Goanna Energy Consulting Pty Ltd

Tasmanian Small Business Council
Uniting Small Business

A consumer perspective on interconnector and transmission investment – Marinus link (case study)

Executive Overview

6 April 2020

Acknowledgements & Disclaimer

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PURPOSE OF THIS EXECUTIVE OVERVIEW

The Tasmanian Small Business Council (TSBC)

The Tasmanian Small Business Council (TSBC) is an "association of [small business] associations", each of which represents their market grouped industry sector. The TSBC seeks to provide the representative voice of small business in Tasmania. The TSBC's role in facilitating meetings of and forums for these trade associations, whose members are predominately small businesses, is paramount to providing informed insights and advice to governments and regulators.

The TSBC welcomes the opportunity for Tasmania to play a role in helping with the nations' transition to renewable energy, and welcomes the position adopted by the Tasmanian government that Tasmanian consumers will not pay for something which does not benefit them.

There are however a number of matters which we believe need to be considered carefully before any commitment is made to the proposed interconnector project (Marinus Link) which would directly affect Tasmania, and other interconnector projects which are proposed in AEMO's Draft 2020 ISP.

The TSBC's interest in Marinus Link and other interconnector projects.

The rules of the electricity market, as they currently stand, would see Tasmanians paying for around 50% of the cost of Marinus, if it becomes part of the regulated transmission system. The Tasmanian government has indicated that such an outcome is not acceptable, but the applicable rules have to be changed to avoid it. There is not yet agreement as to how the rules should be changed, and resolution and implementation of any change could take some time.

It is not yet clear who would build and own Marinus. The Tasmanian government could be expected to be under considerable pressure, for example from wind generators and other vested interests, the national market operator, or the federal government, to ensure Marinus Link proceeds, and may contemplate taking an ownership position, which would see Tasmanian taxpayers taking on the associated project, investment and operating risks.

The Marinus Link project will have a service life of around 40 years. The costs will need to be recovered over that period, which means that consumers will be "on the hook" for that period.

There is however great uncertainty about what will happen in the electricity market. That uncertainty means that any investment of forty years in the electricity industry carries huge risk. If Marinus Link (or other proposed interconnectors) were constructed as a regulated asset, the investors would receive a guaranteed return over the 40 years, but consumers would carry the very real risk of it not being required at some point but would continue to pay for it.

Very large, long lived investments in markets facing high levels of uncertainty is not in accordance with sound investment strategy. Consumers will ultimately carry the risk for large investments in regulated interconnectors. Least regret analysis is one tool to address high levels of uncertainty, as is an investment strategy comprising smaller, incremental investments.

There is also a higher level question – is the ISP interconnector solution, including Marinus Link, the only, or the best way to address the changes which the NEM faces?

TSBC project - A consumer perspective on interconnector and transmission investment – Marinus link (case study)

The TSBC, assisted by Goanna Energy and SavvyPlus Consulting and funded by Energy Consumers Australia, has undertaken a consumer review of the work undertaken by AEMO in its draft 2020 Integrated System Plan and the work by TasNetworks in its Project Assessment Draft Report for the Marinus Link (Bass Strait) interconnector, as a case study for other interconnector projects.

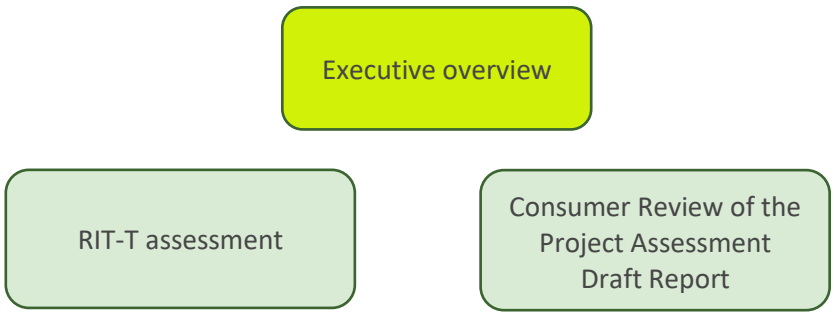
Our objective is to critique the work to test key inputs and findings and to test whether the proposed link is in the best interest of consumers, with the end-goal of creating a blueprint for consumers/advocates to engage in the process for assessing similar major capital spend projects from a consumer perspective.

