

DRIVE



LIVING THE ELECTRIC DREAM

How everyday Australians are flicking the switch to drive electric

DRIVE
.com.au

Prepare to make the electric dream real

James Ward

"By failing to prepare, you are preparing to fail."

This timeless quote, attributed to famed American statesman Benjamin Franklin, has adorned coffee mugs, inspiration posters and desk calendars for decades, and feels particularly relevant when talking about the world of electric vehicles.

As we've often noted, Australia presents a unique landscape for EVs. In fact, if you look at our cover image, the country presents three unique landscapes, each with its own challenges.

But regardless of whether you need to manage rural, suburban or high-density living on your road to the future, preparation and planning are crucial because with planning in hand, the rest is quite easy.

Yes, you read that correctly. Electric car ownership can be easy.

Mind you, that doesn't mean there is a solution for everyone yet. If you need to tow or travel long distances regularly, the technology isn't quite there. But, if you are part of the 86 per cent of the Australian population that lives in an urban area and travel less than 100 kilometres a day, then it can work if you want it to.

And it can be easy if you put your mind to it.

For starters, the cars are good. No matter where in the market



Charging infrastructure is expanding and improving all the time - the system is catching up to levels of demand.

you are shopping, the electric cars we have available in Australia offer a great introduction to this exciting new era of motoring. There are now four models priced lower than \$50,000 and we're edging ever closer to slipping under that \$40,000 mark, which is a huge step forward.

Remember that these are the same cars offered everywhere else in the world so when you hear of

some countries managing the transition better than we do, it's not a factor of the cars, it's entirely about the infrastructure. And this is where planning comes in.

We've spoken to some everyday electric car owners from each of Australia's three "living pillars" - suburban, regional and high-density - to understand how and why they have taken the steps to drive electric.

Only two of our owners can charge at home, our high-density apartment-dwelling owner needing to use the public charging network. And, while it's still far behind, even this can be easy - with planning.

However the best part is, it's going to get even easier.

Every month we see more electric models going on sale. The newer cars often promise longer

range, greater efficiency and hopefully lower prices. Charging infrastructure is expanding and improving all the time - the system is catching up to levels of demand.

We're not there yet, and a change to electric doesn't suit everyone, but if you like the idea of silent motoring and can manage some simple planning, then living the electric dream may just be easier than you think.

The plug-in hybrid has its benefits

James Ward

Of the three types of electrified cars on our roads, plug-in hybrid electric vehicles (PHEVs) tend to get a bit of a raw deal.

Closed-loop hybrids like the Toyota RAV4 or full-electric cars like the Tesla Model Y tend to take all the glory, particularly in terms of sales. To date this year, PHEVs account for just 10 per cent of either hybrid or full-electric sales, a mere 0.6 per cent of the overall new car market.

The argument against them is that a PHEV is neither here nor there.

We get it, it's a hard sell. You have a car with a traditional petrol drivetrain, often with a lower-powered engine, carting around a battery pack and electric motor, all for more money than you'd likely ever spend on petrol. It's not the easiest pitch.

But if you, like many Australians, generally travel less than 50 kilometres a day but occasionally head a little further afield, then the "neither here nor there" angle becomes a "best of both worlds" one.

The majority of models can travel at least 50 kilometres on a single charge and the smaller batteries mean a PHEV can be easily charged on a regular household socket. Plug it in during the day when it's parked at the office, or plug it in at night when it's parked at home, and you've got a full-electric commuter that uses zero fuel during the week.

Better yet, when you need to visit family in the country on a weekend, or head interstate or even tow something, and you've got a petrol engine that can support all of this. Plus, when you're using the car in this manner, the car's petrol engine is operating at its most optimal level.

Get to your destination, plug it in again, and the cycle starts over.

A car like the seven-seat Mitsubishi Outlander PHEV even offers vehicle-to-load functionality like we've seen on full-electric cars, making it a true best of all worlds solution.



For many Australians, the 'neither here nor there' angle becomes a 'best of both worlds' one.

The trick to it all is to plug it in. It's in the name, after all.

Most PHEVs use slow onboard chargers (the Volvo XC60 and Peugeot 3008 for example can only charge up to 3.7kW), making public EV infrastructure almost pointless. If you can find a

The Mitsubishi Outlander and Eclipse Cross plug-in hybrid electric vehicles (top), and the Volvo XC60.

domestic socket, you've got a very flexible and cost-effective charging network already in place.

Where a PHEV may not have the "clean sheet" appeal of a full EV, or the set-and-forget benefit of a closed-loop hybrid, there are plenty of benefits and scenarios

where a plug-in hybrid may just be your best solution.

It comes down to one thing, and for that I will use the catchy hook from UK electronics icons Basement Jaxx as a mantra. Simply, "Plug it in, plug it in, baby ..."

