Six EV myths debunked!

Bryce Gaton unpacks six commonly held beliefs about electric vehicles, and tells us why they are quite simply not true.

1906 Columbia Mark 68 Victoria EV. Image: Getty: Corbis/Hall of Electrical History Foundation.

With any technology transition come the doubters. Whilst it's hard to track down actual quotes from the time, I am sure at the end of the 19th century things like "the horseless carriage will never catch on" or "can a horseless carriage plough a field?" were being said with conviction.

Fast forward to the 21st Century and it seems some things never change. Only a couple of years ago we were subject to public figures making statements like "EVs will ruin the long-weekend" or that setting EV sales targets was tantamount to "stealing the tradie's ute".

Generally, I don't waste much time debunking EV myths: I am too busy in my consulting work preparing government, business and the public for the reality of what is now an inevitable technology transition. However, I thought I would share some of the more common myth-conceptions and the reality behind them to provide you with some summer reading amusement—plus give you something to stop these hoary chestnuts in their tracks should they show up in your social circles (be they online or at your next summer BBQ).

1. EVs are a flash-in-the-pan

Rather than being a recent innovation, EVs were there right at the beginning of the "horseless carriage" era.

By the start of the 20th century, new car sales were (roughly) evenly split between electric, petrol and steam. Back then though, electric supplies were limited to a few of the biggest cities in the world—and two-gallon tins of petrol were easy to pack and transport.

It is easy to see how, with the Model T Ford, the internal combustion engine (ICE) car came to dominate. Mind you, the EV didn't disappear, it just retreated into the shadows and quietly evolved. I can remember as a young child in the 1960s listening in bed to the quiet early-morning hum of electric milk-delivery vans. And don't forget, there are a couple of 1970s EVs still sitting up on the moon!

A corollary of this myth is that EVs would never take off—but the reality is that the genie is already out of the bottle. Worldwide, EV sales reached over 8% last year, and are projected to reach 12% to 13% by the end of 2022.

Even in Australia, EV car sales have gone from 0.6% of total new cars sales in 2020 to the "dizzying" heights of a projected 2.7% by the end of 2022. Given the EV sales trajectory elsewhere—plus manufacturers' planned end of ICE manufacture dates—the future is now an inevitably electric one.

2. EVs are more polluting overall than ICE vehicles

In fact, almost everywhere around the world, EVs charged solely from grid power already produce fewer greenhouse gas emissions than equivalent petrol or diesel (ICE) vehicles.

The confusion comes if people try directly comparing new car petrol/diesel windscreen-sticker CO_2 emission numbers to EV electricity-use emissions numbers. This is not an apples-with-apples comparison.

The petrol/diesel windscreen stickers only show the direct emissions from the fuel burnt. They do not include the emissions due to extracting, refining, transporting and delivering that fuel to the car. Electricity emissions data includes these downstream grid emissions—meaning comparing the two is not a true well-to-wheel comparison of EV to ICE. Figure

