18 April 2024

Dr Kris Funston
Executive General Manager, Network Regulation
Australian Energy Regulator (AER)
GPO Box 3131, Canberra ACT 2601

Lodged electronically via resetcoord@aer.gov.au

Dear Dr Funston,

Marinus Link – Stage 1, Part B (construction costs) revenue proposal – Issues Paper

Nexa Advisory welcomes the opportunity to provide a submission on the AER's Marinus Link 2025-30 transmission determination Issues Paper released in March 2025.

Nexa is an advisory firm with an unwavering focus to accelerate the clean energy transition in a way that provides secure, reliable, and affordable power for consumers of all types. Nexa Advisory is a team of experienced specialists in the energy market, policy and regulation design, stakeholder engagement, and advocacy. We work with public and private clients including renewable energy developers, investors and climate impact philanthropists to help them get Australia's clean energy transition done.

Nexa Advisory supports the delivery of Marinus Link Stage 1 on time and at least cost to consumers. Our previous analysis[1] shows that further delays to the project are likely to result in increased consumer electricity bills, a greater reliance on gas-fired generation, and a missed opportunity to enhance the resilience of the National Electricity Market (NEM) as coal exits the system. Our key findings include:

- **Emissions reduction**: Marinus Link is essential for achieving emissions reductions and renewable energy targets in Victoria, Tasmania, and New South Wales. It enables more efficient use of Tasmania's dispatchable hydro storage and supports reliability as coal retires.
- **Energy resilience**: In the absence of the Marinus Link, both Victoria and Tasmania face reduced energy resilience - particularly in the event of droughts or unplanned outages of Basslink, as experienced in 2016.
- **Increased gas usage**: Without Marinus Link, the NEM would require up to an additional ~4 TWh of gas generation annually to meet demand. This increases wholesale market costs, emissions, and exposure to volatile international gas prices. We are now seeing the impact of this play out, with gas shortfalls forecast by AEMO from 2028[2].
- **Delay Costs**: Delays to transmission build increase wholesale electricity prices and results in upwards pressure on household bills.

The current regulatory framework has not kept pace with the scale and urgency of the clean energy transition. As we have previously discussed[3], the AER maintains a narrow focus on

[1] Nexa Advisory, The Role of Marinus Link in Australia's Renewable Energy Transition, June 2023
[2] AEMO, 2024 Gas Statement of Opportunities
[3] Nexa Advisory, Supercharging Transmission Buildout, September 2024

assessing the prudency and efficiency of costs - rather than incentivising delivery performance. This has contributed to extensive delays across major transmission projects and fails to account for the broader system-wide benefits of timely transmission delivery - including avoided gas use, avoided emissions, reduced wholesale market volatility and improved system resilience.

The AER's current approach to capital cost assessments - although well-intentioned - risks reinforcing a regulatory culture which penalises delivery risk-taking and innovation. The result is a misalignment between regulatory incentives and the outcomes which create value for consumer in the long term - lower bills, energy security and faster decarbonisation. We consider that ongoing reviews and assessments are a key driver of delays and associated costs of transmission delivery.

We urge the AER to use this review of Marinus Link Stage 1 Part B as an opportunity to pivot toward performance-based regulation. We have previously discussed that efficiency schemes under the current regulatory framework do not provide incentives or accountability for TNSPs to deliver specific capital projects (such as the completion of a new transmission line) but rather, are oriented towards the overall efficiency of the TNSP[4]. As such, costs are assessed through the lens of economic prudency and efficiency, rather than in the context of performance in the delivery of transmission projects.

The AER should consider this perspective in deciding on the application of the Capital Efficiency Sharing Scheme (CESS), particularly in the context of the recent AEMC determination on ex post review[5] which would apply to Marinus Link.

Thank you for the opportunity to provide input to the Issues Paper. Please refer to our abovementioned reports for further detail on the need for MarinusLink (attached below) and the challenges with the current regulatory framework, which we consider relevant for the AER's current determination. We welcome the opportunity to further discuss any aspect of our report or submission - please contact either myself or Jordan Ferrari, Director - Policy and Analysis, [redacted]

Yours Sincerely,

Stephanie Bashir
CEO and Principal
Nexa Advisory

[4] Ibid
[5] AEMC, Managing ISP project uncertainty through targeted ex post reviews, August 2024

THE ROLE OF THE MARINUS LINK IN AUSTRALIA'S RENEWABLE ENERGY TRANSITION

June 2023

ABOUT NEXA ADVISORY

Nexa is a full-service advisory firm. We work with public and private clients including renewable energy developers, investors and climate impact philanthropists to help accelerate efforts towards a clean energy transition. We've been shaping the energy industry for over 20 years. With a proven track record across policy creation, advocacy, political risk assessment and project delivery, we're holistic in our approach and deliver solutions with commercial intent.

The Nexa Advisory team is a collaboration of passionate energy specialists, all committed to the successful transformation of Australia's energy markets. The team is focused on helping clients grasp the unpredicted opportunities the energy transformation will bring with trusted and innovative thinking and advice.

About the Authors

Stephanie Bashir, CEO and Principal Nexa Advisory

Stephanie is a respected transformation leader with over two decades of experience across the Australian energy sector and broader economies it impacts. Stephanie has cemented her career in the energy sector holding leadership roles in technical, commercial, strategic, policy and advisory; with expertise in energy market policy and regulation, energy technologies and service innovation, networks and grid modernisation.

Dr Jill Cainey, Associate Research, Policy and Regulatory Nexa Advisory

Jill is an established technical expert, communication specialist, strategic advisor and advocate with over 30-years of experience as a climate scientist and over a decade of experience in the UK, European, US and Australian energy sectors. Jill has influenced the development of policies and regulations to support low carbon electrification, with a focus on supporting electricity resilience for Australians as the climate and weather changes.

Acknowledgments

We would like to acknowledge our partner Endgame Economics for their contributions in providing the detailed analysis, modelling and charts for this project. Endgame Economics is an economics and mathematical consultancy that specialises in the energy sector. Endgame brings expertise in optimisation, quantitative analysis, and critical thinking to bear on complex problems.

We also would like to acknowledge the support of our partner RE-Alliance for their contributions in developing this report. RE-Alliance is an independent, not-for-profit advocacy organisation working to secure an energy transformation that delivers long-term benefits and prosperity to regional Australia.

We also would like to acknowledge the support of the following peers for their valuable insights and contributions to developing this report.

- Tennant Reed, Head of Climate, Energy and Environment Policy at the Australian Industry Group (Ai Group)
- Professor Richard Eccleston, Director, Tasmanian Policy Exchange, University of Tasmania
- Tim Buckley, Director, Climate Energy Finance

We also want to thank all the various environment, NGO and other industry organisations and experts that have reviewed this report and provided contribution and feedback.

THE ROLE OF THE MARINUS LINK:

Delivering energy resilience and ensuring Australia meets its emissions targets

EXECUTIVE SUMMARY

Nexa Advisory engaged Endgame Economics to better understand the role of the Marinus Link in Australia's energy future, and its contribution to meeting emissions reduction targets. Nexa Advisory believes this is an important contribution to the public discussion about the benefits and risks of the project, given the lack of independent, publicly available, modelling and analysis of these issues.

