Mark Feather

Australian Energy Regulator (AER)

Sent via email: NetworkPolicy@aer.gov.au

9 December 2022

Dear Mark

Response to AER Regulatory Framework for Flexible Export Limits

Tesla Motors Australia, Pty Ltd (Tesla) welcomes the opportunity to provide the Australian Energy Regulator (AER) with a response to the AER Regulatory Framework for Flexible Export Limits. We appreciate that the work being done in shifting from static to flexible export limits, and the associated interoperability work will significantly change the Australian Customer Energy Resource (CER) landscape and have long term ramifications on the commercial viability of both the home energy resource, and particularly the virtual power plant (VPP) sectors.

Tesla is a global leading manufacturer of all forms of home CER – battery storage, solar and EV charging, as well as electric vehicles. We are also a leading developer and operator of Virtual Power Plants (VPPs) with 26MW of capacity currently registered with AEMO to provide frequency services.

Australia is world leading penetration in our of rooftop penetration. There is currently ~15GW of rooftop solar installed, with the Australian Energy Market Operator (AEMO) Integrated System Plan (ISP) Step Change scenario predicts 30GW installed by 2030 – approx. 3X the coal and gas capacity that will be operating in the same time period. Similarly, AEMO is predicting that between 2030 and 2050 orchestrated DER, particularly behind the meter batteries, will become the primary form of storage in the market. Making up more than 60% of all installed storage by 2050.

This provides a unique opportunity for Australia to be one of the leading jurisdictions in the world in using distributed, primarily customer owned assets, as a major source of meeting renewable energy targets.

To achieve this, Tesla is supportive of continued focus from the market bodies on how distributed solar energy can be used rather than curtailed – either by storing it for later use or for immediate self-consumption – but to achieve this it is critical that flexible exports are implemented with a regulatory and governance framework that does not detract from the continued industry innovation and growth of both CER and VPPs in Australia**.** To date, AEMO has done a great job in supporting VPP integration into markets, and this work will continue with both the Scheduled Lite and Flexible Trading Arrangements Rule Changes. However, there is a risk that flexible exports will be developed in a manner that is incompatible with these reforms and the continued market integration of CER (on a customer opt-in basis supported by strong customer incentives).

Tesla Motors Australia, Pty. Ltd.
Level 14, 15 Blue Street
North Sydney 2060 NSW
Australia

From Tesla's perspective the AER should have a number of clear priorities as focus areas of this review:

1. Ensuring that the regulatory and governance frameworks support, rather than detract from, the continued VPP growth and market integration of CER in Australia and related rule changes;
2. Prioritise uniformity of approach from NSPs to avoid a complex web of disparate requirements / mandates that require jurisdictional specific work at the expense of OEMs and customers;
3. Consider customer implications and provide clear and transparent customer outcomes that can easily be communicated by solar and CER retailers at the point of sale of the product;
4. Additional regulations on NSPs to ensure that flexible exports are being applied in an equitable manner, with an appropriate cost-benefit assessment; and
5. Develop a regulatory framework that also supports recommendations arising from the AEMC DER Governance Review and the ESB Interoperability consultation – specifically the need for a technical regulator and for an enhanced cost benefit framework of new CER standards that are being introduced.

In addition to the above, Tesla strongly recommends that the AER and other regulatory bodies dedicates sufficient time in the first half of 2023 to directly consulting with different stakeholder groups that are impacted by these rule changes. To date, there seems to be a concerning lack of engagement from installers, OEMs and VPP developers when compared with the level of engagement from network service providers. This can lead to the AER and other market bodies being presented with a false sense of how effective certain policy directions might be. To address this, Tesla suggests that the AER and others should look to host targeted forums for specific stakeholder types – OEMs, VPP developers and installers, to stress test major concerns and provide these groups with the opportunity to directly present positioning and concerns.

Flexible exports and VPP commercial considerations

A major implication of transitioning from static to flexible exports is the uncertainty it creates for VPP developers, operators and CER aggregators in the market. This will impact on customer owned CER VPP commercial models, but there are also an increasing number of VPPs looking to attract project finance (see NSW school VPP proposal[1]). Securing debt and/or equity funding for large scale VPP projects is dependent on being able to develop a bankable financial model.

