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Evaluation of Australian electric vehicle charging policies through a social justice perspective

Isrrah Malabanan[1], Patricia Sauri Lavieri[1], Iderlina Mateo-Babiano[2]

[1]Department of Infrastructure Engineering, The University of Melbourne, Parkville, VIC 3052

[2]Faculty of Architecture, Building and Planning, The University of Melbourne, Parkville, VIC 3052

Email for correspondence: patricia.lavieri@unimelb.edu.au

1 Introduction

Conversion to electric vehicles (EVs) will contribute to global sustainability goals and local climate change and transport targets. In Australia, EVs accounted for about 8.5% of new vehicle sales in 2023 (Electric Vehicle Council 2023). Further growth is expected with the enforcement of the New Vehicle Efficiency Standard (Australian Government 2024) in 2025. To support, necessary EV charging infrastructure are being planned and deployed by the government and charging service providers, while some users are installing the infrastructure at home.

We highlight the role of government interventions in prioritising equity[1] over efficiency[2] in EV charging infrastructure distribution. While efficiency may be appealing from a business standpoint, prioritising equity will ensure mainstream consumers are served in the future, avoiding "charging deserts" (i.e., communities with limited or no EV charging resources) and providing access to dwellings without off-street parking (Hardman 2021). Thus, prioritising equity in charging infrastructure distribution helps ensure that all communities can benefit from EV adoption.

A thorough review and understanding of government policies can help identify equity-focused gaps and highlight opportunities to improve access to EV charging. Such equity-focused assessments of EV charging policies are still missing in Australia. Most of the existing documents providing policy reviews are limited to general overviews (e.g., Electric Vehicle Council 2023). In this abridged paper, we evaluate Australian policies associated with EV charging from an equity-focused standpoint and a social justice lens. This means that besides considering equitable allocation of charging infrastructure, we also recognise users' diverse personal and social circumstances and how these should be included in policy and decision-making processes, thus reflecting the social justice perspective. We introduce and adopt our EV charging capabilities (EVCC) framework to assess how different jurisdictions address charging disadvantage, which signifies the perceived and actual difficulties users face in accessing EV charging (Malabanan et al. 2024). In particular, we review state and territory EV strategies and action plans against the EVCC framework, providing insights into the overall accessibility of EV charging for the private fleet in the country. We also examine residential EV charging-related legislation and guidelines relevant for renters and multi-unit dwelling (MUD) residents using a case study of Victoria (VIC) to demonstrate the nuanced challenges in improving charging access for charging disadvantaged users.

[1] Equity targets underserved areas to facilitate broader EV uptake and serve those with limited access to charging infrastructure, which can result in higher initial costs and a longer time commitment to achieve a return on investment (Soltani Mandolakani and Singleton 2024). For clarity, we adapt Litman's definition of equity as "the distribution of benefits and costs, and the degree to which that distribution is considered appropriate" (Litman 2017).

[2] Efficiency focuses on areas with high EV ownership to meet demand and ensure quicker investment returns.

2 Review framework: Vulnerability to charging disadvantage

The EVCC framework conceptualises charging access as a user's capability and identifies its determinants (Malabanan et al. 2024). These determinants include conversion conditions which dictate how resources and instruments are effectively used to access EV charging. The four dimensions of conversion conditions are considered as vulnerability areas of charging disadvantage and are, in this abridged paper, employed as criteria to evaluate the policy documents: (1) **financial capacity** represents users' ability to afford EV charging technologies and services; (2) **internal personal conditions** refer to individual factors like physical and cognitive abilities, knowledge and skills, perceptions, and preferences; (3) **social roles and relations** pertain to users' identities within families, work, community, and institutions; and (4) **physical environment** encompass geographical settings, dwelling characteristics, and weather and climate conditions (Malabanan et al. 2024). Under the EVCC framework, government policies are structural conditions (encompassing broader social, economic, and political systems) that can influence the four vulnerability areas of charging disadvantage.

3 Method

Our review of Australian EV charging policies is divided into two parts. First, we examine state and territory strategies and action plans (Table 1) to identify equity-focused policy gaps. Second, we focus on residential EV charging policies using Victoria (VIC) as a case study[3]. We review relevant VIC legislation and guidelines for EV charging in MUDs and rentals (Table 2) due to the pronounced challenges residents in these properties face in accessing home charging, making them more vulnerable to charging disadvantage than homeowners of standalone dwellings (Malabanan et al. 2024). Additionally, the provision of charging for these properties is more complex than for detached houses with off-street parking (SCA 2023).

