

National Electric Vehicle Strategy.

Recognising the promise of Distributive Energy Resources.

Chris Lehmann 28th October 2022



Introduction

Master Electricians Australia (MEA) is the trade association representing electrical contractors recognised by industry, government and the community as the electrical industry's leading business partner, knowledge source and advocate. Our website is www.masterelectricians.com.au

MEA is pleased to be able to make a submission on this important consultation and believe that the National EV Strategy is a large part of the wider strategy of moving Australia away from a reliance on the bulk generation and distribution of electricity, to a more efficient, robust, diverse and reliable Distributive Energy Resources (DER) landscape that can grow organically and rapidly, if the integrated policy settings are put in place now.

MEA have formulated a high-level DER policy¹ (see Fig 1 & Fig 2) that has an EV strategy as but one piece of the puzzle that will deliver Australia the energy transition that we require. Without integrating strategic decisions around EV's inside of an overarching energy strategy that takes into account the entire landscape of–

- Tariff Reform
- Solar PV
- Home Batteries
- Home Energy Management Systems (HEMS)
- Electric Vehicles (EV's)
- Private Asset Maintenance

Then, as a nation we will have a disjointed approach with sub-optimal outcomes both in spend of precious taxpayer dollars, and in opportunity cost to the community and the economy.

Do you agree with the objectives, and do you think they will achieve our proposed goals? Are there other objectives we should consider?

- Encourage rapid increase in demand for EVs
- Increase supply of affordable and accessible EVs to meet demand across all segments
- Establish the systems and infrastructure to enable the rapid uptake of EVs.

MEA agree with the objectives, however, believe that the objectives should not be seen in isolation and should explicitly take into account that EV's are an individual part of an overarching grid transformation strategy driven by DER principles.

A rapid and unplanned expansion of EV in this country will exacerbate the current demands and risks experienced on the national grid. It must be understood that EV are most efficient if charged during the middle of the day to “soak” excess solar currently entering the grid however will significantly add to Peak Demand if there is unfettered access during the peak demand hours of 3pm and 9.00pm each night.

¹ <https://masterelectricians.com.au/wp-content/uploads/DER-Policy-Working-Paper.pdf>

Are there other measures by governments and industry that could increase affordability and accessibility of EVs to help drive demand?

MEA believe that the single biggest measure that the government could take to increase the affordability of EVs, is to preference the incentivisation the purchase of bi-directional charge enabled EVs.

Use of the very large batteries in bi-directional enabled EVs could soak excess capacity during the day then have the ability to return it to the grid during peak demand periods. This would support the distribution network, provide the most efficient use of daytime PV capacity, and provide for cost-of-living power savings to households, providing further inherent financial incentives in the decision of consumers to purchase EVs.

Are vehicle fuel efficiency standards an effective mechanism to reduce passenger and light commercial fleet emissions?

Fuel efficiency standards would send price signals to the market to preference fuel efficient ICB cars or EVs, however caution should be exercised, that lower socio-economic citizens do not become disadvantaged by being unable to afford vehicles that meet these criteria. A sufficient changeover period for existing, less efficient vehicles be implemented to allow for a market in affordable second hand fuel efficient ICB cars and EVs to be developed.

MEA also highlights that currently there is no national plan to account for the loss in federal fuel excise tax that EVs will no longer pay. Fuel Excise tax currently produce \$20 Billion in road funding each year, and as we move to decarbonise the economy this revenue will need to be replaced. It is imperative that State Governments are not allowed to raise Taxes in state jurisdictions in addition to excise taxation. Some states are considering a registration tax or road use tax; however, we strongly believe that this must be a federal responsibility and not a state by state approach. Australia does not need competitive federalism in road funding like we experience in payroll taxation

In addition to vehicle fuel efficiency standards for passenger and light commercial vehicles, would vehicle fuel efficiency standards be an appropriate mechanism to increase the supply of heavy vehicle classes to Australia?

MEA gives cautious support for fuel efficiency standards for commercial vehicles, these requirements should be introduced with as long a changeover period as possible, and be non-prescriptive as to the technology, to allow for development of affordable hydrogen or other technologies that may be more suitable for long distance haulage of heavy payloads.

The size and distances to be covered in Australia are enormous and primary producers, first nations people and the companies that assist and service these rural and remote communities must be allowed to continue to live, provide and prosper in their communities. If we examine Queensland, it is the most decentralised populous state in the country where the majority of populations centres are not serviced by regular or affordable air or rail transport.

