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TESLA Corporation

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Dear Matthew,

Public Submission

Response to Consultation Paper: Improving Reserve Capacity pricing signals – a proposed capacity pricing model

1.0 Introduction

Thank you for the opportunity to comment on the Consultation Paper[1].

Tesla Holdings Pty Ltd and its subsidiaries (Tesla) operates four 9.9 MW diesel generators in the South West Interconnected System (SWIS) that are mainly used to provide electricity to meet peak demands.

Tesla invested in these units based on initial design of the Reserve Capacity Mechanism (RCM), as well as encouragement by successive WA Governments for increased private sector participation in the SWIS. Tesla relied on capacity demand forecasts provided by the Independent Market Operator (IMO) that indicated that additional capacity (especially peaking capacity) was required.

The ongoing financial viability of the units is highly dependent on the revenue earned by providing Capacity Credits under the RCM. Proposed reforms that impact capacity certification (i.e. constrained network access and capacity certification processes) and Reserve Capacity Prices (RCP) have the potential to significantly impact the profitability of the Tesla units.

Given the above, we have a significant interest in the development of capacity pricing options in the Wholesale Electricity Market (WEM) and provide this submission to ensure that decision

[1] Public Utilities Office, Department of Treasury, *Improving Reserve Capacity pricing signals – a proposed capacity pricing model*, 22 August 2018

makers consider the impact of proposed reforms on Market Participants and put in place arrangements that maintain the viability of dispatchable generation in the SWIS (such as Tesla's generation units) that is important in maintaining a reliable and secure electricity system in the South-West of Western Australia.

2.0 Preferred Capacity Pricing Approach

As outlined in our previous submission to the PUO on capacity pricing models[2], we were supportive of retaining administered capacity pricing arrangements. In our view, the original Reserve Capacity Pricing Formula (i.e. 1 to 1 relationship between excess capacity and the RCP and the maximum price set at 85 per cent of the BRCP) did not cause the high levels of excess capacity in the WEM. The fundamental problems included the following:

- Over-forecasting of capacity requirements by the IMO;
- Permitting Demand Side Management (DSM) to participate in the RCM when it clearly cannot provide the same level of availability as generation; and;
- Decisions by Synergy to refurbish old, inefficient coal-fired units (Muja AB) when they were not required to meet energy requirements or increase supply reliability in the SWIS.

Tesla has been consistently supportive of capacity market reforms that have been both implemented and proposed to date to address some of the problems mentioned above.[3] This included the introduction of transitional pricing arrangements, differential pricing of DSM facilities, increased availability requirements of DSM resources and dynamic capacity refunds.

In our view, alternative proposals such as capacity auctions and retailer led contracting had the potential to lessen competition in WEM unless complimentary market power mitigation measures were put in place. These other capacity pricing auctions would be expensive and difficult to implement and unlikely to result in efficient outcomes unless the market outcomes are highly prescribed by the RCM mechanism. This would include rules on bidding behaviour by capacity providers with market power in the case of auctions, and rules on market participants sharing acquired capacity credits with independent retailers under retailer led contracting. For a small market like the WEM, the complexity and costs of these arrangements could not be justified.

Given our concerns, we are pleased that the PUO has recommended retaining administered capacity pricing arrangements in the WEM.

3.0 Proposed changes to administered capacity pricing approach

Tesla is generally supportive of the preferred approach, outlined in the PUO's paper (August 2018), to retain administered capacity pricing with a modified pricing formula and transitional measures to ensure that enough dispatchable generation remains in service in the SWIS to meet future reliability requirements. Our views on the proposed price formula and transitional measures is outlined in the following sections.

3.1 Proposed capacity pricing formula

The proposed convex capacity price curve will have the following features:

2 Public Utilities Office, Department of Treasury, Improving Reserve Capacity pricing signals – alternative capacity pricing models, 9 April 2018.

