

Renewable Energy



Tasmania's First Renewable Energy Zone

Options Analysis Report

August 2023

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1. Introduction

In December 2022, the North West of Tasmania was announced as the first region to be explored in detail for its potential to host the state's first Renewable Energy Zone (REZ).

The Tasmanian Government legislated the Tasmanian Renewable Energy Target (TRET) in November 2020, which seeks to double the state's electricity generation through renewable resources. The TRET will be enabled by greater interconnection to the mainland through the planned Marinus Link interconnector and on-island load growth. Achievement of the TRET will require the build-out of significant new renewable generation and the transmission to support it.

Managing the scale of new generation required to achieve the TRET will require significant planning and coordination. The establishment of REZs has the potential to coordinate access to existing and new transmission lines to areas with excellent renewable energy resources. REZs are expected to play a key role in minimising the cost of build out for Tasmanian customers and connecting generators through optimising the design of the power system. REZs can not only coordinate development in areas with excellent renewable resources but also help minimise and manage the impact on other important values (e.g. land use, environment, heritage and tourism).

The establishment of Tasmania's first REZ is a key action under the Renewable Energy Coordination Framework (the Framework). Identification of the state's first REZ is being informed by other key actions under the Framework including:

- scenario planning
- spatial mapping
- register of interest.

This report provides an overview of the process taken to identify Tasmania's first REZ, the findings that informed the decision to commence detailed investigation in the North West, and the planned next steps.

2. Background

2.1. Tasmanian Renewable Energy Target

Tasmania is the first state in Australia, and one of the first jurisdictions in the world, with 100 per cent renewable energy generation.

To drive investment and expansion of the renewable energy sector, the Tasmanian Government introduced the Tasmanian Renewable Energy Target (TRET) in 2020. The achievement of the TRET will increase the state's renewable energy output equivalent to 200 per cent of 2020 electricity generation levels (set at a baseline of 10,500 GWh). The TRET aims to have:

- 15 750 GWh of electricity generation from renewable energy sources by 2030 and
- 21 000 GWh of electricity generation from renewable energy sources by 2040.

Significant new renewable generation is required to achieve the TRET and 2030 interim target. It is estimated that between 2 500 and 3 000MW of new wind capacity would be required to meet the 2040 target. There is insufficient capacity throughout the existing electricity network to support this scale of generation. Therefore, transmission upgrades and/or new transmission infrastructure is required REZs have emerged as the preferred mechanism for coordinating this level of generation.



Figure 1: Proposed location of Marinus Link and North West Transmission Upgrades

2.2. Project Marinus

Project Marinus is a proposed 1 500MW subsea interconnector, delivered in two 750MW stages between Tasmania and Victoria and including augmentation of the transmission network in the North West of the state. Marinus has been identified as an actionable project in the Australian Energy Market Operator's (AEMO) Final 2022 Integrated System Plan (ISP), the key long term planning document for the NEM.

A final investment decision for Project Marinus is scheduled for late 2024.

As Figure 1 shows, Tasmanian transmission development is required in North West Tasmania to facilitate Marinus Link, known as the North West Transmission Developments (NWTD). These upgrades also have potential to support new load and generation in Tasmania. The NWTD (Figure 2) includes the following key upgrades to the North West transmission corridor proposed:

- Hampshire Hills to Burnie and Sheffield to Burnie which are both specific to Marinus Link
- Palmerston to Sheffield which serves both Marinus Link and new generation and load connections
- Hampshire Hills to Staverton and Staverton to Sheffield required for both the full realisation of Marinus Link and new generation connection in Tasmania.