Flexible exports raise a few concerns in this respect:

1. Creating a wide range that dynamic exports can fall within creates no certainty. A range of 1.5kW to 10kW is significant with there being many points within this range that will determine if a project is commercially viable or not,

[1] https://www.schoolinfrastructure.nsw.gov.au/what-we-do/we-partner-with-industry/expression_of_interest_for_renewable_energy_in_schools.html

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2. If flexible exports are applied in a blanket manner with no differentiation of services (i.e. frequency or voltage support services where responses are provided in the minute, second or sub-second) will not be possible, as these are autonomous responses and may push the site above the DOE if, for instance, an FCAS raise response is required from a 5kW FCAS enabled system at the time that the site has a 1.5kW export limit in place. This response will last anywhere from 1 second or less through to 5 minutes depending on the response being provided, while DOEs and flexible exports have clearly been designed with long duration energy exports in mind.
3. In respect of energy arbitrage value, even where the network provides clarity on the % of time per year a site can anticipate being at max export (i.e., 90%) it will be difficult to use this threshold to anticipate the potential impacts on lost market value. For instance, the 10% of time per year the site is curtailed down to 1.5kW could be the 10% of time that the market is at peak pricing. Even where likely curtailment periods are overlaid with historical market data that will not be enough to provide investor certainty as both the dispatch intervals with high prices and with high curtailment will differ year to year. While it is likely that CER will primarily be curtailed during periods of high solar output (often coinciding with negative market prices) there are numerous examples of emergency market events which would result in both high market volatility and pricing, while also resulting in curtailment of CER. The recent SA islanding event provides a perfect case study of this.
4. Flexible export intervals will also raise a potential implementation challenge and will need to be managed closely with AEMO. For instance, if flexible export intervals are aligned with the five-minute dispatch and settlement intervals, they will need to be timed perfectly to provide for sufficient time for traders or aggregators to submit bids and rebids. This is going to particularly important as AEMO considers the Scheduled Lite Rule Change, and increased energy market participation, as a misalignment on timing could lead to non-compliant market bids.

The proposed notification periods discussed in the Issues Paper might provide some benefit to aggregators or traders, but the devil will be in the detail, and how it will be implemented. If curtailment is forecast at a site or feeder level, it will be difficult to reconcile this across an entire portfolio.

The AER should also work with VPP developers, aggregators, retailers and other market participants to understand the full cost of integrating flexible exports into VPPs. It will be worth considering the cost benefit trade-off of different types of intervals and how notifications of curtailment are received as different designs may have significant cost implications for software build-out.

To resolve these issues and ensure that the roll-out of flexible exports does not result in constraining VPP growth in Australia, we recommend that the following should be core elements of the regulatory framework for flexible exports:

1. There must be a level of consistency and uniformity in how NSPs deploy flexible exports – particularly in respect of elements such as dispatch intervals.

2. Multiple options should be tested with different VPP providers and developers to test feasibility ahead of NSP proposals being accepted.
3. NSPs should have an appropriate exemption framework in place for market services that are provided on an autonomous basis, provided that inverters prioritise network protection over those market services.
4. NSPs should provide optionality in how they structure their flexible export offerings. VPP developers and aggregators should have the option of paying more for firmer access. Within this the following points are key:
    a. This should be opt-in with costs recovered only from the sites that have chosen to opt-in;
    b. NSPs should consider including a firm export floor as well at an additional price point to ensure project bankability and provide a basis for a financial model; and
    c. Minimum export thresholds should be clearly articulated.

In respect of optionality, Tesla would like to see a framework that provides full customer choice. As an example of how this might look:

- Customer A might be part of Australian VPP1 which has debt financing from Major Australian Bank. The aggregator responsible for that VPP is happy to absorb $15 p.a. network costs for Customer A. In return they get a guaranteed export floor of 5kW, with export being at max capacity for 95% of the year.
- Customer B is part of Australian VPP2 which is run by Australia's Greatest Retailer. This VPP requires customers to bring their own asset and has no debt funding. Australia's Greatest Retailer is also the VPP aggregator and is happy to pay $10 p.a. per customer for a 95% max capacity guarantee. Australia's Greatest Retailer does not have project debt repayment so does not require an export floor, as they can adjust the customer payments based on actual market value.
- Customer C is not part of a VPP and wants basic export requirements. The broader customer implications are explored below.

Providing some optionality to customers will allow them to choose the option that best fits for them.

In respect of the principles noted by the AER, from the DEIP Working Group:

Principle 1: DNSPs are responsible for setting flexible export limits, with the calculation methodology used to determine the limits being transparent and subject to stakeholder consultation

As noted above, Tesla is supportive of uniformity in approach. We understand that each NSP will need to account for their own requirements and each NSP will need to consult separately, but ultimately managing multiple frameworks and approaches creates risk and cost.

Principle 2: Allocation should seek to maximise the use of network export hosting capacity while balancing customer expectations regarding transparency, cost, and fairness

Tesla Motors Australia, Pty. Ltd.
Level 14, 15 Blue Street
North Sydney 2060 NSW
Australia

As noted above we are very supportive of transparency. The impact of the flexible export should be able to be simply communicated to customers and verifiable by a reasonable end-use customer using basic due diligence.

