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Secretariat  
Standing Committee on the Environment and Energy  
PO Box 6021  
Parliament House  
CANBERRA ACT 2600  
[Via online portal]

Dear Committee Secretariat

**RE: Inquiry into the current circumstances, and the future need and potential for dispatchable energy generation and storage capability in Australia**

As the Tasmanian jurisdictional planner and operator of Tasmania's transmission network, and entity currently delivering Project Marinus, TasNetworks welcomes the opportunity to make a submission to the *Inquiry into the current circumstances, and the future need and potential for dispatchable energy generation and storage capability in Australia* (the Inquiry).

Tasmania has world leading water and wind resources. Water is a key resource in Tasmania with great potential, due to Tasmania's dramatic topography and relatively high rainfall in the central and western parts of the island. This has led to Tasmania being Australia's largest generator of renewable energy, underpinned by the State's extensive hydropower resources. In addition to the State's latent hydro capacity, the capital cost of pumped hydro storages in Tasmania is around 30 per cent lower than sites elsewhere in the national electricity market (**NEM**). Additionally, Tasmania is recognised as having among the best wind resource in the world, lying directly in the path of the Roaring Forties. This wind resource is relatively untapped and plentiful, and complements the wind profile of other states in the NEM.

Supported by increased interconnection across Bass Strait via Marinus Link, the full potential of Tasmania's renewable generation, storage and dispatchable 'on demand' energy can be unlocked to help manage the peaks and troughs of intermittent generation across the NEM. Analysis undertaken by TasNetworks and the Australian Energy Market Operator (**AEMO**) highlights that development of Marinus Link is a key part of an efficient future NEM, delivering clean, reliable and affordable electricity services for customers.

Marinus Link is a proposed underground and undersea high voltage direct current interconnector between Victoria and Tasmania, proposed to be built in two 750 megawatt (**MW**) stages. The first 750 MW stage of Marinus Link provides the opportunity to access latent hydro capacity in the existing Tasmanian hydro system, while the second 750 MW stage of Marinus Link enables development of long duration pumped hydro facilities and further access to one of the best wind resources in the NEM.

AEMO's 2020 Integrated System Plan (**ISP**) places Mariner Link as a critical and actionable project, that needs to continue through design and approvals processes, so that it is ready for service as soon as the market requires it. The Tasmanian and Commonwealth Governments announced the Tasmanian State Energy and Emissions Reduction Deal in December 2020, recognising the importance of the Mariner Link and Battery of the Nation projects for putting downward pressure on electricity prices in a transforming NEM, and committing to progress Mariner Link to an investment decision. TasNetworks urges the Committee to note the importance of the Mariner Link project for maximising access to Tasmania's world class dispatchable energy generation and storage resources, supporting efficient energy generation and deep storage, and putting downward pressure on prices for customers in all regions of the NEM.

In the attachment to this letter (**Attachment A**) we provide information in relation to a number of matters, which we hope will assist the Committee's deliberations. These matters include:

- current and future energy needs;
- issues related to power system integration, connection, and grid transmission requirements;
- comparative efficiency, cost, timeliness of development and delivery, and other features of various energy technologies;
- emerging energy services technology; and
- opportunities for Australia to grow and export dispatchable zero-emission power.

For more information or to discuss the views expressed in this submission, please contact Government Engagement Specialist, [REDACTED], via email [REDACTED].

Yours faithfully

[REDACTED]

Bess Clark  
General Manager, Project Mariner

## ATTACHMENT A

### Current and future energy needs

Many ageing coal-fired generators have recently retired, existing coal-fired generators are forecast to begin closing from the early 2020s, and all are projected to close before 2058. By 2040, at least 19,000 MW of coal-fired generation is forecast to retire in the NEM. The Chair of the Energy Security Board has expressed views that the power system is already exceeding the Step Change scenario forecast in the 2020 ISP: increased generation from variable renewables is likely to exert commercial pressure on coal fired generators as operational inefficiencies arise as output is continually varied to accommodate lower cost variable renewable generation in the supply stack. The recent announcement of the early closure of Yallourn Power Station and AGL Energy's significant asset impairments and restructure plans, including indications that thermal generation units could be mothballed, underscores this observation. The combination of increased interconnection, variable renewable generation, storage, and dispatchable 'on demand' generation will play a key role in supporting stability, reliability and energy affordability across the NEM as the market continues to evolve from centralised coal-fired power generation to a highly diverse system dominated by renewable energy.

