

A close-up, low-angle shot of solar panels on a roof. The panels are blue with silver grid lines, and the perspective is looking down the length of the panels towards the horizon. The background is dark, suggesting a night sky or a dark background.

# **TOMORROW'S ENERGY INDUSTRY**

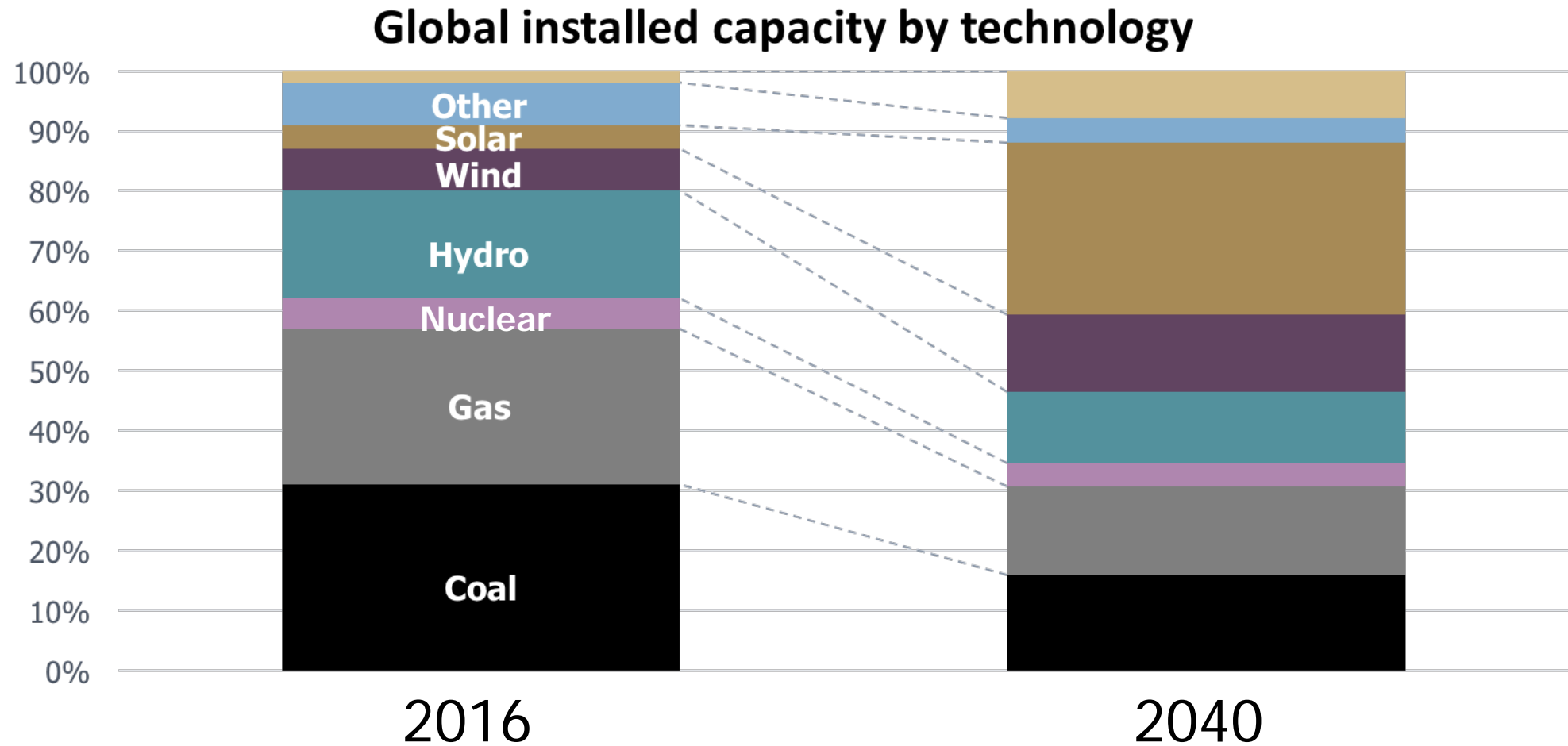
*The new energy economy and how its being revolutionized by blockchain technology*

