Many opportunities when investing in or using renewable energy

- Abundance of secure renewable energy for businesses who are serious about achieving real sustainability targets.
- Opportunities for renewable energy generation through wind, biomass, and geothermal activity and to sell into the National Electricity Market (NEM).
- A perfect location for a nation-leading green hydrogen hub with its advanced manufacturing zone, renewable energy availability, appropriate infrastructure and port access.

Renewable energy

Tasmania is Australia's leader in renewable energy and offers a compelling location for forward-thinking investors who either wish to invest in the renewable energy generation sector or achieve real sustainability targets through renewable energy use and generation. Tasmania is also open for business to new energy retailers who can effectively add a new level of competition for consumers.

Tasmania is 100 per cent self-sufficient in renewable electricity generation, making it one of a handful of places around the world to have achieved this. Tasmania has been net zero six out of the last seven years, and set a goal to double its capacity, to reach 200 per cent by 2040.

The latest Clean Energy Australia report released by the Clean Energy Council of Australia highlights that the state of Tasmania is significantly more advanced in terms of renewable energy penetration (over 100 per cent) than other states, with the next closest being South Australia (at 60 per cent) followed by Victoria (at 28 per cent).

Tasmania has been a forerunner in the development of renewable energy generation with over 100 years of continued investment in renewable energy infrastructure and technology. Years of experience have helped Tasmania to develop an unmatched level of renewable energy skill and expertise among our engineers and technicians.

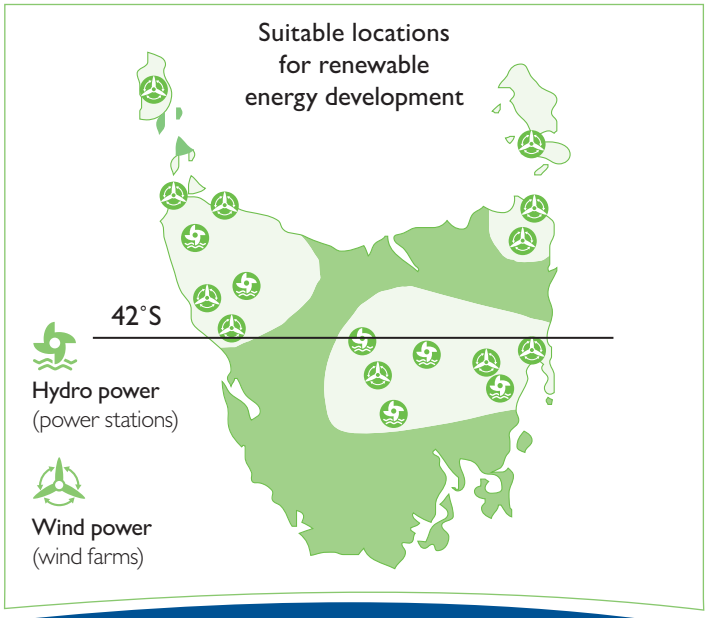
Tasmania is in the enviable position of having a supply of renewable energy that exceeds the state's energy demands. This renewable energy is predominantly from Tasmania's extensive hydro generation and storage schemes, but also with significant contributions from Tasmanian wind farms.

Tasmania benefits from having a significant water resource (27 per cent of the nation's total freshwater dam storage capacity and just one per cent of Australia's land area[1]), and a significant wind resource with the state being perfectly situated to capture the prevailing westerly winds from the 'roaring forties'.

Tasmanian electricity generation comprises hydro-electric, gas-fired generation, wind and embedded generators. In 2019–20, just under 90 per cent of electricity generated was from hydro-electric systems, with around 10 per cent accounted for by wind generation. Gas-fired generation's share of total electricity generation declined from over four per cent in 2018–19 to less than one per cent in 2019–20[2].

There is also a growing number of generators embedded in the distribution network, with small scale solar photovoltaic generation providing approximately one per cent of Tasmania's electricity. Additionally, Tasmania has the lowest per capita greenhouse gas emissions of any Australian state or territory. Our latest figures show that Tasmania has reduced its emissions by 108.6 per cent from 1990 levels.

1. NRE (formerly DEPIPWE), Rural Water Use Strategy, March 2020
2. Economic Regulator, *ENERGY IN TASMANIA REPORT*, 2019-20



Tasmanian Government

Tasmania also has the benefit of importing and exporting electricity via the Basslink interconnector with Tasmania's renewable energy supply making an important contribution to meeting peak demand levels interstate.

