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COMMENT NATIONAL OPINION

Stand by, Australia, for the electric car revolution

By **Josh Frydenberg**
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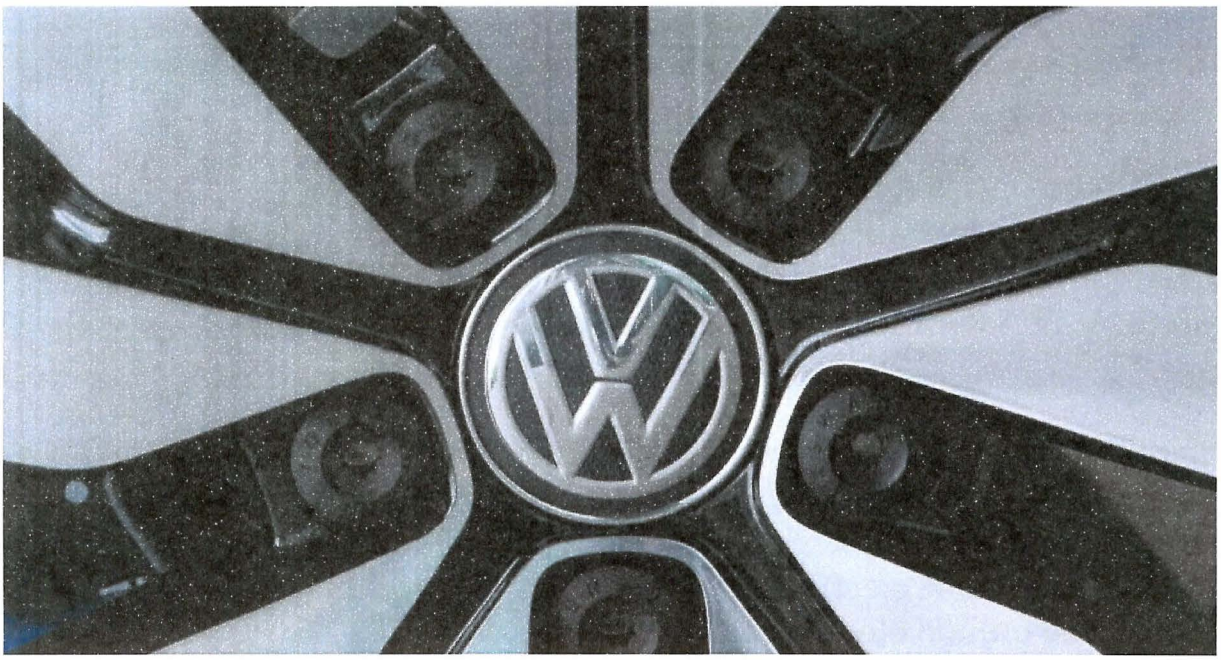
We live in the decade of disruption. Technology is transforming our lives at a rapid rate with no sector immune from its impact.

In communications it's the iPhone, in data management it's the cloud and in energy it's renewables and storage.

In each case, Australians have been among the early adopters. But there is another area of exciting technological disruption with real economic and environmental benefits that is yet to really take off here at home. Electric vehicles.

Capitalising on a declining cost curve, new investments in recharging infrastructure and significant improvements in battery capacity, the industry has now real momentum in Europe, Asia and North America, which will inevitably be replicated here.



Volkswagen, the world's biggest car maker, is targeting three million electric vehicle sales per year by 2025. JENS MEYER

The numbers are illustrative. Today, there are two million electric vehicles on the road around the world, a tenfold increase over the last five years and these cars represent around one per cent of new annual vehicle sales.

Two thirds of electric vehicles can be found in just three countries: the United States, Japan and China, which has the greatest number at over 650,000.