Curtin Corner  
Friday, August 18<sup>th</sup> 2017  
Jemma Green



Curtin University

# Disruption in Energy Markets





# Global Comparison of Solar

Power data "mined" in New block every few minutes or seconds

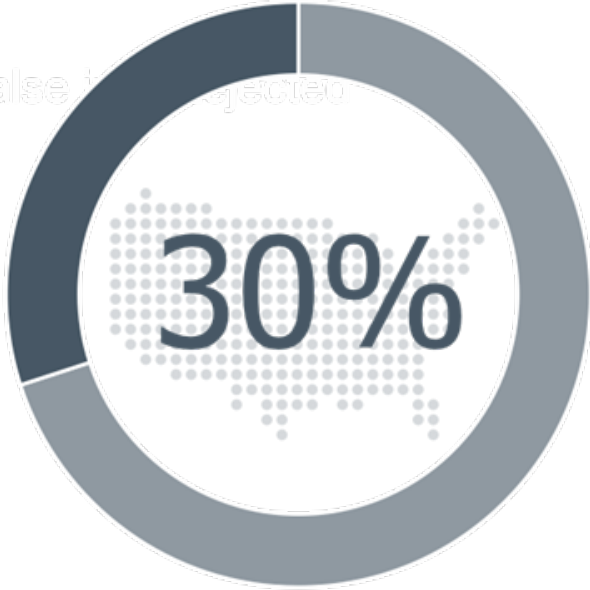
### Australia



### Europe



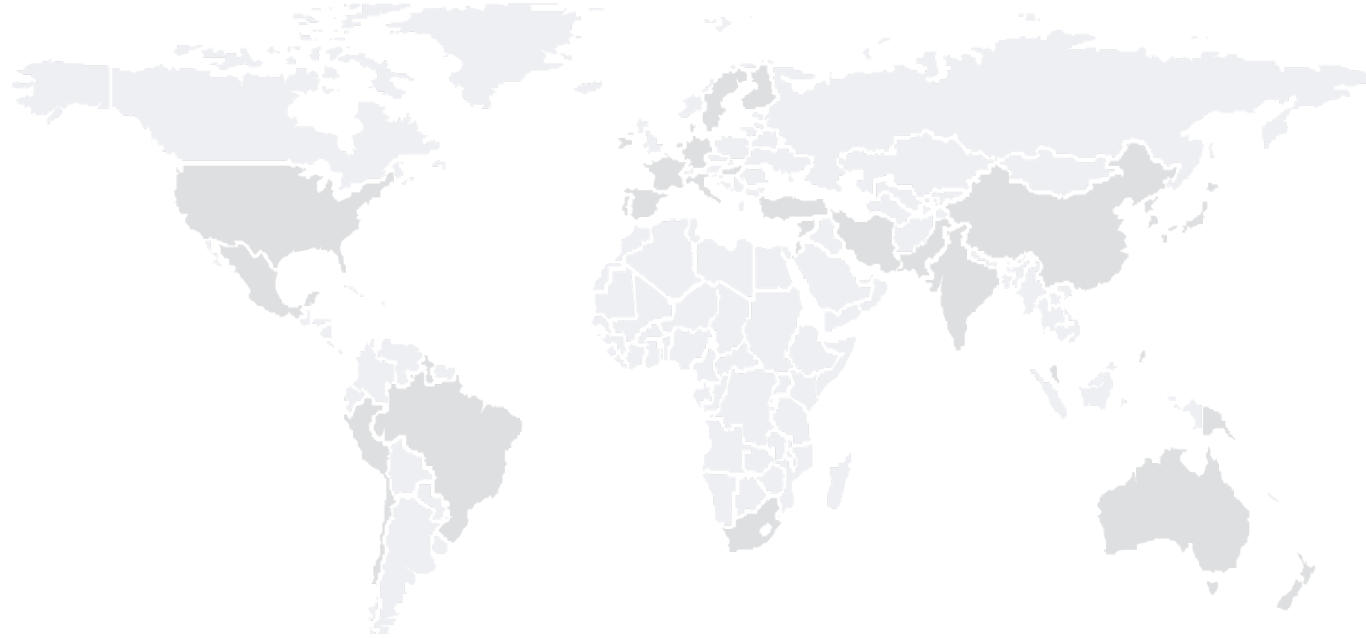
### United States



False information rejected



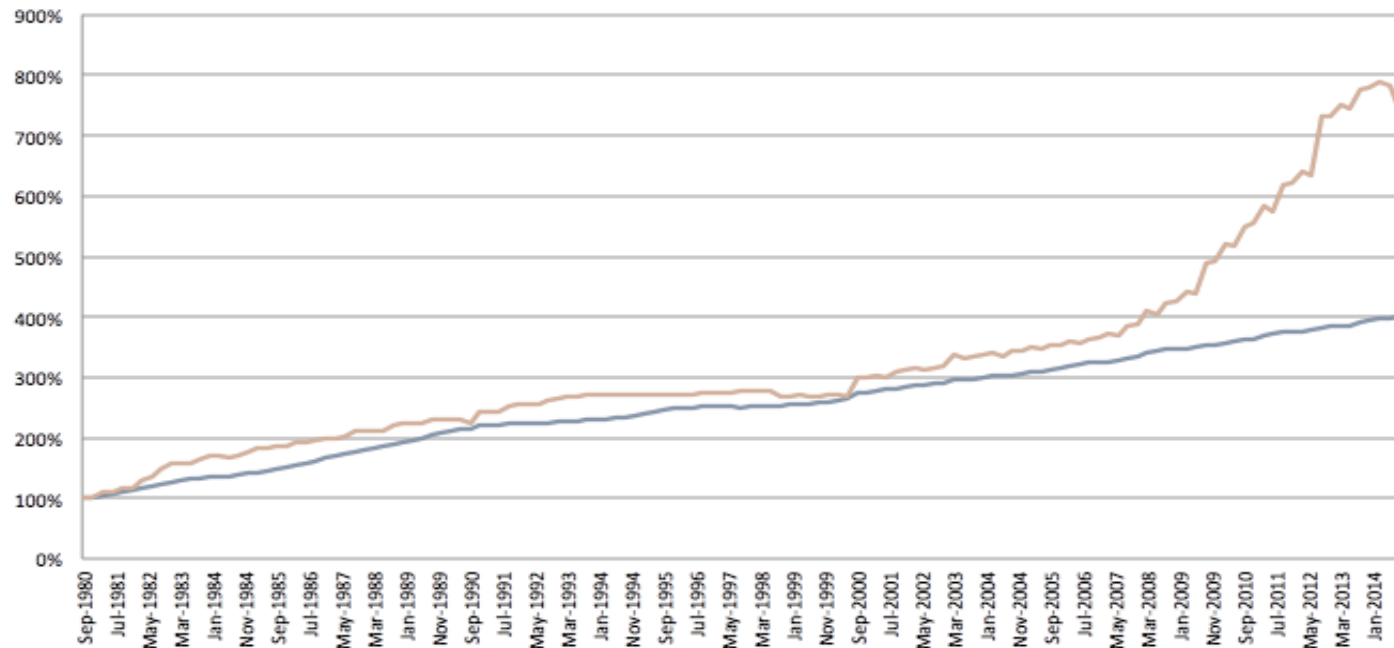
# Countries at Grid Parity



30 of the countries analyzed in 2015 by Duetsche Bank had reached grid parity: where solar generation was equal or less than local retail electricity prices.