Our focus is on the potential costs to energy consumers; how the costs are allocated; how those costs align with the benefits which accrue to consumers; and whether or not the proposed capital spend project delivers the lowest cost outcome to consumers of all viable options.

We have undertaken the review in two parts – an assessment of the Regulatory Investment Test for Transmission (RIT-T) and its application to Marinus link, completed in November 2019, and a Consumer Review of the Project Assessment Draft Report (PADR) for Marinus Link, completed on the 5th April 2020.

This Executive Overview of the project - *A consumer perspective on interconnector and transmission investment – Marinus link (case study)* - provides the context for each of those components and a summary of the associated recommendations, findings and conclusions.

A full report for each of the components accompanies this overview.



Marinus link Project Draft Assessment Report (PADR

The consumer review the TSBC has conducted has been completed in a timeframe which allows us to submit our findings to TasNetworks, responding to the invitation to provide submissions on the Marinus link Project Draft Assessment Report (PADR) by the revised date of 6th Apr 2020.

The TSBC welcomes the opportunity to do so.

Summary of headline findings

RIT-T

The RIT-T in its current form is adequate for the assessment of "traditional" network assets such as a zone sub station required to meet expected load growth, or a new transmission line required to overcome congestion on a particular network. There are improvements which could be made which are addressed in our findings and recommendations.

The RIT-T in its current form is **not** adequate for the assessment of proposed new interconnectors, which represent one possible solution to a range of possible solutions to address the rapid and substantial changes to the NEM associated with Australia's transition from fossil fuel generation to renewable generation.

There are very large risks to consumers in progressing with the investment in or evaluation of very expensive interconnectors, which are part of a future scenario as envisaged by AEMO, ahead of the ESB's assessment of future scenarios for the NEM design/framework, with a key deliverable of that process being to either recommend a package of measures to adapt the existing market design or recommend alternative market designs.

Tasmania should not pay higher electricity (transmission) charges in order to provide surety of supply and/or lower prices in mainland jurisdictions, which would be the case under the current RIT-T and NER, and, noting the move by AEMO to incorporate "least-regrets" decision making into its ISP, the current RIT-T cost benefit analysis is inadequate given the future uncertainties surrounding the NEM and needs to include additional tools, potentially regrets analysis.

PADR review.

We are unconvinced that proceeding with the proposed Marinus Link is in the best interests of consumers.

If consumers were regarded as being investors in this project, it is our opinion that the risks have been understated.

The modelling undertaken in the PADR has made some improvements beyond the Integrated System Plan (ISP) modelling, however given that the PADR relies heavily upon the ISP, they remain intrinsically linked. The modelled Market Benefits arising from the PADR are considered unreliable.

Given Marinus Link is a 'big bang' solution with a 40-year legacy, it fails to meet the internationally accepted principles of smaller and nimble investments being more appropriate at times of high uncertainty. Furthermore, the Marinus Link proposal does not aid consumers by future proofing the system and allowing consumers the benefit of riding the technological benefits that are continually arriving, affecting consumer behaviour, learning curves, generation capacity and capability.

Given the ISP modelling has a systematic bias of under-playing the role of batteries (large and small), then the conclusion that pump-storage and the associated interconnectors are the best Least Regret solution can be regarded as questionable.

We tested an alternative which we called **Battery Link** that is based on fast-tracking behind-the-meter storage using the same annual expenditure as proposed for Marinus Link, and concluded that, when complemented with gas powered generation in Victoria's Latrobe Valley (at a much lower capital cost than the Battery of the Nation and Marinus Link), there are greater comparable consumer benefits.

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1 Introduction

1.1 Background to the Project

The world, including Australia, is undergoing an energy revolution transitioning from fossil fuel generation to renewable generation, affecting all levels of consumers from large industrials through to households and small businesses. The pace and scale of change is almost impossible to keep track of.

As part of the energy revolution, a very small sample of activities incudes:

- Consumers are adopting technology such as PV rooftop generation at a pace which in many areas exceeds the capacity of electricity networks to accommodate the new generation source;
- Large scale wind generation is being installed at a rate which at times exceeds the capacity of the electricity grid to cope;
- Major industrial consumers are examining mechanisms which will allow them to cope with the intermittency of renewable generation; and
- Large scale batteries are being installed at grid level.