Tasmania is well placed to increase its renewable energy supply. In response to identified and forecasted electricity demand across Australia, work is currently underway on a number of capacity building projects.

These include Project Marinus – a proposed second Bass Strait interconnector, Tasmania as the Battery of the Nation project and the opportunities within the Australian Energy Market Operator (AEMO) Integrated System Plan (ISP) to fill the gap that the retirement of ageing coal-fired power stations on the Australian mainland will create. Critical underwater engineering surveys for Marinus Link are currently underway across Bass Strait as technical processes to sensitively design and build this national priority infrastructure continue at pace.

Tasmania – overview of the electricity system

The Tasmanian electricity supply industry comprises of generation, transmission, distribution and retail sectors as well as its relationship with the NEM via the Basslink interconnector.

Within this framework, the main participants in the Tasmanian electricity supply industry are as follows:

Hydro-Electric Corporation (HEC) trading as Hydro Tasmania – A Government Business Enterprise that owns and operates the assets responsible for the vast majority of electricity generation in Tasmania.

TasNetworks – A state-owned company which is the owner and operator of the electricity transmission and distribution systems and the supporting telecommunications network.

Aurora Energy – A state-owned energy retailer operating in Tasmania.

ERM Power – A privately owned energy retailer operating in Tasmania, providing service to business customers.

Basslink – Connects the electricity transmission systems of Tasmania to the mainland state of Victoria enabling Tasmania to participate in the NEM. Basslink is a privately owned market link.

National Electricity Market

The NEM operates through one of the world's longest interconnected power systems spanning around 5 000 kms of Australia's east and south-east and into Tasmania via the Basslink interconnector.

Managed by AEMO, the NEM is a wholesale commodity exchange for electricity, acting as a spot market where supply and demand is met simultaneously in real-time through a centrally coordinated dispatch process.

The market is enabled through a transmission grid covering five state-based networks and several cross-border interconnectors that physically link the market. The five interconnected states act as price regions: Queensland, New South Wales (including the Australian Capital Territory), South Australia, Victoria and Tasmania.

The NEM has a total electricity generating capacity of around 53 000 MW. The NEM's transmission network incorporates around 40 000 km of transmission lines and cables and carries electricity from generators to large industrial energy users and local electricity distributors across the five states.

These assets are owned and operated by State Governments and private businesses. There are over 500 registered participants in the NEM, including market generators, transmission network service providers, distribution network service providers and market customers.

Hydro Tasmania Group

The Hydro Tasmania Group is made up of Hydro Tasmania, Entura and Momentum Energy. Hydro Tasmania is a Government Business Enterprise that holds a licence and the majority of the assets for electricity generation in Tasmania.

Hydro Tasmania is Australia's largest producer of renewable energy typically generating over 9 000 GWh from renewable sources annually. It owns and operates 30 hydropower stations, 54 major dams as well as operating and partly owning two wind farms on mainland Tasmania.

In addition, Hydro Tasmania owns and operates two diesel power stations and wind and solar generation on Tasmania's Bass Strait islands.

Entura brings together 100 years of experience in clean energy innovation as one of the world's most experienced specialist power and water consulting firms.

Momentum Energy is the Group's retail arm, selling electricity and gas to business and residential customers in mainland Australia.

TasNetworks

TasNetworks is a state-owned company and the owner and operator of the electricity transmission and distribution systems within Tasmania. TasNetworks owns, operates and maintains 3 577 circuit kms of transmission lines and underground cables, 49 transmission substations and seven switching substations.

It distributes power through 22 400 km of overhead lines and underground cables, 227 000 power poles, 18 large distribution substations and 33 000 small distribution substations.

TasNetworks is responsible for the network of 'poles and wires' no matter which retailer the power is purchased through.

TasNetworks has a history of innovation, working with customers and energy market bodies to develop technical solutions that support efficient use of the network. This includes dynamic rating and operation of the network and a range of control schemes to optimise use of available network capacity. Some of these schemes are discussed below.

TasNetworks is also undertaking a number of trials to test new technologies in the Tasmanian context, including a residential battery trial, an electric vehicle trial, a remote area power supply solution and a network tariff trial underpinned by advanced meters.

In addition to infrastructure operations and maintenance, TasNetworks also has significant capability in delivering a range of professional and technical services to customers including (but not limited to) metering, electrical contracting, project and asset management, system planning and development, asset monitoring and inspection services.

