

Personal story from EV owner

I am a 36-year-old EV early adopter living in regional Tasmania, originally from Sydney. I heard about this inquiry through the Tasmanian Electric Vehicle Association (Tas branch of AEVA).

My partner and I bought an ex-demo Holden Volt as our second car in 2013, for just under \$49,000. It is now our primary car, the other being a 2001 diesel Toyota Landcruiser Prado, which we have for its offroading ability and towbar.

The Holden Volt was a short-lived right-hand-drive version of the Chevrolet Volt, made in Detroit by GM. It is a plugin hybrid (PHEV) with 50-80km of battery-only range, and a hybrid mode using its petrol range extender of ~400km. This means it uses only electricity and burns no fuel on short trips, but can also go anywhere without needing to find a charging station. The battery capacity is about 10kWh, so on off-peak 15c electricity rates, it costs \$1.50 to fill from empty. When running in hybrid mode, it uses 5-6L of fuel per 100km and turns the range extender seamlessly on and off as needed to supply the powertrain.

In addition to being cheap to run, our car is fun to drive, as it accelerates instantly and silently from a standstill, and slows down and reclaims energy back into the battery when the accelerator is released, so is good at winding roads. It also reclaims energy when rolling down hills, which means it stays on the cruise control speed you set it to and saves on brake wear. If sitting in traffic, it doesn't have an idling engine that belches out fumes. When we are forced to drive a borrowed or hired petrol car, we do not enjoy the experience, and will not be buying a petrol car again in the future!

Although we enjoy our Volt, we are hoping to upgrade in the next 12 months or so to one of the upcoming long-range pure battery EVs (BEVs) so we don't have to burn any petrol at all. I would already own a Tesla Model X except that they are way out of our price range. So I have a Tesla Model 3 reservation and we also have our eye on the Hyundai Kona EV. These cars have a vastly simplified powertrain compared to a petrol or diesel car, or even our PHEV, so are reputed to have very low maintenance costs and long life.

The latest BEVs' range of 400-500km is almost go-anywhere, but for long trips it does require a network of fast-charge stations, much as you couldn't have a fleet of petrol cars with no petrol stations. Tesla, of course, has its own supercharger network currently covering Brisbane to Adelaide via Sydney/Canberra/Melbourne and a couple in WA. The Queensland government has opened a route of public chargers up to Cairns, the RAC built one in southern WA, and AEVA and Tesla Owners Club have been all around the country finding and installing three-phase sockets at strategic points.

But there is still more to fill in and Tassie is hopefully getting some soon, as we live ~160km from Launceston and ~250km from Hobart,

so if we go to town and back in a single day, we will need a charge for the home trip even in the longest range BEV.

My major motivation in owning an EV is actually to reduce my contribution to greenhouse gas emissions, and the fun-to-drive is just a nice side effect. I have been worried about the federal government's irresponsible head-in-the-sand approach to climate change since the disgraceful "axing of the carbon tax". I spend a lot of time online keeping track of the progress of the upcoming BEVs and consoling myself with videos of gigantic offshore wind turbines and stories of large Tesla battery installations. So you could argue that a social benefit of wider EV adoption would be a reduction in stress levels for people like me!

When we bought our Volt, pretty much the only other EVs available were the short-range Nissan Leaf and Mitsubishi i-MiEV. The Tesla Model S arrived perhaps a year after that. So nobody except extremely resourceful early adopters would buy the more affordable BEVs, and the average person would scoff at our willingness to spend \$50,000 on our car, which is essentially an electric Cruze with four seats.

The advent of the \$100,000+ Tesla S and X should hopefully make the next generation of long-range BEVs look like bargains but they will likely still cost in excess of \$45,000, so there is the danger of non-enthusiasts still turning up their noses. Countries which have high rates of EV adoption have implemented incentives such as cashback on purchase, credits on tax paid, or cheaper/free registration and other driving perks. Private companies like AGL are also adding incentives such as cheaper electricity rates for car charging. An easy first incentive for Aus would be to remove the luxury car tax on electric vehicles.

The other point, of course, is that if there is a drive to convert the national vehicle fleet to electric faster and get rid of the most polluting passenger vehicles, there need to be more models available to buy new so that more will arrive on the second-hand market for people who can't afford a new car. We wanted an electric car badly enough in 2013 to pay near-new price, but we wouldn't have if second-hand models were widely available. It is possible to convert an existing petrol or diesel car to electric, but they tend not to get very good range, and the chassis is not designed to carry the batteries in a convenient location. There are some occupations where conversions are useful, such as the recent Voltra Landcruiser conversion for driving into mines, and companies like this should be encouraged.

Regarding availability of electric models, while I can see options in the near future to replace our small car, a replacement for our stinky old Landcruiser is still some way off. There is a small company called Bollinger Motors in the US that has designed a bare-bones 4x4 that will be available in right-hand drive. Tesla is making a "truck" (ie. ridiculous giant American ute), but it's still on the drawing board. Ford or GM might maybe do something if they

get their acts together, but they'd rather keep flogging petrol/diesel until it becomes actually illegal. So this is a potential area Australia could work on - building our own four-wheel drive work/adventure vehicles instead of importing them.