The task of responding to the challenges posed by the energy revolution has been assigned by the COAG Energy Council, at the highest level, to the Energy Security Board (ESB).

The role of the ESB is to coordinate the implementation of the energy reform blueprint produced by Australia's Chief Scientist, Dr Alan Finkel AO[1]. The ESB also provides whole of system oversight for energy security and reliability to drive better outcomes for consumers, through the Australian Energy Market Commission (AEMC), the Australian Energy Market Operator (AEMO), the Australian Energy Regulator (AER) and other agencies and organisations.

The view of the ESB, as expressed in their 2018 assessment of the health of the National Electricity Market[2], provides an appropriate contextual setting for the TSBC's project:

"The NEM is transforming at a rapid rate. It is moving toward a system that requires the integration of more variable and distributed energy resources, and both chemical and hydro storage. The shift toward more variable and distributed energy resources has been driven by government policies, significant reductions in technology costs and changing consumer preferences. This transformation will continue with the addition of embedded micro-systems, peer to peer trading through block chain capability and, over time, electrification of the transport sector. With these changes, traditional concepts of the way in which the system is managed, how investment should be rewarded, and the role played by supply, storage, networks and consumers must be revisited".

The ESB is providing oversight to a range of activities at a national level[3] as follows:

[1] Independent Review into the Future Security of the National Electricity Market, Blueprint for the Future, 9 June 2017

[2] The Health of the National Electricity Market 2018 ENERGY SECURITY BOARD, page 6

[3] Ibid, Annex B, page 7

- Coordination of Generation and Transmission (COGATI)
- Integrated System Plan
- Distributed Energy Integration Program
- Electricity network economic regulatory framework review
- Rocky Mountain Institute - ESB DER project
- Frequency Control Work Plan
- Wholesale Demand Response Mechanism
- Short term forward market review
- Intervention mechanisms and system strength project
- Open Energy Networks
- Consumer Data Right
- Transparency of new projects (rule change)
- Underwriting new Generation investments

The scale of the activity at a national level is unprecedented, reflecting the pace and scale of the energy revolution noted above, and parallels (or perhaps lags) the pace of change at a consumer level.

The Integrated System Plan (ISP, draft 2020) proposes a range of transmission investments to address what the Australian Energy Market Operator (AEMO) sees as significant threats to electricity supply reliability in the medium term (ten to fifteen years).

The very large investments involved, coupled with the very long service and economic lives of transmission assets, are of particular relevance to consumers and consumer representative bodies such as the TSBC, especially given that consumers are not well represented in the decision making processes which lead to the investments, but consumers ultimately bear the costs of those investments.

It is against that background that the TSBC has undertaken its project – *A consumer perspective on interconnector and transmission investment – Marinus link (case study)* - with the objective of critiquing the work undertaken by TasNetworks and the related inputs provided by AEMO's ISP in relation to the Marinus Link project to test key inputs and findings and to test whether the proposed link is in the best interest of consumers.

1.2 Structure of this Document

This Executive Overview provides a summary of two major studies:

- A Consumer-focused Assessment of the RIT-T and its application to Marinus Link; and
- A Consumer Review of the Project Assessment Draft Report (PADR) for Marinus Link.

The report from each of those studies should be read in conjunction with this overview.

2 A Consumer-focused assessment of the RIT-T and its application to Marinus link

Our assessment concludes that the RIT-T in its current form is adequate for the assessment of "traditional" network assets such as a zone substation required to meet expected load growth, or a new transmission line required to overcome congestion on a particular network. There are improvements which could be made which are addressed in our findings and recommendations. We conclude that the RIT-T in its current form is not adequate for the assessment of proposed new interconnectors, which represent one possible solution to a range of possible solutions to address the rapid and substantial changes to the NEM associated with Australia's transition from fossil fuel generation to renewable generation.

We highlight the risks to consumers of progressing with the investment in or evaluation of very expensive interconnectors, which are part of a future scenario as envisaged by AEMO, ahead of the ESB's assessment of future scenarios for the NEM design/framework, with a key deliverable of that process being to either recommend a package of measures to adapt the existing market design or recommend alternative market designs.

