Capturing The Economic Development Opportunities from Renewable Energy Investments in North-West Tasmania

A Discussion Paper developed by TasNetworks and SGS Economics and Planning

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PROJECT MARINUS

TasNetworks | Powering a Bright Future

SGS Economics & Planning

Certified B Corporation

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1. Introduction

1.1 Project background

Project Marinus (the Project) includes Marinus Link, a proposed 1500 megawatt capacity HDVC underground and subsea electricity interconnector between Tasmania and Victoria, and supporting electricity transmission upgrades in North-West Tasmania, known as the North-West Transmission Developments (NWTD).

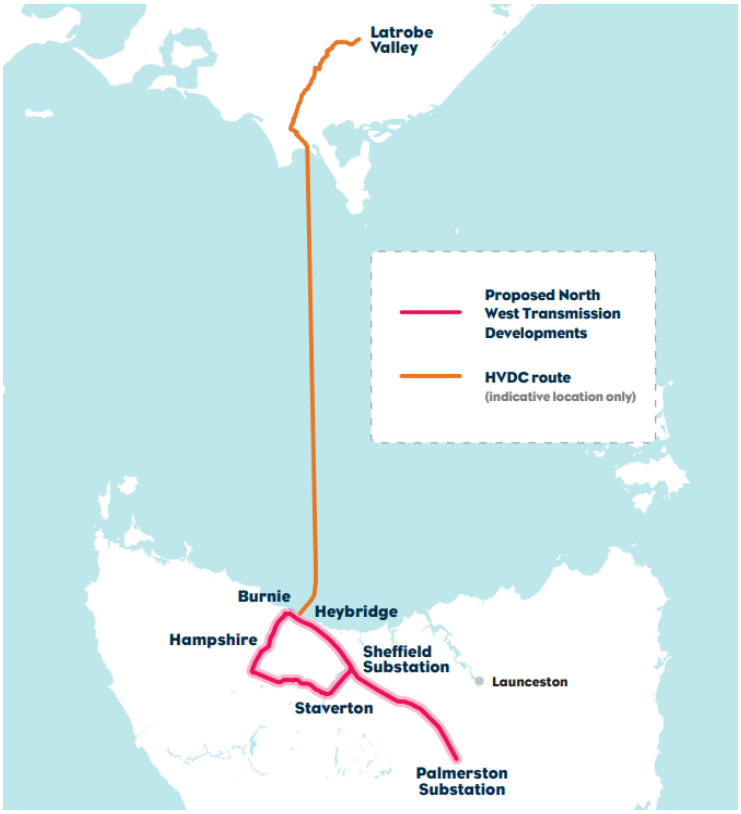
Marinus Link is a key component in Australia's transition to a clean, low cost and reliable energy future.

One megawatt is enough electricity to power roughly 300 homes (Climate Council, 2018), meaning the link can support enough energy for 450,000 homes. The increased transmission capacity will likely be delivered in two 750 MW developments. Marinus Link will be supported by transmission developments on the North-West Tasmanian electricity network as demonstrated in Figure 1.

The National Electricity Market is transforming as coal-fired generation continues to retire and variable renewable generation, such as wind and solar, take its place. Large and small-scale solar and wind generators produce clean and low-cost power, but there can be shortages in supply when the wind is not blowing and/or when the sun is not shining. Hydroelectric generators and storage resources, such as pumped hydro energy storage, can support solar and wind generation by storing excess energy and making it available to customers as required. Project Marinus will provide access to Tasmania's cost-competitive renewable energy and energy storage resources for the nation.

In addition to providing significant energy market benefits, the Project also presents a valuable opportunity to stimulate employment, jobs and investment in local communities. Comprehensive cost-benefit and system modelling indicate that this Project will create thousands of jobs, be a source of skills development and contribute significant economic value to the regional economies of Tasmania and Victoria. During construction, the Project will provide a broad economic contribution to regional communities in Tasmania and Victoria, estimated to be up to

FIGURE 1: PROPOSED MARINUS LINK ROUTE



$2.9 billion, together with 2,800 jobs generated at peak construction (Ernst & Young Australia, 2019).

The Project is currently in the design and approvals phase and is expected to reach Final Investment Decision by December 2024. Construction is earmarked to begin in 2025, with the first 750MW operational by 2029 and the second 750MW operational by 2031.

The Project has strong government support, including its listing as an actionable Project in the Australian Energy Market Operator's (AEMO) 2020 Integrated System Plan (ISP) and its High Priority status in Infrastructure Australia listing of nationally significant initiatives.

The roll-out of Marinus Link and the NWTD will enable the development and operations of substantial additional renewable energy projects in Tasmania. It will also support Tasmania establishing a strong renewable brand as the 'Battery of the Nation'. By strategically planning and collaborating regionally, ongoing economic opportunities can be maximised in local communities in Tasmania and Victoria.

1.2 The objective of this discussion paper

In this context, SGS Economics and Planning were commissioned by TasNetworks to work with key stakeholders across North-West Tasmania to understand the economic development opportunities stemming from Project Marinus and the development of renewable energy in the region.

SGS is an advisory firm with over 30 years' experience in economic development and provides evidence-based insights to inform policy and strategy decisions and help solve social, economic and environmental issues. A certified Benefit Corporation (B Corp), SGS are part of a global movement of people working for a more equitable, prosperous and sustainable society.

SGS and TasNetworks have engaged different government agencies, major institutions, and key industry representatives to develop this paper. The engagement focused on articulating the short-, medium- and longer-term benefits of Project Marinus, focusing on local economic development and community wealth building. The approach also identified what is needed to ensure lasting positive benefits remain in the region from the investments in NWTD, Marinus Link and the renewable energy sector more broadly.

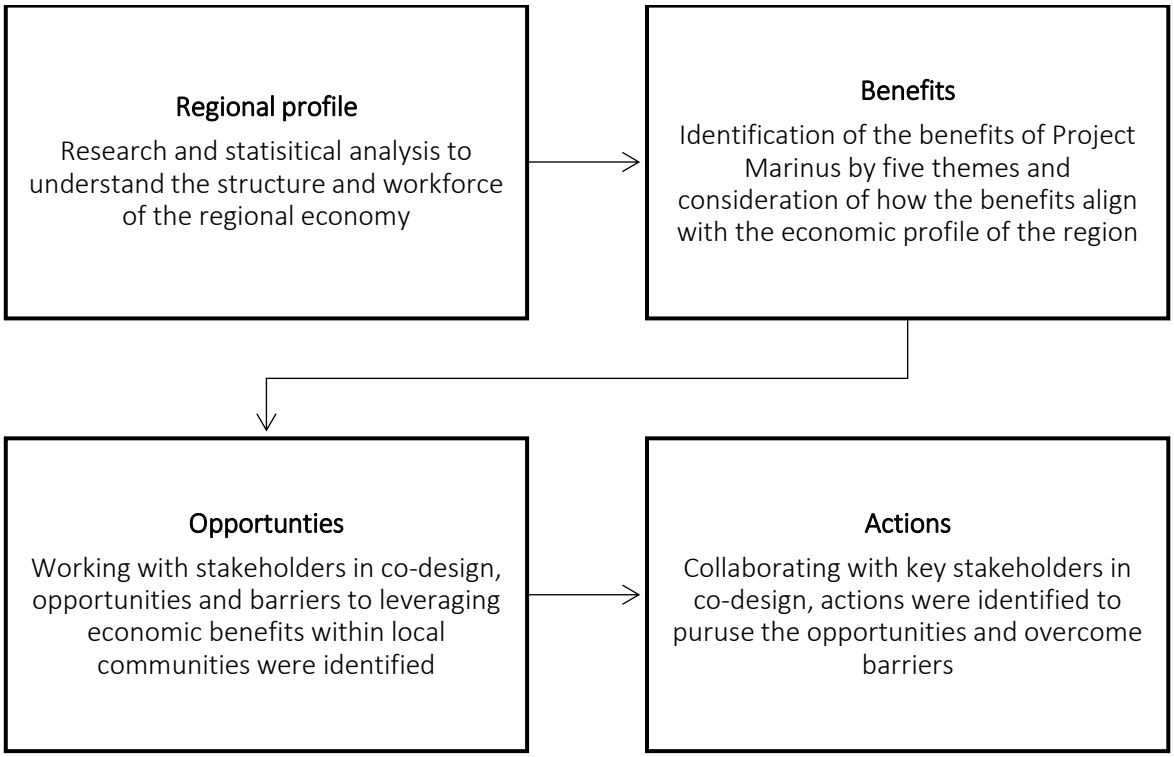
> Project Marinus and the investments in renewable energy can be a major driver of economic development and transform the economic outlook of the region. TasNetworks, as the proponent of Project Marinus, is committed to driving, collaborating and supporting actions and initiatives that will maximise the economic and social benefits for the communities in which the infrastructure will reside. TasNetworks hopes the release of this paper will set the scene for a coordinated and cooperative approach to economic development from the investments flowing into the region. There are many local stakeholders that will play a crucial role in achieving the best possible outcomes for the region. Stakeholders were engaged as part of the co-design process that informed this discussion paper. TasNetworks and regional stakeholders will need to work together to capture and overcome the opportunities and barriers identified in this discussion paper.

1.3 Process for writing this discussion paper

This paper is the outcome of the research and stakeholder engagement undertaken by SGS and TasNetworks. The objective is to outline the opportunities and challenges in pursuing economic

development off the back of the significant pipeline of works proposed in the North-West region of Tasmania. At the end of the document a set of actions are identified for the regional stakeholders to pursue to enable and capture the economic opportunity for the region. This paper is being released publicly to generate discussion and cooperation between the region's stakeholders. Cooperation and coordination between partners across the region will be critical to success.

FIGURE 2: PROCESS FOR WRITING THIS DISCUSSION PAPER



This paper was developed over the second half of 2021 and in early 2022 in partnership with regional stakeholders via co-design. Stakeholders invited to or involved in the process included:

State Government
- Department of State Growth (DSG)
- Office of the Coordinator-General (DSG)
- Renewables, Climate & Future Industries Tasmania (RECFIT, DSG)

Local Government
- Burnie City Council
- Central Coast Council
- Circular Head Council
- Devonport City Council
- Kentish Council
- Latrobe Council
- Meander Valley Council
- Northern Midlands Council
- Waratah Wynyard Council

Regional organisations
- Cradle Coast Authority
- Regional Development Australia (RDA), Tasmania

Workforce development, skills & training
- Beacon Foundation
- Burnie Works
- Civil Contractors Federation
- Department of Education
- Industry Training Hub (Burnie)
- Keystone (Tasmanian Building and Construction Industry Training Board)
- National Electrical & Communications Association (NECA) Tas
- Skills Tasmania (DSG)
- Tasmanian Energy and Infrastructure Workforce Advisory Committee (TEIWAC)
- Tasmanian Minerals, Manufacturing & Energy Council (TMEC)
- TasTAFE
- University of Tasmania (UTAS)

Industry groups & associations
- Business North West (Burnie Chamber of Commerce & Industry)
- Central Coast Chamber of Commerce & Industry
- Housing Choices Tasmania
- North by North West Tourism Association
- Tasmanian Chamber of Commerce & Industry (TCCI)
- Tasmanian Farmers and Graziers Association (TFGA)

Renewable energy industry
- Clean Energy Council
- Hydro Tasmania
- Marinus Link

Based on these conversations, SGS research and economic analysis, and the insights and guidance provided by TasNetworks, the Discussion Paper contains:

1. An introduction to the economic concepts and framings for the research project;
2. A regional economic profile;
3. Articulation of the benefits of Project Marinus and the induced investments in renewable energy generation by five themes;
4. The opportunities to capture the benefits by theme, and the barriers; and
5. An action plan to act as an instigator of regional discussion, cooperation and coordination.

2. Economic Development & Community Wealth Building

2.1 What is economic development?

'Economic development' refers to growing a local economy. This means growth in economic activity such as more exports of local produce or manufactured products, or more visitors spending money on tourist accommodation. Growth, in turn, allows businesses to invest in new equipment, hire more people and pay higher wages. Greater economic activity also means higher government revenues and more money to spend on better quality services for the community. Economic development enables a higher standard of living for people in a region.