# Electricity Price Growth

Comparison of rise in electricity prices and rise in CPI

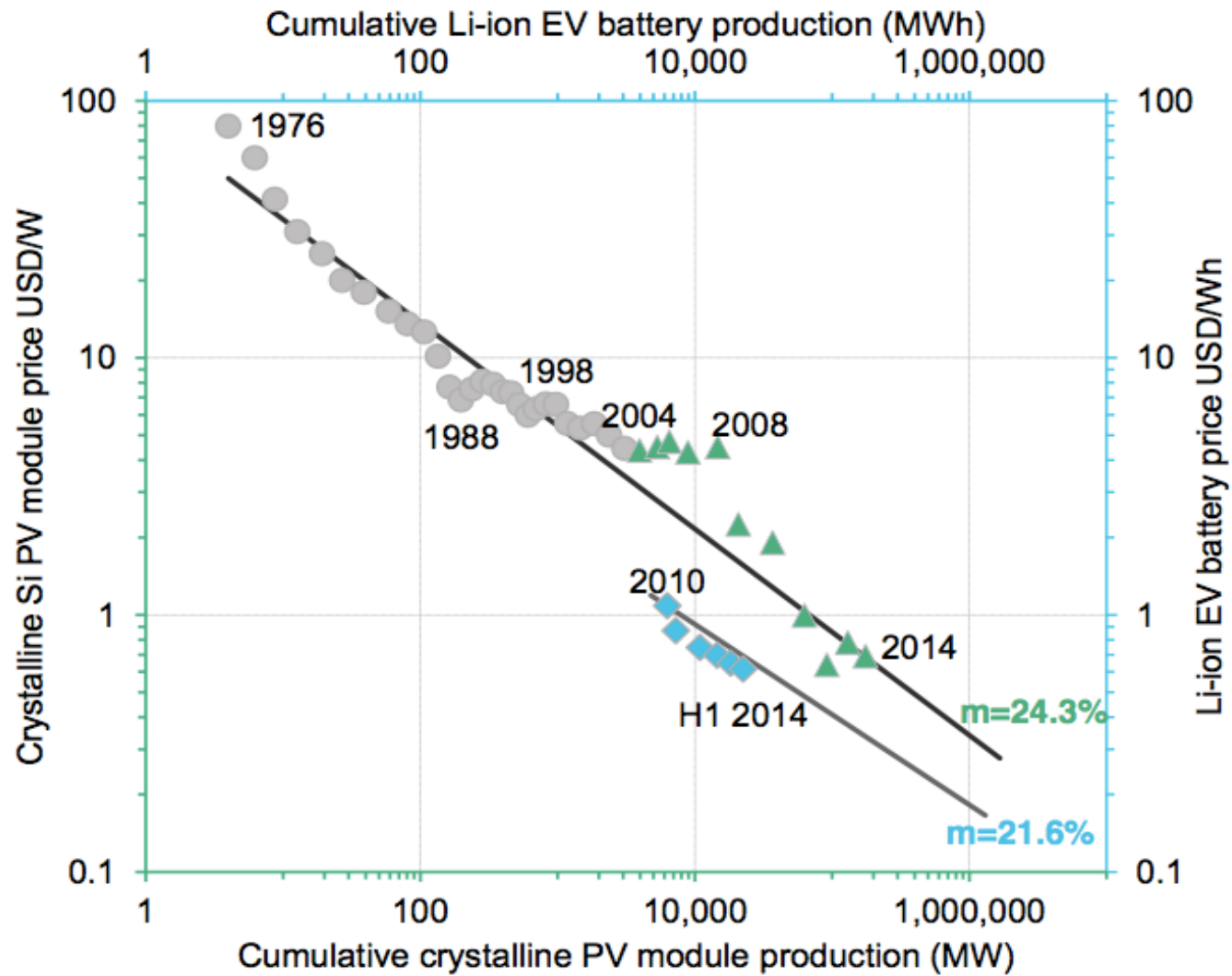


SOURCE: GREEN, NEWMAN & ABS

