



*Australian Utility
Week Conference
24th November
2015*

**What we know
about households
who are already
off-grid**

Associate Professor Heather Lovell



Australian Indices	Currencies	Global Indices	Wheat
S&P/ASX 200 5482.5 +0.20 +0.36%	AUDUSD 1.007579	DOV Jones 18395.40 -07 -0.1%	WAP
S&P/ASX 100 4765.7 -41.00 -0.85%	AUDEUR 1.007571	S&P 500 2125.26 -2 -0.1%	WBC
S&P/ASX 50 3789.9 -49.00 -1.27%	AUDGBP 1.007588	NASDAQ 3871.31 -11.7	WCC
ALL ORD 5482.5 +45.00 +0.82%	AUDJPY 1.007581	FTSE 100 7307.26 +12.2 0.2%	WCS

Australia stares down an electricity 'death spiral'

TONY WOOD | 11 DEC 2013, 7:14 AM | @ 87
INDUSTRIES | RESOURCES AND ENERGY | CLIMATE | ENERGY MARKETS | SMART ENERGY

Australia's electricity transmission and distribution network businesses are facing some unprecedented challenges and the answers are neither obvious nor painless. A history of poor regulation is going to make life more difficult for what were supposed to be low-risk and low-return, regulated monopoly businesses.

One of their biggest problems is that virtually for the first time in 50 years, electricity consumption is falling. Grattan Institute's new report, *Shock to the system: dealing with falling electricity demand*, analyses the consequences of this extraordinary trend and concludes that a

For most of the last decade, the rate of 6 per cent economy became manufacturing. No consumption.

But around 2006, electricity consumption in the West. In Western Australia, sign of going away.

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Oct 9 2014 at 5:40 AM | Updated Oct 9 2014 at 11:11 AM

SAVE ARTICLE | PRINT

Reforms needed to stave off electricity 'death spiral'

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It was a few years ago that economists were talking about a "death spiral" for the role Australia has invested in its electricity.

The idea was that as consumers generate solar panels and supplement this at night they will opt out of the national power.



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Death spiral begins for Australian electricity companies

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Saturday 10 May 2014 12:29PM

Australian electricity prices have doubled over recent years leaving consumers paying some of the highest prices in the developed world. As Jess Hill reports, the bulk of the increase can be attributed to consumers paying off large costs incurred by network companies which have invested in infrastructure, despite demand falling each year since 2009. This makes alternatives such as solar power increasingly attractive, leaving fewer consumers of grid electricity paying the price for a policy built on false projections.



MADE POWER LINES COURTESY ROBERT GIBBY/SHUTTERSTOCK

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Saturday 12 noon Repeated Thursday 9pm Presented by Robyn Williams

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Death spiral begins for Australian electricity companies

Elizabeth Kubler - The Sixth Extinction

The death spiral

Concern about households leaving the grid in Australia

But little data on who actually has gone off grid, and their motivations & experiences



