



Tesla Motors Australia Pty Ltd
650 Church St
Cremorne, Victoria, 3121

Dr Kerry Schott AO
Chair – Energy Security Board
COAG Energy Council

21 June 2019

Re: Converting the Integrated System Plan into Action

Dear Kerry,

Tesla Motors Australia, Pty Ltd (Tesla) is encouraged by the pro-active work program being pursued by the Energy Security Board (ESB) and the clear and defined steps being taken to make the Integrated System Plan (ISP) actionable. Tesla commends the ESB's focus on creating a stable policy environment to underpin long-term investment decision making.

This submission sets out Tesla's perspective on the high-level regulatory framework and guidelines being proposed, focusing on the following recommendations:

1. **Utility-scale:** additional consideration should be given to the integration and participation of utility scale energy storage in the NEM, noting the critical role it will play in achieving an efficient, secure and low-emission future grid. Having clear targets for the level of dispatchable capacity required would provide industry certainty and could build on the Retailer Reliability Obligation (RRO) framework and AEMO's ISP analysis;
2. **Cost Benefit Guidelines:** the ESB should assess existing barriers imposed by the RIT-T that may challenge non-network solutions from demonstrating the full extent of their market and grid benefits; and
3. **Behind the meter integration:** flexibility is required to update the impact of distributed energy resources (DER) as consumer assets will play an increasingly enhanced role for wider system planning in the NEM.

For further information on any of the points raised please contact Emma Fagan at efagan@tesla.com with any questions.

Kind regards

A handwritten signature in blue ink, appearing to read 'Mark Twidell'.

Mark Twidell
APAC Director – Energy Products

1. Utility-scale storage

In AEMO's ISP analysis completed to date, it is widely recognised that planning for dispatchable capacity (e.g. renewables firming with energy storage) is vital for the long-term reliability, security and emissions reduction of the Australian energy mix.

As articulated by the Finkel Review blueprint, reinforced by AEMO's 2018 Integrated System Plan, and consistently advocated by senior Australian energy representatives across academia, industry, utilities and regulators, Australia must prioritise additional energy storage, electricity network infrastructure and demand-response mechanisms, underpinned by supporting electricity-market reform that enables these technologies and fairly compensates owners for performance.

Commentary surrounding the ISP's implementation has often focused on facilitating the level of network infrastructure and investment required; and/or on how to best manage the upcoming retirement of coal plants via replacement generation capacity (e.g. the AEMC's Coordination of Generation and Transmission Investment work stream).

However, as yet there are no overarching plans or direct mechanisms to support the integration of storage that will need to be deployed in parallel (i.e. over 10GW by 2030 as projected in the 2018 ISP 'fast change' scenario) to contribute to both reliability and system security outcomes in the short term, and drive affordability and efficiency outcomes for consumers over the longer term. It is this recognition of economic efficiency (from a system wide optimisation perspective) that will be critical to ensure flows through to any supporting implementation plans – as storage can provide an attractive alternative to investment in network infrastructure, provide key grid services, and enhance market competition for wholesale energy and ancillary services as stand-alone or aggregated assets in the form of additional dispatchable generation capacity.

These benefits are already being demonstrated by a growing collection of utility-scale battery energy storage systems (BESS) being integrated into the transmission network, for example:

- Transgrid - Alexandra Canal Works Depot – 250kW / 500kWh BESS
- Vector - Glenn Innes, Auckland – 1MW / 2.3MWh BESS
- AusNet – Ballarat Terminal Station, Victoria - 30MW / 30MWh BESS

These storage systems provide an array of grid and market benefits – but perhaps most critically for the network businesses involved, a key advantage is their ability to free up network capacity (i.e. addressing congestion issues) by providing peak demand management, which in turn is deferring the need for capital expenditure on conventional network asset upgrades. In addition, battery storage also offers voltage management and reactive power support – increasingly important as the penetration of solar PV increases throughout the network. Even at the distribution level, assessments of Distribution Annual Planning Reports indicates over 140 instances of network capacity being exceeded and requiring millions of dollars in network upgrade investments. Many of these capital investments are also likely to present non-network opportunities – e.g. storage deferring or reducing investment requirements and providing a more efficient solution.

The ESB can support this objective through its proposal of expanded investment assessment guidelines (i.e. the AER preparing Cost Benefit Analysis Application Guidelines). This will provide clarity of direction to market bodies on the interaction between the ISP and RIT-T, allow regulators to work through the options and benefits of non-network solutions, and empower consumers and participants regarding the scale and speed of the NEM transition required to deliver on the infrastructure investment levels outlined in the ISP.

More broadly, the ESB has an opportunity to provide additional investor certainty through specifying clear targets for all dispatchable capacity (e.g. to incentivise the storage required to complement the existing pipeline of renewables). This is already recognised through the mechanism of the RRO, where AEMO forecasts energy supply gaps. By quantifying this as a level of new dispatchable capacity deployments required (underpinned by the ISP analysis), this would support industry in preparing for the transition.