IONIQ 6

More than a car.
A blueprint for tomorrow.



Imagine that

HYUNDAI

Sales continue to surge with Tesla leading the pack

Rob Margett

Australians bought more electric cars in 2022 than ever before. That's according to new car sales data issued by the Federal Chamber of Automotive Industries.

Electric cars accounted for 33,410 new car sales last year, with a further 5937 plug-in hybrid vehicles finding new homes.

And if you're wondering why you're seeing more and more Teslas on our roads, it shouldn't come as a surprise that the American EV car maker has the top two selling vehicles in the market, which accounted for more than half of total electric car sales.

Tesla sold 10,877 of its medium-sized Tesla Model 3 while its Model Y SUV accounted for 8717 sales.

The best-selling non-Tesla electric car in 2022 was the BYD



Atto 3, a newcomer from China, which accounted for 2113 sales, an impressive number considering it only went on sale in September last year. It's a far cry from 2016, when just 219 electric cars were reported

as sold for the year, although it should be noted that Tesla didn't start supplying sales data until March 2022, making meaningful comparisons difficult.

What doesn't change is the

continuing growth in EV sales. So far this year, Australians have bought 23,926 electric cars (to the end of April), an increase of 214 per cent over the same time last year. Tesla is once again dominating the

EV space, with 14,093 sales - or 58.9 per cent of the electric market - to the end of April. If that trajectory continues, Australians are on track to buy more than 70,000 new electric vehicles this year.

The surge in sales has come at the expense of more traditional petrol-hybrid cars, such as the Toyota Camry hybrid, which have slipped below pure electric cars in 2023, recording sales of 21,693.

The Tesla Model 3 continues to dominate sales in the medium sedan segment - whether petrol, hybrid or electric - with 8819 deliveries so far in 2023. That's more than four times as many as its next nearest rival, the once-dominant Toyota Camry, which posted sales of just 1886 cars to the end of April. The Camry had enjoyed a run of 28 years on top of the medium car segment until it was dethroned by the Model 3 in 2022.

What's the real cost of charging your EV?

James Ward

How much it will cost to recharge your electric car's battery depends on various factors, not least the size of the battery. Electric vehicles with smaller batteries, such as the Mini electric and its 32.6kWh array, will obviously cost less to recharge than those with larger storage capacity, such as the 107.8kWh offered by the BMW iX.

And then there are electricity tariffs, which can vary from state to state and from provider to provider. What you pay per kWh of electricity might be different to what your neighbour pays.

And different times of day attract different per kWh fees. Electricity costs more during peak times, such as early evenings and mornings, while off-peak hours, such as the middle of the night, will cost less per kWh. That's why the ideal time to plug in your car for a top-up is overnight.

The table on the right gives a guide to what it could cost to top up a Tesla Model 3's 65kWh battery to 80 per cent - or 52kWh - via various common charging options. For context, filling a petrol-powered Audi A4 to 80 per cent with premium unleaded at \$1.81 a litre will cost around \$78.19.

Of course, there's one way to really minimise electricity costs and perhaps even fill your EV free ... solar (see story at right).



Free power from the sun for just \$29,990

Solar is becoming increasingly popular as a method for many Australians to offset their electricity grid use or even power their homes, and cars, entirely from the sun. But what does solar cost?

Expect to pay around \$8000 for a 6.3kW solar panel system with a 5kW inverter. To store the electricity, add on about \$20,000 for a 13.5kW Tesla Powerwall battery system (not considering any rebates).

This means at the maximum collection rate, your battery will be fully charged in about 2½ hours, and excess energy can be used to power your home or fed back into the grid for a credit on your power bill. While spending \$30,000 on solar may seem a lot for "free" energy, you'll find the capital investment into your property will add at least as much value as the system itself, with Domain.com.au noting that when it comes time to sell up, an energy efficient home can be worth as much as 17 per cent more than an equivalent property.

What does it cost to charge a 52kWh electric car battery?

Home	\$0.22/kWh	\$11.44	
50kW fast	\$0.45/kWh	\$23.40	
75kW fast	\$0.55/kWh	\$28.60	
350kW ultra	\$0.60/kWh	\$31.20	
95RON petrol	\$1.81/L		\$78.19



The future of a world full of low emissions transport is clear.

It's happening now.

Every day, the world is moving towards cleaner, more sustainable electric powered transport. It's not easy, but it's resources like the copper and nickel produced by BHP, that help make it possible.

The future is clear. It's happening now at BHP.

To discover how, visit bhp.com/betterworld

BHP

Australia's global resources company

With public charging infrastructure out of pace with demand, one global oil giant is investing heavily in an electric future, writes James Ward.

