

# An analysis of consumer incentives in support of electric vehicle uptake: an Australian case study

## Supplementary Information

**Table S1.** Questionnaire 1, question 27.

**27.** Next time you buy a car what, if anything, would ENCOURAGE you to purchase an electric vehicle (only uses main electricity as the energy source for the rechargeable battery). (open response).

Category #	Issue	Number respondents / 330	Percentage % respondents
1	Affordable price /cost of ownership issues	184	56.1
2	Acceptable range/improved battery capacity	85	25.8
3	Improved battery issues (including warranty, longevity, disposal)	17	5.1
4	Shorter recharge time	40	12.1
5	Adequate recharge network	92	27.9
6	Unable to recharge at home/ want recharger on the street near home	21	6.4
7	Concerns about environmental impacts	42	12.7
8	Issues related to EV models e.g. availability, aesthetics, performance, comfort, seats, storage capacity, safety, support services, reliability	64	19.4
9	Unsure, including want more information	9	2.7
10	Other (including already own, will buy next time, want free guaranteed parking)	5	1.5
0	Not interested	9	2.7

**Note:** Many respondents included more than one issue in their response.

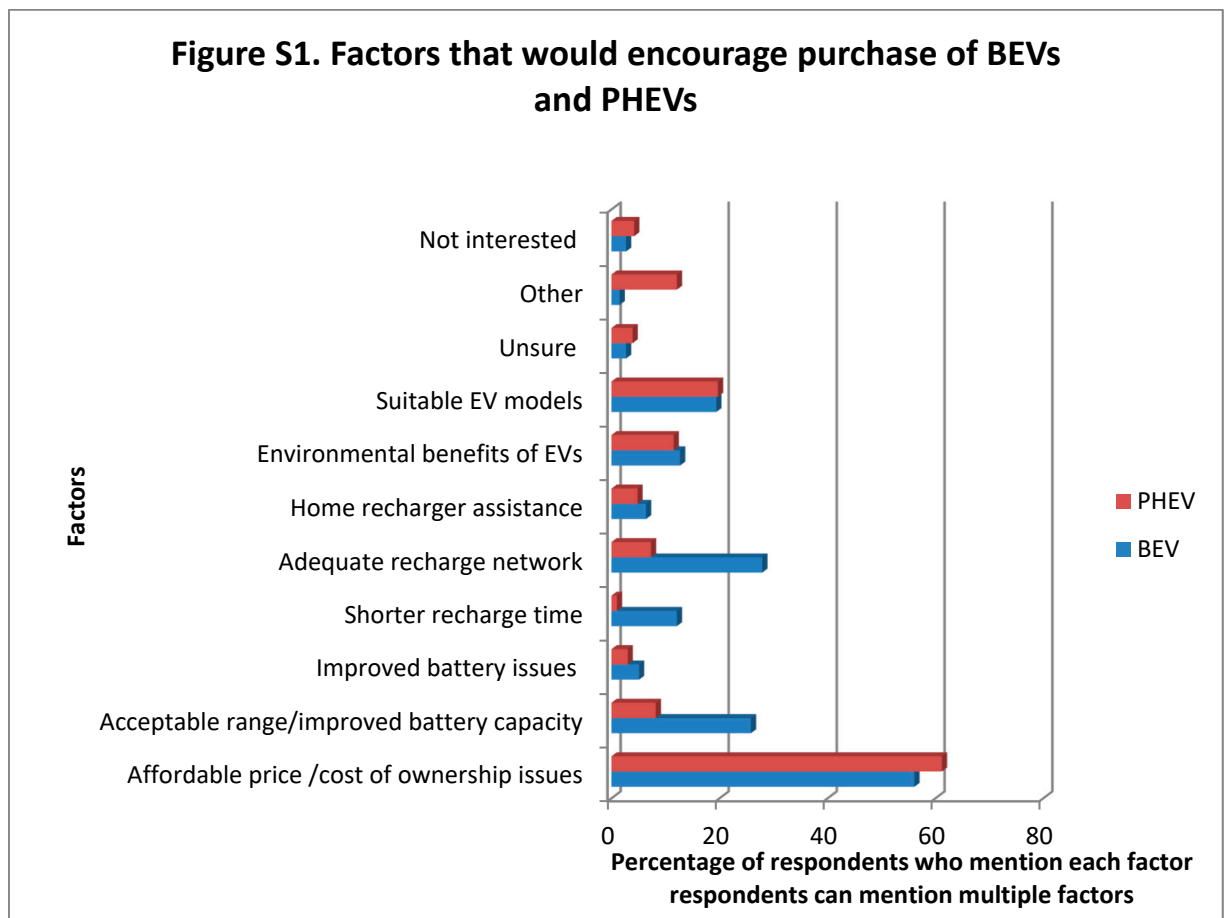
**Table S2.** Questionnaire 1, question 28.