— All groups CPI ; Index 1980  
— Electricity ; Index 1980

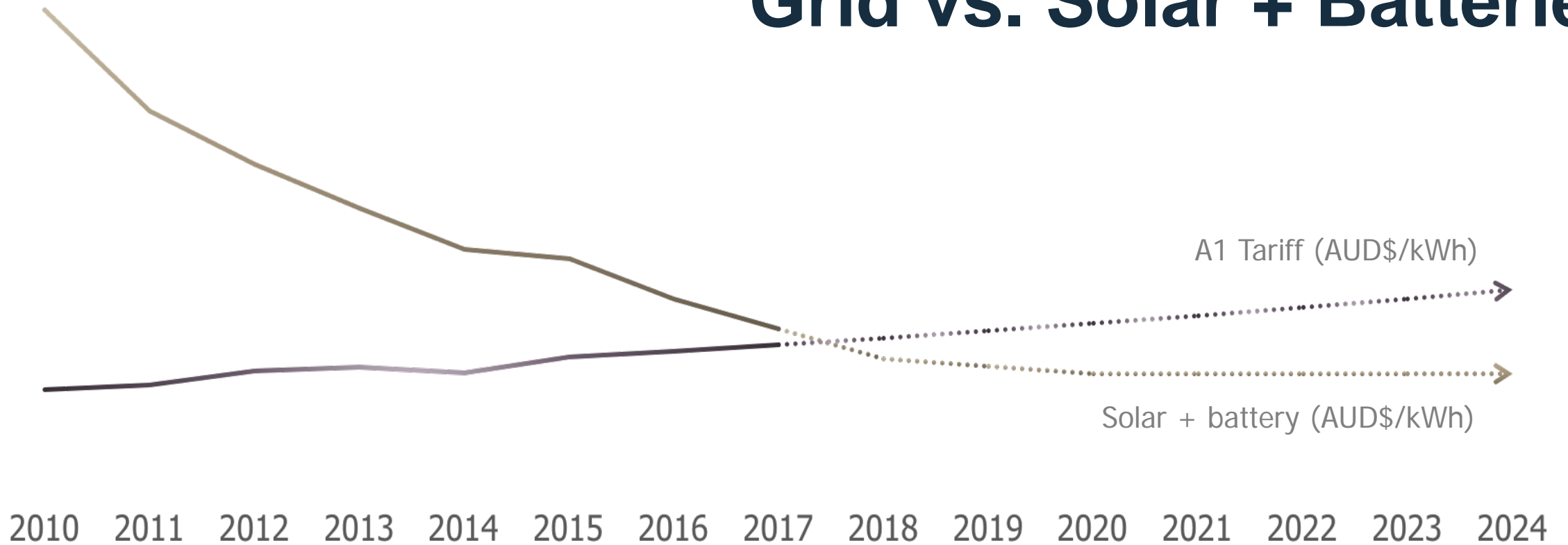


# Battery Prices Will Fall Fast





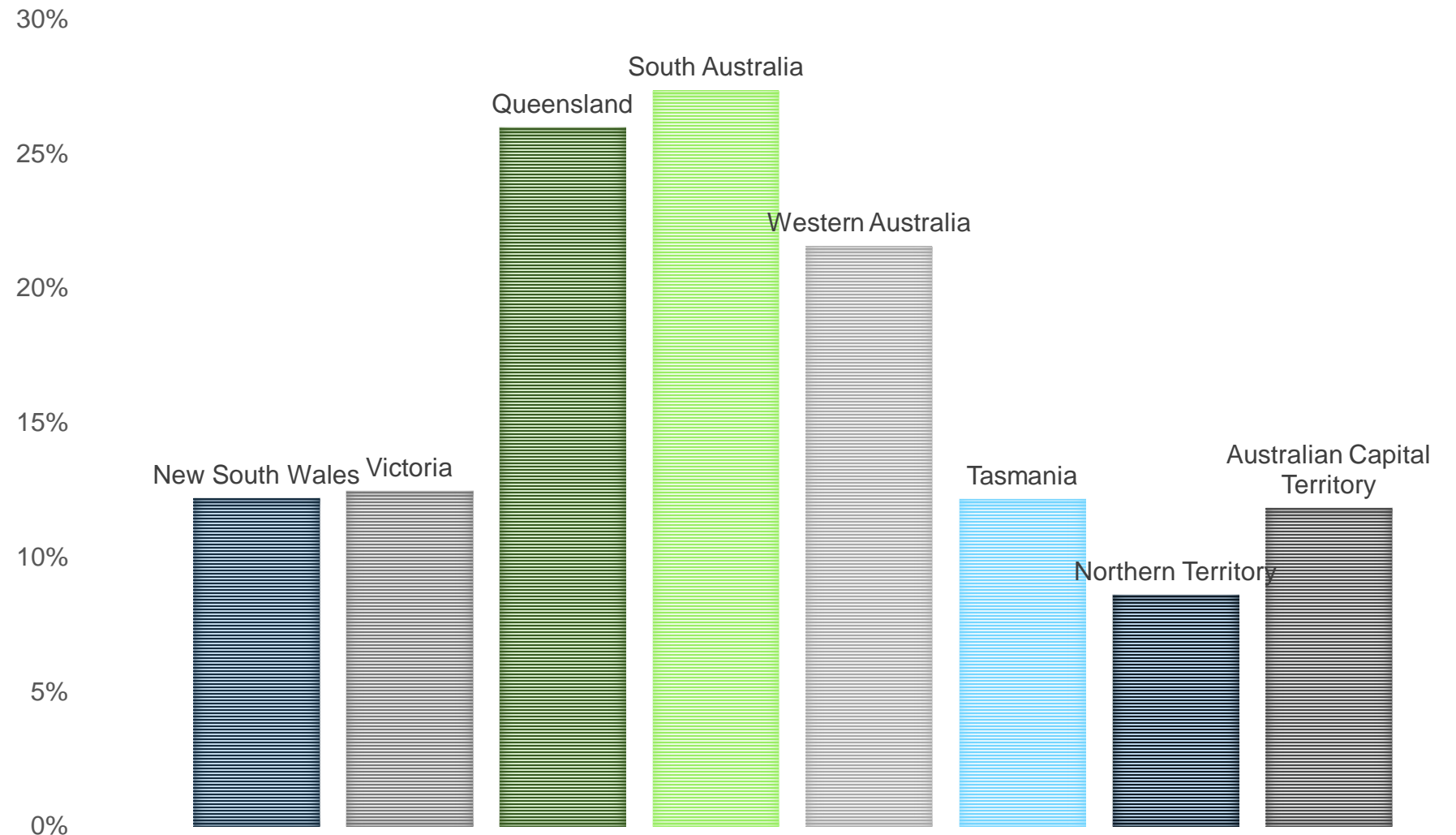
