RAC response to the proposed access arrangement revisions for the Western Power network 2022/23 – 2026/27

April 2022

For the better

RAC's Response to the Issues Paper on Proposed revisions to the Access Arrangement for the Western Power Network 2022/23 – 2026/27

RAC thanks the Economic Regulation Authority (ERA) for the opportunity to respond to the Issues Paper on Proposed revisions to the Western Power Network Access Arrangement 2022/23 - 2026/27 (AA5) (Issues Paper).

RAC is a purpose-led member organisation representing 1.2 million members, in 60 per cent of Western Australian (WA) households. Our purpose is to be the driving force for a better WA and our vision is for a safer, sustainable and connected future for Western Australians. In working towards this, our social and community impact activities include promoting and supporting options that will help reduce vehicle emissions for cleaner and healthier air.

While not responding to the specific questions raised by the ERA in its paper, our submission is focused on key issues surrounding electric vehicle charging (EVs) and, in particular, tariffs related to EV charging infrastructure and installation.

Air pollution in Australia

In 2018 3,236 Australian deaths (two per cent of total deaths) and 1.3 per cent of all injury and disease, particularly cardiovascular (5.8 per cent), endocrine disease (5.4 per cent) and respiratory illness (3.2 per cent), can be attributed to air pollution including from transport sources[1].

[1] Australia Institute of Health and Welfare (2021), Australian Burden of Disease Study Impact and causes of illness and death in Australia 2018. Accessed at https://www.aihw.gov.au/getmedia/5ef18dc9-414f-4899-bb35-08e239417694/aihw-bod-29.pdf.aspx?inline=true

Through the Paris Agreement, the Australian Government has committed to reducing Australia's greenhouse gas emissions by 26 to 28 per cent below 2005 levels by 2030[2] and in 2021 committed to net zero carbon emissions by 2050[3]. Further, the Western Australian State Government has also committed to net zero carbon emissions by 2050[4].

Transport is responsible for 19 per cent of Australia's total greenhouse gas emissions and over 26 per cent of total CO_2 emissions, with cars and light commercial vehicles alone being responsible for 12 per cent of greenhouse gas emissions and 16 per cent of CO_2[5]. On a per capita basis, Australia's emissions are almost twice (92 per cent greater than) the OECD average[6]. According to the Australian Government, even with the current trend in vehicle efficiency improvement, the growth in the light vehicle fleet will add an estimated eight million tonnes of greenhouse gas emissions[7] to the current 45 million tonnes of greenhouse gas caused by cars (alone) each year[8]. The continued growth would also add an additional $5 billion in energy costs to the economy per year by 2030[9].

In addition to CO_2, vehicles emit oxides of nitrogen (NOx), hydrocarbons (including methane, benzo[a]pyrene, toluene and xylene), carbon monoxide (CO), oxides of sulfur (SOx), ozone (O3) and particulate matter (PM). All of these emissions impact negatively on human health and/or the environment:

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[2] Department of Industry, Science, Energy and Resources (2022), International climate change commitments. Accessed at https://www.industry.gov.au/policies-and-initiatives/international-climate-change-commitments#:~:text=Under%20the%20Paris%20Agreement%2C%20Australia,below%202005%20levels%20by%202030.

[3] Department of Industry, Science, Energy and Resources (2021), Australia's whole-of-economy Long-Term Emissions Reduction Plan. Accessed at https://www.industry.gov.au/sites/default/files/October%202021/document/australias-long-term-emissions-reduction-plan.pdf

[4] WA Government (2022), Western Australian Climate Change Policy. Accessed at https://www.wa.gov.au/service/environment/environment-information-services/western-australian-climate-change-policy

[5] Department of Industry, Science, Energy and Resources (2021), National Greenhouse Gas Inventory – Paris Agreement Inventory. Accessed at https://ageis.climatechange.gov.au/

[6] OECD (2021), OECD Data Air and GHG emissions. Accessed at https://data.oecd.org/air/air-and-ghg-emissions.htm