Key findings

Research on Off Grid Households in Tasmania

1. Lack of data

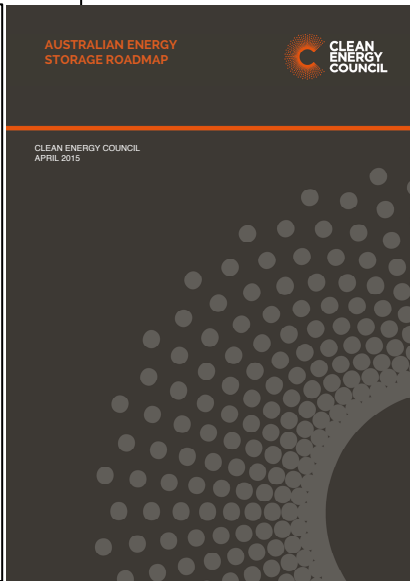
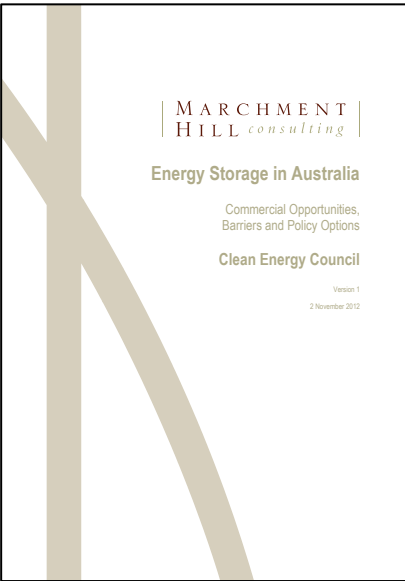
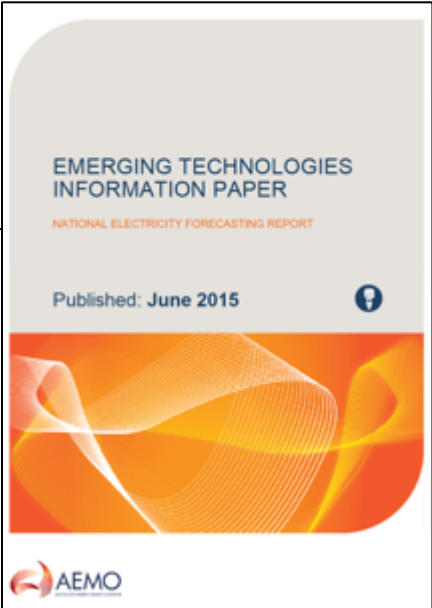
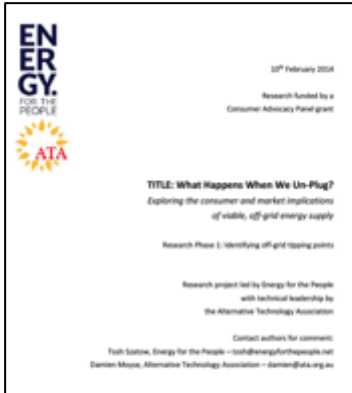
2. Shift in type of household
going off grid



Lack of Data Identified as an issue in off-grid policy & research reports

- shortage of data on who is off grid
- future scenarios not based on actual data

“Data on the number of installed battery storage systems is hard to find”
(CEC, 2015: 6)



Lack of Data

Several different approaches used to source off grid data for Tasmania

1. Whole of market data

- *TasNetworks* data on cancelled new connection applications (2012+)
- Phone survey of specialist installers & architects in Tasmania [9]
- Enquiries: Clean Energy Regulator, Clean Energy Council, Department of State Growth, OTTER, Sustainable Living Tasmania, Living Off Grid Tasmania