We contend that Tasmania should not pay higher electricity (transmission) charges in order to provide surety of supply and/or lower prices in mainland jurisdictions, which would be the case under the current RIT-T, and, noting the move by AEMO to incorporate "least-regrets" decision making into its ISP, the current RIT-T cost benefit analysis is inadequate given the future uncertainties surrounding the NEM and needs to include additional tools, potentially regrets analysis.

The suggested changes to the RIT-T to address the inadequacies we observe are included in our findings and recommendations, and include the following in relation to the assessment of any particular interconnector:

- A requirement to undertake additional analysis, potentially regrets analysis, as part of a RIT-T.
- A requirement to explicitly consider the economic impact of potential changes to the NEM design/framework, which are part of the ESB's consideration of future scenarios beyond 2025;
- A requirement to explicitly consider the economic impact of the operation of other proposed interconnectors;
- An expansion of section 3.1 of the RIT-T Guidelines to clarify the definition of "Identified Need" and a requirement for consumer endorsement of the Identified Need for the interconnector;
- The establishment of a "Consumer Forum" to negotiate relevant outcomes with the Proponent (including the definition of Identified Need);
- The requirement to report on expected regional outcomes, including NPV and pricing;
- The inclusion of a test or trigger point based on an assessment of the risk of the interconnector becoming redundant or underutilised;
- The identification of all parties who will benefit from interconnector investments, in all applicable jurisdictions of the NEM, the value of the benefits, and alignment of cost allocations with those benefits;

- Inclusion of a comprehensive consumer risk assessment, including mitigating actions. The risk assessment would be one of the components of the RIT-T requiring agreement between the Consumer Forum and the Proponent.

Our report provides 10 recommendations and 81 findings.

2.1 RECOMMENDATIONS

Context for the RIT-T

Recommendation 1
The RIT-T should include additional tools that help to minimise risks to consumers from poor decision making based on a RIT-T analysis, including (potentially) a "least regrets" analysis. Specifically, the scale and cost to consumers of any unnecessary investment under one future scenario should be identified in a way which can be directly compared to the cost of failure to invest under a different future scenario. This should be examined more thoroughly to determine its usefulness to electricity consumers in full consultation with them.

Recommendation 2
Any RIT-T evaluation of an interconnector (including Marinus Link) should incorporate explicit consideration of the possible impacts of a revision to the NEM framework/design, and an evaluation of the economic impact of other interconnectors which are or proposed but yet to be constructed. That consideration should include an assessment of the probability of achieving any projected cash flows included in the assessment of net benefits.

Identified Need

Recommendation 3
The AER should revisit the RIT-T Guidelines and expand Section 3.1 to provide guidance specifically for interconnector projects, in particular expand on the current reference to "An identified need may consist of an increase in the sum of consumer and producer surplus in the NEM", supported with relevant examples.

Recommendation 4
The AER should revisit the RIT-T Guidelines and mandate that an appropriate consumer representative body is established ahead of any RIT-T process and, amongst other roles, that body must endorse the Identified Need of the proposed project.

Credible options

Recommendation 5.
Assessment of credible options identified as part of the ESB's Post 2025 Market Design Project should precede the consideration, via the RIT-T process, of any given interconnector, including Marinus link.

Recommendation 6
The RIT-T should be amended to include a formal requirement for RIT-T proponents to report on regional consumer impacts where these are material, and with interconnectors, regional NPVs and projected price impacts across broad customer classes.

Market Benefits

Recommendation 7
The RIT-T as it is applied to interconnectors should be modified to provide a test or trigger point based on an assessment of the risk of the interconnector becoming redundant or underutilised and therefore not delivering the expected market benefits , under a range of plausible scenarios, and the associated need for governments to carry that risk rather than consumers.

Transmission Pricing

Recommendation 8
The ESB should undertake an extensive review of the RIT-T and the provisions of Chapter 6A of the NER and effect the necessary Rule changes to require that the RIT-T clearly identifies all parties who will benefit from interconnector investments, in all applicable jurisdictions of the NEM, the value of those benefits, and that the resulting cost allocations and changes to transmission prices are directly aligned to those benefits.

Consumer risks

Recommendation 9
The RIT-T be amended to require the inclusion of a consumer comprehensive risk assessment, including mitigating actions. The risk assessment would be one of the components of the RIT-T requiring agreement between the Consumer Forum and the Proponent.