# Grid vs. Solar + Batteries



Source: Green and Newman, 2017



# PV Penetration by State

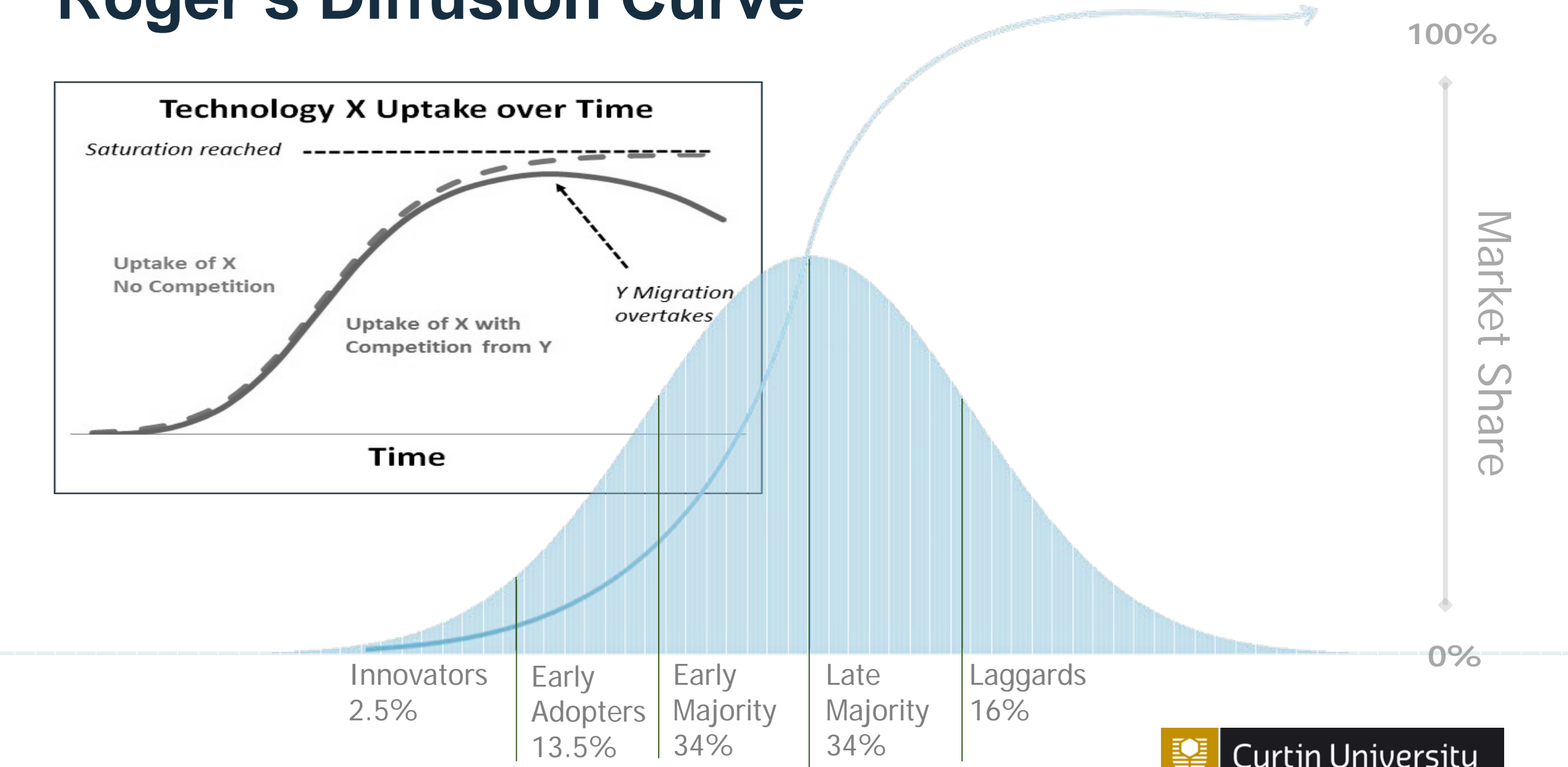
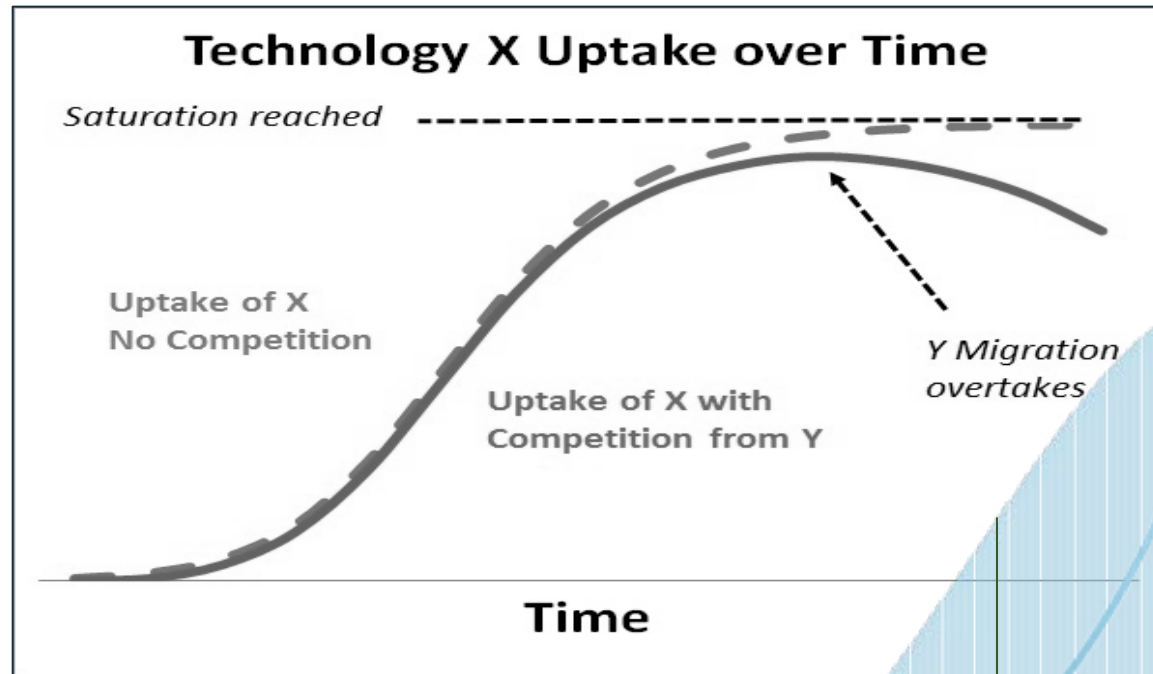