Summary of research findings

Key findings from the research into the role of the Marinus Link in decarbonising our electricity system:

1. The construction of Marinus Link will help ensure Australia, particularly Victoria, New South Wales and Tasmania, meet existing emissions and renewable generation targets.
2. Marinus Link is critical to energy resilience and security, particularly in the eastern states, including Tasmania.
3. It is will reduce wholesale electricity costs and put downward pressure on consumers' bills across the National Electricity Market (NEM).
4. Australia's coal-fired power stations are ageing and increasingly uneconomic. There is an urgent need for government funding and regulatory change to accelerate the approval and build of the interconnectors and transmission so that renewable generation and storage can replace them. Failure to do this will lead to higher prices and less reliable electricity supply, and it will make it more difficult to achieve emissions reduction targets.

Additional findings from the research:

- If the Marinus Link is not built, more new renewable generation and transmission would be needed on the mainland, particularly in Victoria, than would otherwise be the case.
- In Tasmania, if Marinus Link is not built, additional local generation and transmission will still be required to meet on-island demand growth from the decarbonisation of transport, and industrial and domestic electrification.
- The rate at which we are currently delivering new renewable generation and firming capacity is insufficient to meet what is required[1] to transition away from ageing coal power stations and decarbonise our electricity system. The shortfall in required generation and firming is larger in the absence of the Marinus Link.
- If the Marinus Link is not built, reliance on gas-fuelled generation will increase significantly. This will mean greater utilisation rates of existing plants, an average of ~4 TWh of additional gas generation across the NEM each year. This is equivalent to over 2 per cent of NEM-wide annual electricity demand, and almost 40 per cent of annual electricity demand in Tasmania.

State and federal governments have a responsibility to ensure the construction of transmission and renewable generation is done in a way that brings communities with them. Robust policies and practices are needed to ensure social licence is obtained and retained, to protect high value conservation areas, and to ensure the financial costs and risks of transmission projects are equitably distributed.

1 See Appendix for an outline of the Step Change scenario

Key Recommendations Summarised

➜ **NATION BUILDING CAPITAL — THE QUESTION OF WHO PAYS:** Concerns about who should pay for new transmission projects are not new. They can (and often do) result in significant delays in investment for regulated transmission infrastructure.

Resolving the question of who pays for the new transmission infrastructure is one possible way to ensure cost and economic risk are not borne by energy consumers alone.

The Federal Government's Rewiring the Nation policy provides an opportunity to co-fund the cost of building nationally significant transmission interconnectors, such as the Marinus Link. This should not just include facilitating the financing of the interconnectors themselves. In recognition that Marinus Link benefits the entire system and not just the host states, by reducing wholesale energy costs and emissions, upfront capital co-funding by the federal and state governments should be provided in a transparent way to reduce the cost to customers in Victoria and Tasmania.

➜ **MANAGING WHOLESALE PRICE INCREASES AND IMPACTS ON TASMANIAN ENERGY CONSUMERS:** In 2017, the Tasmanian parliament passed a law that allows the energy minister to set the wholesale price that Hydro Tasmania charges for its power. A price cap remained in place until 2020 and was removed to leverage the then low electricity prices in Victoria.

The Tasmanian government should therefore re-examine options and mechanisms to best manage wholesale pricing impacts on energy consumers in Tasmania. This includes exploring the use of electricity subsidy/dividend programs during the energy transition to minimise the impact on Tasmanians' energy bills.

The Tasmanian government is in a unique position to leverage the opportunity of being connected to the mainland due to its vertically integrated ownership of the state's energy assets and operations.

➜ **PLANNING AND REGULATORY ROADBLOCKS:** The current planning and regulatory arrangements for inter-connectors and new generation exacerbates the delays in delivering the clean energy transition and its benefits.[2]

To achieve emissions reduction goals, while guaranteeing energy security and resilience, **the planning and regulatory process for projects of national significance should be prioritised. State and federal governments should work together to expedite critical projects such as Marinus Link.** This could be based on the approach adopted by Victoria and New South Wales, in which ministerial powers underpin investment decisions, rather than the current unwieldy electricity rules and regulatory process. Even with potential changes to the RIT-T as they apply to ISP projects, the regulated framework is not designed to deliver transmission expeditiously. [3]

➜ **CONSIDERATION OF SOCIAL AND ENVIRONMENTAL FACTORS:** Communities need to have confidence that their place-based values are recognised and protected.

The federal and state governments have a key role to play in ensuring that there is transparent geospatial mapping, and that communities, including First Nations communities, are active stakeholders in identifying locations in Tasmania that are not appropriate for energy projects. This will ensure that the siting, planning and delivery of renewable energy projects protects Tasmania's unique cultural heritage, environment, and biodiversity, while ensuring that clear benefits from projects flow to local host communities.

➜ **TRANSPARENT COMMUNICATION OF THE BENEFITS WILL HELP KEEP THE LIGHTS ON: To advance the delivery of the Marinus Link, the Victorian and Tasmanian Governments need to articulate the critical role that it has to play in underpinning energy security in both locations, and in addressing the increasing impacts of climate change.**

Neither Victoria or Tasmania can achieve their decarbonisation goals efficiently and effectively without the Marinus Link and other new renewable generation and transmission interconnection projects in combination. No single option, such as batteries, a specific interconnector, or renewable generation will achieve the necessary outcomes.

Further delays as a result of a lack of community understanding on the need for renewable energy and transmission will only increase electricity bills, delay decarbonisation and increase the risk of black outs.

2 https://nexaadvisory.com.au/site/wp-content/uploads/2022/04/Removing-transmission-roadblocks-discussion-paper-080422.pdf

3 ibid

CONTEXT — THE CLEAN ENERGY TRANSITION IS TOO SLOW

Australia is transitioning away from ageing fossil fuel power stations and shifting to clean and cheaper sources of energy generation, such as wind and solar, with associated storage. This is a broad recognition of both the urgent need to replace ageing coal generators and the benefits of clean and low-cost renewable generation.

In response to the recent Intergovernmental Panel on Climate Change (IPCC) reports[4], and Australia's own national emissions and renewable generation targets, coal power stations are withdrawing from the system more quickly than anticipated, leaving a shortfall in forecast generation and greater risks of more peak pricing periods.

Wind and solar technologies are now the cheapest form of generation per unit of energy and can be integrated with storage to provide dispatchable 'firmed' electricity. Renewable power generation occurs largely in different (and often remote) locations to existing coal-fired power stations. As such, new transmission infrastructure is required to connect it to the national grid.

The Australian Energy Market Operator (AEMO)'s Integrated System Plan (ISP) provides insights into the investment needed in generation and transmission to deliver affordable electricity to customers, while achieving Australia's energy and emissions related goals.[5]

There are significant challenges ahead to achieve this 'clean energy transition' and meet Australia's energy and emissions targets. The scale of renewable power generation (of all types and size) that needs to be built is unprecedented. The transmission build that is required to fully connect the new decentralised generation to the network is the equivalent of 25 per cent of today's entire grid, in less than 10 years. Alongside this, it is critical to ensure that any impacts on the environment and biodiversity related to new generation and transmission are avoided or minimised and that host communities are genuinely engaged and supported with robust benefit sharing arrangements.

While the Marinus Link has been identified as a key transmission project under the AEMO ISP, and there has been progress at federal and state government levels in the form of a signed Memorandum of Understanding (MOU) on the agreed funding approach, there remains significant uncertainty about the project. A range of stakeholders remain concerned about the potential impacts of the project.

