JETCHARGE

Unit 10, 350 Bridge Road
Port Melbourne
VIC 3207
Australia
jetcharge.com.au

To the

Energy Security Board

By email: info@esb.org.au

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Non-confidential

JET Charge Pty Ltd Response to Electric Vehicle Smart Charging – Issues Paper

Background

JET Charge Pty Ltd (**JET Charge**) provides this submission in answer to questions relating to electric vehicle (**EV**) charging in the ESB's *Electric Vehicle Smart Charging Issues Paper* (**Issues Paper**). We are an industry participant with extensive technical knowledge of chargers and related software for control at both the individual charger as well as energy management (including load management) level.

As one of the leading providers of both residential and commercial charging, we also have extensive frontline knowledge of consumer concerns, and the impact of government involvement including funding and regulation, in the growing EV charging sector in Australia.

Electric Vehicle Council Submission

JET Charge is a member of the Electric Vehicle Council (**EV Council**), the national body representing the electric vehicle industry in Australia. The EV Council aims to accelerate the electrification of road transport for a more sustainable and prosperous Australia. It does this through focussing on both consumer awareness and education as well as regulatory advocacy.

JET Charge has had the opportunity to review the EV Council's submission on the Issues Paper. We consider that that submission provides valuable insights, and endorse it in full. In addition, we would like to provide some additional insights as set out below.

JET Charge's Expertise

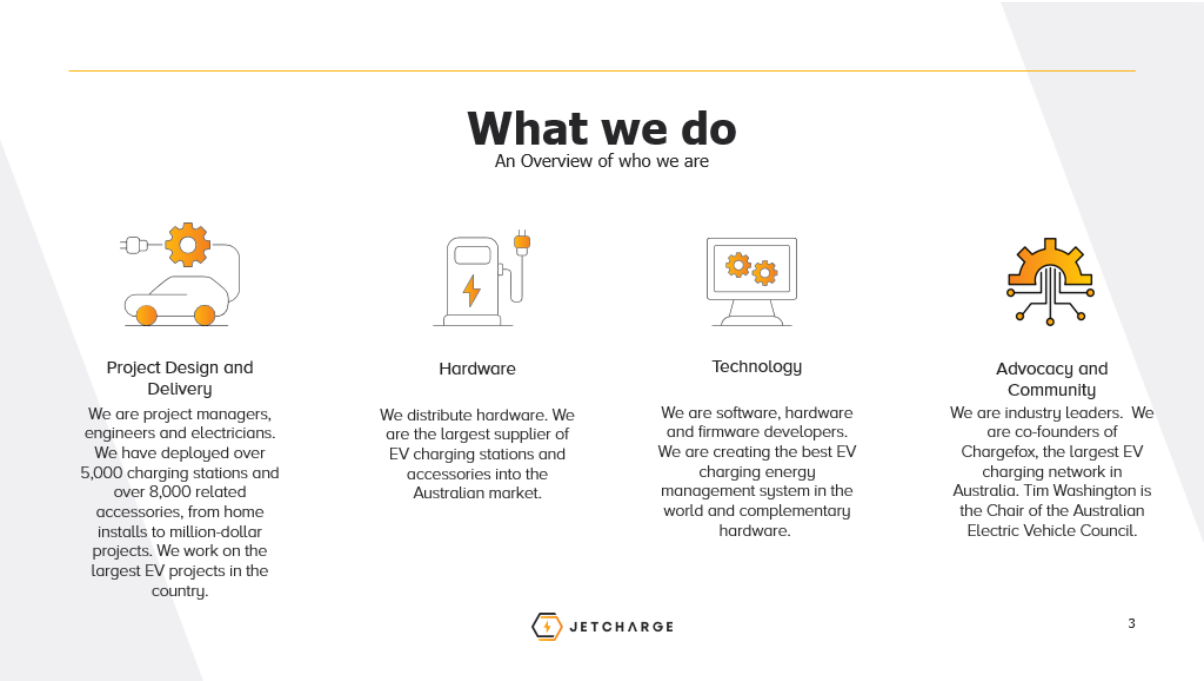

Table 1: JET Charge Overview

Regulatory Balance

There is a clear policy goal of lowering carbon emissions by increasing the number of EVs over time. To make this change sustainable, the grid needs to be able to support the increased energy demand. However, we consider that mandating or mandating limits to the amount of energy or the time when consumers can draw energy for EV charging should be an option of last resort. Our frontline experience tells us that consumers and businesses do choose to opt in and do change their behaviour based on incentives. This, coupled with the fact that EV users always have the option of trickle charging available to them, which results in a total lack of visibility or control, means that incentives (in conjunction with a requirement that all EVSE be smart chargers) are a much more effective way of achieving the policy objectives of grid regulation.

Control through EVSE, not car

The issues paper proceeds from an assumption that energy management occurs at the level of the EVSE, as opposed to the EV. This is evident, for example, in discussing minimum charging equipment standards in the Issues Paper.

We agree with this approach for the following reasons:

- allowing energy management to occur at the vehicle level will make regulation for grid stability very difficult – vehicles are not electrical devices and fall outside the ambit of energy regulation; in contrast, EVSE are electrical devices and already fall within the ambit of energy regulation, meaning that amendments would be relatively minor;
- the software developed by vehicle manufacturers are done so using proprietary code that differ across each manufacturer, resulting in difficult and fragmented integration and regulation, including certification and enforcement; in contrast, EVSE are developed using the

one standard Open ChargePoint Protocol, allowing for streamlined and standardised regulation and enforcement.

