

AUSTRALIA'S TRANSITION TO EVS: NOT JUST SPECULATIVE

WEBINAR
22 AUGUST 2018



WEBINAR AGENDA

- | | |
|---------|--|
| 10.30am | Richard Lovell
Introduction |
| 10.35am | Paul Dowling
Forecasts for mass penetration of EVs in the Australian market

What will drive mass uptake of EVs? |
| 10.50am | Dr. Alina Dini
Experience of EV buyer and user in Australia

What can be done to overcome barriers to EV purchasing? |
| 11.05am | Richard Lovell
CEFC investment opportunities and financing options available for EVs |
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PRESENTERS



Richard Lovell
Executive Director,
CEFC



Paul Dowling
Associate Director,
CEFC Investment
Research

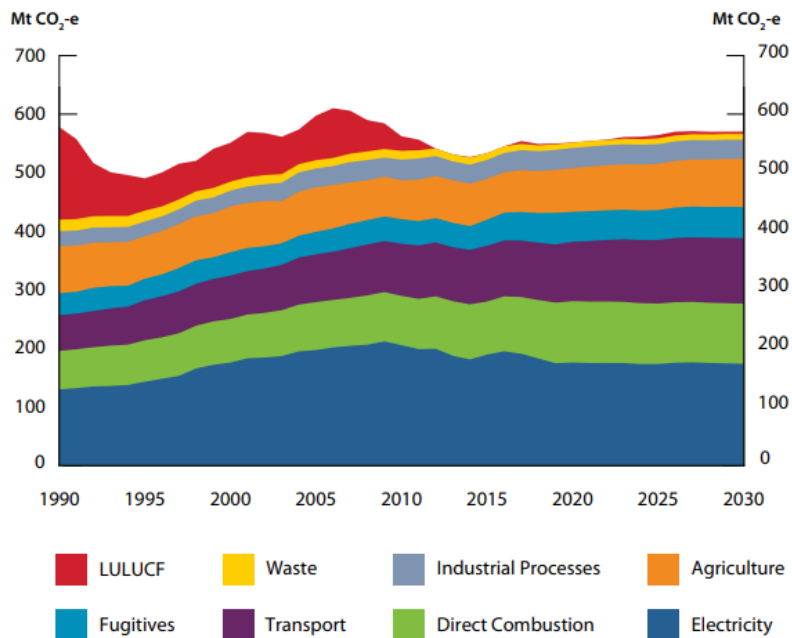


Dr. Alina Dini
Industry Fellow,
Institute for Future
Environments, QUT

TRANSPORT IS THE NEXT SECTOR TO DECARBONISE

- The transport sector is the **third largest source of carbon emissions** in Australia, at 17%.
- Australia is already lowering power sector emissions via LRET.
- In achieving net-zero 2050 targets, the next lowest cost sector to decarbonise after **power generation** is **transport**, which takes the pressure off higher-cost sectors such as **industrial process emissions** and **agriculture**.

Figure 3 Australia's emissions, 1990 to 2030



Source: Australia's emissions projections 2017

NEW FORECASTS SHOW RAPID ELECTRIC VEHICLE UPTAKE

- New modelling from Energeia for the CEFC and ARENA shows rapid EV uptake driven by international policy, battery cost reductions, and manufacturer responses.
- Policy interventions can accelerate mass market uptake.
- Energeia's **Moderate Intervention** scenario sees mass market EV take-off occur six years earlier than a **No Intervention case**.

Figure 3: EV share of sales

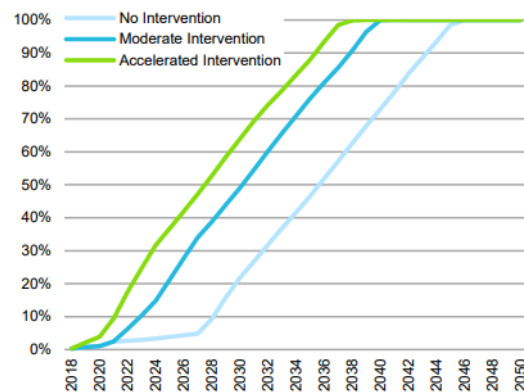
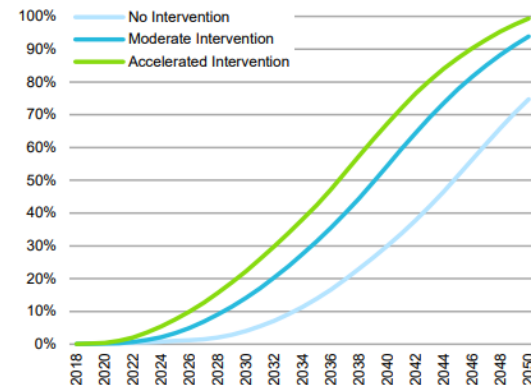


Figure 4: Cumulative EV uptake



Source: Australian Electric Vehicle Market Study 2018

INVESTMENT IN CHARGING NETWORKS

- Public access charging networks will require \$1.7 billion in investment over the next two decades.
- Investment will be split between \$1.5 billion for **local access** charge points and around \$200 million for **range extension** charge points.