Some of the biggest challenges around public charging are the chargers themselves. As they have generally been added "after the fact", some locations can be hard to find, a bit unpleasant or downright unsafe to stop and recharge.

Pair that with a lack of driver facilities and the risk of chargers either being inoperative or blocked when you need them the most.

In terms of operating a reliable charging network, the most logical place to install high-speed EV chargers is where you have existing infrastructure for power, parking and customer service. Somewhere like a petrol station.

This is the approach being adopted by global fuel giant BP, which is starting to roll out 75kW chargers at existing service stations around the country. Its big hook is a very simple combination of coffee and uptime.

We spoke with Josh Hovenaars, head of strategy & business development for BP Pulse, about the company's progress so far.

James Ward: How many [EV charging] locations does BP currently have in operation?

Josh Hovenaars: So far we have 25 locations already set up. We've done that over the last six months and that includes 50 rapid charge points that are already installed and charging vehicles. We're starting with 75kW chargers and those will increase in speed over time.

Regarding our network rollout, we aim to have 100 rapid charge points installed by the end of 2023 and up to 600 over the next two to three years.

JW: The uptime and reliability of the charging network is something we get asked about a lot, and it has been one of the big criticisms of charging to date.

JH: Absolutely. So, if I speak about our goal, I come back to first principles, and that's our mission, which is to be the leading fast, reliable and convenient charging



Fingers on the Pulse



Josh Hovenaars (left) says BP Pulse is rolling out chargers at service stations.

going to power a charger in and of itself, but every little bit helps.

JW: Do the current 75kW chargers have an upgrade potential? So as cars need either more batteries or the technology changes and cars can charge faster, can you upgrade your network to suit?

JH: Yes, we can ... all of our sites across Australia are capable of being upgraded to 150kW. And we often speak about a good rule of thumb for those people out there who are just learning about electric vehicles ... that for a 150kW charge, you can get 150 kilometres of range in 10 minutes of charging, right?

So that's a really important statistic that the potential drivers should know. And in the future, we have plans to install up to 300kW of charging. So that's 300 kilometres of range in 10 minutes. So a quick bathroom break or a coffee break and you've got 400 kilometres of range. So we think fast and ultra-fast charging is where the investment should be placed.

And that's our focus, our core focus. And to ensure that at the same time it's reliable and in convenient locations as well.

provider across Australia. So how do we do that? We want to roll out a network quickly, but that network has to be reliable. So we're aiming for 98 per cent uptime.

We think it's important to have a national maintenance program and we've set that up. We've also got national and global partnerships with some of the leading electric vehicle charging equipment providers, and one of the notable ones is our global partnership with Tritium. And we think that's really important to those uptime targets.

JW: One of the other big criticisms of Australia's charging network is you never really know what you're going to get. And I guess we have seen some that are remote. They feel potentially unsafe. You haven't got a lot of support around you. So the idea of utilising existing service station infrastructure, does this just make sense?

JH: I think so, yeah, and we think so. And that's why we're investing heavily in upgrading our service station network with chargers, installing hundreds of chargers. As I mentioned, at service stations, but also investing quite significantly into our food and coffee establishments and offers so that you do have something to recharge your body with when you recharge your car.

But with regards to locations, yes, we think service stations are terrific locations for fast chargers. And I guess if you look over the past, well, 100 years, there's been a process of natural selection to ensure that service stations are located where drivers need them. They're highly visible. Most people will visit a service station once every week or two weeks.

And so as chargers are rolled out, drivers and prospective drivers will start to see that there are chargers closer than they think. They're not in the back of a car park. They're not

hard to find, actually. They're there straight in front of you and we hope that will encourage a lot of drivers across Australia to think about and eventually move into [EVs].

JW: We know that obviously the move to an electric vehicle for many people is an environmental choice. Do you look at renewable energy supply options for the drivers?

JH: We procure large-scale generation certificates for every megawatt hour of electricity that's used in chargers and that gets invested into renewable energy projects.

And that's a start for us. On top of that, we are looking at large-scale power purchase agreements and we obviously have a subsidiary or a joint venture partner in Lightsource BP, which is one of Australia's largest commercial solar developers. And lastly, we have plans as well to invest into on-site solar. Now that's not

Can energy from the ground be sustainable?

Electric vehicle batteries require a large amount of mineral resources from the earth. **Susannah Guthrie** speaks with Dr Fiona Wild, Group Climate and Sustainability Officer from BHP, about the mining giant's approach to renewable energy, from the literal coal face.

Susannah Guthrie: When people think sustainability, they don't necessarily think BHP. Do you feel like you're coming from a bit of a long way back on this sustainability journey?