Growing a local economy needs to go beyond simple measures of gross domestic product (GDP) growth and the number of jobs. A well-functioning economy also needs to include a just distribution of wealth and opportunity, the provision of life's essentials (such as housing, education, healthcare, a political voice), and it must remain within environmental boundaries to allow for a stable climate and healthy ecosystems.

The economy is not just about business activity but the inter-relationships with social and environmental outcomes. An economy is, after all, a collection of people (including government and businesses) trading goods and services to better their lives and that of their community whilst not degrading the natural environment that underpins life on earth and the economy.

The end goal of an inclusive economy is human wellbeing within environmental limits based on the premise that social, economic and environmental issues are interconnected. CLES, the National Organisation for Local Economies in UK, who are world-leaders in community wealth building, argue that an inclusive economy can only be achieved when local agencies, organisations and businesses across the public, social and commercial sectors, mutually support and develop one another, unafraid to build relationships and share power (CLES, 2019b).

2.2 The engines of local economic development

SGS applies a particular model of the local economy, developed over decades of experience, to its economic development work. This model is illustrated in Figure 3.

Starting on the left of the diagram, 'exports' are a major player in economic development. Exports in this context refer to any product or service which is traded to anyone outside of the region, to the rest of the state, Australia or internationally. Income injected into the local economy creates a multiplier effect as exporting firms draw on local suppliers and workers to meet the demand from external customers.

External private investment provides capital to finance new industries and enhance existing industries, boosting infrastructure and productivity and creating employment opportunities in the process. External private investment also brings new businesses with connections in different markets into the

area, opening additional export opportunities. The construction of induced energy generation capacity (wind and solar) would lead to greater injections of private investment into the local economy.

External public investment is similar but provided by State or the Commonwealth Government to invest in services, infrastructure or businesses. The infrastructure spending on Project Marinus is an example of public investment that will be injected into the North-West Tasmanian economy. The design and approvals phase of the project is already injecting money into the local economy

FIGURE 3: SGS MODEL OF A LOCAL ECONOMY

Source: SGS Economics and Planning 2018

As well as money injected into the economy, the other side of the diagram shows that income can leak back out as local firms import inputs to production (for instance, using suppliers from a business headquartered in a capital city). Similarly, consumers also import goods and services, like buying clothing or products in nearby areas or online, or residents (not always by choice) choosing to work or pursue leisure outside of the local area. These leakages dilute the multiplier effect from the injections of income. Another leakage is when the local economy is dominated by firms owned elsewhere, which sees the wealth generated (as profits and dividends) flowing to shareholders and investors outside of the local economy.

An objective for local economic development is to maximise inter-regional export income and the associated employment by identifying opportunities for export industry growth while also minimising income leakages. However, this task has become difficult for many regions as traditional regionally-based industries such as agriculture and manufacturing have contracted, replaced by more knowledge-intensive professions, typically in the CBDs of large cities.

The benefits of Project Marinus and the development of renewable energy, the size of the local economy, the multiplier effect, and the wealth it generates for the local community will be influenced by a range of government, market and community decisions that are made to support the development of renewable energy in the North-West.

2.3 Marinus Link and NWTD's role in economic development

This perspective gives further impetus for reconceptualising how policymakers can improve local economic outcomes. For much of the past 30 years, a 'trickle down' framework has been explicitly or implicitly applied to the formation of local economic development strategies. This has focused on

discrete major investments in infrastructure or attracting key enterprises to boost the local economy through supply multipliers.

Aspects of this model are still worthwhile. But it is also clear that economic development strategies across Australia have not emphasised curating, sustaining and embedding the existing local business community around public or private investment processes. The trickle down strategies "from the past" did not consider the local content or ownership. To optimise local development, one needs to embed and use the local economic environment as much as possible so it can develop and grow. Spending the money on new infrastructure will have only minor benefits for the local community if little thought is given to ensuring that wealth and opportunity are created locally instead of flowing back out of the region.

TasNetworks, as the owner, developer and operator of the NWTD infrastructure, will be an anchor institution in the region. The term 'anchor institutions' is used to refer to organisations which have an important presence in a place, usually by virtue of being large scale employers, the largest purchasers of goods and services in the locality, overseeing large areas of land and having relatively fixed assets. Anchor institutions are often tied to a place by their mission, histories, physical assets and local relationships (CLES, 2019). Examples include universities, large local businesses, hospitals, housing providores and the combined activities of the community and voluntary sector, plus the local council itself.

Anchor institutions are a form of 'sticky capital,' maintaining long-standing community and social connections and enduring community development capacity but which are unlikely to close down or relocate from their community. They play an important role in community wealth-building due to their capacity as large employers, their sizeable procurement spending, and their infrastructure (including land and facilities) and assets. Because of their engagement in national and global markets, anchor institutions play important roles in linking broader macroeconomic developments with hyperlocal issues to create opportunity, prosperity and inclusive growth.

A strong 'bottom up' approach, focusing on local business growth, skills development, procurement and supply chains and strengthening the local community is warranted.

2.4 How government, businesses, and the community can support economic development around Project Marinus

Leveraging Project Marinus and renewable energy to boost regional prosperity depends on maximising export income while containing income leakages, and optimising local investment. The capacity to do this depends on some enabling factors across three pillars: (1) government, (2) markets & business and (3) the community. The enablers relate to services, leadership and infrastructure provided by government, access to capital and innovation at the firm level embedded in the markets pillar and liveability, skills, equality and wealth held in the community.

A sustainably prosperous economy can be achieved when local agencies, organisations and businesses across the public, social and commercial sectors mutually support and develop one another. Council, State and Federal government, local businesses, anchor institutions and the community should all have a role to play in developing this Strategy and carrying out its actions.

SGS has used a Community Wealth Building lens (CWB) to guide the development of economic development themes. CWB is concerned with how anchor institutions and major projects can grow the wealth of the local community.

The CWB agenda evolved in the USA, UK and beyond over the last 10 years or so with the aim of creating a fairer and more sustainable economy. So far it has been particularly embraced by local authorities with responsibility for communities and sections of the population which have been left behind.

TasNetworks (through Project Marinus) and renewable energy generators will be anchor institutions in the North-West region, and hence have an opportunity to play a vital role in leveraging economic development.

As outlined by CLES, the national organisational for local economies in the UK, CWB revolves around five principles:

1. Progressive procurement of goods and services. Anchor institutions use their procurement processes and decision making to deepen local supply chains and business development, spending and investment. It is a deliberate leveraging of expenditure towards socially and environmentally valuable practices and outcomes.
2. Fair employment and just labour markets. Anchor institutions stimulate and contribute to a fair economy through decent wages and conditions. Often the biggest employers in a place, the approach that anchor institutions take to employment can have a defining effect on the employment prospects and incomes of local people.
3. Socially productive use of land and assets. Anchor institutions use land and property in ways that generate wealth and benefits for local citizens. Anchors are often major land holders and can support the development of under-utilised assets and land for positive community outcomes.
4. Making financial power work for local places. This is about harnessing wealth and savings for local community and economic benefits. The idea is to channel socially virtuous investment to local communities while still delivering benchmark financial returns for investors.
5. Plural ownership of the economy. This is about encouraging different models of business ownership to build wealth that stays in local communities. At the heart of Community Wealth Building is the principle that wealth is broadly held. Cooperatives, mutually owned businesses, SMEs and municipally owned companies enable wealth to stay local.

The principles have been used to shape the economic development themes in this discussion paper. Some principles have greater relevance to Project Marinus and renewable energy development than others, due to the type of projects they are.

The economic development themes, and their links to the CWB framework, in each phase are:

1. **Workforce development, skills & training:** To stimulate and contribute to workforce development and a fair economy by unlocking a pipeline of projects in the renewable energy sector, contributing to decent wages, training opportunities and good working conditions.
2. **Procurement & opportunities for local businesses:** To deepen local supply chains, support business development, and increase spending and investment in the local economy through procurement processes and decision making.
3. **Infrastructure, assets & market benefits:** To generate wealth, financial savings and market benefits for residents, local businesses and industry through the provision of more affordable, cleaner, and reliable energy.
4. **Local & regional community (social) benefits:** To generate flow-on economic, social and environmental benefits for local communities.
5. **Public & private sector investment**: To encourage and enable additional public and private sector investment in flow-on opportunities in renewable energy, manufacturing and other sectors.

Each economic development stream will have different weighting and importance at each stage of the Project Marinus delivery timeline. Stakeholder engagement, relationship building and collaboration are central to all economic development streams and all project phases.

TABLE 1: PRIORITY & TIMING OF EACH ECONOMIC DEVELOPMENT STREAM

Theme	Design & Approvals Phase	Construction & Commissioning Phase	Operational Phase
	Stakeholder engagement, relationship building & collaboration		
#1	Workforce development, skills & training		
#2	Procurement & opportunities for local business		
#3		Local & regional community (social) benefits	
#4			Infrastructure, assets & market benefits
#5		Public & private sector investment	

3. Regional Profile

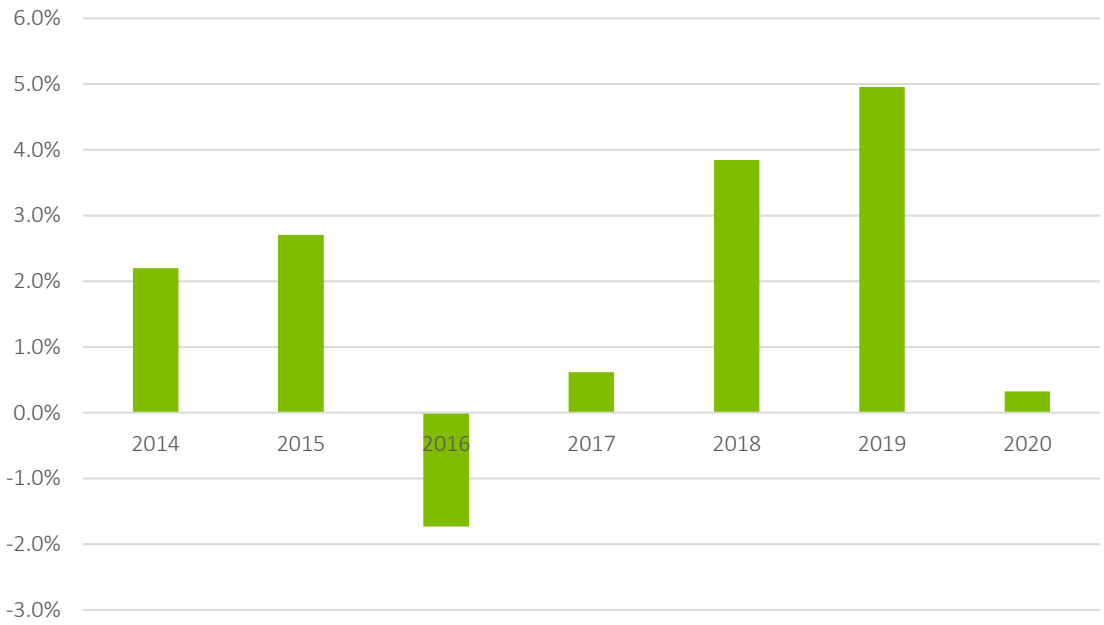
To plan for the future, we need to first understand the current economic situation and trends in North-West Tasmania. This chapter brings together regional economic insights across four areas:

1. The economic structure of the region
2. How the industries of the region support the local community
3. Existing skills and education pathways
4. The alignment of the development of Project Marinus with current government policy and existing economic development efforts

3.1 Economic structure

The economy of the North-West Tasmania region[1] had an estimated gross regional product of $6.8 billion in 2020. After a recessionary year in 2016, the regional economy has been growing strongly in recent years prior to the COVID-19 pandemic beginning in 2020 (Figure 4).