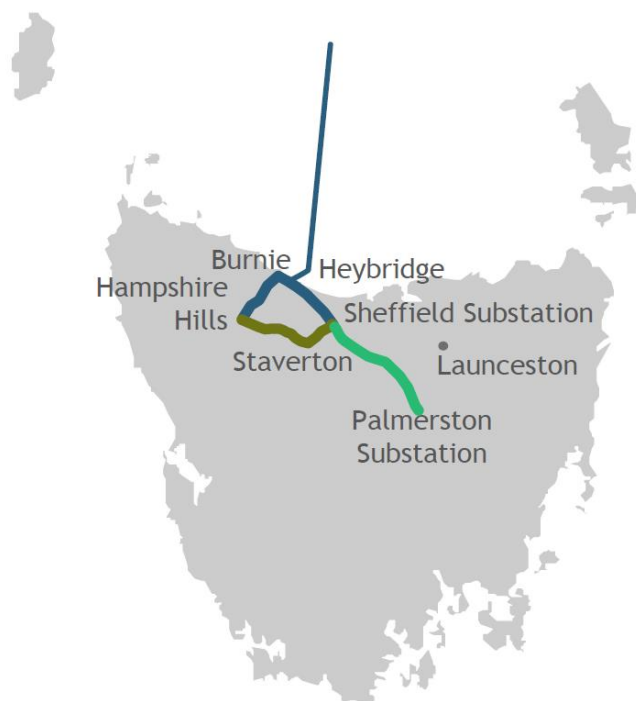


Figure 2: Proposed North West Transmission Developments to support Marinus Link

In October 2022 the Tasmanian and Australian governments made a joint announcement about the funding and financing of Project Marinus. As part of this the Tasmanian and the Commonwealth have signed a letter of intent that includes:

- access to a concessional loan from Rewiring the Nation, through the Clean Energy Finance Corporation, for 80 per cent of the project costs of Marinus Link, with the additional 20 per cent to

be an equity investment shared equally between the Commonwealth, Victoria and Tasmania to get this critical project off the ground

- up to \$1 billion of low-cost debt from Rewiring the Nation for Tasmania's Battery of the Nation projects
- up to 84 per cent low-cost debt for the NWTD.

2.3. Battery of the Nation

Battery of the Nation (BoTN) is about changing the way we use the Tasmania hydropower system to allow Tasmania to provide a greater contribution to the National Electricity Market.

The BotN work program includes potential development of a new pumped hydro site, redevelopment of existing hydro power stations, and better use of existing hydropower latent capacity. This includes the potential redevelopment of the Tarraleah hydropower scheme and a pumped hydro project at Lake Cethana.

The Tarraleah development (190MW replacing the existing Tarraleah (90MW) and Butlers Gorge (12MW) power station) is scheduled to be commissioned by the end of 2029, aligning with Stage 1 of Project Marinus.

The proposed Lake Cethana development (750MW with 20 hours of storage) is scheduled to be commissioned to align with Stage 2 of Project Marinus.

2.4. Hydrogen

The Tasmanian Renewable Hydrogen Action Plan released in March 2020 sets out the state's vision and strategy for the development of a renewable hydrogen industry in Tasmania that capitalises on the state's competitive renewable energy advantages. This vision includes the following goals:

By 2022 to 2024

- Tasmania has commenced production of renewable hydrogen.
- Locally produced renewable hydrogen is being used in Tasmania.
- Export based renewable hydrogen production projects are well advanced.

By 2025 to 2027

- Tasmania has commenced export of renewable hydrogen.

From 2030

- Tasmania is a significant global producer and exporter of renewable hydrogen.
- Locally produced renewable hydrogen is a significant form of energy used in Tasmania.

2.5. Tasmanian 100% Energy Self-Sufficiency

In November 2020, Tasmania achieved its 100 per cent renewable energy target. This means Tasmania has sufficient installed renewable generation capacity to meet all our expected electricity needs, on average.

Based on energy market forecasts, Tasmanian load is expected to increase by almost 10 per cent over the next 5 years. This forecast does not include growth from any new industries such as data centres, hydrogen production or additional green manufacturing.