**28.** Next time you buy a car what, if anything, would ENCOURAGE you to purchase a plug in hybrid car. (A plug-in hybrid uses mains electricity to recharge the car battery for the first 50km of a trip then uses petrol/diesel to recharge the battery for up to 800km until the next refuel).

Category #	Issue	Number respondents / 330	Percentage % respondents
1	Affordable price /cost of ownership issues	202	61.2

2	Acceptable range/PHEV is better than fully electric	27	8.2
3	Improved battery issues (including warranty, longevity, disposal)	10	3
4	Shorter recharge time	4	1
5	Adequate recharge network	24	7.3
6	Unable to recharge at home/ want recharger on the street near home	16	4.8
7	Concerns about environmental impacts	38	11.5
8	Issues related to PHEV models e.g. availability, aesthetics, performance, comfort, seats, storage capacity, safety, support services, reliability	65	19.7
9	Unsure, including want more information	13	3.9
10	Other (including already own, will buy next time, want free guaranteed parking)	40	12.1
0	Not interested	14	4.2

Note: Many respondents included more than one issue in their response.



**Table S3.** Questionnaire 1, question 32.

32. What are the TWO main reasons you would NOT choose to buy an *electric vehicle* or *plug-in hybrid electric vehicle* in the next 5 years?

Category #	Issue	Number respondents / 325	Percentage respondents %
1	Price too high	142	43.7
2	Inadequate range	27	8.3
3	Batteries not good enough	2	0.6
4	Excessive recharge time	12	3.7
5	Inadequate recharge network	34	10.5
6	Unable to have home recharger	18	5.5
7	Environmental impact concerns	9	2.8
8	Other	57	17.8
9	Want to buy one	9	2.8
10	Unsure	2	0.6
0	Not interested/not buying within 5 years	14	4.3

**Note:** Many respondents included more than one issue in their response.

**Table S4.** Questionnaire 1, question 35.

35. Please indicate your OPINION about the following statements by selecting the most appropriate response in relation to the purchase of an electric car.

323 people answered this question, and of these: 159 people were in Test Group (information provided), and 162 people were in Control Group (no information provided).

Statement	Unsure	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree	Weighted average on Scale 1-5
Electric vehicles are too expensive to buy compared to similar sized conventional vehicles (petrol/diesel)	8.4%	2.5%	5.3%	24.8%	40.9%	18.3%	3.53
Test	9.4%	2.5%	5.7%	31.5%	39.6%	11.3%	3.25
Control	7.4%	2.5%	4.9%	18.5%	41.4%	25.3%	3.7
A plug-in hybrid would suit my needs better than a fully electric car	6.8%	7.7%	13%	26%	33.4%	13%	3.25
Test	6.9%	6.9%	9.4%	28.3%	34.6%	13.8 %	3.25
Control	6.8%	8.6%	16.7%	24.1%	32.1%	11.7%	3.2
Electric cars look too unconventional to me	5%	45.8%	20.4%	19.5%	6.5%	2.8	2.36