FIGURE 4: ANNUAL GRP GROWTH IN THE REGION



Source: Australian National Accounts: State Accounts, Cat. No. 5220.0 and SGS Economics Planning

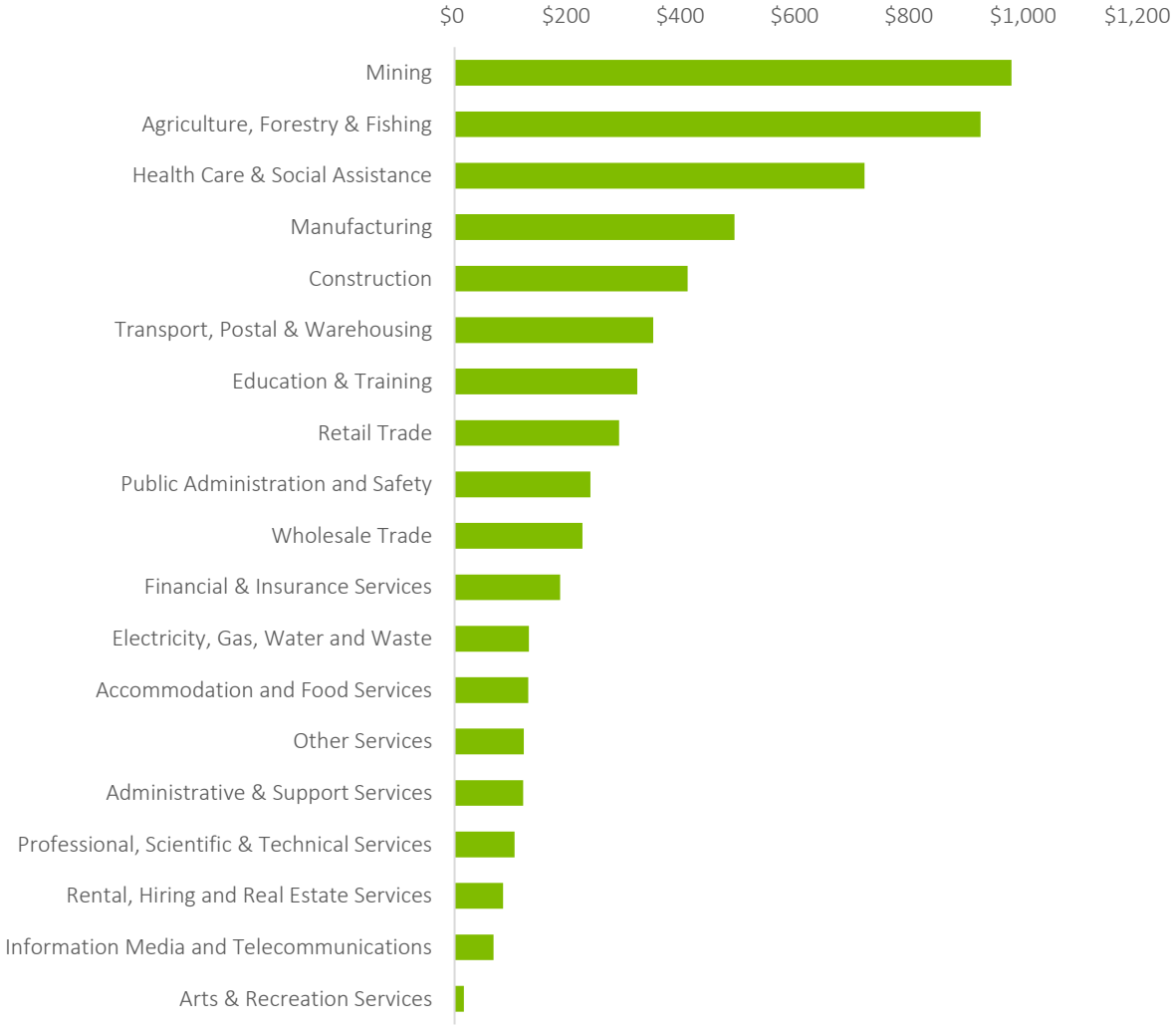
[1] Defined for statistical purposes as the ABS SA4 of West and North-West Tasmania, which stretches from Port Sorrel and Devonport, down and around to Queenstown and Strahan.

Three sectors collectively account for the lion's share (44%) of total income generated in the regional economy; mining, agriculture, forestry and fishing and health care and social assistance (see Figure 5).

Most of the mining activity is located on West Coast and at Waratah, where most mines are located. Agriculture, forestry, and fishing activity is well spread across the region, with food product manufacturing centred on Smithton and Spreyton. Burnie and Ulverstone have strong manufacturing bases. Health care and retail have a significant presence in Burnie and Devonport. Burnie and Devonport are two key ports for the movement of freight in and out of Tasmania.

The visitor economy is also a strategic income earner for the region. Tourism generates income in various sectors, including accommodation and food services, transport and art and recreation, which are all performing well in the region as outlined in LQ analysis (Figure 8).

FIGURE 5: INDUSTRY CONTRIBUTION TO GRP 2019/20 ($ MILLIONS)

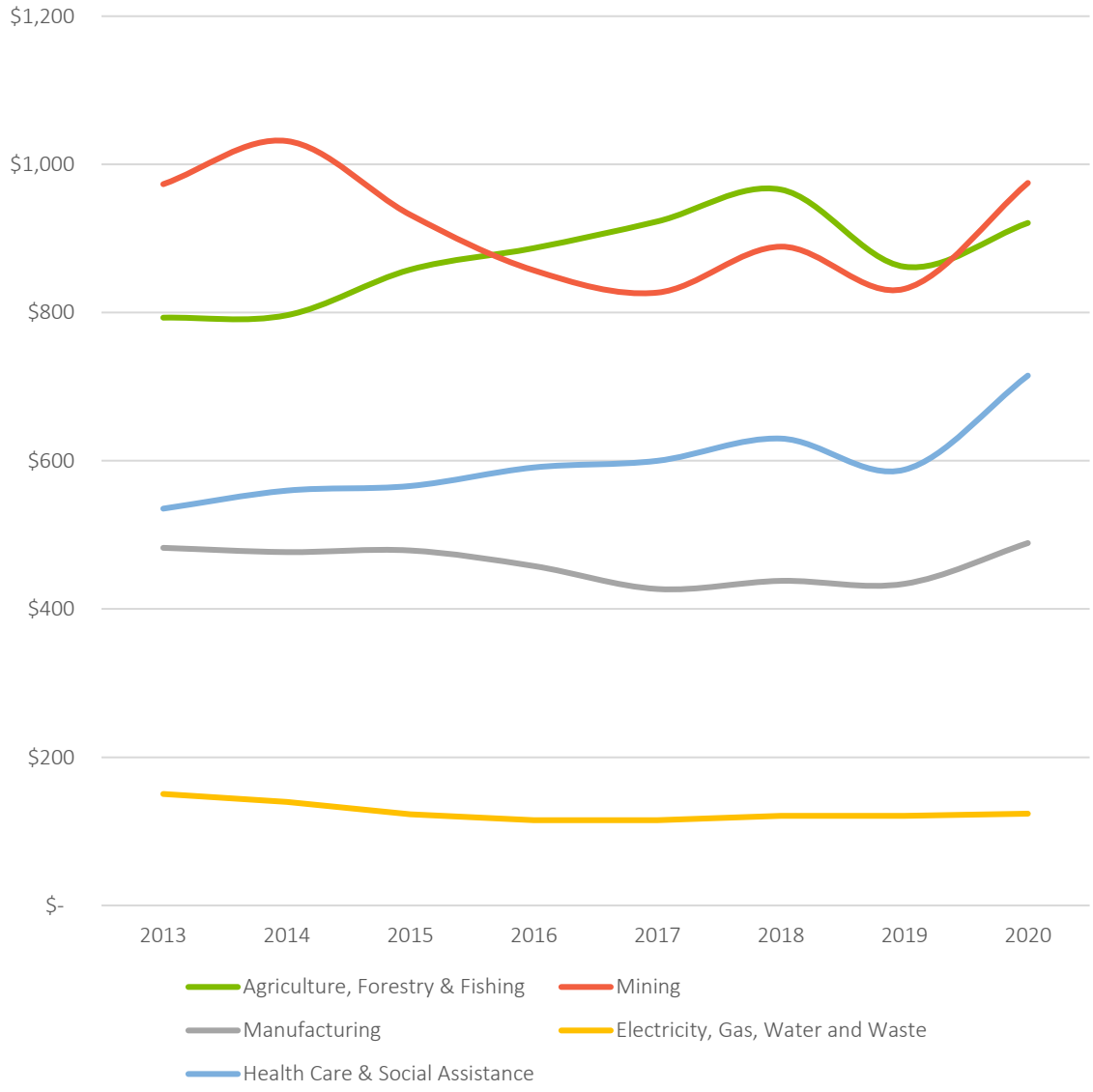


Source: Australian National Accounts: State Accounts, Cat. No. 5220.0 and SGS Economics Planning

Figure 6 shows the performance of the four largest industries by contribution to GRP since 2013, plus electricity, gas, water and waste services. Health care and agriculture, forestry and fishing have been

growing. On the other hand, mining and manufacturing have grown only slightly in terms of economic value. The economic contribution of electricity, gas, water and waste services has slowly been declining in the region. The operation of Marinus Link and the NWTD will stimulate this industry sector.

FIGURE 6: TIMESERIES PERFORMANCE ON MAIN INDUSTRIES (GRP, $ MILLIONS)

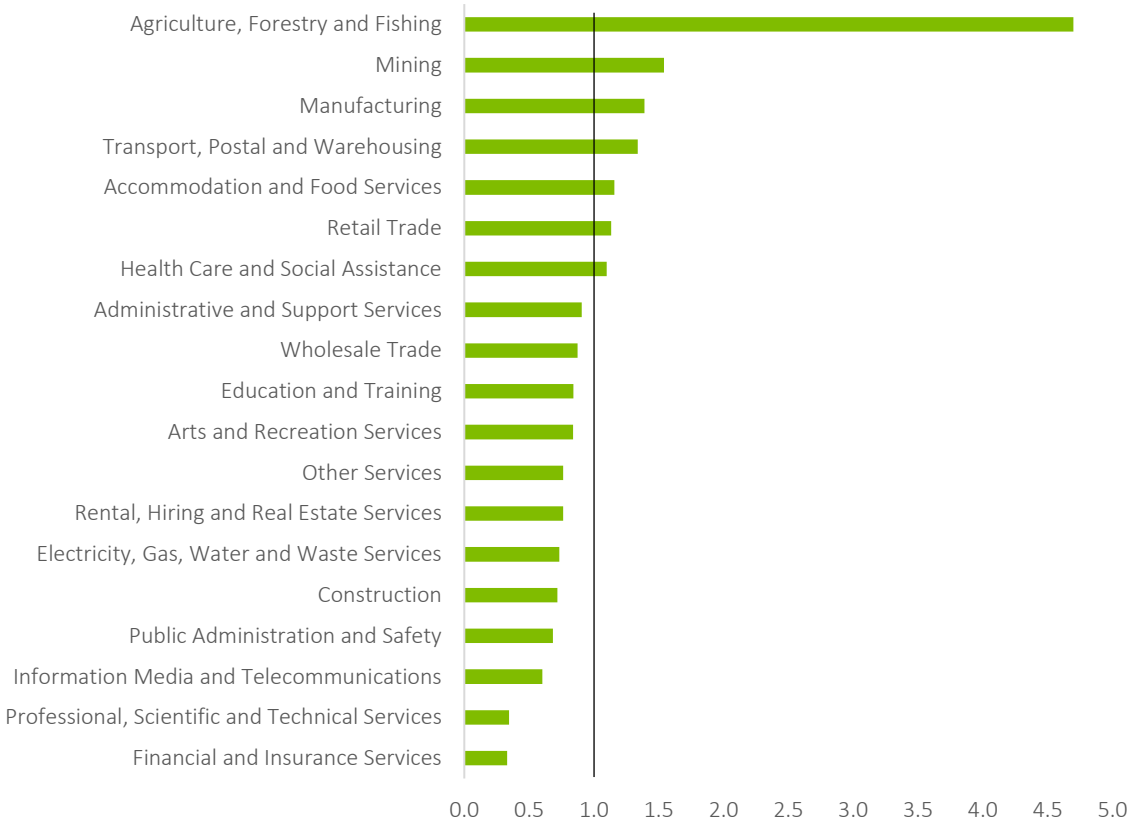


Source: Australian National Accounts: State Accounts, Cat. No. 5220.0 and SGS Economics Planning

While manufacturing has not been a significant contributor to economic growth in recent years, it remains a strategic sector for the region. The West and North-West region has the largest concentration of food product manufacturing and machinery and equipment manufacturing in Tasmania. Burnie is known for its machine engineering cluster that originally evolved around the mining industry, delivering machines and engineering used in this sector. This cluster may be well positioned to diversify and service the rollout of Marinus Link, NWTD and the development of renewable energy projects in the region. There is an opportunity to build on the knowledge and training infrastructure as well as the business cluster.