Current RIT-T process and Consumer Engagement

Recommendation 10
The requirement for consumer engagement in the RIT-T process should be significantly strengthened in line with the mechanisms outlined in the New Reg process, incorporating the establishment of a Consumer Forum noted at recommendation 4 to negotiate key inputs and outcomes from the conducting of any RIT-T.

2.2 Recommendations compared to Marinus Link PADR

Table 1 below provides a summary of the TSBC recommendations 1 to 10 compared to the contents of the Marinus Link PADR.

None of the recommendations receive a “tick”.

We note that TasNetworks has followed the RIT-T guidelines as they currently apply.

Table 1 – Recommendations compared to Marius Link PADR

No.	Recommendation	Marinus Link PADR
1	The RIT-T should include additional tools that help to minimise risks to consumers from poor decision making based on a RIT-T analysis, including (potentially) a "least regrets" analysis.	Whilst the ISP utilizes Least Regrets analysis, EY's analysis of market benefits for the Marinus Link PADR uses the cost benefit analysis prescribed under the current RIT-T guidelines. Least Regrets analysis is not applied, and consumers do not have the benefit of such analysis.
2	Any RIT-T evaluation of an interconnector (including Marinus Link) should incorporate explicit consideration of the possible impacts of a revision to the NEM framework/design and an evaluation of the economic impact of other interconnectors which are or proposed but yet to be constructed.	The ESB's post 2025 market design project is scheduled to identify, by early 2020, potential fit-for-purpose market frameworks for evaluation against each other and the NEM design. Those (alternative) frameworks have not yet been identified. The PADR therefore could not consider the impacts of any such alternative frameworks. Consumers have not been made aware of any possible implications.
3	The AER should revisit the RIT-T Guidelines and expand Section 3.1 to provide guidance specifically for interconnector projects. In particular expand on the current reference to "An identified need may consist of an increase in the sum of consumer and producer surplus in the NEM", supported with relevant examples.	The TSBC considers the Identified Need for Marinus link as specified in the PADR does not meet the AER's requirements and should be more specific and meaningful to consumers.
4	The AER should revisit the RIT-T Guidelines and mandate that an appropriate consumer representative body is established ahead of any RIT-T process and, amongst other roles, that body must endorse the Identified Need of the proposed project.	No such consumer body was established as part of the Marinus Link RIT-T process. One outcome is that the definition of the Identified Need for the project lacks any consumer input or consumer focus.
5	Assessment of credible options identified as part of the ESB's Post 2025 Market Design Project should precede the consideration, via the RIT-T process, of any given interconnector, including Marinus Link.	The TSBC expects that as part of the ESB's post 2025 market design project non network alternatives to the network (interconnector) solutions will be identified. The PADR is constrained to simply evaluating four different sizes for the undersea cable. Consumers are not provided with a view of the relative merit of non-network (interconnector) alternatives.
6	The RIT-T should be amended to include a formal requirement for RIT-T proponents to report on regional consumer impacts where these are material, and with interconnectors, regional NPVs and	The PADR does not provide a view of regional consumer price impacts, including network charges. The TSBC's review of the draft 2020 ISP and the Marinus Link PADR, summarized in section 3 of this overview, examines this