In this report, we present independent research and modelling that provides insights into the role of Marinus Link in Australia's energy transition and decarbonisation. We also focus on the role that Marinus Link has in supporting energy resilience and security on the mainland and Tasmania.

This report and associated modelling do not seek to advocate for or against the Marinus Link project. They present independent views on the consequences in Tasmania and on the mainland of not building Marinus Link, in order to advance a fact-based discussion of the project.

Australia's climate challenge

Decarbonisation has become a global imperative and a priority for governments, companies, and society at large. Companies across all industries have publicly declared their intention to become carbon neutral before 2050.

Australia recently legislated its commitment to achieve net zero by 2050[6]. Australia is also a signatory to the international Paris Agreement to keep climate-change related temperature increases below 1.5°C. Individually, each of Australia's states have made commitments to achieve net zero by 2030 (Tasmania),

4 https://www.ipcc.ch/assessment-report/ar6/

5 https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2022/2023-inputs-assumptions-and-scenarios-consultation/draft-2023-inputs-assumptions-and-scenarios-report.pdf?la=en

6 https://ministers.pmc.gov.au/gallagher/2022/australia-joins-international-net-zero-government-initiative

2045 (ACT & Victoria[7]) and 2050[8] (all other states). Additionally, Australia has an ambitious target to generate electricity using 82 per cent renewables by 2030.[9,10]

According to the UNFCCC and the International Energy Agency, in order to achieve a 1.5°C aligned pathway, all coal-fired generation needs to have been retired by 2030.[11]

What it will take?

FASTER BUILD: The ISP indicates that coal-fired generation is expected to have completely exited the system by 2042. However, with early closures being announced, it is likely that as much as 60 per cent of coal-fired generation capacity will have been shuttered by 2030.[12]

That means, to keep the lights on and meet clean energy generation targets:

- grid-scale renewable generation will need to nearly triple in capacity (from 16 GW to 44 GW) by 2030
- associated storage will need to grow eight times (from 2 GW to 15 GW) by 2030
- of which 380 GWh (~7 GW or nearly half) needs to be deep to medium storage with a duration of 4 to >12 hour duration by 2030
- we will need to invest in more than 10,000km of transmission by 2050

To achieve this, we will need a significant uplift on historical delivery rates of new generation capacity and transmission build.

In 2022 AEMO connected 2.9 GW of large-scale batteries, wind and solar[13]. We need to add at least 3.5 GW of large-scale renewable generation each year, starting now, through to 2030, just to ensure that coal-fired power stations closures are replaced with sufficient capacity to keep the lights on and costs down.

In total, to deliver the ultimate goal of net zero[14] by 2050, AEMO requires at least 200 GW of new renewable generation and storage. As of February 2023, only 14 GW has been committed to, with a further 186 GW proposed[15]. Ultimate requirements may be even larger given decarbonisation of industry, and the significant resources sector.

WE ARE IN A GLOBAL RACE: New programs in the United States, European Union, and Asia are accelerating their clean energy transitions by providing clear financial incentives (e.g. the Inflation Reduction Act, USA; the Green Deal Industrial Plan, EU).

These programs mean that Australia will need to move quickly to ensure that it can attract funding, materials, and skilled people, just to meet the modest goal of replacing outgoing coal power with clean energy.

These issues are going to be particularly acute for interconnectors and other transmission infrastructure. Demand will increase globally for cable, skills, expertise, and equipment for the installation of these critical assets.

7 https://www.climatechange.vic.gov.au/climate-action-targets. Victoria has recently brought forward its net zero target to 2045.
8 https://www.energy.nsw.gov.au/nsw-plans-and-progress/government-strategies-and-frameworks/reaching-net-zero-emissions/net-zer
9 https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/2022-integrated-system-plan-isp.pdf?la=en
10 https://www.aofm.gov.au/media/967
11 https://www.iea.org/reports/phasing-out-unabated-coal-current-status-and-three-case-studies/executive-summary, https://unfccc.int/news/un-chief-phase-out-of-coal-is-key-climate-priority
12 https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/2022-integrated-system-plan-isp.pdf?la=en
13 https://reneweconomy.com.au/australia-connects-3gw-of-new-capacity-in-2022-must-double-that-to-reach-renewable-target/
14 https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/2022-isp-infographic.pdf?la=en
15 https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/generation-information

The global competition for resources will be particularly critical for sub-sea interconnectors, which are complex to build because they are dependent on sub-sea cable laying ships. There is a small and ageing fleet of cable laying ships supporting the global electricity and telecommunications industries[16] and to ensure projects such as the Marinus Link can be delivered, there needs to be early certainty to secure funding, resources and equipment.

Transmission build is a major roadblock to the transition

Lack of new transmission continues to be a significant roadblock to achieving the clean energy transition[17]. As well as impeding progress towards the targets discussed above, even short delays in delivering a new transmission line connecting renewable electricity to Australian households has immediate impacts on electricity bills[18]. The most significant increases in price are being felt in Victoria and New South Wales.

The Federal Government's Rewiring the Nation policy[19] is well-intentioned and welcome. As are recent funding arrangements established in New South Wales for the Hunter Transmission Project, VNI-West and HumeLink, key Renewable Energy Zones (REZ) in NSW[20] and in Victoria[21] and the Marinus Link in Victoria and Tasmania.[22]

However, the reality is that there have been no practical steps taken to deliver these important projects. The Victorian, Tasmanian and Federal Governments have made progress through the agreed MOU. However, progress on the Marinus Link continues to move slowly, and it appears to be beset by a number of problems related to:

- understanding the NEM-wide benefits of the Marinus Link versus the regulated approach to funding interconnectors
- Tasmanian concerns about exposure to higher electricity prices and financial risks
- concerns about the environmental impact of the renewable generation build out that Marinus Link will enable, particularly for endangered species
- concerns about the environmental impact of new transmission
- lack of information in host communities about the impacts and benefits of renewables and transmission development, and clear opportunities for engagement

While the Rewiring the Nation policy and the associated access to concessional finance may help to fund the delivery of an interconnector, little progress has been made on resolving the concerns about the impact the Marinus Link may have on Tasmanian electricity bill costs. Nor have the concerns about the environmental and social impact of renewable generation and transmission projects (that are only viable if the Marinus Link is constructed[23]) been addressed.

16 https://www.datacenterdynamics.com/en/analysis/the-cable-ship-capacity-crunch/#:~:text=However%2C%20the%20global%20supply%20of,small%3A%20just%2060%20ships%20worldwide

17 https://nexaadvisory.com.au/site/wp-content/uploads/2022/04/Removing-transmission-roadblocks-discussion-paper-080422.pdf

18 https://nexaadvisory.com.au/site/wp-content/uploads/2022/06/Report-Modelling-Electricity-bill-impact-due-to-transmission-delay_2022-06-07.pdf

19 https://www.aph.gov.au/-/media/0E6625101815437D8D883CB3DC6C515F.ashx

20 https://www.pm.gov.au/media/landmark-rewiring-nation-deal-fast-track-clean-energy-jobs-and-security-nsw

21 https://www.pm.gov.au/media/rewiring-nation-supercharge-victorian-renewables

22 https://www.energy.gov.au/news-media/news/rewiring-nation-supports-its-first-two-transmission-projects

23 https://recfit.tas.gov.au/major_investment_projects/project_marinus

THE ROLE OF THE MARINUS LINK — MODELLING THE IMPACT

To better understand the role of the Marinus Link in Australia's energy future, Nexa Advisory engaged Endgame Economics to model the Australian electricity system with and without it.