A location quotient (LQ) analysis is shown in Figure 7, and then explored in more detail on the following page (Figure 8). An LQ provides some insight into the competitive strengths inherent in the economic structure of the region. The LQ score for a sector is given by its proportional representation in the region divided by its proportional representation in Australia as a whole, based on employment. An LQ score of greater than 1.0 signifies that the sector in question is over-represented in the region compared to Australia. Over-representation may suggest that the industry has a comparative advantage (that is, the region has a specialisation in the industry) and could be exporting these services to other regions which are specialised in other fields. The chart below shows that the North-West and West region of Tasmania has a clear comparative strength in agriculture, forestry and fishing, mining, manufacturing, and transport, postal and warehousing.

FIGURE 7: LQ SCORES FOR NW TASMANIA INDUSTRIES (2021 SCORE)



Source: SGS Economics and Planning (2021) using ABS Labour Force Survey (May 2021)

An LQ analysis is also often presented on a four-quadrant chart (Figure 8) to better understand how industry performance has been changing over time. While the vertical access indicates the LQ score, the horizontal access shows the sector's growth rate in employment in the region. Growth indicates prevailing industry trends of growth or contraction. The quadrants formed in the chart by lines calibrated to an LQ of 1 and an industry growth rate of 0% per annum (in employment terms), creates a lens for judging the strategic value of sectors.

The top right-hand quadrant shows sectors that are both strongly growing and where the region has a specialisation or implied competitive advantage. On the face of things, these sectors reflect the region's

strengths and best future prospects. A further parameter shown in the chart is the size of each sector, measured by employment numbers, represented by the marker's size. The colours of the markers reflect what type of industry it, with the types being:

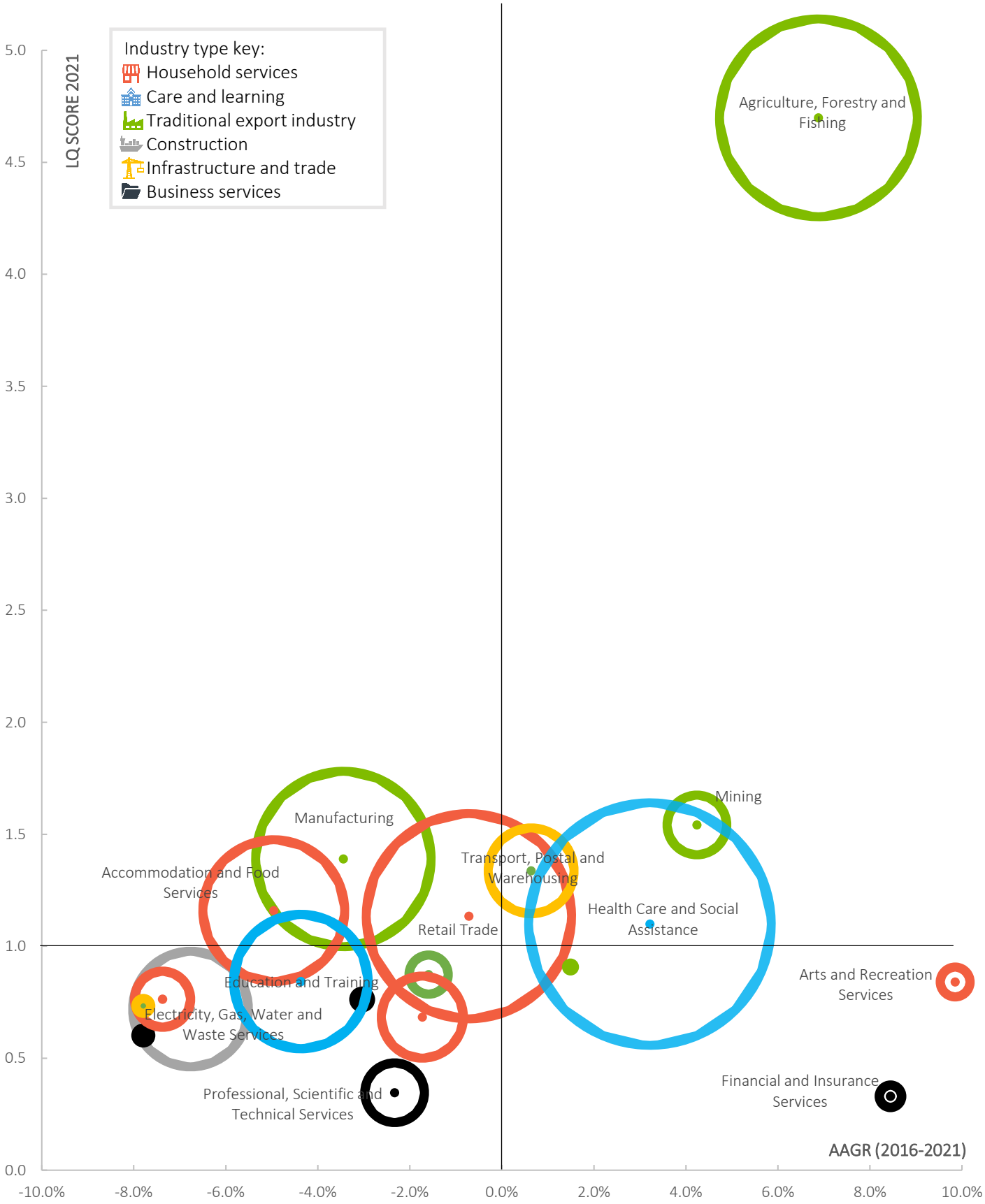
- Household services: Made up of businesses that provide goods and services to the local community, like retail and hospitality.
- Care and learning: Consist of businesses and institutions that teach and care for residents. Health is the fastest growing sector in Australia, with population growth and aging drivers of growth.
- Traditional export industries: These industries have been the traditional strength of regional economies and include agriculture, mining, and manufacturing.
- Construction: Business in the construction sector including builders, material suppliers, construction services, developers etc. This industry group is typically doing well if the above three industry groups are growing.
- Infrastructure and trade: Large businesses or government enterprises like water, waste, telecommunications, and energy providers, and businesses that build and manage transport systems (roads, ports, airports etc.), or store and transport goods to and from markets. This industry group provides the foundation for business and industry and typically performs well when other areas of the economy are growing, particularly export industries.
- Business services economy: Locally owned SMEs and big business that serves other businesses. These include banks, insurance agencies, law firms, financial advisors, accountants etc. In regional economies, these services are typically outsourced to major cities.

Taking all three parameters into account, the standout strategic sector for the region is agriculture, forestry and fishing. The strength of this sector also corresponds to the high LQ score for manufacturing, with food product manufacturing being a significant employer and export earner for the region.

Health care, transport, postal and warehousing and mining also have high LQ scores and are growing and can be considered growth sectors. As with most regions, business services sectors have LQ scores reflecting that most of this work is outsourced to firms in major cities.

The industries of construction, and electricity, gas, water and waste services, which Project Marinus will stimulate, both have low LQ scores. If the local economy is seen to be less specialised in a particular industry then this could indicate a market gap or market imperfection. This could, in turn, indicate an opportunity for expansion.

FIGURE 8: LOCATION QUOTIENT ANALYSIS

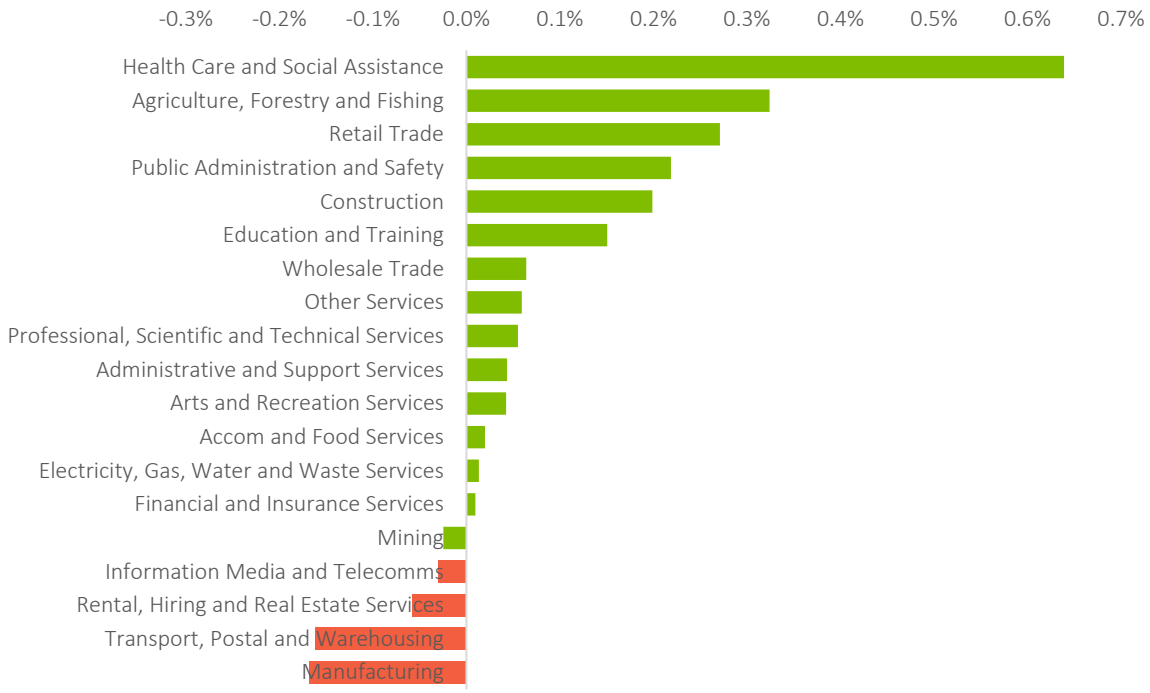


As shown in the LQ chart, employment in manufacturing has been declining. This is consistent with the employment patterns in the industry over recent decades as mechanism and globalisation have reduced the size of the manufacturing workforce in Australia. In Tasmania, too, the industry has become leaner and more agile. Though this reduces employment, it has led to many firms becoming globally competitive. Manufacturing in this region is strongly driven by the machine engineering cluster which traditionally has serviced the mining industry but continues to diversify.

Growth in manufacturing in Tasmania is strongly linked to the overall brand of Tasmania, which is small-scale, high quality, clean and green. The Tasmanian Government is putting work into building the manufacturing industry of Tasmania around these strengths alongside using advanced technologies. Notwithstanding the impacts of COVID-19, the growth in health care, retail, tourism, and agriculture will likely continue to grow based on broader trends like the aging population, worldwide demand for food and Tasmania's growing tourism sector.

Figure 9 below provides Australian Government employment forecasts (Department of Employment, Skills, Small and Family Business , 2019) for the region. It is forecast that employment in health care and social assistance, agriculture, forestry and fishing, and retail will continue to grow. Manufacturing employment is set to continue its decline. As explored in the benefits of the Marinus Link section, the Project offers an opportunity to grow the manufacturing sector in the region. A benefit of Project Marinus is that it will generate opportunities through the supply chain to manufacturers to provide components for Marinus Link, NWTD and wind, solar and hydro energy generation, and the opportunity offered by manufacturing products with zero-carbon energy for export.