# PV Penetration: Top 5 Suburbs



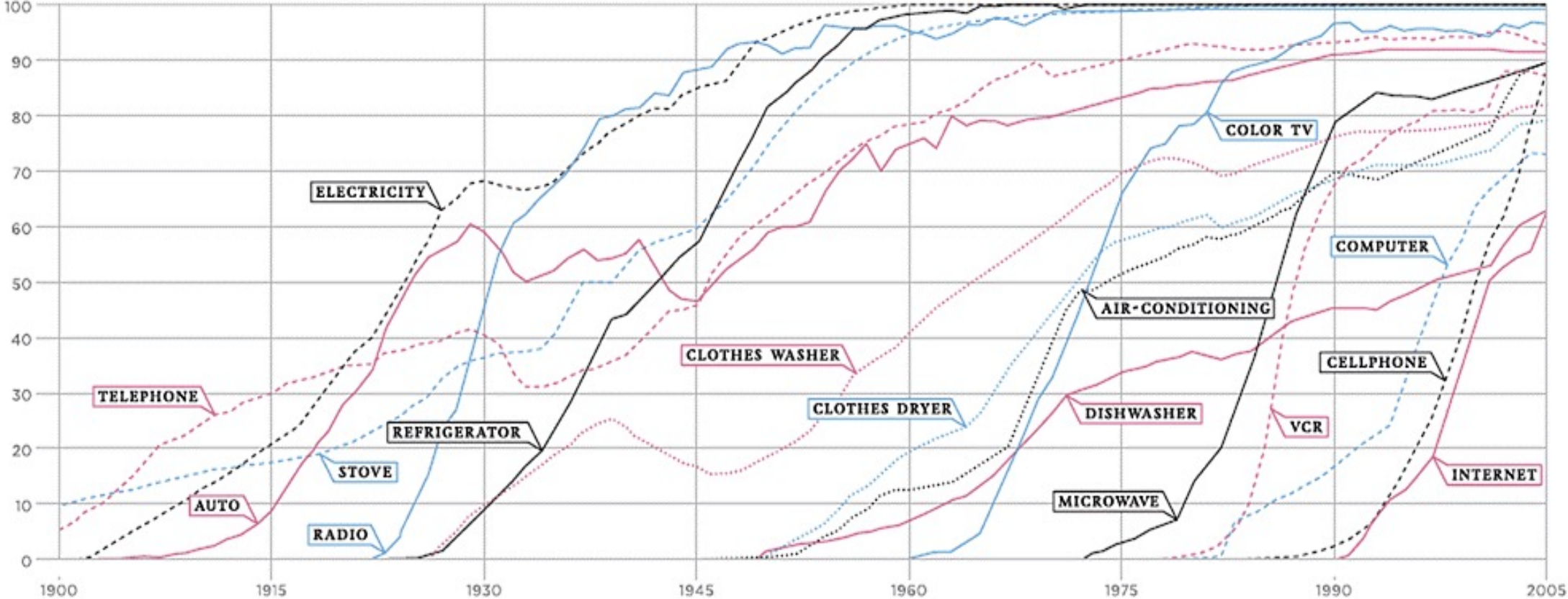
# Roger's Diffusion Curve



# Technology Rates of Uptake

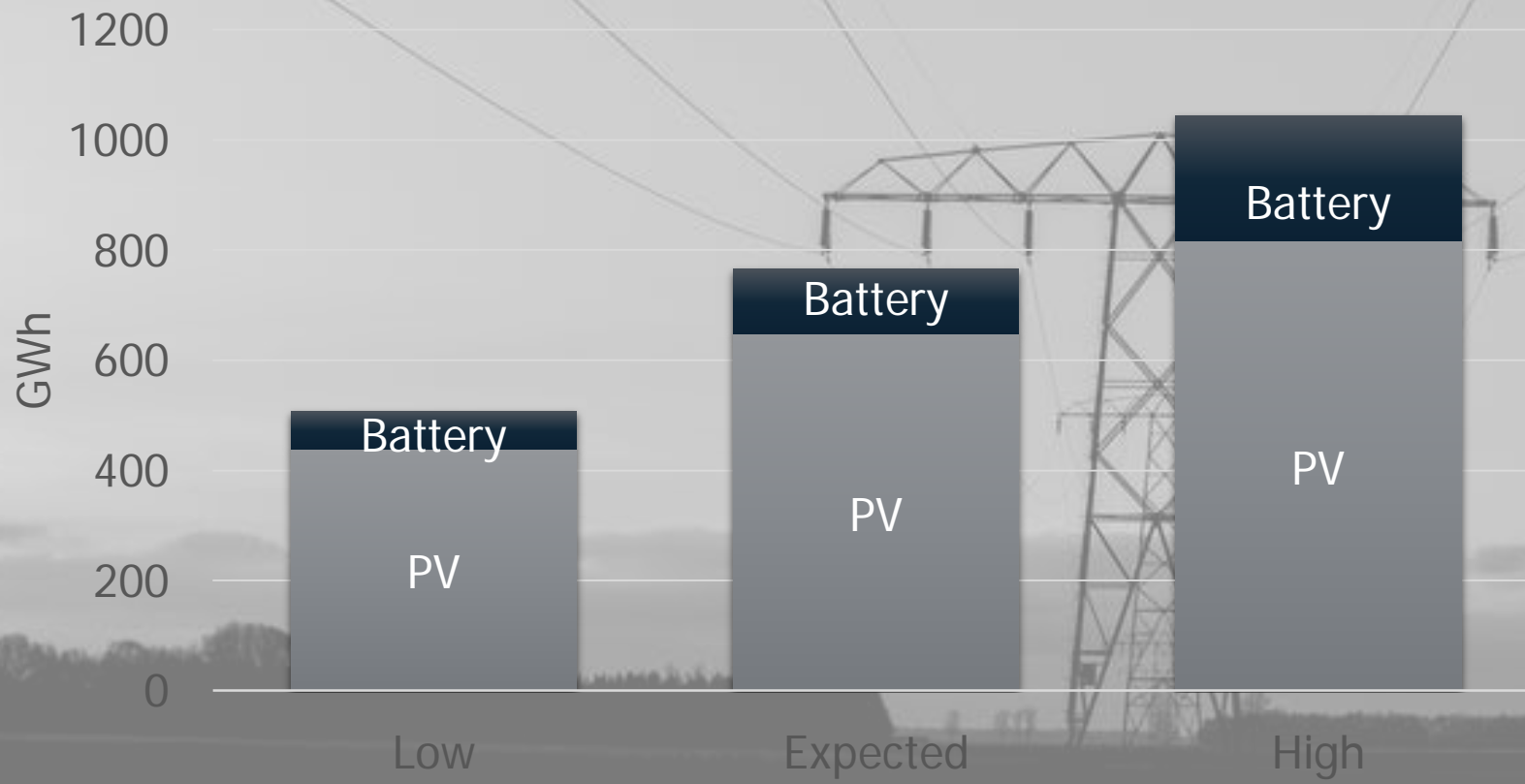
PERCENT OF J.S. HOUSEHOLDS

## CONSUMPTION SPREADS FASTER TODAY



# Impact on Network Utilisation

Additional Displaced Network Energy (2025 vs 2016)