The primary driver for this increase is overall economic growth in the state, coupled with increasing electrification of the economy. In order for Tasmania to maintain its 100% renewable energy self-sufficiency status on-island load growth will need to be matched with new renewable energy generation in the coming years.

3. Renewable Energy Zones

Renewable Energy Zones (REZs) are high-quality resource areas (wind and solar) where clusters of large-scale renewable energy projects can be developed using economies of scale.

The concept of a REZ has come to prominence as mainland Australia faces a transition away from fossil fuel powered generation which will necessitate a large scale build out of new renewable generation. Such a build out has the potential to be dotted across the country if led purely by generation proponents, impacting on many communities. Not only would this approach have this have a higher social cost, the economic cost will also likely be higher as associated new or upgraded transmission lines will be needed in more places.

Focusing the build out geographically and minimising the supporting transmission infrastructure to deliver a more efficient transition is the key aim of REZ.

Within the National Electricity Market, AEMO has identified candidate REZs by considering a range of factors including:

- Quality of renewable resources, diversity relative to other renewable resources, and correlation with demand.
- The cost of developing or augmenting transmission connections to transport the renewable generation produced in the REZ to consumers.
- The proximity to load, and the network losses incurred to transport generated electricity to load centres.
- The critical physical must-have requirements to enable the connection of new resources and to ensure continued power system security (e.g. maintenance of system strength).

In Tasmania, AEMO has identified three candidate REZs and two Offshore Wind Zones (OWZ) (**Error!**

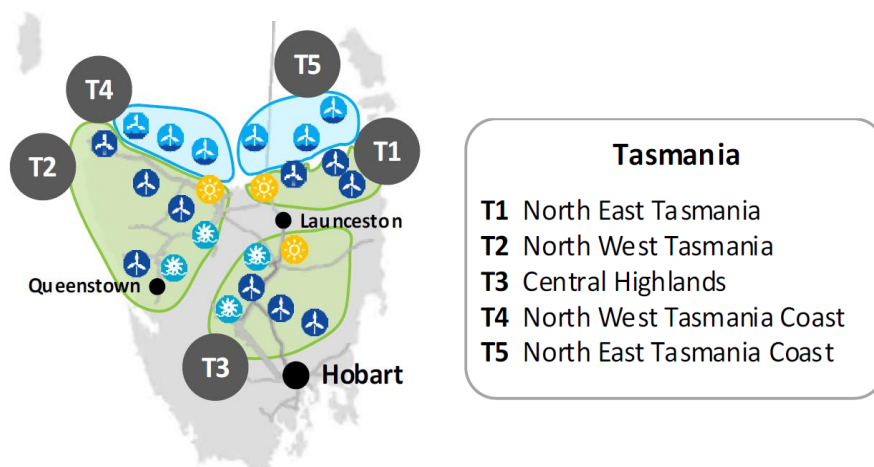


Figure 3: AEMO's Tasmanian Candidate REZ and OWZ as identified in the Draft 2023 Inputs, Scenarios and Assumptions Report

4. Tasmania's First Renewable Energy Zone

In commencing the exploration of a Tasmanian REZ, the following key State objectives and outcomes were determined to guide the approach:

1. Assist TRET achievement

The ambitious 2030 and 2040 targets for the establishment of new renewable generation guide the Government's aims in the renewables sector. The coordinated approach sought under the REZ model is seen as a more efficient enabler of progress towards the targets. The delivery of the TRET supports the strategic objectives of emissions reduction, and State and regional economic development.

2. Supporting Marinus Link and new load growth

Marinus Link and new load growth, particularly the development of a green hydrogen industry, both have the potential to open new demand for large scale Tasmanian generation. REZ are seen as a more efficient enabler of the creation of new generation to meet those load opportunities.