Test	3.8%	41.5%	23.3%	20.8%	=8.2 %	2.5%	2.3
Control	6.2%	50%	17.9%	17.9%	4.9%	3.1%	2.3
The speed and acceleration of electric vehicles is adequate for my needs	12.4%	5%	6.5%	15.8%	30.3%	30%	3.54
Test	10.1%	6.9%	6.9%	15.1%	34.6%	26.4%	3.36
Control	14.8%	3.1%	6.2%	16.7%	25.3%	34%	3.7
I am probably going to move house in the next couple of years	11.2%	30%	10.8%	12.4%	17.3%	18.3%	2.9
Test	10.1%	27.7%	13.2%	13.2%	20.1%	15.7%	2.9
Control	12.4%	32.7%	8%	11.7%	14.8%	20.4%	2.9
It would cost me too much to install a recharger at home	25.4%	13.9%	12.7%	28.2%	14.2%	5.6%	2.48
Test	21.4%	11.3%	13.8%	33.3%	17%	3.1%	2.5
Control	29.6%	16.7%	11.7%	22.8%	11.1%	8%	2.4
The total cost of ownership of an electric vehicle is too high on a per kilometre basis compared to conventional cars	24.2%	15.5%	17.7%	26.9%	11.2%	4.6%	2.39
Test	15.1%	18.2%	24.5%	27.7%	10.7%	3.8%	2.4
Control	32.7%	13%	10.5%	26.5%	11.7%	5.7%	2.3
The distance an electric vehicle can travel on one charge (range) is adequate for my day to day needs	7.7%	7.7%	13%	12.4%	36.8%	22.3%	3.45
Test	4.4%	6.9%	13.8%	12.6%	38.4%	23.9%	3.6
Control	11.1%	8.6= %	12.4%	12.4%	35.2%	20.4%	3.3
I am concerned that I would find it difficult to locate public recharge stations	3.7%	4.3%	5.3%	12.7%	45.8%	28.2%	3.85
Test	2.5%	3.1%	5%	13.2%	51.6%	24.5%	3.85
Control	4.9%	5.6%	5.6%	11.7%	40.1%	32.1%	3.8
I am concerned that when I am driving a	1.2%	2.5%	3.1%	9.3%	35.6%	48.3%	4.24

long distance there are no recharge stations on the way							
Test	0%	1.9%	3.1%	9.4%	41.5%	44%	4.2
Control	2.5%	3.1%	3.1%	8.6%	29.6%	53.1%	4.2
An electric car would take too long to recharge when I am away from home	11.8%	6.8%	12.1%	18.6%	35.9%	14.9%	3.23
Test	6.3%	8.8%	10.7%	20.1%	40.3%	13.8%	3.3
Control	17.3%	4.3%	13.6%	17.3%	31.5%	16.1%	3.1
The lithium batteries are very polluting compared to lead batteries	31.9%	25.4%	13%	21.1%	6.2%	2.5%	2.09
Test	18.2%	37.7%	17%	21.4%	3.8%	1.9%	2.1
Control	45.7%	13%	8.6%	21%	8.6%	3.1%	2

Table S5. Questionnaire 1, question 37.

37. Please briefly explain your response to the previous question.

Category #	Reason	Number respondents/320	Percentage respondents including this reason %
1	Pollution reduction	165	51.6
2	Infrastructure investment	33	10.3
3	Government should provide incentives (including cheaper cars)	20	6.3
4	Government should kick-start the market (including government procurement)	26	8.1
5	It is the future/ EVs are innovative	23	7.2
6	Government should invest in research	12	3.8
7	Other benefits accrue (including reducing oil use, better for economy, reduces noise, better for health, reduce oil dependency)	53	16.6
8	Unsure	28	8.8
9	Other	25	7.8
0	No investment	11	3.4

Note: Many respondents included more than one issue in their response.

**Table S6.** Questionnaire 1, question 38.

38. [Incentives] Imagine the government took actions to encourage ownership of electric cars, how important would each of the following factors be to motivate you to buy an electric car?

315 responses, weighted average response shown for a scale 1-5.

Preferred incentive	WAR	Test (n=157)	Control (n=158)
A subsidy to make the cost of an electric car the same as an equivalent petrol/diesel car	3.6	3.6	3.6
Subsidy to reduce battery replacement cost	3.3	3.2	3.25
Free parking	2.68	2.85	2.6
No annual registration cost	2.97	3	2.9
Free recharger for you to install at home	3.41	3.4	3.25
Public recharge stations available in every town and on highways	4.24	4.2	4.25
Access to transit lanes no matter how many passengers in the car	2.7	2.8	2.75
Higher taxes on diesel/petrol that results in more expensive fuel	2.98	2.85	3.1
A tax deduction available at the end of the financial year in year of electric car purchase	3.24	3.1	3.25
Subsidies that make total cost of ownership of the electric vehicle equivalent to owning a similar sized petrol/diesel vehicle for 10 years	3.5	3.3	3.6
A recharger to install in my block of flats for residents' use	2.96	2.8	3.1
A recharge station available to me at my workplace	3.03	2.9	3.1
A recharge station is located in my residential street with exclusive parking for electric vehicles only	3.05	3	3.1
Reduction in company car tax for electric vehicles	2.88	2.85	2.9

**Table S7.** Questionnaire 2, question 10.

10. Apart from price, what is the *main* factor that would impact on your decision to buy a *fully* electric vehicle? (open response) N= 102 respondents.