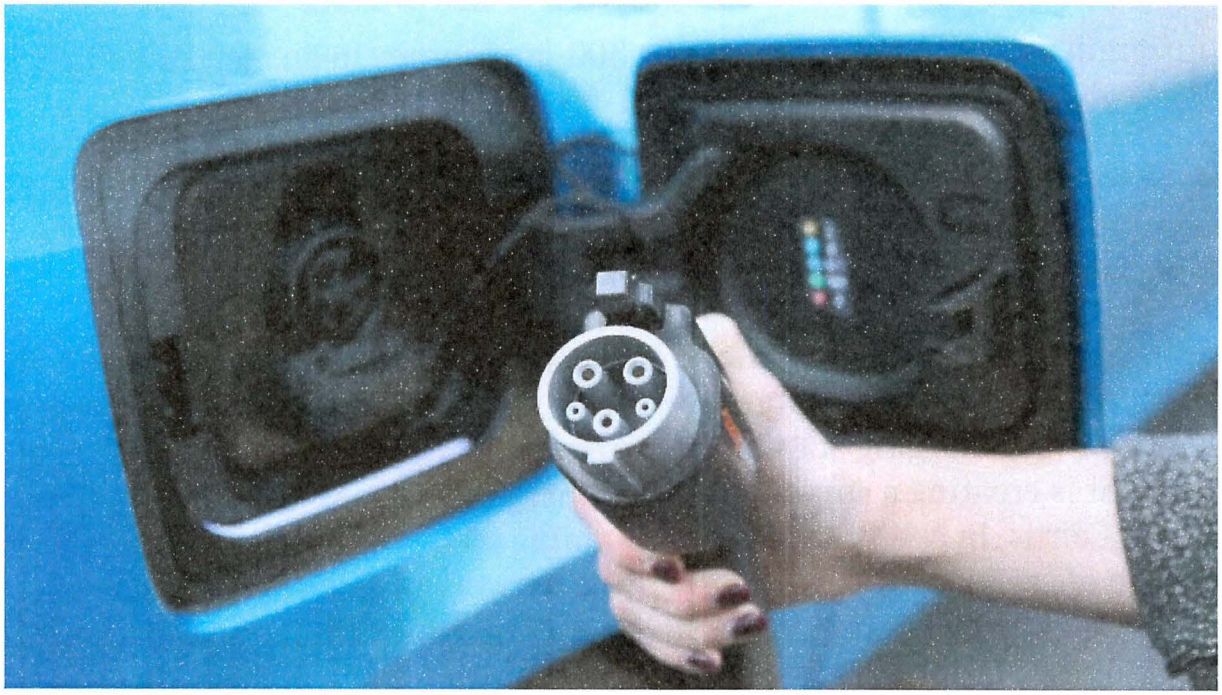
While Norway and the Netherlands have smaller markets, they have an incredible penetration rate, with electric vehicles in Norway making up more than 20 percent of new sales.

But it is the projections that are staggering. China is the largest vehicle market in the world with 25 million annual vehicle sales, with an expectation that electric vehicles will make up 10 per cent of new sales by 2025 and 30 per cent by 2030.

The charge point at BMW in Mulgrave for The BMW i3 electric car. PAT SCALA

France and the United Kingdom have announced that they will end the sale of new diesel and petrol cars by 2040 and Norway and the Netherlands aim to do so by 2025. California has mandated that there be 1.5 million zero emission vehicles in that state by 2025 with already five times as many electric vehicle sales as the US average.

Car manufacturers are also on board. Volvo has said that it will only build hybrid and electric vehicles from 2019, General Motors has announced that they have 20 new electric models under design, Jaguar and Land Rover say all their new model lines from 2020 will be electric and Volkswagen, the world's biggest car maker, is targeting three million electric vehicle sales per year by 2025.



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But in Australia, the emergence of electric vehicles is a different story. Currently, there are 4000 such vehicles on the road, making up just 0.1 per cent of new vehicle sales. Indeed, New Zealand, which is one-fifth of the population of Australia, has already similar number of electric vehicles on its roads.

The lack of take-up is not because of a lack of consumer interest. Australian surveys show that about half the people in the market for a new car are prepared to consider purchasing an electric vehicle with many investigating it. But what holds them back are issues relating to price, range and infrastructure. But on each count, there are good things happening, with more to be come.

On price, of the 16 electric vehicle models on sale in Australia, 13 are over $60,000. But the next generation Tesla for example, will sell for less than half the cost of existing models and the convergence in price is on the way. Bloomberg Energy Finance estimates that electric and conventional vehicles will be of a similar price by 2025.

