Agency



reposit



TasNetworks
Delivering your power

CONSUMER energy systems providing cost-effective grid support!

Developing a platform that enables consumers to assist network operators with ongoing network issues.

Consumers gain new revenue stream.

Operators gain cost-effective solution.

- \$4.2M project (\$2.9M ARENA)
- 3 years
- 5 partners
- 40 PV-battery systems to solve a network congestion problem



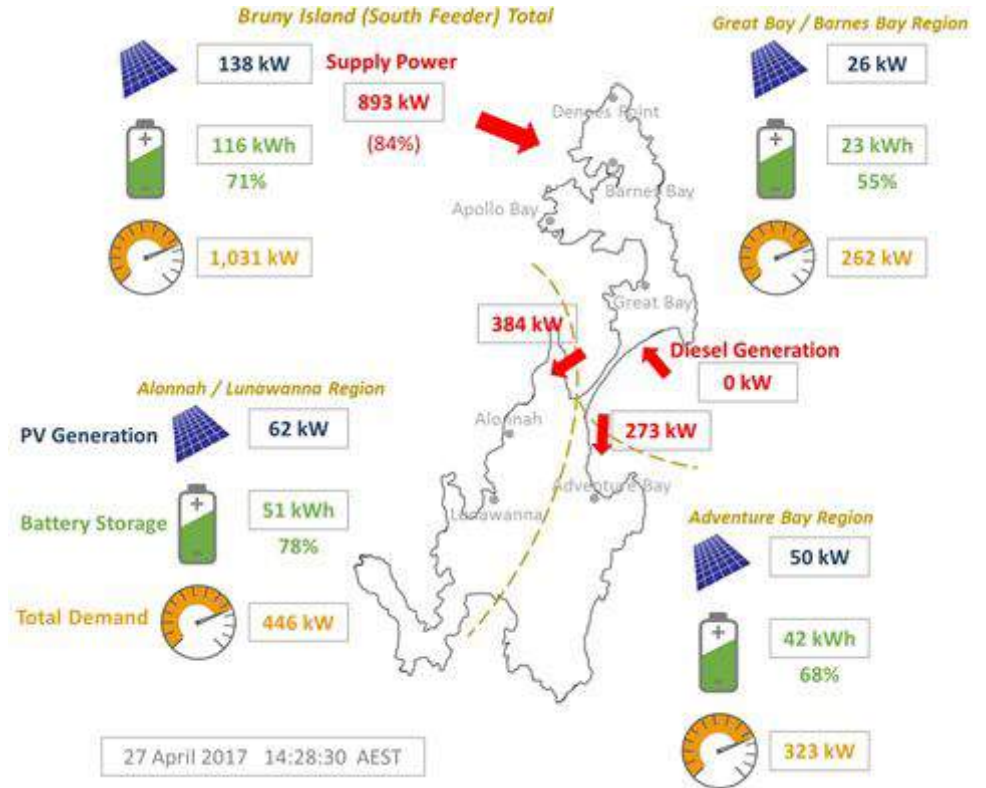


Bruny Island

Deploy up to 40 PV-battery systems and
Reposit Power controllers in islander **homes**.

Platform to **coordinate** battery actions to
alleviate network constraint and **reward**
consumers for participation.

Evaluate benefit to network and consumers, and
attitudes to the technology and collaboration.