	projected price impacts across broad customer classes.	shortcoming, noting that the allocation of Marinus Link costs is not yet determined. Attachment 3 to the PADR – "*Discussion Paper: Beneficiaries pay pricing arrangements for new interconnectors"*, addresses the existing shortcomings of interconnector cost allocations under the current NER. Consumers impacted by the construction of Marinus Link cannot know what the impact on electricity prices they pay will be until that issue is resolved.
7	The RIT-T as it is applied to interconnectors should be modified to provide a test or trigger point based on an assessment of the risk of the interconnector becoming redundant or underutilised and therefore not delivering the expected market benefits , under a range of plausible scenarios, and the associated need for governments to carry that risk rather than consumers.	There is no consideration in the benefits analysis for Marinus Link of the link becoming redundant. Such an outcome has a high degree of probability given the changes which are occurring in the NEM, including the consumer revolution noted by the AEMC[4]: *"Australians are at the forefront of a technological revolution in energy".* The probability of such an outcome represents a substantial risk to consumers.
8	The ESB should undertake an extensive review of the RIT-T and the provisions of Chapter 6A of the NER and effect the necessary Rule changes to require that the RIT-T clearly identifies all parties who will benefit from interconnector investments, in all applicable jurisdictions of the NEM, the value of those benefits, and that the resulting cost allocations and changes to transmission prices are directly aligned to those benefits.	The PADR broadly identifies (eg figure 19) customer benefits by jurisdiction. There is however no identification of which parties, other than electricity customers, would derive benefits. Those parties would include generators and network operators (current and existing). The ESB has been tasked with addressing this issue in 2020.Without an explicit examination and alignment of benefits and costs, consumers cannot be confident that they are paying a fair price for the benefits they receive from the construction of any interconnector.
9	The RIT-T be amended to require the inclusion of a consumer comprehensive risk assessment, including mitigating actions. The risk assessment would be one of the components of the RIT-T requiring agreement between the Consumer Forum and the Proponent.	A comprehensive risk analysis and risk mitigation strategy is a key component of any business plan or major investment analysis, but is notably absent from the current RIT-T guidelines and therefore absent from the Marinus Link PADR. The current uncertainties surrounding the future shape of the NEM introduce substantial risks to all NEM participants, but particularly to consumers who will ultimately bear the costs of major regulated network investments such as interconnectors.
10	The requirement for consumer engagement in the RIT-T process should	No such forum is currently required under the RIT-T guidelines, and none was established as

[4] AEMC Chairman John Pierce, published on 26 September 2019 in the Australian Financial Review

	be significantly strengthened in line with the mechanisms outlined in the New Reg process, incorporating the establishment of a Consumer Forum noted at recommendation 4 to negotiate key inputs and outcomes from the conducting of any RIT-T.	part of the evaluation of the Marinus Link proposal.

3 Consumer Review of the Project Assessment Draft Report (PADR) for Marinus Link

TasNetworks has invited submissions on its Project Assessment Draft Report (PADR) prepared as part of the Marinus Link Regulatory Investment Test – Transmission (RIT-T) process. The Tasmanian Small Business Council (TSBC) has initiated a review and compiled this report with sponsorship from Energy Consumers Australia (ECA). The research was undertaken by Goanna Energy and SavvyPlus Consulting.

The key perspective of this review was to consider the proposed Marinus Link from a consumer perspective. Furthermore, given consumers will be expected to pay for this regulated interconnector, it seems appropriate that consumer views are deeply incorporated into the decision-making process.

3.1 FINDINGS

The highlights from this review are:

1. We are unconvinced that proceeding with the proposed Marinus Link is in the best interests of consumers.

2. By treating consumers as if they were investors in this project, it is our opinion that the risks have been understated and can be classified into the categories of:

    a. Technology;
    b. Modelling; and
    c. Market risks.

3. The modelling undertaken in the PADR has made some improvements beyond the Integrated System Plan (ISP) modelling, however given the PADR relies heavily upon the ISP, they remain intrinsically linked. The modelled Market Benefits arising from the PADR are considered unreliable given that:

    a. The discount rate applied is not consumer risk-adjusted;
    b. The margin of error associated with the Market Benefits forecasts are so great it makes the conclusions unreliable;
    c. The ISP and therefore the PADR, mis-represent the up-take of large-scale batteries already undertaken or under serious review by leading market participants, and therefore is disconnected from market developments; and
    d. Behind-the-meter batteries and electric motor vehicle batteries (becoming more abundant over time) are poorly modelled and therefore do not reflect the likely commercial behaviour of these assets, nor contribute to potential management of system security and reliability.

4. Given Marinus Link is a 'big bang' solution with a 40-year legacy, it fails to meet the internationally accepted principles of smaller and nimble investments being more appropriate at times of high uncertainty. Furthermore, the Marinus Link proposal does not

aid consumers by future proofing the system and allowing consumers the benefit of riding the technological benefits that are continually arriving, affecting consumer behaviour, learning curves, generation capacity and capability.

5. Given the ISP modelling has a systematic bias of under-playing the role of batteries (large and small), then the conclusion that pump-storage and the associated interconnectors are the best Least Regret solution can be regarded as questionable. In a re-work of the modelling, we would be surprised if gas powered generation built in Latrobe Valley complemented with a better utilisation of battery technology, would not be a better Least Regret solution.