What policies and/or industry actions could complement vehicle fuel efficiency standards to help increase supply of EVs to Australia and electrify the Australian fleet?

We urge the government to consider the CSIRO “State of Play”² report that explored the viability of setting up a domestic battery manufacturing industry in Australia, with the resulting high tech spin-off industries that would attend these mining, refining, and manufacturing activities. Also -

- Electricity Tariff reform
- Preference for bi-directional charging capable cars
- Removal of the luxury car tax as we no longer produce vehicles
- Nationally consistent road user charges
- Prohibition of state governments to introduce new taxes in relation to registration road use

How could we best increase the number of affordable second hand EVs?

Increasing EV fleet vehicle purchases by government, and by providing generous (but tapering over time) incentives for commercial fleet operators to purchase EVs, to start a pipeline of supply for the second-hand market.

It may assist to increase the number or turnover of vehicles that businesses buy by reinstating the instant asset write off option that was previously used during Covid to encourage businesses This however rather than being instant may well be suited to be timed over just a 2-year period. Many ICE vehicles fleet turn vehicles over on a 2-year 40,000 basis based on servicing and wear and tear. Equating a similar set of parameters to encourage a turnover of asset over a 2 year or 40,000km basis may assist

² https://fbicrc.com.au/wp-content/uploads/2020/10/20-00191_MR_REPORT_FBICRC-StateOfPlayBattery_WEB_201002.pdf

Should the Government consider ways to increase the supply of second hand EVs independently imported to the Australian market? Could the safety and consumer risks of this approach be mitigated?

MEA are in favour of importing second hand EVs from other jurisdictions, as we make none of these products on shore currently. We would like to see this tied to an abolition of the luxury car tax, as this was initially a measure used to support the domestic vehicle industry.

What actions can governments and industry take to strengthen our competitiveness and innovate across the full lifecycle of the EV value chain?

MEA believe that the lifecycle of EV batteries should include a pathway to re purposing to grid storage batteries (either at the household level or in community batteries) as a “second life” usage once efficiency for vehicle transport falls below acceptable levels. MEA also believe that a domestic recycling and disposal industry should be part of the lifecycle and value chain for EVs and grid storage batteries.

Are there other proposals that could help drive demand for EVs and provide a revenue source to help fund road infrastructure?

MEA are supportive of a per km road user charge calculated at registration renewal, and/or a per kwh levy applied to dedicated public or controlled tariff domestic chargers.

Incentives could also be offered for the purchasing of EVs, but also importantly for the installation of the infrastructure to support charging, such as a dedicated circuit or upgrades to switchboards to accommodate the extra load.

What more needs to be done nationally to ensure we deliver a nationally comprehensive framework for EVs?

As laid out in MEAs DER policy, *we believe that EVs are but one part of a suite of interrelated actions* to drive the grid transformation and de-carbonisation of the economy. These include –

- Accelerating the digital meter rollout - clearing the roadblocks caused by the Power of Choice reforms.
- Tariff Reform – a move towards flexible demand driven “time of use” tariffs, and mandated smart charging for EVs
- Home Battery Storage – installation of home batteries to charge during periods of oversupply, and discharge during peak demand periods.
- EVs – prioritise bi-directional EVs to be able to be used for the dual purpose of transport and home battery storage.

- Home Energy Management Systems (HEMS) – behind the meter, privately installed systems that controls and prioritises energy usage and management of loads in line with grid demand and electricity prices.
- Private Asset Maintenance – as private energy assets become a more integral part of the public grid, ensuring the integrity of the network and the safety of the public by having minimum maintenance requirements on private energy assets that export to the grid.

How can we best make sure all Australians get access to the opportunities and benefits from the transition?

There will be some Australians that do not have access to solar PV or home batteries, either through the style of accommodation (apartments, townhouses, community living etc) or by the financial relationship to the dwelling (renting vs owning). But every Australian can participate in the benefits afforded by Smart Meters, HEMS capabilities, and bi-directional EVs and contribute towards the decarbonisation of the grid and the energy transition.

Policies to speed up the roll out of smart meters and remove inefficient roadblocks to installation, preferencing of bi-directional enabled EVs in the Australian market, coupled with incentives and subsidies for home batteries, EVs, and HEMS will mean that all cohorts of the population have opportunities to benefit from the transition.

We include some scenarios below to illustrate the different challenges -

Scenario 1 – Apartment Owner

Rahul and Mary both work and their own apartment, they do not have the room to install a home battery or have the roof space to install solar PV.

