Rupert Doney

Project Leader

Australian Energy Market Commission

14 January 2020

Dear Rupert

Re: ERC0301 – Technical Standards for Distributed Energy Resources – Draft Rule and Determination

Tesla Motors Australia, Pty Ltd (Tesla), welcomes the opportunity to provide the Australian Energy Market Commission (AEMC) with a response on the Draft Rule Determination on the "National Electricity Amendment (Technical Standards for Distributed Energy Resources) Rule 2021" (**"Draft Determination"**).

Tesla generally supports the current suite of work underway looking to streamline the approach taken for the development of technical standards for distributed energy resources (DER) in the national electricity market (NEM). In particular, we are supportive of the work led by the Energy Security Board (ESB) in respect of establishing a DER Technical Standards governance framework.

We understand that the ESB has made a separate rule change submission to the AEMC in respect of "Governance of DER technical standards"[1] ("**ESB Rule Change"**) which has not yet commenced. Our earlier feedback to the AEMC was that we believed this Draft Rule Determination should be postponed until further work had been done on establishing the appropriate governance frameworks. We still believe that there are risks associated with pushing forward a new approach for establishing DER Technical standards in the absence of undertaking a full review of the governance requirements and industry roles and responsibilities in respect of DER.

We also note that the proposed ESB Rule Change is pending, so there is no guarantee that an appropriate governance framework will be established at all or what the timelines might be. Any support we give to any changes suggested by the Draft Determination is caveated on the basis that we expect an appropriate DER governance framework to be established as a matter of priority.

It[1] https://www.aemc.gov.au/rule-changes/governance-distributed-energy-resources-technical-standards

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Our primary feedback to the AEMC in respect to the Draft Determination is as follows:

- Compliance timeframes for the new AS4777.2:2020 should remain as 12 months as anticipated in the Standard, as opposed to 6 months as proposed in this Draft Determination.
- There are a number of governance issues that need to be addressed. This Draft Determination will result in two separate compliance pathways for AS4777.2:2020, and the AEMC needs to give further consideration to how these compliance pathways will interact.

While Tesla is not against the introduction of a defined “DER Technical Standard”, we believe there are a number of questions that still need to be addressed in respect of the process proposed in the Draft Determination in order for this Rule Change to be practically implemented.

Our full submission on all parts of the Draft Determination follows. For more information on any of the content and recommendations provided by Tesla, please contact Emma Fagan (efagan@tesla.com).

Kind regards

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Support for continued work on DER in the NEM

Tesla's global mission is to accelerate the world's transition to sustainable energy and DER will play an important role in this area. Across Australia distributed energy is already playing a big role in reducing emissions and providing clean energy to commercial customers, residential customers and the energy market.

Increasingly aggregated DER is also being used to provide critical system support services. Tesla has participated in the AEMO NEM Virtual Power Plants (VPP) Demonstrations trial since September 2019, and currently has 10MW registered to provide contingency FCAS services across all six contingency FCAS markets. This trial has done an excellent job of proving out the capabilities of DER. Figure 1 below shows the rapid and accurate response of the Tesla / Energy Locals SAVPP during the islanding of South Australia in January 2020.