Fiona Wild: I don't think we are, to be honest. We've been setting

targets and delivering against those targets to reduce emissions, to reduce water consumption, to engage well with communities for such a long time. And more and more what we're seeing is the commodities that we produce are fundamental to the world decarbonising.

SG: I think some people would also say maybe that mining by its very nature is inherently unsustainable. What are some of the practices BHP is implementing now?

FW: There's absolutely no doubt that the work that we do as miners does have an impact on the environment and so it's important that we're aware of that.

It's also important that we set targets to reduce those emissions and impacts as much as we possibly can and that we transparently report on our progress and our delivery and are held accountable through that.

SG: The materials that are going

into the batteries for electric cars are predominantly copper and nickel. Is it sustainable to keep mining them at this rate? And are we going to struggle if the sales of electric cars increase exponentially in the future as they're predicted to do so in terms of resourcing?

FW: We've done a lot of work to think about how the demand for copper and nickel might change over time, particularly if the world is to rapidly decarbonise.

An electric vehicle has something like four times as much copper in it as a conventional car.

When you look at electric vehicle batteries, they have around 40kg of nickel in them, and so the

commodities that we produce are incredibly important to the rollout of electric vehicles.

As you might expect, demand for nickel is projected to increase fourfold in the next 30 years in comparison with the past 30, and the demand for copper is tipped to double.

That means we're going to have to continue to look to produce copper more sustainably from current operations. And we're going to have to try and do more effective recycling of batteries to make sure we're pulling that metal back out again and reusing it where we can.

And I think with those initiatives, we're in a really good position to meet the demand that we expect to see for copper and nickel worldwide.

THE EV ADVOCATE

Home charging is a game changer

With the effects of climate change at their forefront, Paul and Margaret Todd bought their first electric car last year. Their decision was just one part of a wider environmental strategy, writes **Rob Margeit**.

Research was the key to buying an electric vehicle for Paul Todd, who along with his wife Margaret took the leap into electric car ownership last year.

Their decision was primarily driven by concerns for the environment and formed just one part of making their lives more energy efficient.

Not only did Paul and his wife buy an electric car, a Kia EV6, they also took steps to maximise the energy efficiency of their home in Hawthorn, Melbourne.

"We'd been looking at it for probably about a year before we went ahead and purchased the EV6," Paul told Drive.

"Part of the reason behind it is we were trying to make our home more efficient back in Melbourne and we put in solar panels, double glazing ... heat pumps for the hot water system.

"And an electric vehicle was part of that journey."

It wasn't an emotional decision, however. "I'd done a lot of research and looked at a lot of different YouTube videos about the different cars available. So, I think it's a very logical decision rather than emotional."

One of the appeals of the Kia EV6, according to Paul, was its ability to supply power back into their home. Dubbed V2H (vehicle to home), the technology enables the battery of an electric car to be used as a domestic power source during a blackout – or in peak periods.

The technology is only available in the Kia EV6 and electric cars from Kia's sister brand, Hyundai.

Paul says it's come in handy more than once, supplying power to their holiday house in Lorne during blackouts.

"We got down here [and] the power was out so we couldn't open the garage door because it needs power. So, I ran a lead from the car to the inside, opened up the garage door and then plugged it in and we had lights and everything ... A brilliant system."

Living with an electric vehicle brings its challenges with range anxiety, where owners dread their battery running out of charge while out on the road, and the ability to easily recharge the battery high on the list of barriers to large-scale uptake of the technology.

Paul admits electric cars are not for

Kia EV6 GT-Line

Price: \$79,590 plus on-road costs

Platform: Single motor, rear-wheel drive

Power: 168kW

Torque: 350Nm

Battery size: 77.4kWh

Driving range: 504km (claimed)

Approximate charging times (from 10 to 80 per cent)

Household socket (2.4kW) 25h 50m

Three-phase home charger (11kW) 7h 20m

Public DC charger (50kW) 1h 13m

Maximum (350kW) 18m

"We got down here [and] the power was out so we couldn't open the garage door because it needs power. So, I ran a lead from the car to the inside, opened up the garage door and then plugged it in and we had lights and everything ... A brilliant system."

everyone at the moment, depending on what an individual's driving needs are.

"I think something that's important is that you need to be able to charge either at home or at your work, perhaps maybe 80 per cent of the time," he says. "If you can't do that, then I think it would become frustrating having to rely on public chargers all the time. So, you really need to have most of charging [done] at home or at work."

With a dedicated charger installed at both their homes, Paul and Margaret manage the challenges of electric vehicle ownership on their own, rarely, if ever relying on Australia's nascent public charging network.

"Typically, we never go below about 50 per cent [of battery charge], maybe 40 per cent," he says. "So, to top it up to 80 per cent ... it's three or four hours, just to top it up."