Modelling scenarios

The modelling by Endgame Economics is an extension of the methodology used in earlier work[24]. The modelling scenarios and inputs are based on AEMO's ISP 'Step Change' (including fuel cost and generation build). The focus of the modelling period is the 10-years between FY2030 and 2039. The base case assumes:

- all transmission projects in the Optimal Development Path (ODP) proceed as per the 2022 ISP. Marinus Cable 1 is commissioned in FY2030 and Cable 2 in FY2032.

Two scenarios without the Marinus Link have been modelled:

- **SCENARIO ONE** Amidst an overall NEM transition that is ambitious and not contentious, objections specific to Marinus lead to it not proceeding. In this scenario, we take Marinus out of contention but impose no other constraints on energy developments. We assume that the build out under the 2022 ISP Step Change scenario progresses as planned, including the additional build of new transmission and renewables needed to substitute for Marinus Link.
- **SCENARIO TWO** Amidst an overall NEM transition that is highly contested, Marinus is not delivered. In this scenario, we remove Marinus and impose constraints on other energy developments. The constraints imposed are based on the current state of play with regards to planning, testing, and building alternative transmission, and delays in additional renewable and storage connections due to insufficient transmission capacity in the areas where variable renewable energy (VRE) is commercially viable.

In practice, given we are seeing overall delays and objections to transmission projects and renewable energy zones across the NEM by comparable stakeholders, we consider Scenario Two to be the most realistic. The specific constraints modelled were: lack of transmission network; supply chains constraints; inadequate financial resources; and delayed planning processes.

These delays, as shown in Figure 4, make Scenario One challenging to achieve, given it will require alternative unplanned renewable generation and transmission to be built in place of the Marinus Link.

Note: the modelling and subsequent results are primarily based on export dynamics and do not consider a full assessment of the state of energy and resilience in energy supply in Tasmania.

Interconnection between Australian states provides diversity in supply and resilience in the face of changing weather and climate.

Earlier work commissioned by Nexa Advisory demonstrated that delaying the build of interconnectors, including the Marinus Link, pushes up bills for electricity customers.[25]

New transmission is nation-building infrastructure and must be prioritised. It is essential that it has capital funding, including funding to ensure the Marinus Link project earns and maintains social licence through community benefit sharing and strong environmental protections.

24 https://nexaadvisory.com.au/site/wp-content/uploads/2022/06/Report-Modelling-Electricity-bill-impact-due-to-transmission-delay_2022-06-07.pdf

25 Ibid

What happens if Marinus is not built

Tasmania and Victoria will always be dependent on each other (and the wider interconnected NEM) to meet electricity demand, as explained further in the report.

This includes Tasmania's hydrogeneration fleet being able to switch from providing 'baseload' electricity to providing responsive firming capacity to support lower cost, higher VRE generation and battery storage penetration throughout the grid.

The modelling in Scenario Two shows that without the Marinus Link, the mainland would need to rely on more gas-fuelled generation for a lot longer. Meanwhile, Tasmania would increasingly have to rely on the gas-fired Tamar Valley Power Station. This means an ongoing direct link between electricity bills and hyper-inflationary international gas prices.

In Scenario Two the modelling assumed that no new gas generation was built and coal power station closures continue as planned. This scenario results in greater utilisation rates of the existing gas-fired power station fleet to meet energy demand, leading to an average of ~4 TWh additional gas generation across the NEM each year. This is equivalent to over 2 per cent of NEM-wide annual electricity demand, and almost 40 per cent of annual electricity demand in Tasmania. It is comparable to the ongoing running Alinta's Loy Yang Brown Coal Power Station Unit B, resulting in up to 2.5 MtCO2e of additional emissions each year.

Figure 1 shows the change in NEM generation mix if Marinus Link is not built – a positive bar means more generation from gas, solar and utility scale storage on the mainland to replace the wind and pumped hydro that would otherwise be shared from Tasmania.

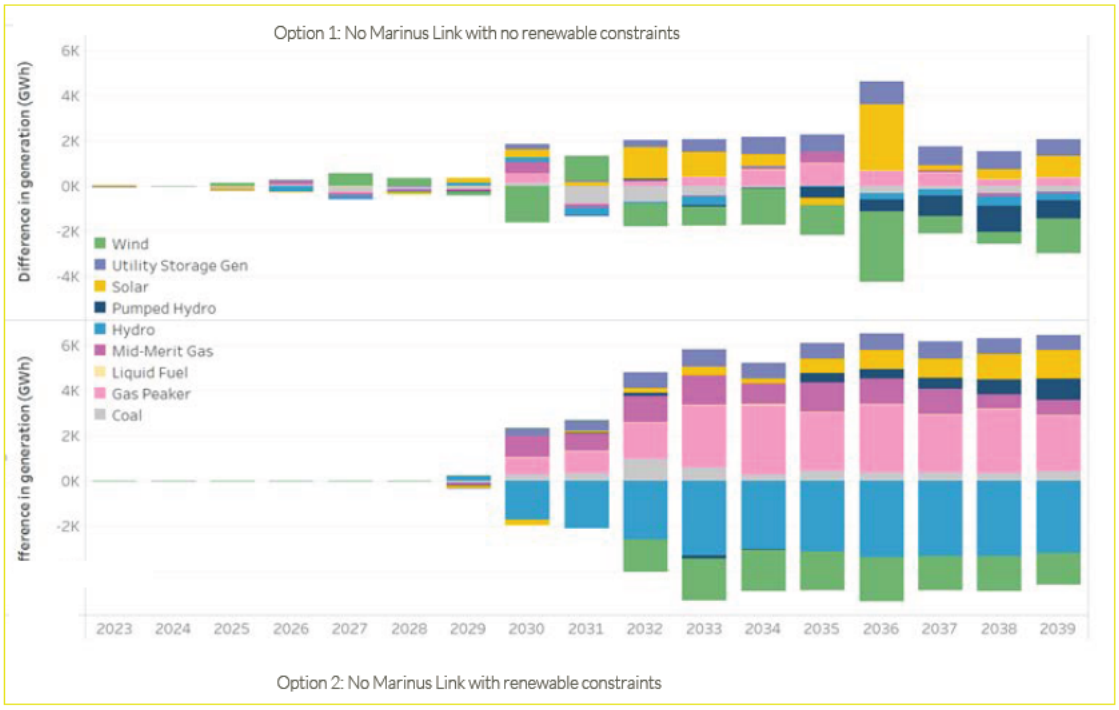

Figure 1: Change in generation mix in the NEM without Marinus Link in the absence of Marinus Link [Endgame Economics]

In Scenario One, where Marinus Link is not built but the transition proceeds well, with generation and batteries are added to the NEM to compensate. The loss of an interconnector, such as Marinus Link, necessarily means building more generation and transmission in each region on either side of the interconnector to meet local demand. While the cost and localised environmental impacts of the interconnector are avoided, they are replaced by alternative impacts. It would also cost more to build the generation and longer duration batteries to compensate for the absence of the Marinus Link, and there is a high risk some of the generation would be 'gas peakers', driving up emissions[26].

