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Australian Energy Market Commission (AEMC)

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Dear Nomiky

ERC0290: Improving Security Frameworks in the Energy Transition – Second Direction Paper

Tesla Motors Australia, Pty Ltd (Tesla) welcomes the opportunity to provide a brief response to the Australian Energy Market Commission (AEMC) on the Second Directions Paper on "Improving security frameworks for the energy transition". We have been engaged on this Rule Change, and associated AEMC led work on Essential System Services, over the last couple of years.

While we recognise the immediate need for services that have historically been provided as a by-product of the existing synchronous thermal fleet, such as inertia and system strength, we understand the challenges with translating these services to new markets. However, we have also been supportive of more work being done on what a potential inertia spot market might look like, and it would be disappointing for that work to be voided on the basis of this Draft Determination.

We also agree, in principle, with the request made in the Clean Energy Council (CEC) submission for there to be a second Draft Determination. There is a lot of new information presented by the AEMC, making it challenging for industry to provide support without further analysis and understanding of what is being proposed.

We understand the need to act quickly, but it is not clear how pressing it is to lock in the exact, newly-made recommendations. In our response to the Efficient Provision of Inertia Rule Change we provided support for additional work being done to consider the inertia shortfall expected across the grid as we move to a 100% renewable energy grid. We noted that a technical assessment of inertia should include the following:

- Inertia needs for all jurisdictions in normal operating conditions and when islanded.
- Levels of inertia provided by existing synchronous fleets with known retirement dates
- Levels of inertia provided by utility scale batteries that are, or will be, operating in grid-forming mode (i.e. Hornsdale Power Reserve[1], Wallgrove Grid Battery[2] and the Riverina Energy Storage System[3].
- Levels of inertia that will be provided by 2GW of BESS assets which will be deployed with funding from the ARENA Large Scale Battery Storage funding round[4]
- Grid-forming batteries which may come online supported by other state policy priorities such as the Victorian REZ Development Plan
- Levels of inertia that will be provided by all synchronous condensers that are currently operating or planned for deployment
- The level of inertia that can be replaced with fast frequency response (FFR). We note that with the 2020 inertia shortfall in South Australia, AEMO directed that the inertial gap be filled with FFR[5]. If

all or some of the long-term inertia requirements can be provided by FFR services then this provides an additional asset pool –virtual power plants (VPPs) and distributed residential batteries that can also address any inertial needs.

We still believe that is important to understand the full extent of the problem we are trying to solve with this Rule Change, the level that it is currently being addressed through other means, and the immediacy of finding a solution. This should inform whether we can maintain the current inertia procurement framework, while industry is given time to consider this new model in more detail through a second draft determination.

Our preliminary feedback on the areas considered by the AEMC in the Second Directions Paper is below:

Alignment of the inertia framework with the recently evolved system strength framework

As above, Tesla has been actively engaged on the Efficient Provision of Inertia Rule Change and would not like the industry insights provided during that process, or the AEMC work to date on looking at the most efficient ways to meet grid inertia requirements, to be effectively voided by this Directions Paper.

Introducing a mainland inertia floor

Tesla is interested in whether this recommendation is intended to be purely information or if the intention here to change the current TNSP led inertia procurement approach, i.e. will it provide more flexibility for inertia to be procured out of region? Linked to the synthetic inertia recommendation below, would the idea of a NEM-wide inertia floor better enable a TNSP to use an interstate resource to deliver a secure operating level of inertia for that region.

If it is purely information, it is hard to see what additional benefits publishing an inertia floor would make to the current procurement structure beyond the current approach of AEMO releasing their annual inertia report[1]. Given that investment is currently informed by the shortfalls identified by AEMO, developing a NEM wide floor does not seem to be a solution for addressing the under/ over-investment concerns raised by the AEMC, unless there is also a change in the procurement approach.

We do, however, think that having increased visibility of the total inertia requirements for the NEM will have other benefits. If for, instance, some form of inertia market was to progress then understanding total NEM inertia requirements will be critical. Similarly understanding the total NEM inertia requirements (and level of gap) will also provide industry with insights on the level of very fast FCAS that will be procured, since that procured capacity is tied to the level of inertia in the NEM.

Aligning inertia and system strength procurement timeframes

Tesla is supportive of this alignment. In combination with the recommendation below on enabling synthetic inertia to be used to meet inertia requirements, aligning time frames will likely also result in more efficient investments with the same asset (such as a GFM battery) able to provide more than one service (i.e. system strength and inertia). This alignment should enable joint procurement exercises.