Figure 3 Response of Energy Locals VPP to contingency event, 31 January 2020

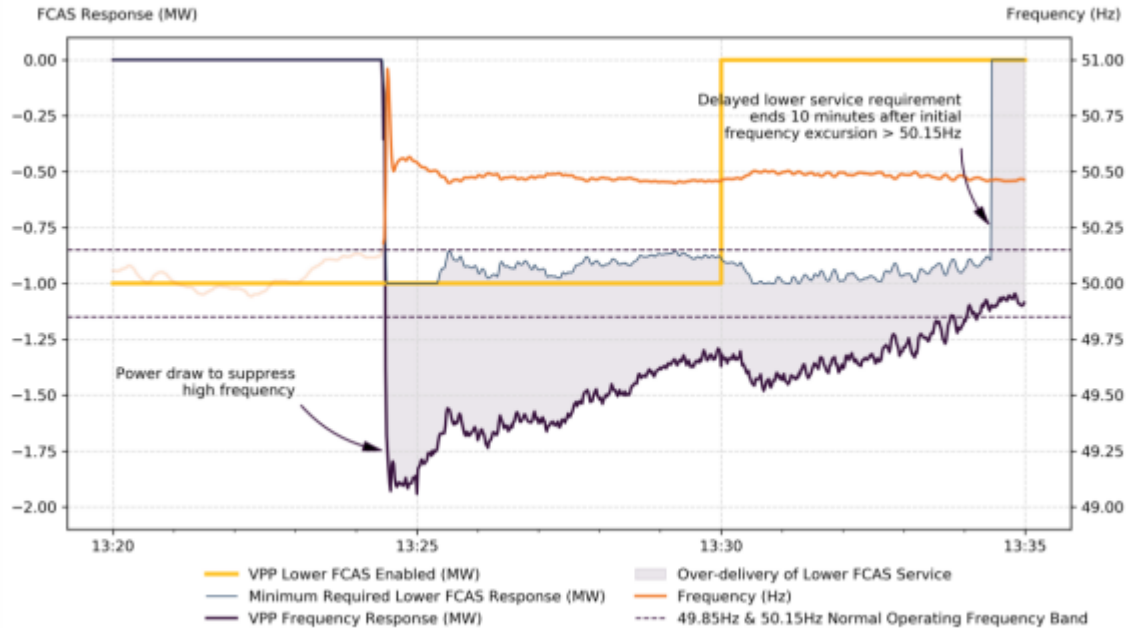

Figure 1: SAVPP response to SA islanding event

Tesla believes that it is critical that the introduction of DER Standards should be complementary to the integration of DER into established and emerging markets. It is important that new DER Standards do not erode the potential for DER to play a competitive market role. Similarly it is important that DER should not be asked to provide services that provide tangible market or network benefits as a "minimum standard". Having an appropriate DER Technical Standards governance approach will help determine which requirements are genuinely "minimum" DER technical standards, and which requirements should be a contracted service. Including DER Technical Standards within the National Electricity Rules (NER) should also allow for more scrutiny on the costs and benefits of implementing

different standards, including considering the impacts on customers and virtual power plant (VPP) operators. Tesla has included more information on this in our response below.

We are particularly supportive of the broader DER technical standard work program being proposed by AEMO around interoperability and cyber security. Continued work on these fronts will help create consistency amongst industry and promote innovation. This will result in more DER actively providing market services, and create new opportunities for end-use consumers. As above, however, it will be critically important that a DER Technical Standards governance approach is established to support work in these areas. Collaboration across industry bodies is needed to achieve the optimal outcomes, and clarity is needed on roles and responsibilities of different industry bodies.

Timeframes for testing

The Draft Determination proposes that compliance will be required by industry within 6 months of the Final Determination being released. We note that the Draft Determination and Draft Rule refer to AS 4777.2:2015 but also notes the following:

> *"It should be noted that if Standards Australia releases the updated version of AS 4777.2 (that is, AS4777.2:2020) before the publication of the final rule determination, then the Commission anticipates that the final rule will refer to AS 4777.2:2020 alone"*

As AS4777.2:2020 has now been released, we assume that this is the case and that the Final Determination will reference AS4777:2.2020. The preface in AS4777.2:2020 notes that

> *"AS4777.2:2015 will remain in force for 12 months after the release of AS4777:2.2020, with compliance with the 2020 version of AS4777 expected after 12 months"*.

This 12-month industry compliance period is industry standard and reflects the timelines that will need to go into firmware development and system upgrades to comply with new AS4777.2:2020 requirements, as well as the timelines for testing and approval.

As such we strongly disagree with the notion that the new DER Technical Standards come into effect 6 months from the date the final rule is made. Pushing a 6-month compliance period for compliance with the new AS4777.2:2020 would bring the compliance timeframes forward from December 2021/ January 2022 to August 2021.

The 12-month compliance timeframes for new standards are well established for a reason. They take into account the testing requirements order to comply with AS4777.2:2020, including the full process of developing firmware and/ or hardware updates, establishing lab-time, testing and verification. The 12-month compliance timeframes also represent industry standard lead time needed to access testing facilities and manage local Australian tests with testing requirements for international standards.

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We do, however, recognise that the new schedule 5A.2 (" Short duration undervoltage response test requirements") can be complied with within the proposed 6-month period. The majority of inverter suppliers will be complying with this requirement as part of the South Australia "Smarter Homes" inverter requirements[2], with a testing deadline required by 31 March 2021.

Recommendation: Notwithstanding our general concerns in finalising this Rule Change in the absence of a DER governance framework, Tesla recommends that following compliance timelines

- ***Short duration undervoltage test: 31 March 2021***
- ***Full AS4777.2:2020 – 12 months from release of Standard, as anticipated in the Standard preface.***

Questions around governance

Tesla supports the approach proposed by the AEMC in not introducing a subordinated instrument for DER Technical Standards. We agree with the position that the AEMC has stated in that this may potentially result in duplication and inefficient costs borne by industry.

