19 August 2022

Anna Collyer
Chair
Energy Security Board
Submitted via email to: info@esb.org.au

Dear Ms Collyer

Submission: Electric Vehicle Smart Charging Issues Paper

CS Energy welcomes the opportunity to provide a submission to the Energy Security Board's (**ESB's**) *Electric Vehicle Smart Charging Stations Issues Paper* (**Issues Paper)**.

About CS Energy

CS Energy is a Queensland energy company that generates and sells electricity in the National Electricity Market (**NEM**). CS Energy owns and operates the Kogan Creek and Callide B coal-fired power stations and has a 50% share in the Callide C station (which it also operates). CS Energy sells electricity into the NEM from these power stations, as well as electricity generated by other power stations that CS Energy holds the trading rights to, which includes an increasing number of renewable generation assets.

CS Energy also operates a retail business, offering retail contracts to large commercial and industrial users in Queensland, and is part of the South-East Queensland retail market through our joint venture with Alinta Energy. CS Energy is 100 percent owned by the Queensland government.

CS Energy has been focussed over the past 24 months on delivering electric vehicle charging solutions to its Government and commercial and industrial clients in Queensland. To do this, CS Energy has partnered with Australia's two leading suppliers and solution providers, being JetCharge and EVSE Australia. CS Energy supplies Queensland Government entities under a QFleet Standing Offer Arrangement to deliver high quality electric vehicle charging infrastructure. CS Energy is also TAFE Queensland's preferred supplier for charging infrastructure solutions.

Key recommendations

As Australia progresses towards a lower carbon footprint, the uptake of electric vehicles (**EVs**) and associated charging infrastructure is expected to increase. Given the expected penetration of Electric Vehicle Charging Stations (**EVCS**), the Issues Paper is timely.

CS Energy's comments draw upon its experience in delivering EV charging solutions to Government and commercial and industrial clients. CS Energy is supportive of the general approach the ESB has undertaken as outlined in the Issues Paper.

Standards and functionality

CS Energy agrees that standards to support the effective integration of charging devices for EVs should be a priority, with these charging needs differing between domestic and public settings. CS Energy is concerned that there may be a proliferation of "dumb" (non-smart) chargers in Australia in the absence of appropriate standards. Currently, there are many non-smart chargers available on the market and they are generally significantly cheaper than smart charging devices. Customers often opt for the short-term savings provided by non-smart charging devices over the longer-term benefits represented by smart capability.

Smart charging devices with associated connectivity facilitate the following functions:

- Remote software updates and data reporting. This data includes but is not limited to information on who is charging, when, which stations, over which selectable time periods and greenhouse reporting. It is anticipated that greenhouse and EV reporting will become increasingly important;

- Default and programmable load scheduling providing the ability to shape charge times during the most appropriate periods for the power system while still managing consumer needs. For example, charging outside of evening peak periods to avoid a more costly retail electricity tariff shape. The retail customer may wish to reduce charging activity in these less appropriate times, whilst still achieving 100% vehicle charging over the desired time period;

- Fixed and dynamic load management where chargers can be managed as an aggregate within set distribution board capacity limits. This facilitates the installation of more chargers for a given capacity which will be important for future expansion or in locations where electrical capacity might be limited. In the situation that all customers seek to charge at the same time, the chargers will automatically scale back as a group to keep within limits. If only a portion of EVs are plugged in at once, they can charge at full capacity. This functionality supports future growth of the EV industry, contrasting with the installation of non-smart chargers which cannibalise any remaining building capacity, preventing the installation of further chargers;

- User over-ride and remote load control;

- Ease of programming of RFID cards;

- QR code functionality allowing the customer to unlock the charger by scanning a QR code. This facilitates an efficient process for public charging with users invoiced individually via a mobile app;

- Supporting software and user app or connectivity interface to allow owner and/or consumer to interrogate data, set default charge profiles, adjust default profiles where required and set parameters to delay the start of charging; and

- Connectivity over a minimum of wi-fi but CS Energy suggests inclusion of cat 6 and 4/5G. Consideration could be given to mandating working connectivity at a future date.

As well as optimising the consumer experience, smart charging devices will benefit the power system in several ways. Initial benefits will be derived from shifting charging from peak times. Without smart chargers, it is likely that consumers will charge their EVs when they return home from work, adding non-controllable loads into the evening peak. Over the longer-term, benefits will arise from the ability to manage chargers over a wider network as a virtual power plant. This will become increasingly important with future integration of V2G and other chargers that inject electricity back into the network.

Further customer benefits can be unlocked in domestic environments with installed solar PV if smart chargers are capable of integration through Current Transformer (**CT**) clamps on solar PV feed with user capability to set charge rates to automatically follow the solar output. This provides a fully green option for the customer.