3 Tesla Corporation, Reforms of the Reserve Capacity Mechanism: Tesla Corporation Response, 3 May 2016.

- Price Cap – the capacity value associated with no capacity surplus, to be set at 1.3 times the Benchmark Reserve Capacity Price (BRCP).
- Absolute zero point – the point where the amount of excess capacity is deemed to be sufficiently high for the capacity price to be zero, set at a 30 per cent level of excess capacity.
- Economic zero point – a level of capacity surplus and price at which no additional resources should enter the system under a very wide range of market conditions, set at a capacity price equal to 50 per cent of the Benchmark Reserve Capacity Price and at a level of excess capacity of 8 per cent.

Price Cap

The purpose of the Price Cap is to encourage new investment in Reserve Capacity if the RCM is forecast to be in deficit or has low levels of excess capacity. The PUO has recommended that the price cap be set at 1.3 times the BRCP.

We agree that at zero excess capacity, prices should be a multiple of the BRCP. Setting a price equal to the BRCP (annualised cost of new entrant plant) may not be enough to encourage investment in a timely manner, which could result in capacity shortfalls.

Setting very high prices when excess capacity is zero (say 1.9 times the BRCP) provides incentives for participants with significant capacity resources to withdrawal capacity or delay investments in new capacity to drive capacity prices to the Price Cap. In our view, given the risk of capacity shortfalls, the price cap should be set at 1.6 times the BRCP to reflect the high value of capacity to consumers.

While we agree with the BRCP being a multiple of the RCP, we have had concerns with the way in which the BRCP has been set.[4]

Currently, the BRCP is set with reference to a 160 MW Open Cycle Gas Turbine (OCGT). However, demand growth in the SWIS has been historically much lower on an annual basis and units of this size have not be built in recent years. We argue that benchmark generating unit should be reduced to reflect the size of units that have recently been installed in the SWIS (i.e. 30 to 40 MW).

In addition, the methodology for calculating the WACC used in the BRCP calculation underestimates the capital costs of a new entrant generator, especially the use of a negative real rate of return, which was used in the setting of the 2019-20 BRCP. Using a 20-day average of the annualised yield of Commonwealth Government bonds with maturity dates of 10 years, the AEMO had calculated a nominal risk-free rate of 2.12%. This nominal rate is then adjusted for inflation to yield a real risk-free rate of return on -0.26% (assuming inflation of 2.39%). A negative risk-free rate of return makes no sense to Tesla given other sectors of the Australian economy are making significant real returns (as reflected by increases in the All Ordinaries stock index in recent times).

Hopefully these issues will be addressed as part of the AEMO's 5-year annual review of the BRCP methodology.

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[4] Tesla Corporation, Public Submission to AEMO, Draft 2017 Benchmark Reserve Capacity Price for the 2019-20 Capacity Year, December 2016.

Absolute Zero Point

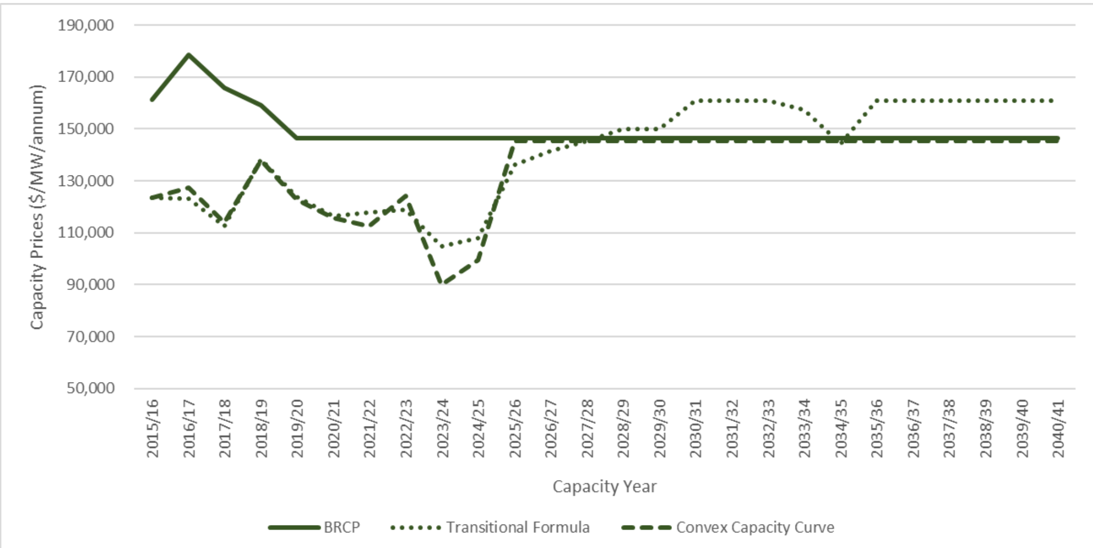
Tesla understands that at high levels of excess capacity the value of capacity to consumers is effectively zero and that a strong signal needs to be provided to market participants not to invest in any additional capacity.