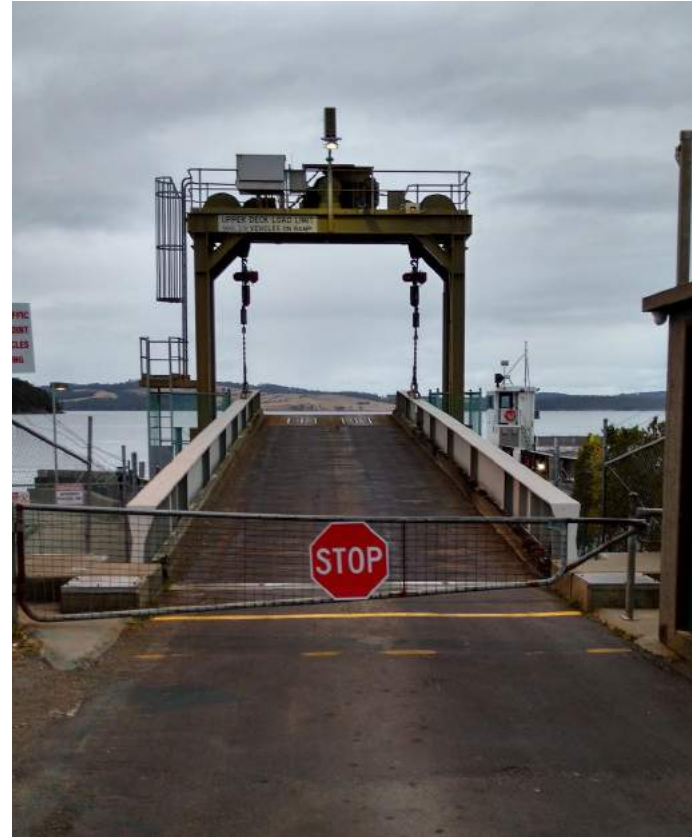


Wide Application

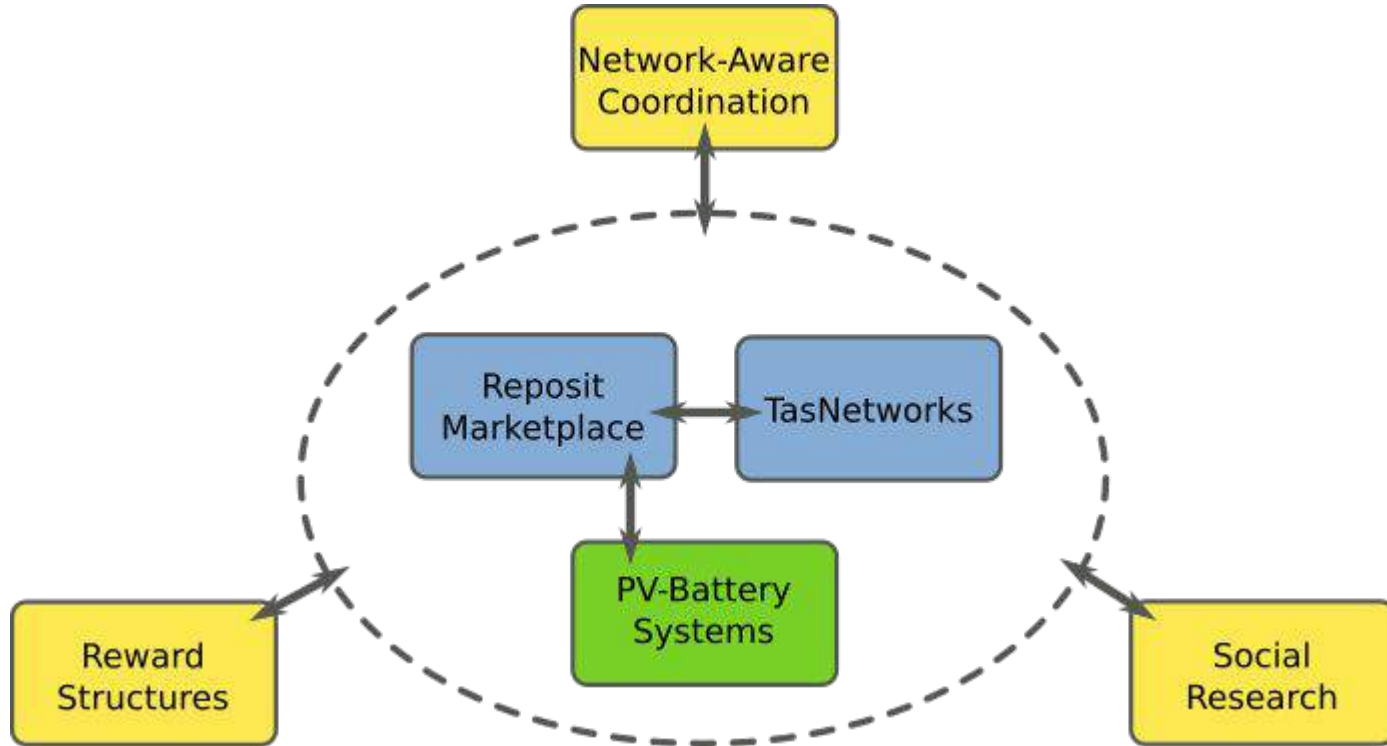
Why Trial Platform on Bruny Island?

Contained problem where can today demonstrate clear benefits with low levels of deployment and within existing regulations.