26 https://www.netzeroaustralia.net.au/wp-content/uploads/2023/04/Net-Zero-Australia-Modelling-Summary-Report.pdf

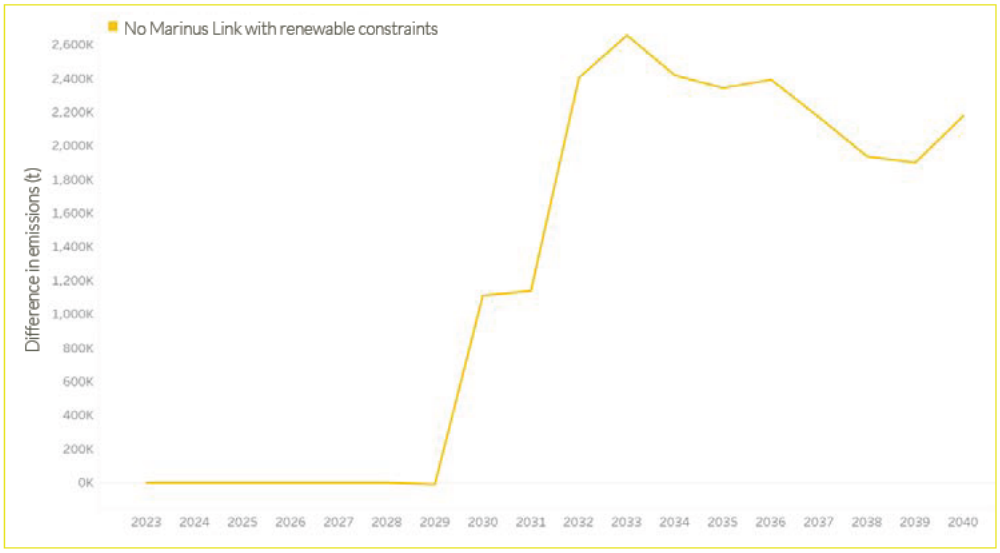

Figure 2: Additional emissions as a result of relying on gas generation in the absence of Marinus Link, when compared to the base case [Endgame Economics]

As a result of the increased reliance on gas generation in Scenario Two, Australia's carbon dioxide emissions would increase by 2.5 Mt_{CO2e} per year. If the modelled trends are extrapolated, then the target of net zero by 2050 may not be achieved (Figure 2).

We are falling behind the necessary build rate by ~3–5GW per year

The modelling shows that we are not building the renewable generation, storage and transmission needed to replace the ageing coal power stations fast enough to meet electricity reliability and security requirements, as well as emissions targets.

Figure 3 below shows the current build rate of VRE compared to what is needed. The *dark blue line* shows the total build required across the NEM under the base case, the 2022 ISP Step Change scenario, and the *grey line* shows the current 3 GW per year delivery rate for new large-scale wind and solar generation and storage. The *coloured bars* for each year, 2025 to 2040, show the new generation and types of generation that need to be built in Scenario Two, where Marinus Link is not delivered and new generation and transmission is added on both sides of Bass Strait to compensate for its absence.

The grey (lower) line is below the required build rate shown by the dark blue (upper) line. Clearly, the rate at which new renewable generation is being delivered is inadequate to meet what is required for the 2022 ISP Step Change, and the shortfall in generation is larger in the absence of the Marinus Link. The figure also shows that the shortfall in what being delivered increases with time, such that in 2030 it is 18 GW, and by 2040 it is 27 GW (difference between grey line and dark blue line).

Complicating this picture is the fact that we are already failing to deliver major interconnection projects on time due to a range of issues, including a lack of social licence.

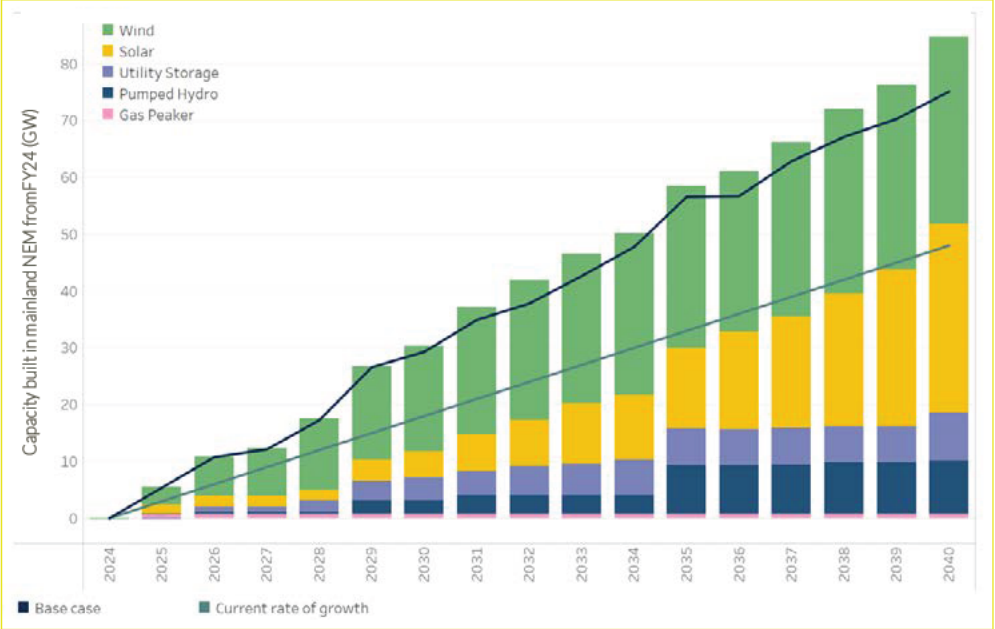

Figure 3: Build out rate and shortfall [Endgame Economics]

Separately, while the difference between the new generation build required without the Marinus Link in Scenario Two (coloured bars) and the Step Change scenario (base case, shown in the dark blue line) may appear trivial, even the 1 GW of additional generation required in 2030 will be hard to deliver given the already significant 18 GW short-fall in meeting the base case.

The gap in what is required to address the absence of Marinus Link would then widen through to 2040, with an additional 10 GW of new generation required to replace Marinus Link.

Making up this generation and longer duration storage shortfall on the mainland will already difficult, let alone the additional investment in both new generation and new transmission required on the mainland if the Marinus Link does not go ahead.

Risks to energy resilience

Both Victoria and Tasmania have suffered significant power outages in recent years as the result of short intense storms, heatwaves, and other prolonged climate events. Tasmanians will recall the energy crisis in 2016 when a failure of the existing 20-year-old interconnection asset, the Basslink HVDC cable, coincided with a drought. This led to record low storage levels in the state's hydroelectric system that supplies 75–90 per cent of the Tasmania's electricity. The consequent use of diesel generators cost the state at least $126m[27] and up to $500m[28]. Carefully considered asset standards and route options for transmission do improve resilience to such events, but interconnection between regions has significant advantages, providing diversity in supply options through inter-regional transfer.

The modelling commissioned shows, in both scenarios, that if the Marinus Link is not built, more new renewable generation and transmission will be needed on the mainland, particularly in Victoria, than would be the case if Marinus is built. More transmission is also needed in Tasmania without the Marinus Link to connect the new renewable generation needed to meet local demand growth. Marinus Link would allow Victoria and Tasmania to share generation capacity, which offers improved resilience to system events and climate-change impacts[29].