4 State and territory EV strategies and plans

Financial capacity is the most cited variable across all the policy documents. Funding opportunities for charging infrastructure installation are available for eligible households, councils, and businesses across different jurisdictions. Users can also benefit from cheaper late-night charging and daytime charging rates during peak solar energy production (e.g., Origin (2024)). However, the funding may favour users who take early initiatives as some grant schemes operate on a first-come, first-served basis (e.g., Government of Western Australia 2023; NT Government 2023). The grants may also be most beneficial to early adopters (i.e., high-income-earning homeowners (Lavieri and Bas Domenech 2021)), as applicants need to shoulder the remaining costs. Moreover, individuals unaware of these policies, lacking skills to navigate application processes, or who do not meet eligibility criteria may be left behind. Others may also be at a disadvantage in maximising tariff structure benefits due to their socio-temporal constraints (e.g., rigid work hours may limit off-peak charging times (Malabanan et al. 2024)). Notably, incentives specifically for low-income households are yet to be introduced.

Policies targeting users' **internal personal conditions** include inclusive provisions for the physically, cognitively, and technologically disadvantaged such as (micro)accessibility design guidelines (Austroads 2022). While these are applied in government-funded public charging stations, they are yet to be strictly applied to privately-owned EV charging, such as in MUDs. Moreover, inclusive EV charging also requires operational standards like minimum availability uptime, diverse payment options, and safety considerations (Energy and Climate Ministerial Council 2024). A positive step in this direction is SA's plan for Plug-and-Charge technologies which allow charging without mobile phones or membership cards (Government of South

[3] We chose to focus on VIC because of its significance to our primary data collection, aiming to build on and refine the findings in this paper.

Australia 2020) Yet, the implementation and related data security concerns are yet to be further assessed for such technologies. Furthermore, initiatives like ACT's limited free consultations for EV readiness (Urbis 2022), QLD's one-stop shop information hub (State of Queensland 2022b), and VIC's collaboration with Victorian Greenhouse Alliances (State of Victoria 2021) aim to boost consumer awareness. However, their reach and sustained engagements still need to be assessed and validated.

Table 1: List of state and territory EV policy documents reviewed

	Document
ACT	ACT's Zero Emissions Vehicles Strategy 2022-30 (ACT Government 2022a)
	The ACT's Transition to Zero Emissions Vehicles: Action Plan 2018-21 (ACT Government 2018)
NSW	NSW Electric Vehicle Strategy (NSW Government 2022)
NT	Northern Territory Electric Vehicle Strategy and Implementation Plan 2021-26 (NT Government 2020)
VIC	Victoria's Zero Emissions Vehicle Roadmap (State of Victoria 2021)
QLD	Queensland's Zero Emission Vehicle Strategy 2022–32 (State of Queensland 2022b)
	Queensland's Zero Emission Vehicle Strategy - Action Plan (2022–24) (State of Queensland 2022a)
SA	South Australia's Electric Vehicle Action Plan (Government of South Australia 2020)
TAS	Tasmania's Climate Change Action Plan 2023-25 (ReCFIT, 2023)
	Fact Sheet - Supporting Electric Vehicle Uptake (Tasmanian Government 2021)
	Electric Vehicles in Tasmania: Current State of Play (Tasmanian Government 2018)
WA	State Electric Vehicle Strategy for Western Australia (Government of Western Australia 2020)
	Electric Vehicle Action Plan (Energy Transformation Taskforce 2021)

Note: ACT= Australian Capital Territory, NSW=New South Wales, NT=Northern Territory, VIC=Victoria, QLD=Queensland, SA=South Australia, TAS=Tasmania, WA=West Australia

Table 2: Key residential charging policy documents reviewed

Type	Title
Legislation (VIC-specific)	*Planning and Environment Act* 1987 (Vic)
	– Victoria Planning Provisions
	– Planning schemes
	Subdivision Act 1988 (Vic)
	Owners Corporation Act 2006 (Vic)
	Residential Tenancies Act 1997 (Vic)
Guidelines (VIC-specific)	Guidance for Owners Corporations to make their buildings EV-ready
Standard (non-VIC-specific)	National Construction Code
Report (non-VIC-specific)	SCA: Electric Vehicles in Strata

The mentions to **social roles and relations** are focused on the provision of destination charging for tourism purposes, with limited emphasis on scheduling convenience, which refers to the ease and flexibility of planning EV charging times while accommodating users' social engagements. Notable initiatives include locating charging infrastructure in "areas where people are parked for long periods" (State of Queensland 2022b), within "activity centres" (State of Victoria 2021), and at commuter car parks (NSW Government 2022). Ensuring reliability is also key, as evident in guidelines on annual uptime for public charging stations (Energy and Climate Ministerial Council 2024). However, attention to managing shared chargers, particularly in MUDs, is limited, which may lead to users experiencing long wait times and scheduling challenges. Moreover, bridging the homeowner-renter gap in charging access is important. ACT leads in this area, reviewing Residential Tenancies Act 1997 (Urbis 2022) and providing guidance on charger installation in rentals (ACT Government 2022a).