FIGURE 9: PROJECTED CONTRIBUTIONS TO THE RATE OF TOTAL EMPLOYMENT GROWTH BY EACH INDUSTRY (PERCENTAGE POINTS) IN NORTH-WEST AND WEST TASMANIA – FIVE YEARS TO MAY 2024



Source: Australian Government, Department of Employment, Skills, Small and Family Business (2019)

3.2 Employment and incomes

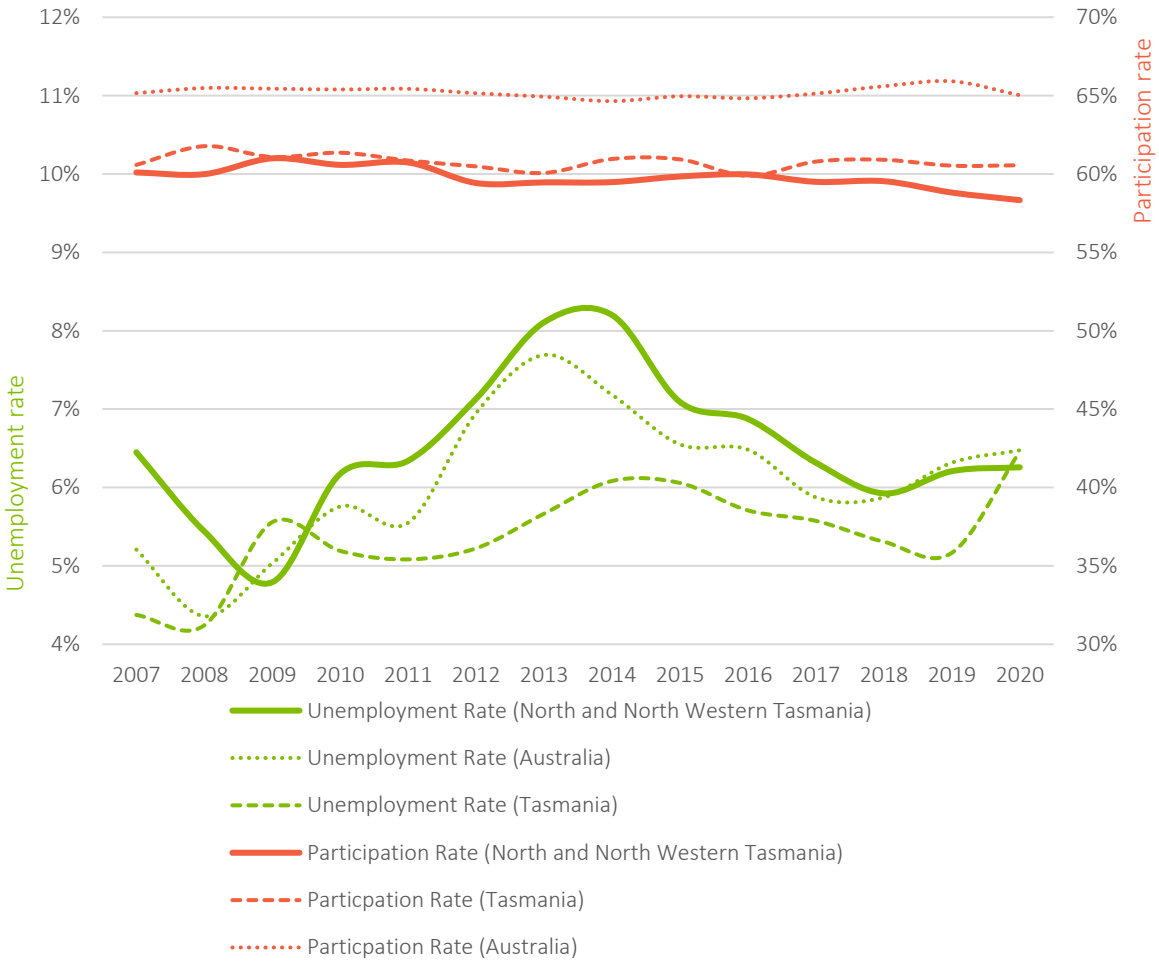
This section considers how well the industries in the region are supporting the community via employment and wealth creation.

There are 93,000 adults aged over 15 in the region, broadly the same number as in 2011. In May 2021, there 30,700 adults working full-time, 17,900 working part-time, 3,900 unemployed and 41,400 not in the labour force. In May 2021 the unemployment rate was 7.4 per cent, and 14.1 per cent for young people (aged 15-24). The national youth unemployment rate is 10.7 per cent (ABS, 2021).

As shown in Figure 10, the participation rate of adults in the workforce is around 58 per cent, with participation trending downwards. For comparison, the participation rate in Tasmania sits at 61 per cent and 65 per cent across Australia. A low participation rate points to an aging population, some disengagement and disadvantage.

In terms of unemployment, after spending most of the past decade above the Tasmanian and Australian rates, unemployment has just recently fallen below the state and national average.

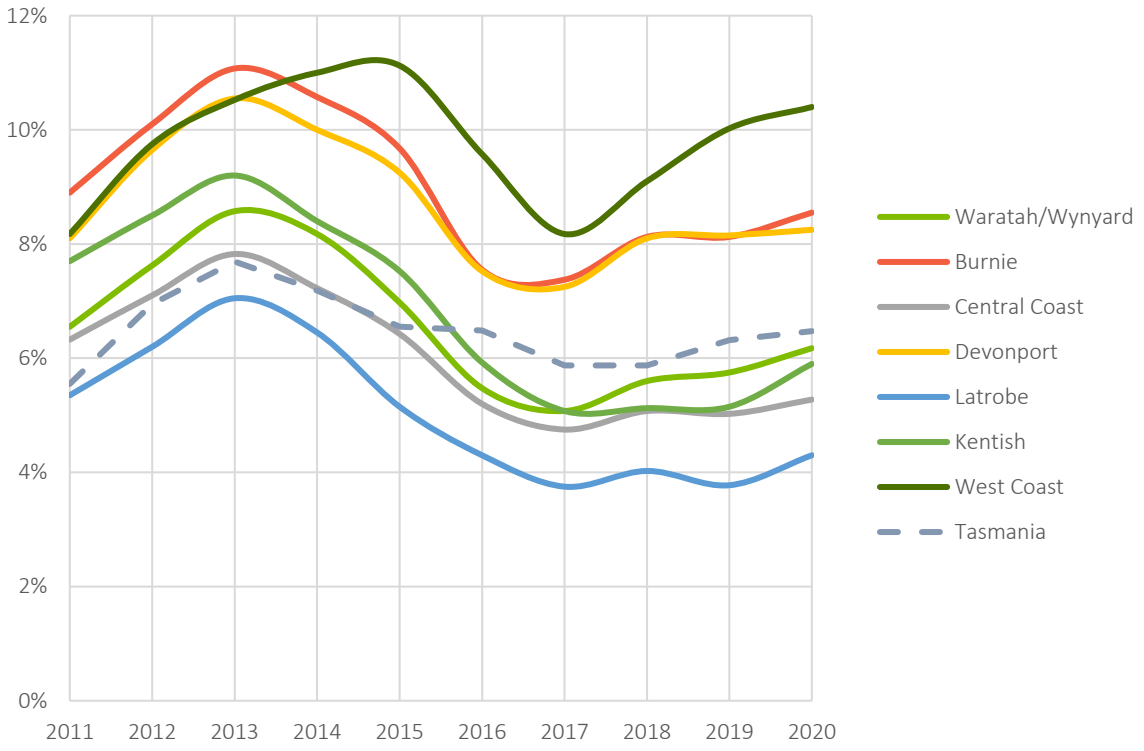
FIGURE 10: UNEMPLOYMENT AND PARTICIPATION RATES



Source: SGS Economics and Planning using Department of Education, Skills and Employment (2021) small area employment data

At an LGA level, there is some variation across the region. Unemployment rates are low in the Latrobe, Central Coast, Kentish and Waratah/Wynyard LGAs. Unemployment rates are highest on the West Coast and in Burnie and Devonport, which have considerably higher unemployment rates, and well above the Tasmanian rate. Unemployment was increasing even before the COVID-19 pandemic.

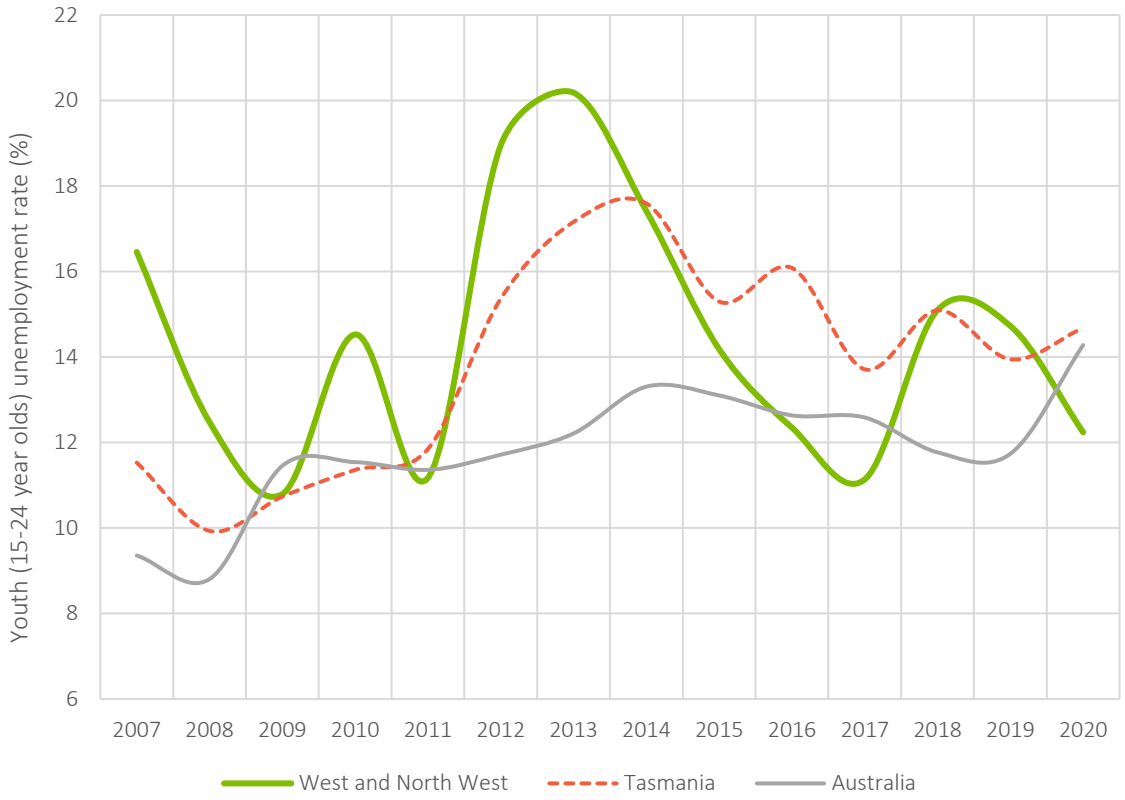
FIGURE 11: UNEMPLOYMENT RATE BY LGA



Source: SGS Economics and Planning using Department of Education, Skills and Employment (2021) small area quarterly unemployment rate data

Youth unemployment has been an issue for the region. For the West and North-West region, the youth unemployment (those aged 15-24) in the region was much higher than Australia between 2012 and 2015, before falling in 2016 and 2017. In 2018 and 2019 the youth unemployment rate rose again, with the Brotherhood of St. Laurence naming the North-West of Tasmania as one of the twenty youth unemployment hotspots in Australia in 2018 (Brotherhood of St.Laurence, 2019). The report says that young people are navigating a period of testing social and economic change due to the interconnected challenges posed by globalisation, technology, climate change and demographic change.