27 https://tasmps.greens.org.au/media-release/hydros-losses-cost-taxpayer-dearly#:~:text=Dr%20Rosalie%20Woodruff%20MP%20%2D%20Thursday%2C%2027%20October%202016&text=The%20energy%20crisis%20cost%20Tasmanians,them%20came%20to%20%2464%20million

28 https://www.afr.com/markets/equity-markets/hit-from-basslink-power-cable-failure-560m-and-rising-energyquest-20160602-gp9mxg

29 https://aemo.com.au/-/media/files/major-publications/isp/2020/appendix--8.pdf

As we approach a clean energy economy with all sectors on a decarbonisation pathway, energy resilience becomes a more acute issue. The move away from fossil fuels involves the electrification of our vehicles, homes, business and industry, and will inevitably require increasing amounts of reliable clean electricity generation.

Tasmania's dependence on the mainland

Tasmania is reliant on electricity generated on the mainland to meet local demand, particularly in the summer, with the nearly 12 per cent of electricity consumed in Tasmania in 2021–22 being imported over Basslink.[30]

The existing Basslink between Tasmania and the mainland is an ageing asset with a history of unreliability and financial problems. In both 2018 and 2020 Basslink failed to reach its performance requirement of a minimum availability of 97 per cent[31], potentially compromising the resilience of Tasmania's system. Should Basslink fail without a backup or replacement, the reliability of Tasmania's system would be reduced.

In years when rainfall is low in Tasmania, akin to 2015, 2019, and 2022, the Marinus Link will provide critical resilience to Tasmania's energy security by allowing the import of electricity from across Bass Strait.

Tasmania can experience droughts in both El Niño (2015[32], 2019[33]) and La Niña (2022)[34] years. Projections of climate change impacts suggest that Tasmania is likely to receive decreasing levels of rainfall and spend increasing periods in drought[35]. Inflows in western catchments will reduce by up to 30 per cent in summer and are likely to reduce hydroelectric generation capacity[36], reducing Tasmania's access to reliable hydrogeneration and increasing the need to access other sources of electricity.

In 2015–2016, as a result of the drought and the failure of Basslink, the gas-powered Tamar Valley Power Station provided nearly 800 GWh of electricity, supported by 55 GWh from emergency diesel generating plants[37]. During this time, wholesale electricity prices in Tasmania increased to approximately three times those in Victoria[38]. This also increased Tasmania's carbon emissions from electricity generation by 7 per cent over the 1990 baseline, and nearly 10 per cent above the previous year, undoing prior emissions reductions[39,40].

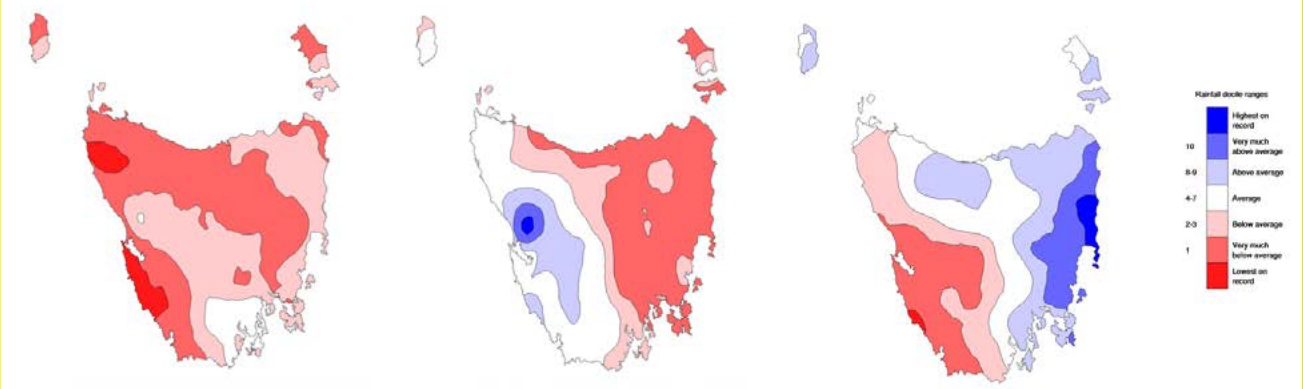

Figure 4: 2015 rainfall (left), 2019 rainfall (middle) and 2022 rainfall (right)

30 https://www.economicregulator.tas.gov.au/Documents/22 2525 Annual Energy Security Review 2021-22.pdf

31 https://www.economicregulator.tas.gov.au/Documents/Energy in Tasmania Report 2019-20.pdf

32 http://www.bom.gov.au/climate/current/annual/tas/archive/2015.summary.shtml

33 http://www.bom.gov.au/climate/current/annual/tas/archive/2019.summary.shtml

34 http://www.bom.gov.au/climate/current/annual/tas/summary.shtml

35 https://www.energynetworks.com.au/resources/reports/2022-reports-and-publications/electricity-networks-a-guide-to-climate-change-and-its-likely-effects/

36 https://web.archive.org/web/20150406013417if_/http://www.dpac.tas.gov.au/__data/assets/pdf_file/0005/140198/Water_and_Catchments_Technical_Report.pdf

37 https://www.economicregulator.tas.gov.au/Documents/Energy in Tasmania 2015-16 Report.PDF

38 ibid

39 https://stors.tas.gov.au/1127442$stream

40 ibid

Without Marinus Link, Tasmania will need to rely increasingly on its gas generator. This will further expose Tasmanian consumers to gas pricing, drive up carbon emissions, and damage Tasmania's reputation as a clean, renewable energy powerhouse.

Tasmanian electricity demand is forecast to grow by 760 GWh by 2040, increasing to 1.5 TWh by 2050. This is a 7 per cent growth in operational electricity consumption to 2040, and a 14 per cent increase by 2050.

One major component of this growth is electrification, shown in Figure 5. Electrification grows from being approximately 4 per cent of demand in 2022 to 18 per cent of demand in 2050.

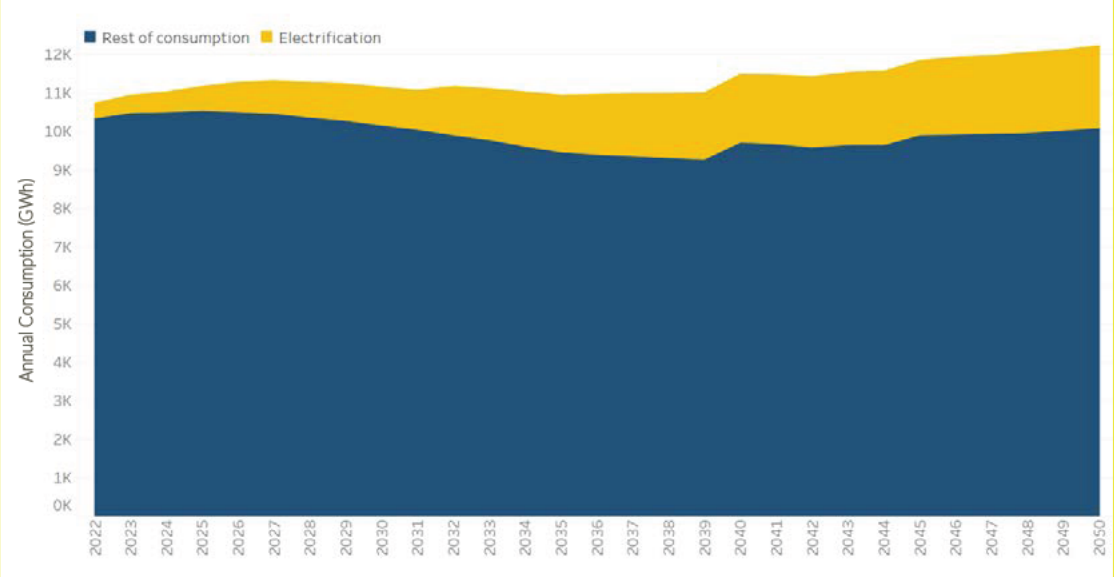

Figure 5: Tasmanian electrification demand forecast (Endgame Economics)

Tasmania will need to build its own new renewable generation and transmission, in the absence of the Marinus Link, to meet this projected local organic growth in electricity demand as a result of the shift to electrify everything, including cooling and heating, transport and industry. This will be critical to meet Tasmanian emissions goals[41].