Principle 3: Capacity allocation can initially be based on net exports and measured at the customer's point of connection to the network

This point requires more thinking both from a practical implementation perspective and from a market integration perspective:

- Practical implementation: the NSPs that are currently developing flexible export models are enabling native inverter integration. We are supportive of this model and the fact that NSPs are considering multiple options for practical implementation of flexible exports. However, if there are multiple inverters at a single site and all have opted for native inverter integration, then a single signal applied at the primary point of connection is not technically feasible.
- Market consideration: the AER should continue to work with AEMO on the design of flexible trading arrangements and the Scheduled Lite program to determine if a connection point flexible export limit works in effect. The market design work for VPPs seems to be leaning towards differentiating between controllable, dispatchable capacity, and passive imports and exports. Tesla is not supportive of any principles that are incompatible with long-term market integration of VPPs.

Principle 4: Capacity should be allocated to small customers irrespective of the size or type of customer technology (e.g., solar or batteries) at the customer premises

As above, this should also be considered through a market lens. There may need to be differentiation of technology types where some are passive and others are active, market participating or providing active market services.

Principle 5: In the near term, flexible export limits should be offered on an opt-in basis with capacity reserved only to make good on legacy static limit connection agreements, with efficient incentives provided for customers to transition to flexible export limits over time.

Tesla supports this principle. Though we note that where CSIP-Aus is mandated, as per the ESB recommendations, customers will be required to buy a "flexible exports" ready system. So, the choice is really whether to enable those flexible exports or not.

General customer implications

Tesla Motors Australia, Pty. Ltd.
Level 14, 15 Blue Street
North Sydney 2060 NSW
Australia

Allocation of capacity – DNSP flexibility

We agree with the AER that allocation of capacity is going to be a critical point that needs to be resolved. While we agree that this space is still emerging, allowing for varying methodologies of capacity allocation will be confusing both for customers and resellers. The more flexibility that is provided to DNSPs, the more expensive, administratively onerous, and convoluted Australia becomes as a market to operate in.

Even where customers are not part of a VPP it will be important that flexible exports are structured in a clear manner that is simple for all CER resellers to articulate to their customers. Flexible exports need to be simple enough that resellers can calculate system pay-back periods/ returns (which is necessary for reseller compliance with the New Energy Tech Consumer Code (NETCC) as an example) and that customers are able to do their own due diligence in a simple manner to confirm the value that has been described to them.

To this end, a number of the points raised for VPP customers above will be equally applicable for all CER customers:

- Optionality is important – customers should have choice in the level of export they want – including the firmness of this export, and the annual costs per year should be transparent.
- The expected export thresholds should be fixed, not within a wide range, and clearly articulated. Allowing NSPs to use complex AER methodologies, like the *Customer Export Curtailment Value (CECV)* will not provide enough transparency for CER resellers to provide clear guidance to customers on the economic benefits they will get from the purchase of their CER.
- Further work needs to be done to assess the additional benefits that networks received from including residential batteries in the scope of flexible exports as well as passive solar. Particularly where these systems are not part of a VPP and are set-up to provide self-consumption benefits.
- New requirements like dynamic **imports or generation** should not be included in any network connection agreement without a thorough cost benefit analysis. We support the AERs approach of starting with flexible exports before imports are considered, but CSIP-Aus already creates the mechanism to include flexible exports and allow networks to include it within their dynamic connection standard. The fact that this can be done without any cost-benefit analysis on the value that a network receives from, for instance, dynamically reducing a battery charge rate, demonstrates some very clear and worrying gaps in the current regulatory framework on flexible exports.

As such we are supportive of the AER building up their existing regulatory framework to better manage how the NSPs implement flexible exports. This is considered below, both in respect of how the NSPs should be regulated, as well as how the role of the AER needs to fit into a broader regulatory framework.

Tesla Motors Australia, Pty. Ltd.
Level 14, 15 Blue Street
North Sydney 2060 NSW
Australia

Transparency and accessibility of information

Transparency and accessibility of information is critical – with simple information available to CER resellers, installers, OEMs, VPP developers, and most importantly customers.

The AER suggest that "*We expect that the capacity allocation methodology for flexible export limits should be documented in a DNSP's CER integration strategy as outlined in our DER Integration Expenditure guidance note*".

It is unreasonable to expect small CER resellers or installers to locate each DNSPs CER integration strategy on the AER website, analyse it and assume on what the customer implications are going to be from this information.

Information needs to be accessible on a single landing page with all customer options for each DNSP set out. This will also provide a simple mechanism for the AER to continue to assess the performance of each DNSP.