FIGURE 12: YOUTH UNEMPLOYMENT RATE (15–24-YEAR-OLDS)



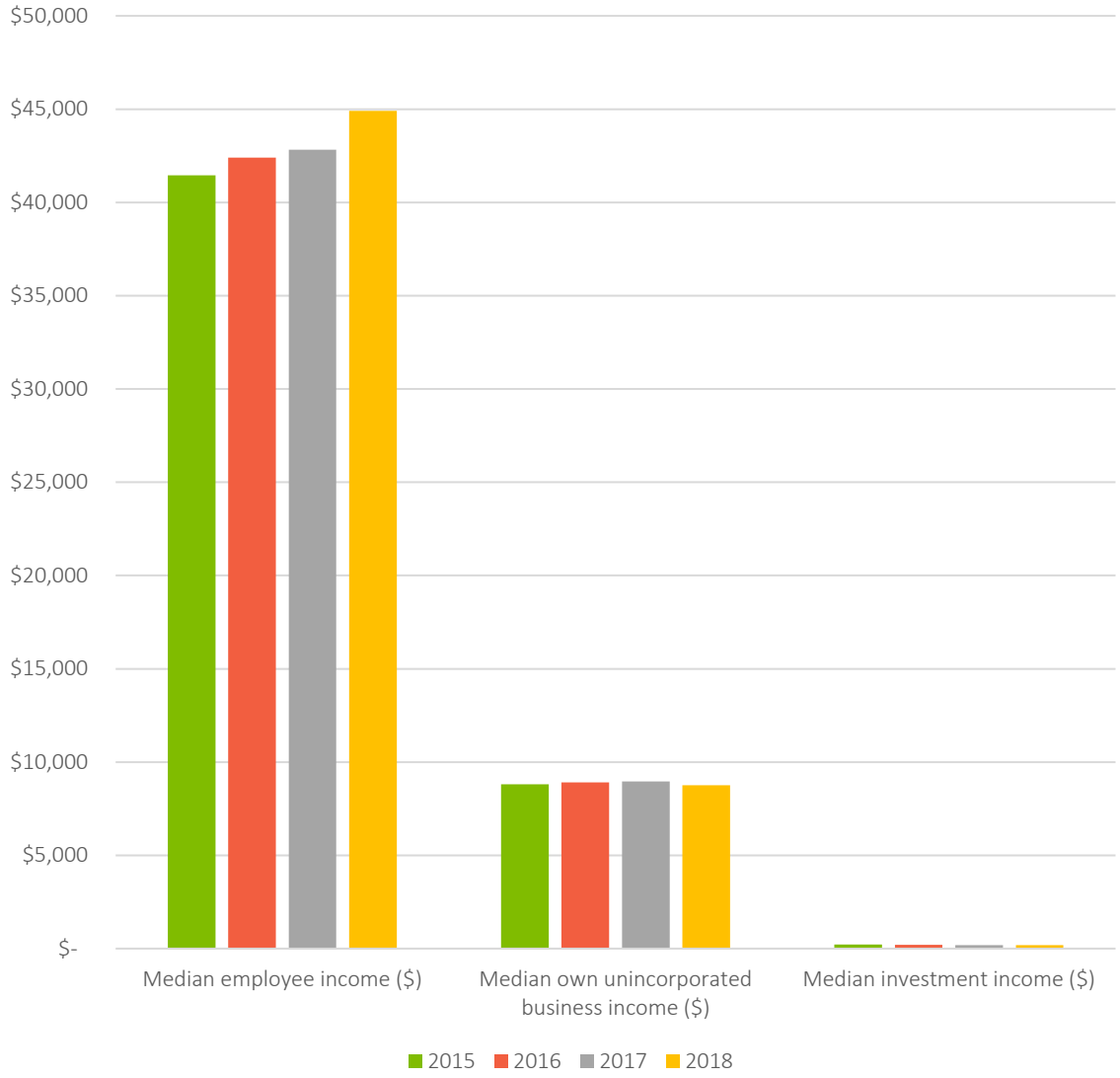
Source: SGS Economics and Planning (2021) using ABS Labour Force Survey (2021)

The unemployment rate in the region for Aboriginal and Torres Strait Islanders is also high, coming in at 12.6 per cent in 2016 (Australian Bureau of Statistics , 2016). There is a need to develop training and employment pathways for young and socio-economically disadvantaged people in the region.

In terms of incomes, Figure 13 shows that the median income from employment has been rising, but only slightly and close to inflation rates. Low rates of wage growth have been a national trend over the past decade. The median income from employment was $44,910 in 2018, up 2.7 per cent per annum since 2015. However, the incomes from wages are lower in the region than for the state as a whole ($46,080).

The median income from the ownership of businesses has been declining slightly in the region. In 2018 incomes from business ownership contributed $8,751 per taxpayer (median), which can be considered low. The median income from business ownership across Tasmania was $10,088, or 15 per cent higher. Similarly, median incomes from investments in the region were $179 in 2018, 15 per cent lower than in Tasmania. There is a need to generate more wealth for individuals in the region via the ownership of businesses and investments and increase wage growth.

FIGURE 13: MEDIAN ANNUAL INCOMES

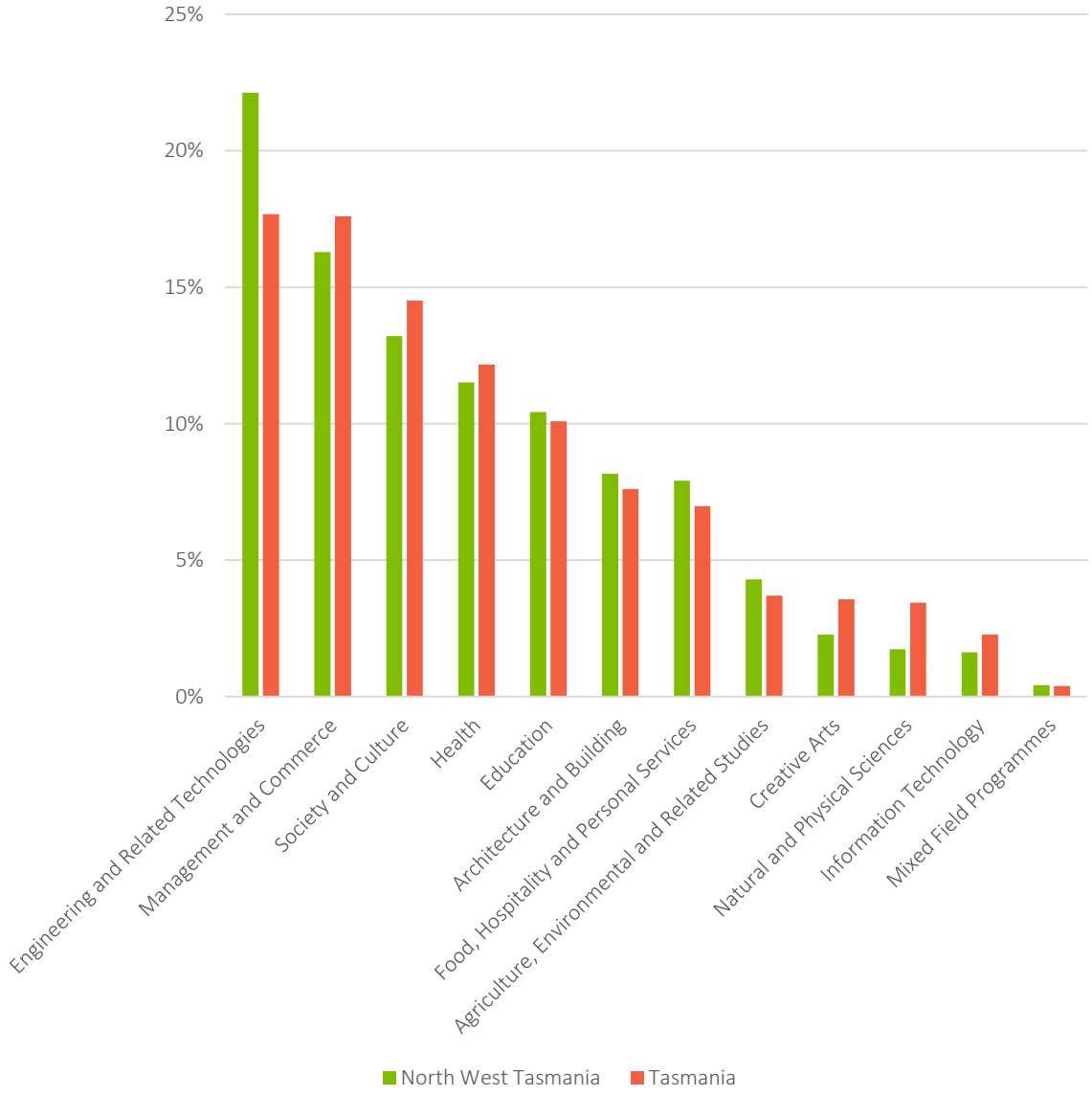


Source: SGS Economics and Planning using Australian Taxation Office (2021) Taxation Statistics

3.3 Skills and education

Over a fifth of persons with a post-school qualification have a qualification in engineering and related technologies, much higher than the rate across Tasmania as a whole. These skills provide a good base for economic development. Other areas where the North-West has a higher share than Tasmania are architecture and building, food, hospitality and personal services and agriculture and environment. These areas of qualification align with the key industry sectors in the region. Figure 14 and Figure 15 explore the skills of the region's workforce. Figure 14 shows the share of people in the region with qualifications in different study areas.

FIGURE 14: SHARE OF WORKING PEOPLE WITH QUALIFICATIONS BY FIELD OF STUDY (COMPARED TO TASMANIA)



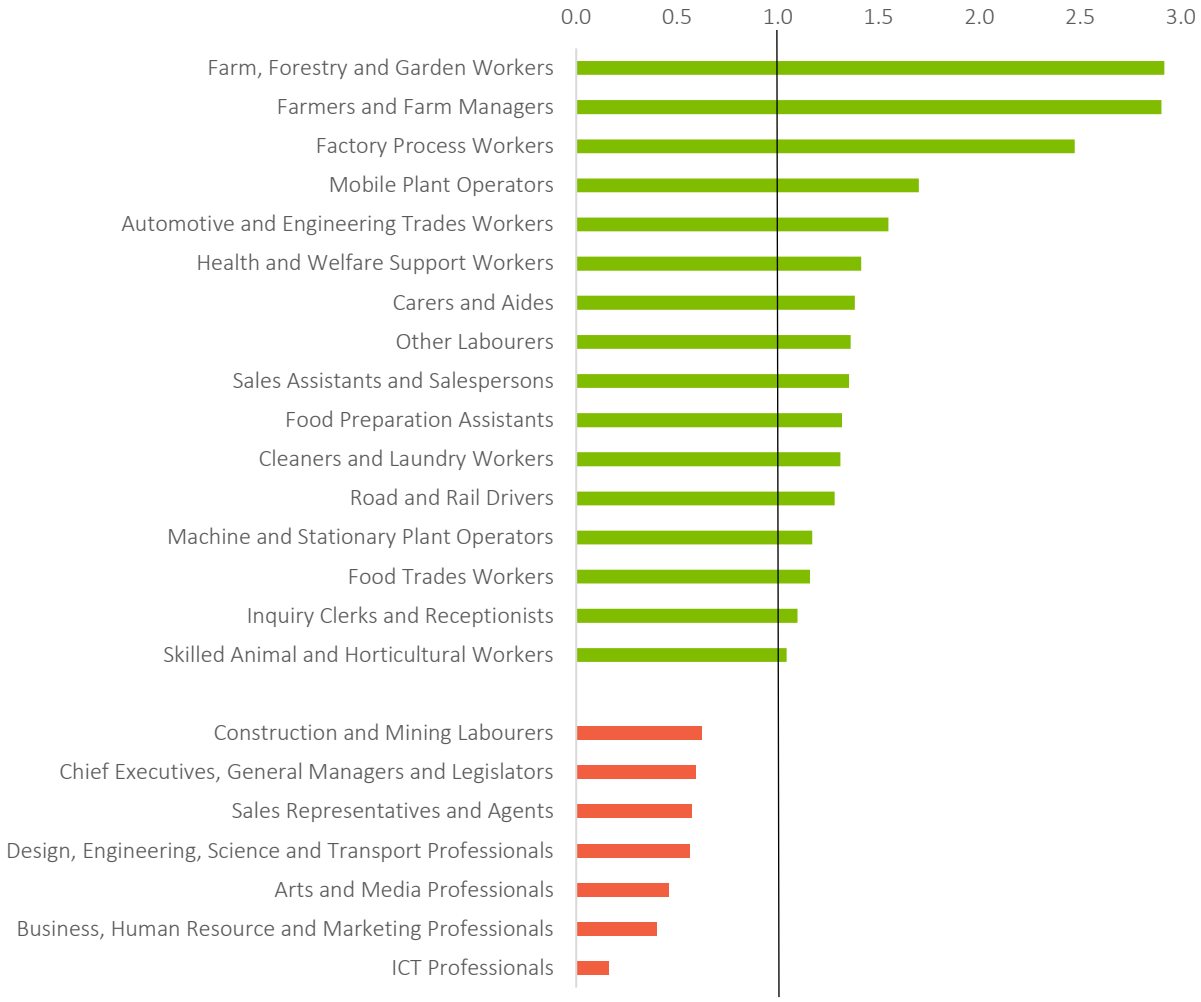
Source: SGS Economics and Planning using ABS Census Data (2016)

