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Australia

Gavin Fox
Australian Energy Regulator
GPO Box 3131
Canberra ACT 2601

17 May 2024

RE: Energex and Ergon Energy Determinations 2025–30

Dear Gavin,

Tesla Motors Australia, Pty Ltd (Tesla) welcomes the opportunity to provide the Australian Energy Regulator (AER) with a response to the AER's Issue Paper for Energex and Ergon Energy Regulatory Proposals for the 2025 – 2030 period. We appreciate the work being done by the AER and distribution network service providers (DNSPs) to adapt to a shifting energy landscape with significant uptake in consumer energy resources (CER).

Tesla's global mission is to accelerate the world's transition to sustainable energy. In Australia, we cannot achieve that full transformation without CER. Most importantly, Tesla is focused on deploying smart, orchestrated CER, where customers are compensated for the market benefits their systems provide. From Tesla's perspective, we believe the following:

1. CER – particularly distributed behind-the-meter batteries – are one of the most cost-effective technologies that should be considered within the broader renewable energy technology stack; and
2. CER provides greater market benefits when they are orchestrated and actively responding to market signals, rather than just providing self-consumption benefits to an individual customer.

These statements and world views are not unique to Tesla. A large proportion of homes across Australia have already invested in rooftop solar, and AEMO views behind-the-meter battery storage, and particularly orchestrated CER as the key storage technology in the broader storage mix. AEMO is predicting a four-fold increase in rooftop solar capacity reaching 72 GW by 2050 and facilitating the use of consumer-owned batteries and VPPs to deliver 27 GW of flexible demand response for the NEM.

In Tesla's view we see energy generated from rooftop solar PV being used at the point at which it is generated – used to charge an electric vehicle (EV) or to power an air conditioner, hot water heater or another home or commercial appliance; or alternatively that energy is stored for future use – either for customer home consumption or for export to the grid where the market value and customer incentives dictate. The worst future outcome would see solar PV switched off during the day – due to excess generation, and EV charging switched off in the evening – due to excess load.

Tesla's continued preferred use-case is to store energy for later use, and time-shift loads to charge during period of high solar penetration rather than curtailing. We note that the transition creates emerging considerations for DNSPs to adapt to a shifting landscape, including the establishment of dynamic operating envelopes (DOEs) and two-way export pricing to manage the increasing supply from rooftop solar, coupled with falling minimum demand. Tesla is supportive of SAPN continuing to utilise innovation to manage the risk of excess variable renewable energy and supports their approach that aims to manage the network through an efficient combination of price signals and pursuing network as well as non-network and market-based solutions.

We are, however, generally concerned with Energy Queensland's seeming preference for network control solutions, and function limitations over industry-led solutions. We are concerned that the direction Energy Queensland is taking is at odds with the Queensland Energy and Jobs Plan and will create further delays in the deployment of critical infrastructure needed to support the clean energy and electrification transition Queensland is rapidly going through. While we understand the need for robust network connection requirements, and the world leading position Queensland has in regarding rooftop solar penetration. Energy Queensland is dealing with a real and current issue – high levels of daytime solar export heightening risks of minimum demand issues, and a perceived future issue – increased peak EV charging.

The obvious solution and opportunity is to create the right incentive structures to time-shift charging behaviour to solar generation hours. However, Energy Queensland's focus seems to be on finding solutions to both reduce solar generation (total generation, not just export) and EV charging rates. In Tesla's view this approach is flawed, misses an opportunity to utilise low-cost solar generation, and we believe there are some fundamental principles that should be adhered to in implementing new requirements that will avoid continuing down this path:

- Technical requirements should consider the costs and impacts on industry and on consumers, as well as on the networks, to ensure a measured response.
- Requirements should be evidence based and address an actual network risk (current or immediate) rather than solving for a potential future risk. This includes looking at international evidence from jurisdictions dealing with future Queensland issues – such as higher penetration of EVs
- Requirements should be aligned with the direction of Australian or international policy on critical industry topics such as connection of EVSE and management of rooftop solar.

We welcome working further with the AER throughout the determination process. Please contact Emily Gadaleta ([redacted]) with any questions or follow-up.

Sincerely,

Tesla Energy Policy Team

[redacted]

Flexible imports offer minimal consumer benefit

Tesla does not support any introduction of import limits by any DNSP as part of their program to shape daytime load and reduce export peaks. A large, ongoing concern that Tesla has within the broader dynamic operating envelope space (distinct from flexible exports), is the use and introduction of flexible import limits. We are also concerned about when and how generation limits are used. Both of these mechanisms stand in stark contrast to flexible export limits as they are not about controlling site exports that may have a direct impact on the grid, and instead result in DNSPs reaching behind the meter to control when and how customers are using energy – either from their own generation or from the grid. We note that even the AER has focused primarily on considering the regulatory impacts of flexible exports and notes the following on flexible imports:

> *"we recognise any discussion of flexible load management at a consumer's premise is in the formative stages and potentially controversial. This is because that there are risks to consumers associated with flexible load management that are not present for export limits."*[1]

We understand that the AER sees flexible exports as the more pressing priority, however it is important to recognise that just because there is less talk about flexible imports (and generation) does not mean that it is not happening. Further import and generation controls are already explicitly enabled through both the existing CSIP-Aus, and further fleshed out within the scope of the CSIP-Aus Handbook. This effectively gives licence to DNSPs to introduce import controls, but in a way that is totally unregulated or ungoverned while it sits outside of the AER remit.