8 – 16% of energy served to small businesses and residential customers

This group accounts for \$1.1Bn of network revenue for 2016/17

Tariff would need to increase up to 22% to compensate

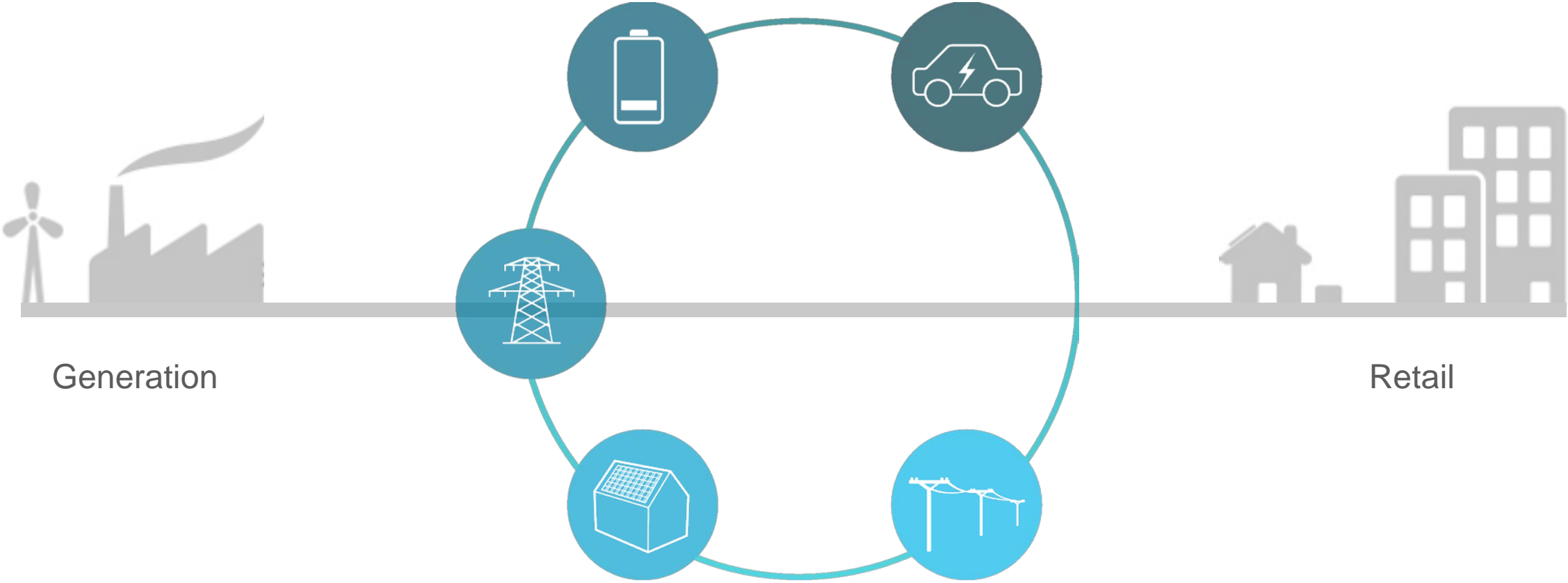


# The traditional industry





# The industry today



Generation

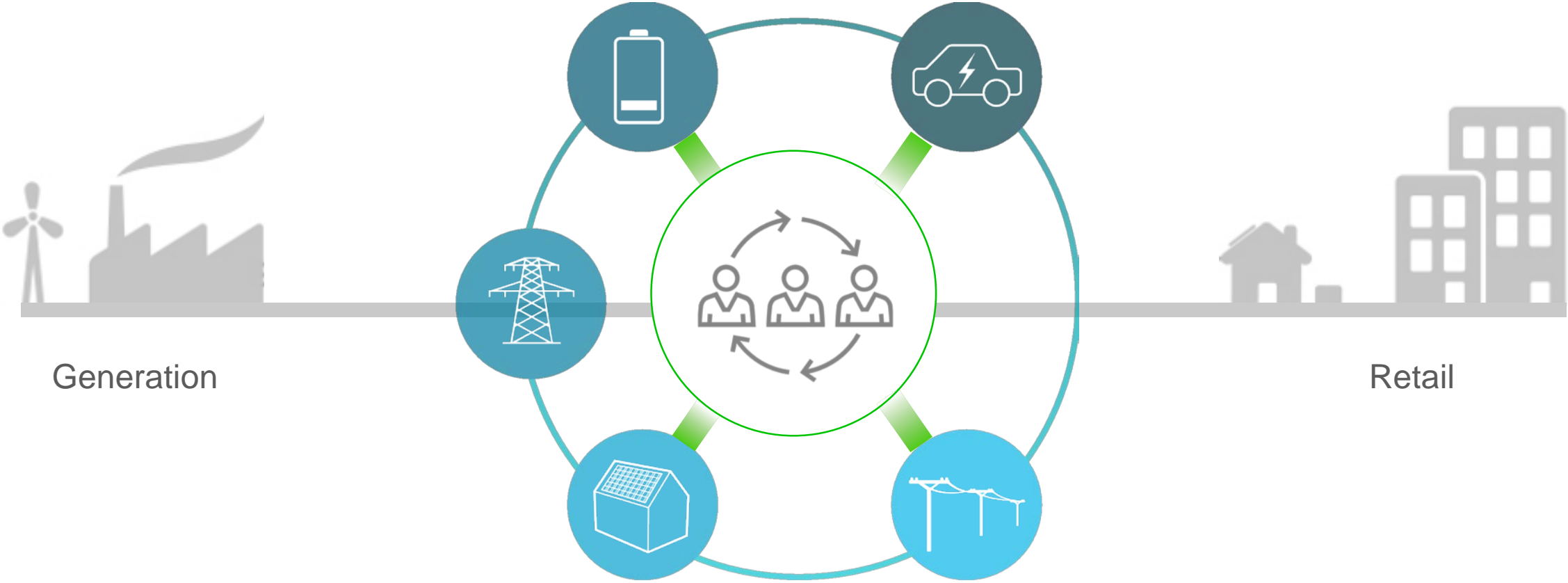
Retail

The New Energy Economy



# The solution

POWER  LEDGER



# Why blockchain?

- Fast, cheap, secure and transparent settlement of multi-party transactions
- Formation of dynamic trading ecosystems
- Autonomous distributed trading markets with low-cost and virtually instantaneous market reconciliation and settlement
- A 'trustless' system with no interference or interpretation by any other counterparty





# The benefits

1

Improved economics for solar PV and battery storage

2

Fixes the spilt-incentive problem with multi-tenanted properties

3

Increases the utilisation, and therefore, value of network assets

4

Easier access to low-cost renewable electricity

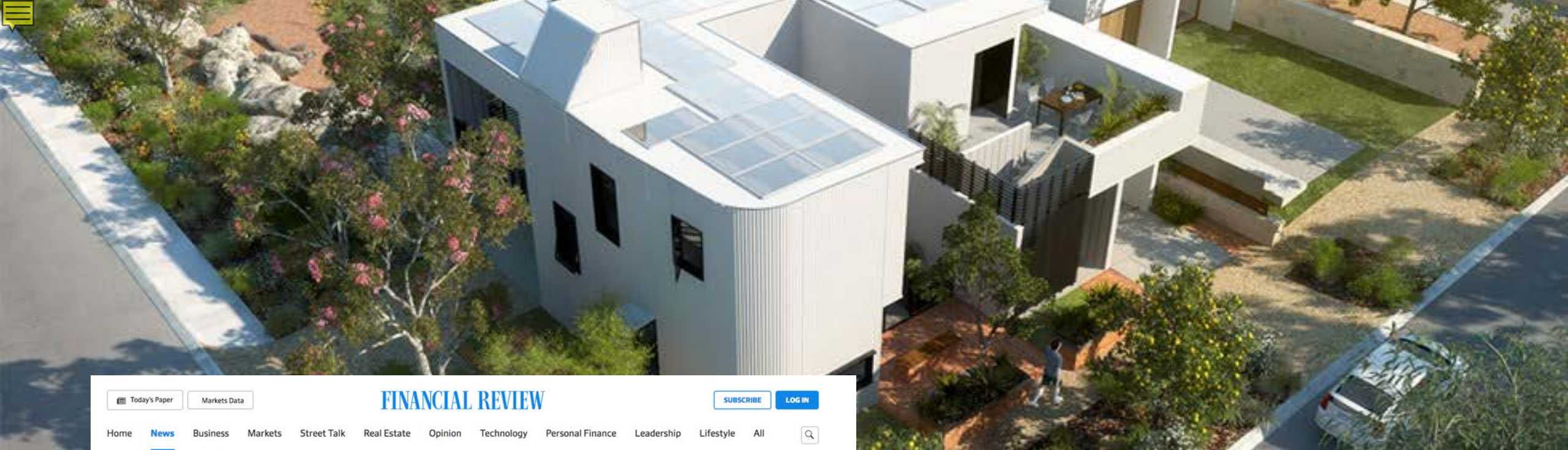
5

Decreases wastage of electricity in transmission

6

Provides platform for community-owned generation or storage





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## Blockchain power trading for low-cost apartments

📧 G+ f t in



A new front in the energy revolution sweeping Australia's suburbs has been opened up with the help of (from left) Landcorp's Frank Marra, Power Ledger's David Martin and architect David Barr. Trevor Collins



Residents of a visionary new affordable housing development in Fremantle will be among the first apartment-dwellers in the nation to be able to trade their surplus solar power with their neighbours.