[1] https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/operability/2022/2022-inertia-report.pdf?la=en

Enabling TNSP procurement of synthetic inertia to meet the minimum threshold level

Tesla is very supportive of this recommendation. The current limitations preventing the use of synthetic inertia are needlessly restrictive and ignore the technical capabilities of grid-forming inverters. This is particularly so in light of the following:

- Many grid-forming inverters currently operational or under construction, or in the process of going through a 5.3.9 grid application to switch from grid-following (GFL) to grid forming (GFM)
- As noted by the AEMC non-network solutions such as GFM can currently provide inertia support as "other inertia support activities" such as procurement of FFR to address shortfalls. The effectiveness of this approach was demonstrated during the 12 November 2022, with FFR being effectively provided by both Hornsdale Power Reserve and Tesla's SA virtual power plant (SAVPP) based on procured capacity with ElectraNet[2]
- No such restriction exists within the system strength frameworks. RIT-T processes for system strength services this year indicate a keen focus on non-network solutions. If the approach is not aligned it may lead to inefficient investments (i.e. GFM inverters being the lowest cost solution for providing system strength and entering into a contract for such services, and a subsequent contract for inertia being entered into with a synchronous asset, when the same GFM could provide both services at a lower cost).

In respect of the approach, Tesla's preference would be to have an all-inclusive definitional approach in the NER to "inertia" rather than creating a new definition for "synthetic inertia". The risk of separate definitions is it may still create regulatory loopholes for selecting "inertia" or "synthetic inertia" for different services. Tesla is happy to work with the AEMC on options here. It may be as simple as removing the phrase "electro-magnetically coupled" from the current definition of inertia within the NER.

We also recommend that this solution is implemented in parallel with the other reforms designed to make it simpler for GFM to connect.

We are also supportive of AEMO doing work in developing a detailed specification. The Voluntary Specification for Grid-forming Inverters[3], released May 2023, appears to be a good starting point.

Removing the exclusion of inertia and system strength under NSCAS

Tesla supports a RIT exemption where the shortfall is <18 months. This would not present enough time to run a full RIT process.

Create a new, transitional non-market ancillary service (NMAS) which will allow AEMO to procure services

As a general principle, Tesla is supportive of open, competitive, market-based approach to delivering services. Though we also acknowledge that some services are necessary as a function of maintaining grid security; and that direct procurement of some services is inevitable.

What is being proposed by the AEMC with the new NMAS structure appears to be very broad. It is not fully clear whether the purpose would be for AEMO to create new classes of requirements that they

[2] https://aemo.com.au/-/media/files/electricity/nem/market_notices_and_events/power_system_incident_reports/2022/trip-of-south-east-tailem-bend-275-kv-lines-november-2022.pdf?la=en

[3] https://aemo.com.au/-/media/files/initiatives/primary-frequency-response/2023/gfm-voluntary-spec.pdf?la=en&hash=F8D999025BBC565E86F3B0E19E40A08E

could procure on an ad-hoc basis; or set-up trial frameworks to test new technology capability (presumably with the goal of moving up the commercial readiness curve) or a combination of both.

From Tesla's perspective we would need more information on the goal here in order to provide support. Based on what is being proposed, it seems like there is a potential risk of non-transparent arrangements being entered into, almost at the discretion of AEMO.

Regarding trialling new technologies, we would see targeted AEMO and ARENA partnerships as a preferred way of achieving this outcome. The ARENA Grid-forming inverter fund is a good example of this. Further, AEMO are involved in both the Capacity Investment Scheme (CIS) and NSW long-term energy services agreements (LTESA) tenders (through AEMO Services), so it might make more sense to ask for specific services that arise as a condition of eligibility for those schemes – rather than creating a brand new, transitionary, non-market procurement approach.

We are also concerned that this approach may result in a lot of additional work for AEMO with no lasting market benefits, given the transitionary nature of the change. We also question whether there is a simpler way for AEMO to procure critical services that do not fit within any of the existing frameworks.

We would only be supportive of a NMAS model if there was full transparency on the requirements that were likely to arise (forecast over a 12- or 24-month lead-time window) and all services were procured on a transparent, fully-competitive, technology agnostic way.

We recognise that the response above only partially covers the broad suite of content covered in the Second Directions Paper. We are happy to continue supporting the AEMC however we might be most useful, but particularly in respect of the role of GFM inverters and how to best enable synthetic inertia to participate in the existing inertia procurement frameworks.

For more information on anything included in this submission, please contact Emma Fagan (efagan@tesla.com).

Kind regards

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