Aurora Energy

Aurora Energy is a state-owned company that provides electricity and gas retail services in fully competitive markets to more than 279 000 customers throughout Tasmania.

Basslink

Basslink is an electricity interconnector between Tasmania and Victoria that allows electricity to be traded between Tasmania and the NEM. Basslink is a high-voltage direct current electricity interconnector.

Tasmanian opportunities

Tasmania presents four key opportunities to those who wish to invest in renewable energy.

1. Opportunities for businesses who are serious about achieving real sustainability targets

Tasmania offers a strong and cost-competitive alternative for intensive energy-based operations wishing to establish themselves in an environmentally sustainable location.

Tasmania is Australia's renewable energy state having achieved 100 per cent self-sufficiency in renewable energy generation.

As a result, the emissions associated with grid purchased electricity are the lowest of any Australian state or territory[3]. This emissions factor can be used for National Greenhouse and Energy Reporting (NGER) purposes by businesses and may provide an advantage in sustainability reporting for businesses operating in Tasmania.

Hydro Tasmania is also able to offer investors long-term electricity price certainty.

Data centre

The Tasmanian Government recognises that when you combine our renewable energy advantage together with our temperate climate (ambient temperature) and water availability, there is an excellent opportunity for ICT and data centre investment.

Attributes such as these are already creating strong market interest and we welcome the recent decision by Firmus Grid to invest $100 million in a low-carbon cutting edge data centre in regional Launceston. According to Firmus Grid, Tasmania is the perfect location for the investment.

Tasmania has a number of experts able to support the establishment and ongoing operation of data centres, including TasNetworks, Telstra and TasmaNet which provide services to a range of customers.

Smelter opportunities

Tasmania has the key components required for the establishment of a state-of-the-art manufacturing industry based on silica or tin. In addition to a renewable energy base, Tasmania has access to a high-grade industrial silica resource and large tin deposits and suitable site locations in close proximity to necessary infrastructure. In addition, Tasmania has a capable and skilled workforce, competitively priced energy, and a stable and welcoming business environment.

There is currently no tin smelter operating in Australia and Tasmania's tin is primarily shipped as concentrate to smelters located in Malaysia, Thailand and China. Australia has 5.7 per cent of the world's identified tin resource, of which Tasmania has more than 80 per cent (of the Economically Demonstrated Resources). This deposit is located in the Renison Bell deposit, near Rosebery, and is mined by Bluestone Mines Tasmania, Australia's largest tin producer.

Tasmania's deposits of high-grade silica (high purity, low iron) are suitable to produce a variety of high value products, attracting price premiums for a range of niche applications. Tasmania's silica resource industry includes active and potential exploration projects and production phase projects based on silica deposits in the south and on the west and north-west coasts of Tasmania.

2. Opportunities to develop renewable energy generation through wind, biomass and geothermal activity

Tasmania offers unique investment opportunities from its diverse range of renewable fuel sources. Tasmania is especially endowed with high quality natural resources and ready development sites.

Further opportunities exist in the renewable energy space for proponents to partner with business and industry within Tasmania as well as supply to mainland NEM participants.

The Australian Government has committed to reduce national greenhouse gas emissions by 26 to 28 per cent below 2005 levels by 2030 and Tasmania's renewable energy potential could play a significant role in achieving this goal.

3. Tasmanian emission factor 0.15 kg CO2-e/kWh. Australian National Greenhouse Accounts, August 2019

Wind

Tasmania has a world-class wind energy resource – the island lies directly in the path of the 'roaring forties', the prevailing westerly winds that circle the Earth's high southern latitudes. More specifically, the midlands and northwest regions have been identified as ideal locations for large-scale development of wind farms in AEMO's Integrated System Plan, released in July 2018.

A number of greenfield wind farms have been proposed for Tasmania by various proponents. These projects are in various stages of development from pre-feasibility stage through to investor ready projects.

In 2019-20, two major wind farms, the Cattle Hill wind farm (148.4 MW) and the Granville Harbour wind farm (111.6 MV), commenced operations and are now supplying electricity to the grid. These wind farms are located in the west of the state and in the central highlands respectively and have a combined installed capacity of 260 MW.

Biomass

There is an abundance of suitable resources for biomass projects in Tasmania[4]. A study by Rothe[5] has suggested that up to 3.3 million green tonnes of woody biomass, equivalent to 33 PJ of energy, could be sourced and provided to the market, with the bulk coming from private plantation estates.