Beyond Bruny can manage high deployments of distributed generation, and electric vehicles. Enable new distribution-level markets for trading energy and managing congestion/voltage constraints.



Project Overview

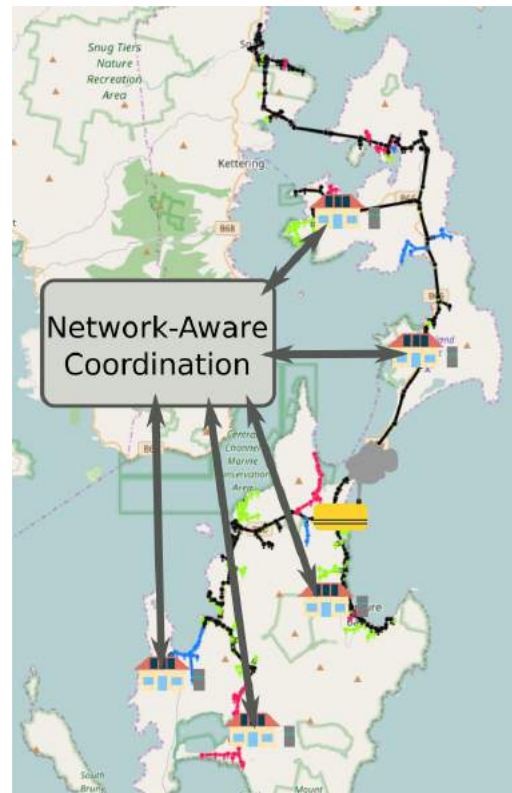


Network-Aware Coordination

How can we coordinate many distributed “prosumers” with diverse energy requirements and energy resources to operate the network safely at lowest cost?

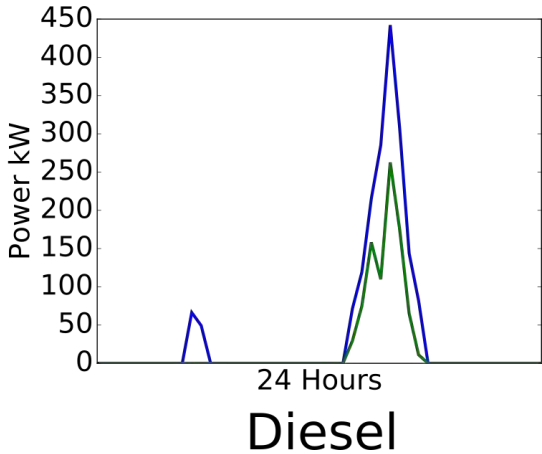
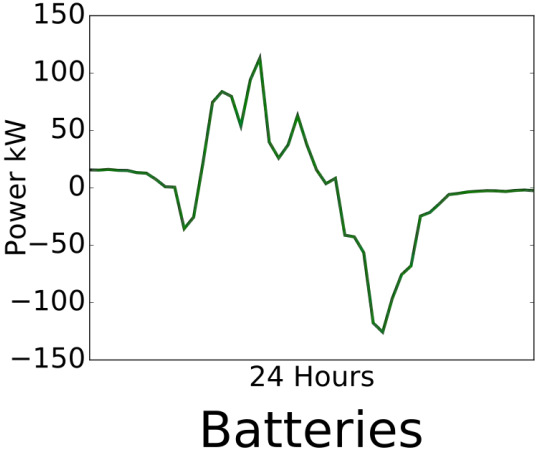
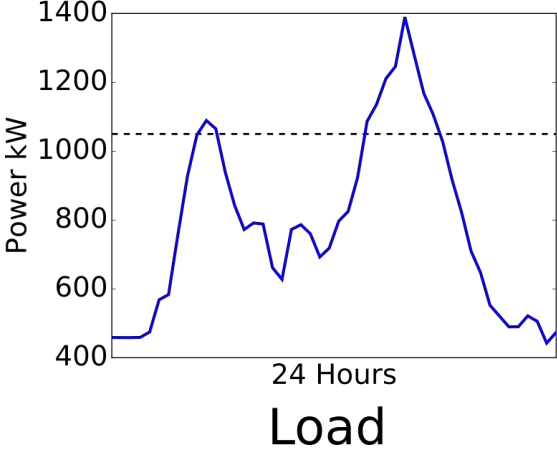
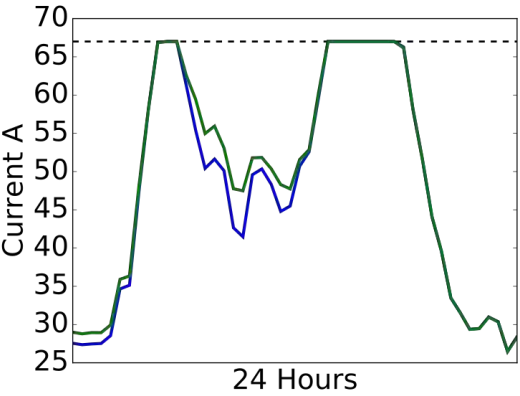
- Model-based, using market for coordination
- Distributed optimisation techniques leveraging the processing power of the battery controllers