This concern is based on the current market reality.

Energy Queensland has recently released their final Queensland Energy Connection Manual (QECM)[2] which includes dynamic import controls for electric vehicle supply equipment (EVSE), and the current "Dynamic Standard for Small IES connections"[3] .

[1] https://www.aer.gov.au/system/files/Flexible%20Exports%20-%20final%20Issues%20Paper_0.pdf
[2] https://www.ergon.com.au/__data/assets/pdf_file/0008/1170953/Queensland-Electricity-Connection-Manual-Version-4-2912908.pdf
[3] https://www.energex.com.au/__data/assets/pdf_file/0008/1072592/STNW3510-Dynamic-Standard-for-Small-IES-Connections.pdf

8.10.4 *Dynamic*

(a) Technical requirements, maximum and minimum *dynamic* capacities and fixed limits for *dynamic EG* systems are specified in *EG* standards as per clause 8.15.1.

(b) *Dynamic EVSE* shall:

(i) have *dynamic import* limits supplied by the *DNSP* to *dynamic EVSE* at the *premises*. The *dynamic import* limit supplied will be no more or less than the minimum and no more than the maximum shown in Table 46.

(ii) be capable of dynamic operation within the limits as specified in Table 46. The *import* limits are based on the aggregated *import* of all *dynamic EVSE* at the *connection point*.

Table 46 *Dynamic EVSE* limits

	Fixed *import* limit / minimum *dynamic import* limit	Maximum *dynamic import* limit
single-phase	≤ 1.5 kW	≤ 15 kW
two-phase	≤ 1.5 kW	≤ 10 kW/phase
three-phase	≤ 1.5 kW	≤ 15 kW/phase

Figure 1: Dynamic EVSE imports included in the QECM

4.3.3 Import limits at Connection Point

Dynamic Small IES capable of importing electricity from the Distribution Network, such as an ESS, shall be subject to Import limits. The Import limits for a Dynamic Small IES shall meet the following requirements:

a. The dynamic Import limits are supplied by the DNSP to the Dynamic Small IES. The dynamic Import limit supplied will be no less than the minimum and no more than the maximum shown in Table 5 **Table 7**.

b. For Premises with multiple Connection Points the aggregate of the Import limits are applied to the Premises, and all across the multiple Connection Points must collectively will not exceed the limits in Table 5.

c. The Import limits shall meet the measurement and control requirements in Section 4.3.4.

Table 5 Dynamic Import limits

Subcategory		Minimum dynamic Import limit	Maxiumum dynamic Import limit	Techical study required
Single-phase		1.5 kW	18 kW	No
Two-phase		1.5 kW	10 kW per phase[1,2,3]	No
Three-phase		1.5 kW	10 kW per phase[1,2,3]	No
SWER	Single-phase	1.5 kW	10 kW	Yes
	Split-phase	1.5 kW	10 kW per phase[1,2,3]	Yes

Note 1: Multiphase EG Systems shall meet phase balance requirements from Section 4.3.5 of this Standard.

Note 2: Availability of Import limits above the minimum dynamic Import limit in Table 5 are subject to availability of Distribution Network capacity.

Note 3: Aggregate Import limits will not be permitted to exceed Distribution Network capacity limits.

Figure 2: Dynamic IES import controls included in the Dynamic Connection Agreement

In general, we believe that the market rationale for flexible or dynamic exports has been well established. Tesla understands the principles that networks have excess capacity to enable higher levels of export for the majority of the year but need to constrain exports during those high solar yield/ low load periods. The customer benefits of moving to flexible exports are also clear (based on the current SA Power Networks approach, and others that are under design). The status quo for standard static connections is 5kW, and customers have the potential to double that where they move to dynamic connections.

We do not believe that the equivalent rationale for import controls has been considered. For instance, explaining to customers that they can install a 32A induction cooktop with no restriction, but cannot do the same for EV charging infrastructure, does not appear to have been justified.