2. Creating appropriate Cost Benefit Analysis guidelines

Tesla is strongly supportive of the ESB's proposal to “*take a broader definition of 'NEM Obligations'”* and to “*give AEMO greater flexibility to manage uncertainty, have sufficient regard to power system resilience, public policies, broader interactions with other systems, and report on a range of benefits*”. As proposed, this should provide the necessary flexibility to consider new non-network technologies and wider integration impacts, including complimentary market benefits not directly attributable to the individual project being assessed by transmission network service providers (TNSPs).

However, whilst it makes sense to create linkages between the existing RIT-T application guidelines and the ISP, care must be taken to ensure analysis of the options and benefits of non-network solutions is included and that potential outcomes can be represented accurately for the full value provided.

Even if TNSPs are required to call for and consider non-network options, if assessments are based on restricted definitions of 'benefits' and 'costs' than these options will continue to be hampered. For example, when comparing network infrastructure options in a RIT-T, the wider benefits of non-network solutions (such as utility-scale storage) are often not captured fully, over-looked completely, or unable to be assessed:

- **Economies of scale are excluded** - i.e. a centralised utility-scale storage solution would be more efficient than each individual generator deploying storage, but this may not be considered a true 'NEM-wide market benefit' under the RIT-T, even if it leads to system-wide optimal outcomes;
- **Broader market value streams are restricted** – non-network solutions often do more than simply replace the network infrastructure alternative. For example, battery storage can relieve network congestion, whilst also providing ancillary services such as frequency and voltage control, inertia, and put downward pressure on energy prices through optimising dispatch and time-shifting energy at peak periods. However, the 'market benefit' definition may also limit how these broader system benefits are captured under RIT-T assessments – even if they are demonstrating wider market efficiencies. The AER's recent SAPN Draft Determination provides an instructive counterpoint where the full market benefits were incorporated in the regulator's assessment of DER participation, including the potential reduction in wholesale energy prices;
- **Cost-sharing is limited** – the ESB should recognise that there are new and innovative commercial models where a combination of network, retail and customer stakeholders pay for the same asset, and in return each party obtains different value from their investment. Existing RIT-T processes apportion full costs to TNSPs, even when only a fraction of the cost (and value) may be realised in practice (in effect providing a bias to network ownership);
- **System strength benefits** – local network benefits are often excluded from non-network options based on a top-down assessment of region wide reliability shortfalls and security requirements, even if system benefits can contribute to longer-term efficiency (e.g. removing the need for deploying individual syncons at generation sites);
- **Updating cost parameters** – AEMO's work in updating its cost modelling assumptions should continue to be supported and integrated across wider market planning and forecasting consultations, particularly given the rapid technological advancements for non-network solutions.

As CBA guidelines will underpin ongoing analysis by AEMO and TNSPs (including to outline scenario development, define reliability metrics and assess applicable benefits), it will be vital to ensure they take a truly system-wide approach and can ensure the ISP's optimised solutions (particularly with regards to non-network solutions) are facilitated through subsequent RIT-T processes as required. This may also require credible checks and balances where TNSP 'preferred options' are confirmed to address system-wide needs identified through the ISP in a 'least-cost / maximum benefit' optimisation.

A broader review on network assessment frameworks may also be required to address challenges faced by non-network investments, noting that alternative models have already proven successful in other markets, such as California's Transmission Economic Assessment Methodology.

3. Distributed Energy Resources

The role of DER in energy generation and load control, grid stability and reliability is now well established and is currently being demonstrated through several projects and trials underway. Again, as noted by AEMO's modelling in the 2018 ISP, the role for DER will continue to be enhanced and as aggregation is facilitated, will be increasingly felt beyond the local distribution networks in which it is deployed.

The scale, scope and timing of this impact of DER, and the role of the consumer, is still uncertain and will also be subject to several complementary reforms and market reviews currently underway. These are being led by a combination of the Australian Energy Market Operator (AEMO), the Australian Energy Market Commission (AEMC), Energy Networks Australia (ENA) and the Australian Competition and Consumer Commission (ACCC).

The key risk for actioning the ISP is therefore in compounding any existing uncertainties with a lack of overarching vision (that can coalesce each of these individual reform pieces). At the same time, once a unified DER strategy is set, the uptake of behind the meter assets will be significantly accelerated and will necessitate appropriate integration within the broader electricity system.

Tesla supports the proposed methodology where input components are *“able to evolve over time”*, particularly in regard to demand side *“uptake and profile of distributed energy resources”*. This flexibility should be reflected across all proposed guidelines, to ensure both methodologies and input parameters can be updated in line with new information and changes to AEMO's underlying modelling assumptions as markets and regulations adapt in the coming months/years.

4. Conclusion

Tesla welcomes all ongoing work being undertaken to coordinate Australia's electricity system transformation and will continue to engage with relevant government and market bodies.

An integrated regulatory approach for actioning the integrated system plan is a sensible approach that will ensure true cost efficiency, reliability and emissions-reduction is achieved in an optimised way. It will also underpin the ongoing investment in critical infrastructure requirements going forward (more broadly than just traditional network investments), whilst also unlocking the potential for true consumer participation (e.g. through aggregation, behind the meter participation and demand response mechanisms).

Tesla will continue to support the ESB in achieving its ambitions and looks forward to further engagement opportunities.