With the purchase of more electric vehicles as part of company and government fleets and fleet cars being turned over on average every 3-5 years, the range of second-hand electric vehicles is also likely to increase exponentially.

With regards to range and recharging, the Chevrolet and Renault models already travel around 350 kilometres without needing to be recharged and using the increasingly prominent DC recharging stations, an electric vehicle can be recharged in less than 30 minutes. Indeed, it's the view of Australia's Chief Scientist that by 2025 there might be electric vehicles in production that can drive 1000 kilometres on a single charge. This will be remarkable.

Not insignificantly too the fuel cost of a 300-km journey in an electric vehicle is currently about a third of that of a petrol-fuelled car.

The technology around batteries is also improving rapidly. The density of batteries has nearly doubled on average every five years and the price has halved in the same period.

The infrastructure of electric vehicles is also rapidly becoming more feasible for long distance journeys. In Western Australia, the Royal Automobile Club recently rolled out 11 fast charging stations in the south-west, in Queensland the state government is creating a superhighway of charging stations between the Gold Coast and Cairns, in NSW the NRMA is building 40 fast charging stations suitable for a range of car types and Tesla has built a network of fast-charging stations between Adelaide and Melbourne, Sydney and Brisbane. While Australia's 476 public charging stations are just a fraction of the more than 60,000 you can find across Europe, it will quickly grow over time.

With these changes coming to the cost, range and infrastructure for electric vehicles in Australia, it is estimated that by 2025 there will be 230,000 such cars on our roads and more than one million by 2030. This will not only produce a good economic dividend for consumers, but also a better environmental outcome.

With transport responsible for around 18 per cent of Australia's emissions, the CSIRO Energy Roadmap estimates electric vehicles could reduce CO2 emissions by at least 15 million tonnes by 2030.

One of the challenges that will come from the big increase in electric vehicles in Australia will be the demands on the electricity grid. An extra one million electric cars is the equivalent of 5.2 terawatt hours of power demand. This is about a 2 per cent increase in overall grid demand.

The issue is not whether the grid has capacity to meet this increased demand, for it does. The Finkel Review found electric vehicle charging can be 'relatively easily managed' and AEMO has said something similar. The question rather is whether with sufficient system planning the new demand can be scheduled to come at off peak times to maximise the efficient utilisation of the grid. With 90 per cent of electric vehicles likely to be charged at home, the technology needs to be such that electric vehicle owners have the systems in place to charge their battery in the middle of the night when prices are low and not at the 5pm to 6pm time slot after work when prices are typically higher, reflecting increased household demand.

So, what are the next steps for the electric vehicle industry in Australia? Well firstly, there is a lot of activity already occurring at federal, state and industry level, but there is a need for greater coordination. This is where the Turnbull Government's Vehicle Emissions Forum, which my colleague Paul Fletcher and I lead, can play an important role. Working on new vehicle emission and fuel

efficiency standards it can provide a national platform for key stakeholders to share ideas and work together.

At a federal level, we already support electric vehicles in a number of ways. The government provides a discount on the luxury car tax threshold for low emission vehicles; companies can earn carbon credit units under the Emissions Reduction Fund to transition their fleets to electric vehicles; the Clean Energy Finance Corporation is funding a number of programs that enable the purchase of electric vehicles and the Australian Renewable Energy Agency has provided financial support for research by ClimateWorks which has partnered with the Electric Vehicle Council, the national body representing the industry in Australia.

At a state level, governments have responsibility for vehicle registration, stamp duty, government purchasing and are undertaking new charging infrastructure roll-outs. All important areas for reducing the costs for electric vehicle customers and thereby incentivising their uptake.

Better coordination of existing and future activities around research and development, charging infrastructure planning, vehicle fleet targets and financial incentives, will bode well for the industry in the exciting decade ahead.

A global revolution in electric vehicles is under way and with the right preparation, planning and policies, Australian consumers are set to be the big beneficiaries.

Josh Frydenberg is the Minister for the Environment and Energy.