There are also substantial amounts of agricultural, aquaculture and municipal waste products that can be utilised for biomass and bioenergy production. The waste products that are potentially available from Tasmania for bioenergy have been mapped by the Department of State Growth and Private Forests Tasmania, part funded with a grant from the Australian Renewable Energy Agency via the Australian Biomass to Bioenergy Assessment Program. Details on the volumes and locations of biomass resources are available to view at the Australian Renewable Energy Infrastructure database nationalmap.gov.au/renewables/

The Tasmanian Government is committed to looking at innovative ways to process residues from timber and agriculture and create value-added products.

To support this, the draft Waste Action Plan was released in 2019 to provide a framework for discussing ways to address waste and resource recovery challenges across Tasmania.

The Tasmanian Renewable Energy Action Plan (TREAP) sets out the Government's commitment to develop a Bioenergy Vision, in consultation with industry and stakeholders, to identify how the State can unlock investment in bioenergy in Tasmania, increasing employment, reducing waste and greenhouse gas emissions while producing more Tasmanian renewable energy. In 2021, the draft Bioenergy Vision was released which aims to embed bioenergy into the Tasmanian bioeconomy and circular economy.

Given the rich Tasmanian wood-resource, the potential supply of forest biomass from wood processing is approximately 1 800 kt (dry bone) per annum and could be available for a range of value-adding innovations, from energy production to advanced bio-chemistry products.

A number of bioenergy investment opportunities are currently being evaluated and further opportunities exist in the sector for proponents to partner with business and industry. These include the opportunity to generate and supply bioenergy to mainland NEM participants, generate and supply industrial heat, including flash heat from bioenergy, and the development of bioenergy hubs in Tasmania's industrial and commercial precincts.

Geothermal

Geothermal energy is an emerging industry in Australia and has the potential to be a consistent, efficient and sustainable supplement to other renewable energy resources.

Inferred geothermal resources in Tasmania represent an excellent opportunity for proponents to partner with business and industry, both in Tasmania and in the broader NEM.

Tasmania's granite basement rocks also offer an ideal environment for developing an engineered geothermal system, which is the process of circulating water underground into identified dry rock deposits in hot rock locations, enabling geothermal energy to be harnessed.

Extensive geophysical exploration and commercial resource assessment indicate a broad inferred geothermal resource in central eastern Tasmania located within economic reach of existing transmission lines and includes a postulated electrically conductive target within drillable depth (three to five kilometres).

4. Forest Residues Solutions Study, Stage 2 – Detailed Options Analysis Final Report www.stategrowth.tas.gov.au/__data/assets/pdf_file/0015/135321/Residues_Solutions_Study_Stage_2_Report_final.pdf

5. Rothe A, Moroni M, Neyland M, Wilnhammer M. (2015). *Current and potential use of forest biomass for energy in Tasmania: a comparison with Europe*. Biomass and Bioenergy 80: 162-172.

3. Retail opportunities in a contestable market

Australia is a largely contestable electricity retail market, with all states and territories except for Northern Territory and Western Australia offering choice in electricity supplier.

All Tasmanian electricity customers have been a part of the National Energy Customer Framework (NECF) since 1 July 2012. The purpose of the NECF is to streamline energy retail regulation in Australia and make an efficient national retail energy market which maintains best practice consumer protection.

The NECF seeks to achieve a national regulatory regime for retailers and distributors selling and supplying energy to small customers and provide an interface between the community and a competitive retail market.

Tasmania's electricity market switched to full retail competition on 1 July 2014. The Office of the Tasmanian Economic Regulator currently maintains electricity price regulation for small customers who remain on standard retail contracts.

Customers are able to take up market contracts, which are not subject to price regulation and offer flexibility as to terms and conditions. Gas prices are unregulated.

While there is already a level of competition for Tasmanian business customers, there remains an opportunity for residential electricity retailers to enter the small customer market in competition with the incumbent Aurora Energy.

4. Opportunity to develop a green hydrogen hub to service emerging local and global demand

Hydrogen presents an opportunity for Tasmania to lead an emerging market for low and zero emission energy, by producing hydrogen for export from clean, competitively priced renewable sources of energy.

The use of hydrogen as a source of energy is fast becoming a source of choice for nations looking to decarbonise their economies.

Relatively conservative estimates suggest that global demand for hydrogen for energy is likely to reach more than 8 million tonnes by 2030, and about 35 million tonnes by 2040[6].