6. We tested an alternative which we called **Battery Link** that is based on fast-tracking behind-the-meter storage using the same annual expenditure as proposed for Marinus Link, and concluded that when complemented with gas powered generation in Victoria's Latrobe Valley (at a much lower capital cost than the Battery of the Nation and Marinus Link), there greater comparable consumer benefits. This **Battery Link** strategy also has the benefits of:

    a. Being a more nimble and technologically driven solution that can capitalise upon future technological breakthroughs;

    b. Delivering market benefits to the spot market, but also delivering greater benefits to consumers directly through avoided network charges as well as wholesale market costs, and therefore s not suffering the risk that the fuel switching benefits that under-pinned the PADR Market Benefits are not passed through to consumers;

    c. Providing the opportunity to use behind-the-meter storage for:

        i. black-out protection (local and grid events);
        ii. providing local network support which has the subsequent potential benefit of lowering network charges for all consumers; and
        iii. aiding the management of over-voltage supply caused by solar PV, which is considered a growing challenge which must be addressed to avoid a punitive approach of limiting the adoption of solar PV.

    d. Complementing messages from the AEMC, Energy Security Board and others regarding the pending consumer-led energy revolution. Battery Link is a platform to accelerate the revolution for the benefit of consumers;

    e. Mitigating the risk of further market power concentration as both SnowyHydro and HydroTas are already critical market Price Setters that do not fundamentally have the same commercial driver as consumers for lower prices. These entities will have a greater financial burden caused by capital serving costs and operating costs associated with developing their respective deep-storage assets; and

    f. Creating more competition as consumers, who are traditional demand-side participants, will now be able to compete against the supply-side of the market by demand responding and/or discharging storage. Such an initiative will be a game changer for competition, benefiting consumers.

3.2 Next Steps

The recommended next steps from this review are:

1. Discuss with TasNetworks the findings of this review to clarify any issues that may arise.

2. AEMO to take onboard the modelling issues identified in this review and explore other options such as the Battery Link concept outlined in this review. In consultation with TasNetworks, the TSBC and partners would welcome the opportunity to work with AEMO in this endeavour.

3. We contend that the findings and suggestions outlined in this review have relevance in the wide range of activities underway in relation to the NEM and therefore the TSBC and partners would welcome the opportunity to participate in further, in conjunction with Energy Consumers Australia. These activities include, but not limited to:

    a. The Energy Security Board's Post 2025 Market Design review;
    b. The AEMC's Economic Regulatory Framework Review;
    c. Integrating Distributed Energy Resources for the Grid of the Future project;
    d. Open Energy Networks project;
    e. The COGATI review;
    f. Establishment of an expert ISP consumer panel to advise AEMO during the development of the ISP, as announced by the COAG Energy Council on the 27th March 2020; and
    g. The Distributed Energy Integration Program.

We look forward to any feedback from TasNetworks on our submission and would be prepared to meet directly to discuss and clarify any element of our review.

We further contend that our findings and suggestions are very relevant to a range of activities which are taking place in relation to the NEM, including, but not limited to, the ESB's *Post 2025 Market Design* review; the AEMC's Economic Regulatory Framework Review, *INTEGRATING DISTRIBUTED ENERGY RESOURCES FOR THE GRID OF THE FUTURE;* the *Open Energy Networks* project; the COGATI review; the establishment of an expert ISP consumer panel to advise AEMO during the development of the ISP (announced by the COAG Energy Council on the 27th March 2020); and the Distributed Energy Integration Program.

3.1 Detailed Observations And Findings

3.1.1 Consumer issues observations and findings

Observation	Finding
1. Price Impacts and Price Signals	• As modelled in the PADR, the main benefits arising from Marinus Link is from fuel switching, however prices are not expected to be impacted at the time when most of the benefits can be expected to be realised. • Consumers should not be forced to pay for a regulated asset that delivers benefits to others. • The Australian consumer has proven to be adaptable, especially when provided with appropriate technology. • We need to pass through more price signals to reward good behaviour and encourage further incentives to assist in lowering the cost for all.
2. Investment Proposition	• Consumers are expected to pay for regulated transmission assets and therefore carry three levels of risk - technology, modelling and market risks. • It is our conclusion that whilst the discount rates applied in the PADR conform to the Energy Network Australia RIT-T Economic Handbook, such a rate is not appropriately risk-adjusted from a consumer perspective.