However we believe that the current process still leaves a residual risk for duplication, inefficiencies and potentially multiple compliance pathways that industry will need to grapple with.

As noted above, Tesla sees risks in pushing forward this Rule Change in the absence of also establishing the supporting DER Governance framework. While the DER Governance Rule change has been submitted to the AEMC from the ESB, it is still pending. There is no guarantee if, or what, future governance arrangements might look like in respect of setting DER technical standards.

Outside of the ESB governance work, there are still governance areas that need to be addressed to support the proposed direction of this Rule Change. Tesla notes the following points that should be addressed by the AEMC prior to finalising this Rule Change process:

1. Compliance pathways – the proposed approach creates two regulatory pathways for compliance with AS4777.2:2020.
2. Management of ambiguities – who has adjudicative authority?
3. Central listing process – how is this going to be managed?

[2] https://energymining.sa.gov.au/energy_and_technical_regulation/energy_resources_and_supply/regulatory_changes_for_smarter_homes

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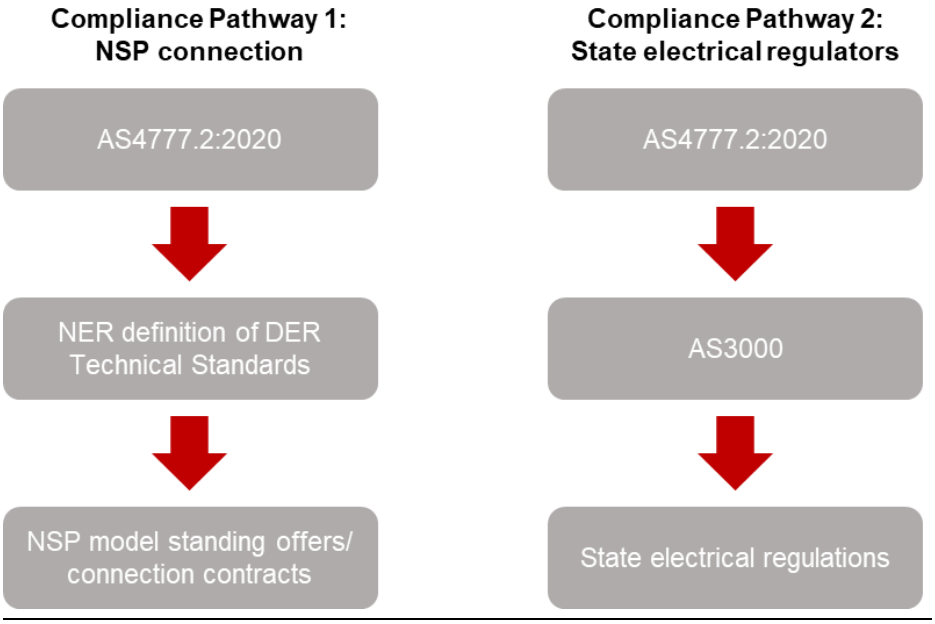
Compliance pathways

An important issue that should be considered is how this Rule Change will interact with the existing regulatory framework. Specifically, this Rule will embed AS4777.2:2020 in the National Electricity Rules (with the National Electricity Law as the key piece of legislation). At the same time, AS4777.2:2020 will also be referenced in AS3000 which is enforced through the state electrical regulations. The two compliance pathways are shown below.



A key risk exists in establishing multiple compliance pathways for DER without also reviewing the current roles and responsibilities of different players in the DER space. While AS4777.2:2020 remains unamended this may not create major concerns, however it will create added compliance layers both for industry and for regulatory bodies – there will need to be a key focus on ensuring that the two compliance pathways remain fully consistent.

Adjudicative authority

A related point in respect of the competing compliance pathways is the current lack of body who has adjudicative authority for responding to queries on ambiguities, and/or consumer complaints for Australian Standards. This issue is broader than this particular Rule Change, and relates to all Australian Standards related to DER, however for the purpose of this Draft Determination, it needs to be addressed due to the introduction of AS4777.2:2020 into the Rules.

Tesla suggests that in the Final Determination, the AEMC will need to make a statement on which body will ultimately be responsible for responding to industry queries on AS4777.2:2020 ambiguities. If this Standard is to sit within the definition of “DER Technical Standard” does this mean ambiguities are addressed through the AEMC or AER?