Figure 5: Cumulative charge points: Moderate Intervention scenario

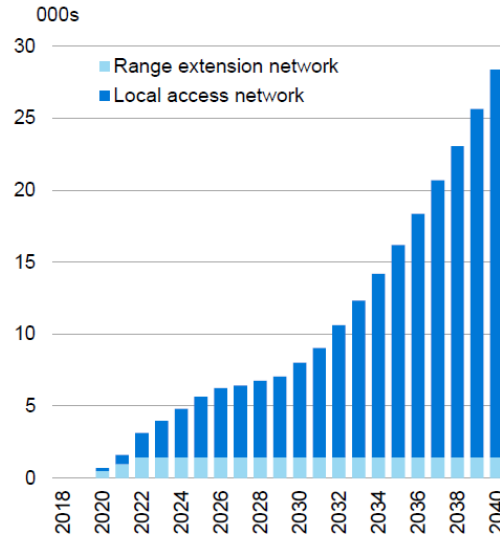
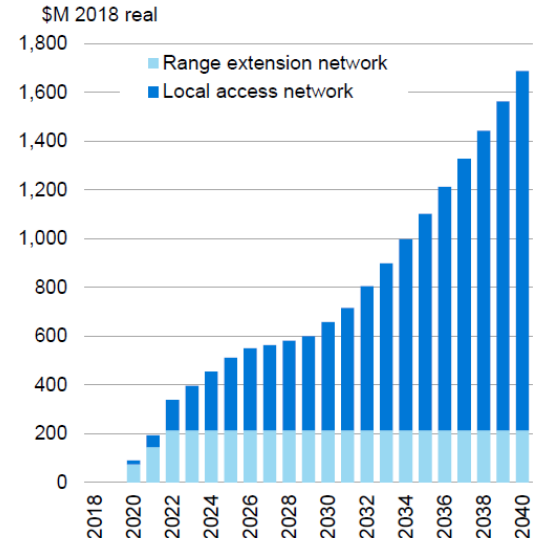


Figure 6: Cumulative charge point capex: Moderate Intervention scenario



Source: Australian Electric Vehicle Market Study 2018

USER EXPERIENCE WILL BE IDENTICAL BY 2024

- Rapidly improving technology means the user experience will be identical by 2024.
- Driving range of EVs will be **identical to ICEs by 2024** – 99% of trips are less than current battery ranges.
- Recharging time for EVs will be identical to ICE **refuelling times by 2020** under current battery trends.

Australian Charging Market Segmentation

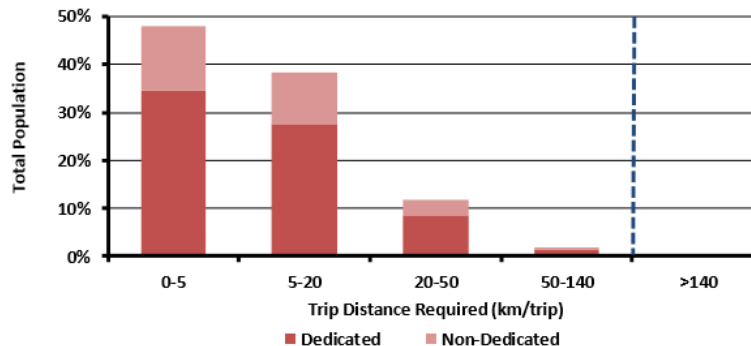
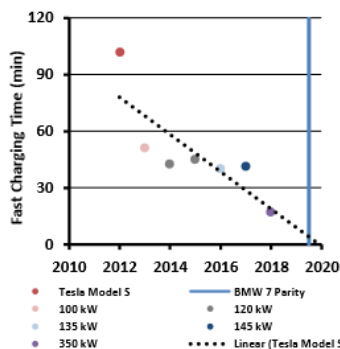
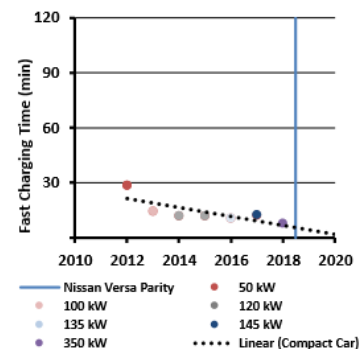


Figure 33 – BEV Charging Times – Outlook to 2020

Luxury Car Range (Tesla Model S / BMW 7 Series)