4. Alternative Proposal **Battery Link.**	• The Marinus Link proposal expects consumers to pay $193m pa for the next 40-years. • An alternative approach is to invest in accelerating the consumer-led energy revolution by funding the purchase of behind-the-meter batteries. • Complemented with gas powered generation. • Given the greater consumer prize and other benefits, the benefits of Battery Link far outstrip the estimated Market Benefits of Marinus Link.
4. Market Power	• Consumers are concerned that bas a consequence of large interconnectors being constructed in a marketplace that has limited effective competition, market power will become further concentrated.
5. Wealth Transfer	• The ISP has not considered: ○ The economic impact on the low price periods being impacted by storage facilities when concluding to favour pump storage from other technologies such as gas, hydrogen etc. ○ The possibility that the high price periods are not averted by pump storage due to a strategic decision by the owner to let extreme prices occur, without threatening system security.

3.1.2 Industry methodology observations and findings

Observation	Finding
1. Least Regret Plan	• It is unclear is how the Least Regret plan has been selected in terms of selection criteria, weightings, metrics and scoring. • It is difficult to envisage how 40-year investments are deemed to be the best Least Regret option in times of great uncertainty.
2. Industry Track Record	• Looking at the industry's track record to accurately predict the future, the results show the track-record is poor. • Further scenario testing and qualifications of inputs is required.

3. Modelling margin of Error	• The price forecast undertaken by Marsden Jacobs for Snowy 2.0 did not venture beyond 10-years due to the high levels of uncertainties. • Long term energy price forecasting prices is problematic, and the inherent margin of error is profound. • To rely upon fine-tuned estimates that only show modest gains to economically justify projects like Marinus Link, is fraught with danger • Consumers should not be expected to carry such modelling risks.

3.1.3 Modelling critique observations and findings

Observation	Finding
1. Net Market Benefits	• A key observation of the PADR Market Benefits is that the material benefits begin from 2035, which is very risky planning given the long lead time. It is also inconsistent with the Least Regret methodology; holds significant "Kodak" Risk for consumers and uses a discount rate which has not been appropriately risk adjusted.
2. Reliability Standard Bias	• The Reliability Standard has been measured based on the assumptions used in the ISP modelling, however, we have concerns that the modelling has a systematic bias skewing the results from battery storage and other technologies.

3.1.4 Industry assumptions observations and findings

Observation	Finding
1. Behind-the-Meter	• The modelling for behind-the-meter capability appears not to maximise the benefit to the consumer, or to the industry in increasing security of supply. As a result, the conclusions reached for the Least Regret plan are questionable. • Further, we submit that the behind-the-meter capability, including batteries and electric motor vehicles, together with smart orchestration, offer the consumer significant benefits and if used correctly, will assist in managing the security of the system
2. Large Scale Batteries	• Our conclusion is that: ○ History is being repeated whereby market investors are investing in technologies that differ from a central planner's view. ○ The battery information used in the ISP is out-of-date, leading to a systematic bias away from large scale battery storage.
3. Large Consumers	• The TSBC is surprised to observe that none of the ISP scenarios consider the possibility that a large-scale consumer will face closure. In terms of contingency planning, this is considered a major shortfall in the modelling design.

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GLOSSARY

ACCC	Australian Competition and Consumer Commission
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
Capex	Capital Expenditure
CER	Clean Energy Regulator
COAG	Council of Australian Governments
COGATI	Coordination of Generation and Transmission Investment Review
ECA	Energy Consumers Australia
ENA	Energy Networks Australia
ESB	Energy Security Board
EY	Ernst and Young
HVDC	High Voltage Direct Current
IFR	Initial Feasibility Report
ISP	Integrated System Plan
NEM	National Energy Market
NTNDP	National Transmission Network Development Plan
OFGEM	Office of Gas and Electricity Markets (UK)
Opex	Operating Expenditure
NPV	Net Present Value
PACR	Project Assessment Conclusions Report
PADR	Project Assessment Draft Report
PSCR	Project Specification & Consultation Report
RAB	Regulated Asset Base
RIT	Regulatory Investment Test
RIT-D	Regulatory Investment Test for Distribution
RIT-T	Regulatory Investment Test for Transmission
TNSP	Transmission Network Service Provider
VSC	Voltage Source Converter