The ESB could consider mandating a minimum level of smart charging capabilities and connectivity for all AC and DC vehicle chargers sold with nameplate capacity rating of 5 kW or larger. This requirement should be introduced as soon as possible. CS Energy's preference is for this capability to mandated from 1 October 2023. This should be accompanied by restricting imports of non-smart charging devices of 5 kW or larger applicable from the same date.

Cost impost of smart charging

A key barrier to the uptake of smart charging is the current cost of the desired app and software especially when considered in addition to the cost of the charger and its installation (> $2,500). These costs exceed the benefits to the consumer, retailer and Distribution Network Service Provider (**DNSP**). For example, currently the cost of an appropriate software platform is around $15 per month. These functionality costs are ongoing and represent a sizable cost compared to the cost of electricity. Recovering these costs is difficult as the value proposition is currently not there for a retailer to offer a fully subsidised smart charging package.

Given consumers already have the option of charging their EVs through the 'dumb' boot charger, albeit at lower capacity, the cost of installation and ongoing functionality of smart chargers dilutes their appetite despite the benefit. The ESB should consider appropriate subsidy arrangements to help reduce this barrier to the electricity retailer and consumer. This would also have safety benefits as boot chargers have no smarts, no control and are only intended for top-up charging. A constant 2-2.4 kW load on an existing domestic power point represents fire hazard and safety concerns due to dated house electrical wiring, dated power points, connections/plugs and extension leads.

Building standards

The lack of appropriate building standards currently presents a barrier to the uptake of smart EV charging. New commercial and multi-story residential buildings (or those undertaking substantial renovations) generally do not consider provisioning for sufficient EV electrical capacity. Building standards need to require considerations such as suitably sized mains or sub-mains feeder, property or street transformer upsizing, provisioning of EV distribution boards etc.

Consumer choice and protection

Appropriate standards will ensure investment in EV chargers that have the capability to facilitate convenient and efficient charging behaviour. Unlocking this capability in an efficient

and effective way requires the right incentives and frameworks to be in place for consumers to manage their charging needs as well as allowing third-party controllability. Benefits, including those of load flexibility, will accrue from facilitating consumer flexibility while maintaining simplicity in the product offering.

Firstly, CS Energy considers that only AC chargers should be permitted in domestic environments unless the charger is a DC V2G charger. Chargers 5 kW or greater must be registered with the DNSP and electricity retailer. The registration process needs to be simple and could be coordinated by either the installer or the electricity retailer. Given their size, these chargers must be smart connected and available for load control.

Any party seeking to control the device must have an agreement or contract with the owner of the charging device. CS Energy considers the electricity retailer best placed to manage remote controllability as:

- This benefits the consumer as it means they only have one contract for their electricity;

- With the electricity retailer as the counterparty, the consumer has more choice and can shop around for a package offering that best suits them. For example, some retailers may subsidise the smart charger and they are likely best placed to share the benefits with the owner. If the consumer contracts with the retailer, it can access the most appropriate incentives and best value sharing arrangements without the problem of competing contracts or obligations. Conversely, if the DNSP is the default service buyer, the consumer has no flexibility and multiple contracts; and

- The DNSP can still benefit from the load control capability by purchasing load control from the electricity retailer. The DNSP will have visibility of the capacity in its network through the registration process.

Furthermore, there should be no central Charge Point Operator (**CPO**). Customers should have the flexibility to secure the best deal and arrangements which is likely to be via the electricity retailer's offering.

The Issues Paper provides a good discussion of tariffs and CS Energy reinforces the criticality of retailers being able to appropriately incentivise charging at times of system benefit through electricity tariffs, subsidies and other incentives.

Vehicle to Grid

The ESB should consider requiring all future EV imports to be capable of both AC and DC V2G functionality allowing both import and export of electricity via signal to the vehicle charger. Industry will need to develop the software required to unlock this capability and this may present cost barriers as per above.

For V2G chargers which utilise the EV battery to transfer electricity to or from the consumer's house or the power grid, an appropriate set of requirements needs to be in place to protect the consumer. For example, any contract must be transparent and clearly stipulate appropriate use parameters so as the vehicle is not degraded, with strict penalties applicable if these parameters are breached. The level of incentive that the retailer offers for this functionality should be reflective of the agreed parameters.

The retailer would be required to provide transparent reporting to the customer on parameters such as energy usage, throughput, depth of discharge, cycles per day, number of cycles etc. in simple graphical and numerical format.

If you would like to discuss this submission, please contact Stephen Hoult (Principal Consultant Commercial & Future Energy) on (07) 3854 7452 or shoult@csenergy.com.au.

Yours sincerely

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