3. Build community and stakeholder support for renewables development in Tasmania

If a REZ is determined to have the best balance of land use, heritage and other values, it is expected that renewables development in a REZ will have a greater chance of securing a positive social licence. Further, community engagement guidelines (a draft of which has already gone through consultation) will be released which will ensure all project proponents within a REZ are working to a single, defined set of parameters. Engagement strategies developed by the REZ Coordinator and REZ Planner will guide REZ consultation and identify opportunities for community and stakeholder input through the REZ creation process.

It was also resolved that the selection and delivery of REZ is to have consideration to:

- delivering investment at least cost and support NEM/ISP objectives
- incentivising generation in optimal locations
- optimising build out to meet demand/Deliver scale efficient network planning
- complementing existing interest and development pipeline
- community benefit-sharing
- maintaining the state's energy self-sufficiency
- maintaining system security and reliability.

In its role as REZ Coordinator, ReCFIT led the process to determine which candidate areas should be considered for the first REZ in Tasmania. A two-stage process was adopted, with the first stage shortlisting candidate options for consideration within each of the REZ regions and a preliminary assessment of the sequencing between regions based on:

- a Register of Interest process to confirm the current investment pipeline

- spatial analysis of candidate resource areas
- social impact evaluation of each region
- transmission and regulatory impacts assessment.

The second stage of the process involved scenario planning to identify any least regrets infrastructure investments associated with REZ (i.e. are there investments that could be made regardless of which future scenario eventuates), appraising the cost of network augmentation options required to support REZ and consideration of the alignment with Government objectives.

ReCFIT sought advice from TasNetworks on technical, system planning and regulatory matters throughout the process in its capacity as REZ Planner.

4.1. Register of Interest (ROI)

A ROI process from 15 June to 13 July 2022 to better understand investment interest in Tasmania's renewable energy sector. The aim of the ROI was to develop a comprehensive pipeline of renewable energy generation and load projects in Tasmania,

The ROI sought feedback from the following participants:

- renewable electricity generation projects (including offshore developments) of 10 MW or greater
- industry/businesses with new or increased electrical loads of 1MW or greater
- existing load proponents looking to source electricity from new renewable projects.

An online ROI survey was developed that included questions that would allow for projects from the early stages of development to more advanced or completed projects to participate. The ROI survey questions sought to understand the scale of potential development, as well as their timing and geographic location. It also sought to understand any barriers to projects progressing, and whether project timeframes are contingent on other developments (e.g. Marinus Link or new load developments).

The ROI identified significant commercial interest in developing renewable energy generation projects in Tasmania, with around 28 GW of potential generation identified, including projects at various stages of development. When considering projects by REZ region, the North West, then the North East and the Central had the largest amount of proposed renewable generation capacity – this includes 4.8GW of proposed new generation development with around 1.9GW aiming to be operational before 2040 (Table 1). Timing of proposed developments in the North West REZ region aligned with achievement of the interim TRET.

	Installed capacity by 2030	Installed capacity by 2040
North West	1,450MW	1,910MW
North East	800MW	1,200MW
Central	650MW	650MW

Table 1: Proposed installed generation capacity with known commissioning date by region

4.2. Spatial Analysis of Candidate Resource Areas

Detailed geospatial mapping analysis has been undertaken, building on previous work from AEMO and TasNetworks, and drawing together a range of data layers from Tasmanian Government agencies to ensure the first REZ identification process also considered potential alignment to state policy and regulatory land use, environmental and heritage frameworks.

This analysis considered the following key criteria to identify best locations for candidate areas:

- renewable energy resource - the level of wind resource and other technical constraints impacting generation capacity
- environmental, heritage and land use values
- cost-effectiveness – assessed spatially through proximity to existing transmission infrastructure
- investor interest - proximity to areas with the highest probability of commercial development (as identified through the ROI).

The spatial analysis process brought together relevant Government agency data owners with more than 380 individual spatial features from over 60 spatial data layers. Data owners assessed the ability of the various spatial features (e.g. flora and fauna, land uses like mining and forestry, cultural and built heritage, populations centres) to be co-located with, or near, renewable generation, such that a desktop view of prospective REZ was formed where generation at scale may be appropriate.