Figure 15, using the LQ methodology, considers which occupations are highly represented in the region compared to Australia. Occupations related to agriculture, forestry and fishing (farm, forestry and garden workers, farmers and farm managers) are well represented. So too are occupations related to manufacturing (factory process workers, automotive and engineering trade workers, machine operators) and health care and the care economy (health and welfare support workers, carers and aids).

Some occupations are underrepresented in the region, with LQ scores well below 1. These include information and computer technology (ICT) professionals and professionals in business, human resources and marketing, arts and media, design, engineering, science and transport. The high score for engineering trade workers, but not engineering professionals, suggests that engineering professionals

do not have their businesses based in the region, but the support staff are. Another occupation that is underrepresented is construction and mining labourers.

FIGURE 15: LQ SCORES FOR OCCUPATIONS (GREEN IS A REGIONAL STRENGTH, RED A GAP)



Source: SGS Economics and Planning using ABS Census Data

Skill gaps

A range of information is available from stakeholders and the government that identify skills gaps in the region. For example, the Tasmanian Energy and Infrastructure Workforce Advisory Committee (2020) has found that concerning the skills required for the renewable energy sector in Tasmania:

- For civil construction skill gaps currently appear at the plant operator, paraprofessional and project management levels.
- For engineering, technicians and draftsmen are needed.
- Digital literacy and Information Communication Technology (ICT) skills are required to respond and adapt to the fast pace of implementing new technologies. Traditional technical roles such as

engineering and electricians will be where the greatest change will appear, with skill gaps relating to ICT needing to be addressed.

- Cybersecurity specialists have been identified as one of the most critical roles for the future, but remains a gap. The electricity grid has become more dependent on digitally connected information systems requiring highly trained workers to protect consumers' personal information and grid infrastructure.
- Leadership, mentoring and project management skills are in demand. Project managers with sound project skills are necessary to tackle both small and large projects
- Transferrable skills, including digital literacy, creativity, communication, enthusiasm for learning and complex problem-solving skills, will become a requirement for all sector workforces and will become critical for workers to adopt and organisations to encourage within the renewable energy sector and supporting industries. These skills have not traditionally been embedded within vocational and higher education pathways (Tasmanian Energy and Infrastructure Workforce Advisory Committee, 2020).

Concerns also exist with the current electrical qualifications. The current electrical qualification is considered too long, with a high level of time and commitment required for completion. The qualification is seen as inflexible and does not meet local industry needs (Tasmanian Energy and Infrastructure Workforce Advisory Committee, 2020).

The Australian Government's Local Jobs Plan (Australian Department of Education, Skills and Employment, 2020) notes that:

- There are low levels of digital literacy in the region, even though Tasmania was the first state to be connected to the NBN.
- Limited public transport outside of metropolitan centres inhibits opportunities for some job seekers to take on work and training.
- There is historic and generational low educational attainment, particularly outside of metropolitan areas.

The Australian Digital Inclusion Index has been created to measure the level of digital inclusion across the Australian population, and to monitor this level over time. Tasmania's score on the index in 2020 was below the national average and positions Tasmania as the least digitally included of Australia's eight states and territories (Thomas, et al., 2020). Within Tasmania, the West and North-West region is the least digitally connected region in Tasmania. Since 2014 though, Tasmania has recorded sustained annual increases in digital access, generated by the take-up of NBN fixed broadband.

Consultation work that lead to the development of the Cradle Coast Authority's Regional Futures Plan (Authority, 2018) identified some deeply embedded systemic, structural challenges that need to be overcome to ensure the workforce is well-placed to provide the skills and capabilities to take on the jobs that are coming including:

- High unemployment rates
- Low educational attainment levels
- Shrinking working-age population
- Regionally dispersed population
- Significant labour demands

The Local Jobs Plan for the region states that Project Marinus offers opportunities for employment and apprenticeships. The Plan stresses that Project Marinus and other infrastructure projects in the region need to maximise the extent to which local positions are filled by local job seekers. This includes ensuring apprenticeship positions are filled and locals are skilled to meet the needs of employers in the construction and other relevant sectors (Department of Industry, Science, Energy and Resources , 2020).

Education facilities

Project Marinus has the opportunity to collaborate with all three levels of education; tertiary, vocational and school. The University of Tasmania offers degree and research programs to suit the managerial and professional level occupations required, whilst the vocational sector supports the industry more broadly through a range of offerings across various areas of study.

More specifically, the University of Tasmania (UTAS) currently has a range of industry-focused programs. Current offerings include a course for upskilling existing engineers and a Masters in Renewable Energy, presently going through the approval process. UTAS is exploring increased opportunities for students with pathways into the current projects and targeting thematic areas around transport, mechanics, renewable energy, and electricity. UTAS is also focusing on training pathways, collaborating with industry to ensure jobs and training connections. It is keen to support the industry with specific education demand and have identified an opportunity to expand renewable energy subjects into humanities, finance, business, and management to create more pathways (Tasmanian Energy and Infrastructure Workforce Advisory Committee, 2020).

Through its Centre for Renewable Energy and Power Systems, the University is simultaneously working on research opportunities and collaborating in areas around electrical power, specifically around engineering, as well as investing in small scale hydrogen areas, marine renewable energy, and tidal and wave technology. In conjunction with University College, UTAS is keen to assist the renewable energy industry with support in terms of either short form credentialed offerings (to upskill) or Diploma (AQF 5) pathways into further development.

University College considers that it is crucial to develop people to ensure that they can ‘pivot’ across industries with transferable skills and capabilities to maximise work opportunity for individuals due to the nature of these type of projects.

University College currently has offerings that would have direct industry relevance, including:

- Diploma of Construction Management (AQF5)
- Associate Degree Applied Technologies
- Undergraduate Certificate in Applied Technologies
- Associate Degree Equipment Design and Technology
- Undergraduate Certificate in Equipment Design and Project Management.

The University is also introducing a suite of regionally-distinctive courses at their West Park Campus in Burnie. These courses are designed to leverage the strengths of the North-West, and align with workforce requirements. New courses which will be offered are an Accelerated Bachelor of Business, Bachelor of Psychological Sciences and a Bachelor of Engineering Technology.

The vocational sector also supports Marinus Link and NWTD specifically by direct enrolments in trades, particularly electrical qualifications.

Current data shows that enrolments for electricians at Certificate III level in Tasmania are strong, but numbers in all other electrotechnology qualifications remaining negligible (Tasmanian Energy and Infrastructure Workforce Advisory Committee, 2020). These other fields with low enrolments include electrical machine repair, photovoltaic systems, and generation operations. This disparity needs attention given evidence of current skill shortages and forecast demand from Project Marinus.

Meanwhile, the Tasmanian Department of Education is developing a future focussed curriculum in Years 9 to 12. Work is being done on mapping and renewing curriculum with current economic priorities and developing packages of learning accordingly. The focus is on looking at jobs into the future, building on quality through industry and community connections and work placements.

Skills Tasmania is rolling out the Energising Tasmania skills and training initiative, with plans to deliver $16.1 million in skills and training to boost Tasmania's renewable energy sector. Managed by Skills Tasmania, Energising Tasmania will provide training in significant energy development-related priority skills needs areas such as engineering, project management, civil construction and trades.

The Australian Government has employment services in the region, including JobActive, Transition to Work, Parents next, Employability Skills Training, PaTH industry pilots, Skills for Education and Employment (SEE). The Australian Government has also developed an Industry Training Hub and the Career Facilitator in Burnie. The Industry Training Hub has been in place since March 2020 and aims to improve opportunities for young people, working with them to build skills and choose occupations in demand.

3.4 Policy profile

The Project has strong government support, including its listing as an actionable Project in the Australian Energy Market Operator's (AEMO) 2020 Integrated System Plan (ISP) and its 'High Priority status in Infrastructure Australia listing of nationally significant initiatives.

Project Marinus is the enabler of the Tasmanian Renewable Energy Action Plan. It provides the infrastructure to achieve the State Government's 200 per cent renewable generation target by 2040 (Tasmanian Renewable Energy Target).

Other state and regional strategies and policies that align with the ambition of Marinus Link and NWTD include:

- The Tasmanian Government's *Renewable Energy Coordination Framework*
- The Tasmanian Government's *Energy Sector Workforce Development Plan*
- Infrastructure Tasmania's *30 year Infrastructure Strategy*
- The Tasmanian Government's *Renewable Hydrogen Action Plan*
- The Tasmanian Chamber of Commerce and Industry, Tasmanian Small Business Council and Tasmania Government's *Business Growth Strategy 2019-2023: Supporting Small Business Growth in Tasmania*

- The Tasmanian Department of State Growth's *Northern Cities Major Development Initiative* and Advanced Manufacturing Action Plan 2024
- Cradle Coast Authority's *Cradle Coast Authority Renewable Energy Working Group Action Plan* and *Cradle Coast Renewable Energy Working Group*
- The work of the Premier's *Economic & Social Recovery Advisory Council*
- Tasmanian Government *Buy Local Policy*
- RDA Tasmania's *The Future for Renewable Energy: Opportunities for Tasmania*

Councils and communities in the region also have existing economic visions, strategies, and ambitions. As shown in Figure 16, those ambitions align well with the benefits of Project Marinus, including the development of renewable energy, support for the manufacturing sector and support for workforce and skill development. Some Councils have already stated their support for Project Marinus in their published economic development policies and strategies.