Tasmania will also need to consider how to manage its ageing hydrogeneration assets, which will need investment if they are to continue to provide electricity and/or storage for Tasmania. In the absence of further transmission interconnection to the mainland, it may be very difficult to secure a business case for investment in new VRE without significant government support[42].

Additionally, without the Marinus Link to ensure a reliable and secure supply of electricity, some current large energy users may choose to leave Tasmania. This means that Tasmania will miss out on other potential economic opportunities, such as green hydrogen and green aluminium.

Developers and investors are currently unable to build robust business cases or secure finance for new renewable generation projects, since it is not clear whether or when new mainland projects will need to compete with new Tasmanian renewable generation (via Marinus Link). This uncertainty will severely limit the ability of Tasmania to fully electrify and decarbonise the state.

41 https://www.utas.edu.au/__data/assets/pdf_file/0008/1545560/discussion-paper-summary-slides-final-201021.pdf

42 https://reneweconomy.com.au/tasmanias-granville-harbour-wind-farm-reaches-financial-close-18064/

The critical role of Tasmania in Australia's clean energy transition

Victoria is currently a net exporter of electricity. Exporting approximately 5.5 TWh of electricity to Tasmania, NSW and South Australia (negative values mean exports from Victoria, positive numbers, imports).

However, following the closure of its coal-fired power stations in 2028, Victoria will become a net importer of electricity. The modelling in the base case (with Marinus Link) shows that by 2025 Victoria will be a net importer from Tasmania, and in 2028–2029 will also become a net importer from both NSW and South Australia. (Figure 6).

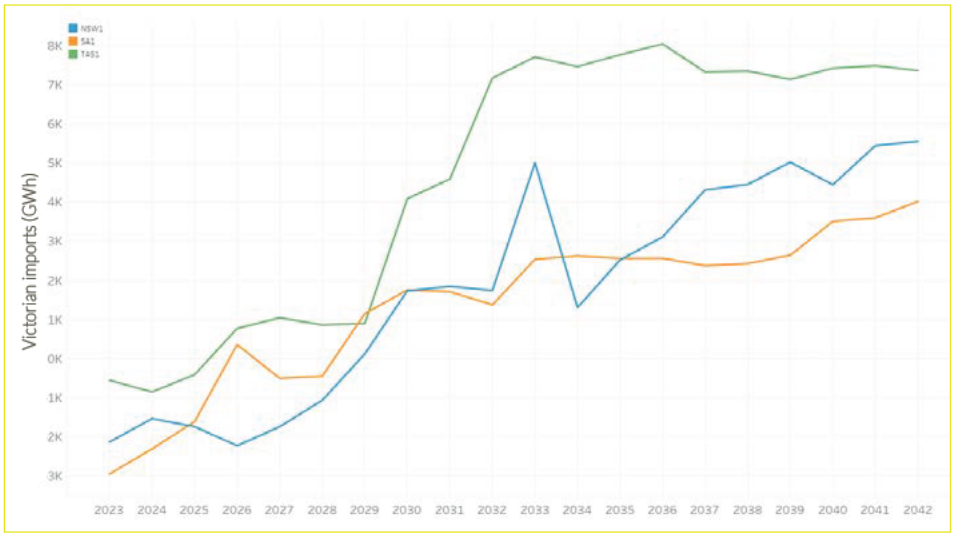

Figure 6: Victorian imports [Endgame Economics]

Tasmania boasts an impressive portfolio of existing hydropower assets that are critical to enabling Australia to run on clean electricity. Some of these assets are under-utilised, whilst others could provide additional power through relatively cost-effective, and at times, low impact augmentation. It is important to note that medium to long duration storage is premium and therefore critical to reliability and security.

Tasmania exported 0.7 TWh to support Victoria in 2022, 2 per cent of Victoria's (44 TWh) annual demand[43]. However, by 2040, when Victoria's demand is projected to be around 60 TWh (2022 ISP Step Change scenario[44]), imports via interconnection are foecast to be routinely meeting over a quarter of Victoria's electricity demand: just over 7.5 TWh of electricity from Tasmania and a further 8 TWh combined from both NSW and South Australia.

Figure 7: Tasmania generation mix, including net imports [Endgame Economics analysis of OpenNEM data]

43 https://www.aer.gov.au/wholesale-markets/wholesale-statistics/annual-electricity-consumption-nem

44 https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2022/2022-electricity-statement-of-opportunities.pdf?la=en&hash=AED781BE4F1C692F59B1B9CB4EB30C4C

Additionally, Tasmania relies upon imports from Victoria when local hydro inflows are not sufficient to meet local demand. The modelling suggests that Tasmania has imported on average 12 per cent of its annual demand per year since 2006 (Figure 7, above).

The addition of Marinus Link enables Tasmania to balance any shortfall in generation that might be caused, especially during periods of drought, with imports from the mainland NEM via Victoria. Furthermore, Marinus Link allows access to diversity of supply not only for Tasmania, but for the wider NEM. Strong interconnection has the benefit of reducing the risk of supply shortfalls[45].

IN CONCLUSION: WE NEED ALL OPTIONS ON THE TABLE

In summary, the research found that if the Marinus Link is not built, Tasmania and the mainland will need more new renewable generation, and the transmission to connect it, than would otherwise be the case.

The research also found that the rate at which we are currently delivering new renewable generation is insufficient to meet what is required for the ISP 2022 Step Change scenario, and that the shortfall in required generation is larger in the absence of the Marinus Link. Therefore, if Marinus Link is not built, reliance on gas-fuelled generation increases significantly, via greater utilisation rates, to meet energy demand.

As we have seen in recent years, a shortfall in building and connecting new renewable generation to replace the ageing thermal coal generation could have the undesirable outcome of delaying coal-fired power stations closures, to ensure energy security and keep the lights on. Therefore:

1. The Marinus Link is key to ensuring Australia, particularly Victoria, New South Wales and Tasmania, meets emissions and renewable generation targets. No other solution has been demonstrated to ensure we meet emissions and renewable energy targets in the limited time available.
2. Marinus is critical to energy resilience in the eastern states including Tasmania, and to reducing wholesale electricity costs and putting downward pressure on consumers' bills[46].
3. There is an urgent need for government funding and regulatory change to accelerate the build of Marinus Link, and other necessary interconnectors and transmission to enable the renewable generation and storage that is needed to replace the ageing coal power stations.