"So that's all we've got set up in Melbourne. We try and manage how much solar we use and charge where we need to overnight at the cheaper rates in Melbourne ... we just plug it in every second or third day and you know, we don't even think about it."

"So, it's pretty straightforward from that. As long as we don't forget to plug it in, that's the main thing ... it's like your phone, right? You forget to plug that in, you pay for it the next day."

While Paul doesn't feel like an early adopter, he concedes that he and Margaret are the only people within their close circle of friends who own an electric car.

Unsurprisingly, that's led to the Melbourne couple being advocates for the technology, often asked about their EV experiences.

"I don't really see myself as an early adopter," says Paul.

But having spoken to friends, Paul says many people still don't understand a lot about EVs and things such as range and charging options.

One of the big questions Paul faces is what it's like to drive an electric car, whether the experience is different to driving a vehicle with an internal combustion engine.

"I don't think it's changed the way I drive," says Paul.

"It's really just a car. I mean, I do find it very easy to drive very smooth, very quiet. I find it probably more pleasurable to drive than previous cars. But it's just a car, really. I mean, it just drives like a normal car, except it's quieter and smoother."

Paul's and Margaret's Kia EV6 has covered around 11,000 kilometres since they bought it new in 2022. It replaced a Volkswagen Passat and is now their only car. The EV6 serves primarily as a daily driver, but the couple do regularly complete the 300 kilometre round-trip from their home in Melbourne's inner east to their holiday house in Lorne. So, has owning an electric car changed Paul and Margaret's life?

"Not really, no," he says. "I mean, we never go to petrol stations, obviously."

Paul Todd uses his Kia EV6 as a daily drive and finds that regularly topping up the battery at home takes away any range anxiety.



Zach Chapman typically adds around 100 kilometres of driving range to his Tesla overnight using a regular household socket.

THE APARTMENT DWELLER

Zach in for the long haul, despite the challenges

Living in an apartment can be a barrier to owning an electric vehicle. But at least one Sydney resident has met the challenge head-on, writes **Rob Margeit**.

Living in an apartment complex as an electric vehicle owner presents its own unique challenges. While some modern-built apartment blocks are fitted with electric vehicle chargers, many aren't, and that makes charging an electric car difficult.

The images of happy home-owners with their shiny new EV's parked in the garage or a carport hooked up to a home charger are used often to promote the benefits of electric car ownership. But the reality for many apartment dwellers is far removed from the idyll presented in glossy advertising.

Zach Chapman knows the challenges only too well. He owns an electric car, a Tesla Model 3, and lives in an apartment with no EV charging infrastructure. And in a double-whammy, Zach rents his apartment on Sydney's northern beaches meaning that even if he wanted to, the hurdles to installing a home charger are many and tall.

"I think living in an apartment complex as a tenant as opposed to actually owning the apartment ... makes it a little bit more difficult because you've actually got to go and get approval from your strata and also from the landlord," says Zach. "So that makes it a lot more difficult."

Luckily, Zach's car space in the complex is equipped with a regular household socket and he can charge his Tesla overnight. But, as with all regular household sockets, the rate of charging is slow, and Zach typically adds around 100 kilometres of driving range to his Tesla overnight.

As he admits, if he needs more range, Zach has to rely on public charging stations to fulfil his driving needs which he says can run to around 500-600 kilometres every week. And while it presents its challenges, Zach has made it work by utilising the public charging network in his local area.

"I have a couple of charging options around my area," he says. "We have a Westfield up the road which has five Tesla chargers in there which are also free."

"So you can park in there, go and grab a coffee if I need to charge my car up and come back and it's fully charged."

Tesla Model 3

Price: from \$74,300 plus on-road costs

Platform: Dual motor, all-wheel drive

Power: 366kW

Torque: 510Nm

Battery size: 82kWh

Driving range: 602km (claimed)

Approximate charging times (from 10 to 80 per cent)

Household socket (2.4kW) 27h 20m

Three-phase home charger (11kW) 5h 58m

Public DC charger (50kW) 1h 19m

Maximum (250kW) 16m

"You can park in [Westfield], go and grab a coffee if I need to charge my car up and come back and it's fully charged."

Zach is relatively new to his electric car ownership journey, having purchased his Tesla Model 3 earlier this year. It wasn't a decision taken lightly, coming only after researching the world of EVs for around six months before taking the plunge.

"I probably looked into it for six months just figuring out where all the chargers were around my area [and] trying to look at costs," Zach says. "And then you have about a six-to-nine month [wait time] once you order with Tesla."

In stark contrast to his new Tesla, Zach's previous vehicle was a diesel-powered Mazda BT-50 dual-cab ute which, he admits, was costing him around \$200 a week in fuel bills. That was a large factor in Zach choosing to replace the ute with an electric car.