[7] Department of Infrastructure and Regional Development (2016), Improving the efficiency of new light vehicles Draft Regulation Impact Statement December 2016. Accessed at https://www.infrastructure.gov.au/sites/default/files/migrated/vehicles/environment/forum/files/Vehicle_Fuel_Efficiency_RIS.pdf

[8] Department of Industry, Science, Energy and Resources (2021), National Greenhouse Gas Inventory – Paris Agreement Inventory. Accessed at https://ageis.climatechange.gov.au/

[9] Department of Infrastructure and Regional Development (2016), *Improving the efficiency of new light vehicles Draft Regulation Impact Statement* December 2016. Accessed at https://www.infrastructure.gov.au/sites/default/files/migrated/vehicles/environment/forum/files/Vehicle_Fuel_Efficiency_RIS.pdf

- NOx effects the respiratory system, and can form smog and acid rain;
- hydrocarbons include known carcinogens and hydrocarbons such as methane has 21 times the global warming impact of CO_2;
- CO deprives the blood of oxygen and contributes to greenhouse gases;
- SOx impacts on the respiratory system and creates sulphuric acid creating acid rain;
- ozone can be both good and bad for human health (naturally occurring ozone occurs in the upper atmosphere, while tropospheric or ground level ozone is caused by chemical reactions from pollutants and is toxic to human health); it impacts negatively on the respiratory system and is a main contributor to smog; and
- PM can be inhaled, causing serious health problems.

Banning the sale of internal combustion engines

Across the globe several countries have announced they will be banning the sale of new petrol or diesel internal combustion engine (ICE) vehicles, see Figure 1 (below)[10], and recently the European Union (EU) has proposed to ban the sales of ICEs across the EU from 2035[11]. A number of other countries have also signed the COP 26 declaration to *'put in place policies to accelerate uptake of zero emission cars, vans, buses and trucks… to commit to ensuring all new car and van sales are zero emission vehicles by 2035 (advanced markets) or 2040 (all other markets)'*[12]. In Australia, ACT, SA, Victoria and NSW have all signed up to the zero emissions vehicle pledge (banning fossil fuelled vehicles) by 2040, independent of the Australian Government[13].

[10] International council on clean transport (2021), *Update on government targets for phasing out new sales of internal combustion engine passenger cars*. Accessed at https://theicct.org/wp-content/uploads/2021/12/update-govt-targets-ice-phaseouts-jun2021_0.pdf
[11] Reuters (2021), *EU proposes effective ban for new fossil-fuel cars from 2035*. Accessed at https://www.reuters.com/business/retail-consumer/eu-proposes-effective-ban-new-fossil-fuel-car-sales-2035-2021-07-14/
[12] UN Climate Change Conference 2021, *Transport Accelerating the transition to zero emission vehicles*. Accessed at https://ukcop26.org/transport/
[13] Which car? (2021), *NSW, Victoria, SA and ACT join six carmakers to axe fossil-fuel vehicles by 2040*. Accessed at https://www.whichcar.com.au/news/nsw-victoria-act-join-carmakers-cop26-2040-deal