Setting the absolute zero point at relatively low levels of excess capacity (5 to 8 per cent) could result in highly volatile capacity prices, which would not be bankable for existing generators and new generation projects. On the other hand, not having an absolute zero point could encourage additional investment in new capacity which is not valuable to consumers.

Tesla would prefer that there should be an absolute limit on the amount of excess capacity that can occur in any capacity year (say 15 per cent). Any additional capacity that enters the market would not be accredited for capacity credits until the level of excess capacity reduces to 15 per cent. The reasons for the absolute limit are that Tesla is concerned that investment in new DSM facilities, renewable, baseload and mid-merit plant are relatively insensitive to capacity prices. DSM facilities have low entry costs, while renewable plant mainly derive their income from providing environmental products (LGC's) and energy. Baseload and mid-merit plant also mainly rely on income from energy markets. As a result, capacity price reductions don't deter new investment in these other plant types, with the result that capacity prices can fall substantially, which reduces returns to OCGT plant which is not even entering the market.

Highlighted below are a set of RCP forecasts for the WEM based on expected demand from the 2018 WA Electricity Statement of Opportunities (ESOO) and our view on the uptake of future DSM facilities (additional 150 MW by 2023/24) and renewable plant investment (i.e. 228 MW by 2023/24). No major coal plant retirements are made over the forecast period until 2030's. As a result, capacity prices fall to a low of $90,000/MW in 2023/24 due to the future entry of DSM and renewable plant (excess capacity of 6.8 per cent). The low capacity price will not stop the entry of this plant but will certainly reduce the income of dispatchable generation in the WEM which has not caused the amount of excess capacity to increase to 6.8 per cent.

Figure 1: Reserve Capacity Price Forecasts ($/MW/annum, 2018 dollars)



However, if the PUO is committed to having a zero-price point, then Tesla reluctantly supports the absolute zero point at 30 per cent of excess capacity, on the basis that it should not be binding in most instances and that the PUO sets financially viable price floors for incumbent generators in the market (discussed in the Transitional Assistance section below).

Economic Zero Point

As outlined in our earlier submission to the PUO (May 2018), Tesla was supportive of a convex capacity price curve. The PUO has suggested that the inflection point (i.e. change from a steep slope for the curve to a shallow slope) occurs beyond 8 per cent excess capacity. Having a steep capacity price curve provides incentives for participants to withdrawal or delay investment in new capacity, while a flat curve provides incentives for participants to keep investing in capacity when it is not required.

In our view, a level of 8 per cent level of excess capacity is highly likely in the WEM for several reasons.

Firstly, as explained earlier, the responsiveness of investment in various technologies (e.g. renewable plant and DSM capacity) is price inelastic. DSM facilities are typically the cheapest type of capacity in the market. These facilities are likely to be able to participate in the market even if capacity prices are low (e.g. $70,000/MW/annum). In addition, renewable plant earns most of its revenue from environmental (e.g. sale of large-scale generation certificates or LGCs) and energy markets. Mid-merit and baseload facilities earn most of their revenue from energy markets. Thus, investment in these technologies is likely even if capacity prices reduce below 50 per cent of the BRCP

Secondly, the WEM is a small and isolated market where lumpy investments in new plant (e.g. 100 to 200 MW) can result in substantial changes in the capacity demand and supply balance. The Reserve Capacity Target for the WEM is around 4600 MW, which implies that a plant which is 250 MW represents more than 5 per cent of capacity demand. Significant investment in new capacity and incorrect demand forecasts (i.e. demand is lower than expected) could result in excess capacity levels of between 7 to 10 per cent, with capacity prices falling below 50 per cent of the BRCP if exceeding 8 per cent.