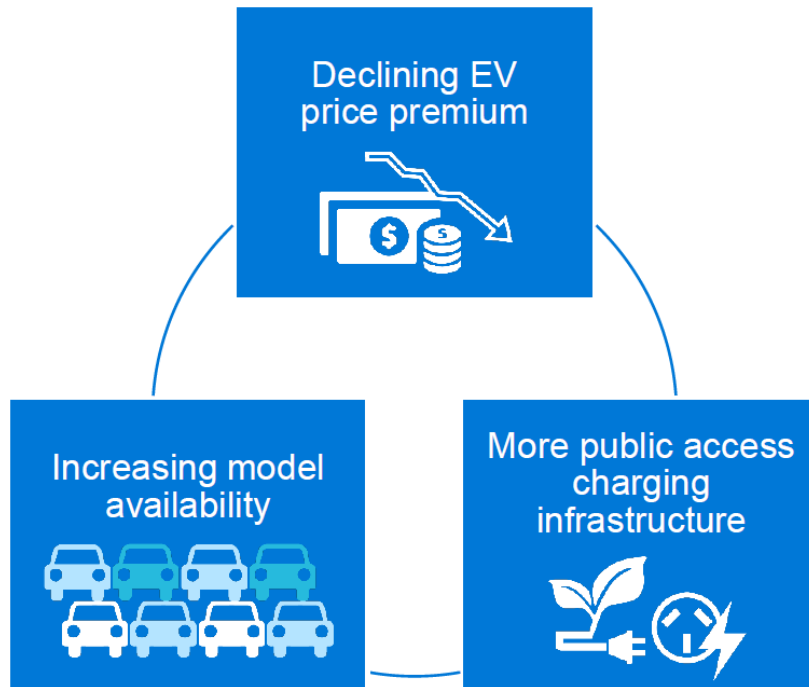
Compact Car Range (Nissan Leaf / Chevrolet Volt)



Source: Australian Electric Vehicle Market Study 2018

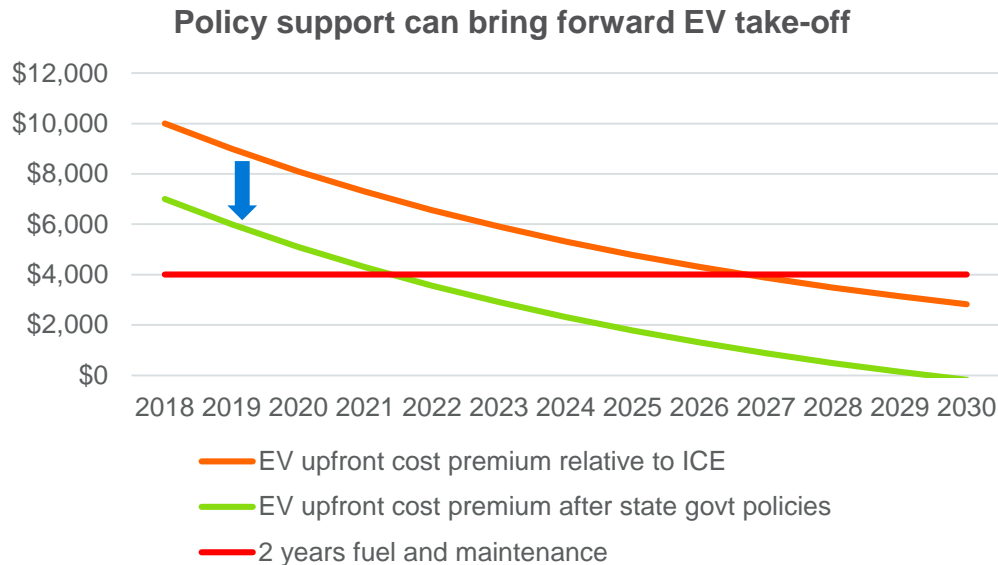
DELIVERING THE EV TRIFECTA

- Three steps to lower the barriers to mass-market EV uptake:
 1. The **upfront cost premium** of EVs must reduce
 2. The **number of models** must increase
 3. **Public charge points** must be available
- Local, state and federal government policy can play a role in directly or indirectly addressing each of these barriers.



UPFRONT COST PREMIUM MUST REDUCE

- Bringing forward the mass-market take-off point from 2027 to 2021 would need ~\$3,000 of upfront cost reduction today, declining over time.
- Mass-market take-off occurs when the EV purchase cost premium is 'repaid' from two years of fuel cost and maintenance savings.
- The upfront cost premium decreases as battery costs decline.



Source: Australian Electric Vehicle Market Study 2018

WIDER MODEL CHOICE REQUIRED

More models are coming:

- Five models are on the market: Tesla X, Tesla S, Renault Zoe, BMW i3, Renault Kangoo.
- Potentially 22 models by 2020: 5 luxury, 7 mid-range, 8 mass market, 2 vans.