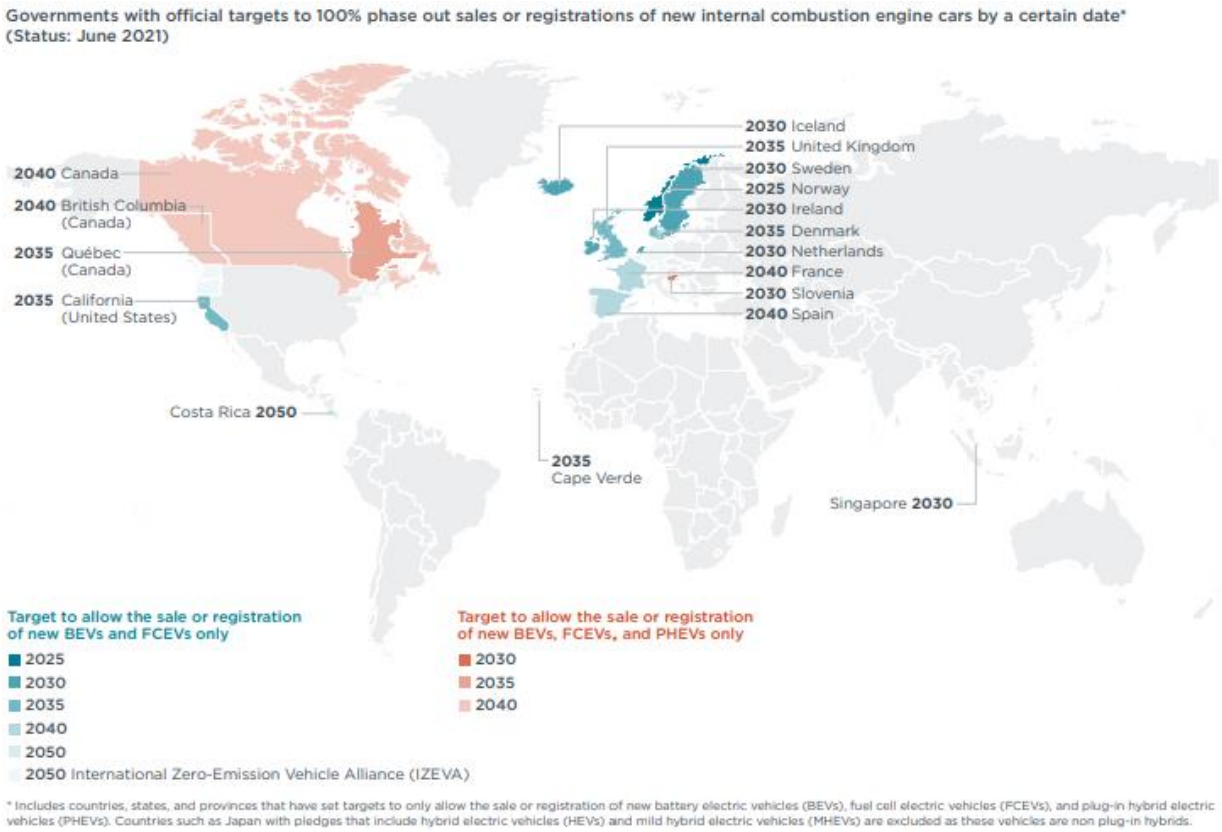

Figure 1: Countries banning ICEs

EVs and EV charging

EVs, will play a role in reducing vehicle emissions, particularly when charged through renewable energy. There are a number of different 'levels' of charging currently available for EVs. At-home charging through a standard wall plug, up to 2.3 kW, is suited to overnight or longer charges as is can provide approximately 3km of range in about 15 minutes. Standard AC chargers charge up to 22kW, providing approximately 30km of range in about 15 minutes. Fast DC chargers are typically about 50kW and provide about 60km of range in approximately 15 minutes. In recent years we have seen the emergence of ultra-rapid chargers which can provide up 350kW charge – or approximately 400kms range in about 15 minutes. There are also Tesla Superchargers which are approximately 120kW and up to 250kW internationally, and exclusively for Tesla charging. These charging levels are current-day options; although it may be assumed as the technology is further refined and improved, different or greater electricity may be required by EV chargers. It is also important to note charging times and kWh supply can vary depending on the charger itself and the electricity supply it has connected, the EV and how full the battery is before charging[14,15]. In the five years since the previous review, we have seen an increase from 50kW as the highest charging output rate in Australia, increase seven-fold to 350kW.

