Submission for the provision of Electric Car charging facilities in the Huntington complex

As a possible future owner of apartment A302 in Huntington, I want to make the case for making the building electric car ready.

Australia is lagging other countries in the uptake of electric vehicles (EV). The main reason for this is that very few electric cars have been available in Australia with a price point that most people can handle and with a reasonable range. The fact that the current federal government is actively trying to discourage the uptake of electric vehicles doesn't help.

But all this is about to change and the predictions are that in just 5-10 years, most cars sold will be electric. See this link:
https://thedriven.io/2018/08/31/the-driven-podcast-by-2025-all-new-cars-will-be-electric/
and this one:
https://reneweconomy.com.au/global-ev-sales-top-four-million-as-uptake-accelerates-53499/

The disruption will be profound and will affect many sectors of the economy, such as the automotive industry (an electric car needs very little servicing) and the oil industry.

Australia will benefit greatly with more EVs on the road. The level of pollution will be reduced and we will be less dependant on imported fuels. An argument against EVs has been that the power comes from coal fired power stations, thus contributing to the creation of greenhouse gases. However, the amount of renewables in the grid is increasing all the time so this argument is less and less relevant.

Our personal situation is that we bought a Nissan Leaf a year and a half ago. Nissan imported a number of these cars in 2012, but due to the high price and the relatively limited range, the Nissan Leaf was hard to sell and, therefore, we managed to buy one of the last "new" Nissan Leafs for a good price The car had been sitting at the dealer for five years.

Our Nissan Leaf being charged in the garage with solar generated electricity

Now, after we had the car for 15 months, we have gained a lot of experience and we can truly say that we will never go back and buy a petrol or diesel car again. This seems to be the general consensus of owners of EVs. The car is perfect for local trips around the Newcastle area. Our next car will possibly be a 2019 Nissan Leaf, which is said to have a range of around 400-500 km, compared to about 100 km with our current Leaf.

We charge the car at home in the garage and this is the way the majority of EVs are charged today. There are charging stations being built around the major highways and at other strategic locations and they are required to facilitate longer trips, however, the normal driving pattern for the vast majority of car users is no more than 20-50 km/day, which makes home charging the obvious solution.

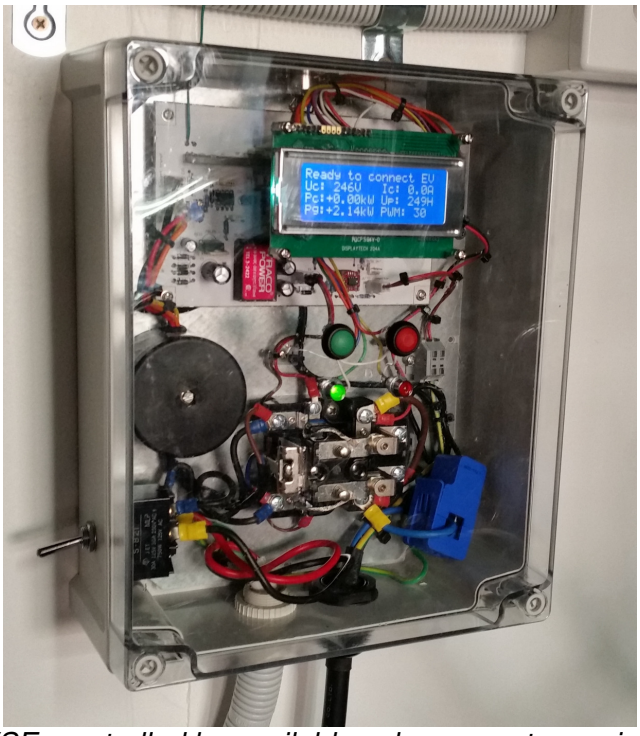
Without the necessary infrastructure to charge the car at the home garage or parking space, ownership of an electric car will be very hard if not impossible. See this link:
https://www.afr.com/personal-finance/is-your-apartment-block-ready-for-electric-cars-20180704-h1292i
and this one:
https://thedriven.io/2018/09/03/sydney-apartment-dwellers-want-user-pays-ev-charging/

Requirements for home charging

To understand what is required, the following will be a bit technical.

Units and definitions:

- Alternating Current (AC). What the grid provides
- Direct Current (DC). The current that goes in or out of the car battery
- Ampere (A). Unit to measure electric current
- Volt (V). Unit to measure electric potential
- Watt (W). Unit to measure electric power. Power = current * voltage.
- Kilowatt (kW) = 1000 watts. A standard electric heater on full power is usually rated 2.4 kW, which equals 10 A @ 240 V, the maximum for a 10 A GPO.
- Kilowatt hour (kWh) = 1 kW power delivered during one hour. Unit to measure energy
- Electric Vehicle Supply Equipment (EVSE). The interface between the AC supply and the car to control and monitor the charging.



EVSE, controlled by available solar power to maximize renewable energy use while charging

Most electric cars have two modes of charging:

1. By connecting an AC source from the grid to the car, which has an integrated charger. The conversion to DC for the battery takes place in the onboard charger. The charging process is controlled and monitored by the EVSE (see above). This is how the EVs are charged in the home environment.

2. DC fast charging. When using this mode of charging, the charger is external to the car and it is plugged in to the car in such a way that the DC will be directly fed to the battery. This type of charging is used to fast charge the car, for example at charging stations along the highway. The power requirements for this type of charging are such that it is not feasible to use in a home environment. The advantage is that a car can be charged very quickly.

For the home charging to be practical, the following requirements need to be met:

1. Enough “grunt” in the supplied power source. The charger capacity in most new cars is rated at around 6 kW. To charge a car with a 60 kWh battery, fully discharged, would take 10 hours. In order to cope with 6 kW power requirement (single phase supply) a circuit breaker or RCD rated 32 A is required. A 4 or 6 mm sq cable will be required and it needs to be hardwired to the EVSE.

To future proof the building, the incoming supply needs to be rated so it can handle the expected future uptake of electric cars.

2. The supply has to be metered. By our own experiences, the daily average energy used for the car is around 4-5 kWh, which, with a power price of 30 cents/kWh, equals $1.50/day and for a year $550. This can obviously vary considerable, depending on the driving pattern. But, as it will be a significant amount, the metering needs to be done for each individual dwelling for it to be fair to all residents.

There are other factors to consider, such as smart meters. As the amount of solar generated power increases with peaks around midday, incentives, such as time of use (TOU) metering, will most likely be introduced to avoid that all cars are charged simultaneously during the afternoon/evening. We usually charge our car during the day when we have enough solar generated power to charge the car. My estimate is that the energy we use for the car is 80% generated by solar power.

We think the ideal scenario is that each parking space will have an individual cable that ran back to the meter, wherever that will be located.

The next best thing will be to have cables running from the meters to electrical junction boxes, located strategically in the garage space. Residents with electric cars would have to pay for an electrician to run the cable from this junction box to the car space.

We think that an option of having a car space, prepared for EV charging, should be offered as an inclusion.

One idea is that the residents that take up this inclusion could have their parking spaces grouped as to reduce the amount of wiring in the parking area.

It is also important that the Strata bylaws allow for electric vehicles to be charged in the garage.

It is our firm belief that the inclusion of charging facilities for electric cars in the building will significantly increase the resale value of the apartments and, consequently, will also benefit owners without an electric car.

Stockton, 6/8 2018

O. Scholin
12 King Street
Stockton

oscholin@bigpond.com