Type	Existing	2018	2019	2020
Luxury	Tesla Model S Tesla Model X	Jaguar i-Pace Audi E-tron Quattro	Porsche Mission E	
Mid-range	BMW i3	BMW i3s	Mercedes EQA Volvo XC40 Tesla Model 3	Mercedes e-Vito Mercedes e-Sprinter
Mass-market	Renault Zoe	Hyundai IONIQ	Mitsubishi ASX Nissan LEAF Kia Niro EV Hyundai KONA	Mini EV Volkswagen ID
Small vans	Renault Kangoo			Volkswagen ID Buzz



BMW i3s

- Supportive policies at all levels are an important signal to manufacturers to supply more models.
- **Fleet targets for EVs can encourage manufacturers to bring new models to market, and provide supply to the second-hand market.**

PUBLIC CHARGING NETWORKS

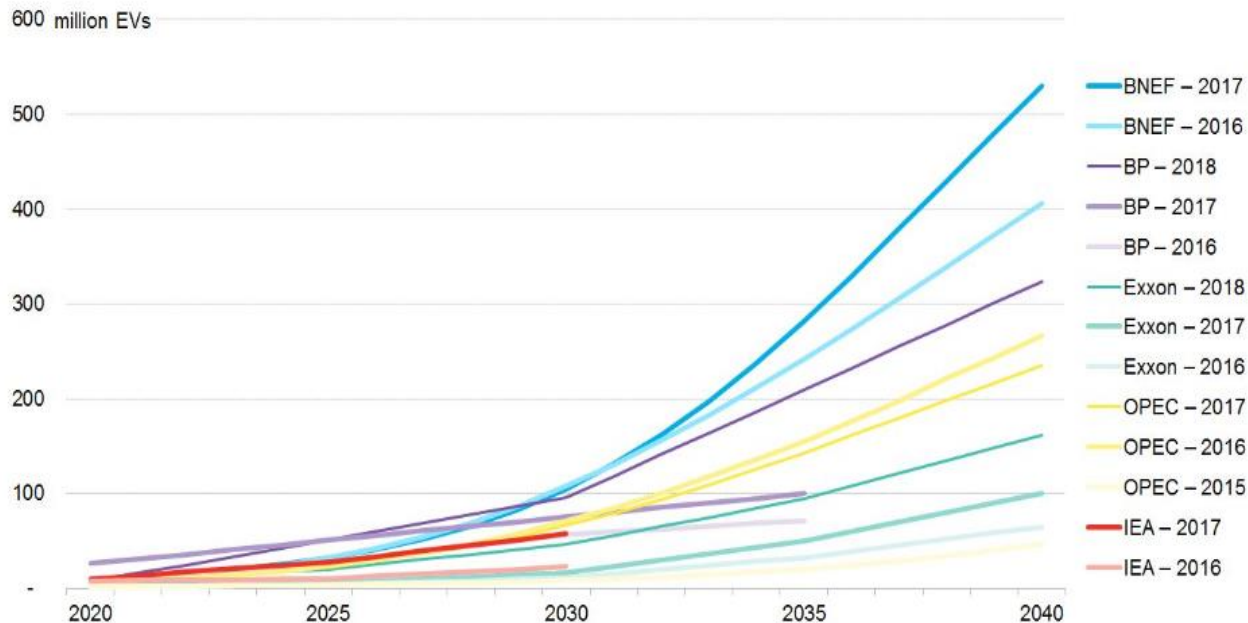
Range anxiety is being addressed now. Several well-advanced EV charging projects are underway.

- The Queensland Government is doubling the number of charge points on its 'superhighway'.
- NRMA is building a ~40 station regional charging network for \$10 million and recently launched its first station.

Government policies to reduce the EV price premium and fleet buying, improves the business case for the early roll-out of commercial charging businesses.



UPWARDS REVISIONS IN GLOBAL EV OUTLOOKS



Sources: Bloomberg New Energy Finance, BP, Exxon, OPEC, IEA

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THE DEMAND-SIDE OF THE EV MARKET