"With the amount of kilometres I was doing, I was probably spending \$150 to \$200

a week in diesel," he says. "I've probably cut that down to thirty bucks a week in charging costs at the moment."

But saving money on fuel wasn't the only determining factor in Zach's decision.

Like so many people who have made the switch to electric cars, concerns for the environment and the impacts of fossil fuels on climate change were a large part of the decision.

"The reason I first looked into an EV was probably the environment and the impact that petrol vehicles are having," he says. "That got me excited. And then after looking into them, I realised the other great [advantage] in comparison to the petrol."

"Even if the charging costs were a lot more ... there's obviously the environmental impact and the fact that we all need to start looking at making the change to EVs ... so I guess I was just looking to jump on early and start the transition."

While Zach has taken on the not-insignificant challenge of electric vehicle ownership despite being a renter in apartment block, he readily admits owning an electric car isn't for everyone.

"I guess the people I'll definitely recommend get an EV are the people travelling a lot for work," he says.

"They're going to enjoy their rides and be a lot more comfortable when they're doing it. But also, obviously there's the savings that they'll get from driving an EV."

"[But] I wouldn't recommend people who are doing long-distance drives every day for work get one unless they have a really good charging option at home."

Far from being frustrated by the challenges he faces every single day, Zach remains an advocate for electric vehicles and says he is in for the long haul.

"We know a few people in the area who have bought Teslas and ... they're all really happy with their decision. Everyone said they would never go back to a petrol vehicle again after buying a Tesla. And so far ... I'm inclined to agree."

Domestic install for cost, energy efficiency

Rob Margeit

Buying an electric car is just the first step in a journey towards zero emissions motoring. Buyers wanting to get the most out of their new purchase are increasingly paying for a charging set-up in their homes which will allow for far more rapid charging than a regular household wall socket which can take as long as 24 hours or even more to recharge an EV's battery from 10 to 80 per cent.

A home charger can cut that time to anywhere from six to eight hours (depending on battery size), meaning an electric car can go from near-empty to near-full overnight when electricity costs are typically cheaper.

Installing a home charger might sound daunting but, as with any major purchase, research is key. That's according to Daniel Di Martino, a senior technician at Spark Innovation which specialises in installing home chargers for electric cars.

"The way to start the process of setting up a home charger would be to engage an electrician," says Di Martino. "Figure out what's capable at your particular home in terms of single phase, three phase, the location of the charger, and then move forward from there."

A typical set-up for home charging gets under way at around \$2000 but can quickly escalate



'Somewhere around about the \$2000 mark is an entry-level price for a supply and installation for a good quality well-featured EV charger.'

Daniel Di Martino, a senior technician at Spark Innovation

from there depending on the amount of power and rate of charge required.

"Somewhere around about the

\$2000 mark is an entry-level price for a supply and installation for a good quality well-featured EV charger. The sky's the limit from

there, but that price of \$2000 is where you'd likely start."

That outlay would be enough to ensure an electric vehicle, in most cases, is recharged overnight ready for a full range of driving duties the next day.

Di Martino added that while living in an apartment complex can present its challenges when it comes to EV infrastructure, they're not insurmountable.

"So some of the things you'd need to consider is the location of

Daniel Di Martino says a home charger can add value to your home or you can take it with you.

the charger," he says. "It would be best suited if you could get that charger as close to your car spot [or] designated parking area as possible.

"Ideally, connect the power supply to your metered power supply through the main switchboard. If that's not possible, you'll have to go through to the strata committee or building management and start discussing the pay as you go options."

Adding a charger to your home can also add to the value of your property if you choose to leave it in place when selling up. However, if you do decide to sell your home and want to take the charger with you to your new residence, then it's a simple process according to Di Martino.

"[It's] no harder than disconnecting the power supply at the local isolation switch," he says. "Remove the cabling, remove the hardware, pull it off the wall, take it to the new home and complete the installation again."

There are many benefits to having a home charger, but one that stands out for Di Martino is cost-effectiveness.

"It is the most efficient way to charge the car and costs you the least amount of money."

Changing rural landscape means barriers are falling

Rob Margeit

One of the criticisms often levelled at electric cars is that they're just not suitable for Australian conditions. Critics cite the vastness of our continent, the long distances between major towns and cities and the lack of infrastructure needed to support large-scale use of EVs. While EVs undoubtedly make sense for people living in our major cities, for anyone living in rural and regional areas, the challenges to ownership stack up pretty quickly.

But, all is not lost, and with some careful planning, owning an electric car away from major urban centres need not be a barrier.

One regional resident who has made the transition is Neil McCarthy who made the switch to electric about three years ago.

The Port Stephens retiree says his decision to buy a Hyundai Kona EV three years ago was driven primarily by concerns for the environment.

