#### The value proposition of

energy storage.

sources of value, how they are captured and how they can be optimised.

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Dr Lisa McDonald

**Ergon Energy Retail** 



### Ergon Retail's Residential storage pilot.

• 33 customers in 3 locations, with a VPP capable system to explore the multiple value streams.





ARENA



Australian Government

Australian Renewable **Energy Agency** 





# Battery systems are still expensive – but prices are falling rapidly.

Figure 1: Expected component breakdown for residential energy storage systems, 2015-20 (Real 2015 \$/kWh nameplate capacity)



Source: Bloomberg New Energy Finance Note: This assumes a solar and storage hybrid inverter which is currently significantly more expensive than a PV only inverter. The ratio of the inverter kW output to energy storage nameplate capacity was set at 5kW:6kWh.

## When do they become economic after their full value can be extracted

# Role of Tariffs: <sup>1</sup> facilitate or defend



Revenue: Use of System charges charged to recover a fixed revenue requirement

Focussing on drivers of long run costs can extend the life of network assets and in the long run reduce costs to customers

Using tariffs to defend against innovation and choice is arguably not a sustainable strategy for networks



#### Tariffs & customer value



Tactical use of batteries creating Network and Retail value







charge



Discharge

## Tactical Response – wholesale energy

- Current Market Price Cap \$13,750 per MWh . Occurred 5 times in 2015.
- Friday 29 Jan-16, market went to ~ \$11,000 for a 5min period.





## Network tactical response

**Feeder Loading** 





## The devil in the detail – system size



EEQ-02-01 Load Too Low, Of interest is the pickup of very low load at night is forcing the system to operate in a very inefficient mode.



#### The devil in the detail – system management





## Managing for new tariffs

Using Tariff price signals and hybrid systems to flatten the load profile



#### Optimising the system – integrated energy management





#### Energy management technology to optimise value



GO

RETAIL

## Issues to be solved

At the moment - batteries aren't for everyone. Can they be designed to be more flexible??

- variability in usage patterns and switchboard variations
- Off-peak tariffs
- Multiple phases
- Meeting network connection and safety standards

And – what are the best business models



# The full value of batteries needs the right ecosystem