Regulation of NSPs

There are a number of overlapping policy priorities that have been put forward over the last 24 – 36 months that all have the same first principle goal of increasing CER hosting capacity. Tesla is supportive of the number of gaps noted in Part 4 of the Issues Paper including work on monitoring export limit performance and information provision.

It will be critical for the AER to constantly monitor these overlapping priorities to ensure they are not being applied in an uncoordinated manner to the customers detriment, or that industry is unnecessarily spending money to comply with requirements that will be redundant within a year.

Every new network requirement that is put onto consumer assets should be considered for the additive benefit it provides the network. If we get to a point where each network is introducing export pricing, flexible exports, and then also working on new inverter technical requirements to improve network hosting capacity, it will be critical that each of these elements adds value.

Given the rapidly changing regulatory requirements and expectations from customer owned assets in the Australian market, the AER will also need to play an enhanced regulatory role including:

- Ensuring that NSPs are subject to a clear and transparent reporting framework on flexible exports. It will be important that the level of curtailment is reported on each year both within each network and across the different networks, so that customers and industry have a point of comparison as to what is national best practice. We note that it may be challenging for the AER to compare performance of the NSPs if all NSPs are provided complete flexibility in how they implement flexible exports.
- If customers are not given a fixed export threshold, there should be a clear and transparent methodology that is published by networks as to how hosting capacity is applied across customers. Customers, OEMs, and

aggregators should also be given a forum to highlight levels of curtailment that go beyond what they were expecting.

- A level of equity must be maintained across customers. This will apply to a number of areas:
    - There should be a level of consistency in how customer export access is set and published.
    - Customers within a network should expect the same outcomes as other customers in the same network regardless of where they are located. Applying flexible exports is not an alternative to investing in distribution network infrastructure and customers should not have to worry about being constrained down to 1.5kW 45% of the time while their neighbours are at 10kW export 95% of the time.

In addition to the change in regulatory approach, the AER should also consider whether the current cost-benefit analysis framework assessing network expenditure proposals is appropriate.

The AER will need to take a more holistic view to the costs of one proposal when compared to another. As more and more emphasis is put on using CER as an alternative to traditional network expenditure, the AER cannot just consider the costs to the individual NSP. There are a range of other costs that should be considered into the assessment of each individual NSPs approach to implementing flexible exports:

- The market opportunity cost (i.e., being curtailed an extra 15% of the year might result in lost market value of $10m to a VPP operator, if this is the lowest cost of generation in the market this impact needs to be accounted for).
- The costs to industry for compliance – this should include a consideration of the costs of inconsistency. Each NSP that introduces their own approach to implementing flexible exports will increase costs for all compliant OEMs and aggregators.
- The costs to individual consumers for the lack of functional use of their CER for the period that it is curtailed.

Overlap with other work underway and need for a technical regulator

In addition to the specific changes required to AER regulatory function, it is also important to reflect on the broader regulatory changes that need to be implemented to manage increasing implementation of flexible exports.

In Tesla's response to both the AEMC DER Governance and the ESB Interoperability Consultation paper we noted the need for a national technical regulator to ensure that the dynamic operating envelopes. The role of the technical regulator will be critical for:

- Ensuring that a consistent approach is used for the roll-out of flexible exports is consistent across networks and jurisdictions to avoid the need for multiple approaches to be developed.

Tesla Motors Australia, Pty. Ltd.
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Australia

- Ensuring that network requirements are not introduced in a way that is in direct opposition to continued VPP development and market integration of CER.

In addition to the need for a national technical regulator, there is also a clear regulatory gap in providing clear cost benefit analysis functionality.

As noted above, the current network cost benefit analysis considers only costs to the network of different options – not cost to industry, consumers, or the market. This has been a process gap in flexible export development since it was initiated.

Outside of AER improvements in how they consider the costs of network solutions put forward, it will be particularly critical that someone takes on the role and responsibility of doing a detailed, early cost benefit analysis of all new CER technical standards that are considered.

This will be especially critical in the development of new standards and approaches for implementing dynamic operating envelopes. As mentioned above, Tesla has serious concerns with CSIP-Aus being used to justify the introduction of import controls. This is particularly concerning given that CSIP-Aus itself was developed by a working group formed by ARENA, with no regulatory oversight, obligations to consult broadly or requirement to consider costs and benefits. This document has now become a de-facto flexible export requirement that industry must comply with.

It is critical that the combined work of the AER, ESB and the AEMC in this space currently addresses some of these critical gaps in the governance and regulatory framework. We look forward to continuing to work with the AER on this important and complex reform piece. For more information on any of the content included above, please contact Emma Fagan [redacted].

Sincerely,

Emma Fagan

[redacted]

Head of Energy Policy and Regulation

Tesla Energy