NAC for feeder coordination only needs to know network connection location of each participant. Online **negotiation** of feasible power allocations.



NAC Simulation

Line Current



Preliminary Analysis

150kW/300kWh Storage, 180kW PV
Simulation over 2 years to understand potential

Quantity	Reduction
No. diesel starts	67%
Diesel run-hours	83%
Annual diesel	91%

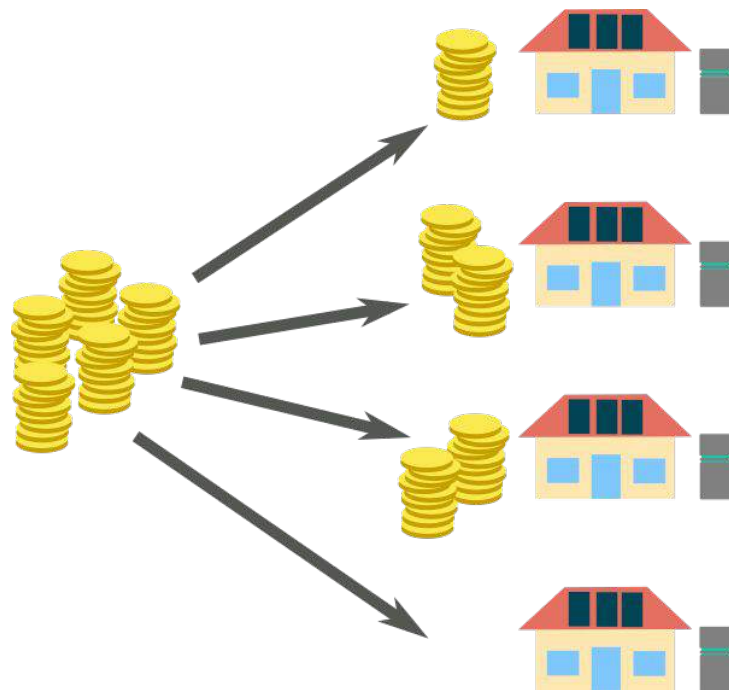
See talk tomorrow by **Evan Franklin**:

Peak Demand Management on Distribution Networks using Coordinated Behind-The-Meter PV / Battery Systems: The Bruny Island Battery Trial

Reward Structures

How can we compensate/reward consumers for the use of their batteries in a way that is “fair”?

- Scheme to be attractive enough for consumers to opt-in
- Payments transparent and understandable to homeowners
- Local controller only to act on network support decisions if they have net benefit to user



Social Research

How do householders respond to control system interface, PV-battery system and pricing schemes? Is this consumer-network relationship feasible/sustainable, and what are the blocks?

- Focus groups (before and after install)
- Energy diaries (for 2 weeks)
- Interviews (4 throughout project)
- Energy tours (select participants)



Battery Deployment

- Disclose process up front for transparency
- Try to replicate real-world setting as much as possible
- Subsidy calculated based on power supply capability of battery (\$3,200/kW) combined with minimum contribution (\$2,000)
- 118 applications submitted
- 35 offers sent out
- Majority of approved quotes LG Chem 5kw 10kWh
- Majority UPS-style enabling backup
- Target all systems up and running by Easter 2017

Findings and Next Steps

Reliability of supply for islanders is key

Positive engagement

Rumours spread quickly

Strong sense of community

Internet access will be ongoing challenge

- Finish deployment/commissioning
- Use manual requests as first step to managing congestion
- Trial NAC software for coordinating battery systems
- Trial different pricing/reward structures for grid support actions
- Continue to conduct interviews and analyse consumer attitudes

Thank you

<http://brunybatterytrial.org>