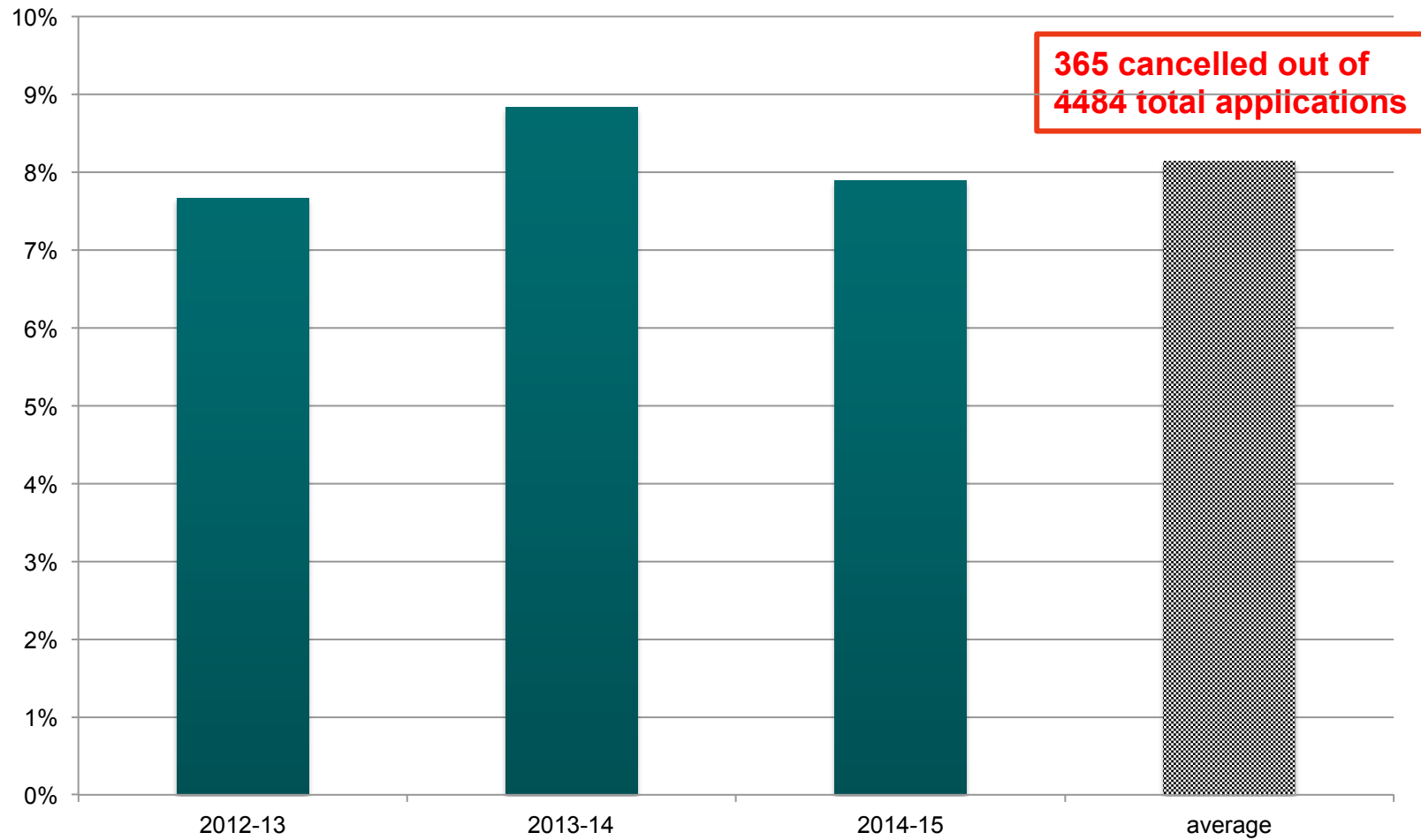
2. 'Bottom up' survey of householders

- online survey [c20], & follow up phone interviews and home visits [6]

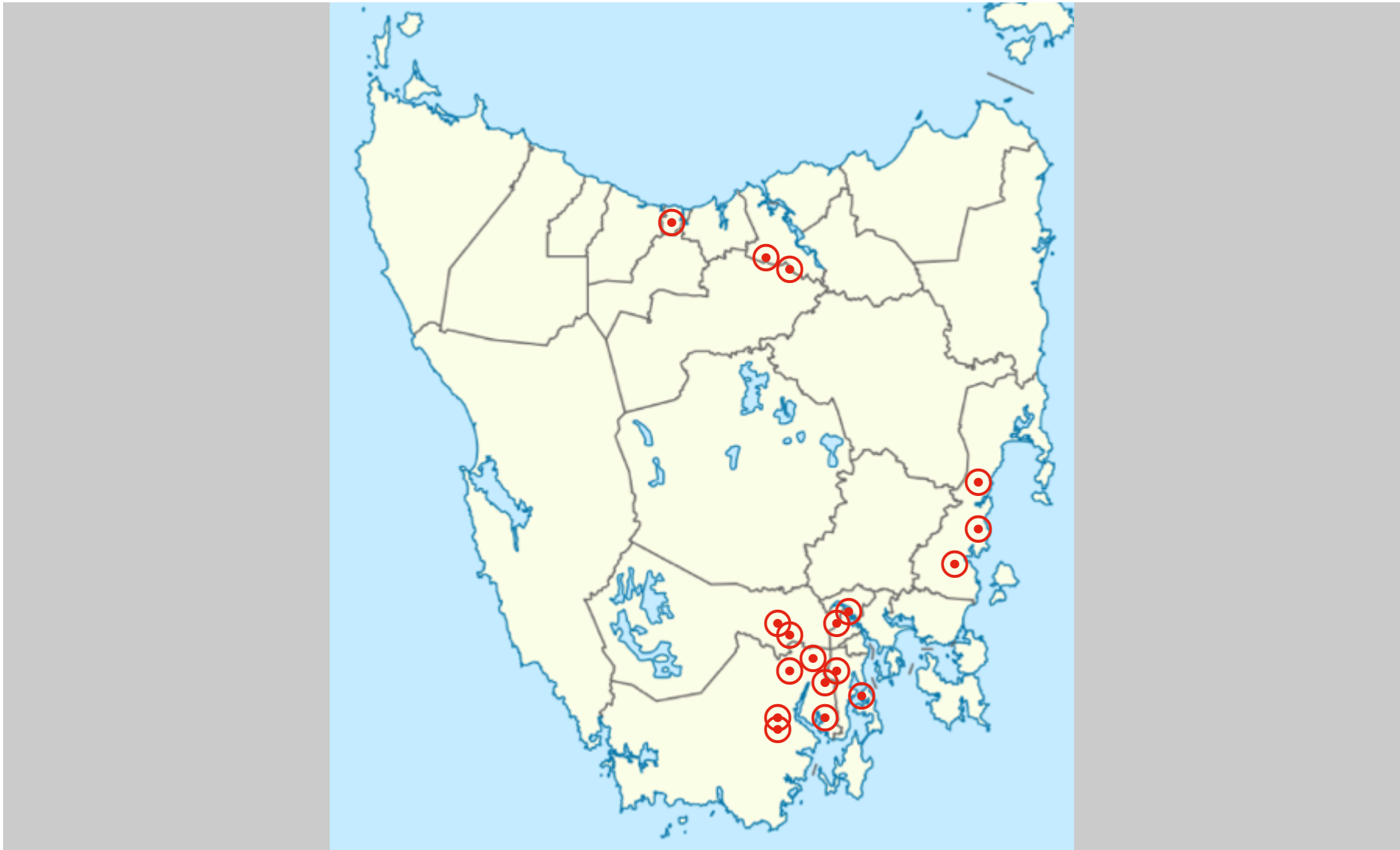
Estimates > accurate data; large range in estimations from 200 to 10,000 off grid households in Tasmania