Transmission investment reduces the need for dispatchable storage by enabling better sharing of resources between regions. Independent analysis shows that the benefits of transmission expansion between areas with diverse renewable generation resources are substantial, with significant reductions in system-wide costs and renewable generation curtailments.<sup>1</sup> TasNetworks' analysis shows that Marinus Link and supporting transmission in North West Tasmania can provide the NEM with reliable access to Tasmania's extensive and well established hydropower system, as well as new hydroelectric generation and deep storage capacity, with the Cethana pumped hydro project announced as the preferred site of the three projects totalling 1.7GW shortlisted within the Battery of the Nation project.

The first 750 MW stage of Marinus Link provides the opportunity to access latent hydro capacity in the existing Tasmanian hydro system including proposed upgrades to the Tarraleah site, while the second 750 MW stage of Marinus Link enables development of long duration pumped hydro facilities and further access to one of the best wind resources in the NEM.

TasNetworks' findings show that Marinus Link and supporting transmission will support increased variable renewable energy generation across the NEM and help to reduce the issues of energy reliability and security, and cost impacts, associated with the NEM's continuing transition away from coal-fired generation by:

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<sup>1</sup> Boston University, Institute of Sustainable Energy, *The Value of Diversifying Uncertain Renewable Generation through the Transmission System*, September 2020.  
<https://www.bu.edu/ise/files/2020/09/value-of-diversifying-uncertain-renewable-generation-through-the-transmission-system-093020-final.pdf>

- providing access to storage and firming services needed to support the pipeline of renewable energy projects proposed across the NEM through existing hydro resources and the suite of Battery of the Nation pumped hydro energy storage project proposals;<sup>2</sup>
- enhancing access to Tasmania’s complementary wind profile, and improving energy reliability and stability for the Victorian grid during the peak summer period;<sup>3</sup>
- supporting NEM states’ capacity to achieve their net zero greenhouse gas emissions targets; and
- exerting downward pressure on wholesale electricity prices across the NEM by introducing cost-effective additional dispatchable capacity that replaces the marginal gas-powered generators.<sup>4</sup>

### **Issues related to system integration, connection, and grid transmission requirements**

Much of Australia’s transmission network was designed to deliver energy to customers in large load centres from coal-fired generators. As the generation mix changes, the transmission network needs to be modified to improve capacity, manage local congestion, and enable the benefits of significant renewable energy generation and storage resources in different NEM regions, to be efficiently shared.

As existing transmission assets in Tasmania are nearly at capacity, North West Tasmania’s electricity transmission network will require both the augmentation of existing corridors and the establishment of new corridors to unlock the energy potential identified by AEMO in the North West and Central Tasmanian REZ, facilitate connection of additional energy generation and storage, and to support energy flows to and from Marinus Link. TasNetworks’ North West Strategic Transmission Plan proposes a collector network for multiple projects from multiple parties to minimise the amount of transmission infrastructure that will ultimately be required to achieve these objectives. This will require significant investment in the region and proposed transmission developments for North West Tasmania – in the order of \$600 million (\$2020) as part of the Project Marinus interconnector project. Economic analysis undertaken by TasNetworks and AEMO demonstrates that this investment is part of the optimal development path for the NEM.

Interconnector projects need to be progressed in a timely way to support clean energy exchange between NEM states and help to facilitate efficient REZ development as coal-fired generators continue to retire. Independent analysis shows that, with Marinus Link and other actionable ISP projects in service (including Humelink, VNI West and Project Energy Connect), better sharing of renewable and dispatchable resources (including deep storage from Battery of the Nation and Snowy 2.0) is possible between the three southern NEM states.<sup>5</sup> This supports the development of REZs across the NEM and also assists in lowering wholesale energy costs for consumers. Independent analysis also shows that, without increased

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<sup>2</sup> TasNetworks, *Project Marinus RIT-T Project Assessment Draft Report*, December 2019.