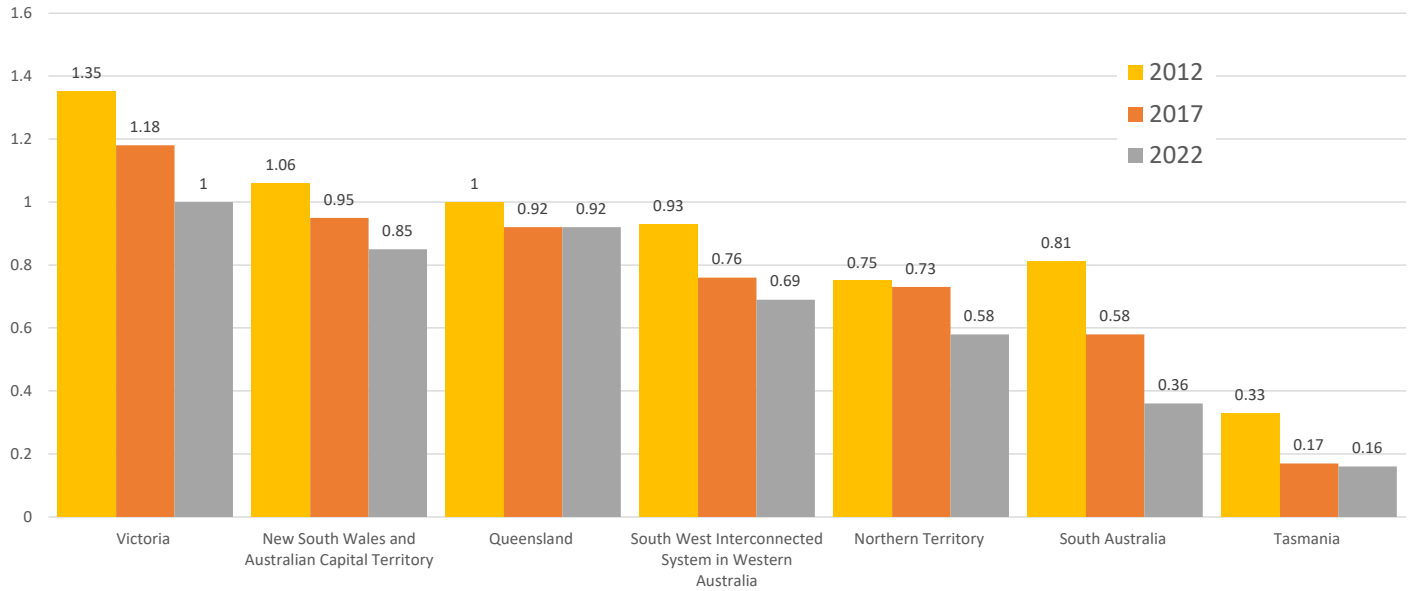


Figure 2: Full CO_2-e in kilograms per kilowatt-hour for each state and territory over the last 10 years.

Note: data correct as of time of writing. The department does make retrospective amendments to the NGA tables, therefore the historical data given in the 2021 tables differs slightly to this graph.

1 does give that comparison. The data is from the Australian National Greenhouse Accounting Factors (produced annually by the Department of Industry, Science and Resources) and the calculations were made using the carbon-emissions accounting methodology specified in that document.

3. Over the lifetime of an EV, manufacturing an electric car consumes more energy than internal combustion engine vehicles

In the US, a Union of Concerned Scientists report concluded that it would take only six to 16 months' of average driving to pay back an EV's manufacturing emissions. In Europe, the figure given by the International Council on Clean Transport is around two years. This difference is due to European drivers doing fewer kilometres per year than US ones.

Manufacturers are also doing their part. A typical example is Volvo, who recently announced they are to sell only fully-electric cars in Australia by 2026. (Volvo internationally have set the ICE end date as 2030). Volvo is also working towards having their full manufacturing process driven by renewable energy by 2035, meaning there will effectively be no 'payback' period for its EVs.

4. EVs will never replace the diesel ute

When you look back at any historical transition, it seems almost instantaneous—but if you're in the middle of one it can seem torturously slow. Realistically, whilst we have come a long way since the first Nissan Leafs and Mitsubishi iMiEVs of 2010, at less than 3% of new car sales in Australia, we are still not far into it.

Mind-you, even now we have around 32 BEV models for sale here—but these are limited to the major passenger vehicle types, with only a couple of light commercial vehicle (LCV) offerings. This means that not all segments of the vehicle market are currently well served (if at all) by EV models, but this is changing fast.

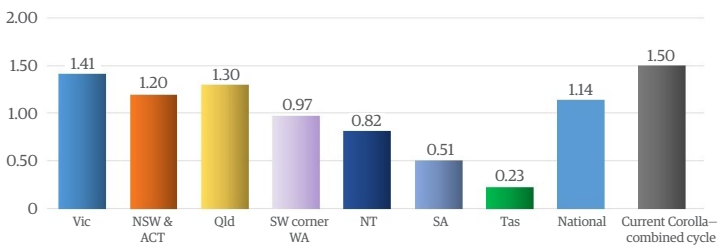


Figure 1: 2022 EV use emissions on Australian state/territory grids.