New electricity connection applications

TasNetworks % of applications cancelled



Location of Off Grid Households Identified via online survey



Shift in type of household going off grid

Evidence from specialist installer survey and householder survey & interviews

- Some households making the choice for financial reasons
- Generous sizing of systems so provide reliable electricity supply without behavioural changes
- Not necessarily technical enthusiasts nor environmentally motivated
- But diversity of motivations remain

“Mostly they want to reduce their bill, because it costs so much to connect the grid to the building site.” [Installer #1]

“People are choosing to go off grid because it is financially better than connecting.” [Installer #2]

“People are off grid mainly because of the cost of connection to TasNetworks” [Installer #3]

“There is increasing interest in adding battery storage to grid connected systems” [Installer #5]

Case Study One

Classic 'Old Generation' Off grid

- 30 mins from Hobart
- Off grid since 1991
- **Motivations:** environmental (Lake Pedder)
- Family of 3 (1 technically-literate/system manager)
- **Technologies:** gas, wood heater, wind turbine, solar hot water, PV panels, battery storage, back up generator
- **Household practices:** highly efficient (low wattage) appliances; cluster washing/ironing & vacuuming and run generator; frugal in winter



Case Study Two

Next generation Off grid

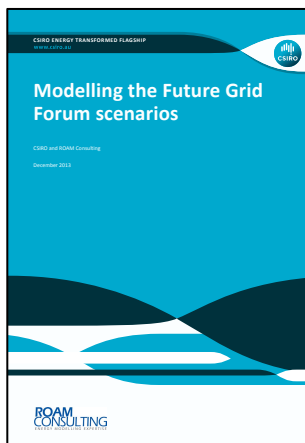
- 20 mins from Launceston
- Off grid since 2010
- **Motivations:** financial (cost of system \$55k; grid connection quote c\$40k)
- Couple with young children
- **Technologies:** integrated off grid system designed and installed by specialist company, gas, wood heater, solar hot water, PV panels, battery storage, back up generator
- **Household practices:** attentive to batteries and the weather, housework done during the day, use dishwasher only in summer



Conclusions

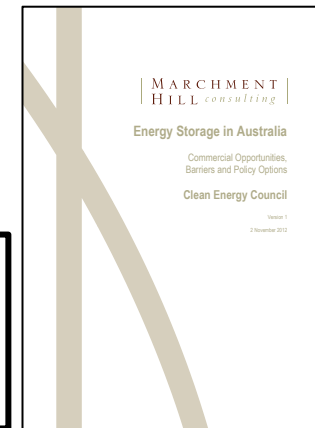
Lack of accurate current data is a problem: **200 or 10,000 off grid households in Tasmania?**

Dynamics of innovation: “A common pattern is that outsiders and entrepreneurs nurture and develop radical innovations in niches ‘below the surface’ of incumbent regime actors.” (Geels, 2010: 498)



"We assume that domestic scale battery systems are available in 0% of detached dwellings in 2015" (CSIRO & Roam Consulting, 2013: 28)

"Practically no households have yet taken up domestic storage technology independently." (Marchment Hill, 2012: 38).



Thank you and any questions?

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