[14] Chargefox (2021), Our network. Accessed at https://www.chargefox.com/network/#:~:text=How%20long%20does%20it%20take,or%20200kms%20in%208%20mins.
[15] Chargefox (2022), EV facts. Accessed at https://www.chargefox.com/ev-facts/

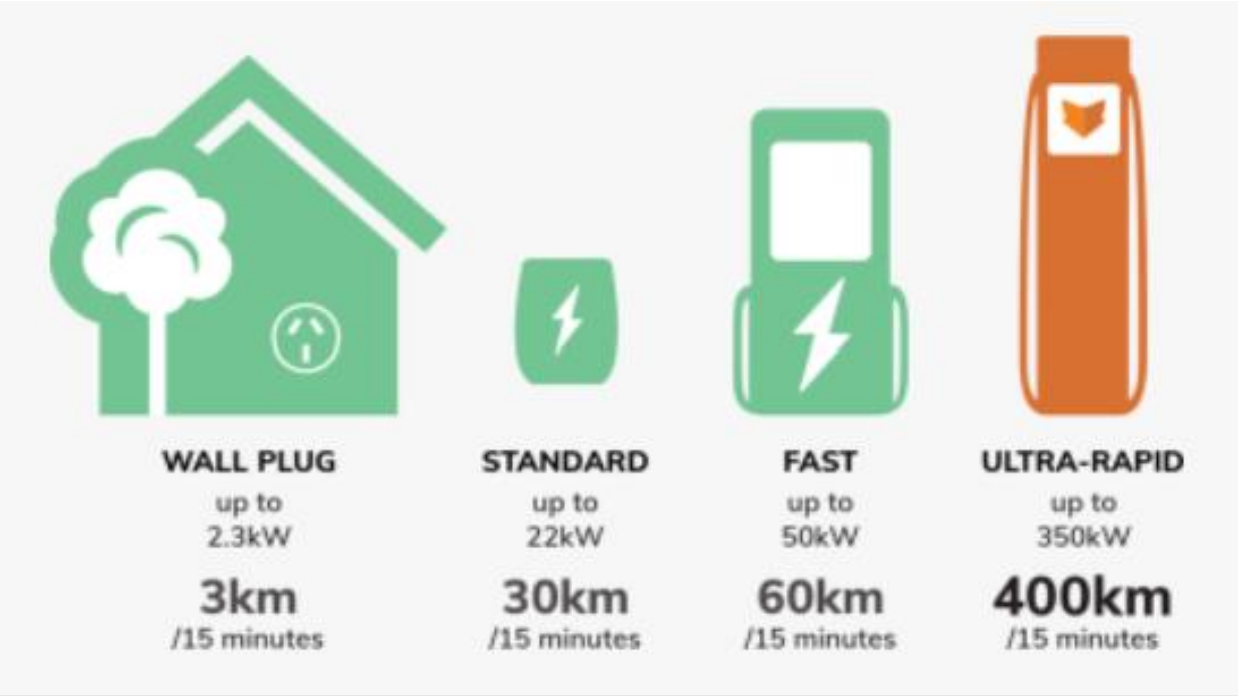

Figure 2: Charging times and electricity[16]

In 2015, RAC planned, funded and installed Australia's very first EV charging highway, providing 11 fast charging stations between Perth and Augusta to open up the South West to EV drivers. The RAC Electric Highway® has since been expanded and now features a network of 16 locations with publicly accessible EV chargers, including 12 fast and ultra-rapid charging stations, between Perth and Esperance and to the north in Monkey Mia. To deliver the network, RAC partnered with local governments, who now own and maintain the stations. RAC was also pleased to partner with Chargefox in the launch the State's first two ultra-rapid chargers in Australind and West Perth. As of this year, eight fast and ultra-rapid stations have been transitioned to green energy.

Currently, in WA there are over 3,700 EVs – more than ten times the number less than five years ago, and over 80 per cent of these are battery EVs[17]. Over the last six months of 2021, the proportion of EVs of overall new vehicle sales increased from approximately one per cent to approximately three per cent. There are also now over 300 dedicated EV chargers across the state, with 38 of these fast or ultra-rapid chargers[18].