With their digital smart meter installed by their energy retailer, they can install an EV smart charger compatible with the bi-directional EV they want to purchase. They can then set their smart charger up to charge the car when the energy prices are low, and to discharge (feed back into the house and the grid) when energy prices are high and the grid is under pressure.

Using their integrated HEMS (Google Nest, Alexa, Apple HomeKit, Samsung SmartThings, etc.....), they can program their IOT (internet of things) modern appliances (pool, hot water, aircon, dishwasher, washing machine etc) to run based on the energy usage of the house, energy price, or time of day.

They can make significant savings on their energy bills and also use their bi-directional EV available to support either their own load during peak times or to get paid to put energy back into the grid via a FIT arrangement.

Scenario 2 – Rental Tenant

Darren and Sharon live with another couple Lily and Ebony in a rental home. The home has a 5kw solar system on the roof but no home battery, the landlord is prepared to install an EV charger on a separate circuit utilising the government incentive as Ebony has an EV as a work vehicle from her employer.

The housemates get the retailer to put the new EV charger on a smart tariff to ensure that it is charging outside of peak hours, and the general light and power in the house on a TOU tariff.

Darren has a Google Nest and has set up appliances to be controlled by the HEMS function in the Google Nest, the housemates set up the washing machine, dishwasher, and air con to run and cool the house down during the day when the solar is producing and to switch off between 3 and 7pm

Scenario 3 – Homeowner

Jack and Jill live in a 3-bedroom brick and tile home with 2 primary school aged kids in outer Brisbane. They used government incentives to put 5KW of solar on their home, they have a pool and modern appliances. Jill works from home mostly in an IT job, and has networked the modern appliances to their Amazon Alexa, as well as having Alexa control Wi-Fi relays installed by an electrician, switching the pool pump and hot water storage heater. Alexa controls these appliances to switch off or on, in the case of the variable speed drive air conditioners Alexa reduces the load once the energy usage in the house reaches a certain level.

Jack has a Volks Wagon EV on order to be delivered in March 2023, he chose the VW because they have a bi-directional charger and can deliver up to 25 amps of power back into the home via its smart charger during times of peak grid usage. Jack and Jill were going to install home batteries, but with the local train station having EV chargers where Jack parks, and his office also having an EV charger for those days when he drives to work to attend meetings, they have done the sums and it works out cheaper to charge at work or at public car parks and drive the car home to use as the home battery, topping it up completely on the weekends during the day.

Jack and Jill have worked out that by being able to soak power during the day on their appliances and using only a small portion of the big 77KWh battery in the VW in the evening, they will actually be able to produce and store more electricity than they use, supporting the grid.

Scenario 4 – 10 Story Residential Apartment Building

Infinity Apartments at Hamilton in Brisbane is a 14-year-old residential apartment complex with 63 units. They have a commercial power deal and an embedded network, allowing them to get power prices cheaper than most residential domestic consumers, they have no solar.

They engaged a consultant and they recommended the following –

- they have sufficient roof space to install 25KW of solar on the roof which would deal with most of the needs for their common community power (air con, lifts, pool, carpark lighting and essential services, etc).
- they have space in the carpark to install community battery capacity of up to 100KW to feed the embedded network.
- they go on a flexible, reflective TOU Tariff that allows them to purchase power during the day at even lower rates to run the building and charge up the batteries, then to use the battery capacity in the evening to supply during the peak period, and any excess could be fed back into the grid on a FIT arrangement to offset the body corp power bills.
- Installation of a number of smart EV chargers in the basement car park tied to the BMS (building management system) to ensure that charging only takes place during times of low grid demand.

Medium sized power consumers such as residential apartment complexes provide an opportunity to get economies of scale for power aggregation, there will be some challenges with infra structure in older buildings, however there is also an opportunity to get better, more integrated, smart, load sharing and load shifting solutions.

Conclusion

If the strategy for grid transformation focuses on DER and not just on the constituent parts, then all of the Australian community can benefit to varying degrees. A combination of sending price signals for power pricing, incentives for new technologies, smart metering solutions (digital smart meters), and “behind the meter” technology solutions with HEMS and BMS, is the way forward. Simply focusing on uptake of EVs is not enough, it will create more problems than it solves if a holistic approach is not taken.