Some further points and summary:

In online "why do you want an EV?" surveys, a lot of American and international respondents' primary motivation is not that they are save-the-planet hippies, but that they like the performance of Teslas, the cool technology, the saving money on fuel, the made-in-America and the national security benefits of not relying on "Middle East oil" for transportation. The fuel security one could be of particular interest to Australia.

Economic benefits:

- * Electricity is cheaper for consumers than petrol/diesel and electric vehicles are more efficient, so drivers get more go for their dollar.
- * Electricity is generated domestically, does not require long, expensive international supply chains with potential national security concerns.
- * Electric cars have fewer moving parts and are therefore likely to cost their owners much less in maintenance as well as fuel costs. Electric service vehicles, eg. buses, garbage trucks, should break down less often, thus saving local councils, etc.
- * Many European countries are recognising that the petrol/diesel emissions other than CO2 are harmful to human health - the elimination of these may eventually lead to reduced health costs for the country.

Social:

- * Electric cars and trucks are quiet and make less noise pollution.
- * They are fun to drive, and some have semi-autonomous features that make sitting in traffic less stressful.
- * One of Tesla's upcoming Semi truck's promoted features is jack-knifing prevention, facilitated by its four separate motors. Safer trucks will obviously benefit other road users.
- * For people who have been worrying about climate change, to see the national vehicle fleet being replaced by electric may lead to relief that something is being done.

Environmental:

- * Australia needs to play its part in greenhouse gas emission reduction.
- * Electric cars run on electricity, which can be generated by burning coal or gas, or from solar/wind/hydro etc. Once generated, it is transmitted through wires. ICE cars not only inefficiently burn petrol or diesel to move themselves, but more fuel is burned in the ships and trucks that transport the fuel, and to mine and refine that fuel in the first place.

- * Any vehicle used for a task that involves a lot of stop and start or extended periods of idling should be electric, eg. buses, garbage trucks, police cars.

Opportunities:

- * Recent reports that WA has all the raw materials necessary for batteries - <https://www.smh.com.au/business/the-economy/jobs-and-billions-on-the-table-if-wa-gets-lithium-valley-right-20180716-p4zrsk.html>
- * Toyota and Holden plants should be reopened as EV manufacturers and re-employ the workers. Locally-built cars without import costs would be more affordable for consumers.
- * BP in the UK has recently purchased an electric vehicle charging company. Our petrol station companies here should also start adding fast chargers to their sites. Good PR for them as they transition.

Measures to support uptake:

- * The lack of any government support for electric vehicle uptake thus far has meant very few manufacturers have bothered to import their models to Australia, and when they do come, they are very expensive.
- * People will buy electric vehicles if they have price parity with ICE models, because the fuel savings then immediately begin.
- * Countries which offer incentives for their citizens to purchase electric vehicles, such as Norway, which exempts buyers from purchase and ongoing taxes, and Ontario in Canada, which until recently had an up-to \$14,000 rebate see very high levels of EV uptake, but this can eventually lead to a political backlash. If the new electric vehicles start to inconvenience other drivers by, eg. causing holdups in transit lanes or leading to an increase in registration costs, this can be an issue.
- * Charging stations - the other factor that prevents electric vehicle purchase is range anxiety. There is no range anxiety for ICE cars because petrol stations are everywhere. 150kW-plus fast-chargers also need to be everywhere too, for people travelling around. These also need to be standardised so you can just pay for them with a credit card. In the UK there are stories of people with multiple membership cards in their wallets for each charge supplier.
- * Regarding slower 240V connections for cars that will be parked for longer periods, while it is often said that electric car owners will "just charge at home", consideration needs to be given to people living in unit complexes rather than houses, and for those who might "charge at work", not every business has its own carpark for its employees.
- * Do some kind of deal with power companies for very cheap electricity for EV owners, then can sell the "total cost of ownership" as being less than an ICE in spite of a higher purchase price?

Attracting EV manufacturing:

- * Anyone who wants to build a Tesla-style gigafactory in WA near the mining resources should be encouraged. This will reduce the costs of batteries for drivetrains.
- * Large-scale automotive manufacturing perhaps a problem competing with overseas due to high wages.
- * Any companies that remain in Oz producing vehicles in smaller volumes (trucks, buses, ATVs, motorbikes?) should be assisted/rewarded to go electric.

Government:

- * The federal government needs to stop with its ludicrous anti-renewable energy agenda that has been going on ever since Tony Abbott axed the carbon tax. Even the USA has federal incentives for electric vehicles. It is time we stopped embarrassing ourselves.
- * Whatever incentive for consumers is put in place, make it reasonably standardised across the country, or you'll get situations like NSW residents going to Qld to buy caravans because the rego costs were way cheaper
- * Do not put roadblocks in front of companies like Tesla who have stepped in to start building charging networks etc. while government twiddled its thumbs. eg. in the US some states won't let Tesla sell cars from their stores, to protect other auto dealerships.

Other:

- * Watercraft. Ferries that go back and forth between the same short routes should also be electric, with chargers at the wharves. Again, countries like Norway are moving on this.
- * In building infrastructure for electric vehicles, it is worth considering the predicted arrival of the self-driving car - many people will choose not to own a vehicle but just summon one when necessary. Will these cars have a home base that they return to, will they be owned by private individuals who lease them out while they are at work for the day? Presumably any location a human can park a car in, a car can park itself in, but chargers may need some kind of modification so the car can plug itself in (eg. wireless floor panels, Tesla's weird experimental snake charger).