[16] Chargefox (2021), Our network. Accessed at https://www.chargefox.com/network/#:~:text=How%20long%20does%20it%20take,or%20200kms%20in%208%20mins.
[17] Department of Transport WA communication.
[18] Plugshare. Accessed at https://www.plugshare.com/

Charger installation

In terms of installing fast and ultra-rapid DC EV chargers, the requirements are unique from most other power supply arrangements. These charging stations often require a transformer to be installed/upgraded or an upgrade to the existing power supply. Large-scale electricity is required for relatively short periods of time, in very small and localised areas. As Levels 3 and above charging infrastructure (i.e. fast and ultra-rapid) demand increases, so will the requirements for these energy intensive upgrades.

Current 'standard' or 'BAU' electricity supply and access-demands include business and residential users, and demand that is assumed to be reasonably consistent and forecastable. These locations, for the most part, would be on land that is already fit for purpose, or within close proximity to appropriate power supply, and given the 'standard' nature of most requirements, without large, additional or costly works required. **However, the installation and overall cost of public fast and ultra-rapid EV charging stations, particularly in light of electricity capacity investigation and redirection/upgrade costs, will for the most part mean EV charging infrastructure is at risk of being unviable, for either commercial providers or community-based providers and organisations, such as local governments.**

Determining an appropriate place to access a sufficient and cost-effective power supply, coupled with convenience, is of the highest importance particularly for fast charger installations in WA. **Accessibility and the knowledge requirements to determine a suitable location is complex, and an appropriate and standardised mechanism needs to be in place to allow for a cooperative approach to accessing supply. Such a mechanism or indicators should ensure it is viable for private enterprise, in addition to or instead of Government, to enter into a large-scale roll out of publicly available charging infrastructure.** The NSW Government has recently released the 'Master plan map' which incorporates:

- projected EV adoption in the area;
- traffic movements;
- tourism data;
- vehicle ownership;
- local points of interest;
- location of major cabling across NSW; and
- available substation capacities[19].

[19] NSW Government (2021), *Electric vehicle fast charging master plan*. Accessed at https://www.energysaver.nsw.gov.au/reducing-emissions-nsw/electric-vehicles/electric-vehicle-fast-charging-master-plan

The Master plan (See Figures[20] 3 and 4 below) allows for in-depth analysis of charging infrastructure installation viability coupled with future demand.

