Potential Early Adopters of Electric Vehicles in Victoria

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Electric Vehicles
What is an Electric Vehicle?

Electric motor & battery storage – from mild hybrid to 100% electric drive

Immature technology, especially battery storage, but 100 years ago was the dominant car technology

Electricity cheap – storage not

Batteries expensive, heavy & low energy density: getting cheaper, lighter & higher energy density – but long way to go
Electric Vehicles are coming to market ...

... but not here yet

Uni SA
(Concept)

Mitsubishi i MiEV
(2010, $60,000?)

Tesla Roadster
(at market, $120,000+)
Victoria is undertaking Electric Vehicle Trials

Understand how they are used in a real-world setting, 5 years beginning late 2009

First step – who are likely to be early adopters. Also later adopters, supply of vehicles, recharging issues, implications for driving behaviour, etc

Seek industry participation – vehicle providers, electricity companies, recharge infrastructure providers, consumers, etc

Trials NOT to prove electric vehicle technologies
Background

PROTESTING AGAINST NEW TECHNOLOGY - THE EARLY DAYS
Greater Melbourne Travel Demand

Well over 2 million passenger vehicles in Greater Melbourne (just hit 4 million population), radial public transport & road system

Average daily travel <34km (36km weekdays), 30% don’t drive at all on average day

Vehicle fleet averages 10 years

Half of new cars sold to government & commercial fleets - not considered in this study
Methodology

Market development theory:
- Innovative product markets

Overseas evidence:
- Early adopters of hybrid electric vehicles

Early Victorian adopters of hybrid electric vehicles

Potential early Victorian electric vehicle adopters
Market Development theory: “Early Adopters”

Rogers (1962) *technology adoption life cycle*: early adopters around 16 per cent of total market

Moore (1999) refined Rogers’ work: suggests early adopters are a distinct group, with very different drivers for adoption

Early adopters important for a new technology: ‘groundbreakers’ to adopt and spread the word before gains mass-market acceptance
Early evidence: hybrid electric vehicle adopters

Very few electric vehicles on the road now so no current market for EVs – no good data on EV uptake in Australia or overseas

Hybrid electric vehicles closest we’ve got

Similar attributes:
  • New technology
  • Premium price
  • ‘green’ branding/perception
  • Electric drive & battery storage
Overseas Evidence – early hybrid purchasers

Overseas studies (US, Switzerland) - Prius purchasers tend to be:
• Older
• Richer
• Better educated
• More environmentally conscious
• More comfortable with technology

Several hybrids on sale in Victoria, however only have good data for Toyota Prius sales
Prius Registrations, Victoria, 2002 - 2009
Prius Registrations per 10,000 households, Greater Melbourne

Less than 3,500 private Prius registrations (0.1%)
Early EV Adopters

Department of Transport

Victoria The Place To Be
Data

Household data from Australian Bureau of Statistics (ABS) Census. All Australian households every 5 years (last in 2006)

Household information includes income, education, age profiles, internet access, number of vehicles

1,283,000 households in Greater Melbourne

Overseas evidence of hybrid purchasers to predict EV purchase
Methodology

Explanatory variables from electric hybrid purchase decision:

- Households top quartile income (>\$1052/week)
- 1+ person with Bachelor degree or higher
- Broadband internet access (proxy for technology)

But Prius is a hybrid – effectively efficient petrol vehicle – can it proxy for a range limited EV?

- 2+ vehicles in household
Results
Location of Potential Early Adopters, Greater Melbourne

80,000 households (6.2%)

Band in inner east of Melbourne – not much else

Few areas with >25% households
Prius Registrations vs. Potential Early Adopters

![Graph showing Prius registrations per 10,000 households versus potential early adopters as a percentage of households. The graph includes data points for Hobsons Bay, Darebin, Port Phillip, Yarra, and Monash. The data points are plotted on a scatter plot with a trendline indicating a positive correlation.]
## Outliers

<table>
<thead>
<tr>
<th>LGA</th>
<th>Weekly income $1,052+</th>
<th>2+ vehicles</th>
<th>Broadband internet access</th>
<th>Bachelor degree or higher</th>
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<td>48.6%</td>
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</table>
So in conclusion ...

Identified EV early adopters largely east of Melbourne CBD. Some correlation between EV early adopters and Prius registrations, however not inner city areas
- Caution in reading too much into this data

Identified household locations – support development and implementation of EV trials. Installation of refuelling infrastructure in these areas?

Slow hybrid uptake suggests EV market may take some years to maturity
... and need for further work

Understand potential EV markets for different groups in different areas (later market & regional Victoria)

Broader questions around impact of EVs on:

- Driving behaviour
- Refuelling behaviour
- Impacts on electricity demand
- \( \text{CO}_2 \)-e emissions
- Commercial & Government fleets
Thank you!