MEA are broadly supportive of Australian Government initiatives in respect to EVs and believe that the electrical contracting industry and licensed electrical workers are at the forefront of helping deliver constructive solutions to deliver their emissions reduction targets. In summary these would be:

- Licensed electrical contractors could become Authorised Service Providers (ASPs) to install new meters and replace old metering. This would reduce connections times, improve consumer experience, reduce smart-meter roll out costs and help facilitate a swifter transition to a responsive electricity grid that can take advantage of DER opportunities.
- MEA believes that the default Tariff for electricity consumers should be a flexible demand driven tariff.
- MEA also believe that as more EVs become available on the Australian market with bi-directional charging ability, they should be preferred in the payment of incentives for EVs and in government fleet procurement policies.
- Governments should consider moving subsidies towards batteries and EV infrastructure, in concert with home solar to drive consumer behaviour to the DER phase to make the most efficient use of the stocks of rooftop solar in the market.
- Governments should consider incentives and funding for pilots to assess the effectiveness of HEMS to identify the best application of these in homes and businesses to reduce energy usage.

MEA recommend mandating inspections on grid connected solar and battery systems receiving a FIT, by an appropriately licensed electrical contractor every 5 years.

Fig 1.

Distributed Energy Resource Cycle

Achieving emissions reduction targets through removing regulatory roadblocks and delivering on the ground DER solutions.

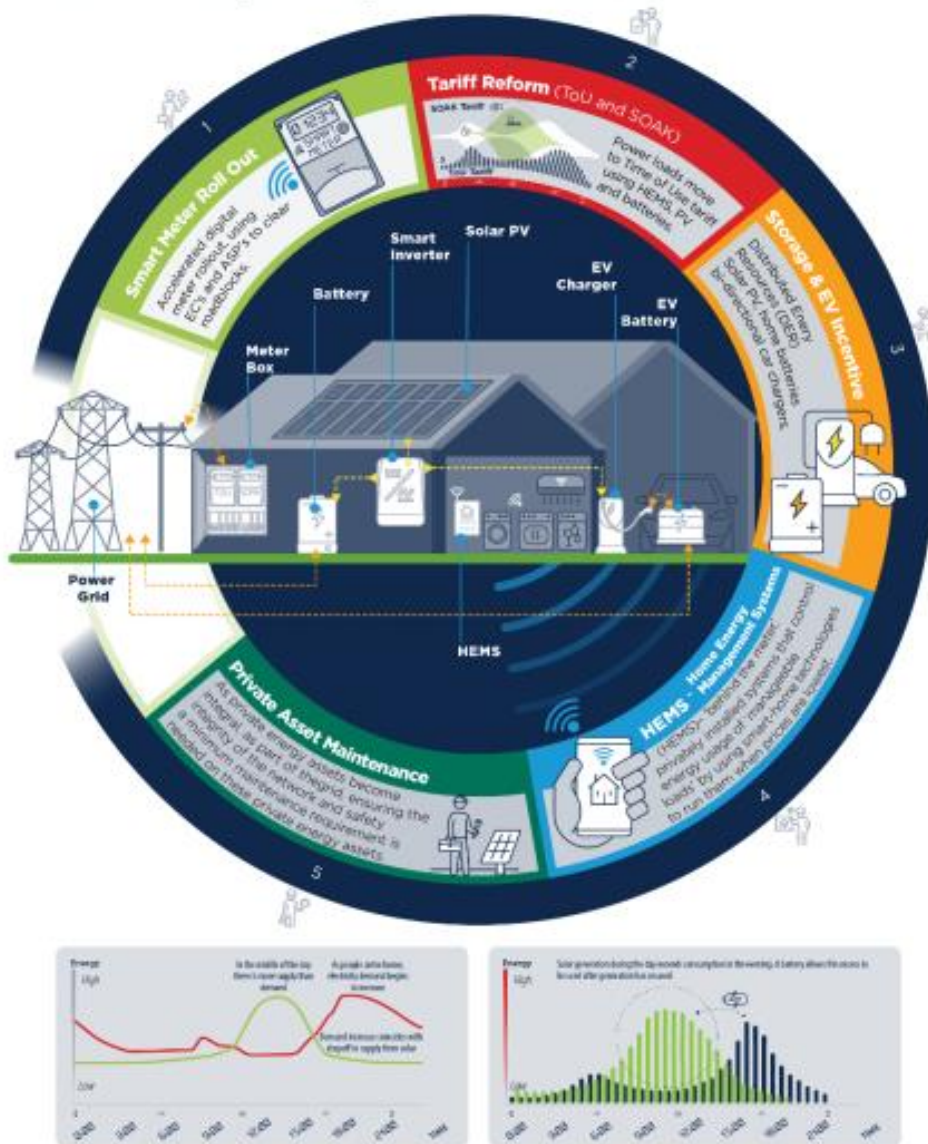


Fig 2.

DER Home Solution Opportunities