Responses to questions in the Issues Paper

JET Charge provides responses to specific questions in the Issues Paper as detailed below.

Question 15)

Do stakeholders have any views on aspects of cybersecurity for EV charging that are specific to Australia, or that would require a departure from European and/or US standards?

Noting that no specific standards have been stated, we would just highlight that any conduits for mandatory control of electric chargers would provide a potential avenue for an orchestrated cyberattack. This could occur switching chargers on, off, or combinations thereof.

As detailed in the EVC's submission, orchestrated "all-on" attacks at a time when many EVs are connected to EVSE poses a very real risk of high demand and ensuing damage to "street-level" distribution infrastructure. If mandatory control of EVSE is instituted, this should therefore only occur with appropriate consideration of and safeguards against such a scenario.

Question 16)

The ESB welcomes stakeholder views on barriers in existing regulatory and legislative frameworks that may be acting to limit the introduction of more advanced EV services such as Vehicle-to-Home (V2H), Vehicle-to-Grid (V2G), and Vehicle-to-Anything (V2X)?

Generally, harmonisation of requirements across jurisdictions is necessary to encourage industry to bring suitable products to market. One specific standard that needs review and amendments to better accommodate bidirectional EV charging is AS/NZS 4777.2:2020, for the reasons set out below. This has been discussed in detail in a summary of this aspect for the Realising Electric Vehicle to Grid Services (**REVS**) trial (*Lessons Learnt – Certification and Performance of Charger against AS4777.2:2022 Standard* see https://arena.gov.au/assets/2022/05/realising-electric-vehicle-to-grid-services-lessons-learnt-2.pdf). We highlight a few key points from that publication below. Stakeholders including the EVC standards bodies, and the Clean Energy Council could collaborate to revise/organise a revision of AS4777.2:2020 to better accommodate bidirectional EV charging technology.

As REV points out, the fundamental difficulty for bidirectional chargers passing AS/NZS 4777.2:2020 is that this standard categorises bidirectional chargers as a multiple mode inverter connected to a stationary battery. EVs should not be classified as a stationary battery because they are not fixed to a wall. The standard also presumes that the connected battery provides an earthing point. However, EVs clearly do not provide any electrical routes to earth because they rest on the ground on insulating rubber tyres. This is an issue that needs to be addressed in the review of AS/NZS4777.2:2020.

REV strongly recommended that AS/NZS 4777.2:2020 needs to be extended to include a dedicated classification and test procedure for bidirectional chargers. They also recommended that the classification of electric vehicle as a stationary "battery" should be changed to support bidirectional EV charging technology.

It would also be beneficial to adopt clearer nomenclature for AS/NZS4777.2:2020 that cover "bidirectional charging", "Vehicle-to-Grid (V2G)", and "Vehicle-to-Home (V2H)".

EVs are considered as a battery energy storage system (BESS) because an EV contains a battery energy source. AS/NZS 4777.2:2020 specifies in clause 2.4.27 that, for inverters used with battery systems, AS/NZS 5139 may apply for the requirement of earth fault alarm monitoring. However, it seems that AS/NZS 5139 does not apply to the electrical installation of battery systems in electrical vehicles. Earth fault alarm monitoring is not applicable to V2G chargers.

One practical example of standards and accreditation requirements not aligning leading to difficulties in implementing bidirectional charging for JET Charge arose in the context of providing, adapting and optimising EV charging equipment in the context of REVS trial.

Although JET Charge obtained the AS/NZS4777.2:2020 certification for the bidirectional charging hardware that is capable of V2G for the project, we continue to face a challenge with the Clean Energy Council (**CEC**) approval process. In order to roll out V2G technology at a commercial level, most DNSPs want CEC approval.

An electric vehicle cannot comply with AS/NZS 5139 because it isn't a stationary battery fixed to a wall. It would be helpful if the CEC could work with stakeholders to minimise the gap between standards that are relevant to bi-directional EV charging, for example AS/NZS4777.2:2020 and AS/NZS5139.

We would also like to raise a specific concern in relation to V2H where the home acts as a load with a changeover or transfer switch in the main switchboard (e.g., outlined as V2H-AC method in the EVC's submission). Back feeding, that is, to provide power to a home by connecting the V2L adapter to a power outlet, and allowing electrical power to flow in reverse (backwards) through the electrical distribution (& circuit breaker) board, can be a dangerous practice. It may pose safety issues, specifically the risk of electrocution or fire. For this reason, vehicle manufacturers that offer V2L using an adapter advise against back feeding.

Question 20)

Aside from the grandfathering issues for existing equipment, are there any other metrology issues concerning public charging that should be considered?

The National Measurement Act 1960 (Cth) requires EV charging stations, where used to bill customers for energy consumed, must comply with requirements for electricity metering under that Act, including certification of any meters by the National Measurement Institute (**NMI**). The NMI is currently taking an approach of acknowledging those regulatory requirements, but not enforcing such requirements. This creates uncertainty for suppliers of such infrastructure, and most importantly for the consumers and users of that infrastructure.

There would be a clear benefit in agreeing and communicating technical standards (including providing clarity on enforcement of the current requirements under the Act) for all EVSE as soon as possible.

JET charge would welcome the opportunity to answer questions or provide further information in relation to this submission. Please feel free to contact Tim Washington by email at tim@jetcharge.com.au.

Tim Washington CEO, JET Charge Pty Ltd