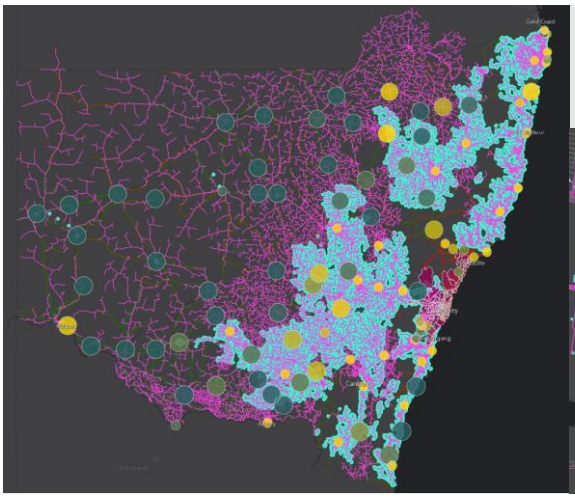

Figure 3: NSW Master plan - Whole State

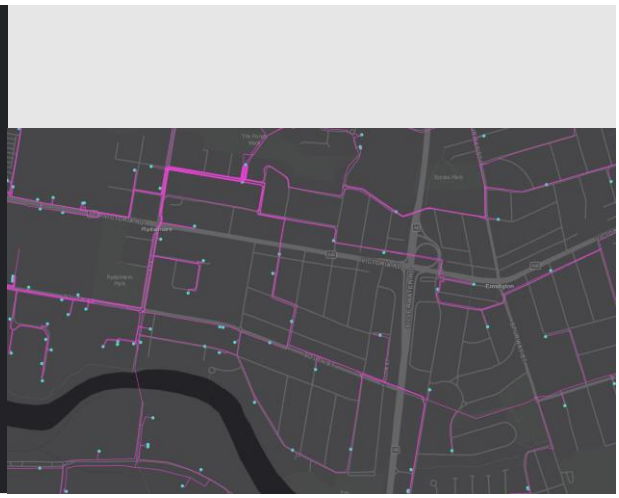

Figure 4: NSW Master plan – zoom

There is also a need to ensure increasing EV numbers do not impact on the State's electricity supply during peak demand periods and this may be alleviated or avoided by investigating the introduction of smart metering and monitoring. This would enable and encourage EV owners charging at home, to do so during non-peak times and in the long term may assist in smoothing peak electricity demand periods for all users.

Proposed tariffs

The proposed tariffs for energy consumption should ensure they adequately price-signal the consumer to charge – and use electricity – during the periods when Western Power is experiencing peak periods of electricity supply onto the network. As discussed in the Issues Paper, **the introduction of a 'very-low super off-peak rate' is welcomed to encourage charging at a time when energy is plentiful, and especially during peak times of renewable energy out-put through solar and rooftop solar photovoltaic (solar PV) - further reducing the emission of EVs.**

In the absence of smart meters, price-signalling the consumer will be the most effective way of nudging consumer behaviour to be consistent with excess supply of electricity. **At the retail side – smart meters should also be encouraged to ensure consumers have the ability to control their EV charging and align this to periods of low electricity demand, and in times of excess supply.**

[20] NSW Government https://nswmaps.evenergi.com/

Similarly, any proposal for dedicated EV charging station tariffs should ensure that they are appropriate and reflective of the increasing need for public EV charging stations, noting the current nature of public EV charging which is sporadic and unpredictable and may not be in great demand until there are more EVs on the road.

Given the potential for EVs to help stabilise the grid and soak up 'excess electricity', the overarching **Western Power cost arrangements for the assessment and installation of EV chargers for public access, should ensure they are not cost-prohibitive and as a flow on – reduce the grid's ability to rely on technologies such as EVs to help stabilise the peaks.** The unique requirements of EV charging infrastructure, as well as the role it plays in helping EV uptake should be considered.

The emissions reduction potential of EVs (and the need for associated charging infrastructure) should also form part of Western Power's climate change action plan, and consideration should be given, amongst other things, to facilitating both at-home and publicly available charging infrastructure, and future vehicle to grid (V2G) export.

Western Power should continue to increase the renewable generation components of the electricity generation network, while maintaining grid stability. Western Power should work to achieve at least 50 per cent renewable generation as soon as possible before 2031.

We trust RAC's response, which recognises the need for industry and regulators to work together to prepare for and support the ongoing and increasing growth of EVs, while ensuring a sufficient and appropriate rollout of public and private EV charging infrastructure, adequately highlights the unique electricity access requirements and complexities surrounding EV charging infrastructure in WA. To support the critical uptake of zero emissions transport, we ask that both the ERA and Western Power give adequate consideration to these issues throughout the review, more broadly, and beyond. Ensuring that EV charging today and into the future is adequately supported by Western Power is essential and should include appropriate price signalling for increased installation of EV charging infrastructure and off-peak charging through tariff structures. Further, Western Power should ensure its future climate commitments and EV strategies are actioned as soon as possible.

At the State and Federal levels, RAC is working to encourage activities, policy, incentives and infrastructure that accelerate the transition to clean transport. Our *State Budget Submission 2022-23*, which covers our longstanding strategic infrastructure and policy priorities for a sustainable WA, includes working with the Federal Government to ensure introduction of an impactful light vehicle CO_2 emissions standard; increasing the uptake of EVs in the State Government fleet; introducing tax incentives; and improving consumer information.