UNDERSTANDING REAL WORLD CONSUMER BARRIERS TO EVs



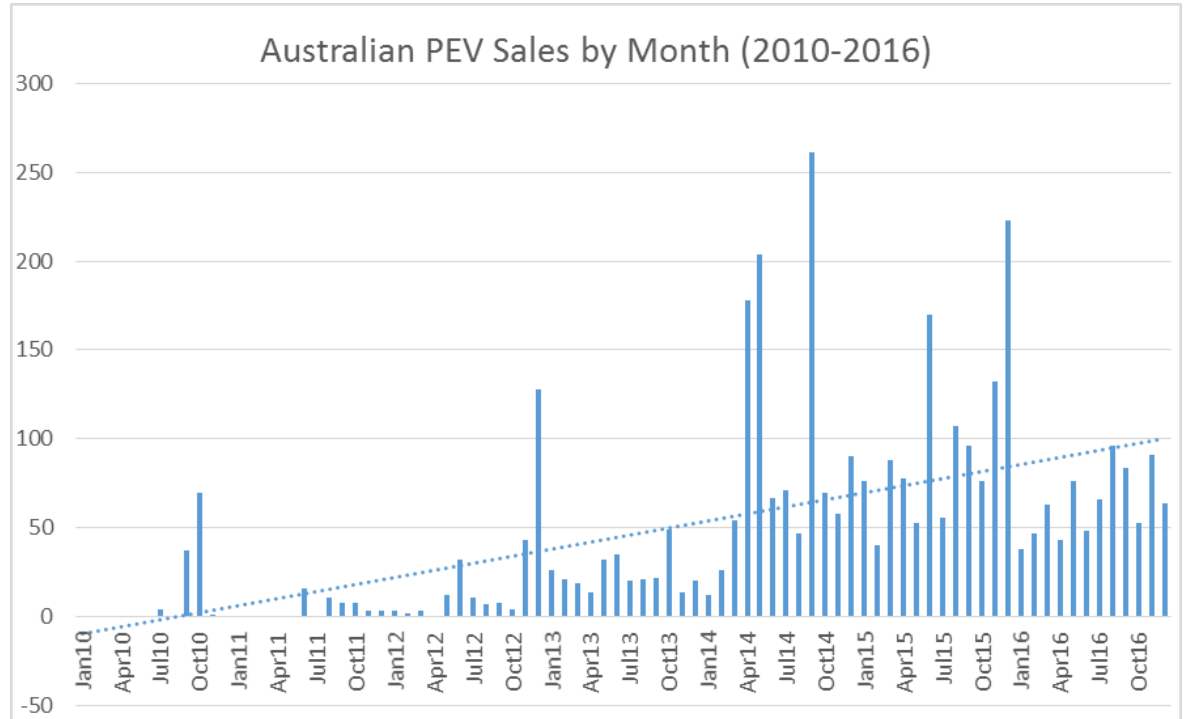


CONSUMER DEMAND FOR EVS

LOCAL MARKET HAS FACED MANY FALSE STARTS

Since 2010, Australians have had access to EVs but:

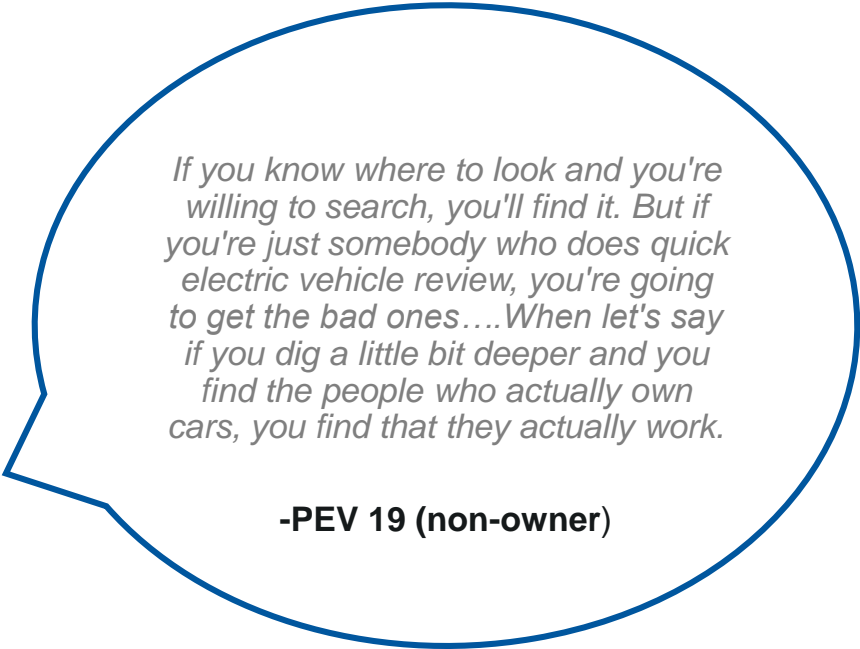
- Sales low
- Consumer confidence low
- Buying patterns inconsistent
- Product supply unpredictable



Source: VFACTS, FCAI, 2017, excludes Tesla

EXPRESSED BARRIERS FOR EV CONSUMERS

- ❌ Real market presence undetectable
- ❌ Low product diversity
- ❌ Few trusted resources for info
- ❌ Limited options for real-world EV experiences
- ❌ No peer users
- ❌ Sales (dealer) engagement has been off-base



If you know where to look and you're willing to search, you'll find it. But if you're just somebody who does quick electric vehicle review, you're going to get the bad ones....When let's say if you dig a little bit deeper and you find the people who actually own cars, you find that they actually work.

-PEV 19 (non-owner)

SNAPSHOT OF AUSTRALIAN EV OPTIONS

2010-2014



Mitsubishi i-MiEV



Nissan LEAF



Holden Volt

2014 - now

FOR SALE



Mitsubishi Outlander PHEV

FOR SALE



Tesla Model-S

FOR SALE



BMW i3s

Late 2018 - onwards

COMING
SOON!



Tesla Model 3

COMING
SOON!



Hyundai Ioniq

COMING
SOON!



Nissan Leaf Gen 2

COMING
SOON!



Audi e-Tron

COMING
SOON!