45 https://www.griffith.edu.au/__data/assets/pdf_file/0024/1615614/No.2022-04-VRE-droughts-modelling-Griffith.pdf

46 Delays in building new transmission infrastructure will increase consumers' bills — Nexa Advisory

KEY RECOMMENDATIONS

What needs to happen

Decarbonising Australia's electricity system is an investment in Australia's future. This is occurring in a global environment where many countries are accelerating the pace of their decarbonisation and providing significant central funding to drive progress. Decarbonisation addresses the risks posed by climate change and is a nation building opportunity.

As such, consideration should be given as to whether it is appropriate to fund it centrally, rather than through individual customer bills.

Nation building capital: the question of who pays

Concerns about who should pay for new transmission projects are not new. They can (and often do) result in significant delays in investment for regulated transmission infrastructure.

As we have previously highlighted in our report 'Removing Roadblocks to Transmission'[47] there is only one pathway to capital investment in regulated transmission investment paid for solely by consumers, using Transmission Network Service Providers' (TNSP) capital via the Regulatory Investment Test for Transmission (RIT-T) approval process. This regulated investment method results in the entire cost of each investment being carried by the TNSP(s) involved, with costs recovered solely from energy consumers with the vast majority of costs recovered from consumers located in the investing TNSP(s) region(s) through the Regulated Asset Base (RAB). This is the case, even if the construction of new transmission results in broader benefits to consumers in other regions of the NEM, or the wider economy.

Resolving the question of who pays for the new transmission infrastructure is one possible way to ensure cost and economic risk are not borne by energy consumers alone.

The Federal Government's Rewiring the Nation policy provides an opportunity to co-fund the cost of building nationally significant transmission interconnectors, such as the Marinus Link. This should not just include facilitating the financing of the interconnectors themselves. In recognition that Marinus Link benefits the entire system and not just the host states, by reducing wholesale energy costs and emissions, upfront capital co-funding by the federal and state governments should be provided to reduce the cost to customers in Victoria and Tasmania.

Governments should set up a mechanism to fully fund the upfront cost of capital expenditure for the build of new transmission assets. Alternatively, governments could initially fund these projects and then transfer these assets to the RAB or another cost recovery mechanism, once the assets are operational and generating market benefits in the NEM.

At a minimum, governments need to fund the cost of investigation and feasibility of projects as a way of expediting the approval of transmission infrastructure projects.

These proposed changes, if implemented correctly, would reduce financial and longevity risk for investors, reduce costs and economic risks to consumers, share costs with all beneficiaries, and unlock a funding pipeline for asset ownership. This should be coupled with a clear set of investment criteria to prioritise projects and minimise the financial impact on consumers.

47 Removing Transmission Roadblocks — Nexa Advisory

Managing wholesale price increases and impacts on Tasmanian energy consumers

Since Tasmania joined the NEM in 2006, it has been exposed to Victorian electricity price fluctuations, including to its benefit which will be a feature of the energy transition for some time. Regardless of Marinus, the electricity prices paid by Tasmanian homes and small businesses are calculated based on the price of electricity in the Victorian market, so as power prices rise and fall in that market, they rise and fall for Tasmanian power bills, directly exposing Tasmanians to international fossil fuel prices.

In 2017, the Tasmanian parliament passed a law that allows the energy minister to set the wholesale price that Hydro Tasmania charges for its power. A price cap remained in place until 2020 and was removed to leverage the then low electricity prices in Victoria.

The Tasmanian government should therefore re-examine options and mechanisms to best manage wholesale pricing impacts on energy consumers in Tasmania. This includes exploring the use of electricity subsidy/ dividend programs during the energy transition to minimise the impact on Tasmanians' energy bills.

The Tasmanian government is in a unique position to leverage the opportunity of being connected to the mainland due to its vertically integrated ownership of the state's energy assets and operations.

Planning and regulatory roadblocks

The current planning and regulatory arrangements for interconnectors and new generation exacerbates the delays in delivering the clean energy transition and its benefits[48].

To achieve emissions reduction goals, while guaranteeing energy security and resilience, **the planning and regulatory process for projects of national significance should be prioritised. State and federal governments should work together to expedite critical projects such as Marinus Link**. This could be based on the approach adopted by Victoria and New South Wales, in which ministerial powers underpin investment decisions, rather than the current unwieldy electricity rules and regulatory process. Even with potential changes to the RIT-T as they apply to ISP projects, the regulated framework is not designed to deliver transmission expeditiously[49].

Consideration of social and environmental factors

There needs to be recognition by the federal and state governments that failing to build the Marinus Link will in fact require *more* new renewable generation and transmission, and risks increasing pollution from gas and possibly even coal generation. What is more, in Tasmania, new transmission and generation will be required to meet local demand growth as electrification of households, transport and industry progresses. The community and environmental challenges of new renewable generation and transmission are not avoided in the absence of the Marinus Link.

Tasmania prides itself on being a state with high value conservation areas that many groups have spent decades fighting to protect. While climate change is the greatest long-term threat to biodiversity, the location of new renewable generation projects and new transmission build should avoid and minimise impacts on biodiversity and the environment.

Communities need to have confidence that their place-based values are recognised and protected.

The federal and state governments have a key role to play in ensuring that there is transparent geospatial mapping, and that communities, including First Nations communities, are active stakeholders in identifying locations in Tasmania that are not appropriate for energy projects. This will ensure that the siting, planning and delivery of renewable energy projects protects Tasmania's unique cultural heritage, environment, and biodiversity, while ensuring that clear benefits from projects flow to local host communities.

48 https://nexaadvisory.com.au/site/wp-content/uploads/2022/04/Removing-transmission-roadblocks-discussion-paper-080422.pdf
49 ibid

Transparent communication of the benefits will help keep the lights on

To advance the delivery of the Marinus Link, the Victorian and Tasmanian Governments need to articulate the critical role that it has to play in underpinning energy security in both locations, and in addressing the increasing impacts of climate change.

Neither Victoria or Tasmania can achieve their decarbonisation goals efficiently and effectively without the Marinus Link and other new renewable generation and transmission interconnection projects in combination. No single option, such as batteries, a specific interconnector, or renewable generation will achieve the necessary outcomes.

Further delays as a result of a lack of community understanding on the need for renewable energy and transmission will only increase electricity bills, delay decarbonisation and increase the risk of black outs.

APPENDIX: AEMO'S 2022 INTEGRATED SYSTEM PLAN

AEMO produces a whole-of-system development plan (the Integrated System Plan, ISP) for the NEM and transmission network every two years[50]. The ISP provides a roadmap of how the NEM and transmission system could change over the next three decades, to 2050, to support the decisions of government, market participants, investors, policy-makers, and consumers.

The ISP examines a collection of future-looking scenarios on the required development of electricity generation and transmission network using least-cost optimisation modelling. The most recent ISP focuses on the 'Step Change' scenario as being the most likely, selected using a voting process with industry and key stakeholders.

The key highlights of this scenario include:

1. The electricity delivered to the grid would need to double from 180TWh per year to 330TWh per year by 2050, given electrification of much of the Australian economy.
2. Australia will need nine times today's utility-scale renewable energy generation (online and fully connected) by 2030 in order to replace aging coal units and to manage reliability.
3. 45GW/620GWh of energy storage will be needed in batteries, hydro, and other forms.
4, The installation of more than 10,000 km of new transmission is needed to connect geographically and technologically diverse low-cost generation and firming capacity.
5. The actionable ISP transmission projects must be on a pathway that is low cost and low regret for consumers, with work commencing on their earliest planned schedule.
6. It is important to manage the supply chain and social licence risks for investments of this scale.

50 https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp

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