Full CO_2-e comparison: tonnes CO_2-e per 10,000 km (using the 2021 Australian National Greenhouse Accounting Factors). Current model Hyundai Kona electric—direct and indirect CO_2-e emissions per state, versus equivalent CO_2-e from city and combined cycles for current and 2012 Toyota Corolla models.

BEV passenger car make/model	Tow rating in kg unbraked/braked	Available now? Or ETA[a]?
Audi e-tron 50	750/1800	Y
Audi e-tron 55	750/1800	Y
BMW i4 eDrive40	750/1600	Y
BMW xDrive40	750/2500	Y
BMW xDrive50	750/2500	Y
Hyundai Ioniq 5	750/1600	Y
Jaguar I-Pace	750/750	Y
Kia e-Niro (2022 update)	300/750	Y
Kia EV6 4WD, long range	750/1800	Y
MG ZS EV 2022 update	500/500	Y
Renault e-tech Megane	TBC: 750/900	H2 2023
Tesla Model 3 Long Range	750/910	Y
Tesla Model 3 SR+	750/910	Y
Tesla Model X Long Range	750/2250	Q4 2023
Tesla Model Y Long Range	TBC: 750/1600	Y
Volvo C40 Recharge	750/1800	Y
Volvo XC40 Recharge	750/1500	Y
BEV LCV[b] make/model		
EV Auto EC11 1.79T van	750/TBC	Y
LDV eDeliver 9	TBC: 750/1500	Q4 2022
Renault Kangoo ZE van	322/322	Y
BEV ute make/model		
LDV eT60	TBC/1500	Q4 2022
Rivian R1T	TBC/5000	2024?
Ford 150 Lightning	TBC/4500	N
GMC Hummer electric	TBC/3400	N

Table 1. BEVs due in the next two years.

Notes to table:

a. ETA = estimated time of arrival
Q=quarter. Q1=Jan-Mar; Q2=Apr-Jun; Q3=July-Sept; Q4=Oct-Dec. H1=Jan-Jun; H2=Jul-Dec.
N=manufacturer not currently planning to bring model to Australia

b. LCV = Light Commercial Vehicle

Source: aeva.asn.au/battery-electric-vehicle-models-bevs © B Gaton

The next segment to see an influx of electric options will be the LCV market. In fact, 2023 is likely to be the "Year of the LCV", with nine or more LCVs under 4.5t arriving, including the LDV eT60 dual-cab ute!

Following LCVs will be the 4WD EV (dual-cab and SUV styles). These are already being manufactured overseas, with six models available in the US. (These include the Rivian R1T dual-cab ute and R1S SUV, Ford F150 Lightning, GMC Hummer dual-cab ute and SUV and the Chevrolet Silverado). All of them have long waiting lists, so we are unlikely to see any till perhaps 2025, but they are coming.

5. BEVs can't tow

The reality is that the electric motor is perfect for towing: maximum torque for an electric motor happens at zero revs! As a result, BEVs generally make good tow vehicles and have many towing advantages over ICE vehicles.

Unfortunately, manufacturers in the past simply weren't bothering to rate many BEVs for towing—but this is changing. Many of the coming crop of EV cars, utes and SUVs will come with class-leading tow ratings. Table 1 shows the current (and soon to come) BEVs available in Australia that are rated for towing, along with their tow ratings.

6. The grid cannot support electric vehicle charging and the real answer is hydrogen

Studies from around the world show that (in general) grids will comfortably cope as EV uptake grows. Plus, given the vehicle fleet simply cannot transition to 100% EVs overnight, with proper planning any local area changes to the grid and its management can easily be put in place well before they might be needed.

This is especially true when EVs can be selectively "demand managed" to charge at slower rates over a longer length of time or during selected times. Using this scenario, it has been suggested that a full EV fleet would add around 10% to overall electricity demand. In fact, many supply authorities around the world have stated that they are ready and able to absorb EV demand as it grows and are planning for additions and changes to the system as and when they are needed.