<sup>3</sup> Hydro Tasmania, *Battery of the Nation – Unlocking Tasmania’s Energy Capacity – The Potential of Tasmania’s Renewable Generation Assets with More Interconnection*, December 2018.

<sup>4</sup> FTI Consulting, *How do customers benefit from Marinus Link?* (due for release mid-2021).

<sup>5</sup> FTI Consulting, *How do customers benefit from Marinus Link?* (due for release mid-2021).

interconnection, the mainland NEM states will rely more on gas generation and less on renewable generation.<sup>6</sup>

Marinus Link is proposed to be built in two 750 megawatt (MW) stages with an estimated capital cost in the order of \$3 billion (\$2020) for the high voltage direct current cables and converter stations, supported by the North West Transmission Developments as part of the integrated interconnector project being assessed under the Regulated Investment Test for Transmission (RIT-T) and ISP. The need to progress Marinus Link now to support a shovel-ready project by 2023-24 should be recognised by the Committee, with the Commonwealth and Tasmanian Governments progressing this important work. This timing would allow the first 750 MW link to be delivered by 2027-28, and align with the objectives of the Tasmanian State Energy and Emissions Reduction Deal by improving energy security, putting downward pressure on energy prices, and enhancing renewable energy production as coal-fired generators continue to retire.

### **Comparative efficiency, cost, timeliness of development and delivery, and other features of various technologies**

Electricity generation in Tasmania is dominated by hydropower, which presently supplies around 80 per cent of the State's power. In November 2020, Tasmania reached its target of 100 per cent renewable energy - one of the only regions worldwide that has done so – and has committed to doubling Tasmania's renewable generation by legislating a renewable energy target of 200 per cent of current needs by 2040. In recent times, wind farms have joined the mix of generation types in Tasmania. Tasmania's hydropower stations are in six high-rainfall catchments formed from natural river systems. Power stations and water storages are linked through natural and man-made channels. There are 30 hydropower stations operating in Tasmania. Tasmania also has significant pumped hydro potential and can offer a diversity of storage durations ranging from hours to several days.

Tasmania's existing hydro capacity is a significant source of value to mainland Australia's electricity customers, given the forecast coal plant closures and the projected growth in variable renewable generation. TasNetworks' analysis shows that Marinus Link and supporting transmission in North West Tasmania can unlock Tasmania's clean, cost-competitive generation and storage resources. Together, they are part of the lowest cost solution to provide dispatchable energy to the NEM where and when it is needed.

The overall benefits of Marinus Link and supporting transmission are demonstrated in TasNetworks' RIT-T Supplementary Analysis Report released in November 2020. This report shows significant cost savings are derived from deferred and avoided capital costs by utilising the existing and repurposed Tasmanian hydro capacity along with the development of longer duration cost-effective pumped hydro in Tasmania. Since the storage duration of pumped hydro in Tasmania is typically 2-4 times longer than comparable facilities elsewhere in the NEM, this reduces the need for developing and maintaining additional gas-fired peaking generation that may only operate occasionally.

In the same report, TasNetworks considered whether battery capacity could be a cost-effective alternative to Marinus Link by providing the increased storage capability required by the NEM. The analysis considered the latest projections for the growth in battery capacity and the potential for lower cost batteries in the future, and ultimately showed that Marinus Link

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<sup>6</sup> FTI Consulting, *How do customers benefit from Marinus Link?* (due for release mid-2021).

unlocks longer duration pumped storage in Tasmania that provides seasonal energy shifting capability. Shorter duration storage solutions are effective in shifting energy across hours or a day, but cannot provide a cost effective alternative to deeper storage capability that is accessed by Marinus Link. TasNetworks' findings were supported by sensitivity analysis that considered a further 30% reduction in battery costs, as compared to projections set out in AEMO's 2020 ISP Central scenario. Results of that sensitivity analysis showed that Marinus Link still provides net benefits in a future with very low battery costs and confirmed that batteries and Marinus Link both have important roles to play as Australia transitions to a low carbon economy.