"When we retired, we were trying to figure out what we can do for the environment, something that is going to help in some small way," he says. "So, [buying an electric car] was one of our first steps."

The car they bought was a Hyundai Kona Electric Highlander, equipped with a 64kWh battery providing a claimed driving range of 484km. That's more than enough to enable the NSW Mid North Coast resident to make to 210 kilometre trek to Sydney's northern beaches to visit family.

"To get to Manly from here is around 210 kilometres on average," he says. "We use around about 37 to 40 per cent of the battery power to get there [and] probably the same back."

The second part of Neil's electric car journey was to install solar power and charging at his home, not only to defray the costs



Port Stephens retiree Neil McCarthy made the switch to electric because of his concern for the environment.

of long-term EV ownership, but to also reduce his carbon footprint.

"When we went in, we went in reasonably big," he says. "We put 9 kilowatts [of solar] on top of the house. I have a 5-kilowatt battery [for storing electricity] as well. It needs a lot more than that though if you're going to keep an EV going without using the grid."

As a retiree, Neil can choose when he charges his Hyundai, using low-peak electricity rates to help keep costs down.

"I will turn the car on at about 10 o'clock or 11 o'clock in the morning if I want to top it up [and] turn it off at three [in the afternoon]," he says. "[The range] pretty much sits all the time at around 80 per cent or so. And if I'm going to Sydney, I'll just make sure I'm on 100 per cent."

Neil rarely uses public chargers, the bulk of his charging needs (as



'It's got a good enough range not to give me anxiety.'

much as 90 per cent according to Neil) met by a 7-kilowatt wall charger installed at his house.

"I would say 90-plus per cent would just be the plug [at home]," he says. "There are no [public] fast chargers in Nelson Bay... There are a couple of free ones in Newcastle... and if we're going in there and we're near one we'll pop in and just top it up."

Neil has covered around 27,000km in the Hyundai Kona Electric in the three years since he bought it new. And while range anxiety (the fear of the battery running out of charge) is a thing, especially in regional and rural areas, Neil says he hasn't come close to running dry.

"It's got a good enough range not to give me anxiety," he says. "I've been down to around 20 per cent [of range] but I've been down further than that in a petrol car."

Hyundai Kona Electric Highlander

Price: \$64,000 plus on-road costs
Platform: Single motor, front-wheel drive
Power: 150kW
Torque: 395Nm
Battery size: 64kWh
Driving range: 484km (claimed)

Approximate charging times (from 10 to 80 per cent)

Household socket (2.4kW) 21h 20m
Three-phase home charger (11kW) 4h 40m
Public DC charger (50kW) 1h
Maximum (100kW) 30m

The one remaining hurdle for Neil is a long-distance road trip. But with family in Queensland, Neil has planned a potential route that should ensure he's never further than 200km from a public charging station.

"We haven't taken it to Queensland or out bush or anything," he says. "We have done a couple of plans where should we go to Queensland there's more than enough charging stations all the way up the highway for us to never be in more than 200-kilometres from one."

"[We've] planned it out a couple of times, checked them on the way past when we've been going off in different directions but haven't had to yet... certainly it just takes a little bit of planning."

The regional auto-scape is changing, maybe not as rapidly as it is in the city, but if Neil's anecdotal evidence is anything to go by, the uptake of EVs outside of our metropolitan areas is on the rise. "There's a few more Teslas turning up now," he says. "We do see the odd one or two around [from other brands]. But Teslas are getting a little bit more common."

VOLVO

The C40 Recharge has arrived.

100% electric. To help create a more sustainable future.



DRIVE

Living with electric vehicles

Saturday 27 May 12.00pm on Channel 9

Join the Drive team for an in-depth look at how everyday Australians are living with electric vehicles.



Every EV on sale in Australia today

There are 22 brands offering full battery-electric vehicles in Australia. Pricing starts from \$44,990 drive away for the GWM Ora hatch, and climbs through 44 nameplates to the \$365,100 Turbo S variant of the Porsche Taycan. Eight models are priced from under \$60,000 and more than half start from under \$100,000.



Mercedes-Benz EQB
The only electric SUV on sale offering seven-seats, the mid-sized EQB also dishes up plenty of technology and a 371km range.



Tesla Model 3
Australia's best-selling EV, and the third-most popular new car behind the Ford Ranger and Toyota HiLux utes. The rear-drive Model 3 offers a claimed range of 556km.



GWM Ora
The most affordable EV on sale today, the standard-range Ora features a 48kWh battery pack with a claimed range of 310km.



Audi RS E-Tron GT
Is this the best-looking electric car on sale today? Audi's muscular four-door saloon is a close cousin to the Porsche Taycan, offering 433km range and Teutonic style for days!