The spatial analysis process confirmed that there are refined candidate areas ranging in size from 5,000 to 450,000 hectares within the AEMO zones that may be suitable to host further renewable energy development as part of a REZ. It also confirmed that most of the candidate areas identified are located away from the existing transmission network and would require additional transmission infrastructure to connect to the network.

4.3. Social impact evaluation

This stream of analysis sought to identify the characteristics of the communities that could potentially host REZ and broadly the capacity of those communities to engage in and benefit from being a regional REZ host.

Accordingly, baseline data was gathered to understand and assess the social context including survey data on renewable energy sentiment in Tasmania, interviews on project experiences, as well as desktop information from sources such as Australian Bureau of Statistics and Local Government. The latter data sets provided an understanding of whether there is a strategic vision that has been articulated for the community/region (and if renewable energy is a focus), skill availability and labour market participation rates, available networks and community development initiatives.

Regional communities' engagement capacity was also considered. This was on the basis that it is generally easier to engage with communities that have strong networks, a clear sense of what they want and need and have the resources (time, capacity) to participate in engagement opportunities.

This information was then used to identify some of the strengths and challenges facing each potential Tasmanian REZ region. Overall, the REZ regions are broadly similar in terms of social indicators, levels of community participation and all have existing renewable energy projects. From this baseline data more detailed and targeted engagement and communications strategies are to be developed.

4.4. Transmission and regulatory impacts assessment

To assess the electricity system requirements associated with establishing REZ and achieving the REZ objectives, the REZ Coordinator and REZ Planner undertook scenario planning. The high-level objective of this work was to:

- Consider the credible development pathway to achieve the Tasmanian Renewable Energy Target (TRET) by articulating the most likely generation, transmission, and load elements (including development of Project Marinus, the Battery of the Nation projects and development of an on-island hydrogen industry - referred to as the “target scenario”)
- Consider the likely shared transmission upgrades required to support this pathway
- Consider potential REZ offerings and sequencing that could support the development pathway
- Review other potential renewable development future scenarios to identify least regret investments.

Analysis of a potential development pathway was undertaken to determine the appropriate sequencing of the REZ on a “least regrets” basis. The key findings of this analysis for each REZ region were as follows.

North West REZ Transmission

- The existing North West Tasmania transmission network has the capacity to accommodate around 340 MW of new wind.
- The majority of shared network upgrades required to increase the hosting capacity above 340MW are part of the NWTD identified for Marinus Link.
- Once Marinus Link and the NWTD proceed there will be sufficient network capacity to facilitate 1 300MW of new wind in the North West REZ region.

Central Transmission

- The transmission network from the Central REZ region to the rest of the network limits capacity for new renewable generation to 480 MW
- If Marinus Link is established, the Palmerston to Sheffield 220 kV transmission line augmentation as part of the NWTD is also established, an additional 450 MW of new renewable generation could be accommodated. If not, the cost of the Palmerston to Sheffield link would need to be funded to release the additional hosting capacity.
- The wind resource in the Central REZ region is excellent and assessed by AEMO as the strongest of any Tasmanian REZ.
- Upgrades are required in this region to support the Tarraleah redevelopment linked to Battery of the Nation.

North East Transmission

- A key consideration for a North East REZ region is the potential for future load growth around George Town, including in the Bell Bay Advanced Manufacturing Zone (BBAMZ).

- There is a local renewable resource of approximately 400 MW close to George Town Substation which could be directly connected to the existing network prior to 2030, which could be the subject of a “near North East REZ” or could be achieved through direct connections.
- The shared network upgrades identified to support the North East REZ are designed to increase the supportable load in George Town.
- Development of the Far North East resource would require a substantial new transmission line to connect to the George Town area.