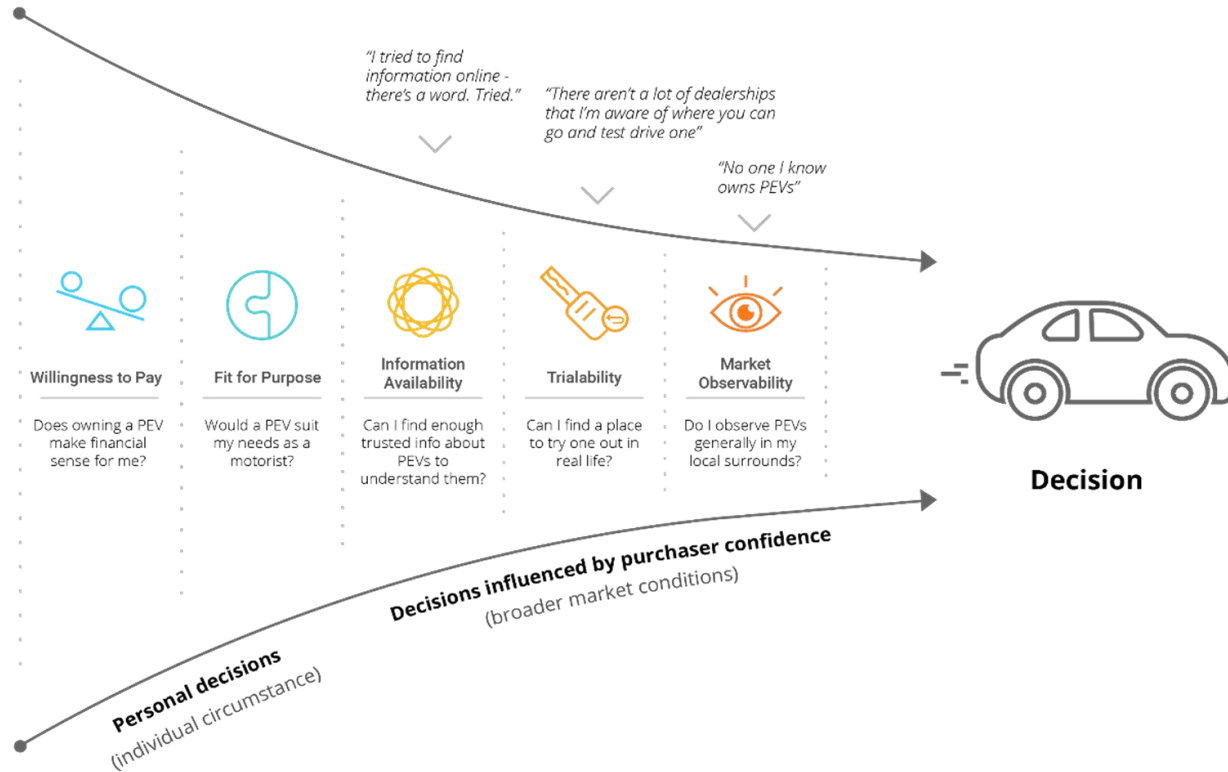
Hyundai Kona EV

COMING
SOON!



Jaguar i-Pace EV

Plug-in Electric Vehicle (PEV) Purchase Decision Framework

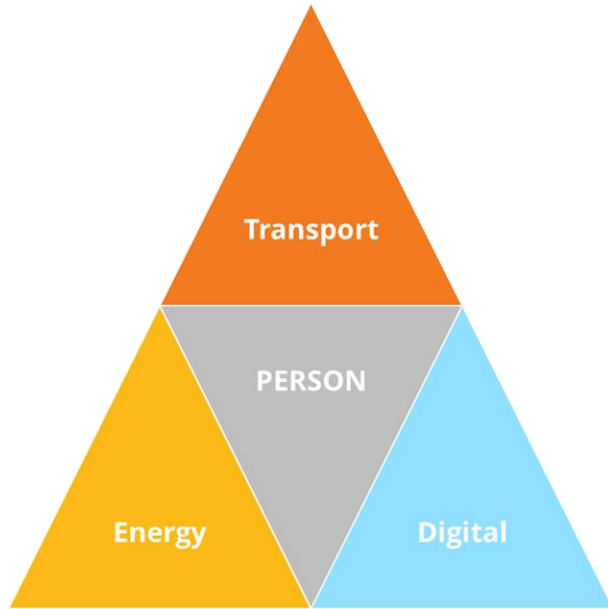


I WANT TO BE PART OF
THE
EV TRANSITION.

WHAT DO I DO NOW?

5 Cost Effective Actions for Businesses,
Governments, and Everyday Consumers

1 – EMBRACE THE *INNOVATION*. ACCEPT THAT ELECTRIC MOTORING IS A NEW PARADIGM AND YOU HAVE A ROLE TO PLAY. *WHAT IS YOUR NICHE?*



Actually my impression of the whole Tesla experience was that it was really very good because it was very transparent, and very clear, and I felt that it was streamlined, and straightforward, and efficient. It's also on par now with a lot of the other purchasing processes that we undergo.