Factor	Overall	Female	Male
Range of the vehicle	41%	41%	40%
Availability of recharge stations (adequate network)	26%	33%	20%
Battery issues	1%	0%	1.8%
Environmental factors	9%	11%	7.3%
Recharge time	2%	4%	0 %
Car model features e.g. performance, aesthetics, storage capacity	19%	17%	21.8%
Cost issues e.g. running costs	4%	0%	7.3%
Other	7%	6.5%	7.3%

**Table S8.** Questionnaire 2, question 14.

NB Survey Monkey presented these options in a rolling manner so that, except for Other, each option appeared in different order for different respondents. N=102

14. The governments of countries with the highest uptake of EVs have implemented programs to incentivise EV purchase. Assuming purchase price of EVs is equivalent to similar conventional cars; from the following list of statements please rank, in order of importance, which would have the most influence on your purchasing decision. For this question Survey Monkey will only allow you to select three options, please put the most important as 1.

Government Incentive Program	Most important	Second in importance	Third in importance	Total Number respondents nominating this incentive (n)
Programs enabling free access to high occupancy vehicle transit lanes for EVs regardless of passenger numbers	2	5	12	19
Exclusive parking for EVs in public spaces	1	3	8	12
Programs to develop information to help EV drivers e.g. smartphone app to locate publicly accessible recharging stations, list of car dealerships selling EVs	3	10	3	16
Government support for the roll out of a fast recharger network every 50 km on highways and in country towns	34	20	9	63
Legislation to ensure you can use a credit/debit card to pay for your recharging away from home, rather than requiring paid membership of privately owned recharger networks	10	8	14	32
Programs that buy EVs for government use (procurement) that, (every 3-5 years), will increase the size of the second-hand EV market	4	9	8	21
Government support to install rechargers at hotels, motels and other tourist destinations	2	5	1	8
Government support to install rechargers at shopping centre car parks and other local destinations	7	8	10	25
Where there is no off-street parking, government support to install rechargers on the street in front of private residences, on request of EV owners, with parking exclusively for EVs	10	5	9	24
Government support to install	2	3	5	10

rechargers at workplace carparks				
No annual registration fees for EVs	19	14	10	43
Free parking in public places for EVs	7	12	10	29
Other	1	0	3	4

**Table S9** Concerns about EV uptake by ICEV motorists in selected regions

Region	Characteristics of drivers interested in EV purchase or those who already own an EV	Most important considerations when buying	EV market uptake	Most concerning features as perceived by ICEV owners
Norway	Early adopters are more frequently more affluent younger men with higher education in full time employment, but women are equally motivated to buy an EV. Older people are less likely to own an EV	Access to recharge infrastructure, followed by toll exemptions and bus lane access were the most effective soft incentives offered [1]; 80% of EV buyers found nationally offered subsidies and tax exemptions were critical [2]. Low energy costs of EVs were important [3],	new car sales 2018 BEVs =25.6% and PHEV=15.3% [4]	ICEV owners were 3 times more concerned about EV driving range, access to charging stations and time to charge than EV owners[iii]
UK	Drivers considering EV ownership are more likely to be men than women, those with a higher education rather than no tertiary degree and those younger than 65.	Recharging and vehicle range on one battery charge were more important considerations than vehicle cost to potential buyers. [5]	[iv]new car sales BEV=2% PHEV=5.7%	Range anxiety and access to rechargers [v]
California	EV owners tend to be better educated wealthier males but they are evenly spread across age groups	Reasons to buy an EV included a range of factors with no stand out variable. [6]	9.9% in 2018	ICEV motorists are most concerned about good access to recharge



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				stations, and also model availability, awareness of programs available at city level, and vehicle price [7]
<b>Australia</b>	Australian motorists who are more likely to consider an EV are female, middle aged more affluent and better educated	The availability of a comprehensive recharge network and vehicle price are the most important considerations for ICEV drivers considering an EV	0.12% of new car registrations were EVs in 2017 [8]	A high vehicle purchase price, range anxiety and uncertainty about recharge availability were the most concerning factors

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## End Notes

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<sup>1</sup> (Mersky *et al.*, 2016)

<sup>2</sup> (Bjerkan, Nørbech and Nordtømme, 2016)

<sup>3</sup> (Figenbaum and Kolbenstvedt, 2016)

<sup>4</sup> (European Commission, 2017)

<sup>5</sup> (UK DfT, 2016)

<sup>6</sup> (Car Max, 2017)

<sup>7</sup> (Lutsey *et al.*, 2015)

<sup>8</sup> (Australian Bureau of Statistics, 2018)

## References

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