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Tiffany O'Keefe Project Lead Australian Energy Market Commission Level 15, 60 Castlereagh St Sydney NSW 2000

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# RE: Tesla submission for the draft determination on enhancing investment certainty in the R1 process ERC0363

Dear Ms O'Keefe, Tesla Motors Australia, Pty Ltd (Tesla) welcomes the opportunity to provide the Australian Energy Market Commission (AEMC) with feedback on its draft determination on enhancing investment certainty in the R1 process rule change.

Tesla's global mission is to accelerate the world's transition to sustainable energy. Tesla has the largest energy storage team in Australia (over 150 employees) and an unrivalled track record in successful deployments of large-scale batteries. Tesla has delivered and connected more Australian utility scale BESS projects than any other provider, including the globally acclaimed Hornsdale Power Reserve (HPR) in South Australia, the Victorian Big Battery, and Transgrid's Wallgrove Battery in NSW among others.

Tesla has been an active participant engaged in various connections reform projects with the Connection Reform Initiative (CRI), alongside ongoing engagement with the AER, AEMO and transmission utilities directly, and looks forward to continued engagement and expediting the connection process to achieve the best market outcomes in support of the NEO through this rule change and other streams of work.

Tesla is aligned with the AEMC's objectives with this rule change to improve the efficiency and visibility that project proponents have in the R1 process, to facilitate the connections process for new assets to support Australia's energy transition. Tesla has supported many customers throughout the NEM on connecting its utility scale BESS and has identified several opportunities to streamline the process. The proposals put forward by AEMC are a good initial step, but Tesla sees this as a big opportunity to go further and work with the CRI participants to streamline a critical bottleneck for projects that will only increase as project deployments increase in pace and size. On specific clauses proposed by the AEMC in its draft determination, we recommend:

- Reducing the role of NSP approval in the R1 process which creates unnecessary cost and uncertainty for generators obtaining registration from AEMO.
- Restricting GPS renegotiation (i.e., limit ability to change study scope, scenarios, or assumptions) at the R1 stage to maintain clarity for projects.
- Greater consideration for Grid Forming Inverters (GFI) in clause 5.3.4A(1b).

More detail on these items is provided below. Tesla looks forward to continued engagement and actively participating in ongoing discussions to support the AEMC in the finalisation of the rule change.

Kind regards,

Tesla Energy Policy Team

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## **Opening comments:**

Tesla has been actively engaging with other market participants and industry associations like the Clean Energy Council (CEC) for over 6 years to strive for improved processes in connection reforms. Tesla supports the longstanding engagement that the CEC has done with consulting with industry, TNSPs and AEMO, to put forward an ambitious rule change proposal for the R1 process, which included the 'Type' model approach with conditional approvals, specific dates and limits for timeframes, greater responsibility for NSPs in holding risk as the connecting generator moves through the R1 process.

Tesla and many others in the industry have deeply engaged in supporting the CEC and is aligned with their position outlined in the initial rule change request. We encourage the final determination from the AEMC to reflect the work and high level of ambition from industry participants to develop a constructive and just path forward for the connections process.

Specific recommendations based on our experience connecting grid-scale battery projects in the NEM are further expanded on below.

## Reducing the role of NSP approval in the R1 process:

Tesla notes that the proposed red line in 2.2.1(e)(3) opens the door to more negotiation at registration, as the new wording links to 5.3.7A(g). This will require additional approval from the NSP, therefore adding complexity to the approvals process compared to the previous 2.2.1(e)(3) wording of 'satisfying AEMO'. Tesla believes the intent of 2.2.1(e)(3) was to demonstrate to AEMO that a generating system has been built in accordance with the design and model data submitted during the application (5.3.4) phase therefore it is capable of meeting or exceeding its performance standards. There are existing processes, namely 5.3.9 and S5.2.2, to cover the process of generation alteration, settings change, and GPS renegotiation if there is any material change from the design data.

## <u>Restricting GPS renegotiation at the R1 stage when due to changing AEMO assumptions or</u> <u>scenarios:</u>

Tesla has experience supporting several project proponents throughout the connection process, and has identified several instances in which renegotiations of the Generator Performance Standards (GPS) were reopened by AEMO, even when there were no material changes to the project such as a change in inverters or number or control settings. Instead, the requests for renegotiation were attributed to changes in AEMO/NSPs study assumptions such as network dispatch scenarios, committed generators, and study methodologies (all outside the control of proponents), which led to expensive and time-consuming remodelling work for the project proponent. This creates a lack of clarity for generator proponents, as there is a lack of guardrails around maintaining the network conditions and study assumptions from 5.3.4A throughout the R1 process.

Tesla proposes that the rule should limit change in study scope and assumptions from AEMO and NSPs. This would ensure the initial assessment results from the application (5.3.4) phase remain valid at time of registration.

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## Greater consideration for grid forming inverters (GFI) in clause 5.3.4A(1b):

Tesla is supportive of the directionality of reform to 5.3.4A(1b) in its relaxation of the 'no less onerous' clause to support new technologies. However, this update in of itself is unlikely to provide the full flexibility required for GFI technology to be considered, as GFI is still being assessed under a-synchronous and not synchronous machines.

Notably, an unintended consequence of the current Rules (i.e. the access standards in Schedule 5.2 for asynchronous generation) is that a project with grid-forming inverter technology is assessed against access standards that appear more suited to asynchronous generating systems that are of a grid-following nature, which can trade-off some of the benefits offered by advanced inverters. Ideally the Rules would promote these grid-forming technologies and encourage targeted system strength capabilities that actively support grid stability with high levels of IBR, delivering more beneficial outcomes for the power system overall.

For example, Schedule 5.2.5.5 has alternative pathways for synchronous machines compared to inverter-based resources (IBR) – defined as 'asynchronous generating systems'. There is significant benefit if Advanced Inverters could be assessed under the synchronous machine pathway (or a hybrid of the two), which can provide desirable overall characteristics.

The ultimate goal is to streamline the connection process for all GIF projects, building on lessons learnt and leveraging performance data from HPR, Wallgrove, and other systems that are now operating with advanced GFI. In its simplest form, this should include the opportunity to progress 5.3.4A/B directly, eliminating the need for a separate 5.3.9 modification application to better enable advanced inverter functionalities.

Through Tesla's experience we continue to build knowledge and understanding across industry and stakeholders more broadly, and welcome AEMC's broader workstreams to build on these lessons and capture developments in technology capabilities.

Tesla looks forward to engaging in other workstreams to develop guidance in ensuring consistency and clarity on this topic, such as the CRI NER 5.3.9 Reform and a revision to the Minimum Access Standards.