Nations such as Japan and the Republic of Korea have made policy commitments to use hydrogen for electricity generation, transport and other processes, and must import hydrogen to achieve this. Since late 2021, the Tasmanian Government has entered into Memorandums of Understanding with the region of Flanders in Northern Belgium and the Port of Rotterdam in the Netherlands as part of Tasmania's vision to become a leader in large scale green hydrogen production by 2030 to meet both domestic and export demand.

Tasmania offers prospective hydrogen producers access to low-cost wind and hydro resources which could facilitate hydrogen generation. Tasmania's large stocks of renewable hydro-electric generation and wind generation provide the flexibility to produce hydrogen with a sustainable supply of renewable energy.

Our world-class water and wind resources, natural deepwater ports and our skilled and knowledgeable renewable energy workforce have positioned Tasmania among the best globally in the race to develop renewable energy.

Bell Bay presents as a perfect location for a nation-leading green hydrogen hub with its advanced manufacturing zone, renewable energy availability, appropriate infrastructure, water availability and port access.

The Tasmanian Government is committed to renewable hydrogen industry development and has adopted a Tasmanian Renewable Hydrogen Action Plan with a comprehensive $50 million over 10 years package of support measures to grow the industry. As part of this plan, the Tasmanian Government has lodged a submission for Australian Government funding to initiate a nation-leading renewable green hydrogen hub at Bell Bay.

6. Medium hydrogen uptake scenario in: ACIL Allen for ARENA, Opportunities for Australia from Hydrogen Exports, 2018

Government policy and projects

The Tasmanian Government, under the 2015 Energy Action Plan, committed to being 100 per cent self-sufficient in renewable energy by 2022, which was reached two years earlier than expected. The Tasmanian Government has now set a 200 per cent renewable energy target by 2040, which is the world's most ambitious target for renewables.

The Tasmanian Renewable Energy Action Plan, dated December 2020, details the Government's vision for Tasmania's renewable energy future. It sets clear targets and actions designed to build on Tasmania's natural competitive advantages and attract large scale investment to significantly grow and expand Tasmania's renewable energy sector into the future.

Tasmania is taking advantage of its significant renewable energy resources as the push for a lower emissions future becomes stronger. This includes prudent planning for a second Bass Strait interconnector with Project Marinus. Recognised as a nationally significant infrastructure project, the project could help to facilitate further investment in renewable energy in the state.

The Tasmanian Government also strongly supports the Battery of the Nation initiative. Hydro Tasmania, working with the Australian Renewable Energy Agency, has identified 14 high potential pumped hydro energy storage sites, with up to 4 800 MW of generation capacity.

The Battery of the Nation project also examines the potential for new wind generation to leverage Tasmania's significant but underdeveloped wind potential.

The AEMO published the inaugural ISP in July 2018, which identified that from 2030 to 2040 a significant number of coal-fired power stations in mainland Australia will reach the end of their technical life.

The substantial gap in power generation and subsequent demand for alternatives to be developed will create significant opportunities to invest in renewable energy generation.

The ISP identifies that Tasmania not only is an ideal site for additional pumped hydro resources, but the north-west, north-east and midlands areas have been specifically identified as three suitable locations for large-scale development of wind farms through proposed Renewable Energy Zones (REZ).

Energy security

The Tasmanian Government has established the Energy Security Risk Response Framework to ensure that Tasmanian customers have secure access to electricity.

Under the Framework, the Tasmanian Economic Regulator is tasked with the ongoing monitoring and assessment of Hydro Tasmania's storages and responsibility has been assigned to the Director of Energy Planning to ensure that if water levels fall below certain levels, mitigating actions will be undertaken to plan for a recovery of storage levels.

Implementing the Framework has further strengthened Tasmania's secure and reliable electricity supply.

Investing in Tasmania

The Office of the Coordinator-General is Tasmania's principal entity to attract and support investment in the state. It provides free confidential services and professional advice to investors, including:

- acting as the first point of contact for project proponents and investors to government
- case managing major projects on behalf of government
- providing information on Tasmania's industry capabilities and strengths, specific business opportunities, investment regulations and government assistance
- assisting investors to identify and select the best Tasmanian site for their business
- facilitating visits to Tasmania and arranging appropriate meetings and introductions
- providing introductions to local industry, government departments and potential joint venture partners
- assisting access to export market.

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Photo credits: images courtesy of the Tasmanian Government, Vestas Granville Harbour Operations, TasNetworks, Josh Lamont, David McCormack and Matthew Stephens.

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