The technical analysis conducted suggests that to achieve the target scenario and in the presence of the NWTD being upgraded as part of Project Marinus, the North West REZ region provides the highest potential hosting capacity.

5. Key Findings and Recommendations

An assessment of the three REZ region options was conducted taking into account the results of the analysis exercises (scenario planning, spatial analysis, register of interest and social impact evaluation) and their alignment with strategic Government objectives and an economic appraisal of value for money (the latter being informed by the cost for shared network upgrades identified in the scenario analysis). The findings of this assessment are summarised in Table 2.

OPTIONS ASSESSMENT	Option 1 NE REZ	OPTION 2 NW REZ	Option 3 CENTRAL REZ
Strategic appraisal			
Assists Tasmanian Renewable Energy Target Achievement (including interim target)	Medium	High	Medium
Supports Marinus Link and New Load Growth	Medium	High	Medium
Social, environmental and sustainability appraisal			
Social impact evaluation	Positive (Moderate)	Positive (Moderate)	Positive (Moderate)
Land use, resource, and environmental assessment¹	Positive (Moderate)	Positive (Moderate)	Positive (High)
Technical and commercial appraisal			
Potential hosting capacity	1 000MW	1 300MW	930MW
Level of commercial interest²	1 200MW	1 910MW	650MW
Economic appraisal			
Maximum allowed revenue (MAR)³ per annum	\$57M	\$40M ⁴	\$28M

¹ Ability to co-locate renewables as determined through spatial analysis

² Includes projects identified through the ROI that will be operational by 2040.

³ Estimated annual cost to transmission customers to develop the shared network required to support increased REZ hosting capacity

⁴ Based on concessional MAR, taking into account funding through Rewiring the Nation

Cost per additional MW of hosting capacity per annum	\$71,250/MW	\$40,000/MW	\$70,000/MW
Complements existing interest and development pipeline	Medium	High	Low
Outcome			
Overall Ranking	2	1	3

Table 2: Summary of REZ Options Assessment

The North West REZ was identified as the ideal candidate for the first REZ in the state for the following reasons:

- Provides for the largest hosting capacity of up to 1 300MW and lowest cost per MW of shared upgrade of the three REZ regions.
- Contains the highest level of commercial interest of all three regions (around 4.8GW – this includes projects without known commencement dates).
- There is 1,450MW of new wind generation capacity seeking to be operational by 2030 in the NW REZ region and a further 460MW seeking to come online in 2031. It strongly aligns with the achievement of TRET.
- Strong alignment with Marinus Link and NWTD and ability to help to support new load.
- Concessional finance arrangements will minimise the customer impacts for the NWTD compared to shared network augmentations required to support other candidate REZs.

6. Next steps

The identification and establishment of REZs is a staged process.



Figure 4: REZ establishment process

Work to date has focussed on researching potential REZs and has included:

- the announcement of the REZ Coordinator and REZ Planner
- development of the REZ Objectives
- research to identify social, environmental and economic aspect associated with REZ (as outlined in this report)
- the announcement of the North West as the first region to be explored in detail for its potential to host the state's first REZ.

Further work needs to be conducted prior to the finalisation of a REZ in the North West of Tasmania, which will primarily be informed by engagement with the community and key stakeholders. This includes defining the REZ in terms of its geographic location, the infrastructure required, the commercial offering, benefits available to communities and any required implementation framework. Further information regarding the REZ process and how you can keep informed of updates can be found at www.renewableenergyzones.tas.gov.au.

Final recommendations will be made to Government regarding Tasmania's first REZ by the end of 2023. Further work within other candidate REZ will be considered in late 2023 and will utilise the learnings from the North West REZ region process.

ReCFIT

Renewables, Climate and
Future Industries Tasmania

Department of State Growth

GPO Box 536 Hobart
TAS 7001 Australia

Phone: 03 6166 4466

Email: rez@recfit.tas.gov.au

Web: recfit.tas.gov.au

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