This will be particularly important if there are ever any conflicts across the two compliance pathways. For instance if a NSP sees a particular install or inverter as being AS4777.2:2020 compliant, but a state electrical authority sees it as non-compliant, who has the overruling authority?

A second aspect of this will be establishing timely pathways for addressing industry queries on ambiguities. Given the lack of current adjudicative authority, industry queries on different standards are currently dealt with in a very ad-hoc manner. The most common approach is to approach individual state regulatory authorities with queries. This leads to inconsistencies across states and a patchwork of different approaches. Trying to establish a nationally consistent approach or response to ambiguities can take months or even years.

Product compliance and listing

A final point on governance regarding the approach proposed in the Draft Determination is how product compliance and listing will be managed by individual DNSPs. The South Australian Office of the Technical Regulator (OTR) is managing the listing process for products compliant with the AEMO "Short Duration Undervoltage Disturbance Ride-through Test Procedure"[3]. Ultimately it is intended that the Clean Energy Council will also update their inverter product list to reflect systems that are compliant with this requirement.

Tesla strongly prefers a centralised portal that OEMs list with. In keeping with the AEMC suggestion of wanting to remove potential inefficiencies and duplication, we suggest that using a central portal and single product listing approach – specifically the Clean Energy Council (CEC) inverter product list – should be a key feature of the NER compliance pathway.

Recommendations:

- ***The Final Determination should clearly outline the compliance expectations for industry and provides clarity as to whether NER compliance obligations in respect of AS4777.2:2020 will overrule AS4777.2:2020 compliance obligations that sit within the state electrical regulations.***
- ***The Final Determination should specify that the AEMC (or another appropriate body) is the relevant body for clarifying any ambiguities associated with AS4777.2:2020.***
- ***The Final Determination should specify a single, consolidated listing process for complying with the undervoltage response test requirements, and any future tests that may fall within the definition of DER Technical Standard.***

[3] https://aemo.com.au/en/initiatives/major-programs/nem-distributed-energy-resources-der-program/standards-and-connections/vdrt-test-procedure

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Cost-benefit analysis

Another issue that Tesla has raised concerns with previously (most recently in providing comments on the 2020 AS4777.2:2020 consultation draft), is that there does not seem to be an existing mechanism for undertaking cost-benefit analysis in respect of proposed technical standards. In our response to that consultation, Tesla noted the following:

> *Tesla has concerns about the proposed approach to reduce the point at which Q absorption begins from 250V to 240V as well as increasing the maximum Q absorption from 30% to 60%. This will have significant impacts on the ability of customers with installed distributed energy resources (DER) to self-consume energy generated.*
>
> *Prescribing the set-point at 240V will increase the period of time that inverter-based systems are actively providing volt/var mode.*
>
> *Tesla has analysed our fleet data across all jurisdictions to consider the impact that these setting changes will have on customer self-consumption. The impacts will be particularly noticeable for customers in New South Wales and Victoria.*
>
> *Key findings from the analysis are:*
>
> - *Significant increase in the period of time Powerwall inverters would be sinking reactive power compared to AS/NZS 4777.2:2015. Increasing from 9.77% of time to 76.92% in NSW and increasing from 4.48% to 65.58% in VIC. This significantly increases the loading on inverters electronics even whilst not charging or discharging.*
> - *The AS/NZS 4777.2:2020 VAR response will cause a significant increase to percentage of customer inverters experiencing real power curtailment, increasing from 28.37% to 51.92% in NSW and increasing from 24.18% to 40.83% in VIC.*
> - *Addition to increasing the frequency of power curtailment the AS/NZS 4777.2:2020 VAR response will cause a significant increase to the magnitude of curtailment.*

Providing this feedback during a Standards Australia consultation process has proven to be largely ineffective due the fact that technical standards do not require a cost-benefit analysis to support their development. Therefore analyzing the impact on customers installing DER, as well as considering the impacts on VPP operators and the broader energy market, is considered as outside of the scope of work.

Tesla believes that this is a critical gap that should be considered within the Draft Determination and associated DER Technical Standards Governance review. Placing the DER Technical Standards in the NER provides an opportunity to address the poor regulatory practices of the past. We strongly recommend the AEMC clarify how the regulatory

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impacts of DER Technical Standards will be assessed prior to being adopted in the NER. This should apply to all part of AS4777.2:2020, but particularly those that will result in system curtailment.

Recommendation:

- ***The AEMC should explain how it proposes to assess the regulatory impacts of DER Technical Standards and future amendments to the DER Technical Standards prior to their adoption in the NER.***