On the other hand, fuel cell EVs (FCEVs or "hydrogen cars") use three to five times as much electricity to create the hydrogen, transport it to the delivery point and move the car as it does to directly charge a BEV to cover the same distance. This means that a 100% hydrogen car economy would need three to five times the electricity generation capacity for transport energy as a BEV transport economy.

Without a much larger, fully renewable electricity grid, FCEVs definitely would place a strain on existing electricity infrastructure as well as significantly increase the carbon emissions from electricity generation.

To sum up

EV myths come and go, and the topical ones evolve. Ten years ago, I was answering quite different questions (like "are EVs safe to drive in the rain?"). Nowadays, well—my six myths above are a sample. But these are not the things delaying Australia's EV transition. In reality, government policy is the major hold-up. Overseas, governments offer both carrots and sticks to drive manufacturers to build, sell and help people to choose vehicles that don't pollute the local environment or contribute to the greenhouse effect.

Here in Australia, we have no national fleet greenhouse-gas emission limits. We also have the poorest vehicle-emissions and fuel-quality standards in the OECD. These are federal responsibilities that cannot be replaced by state/territory actions.

As a result, in place of the previous federal inaction, the states and territories used what powers they do have to implement local EV support policies and incentives. Unfortunately, without those federal policy drivers, the result has been piecemeal support measures that at times have been inconsistent to the point of counterproductive (think Victorian EV Road User Charge or the varying state/territory EV subsidy criteria).

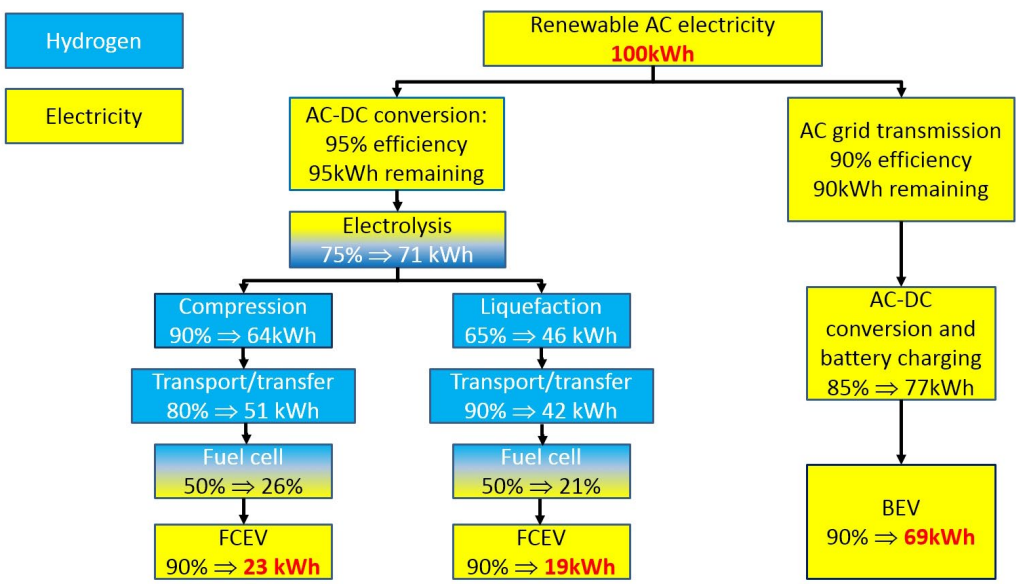
This has resulted in the perverse outcome of effectively creating multiple Australian EV car markets. That, in combination with no federally mandated fuel-emission standards (which need to include carrots and sticks), makes it all but impossible for manufacturers to select models and bring them here in numbers that make the effort worthwhile—let alone not getting the incentives (or fines) happening in their home markets.

What we need in Australia now is a focus on the facts and to push our politicians to use these to support the adoption of cleaner transport as part of our overall transition to non-polluting energy sources.

AUTHOR:

Bryce Gaton

Bryce is a member of the Melbourne branch of Renew and works as an EV transition consultant through his business EV Choice, as well as being an EV writer for TheDriven.



"Does a Hydrogen Economy Make Sense?" Proceedings of the IEEE. Vol. 94, No. 10, October 2006