-PEV 2 (owner)

2. BE PART OF THE EDUCATION VALUE CHAIN EDUCATE YOURSELF. THEN EDUCATE OTHERS.

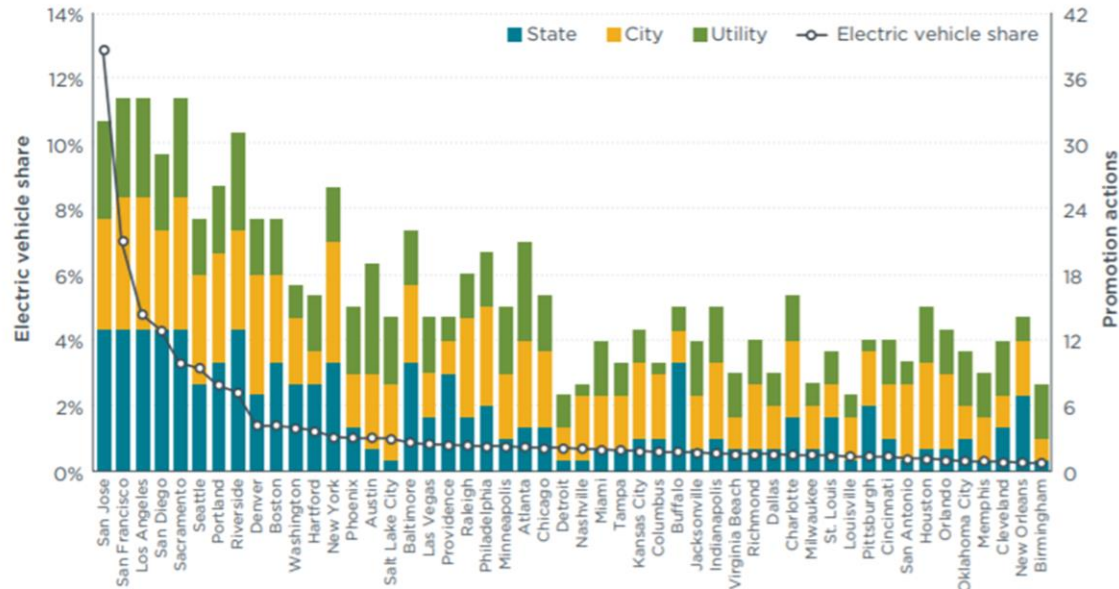
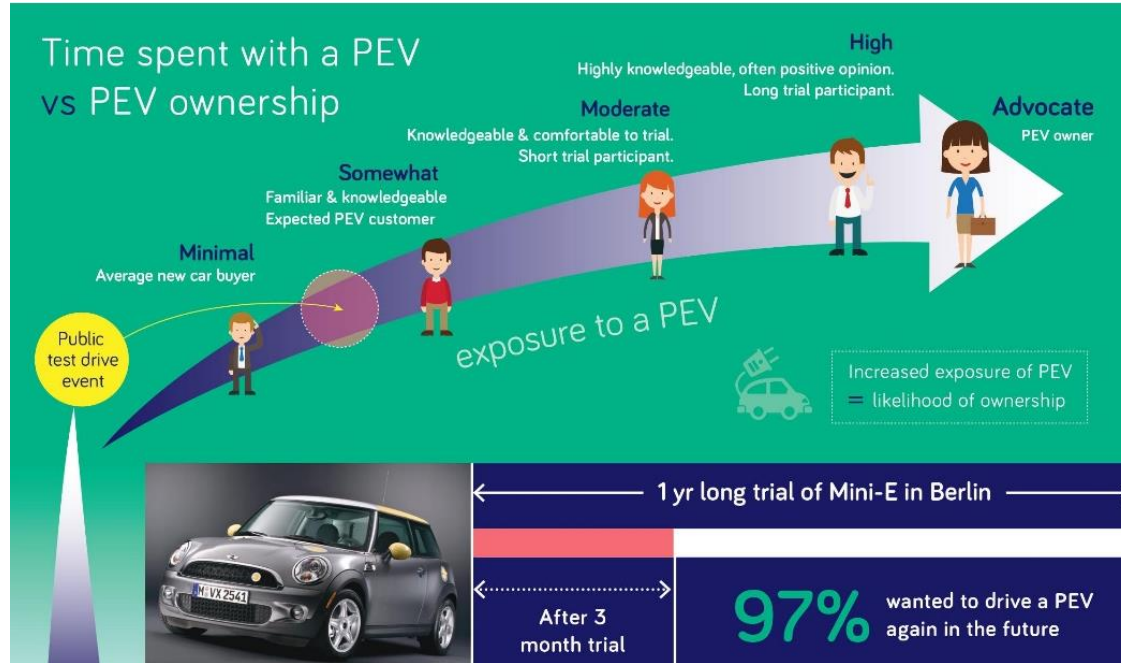


Figure 9. Electric vehicle share of new vehicles and promotion actions. (New vehicle registration data from IHS Automotive)



What's the range of an electric car?