Thirdly, permitting DSM to participate in the RCM and additional investment in renewable energy in response to the Large-scale Renewable Energy Target (LRET), implies that up to 800 MW of new capacity could enter the market by 2023-24. This could result in around 350 MW of additional capacity credits being created. In the absence of plant retirements, this could result in the level of excess capacity exceeding 8 per cent for several years.

In summary, Tesla is concerned that RCP's under the proposed convex capacity curve could be reduced well below the minimum price that Tesla requires to remain viable. In our view, at the inflection point of 8 per cent excess capacity, the RCP should be 0.7 of the BRCP and not at 0.5.

3.2 Transitional arrangements (price band)

Due to concerns about the future viability of dispatchable plant in the WEM with the new convex capacity curve, the Public Utilities Office has proposed transitional arrangements for incumbent generators. The transitional arrangements involve establishing a price band for existing generation facilities between $105,000 and $130,000 per megawatt (Consumer Price Index (CPI) adjusted) for a period of ten years. It is our understanding that the price band would be mandatory for incumbent generators i.e. no ability for incumbent firms to opt in for a "floating" capacity price.

In addition, new entrants would have the option to take the floating capacity price in each capacity year or to lock in the price in the year of entry for five years.

As outlined earlier, the price floor of $105,000 per MW per annum is likely to be binding for several years due to the likely entry of DSM facilities and renewable plant in the WEM. Prices that consistently at these low levels (i.e. below $120,000 per MW per annum) could result in the closure of peaking units.

Establishing a price floor of $105,000 (real 2018 dollars) would not prevent the closure of peaking units in the WEM. We estimate that the minimum price recently developed peaking units (i.e. installed in the last 6 years) require is of the order of $130,000 to $135,000/MW/annum. This is the level of prices that is enough to pay interest on loans and provide a minimum return to equity investors.

In our view, the price floor needs to be set at around $135,000/MW/annum to ensure that peaking plant remains in the WEM. The transitional price cap should be set at the BRCP.

A significant concern that we have with the proposed price band is that it may inadvertently delay the retirement of older plant in the SWIS that have no financing costs. If an incumbent portfolio generator was faced with a price of $70,000/MW, they may consider closing older units to ensure that prices increase beyond this level and provide an economic return to remaining units in their portfolio. By providing incumbents with old generation units (i.e. exceeding 30 years of age) with a price floor, they may keep these plants in service even if excess capacity increases due the entry of DSM facilities and large-scale renewable generators.

In our view, plant which is over 30 years of age should not be subject to the protection of the price caps. They should be subject to the floating capacity price and will help to assist owners of aging plant (e.g. Synergy) to assess whether existing plant should be retired to improve commercial outcomes for that market participant. This is especially important given that we expect significant new investment in large-scale wind and solar farms in the SWIS, as well as the re-entry of DSM facilities in the RCM.

4.0 Summary

Tesla is supportive of the proposed capacity pricing approach outlined by the PUO (August 2018). However, we have several concerns with the current proposal and have proposed alternative market settings:

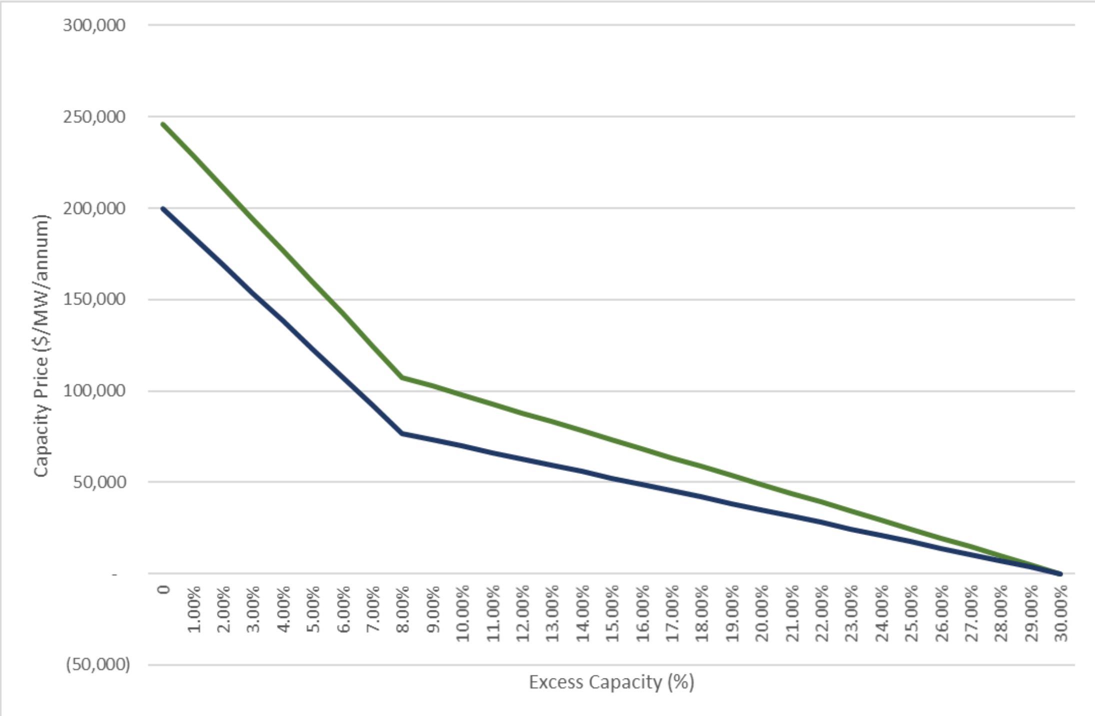
- The Price Cap should be set at 1.6 times the BRCP to reflect the high value of capacity to consumers when there is the risk of capacity shortfalls.
- The inflection point in the capacity price curve can occur at 8 per cent excess capacity, but the EZ BRCP Factor should be increased to 0.7 (i.e. RCP at this point is 70 per cent of the BRCP). This will help increase resultant prices and ensure that dispatchable peaking plant is not incentivised to exit the market if excess capacity increases to relatively modest levels of 4 to 6 per cent (which is highly likely to occur given the re-entry of DSM facilities into the RCM and committed investment in renewable plant to meet the LRET). The resultant RCP (assuming BRCP is $153,600 per MW in 2020/21 – nominal dollars) is $135,168 per MW at 6.4 per cent excess capacity. This is close to the minimum price required by recently installed peaking plant (i.e. OCGT and diesel generators) to meet interest payments to debt providers and provide a minimum return to equity investors.
- The transitional price floor needs to be set at around $135,000/MW/annum to ensure that peaking plant remains in the WEM. The transitional price cap should be set at the BRCP, which in this paper has been set at $146,000 per MW in 2018 dollars based on the nominal BRCP of $153,600 per MW which has been set for 2020/21 by AEMO.
- The methodology for determining the BRCP should be reviewed to ensure that it reflects the cost of new entrant plant. That includes establishing a WACC for determining the BRCP and the choice of the benchmark unit (160 MW OCGT). As a result, the BRCP has been set

below the actual cost of new plant entry. Hopefully, the approach to determining the BRCP will be reviewed to ensure that market settings do drive new investment in the SWIS to meet the target reliability criteria.

- Plant that is more than 30 years of age should not be subject to the price band since this would encourage plant to remain in service for longer and further increase the level of excess capacity in the WEM.

The implications of our proposal are shown below. Clearly, the Tesla proposed convex price curve is higher than the one proposed by the PUO.

Figure 2: Revised Capacity Pricing Model ($/MW/annum)



Under our proposal, the trajectory of RCPs is shown below (next page) assuming 2018 ESOO expected demand forecasts and likely future investment in DSM facilities and large-scale renewable energy capacity in the SWIS. Prices fall in 2023/24 due to the re-entry of DSM facilities into the RCM as well as additional renewable energy capacity being built to meet the LRET. In the longer term, capacity prices move above the BRCP, reflecting the higher risks for plant investing in the WEM given the increased risks associated with the new convex capacity curve (i.e. greater price fluctuations than previous price formulas).

Figure 3: Revised Capacity Price Forecasts with Tesla Price Parameters ($/MW/annum, 2018 dollars)