TasNetworks notes that the current regulatory framework can result in extended generator constraints when imbalance between network and generation investment emerges, leading to less efficient use of renewable resources and higher project risk premiums. A coordinated approach, outside the constraints of traditional network planning and the long timeframes of regulatory investigations like the RIT-T, may be required to help enable the pipeline of new dispatchable supply to be built and operating in time for when it is needed. In this vein, TasNetworks encourages the Committee to note that the economic, land use planning and environmental regulatory frameworks need efficient approvals processes so that actionable projects can be assessed and progressed in a timely way. For example, if Marinus Link can be shovel-ready by 2023-24, the first 750 MW link can be delivered by 2027-28, helping to manage the impacts of closures of existing coal-fired generators, many of which are projected to close before 2058.

### **Emerging technology**

As the world looks to decarbonise, renewable hydrogen is emerging as a significant energy source of the future. It is increasingly being discussed as a promising fuel that could reduce the amount of fossil fuels burned in several sectors, including transportation and heavy industry. Australia's National Hydrogen Strategy identifies Tasmania as having very high potential for the production of renewable hydrogen and TasNetworks notes that the Tasmanian Renewable Hydrogen Action Plan sets out the Tasmanian Government's vision to capitalise on the State's many advantages and become a world-leader in large-scale renewable hydrogen production.

Meaningful, tangible information about the hydrogen opportunity in Tasmania will attract investor confidence and support Tasmania's position as a preferred site for emissions-intensive industries to adopt greener practices and thrive in a lower carbon economy. TasNetworks is currently working with potential proponents of renewable hydrogen production to ensure they have access to comprehensive and consistent information about the Tasmanian power system and its ability to supply the loads involved with producing hydrogen.

A Renewable Hydrogen Connections document has been developed for those seeking more information on opportunities, network pricing guidelines and attributes of the Tasmanian power system. TasNetworks is also exploring the interactions of hydrogen in the power system including where to locate and use hydrogen electrolyzers to maximise system efficiency, and understanding the impact on the development of generation and transmission. For example, our analysis in the RIT-T Supplementary Report, released in November 2020, shows that Marinus Link and the supporting North West Tasmanian transmission upgrades can support significant hydrogen load growth in Tasmania of up to 1,000 MW. These findings are

consistent with the decarbonisation objectives needed for the growth of the hydrogen industry.

**Opportunities for Australia to grow and export dispatchable zero-emission power**

Investing in interconnection, transmission, hydropower, and pumped hydro capacity now will signal to developers, locally and internationally, that Australia is preparing for a more ambitious renewable energy future. This will help to attract investment and industry seeking to locate their operations in a low cost, low carbon environment, bringing jobs and employment opportunities to Australia. Australia may miss this opportunity if other countries move faster.

For example, Marinus Link and the supporting North West Transmission Developments (together Project Marinus), present a significant opportunity to help Australia with the clean energy transition. TasNetworks' findings show that Project Marinus can support Australia's workforce participation by fostering the development of skills related to the energy industry as it transitions from coal-fired power generation to a greater mix of renewables and dispatchable capacity by 2035. TasNetworks' findings also show that Project Marinus would stimulate the following economic opportunities:

- Approximately \$3 billion in economic stimulus in the form of increased employment and economic value added to regional Tasmanian and Victorian communities, particularly in the North West Tasmania and Gippsland regions;
- 2,800 direct and indirect jobs at peak construction, including a range of roles in the project management, engineering, science, trades, and professional services sectors and further supporting roles including education and training, accommodation and food services, hospitality and transport;
- Further development of Tasmania's renewable energy resources, unlocking approximately 2,350 jobs, and adding a further estimated value of \$5.7 billion to the Tasmanian economy; and
- A further estimated \$420 million added to the Victorian economy directly and indirectly over the operational life of Marinus Link.