Constraining **physical environment** aspects include residing in charging deserts and MUDs, and not having assets such as rooftop solar and smart chargers (Malabanan et al. 2024).

Residents of charging deserts can benefit from equitable charging infrastructure distribution, like NSW's plans to provide ultra-fast chargers within 5km of areas with limited off-street parking (NSW Government 2022) and ACT's expansion of public charging in areas "where home charging is not a possibility" (Urbis 2022). For MUD residents, the addition of EV readiness provisions for new developments under the National Construction Code (NCC) (ABCB 2022), strata EV readiness guidelines (ACT Government 2022b; NSW Climate and Energy Action 2023; State of Victoria 2023), and lowering of voting threshold for sustainability items (Strata Schemes Management Amendment (Sustainability Infrastructure) Bill 2021 (NSW)) set positive steps for streamlining charging infrastructure installations in their residences. However, beyond VIC's and SA's strategies to support smart charging in residential buildings (Government of South Australia 2020; State of Victoria 2021), government policies about the integration of EV charging with rooftop solar and smart charging technologies in MUDs remain limited.

5 Residential charging policies in VIC

Our review of state and territory EV policies reveals uneven emphasis on different areas of vulnerability to charging disadvantage, with scheduling convenience being one of the least addressed. Malabanan et al. (2024) highlight that residential charging offers an optimal solution for this; and so, we also investigate residential charging policies, using VIC as a case study. Recent NCC amendments mandating EV charging infrastructure in new Class 2 buildings (i.e., buildings with at least two sole-occupancy units) (ABCB 2022) are improving charging access for new builds but leaving challenges for existing MUDs and rentals.

Upgrading existing MUDs for EV charging is costly, especially older buildings. The division of costs will depend on the strata ownership structures (SCA 2023). However, the Owners Corporation Act lacks clarity on EV-specific provisions, unlike for solar energy panels. Determining how EV charging infrastructure requests are decided by the OC is also complex; where significant alterations or upgrading works to common property require a special resolution (75% votes), while maintenance plan amendments only require ordinary resolution (50% votes) (Owners Corporation Act, ss 37, 52-53). Furthermore, meeting the required vote thresholds may be difficult, leading to a delayed full upgrade approach to charging infrastructure installation, which can subsequently result in inequities in the long run (State of Victoria 2023). Contrarily, when OCs are willing to install but lack technical knowledge, stakeholder guidelines are necessary. VIC's development of an EV-ready factsheet (State of Victoria 2023) is a positive development, which could be improved by adding guidance on addressing equity issues, cost distributions, and defining stakeholder roles.

Tenants have limited ability to modify rented premises. They need landlord consent for any unprescribed changes (Residential Tenancies Act, s 64), which can be challenging due to split incentives (SCA 2023). Currently, VIC's Residential Tenancies Act lacks specific provisions for EV charging infrastructure, making it difficult for renters to request installations and for willing stakeholders to navigate the process. Right-to-charge laws can help by clearly specifying stakeholder roles, responsibilities, and cost allocation schemes.

Some MUDs and rentals lack off-street parking. As a result, they are forced to rely on other charging alternatives like kerbside charging. There are a few local government initiatives on kerbside charging (Merri-bek City Council 2023; City of Stonnington 2024; Port Phillip Council 2024); but, safety regulations for these services are yet to be established. We also emphasise the importance of distributing public charging infrastructure (i.e., destination and en-route chargers) that target users who depend on them, especially those without home charging.

6 Conclusions

Our review of Australian EV charging policies reveals significant opportunities to consider equity in planning and providing charging access. Key policy gaps identified include:

- More effort is needed to financially support the proactive provision of charging access to mainstream consumers and late adopters like low-income households and multi-unit dwelling (MUD) residents.
- Inclusive guidelines are notably absent in private charging settings. Mandating accessible charging infrastructure and easy-to-use technologies can improve charging access for the physically, cognitively, and technologically disadvantaged users.
- Innovative business models and targeted policies are needed to promote scheduling convenience and flexible energy use, yet current efforts overlook the importance of strategically distributing charging infrastructure and designing service operations to minimise disruptions to users' typical travel and activity routines.
- Streamlined charging provisions in existing MUDs and rentals require both legislative amendments (e.g., right-to-charge laws) and clear stakeholder guidelines and processes.
- Lowering voting thresholds for charging installation in strata could ease implementation.

Overall, our findings reiterate the pivotal role of policies in providing equitable charging access, particularly to charging disadvantaged users. Future research can delve into other indicators of inclusive assessments, state of practice evaluation, and empirical investigation.

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