Import controls also have a significant impact on customers. Considering residential battery energy storage systems first. For the most part, these will charge from on-site solar. Grid charge is usually associated with storms and other extreme situations where batteries are looking to maximise charge for customers ahead of potential risk of blackouts. For example, during the application of Tesla “Storm Watch”, Tesla Powerwall’s will make sure that they are charged to a certain level, so customers have sufficient back-up power in case of blackout during a storm. Curtailing battery import during this period creates an outsized negative impact for customers, as it means in the event of a black out, they will not have sufficient back-up capacity to maintain loads – which effectively negates the value proposition of a lot of home batteries, and the fact that many customers buy systems specifically for the purposes of home resilience and reliability of supply during grid outages. This is also problematic in that the restriction of grid charge is applied to a storage asset, which would otherwise be able to provide support during a black-out, rather than to a “dumb” load.

Similar for EVSE, there is no value proposition for customers associated with “dynamic imports”. As noted above, the customer benefits associated with flexible exports are clear and relatively simple to understand and convey by OEMs, installers, aggregators and retailers. On the other hand, from a customer perspective the status quo regarding grid imports for EVSE is that there is no limit beyond the kW rating of a device. Customers are therefore being asked to trade off installing an asset with no import limits, against installing the same asset with import limits – and no associated incentive for having those systems controlled by a network. Alternatively, they are being told that they cannot install a class of assets (i.e. EV chargers) unless there are import controls applied. The broad rationale being put forward is that this is necessary for “network protection” however there has been no detailed analysis of this, and this rationale does not benefit individual customers.

In addition to the above, the following provides an overview of Tesla’s list of concerns regarding the practical implementation of import limits:

- The calculation of capacity limits for import is unclear, and it is not clear how they interact with standard 60A household load ratings.
- Which loads are considered to be controllable and why? Applying specific requirements or grid connection processes to some loads but not others creates an asymmetry, and specifically disincentivises smart loads over dumber loads. This is also the case for batteries which will have their ability to import from the grid curtailed.
- How will import limits be effectively implemented? For the most part networks will only have visibility of the total load of a site. A distribution network will not see whether a customer is installing an

induction cooktop, electric hot water heater, or multiple reverse-cycle air conditioners. However, there is an increasing push for specific requirements regarding the installation of EVSE which may result in import requirements being only applied to smarter loads – see point above.

- Whether import controls will be applied at the site or device level. Networks are generally pushing for both import and export controls to be applied at a site level. The QECM extract above refers to limits being applied to the premises. The IES Connection standard extract above refers to limits being applied at both the premises and the device. This creates significant confusion for customers and opens risk of further customer loads being curtailed – potentially down to 1.5kW for the entire site.

Recommendation: Noting the risks of DNSPs operating in an absence of regulation in this space, we would recommend that the AER issues an additional note to say that flexible imports should not be considered, or implemented, by DNSPs until more work has been done on the cost-benefit application and there has been additional consideration given to regulatory framework for how they are implemented.

Additional tariff design comments

Tesla is generally supportive of the design of the QLD storage tariffs and looks forward to further engagement to refine the design. We are supportive of a time-based tariff design that 'will incentivise storage to 'soak up' solar in the middle of the day and export at times most likely to avoid or defer future network investment'. Tesla aligns with the statement that 'large scale batteries operating at the upper limits of the distribution network are best suited to the ICC Tariff Class', and strongly supports QLD's recognition of the material benefit that batteries can provide to a network perspective. In regard to the Dynamic Flex Storage Tariff, Tesla does not consider dynamic operating envelopes an effective mechanism for stand-alone storage. We acknowledge the benefits of dynamic connections in curtailing excess solar generation, however, note that batteries are naturally incentivised through wholesale pricing to ease network constraints by importing at times of over-supply.

Tesla looks forward to engaging on this issue further to seek greater clarity on how transmission costs are incorporated into storage and storage ICC tariff structures. While the National Electricity Rules (NER) allows for TUOS charges to be applied, Tesla is not aware of a single transmission connected battery that currently pays those costs.

The basis for allocating T/DUOS on market customers is to ensure that network service providers (NSPs) are adequately compensated for maintaining existing network infrastructure to ensure ongoing reliable and efficient supply of energy at all times – both peak and off-peak; as well as for investing in new infrastructure to meet projected increases in peak demand.

From first principles, these charges should naturally fall to end-customers that are passively using the network to receive a service or benefit– i.e., traditional load customers. The NEM framework includes the principle that generators, who don’t receive an equivalent service of firm access at the connection point itself, do not pay TUOS charges, instead providing connection payments for network services. This makes sense for grid-scale storage (or scheduled Integrated Resource Units (IRU)) as well, as a connecting storage unit (ultimately a supply-side asset), must negotiate with the NSP for a power transfer capability at the connection point and should therefore only pay the connection charge that relates to the cost of their connection to the network.

In other words, T/DUOS charges should only apply to customers that drive network expenditure to meet increased load requirements (in exchange for firm access services).
Storage assets are not ‘end-use consumers’ and should therefore not be considered as load customers in this traditional sense. Storage systems are multi-functional assets – providing a range of different services – critical to enabling increasing integration of low-cost renewables and replacing system security services traditionally provided by the synchronous generation fleet.