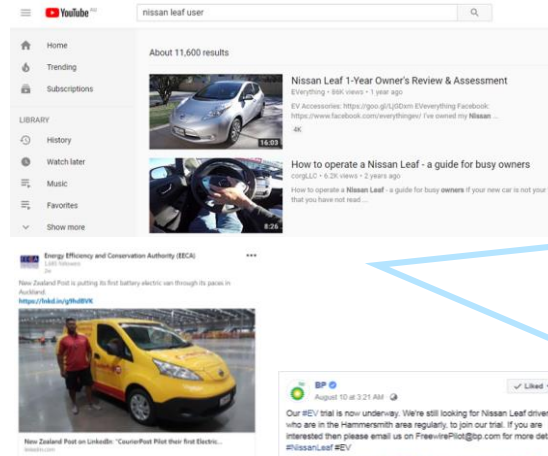
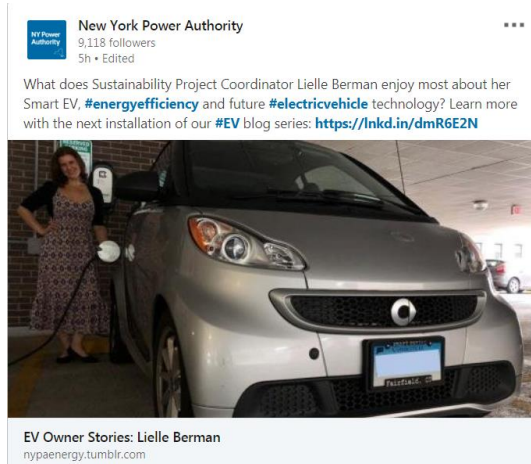
3 – OFFER TEST DRIVES GET MOTORISTS BEHIND THE WHEEL, FOR AS LONG AS POSSIBLE.



The test drive was that was the missing piece of data. It was the missing piece of the jigsaw puzzle. I was fairly confident that it would be good, but I didn't realize how good it was, or was going to be.

-PEV 9 (owner)

4 – USE SOCIAL MEDIA TO SHARE EV USER BUZZ MORE POTENT THAN TARGETED MARKETING.



There are probably hundreds and hundreds of YouTube clips you can watchIf you want to buy just about anything, somebody will have already done that and taken a video of it, and put it on YouTube. It helps a lot.

-PEV 9 (owner)



5 – WALK THE TALK

BUY AN EV. USE IT DAILY. LEARN. TALK ABOUT YOUR DEMONSTRATIONS, PILOTS, TRIALS, ACTIONS – NO MATTER HOW SMALL.

Mitsubishi i-MiEV
2013



Mitsubishi
Outlander PHEV
2015



3kW Solar
2011



DAILY DRIVING EXPERIENCES



Most charging done at home – 240v,
15amp plug

All electric range

50km PHEV + petrol backup

120km EV (100km real world)

20-30km daily average

\$0.70 on fuel daily

\$500 annual servicing

Occasional use of public charging +
car hire

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INVESTMENT INTO THE EV MARKET

- Offshore activity in sustainably focused finance for EVs has been relatively modest compared to other consumer finance sectors, such as solar.
- Light vehicles have not been the focus of global SRI investors.
- Notable transactions include:
 - USD540 million Tesla Auto Lease Trust
 - Toyota Financial Services
 - Zhejiang Geely



WHAT HAS THE CEFC DONE TO DATE?

Aggregation financing programs with banks and financiers

- Operating lease finance structures with Eclix;
- Broker focussed origination for SMEs through partners like Metro Finance, and bank aggregation programs with the major banks;
- A heavily electric vehicle focused program with Macquarie Bank, which has been available for retail and business borrowers;
- A range of other vehicle finance programs aimed at retail channels.



Commonwealth Bank



Macquarie
Leasing



WHAT HAS THE CEFC DONE TO DATE?

Direct finance supporting

Carbon Revolution

Venture capital investment into carbon fibre wheel manufacturing in Victoria.



SEA Electric

A working capital structured venture debt facility for an electric truck assembler.



Reelectrify

Equity investment into new technology to repurpose used batteries from electric vehicles.



Built Environment

Encouraging our partners to look at supportive infrastructure such as end of trip charging facilities.



WHAT DO WE WANT TO SEE?

- Increased commitment to the Australian market from OEMs especially for mass market vehicles.
- Support from all levels of government including both monetary and non-monetary incentives for uptake of EVs.
- Development of investor demand for the asset class to help finance become a pull factor in influencing consumers.
- Continued reduction in the cost of batteries to bring the cost of new EVs in line with ICE vehicles.



QUESTIONS



CEFC

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