All prices are listed at MSRP before on-road costs unless noted otherwise.

GWM Ora..... (drive-away) \$44,990	Mini Cooper SE..... \$64,975	BMW iX1..... \$82,900	Mercedes-Benz EQC..... \$128,000
MG ZS EV..... \$43,990	Kia Niro..... \$65,300	Mercedes-Benz EQB..... \$87,800	Mercedes-Benz EQE..... \$134,900
BYD Atto 3..... \$48,011	Mazda MX-30..... \$66,010	Mercedes-Benz eVito..... \$89,353	BMW iX..... \$135,900
Nissan Leaf..... \$50,990	Tesla Model Y..... \$69,300	LDV eT60..... \$92,990	Jaguar I-Pace..... \$148,800
Fiat 500e..... \$52,500	Hyundai Ioniq 5..... \$72,000	LDV eDeliver 9..... \$99,990	Mercedes-Benz EQV..... \$155,338
Hyundai Kona Electric..... \$54,500	Kia EV6..... \$72,590	BMW i4..... \$102,900	Porsche Taycan..... \$165,700
Cupra Born..... \$59,990	Volvo XC40 Recharge..... \$73,990	BMW iX3..... \$104,900	Audi E-Tron GT..... \$180,200
Peugeot e-Partner..... \$59,990	Hyundai Ioniq 6..... \$74,000	LDV Mifa 9..... \$106,000	Porsche Taycan Cross Turismo..... \$186,500
Tesla Model 3..... \$61,300	Volvo C40..... \$75,990	Genesis GV60..... \$107,700	Audi RS E-Tron GT..... \$248,200
Polestar 2..... \$63,900	Lexus UX..... \$76,700	Lexus RZ..... \$123,000	BMW i7..... \$306,900
Kia Niro Plus..... \$64,450	Mercedes-Benz EQA..... \$81,700	Genesis GV70..... \$127,800	Mercedes-Benz EQS..... \$328,400

THE iX3

The BMW iX3 is where electric meets excellence. With more distance on the open road and less time spent charging. A low centre of gravity to bring you closer to the feeling of speed. And not a single emission in sight, no matter where you go.

To find out more visit bmw.com.au

Ten new cars to get excited about

As mainstream manufacturers embrace electric vehicles, Australians are set to have an ever-expanding choice of makes and models. From a handful of available models just a few short years ago, the next eighteen months will see an influx of more than 40 new electric and plug-in hybrid vehicles into the Australian market including models that just might slip under the \$40,000 mark for the first time, removing one of the barriers to large-scale uptake – affordability. From cheerful and cute to high-tech gadgetry on wheels, here are some highlights of what to expect from the world of EVs over the next 18 months.



BYD Dolphin:
The price leader
Will the BYD Dolphin be the first EV on sale in Australia to dip below the \$39,990 mark? Late 2023



Volkswagen ID.4:
The people's car
The Tiguan-sized Volkswagen ID.4 will launch alongside its ID.5 coupe sibling and will be followed by the Golf-sized ID.3 in 2024. Late 2023



Kia EV9:
The family bus
A full-size, seven seat, family SUV full of style and technology. Better get your order in! Mid 2023



Hyundai Ioniq 5 N:
The hot hatch: Hyundai have tasked their N Performance team with turning the angular Ioniq 5 SUV-hatch into a techno-electro rally hatch, and we can't wait! Mid 2023



Ford Mustang Mach-E:
The generation gap
Mustang by name, but not by nature, the Ford Mustang Mach-E SUV offers American style and impressive performance, with plenty of pony badges to boot. Mid 2023



Mercedes-Benz EQE SUV:
The ski crowd Hot on the heels of the Mercedes-Benz EQE sedan, the GLC-sized EQE SUV will find strong favour in the leafy streets of inner eastern suburbs around the country. Late 2023



Toyota BZ4X:
The late arrival
Toyota arrives fashionably late to the EV party with a funky RAV4-sized SUV that is badge-shared with the Subaru Solterra. Late 2023



Polestar 3:
The style statement
Stand out from the crowd with the visually stunning Polestar 3 SUV, the first new car to offer an optional Lidar driver assistance sensor array. Early 2024



MG 4:
The step change
The first new-generation MG to hit our shores, the MG4 has received strong praise in other markets for being a well-priced, well-packaged and practical electric hatchback. Mid 2023



Abarth 500e:
The fun choice
Who needs a sensible car? The Abarth 500e offers irreverent electric hooliganry, complete with an artificial sound-system to make it sound like a petrol one! Late 2023

Enjoy your flight.

Kia EV6 GT



Movement that inspires

Find your nearest Kia dealer  kia.com.au or  131 KIA/131 542