# Microgrids: Gen Y @ WGV

# NLV Trial in Busselton

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REGIONAL WA

## Trial attracts international attention

Taelor Pelusey

Friday, 17 March 2017 2:52PM





# Vector Partnership

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Where Australia does business  
in commercial property



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### Perth blockchain power trading startup takes Auckland





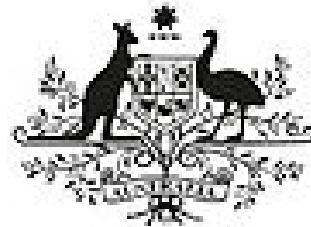
# Building Scale Energy Governance



# Project Partners



ARENA



**Australian Government**

**Australian Renewable  
Energy Agency**





# Energy Governance Team



Greg Morrison



Jemma Green



James Eggleston



Paula Hansen



Moiz Syed



# Shared Electric Vehicle Trial

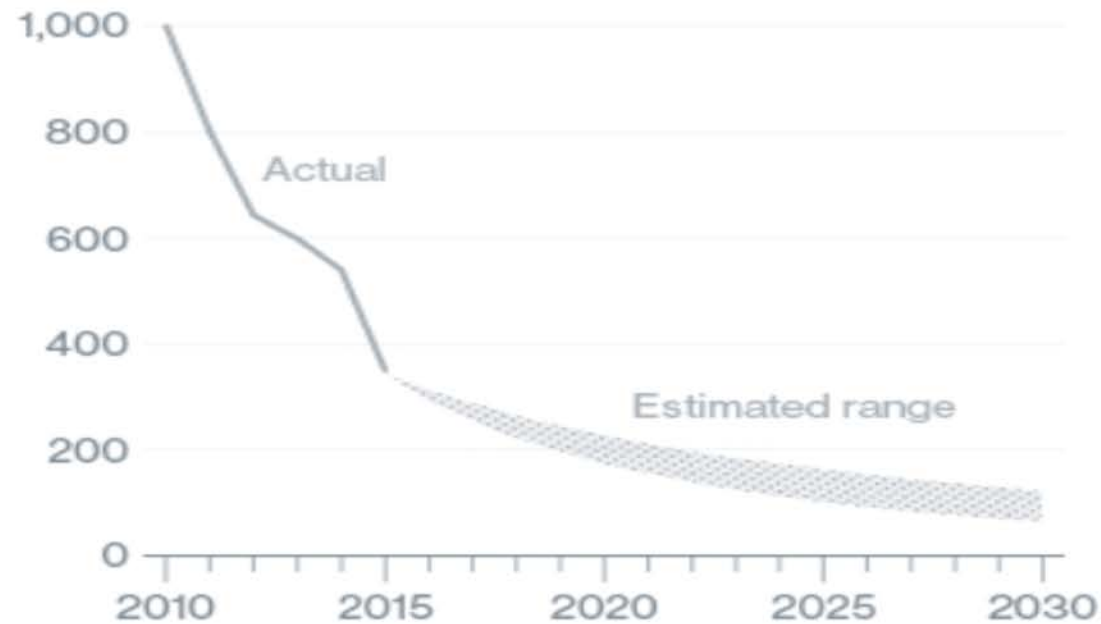




# EV Story is All About Batteries

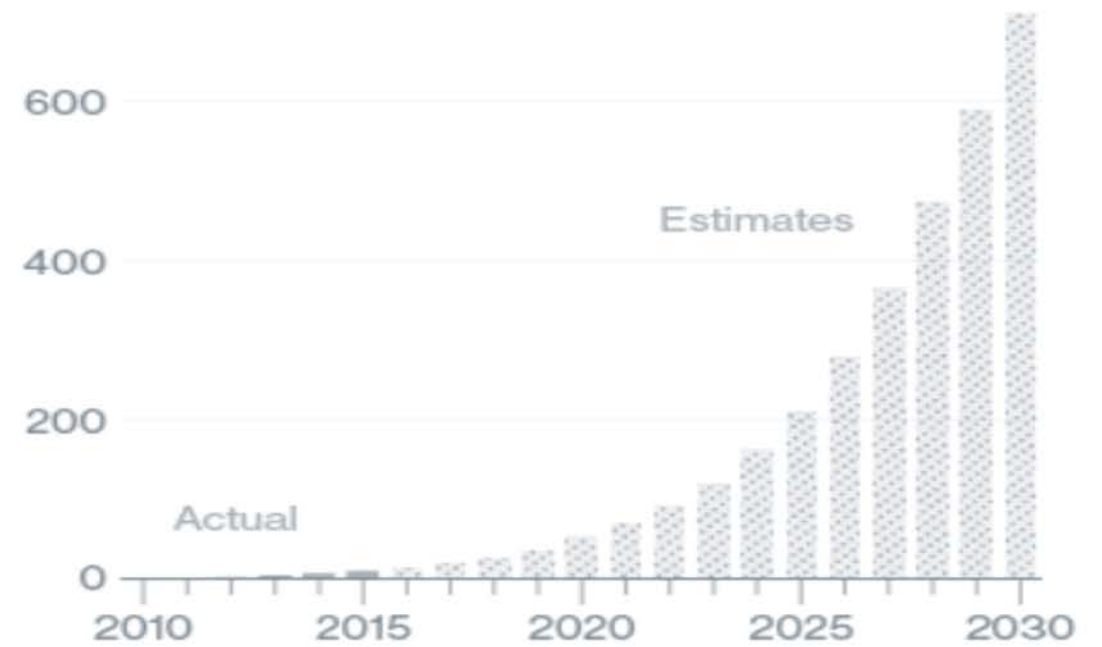
Cost for lithium-ion battery packs

\$1,200 per kilowatt hour



Yearly demand for EV battery power

800 gigawatt hours





# Connect



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