FIGURE 16: ALIGNMENT OF THE PROJECT WITH EXISTING STRATEGIES (AS STATED IN POLICY)

Strategy	Support for renewable energy	Support for industry development	Support for workforce & skills development
Cradle Coast Regional Futures Plan 2019-2022 Drafted 2018	Actions: – Establish a Battery of the Nation Taskforce and advocate for and establish the region as a centre of excellence for renewable energy	Actions: – Establish an advanced manufacturing centre of excellence	Actions: – Promote schools-based apprenticeships – Improve relationships between schools and specific industry sectors – Improve UTas' engagement with industry to provide local short course / responsive options for management training and development
Burnie City Council: *Making Burnie 2030 Strategic Plan* Last updated in 2020	Strategic objectives: – The region develops and uses renewable energy sources (5.2) – A region that is energy, water and waste efficient (5.4)	Strategic objectives: – A globally competitive business community, focused on the development of niche and premium products (4.1)	Strategic objectives: – Our community is skilled and able to manage change and meet global, regional and local challenges (3.4) – Opportunities exist for people to achieve their dreams and potential (3.5) – A highly skilled workforce with a focus on innovation and entrepreneurship (4.2) – There are increased opportunities for people to participate in paid and/or unpaid work (4.6)
Devonport City Council: *Council Strategic Plan 2009-2030* Last updated in 2019	Strategies: – Investigate innovative ways of accessing alternative power sources including renewable energy (1.1.2)	Strategies: – Work in partnership with industry and government to identify needs of business and industry to pursue opportunities, which fosters	Strategies: – Support the provision of facilities and services that encourage lifelong learning, literacy and meet the information needs of the community (4.5.1)

		economic development in the area (3.4.1) – Promote, encourage and develop initiatives that support the local economy (3.4.2)	
Central Coast Council: Local Economic Development Framework Drafted in 2014	Potential action: – Identify new renewable energy generation opportunities – Work with agencies that promote clean technology programs	Potential action: – Facilitate and support the establishment of collaborative networks and clusters around growth sectors – Provide targeted support and critical strategic information for locally owned growth businesses in growth markets – Encourage investment and value creation in the recognised growth markets	Potential action: – Support actions that improve education attainment, retention and engagement – Devise and implement a range of activities that link institutions and employers to improve employment opportunities – Support / develop programs to attract business and skilled migrants
Kentish Council: Economic Development Strategy 2020-2025 Drafted in 2020	Action: – Support major projects that will generate major economic and employment benefit for the municipality as they arise, including providing information for and conducting pre-feasibility studies as required.	Strategy: – Create a Council environment that supports sustainable product and business growth and development, innovation and strategic projects, creating a reputation of the municipality as an ideal location to conduct business and invest	Strategy: – Connect local businesses and potential investors to relevant knowledge, expertise and support
Latrobe Council: Latrobe Council Draft Strategic Plan 2020-2030 Drafted 2019	Action: – Support the North-West of Tasmania being recognised as a renewable energy hub, including the Battery of the Nation project (1.1.4)	Objective: – Identify, promote, and support business and economic development opportunities	Action: – Advocate for and promote the provision of a range of high-quality education and life-long learning opportunities in the municipal area (1.1.6)
Waratah Wynyard Council: 10 Year Corporate Strategic Plan (2017-2027) Drafted 2016		Strategy: – Investigate and embrace new economic opportunities (5.1.1) – Support existing and encourage new innovative activities/industries to the area (5.1.3) – Assess potential capability for economic expansion (5.3.2)	Strategy: – Advocate for regional delivery of training specific to business (5.2.2)

Only Central Coast and Kentish councils have developed specific Economic Development Plans or Strategies (available online), though the Central Coast Framework is from 2014. Kentish Council, having the most recently developed Economic Development Strategy, has direct reference to Project Marinus. The Strategy identifies pumped hydro as an opportunity for economic growth, and it is noted that

pumped hydro in the region is contingent on the Marinus Link between Tasmania and Victoria proceeding. If pumped hydro was developed in Kentish (at Lake Cethana) its reported that it would create new jobs in manufacturing, construction and engineering during the construction phase and would have other flow on economic benefits for service providers like cleaners, and food and beverage providers (Kentish Council, 2020).

4. Benefits of Renewable Energy Investments

Marinus Link, NWTD and the broader investments in renewable energy generation will create a host of benefits for the region, the state, and the country. Benefits are economic, financial, social, and environmental.

In this chapter the economic activity generated by Project Marinus and the forecast investments in renewable energy generation (in terms of contribution to the economy and employment) is explored. Broader benefits covering economic, alongside financial, social and environmental benefits are then captured by theme. The benefits identified have been tested and developed during co-design with regional stakeholders.

4.1 Economic activity

Economic benefits include the value-added to the regional economy from construction and operation of Marinus Link and NWTD in Tasmania and the induced investments in renewable energy generation in Tasmania enabled by these investments.

Direct economic activity

Direct economic activity stems from the construction of Marinus Link and NWTD infrastructure and then its operation. Direct impacts include the first round of impacts, namely money directly spent on construction and operations, including materials, wages and tax contributions.

Ernst & Young (2019) modelled the economic impact of the construction and operation of Marinus Link and NWTD. In Tasmania, the Project directly adds:

- $382 million to the local economy during the 9 years of planning and construction (2020 to 2028). The peak annual contribution occurs from 2025 to 2027, with an annual contribution of almost $100 million. For comparison, the entire construction industry in the region currently adds around $400 million per annum to gross regional product (SGS Economics and Planning, 2021).
- $141 million to the regional economy between 2025 and 2050 for operations and maintenance, at an average of $5.6 million per annum. For comparison, the entire utility sector in the region (electricity, gas, water and waste services) currently adds around $130 million per annum to gross regional product (SGS Economics and Planning, 2021).

Indirect economic activity

The direct economic impact, though, is only the first round of economic benefit. Indirect economic activity captures flow-on activity as the money expended to construct and operate the infrastructure flows through the economy. For example, businesses who supplied goods or services to Project Marinus purchasing goods from a secondary supplier down the supply chain (like a construction firm purchasing concrete from a supplier), or workers on Project Marinus spending their wages in the local economy.

Ernst & Young (2019) also modelled the indirect economic impact of the construction and operation. In Tasmania, the Project indirectly adds:

- $637 million to the local economy during the 9 years of planning and construction (2020 to 2028)
- $213 million to the regional economy between 2025 and 2050 for operations and maintenance, at an average of $8.5 million per annum

In total (direct plus indirect), the total economic contribution of construction is $1.019 billion over nine years, and $354 million over 25 years for operations, noting that operations will continue beyond 2050. For comparison, the total size of the regional economy in 2020 was $6.8 billion.

Induced economic activity

Marinus Link is expected to induce the development of further renewable energy electricity generation in Tasmania to meet the demand for clean energy in the National Electricity Market (NEM). AEMO has identified sites in Tasmania's North-West with natural advantages over sites on mainland Australia for energy generation and storage. With Marinus Link and NWTD infrastructure, there is additional capacity to export electricity and support pumped hydro, wind and solar farm development. It has been forecast that Marinus Link can unlock 3,156 to 4,130 MW of additional installed generation across wind, pumped hydro and solar in Tasmania (Ernst & Young Australia, 2019).

Ernst & Young (2019) modelled the economic impact of the induced renewable energy investments. In Tasmania, it is forecast that Project Marinus would add, in total:

- $2.5 billion to the regional economy between 2020 and 2050 (direct and indirect) due to the construction of new energy generation capacity.
- $1.8 billion to the regional economy between 2020 and 2050 (direct and indirect) due to the operation and maintenance of the new energy generation capacity.

This induced economic activity is larger than the construction and maintenance of Marinus Link and NWTD and is, therefore, a key benefit of the Project.

4.2 Jobs

Ernst & Young (2019) also estimated the direct, indirect and induced employment impact of Marinus Link and NWTD[2] in Tasmania.

Direct jobs

Ernst & Young estimated that the construction and planning phase of Project Marinus would create 1,263 direct job-years in Tasmania between 2020 and 2028. A job year is one full-time position that runs for 12 months, so 1,263 job years across 8 years can also be read as 158 ongoing full-time positions, noting that some years will have higher employment than others. In the years 2025 to 2027, 283 direct jobs will be supported.

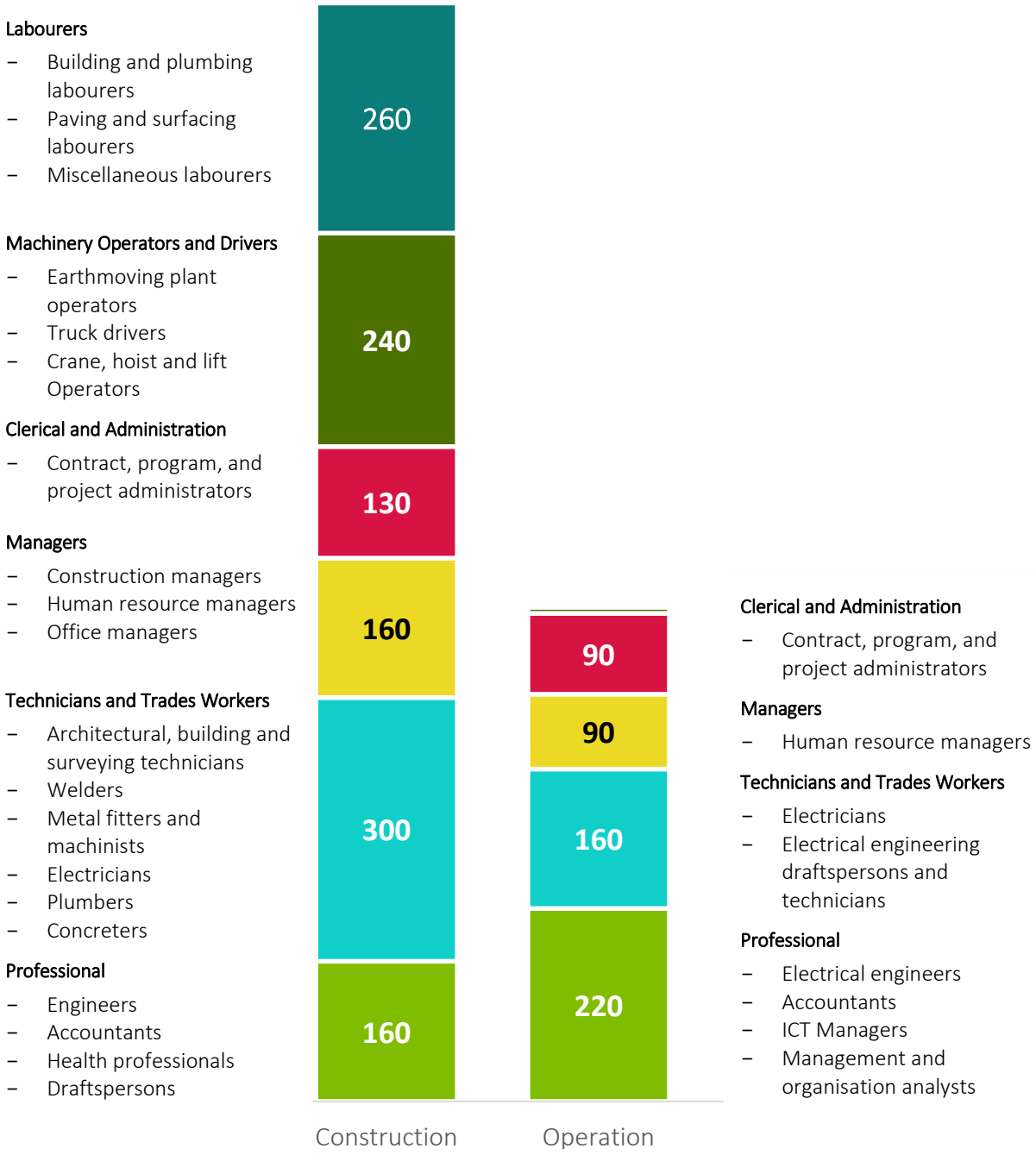
[2] The jobs estimated by EY represent the gross employment opportunity, and does not consider the net impact i.e. whether jobs are additional or transfer workers from existing employment in the region.

Once operational, Project Marinus is forecast to create 573 direct job-years between 2025 and 2049 in the state (or 23 full-time jobs supported on average per annum).

The jobs created are across a wide range of occupations, as captured in Figure 17. The construction phase will lead to employment for technicians and trades workers (most notably electricians, architectural, building and surveying technicians, welders and metal fitters and machinists), labourers and machinery operators. Plus, professional roles like engineers and managers. There are fewer direct jobs for labourers and machinery operators during operations, but still good local employment opportunities for professionals (notably electrical engineers), tradespeople (notably electricians), managers and clerical and administration.

Given Marinus Link is also maritime project, professionals and tradespeople with experience in maritime settings will be required. Examples include maritime safety staff, marine preservation advisors, maritime construction and engineering experts, maritime logistics, and transportation specialists.

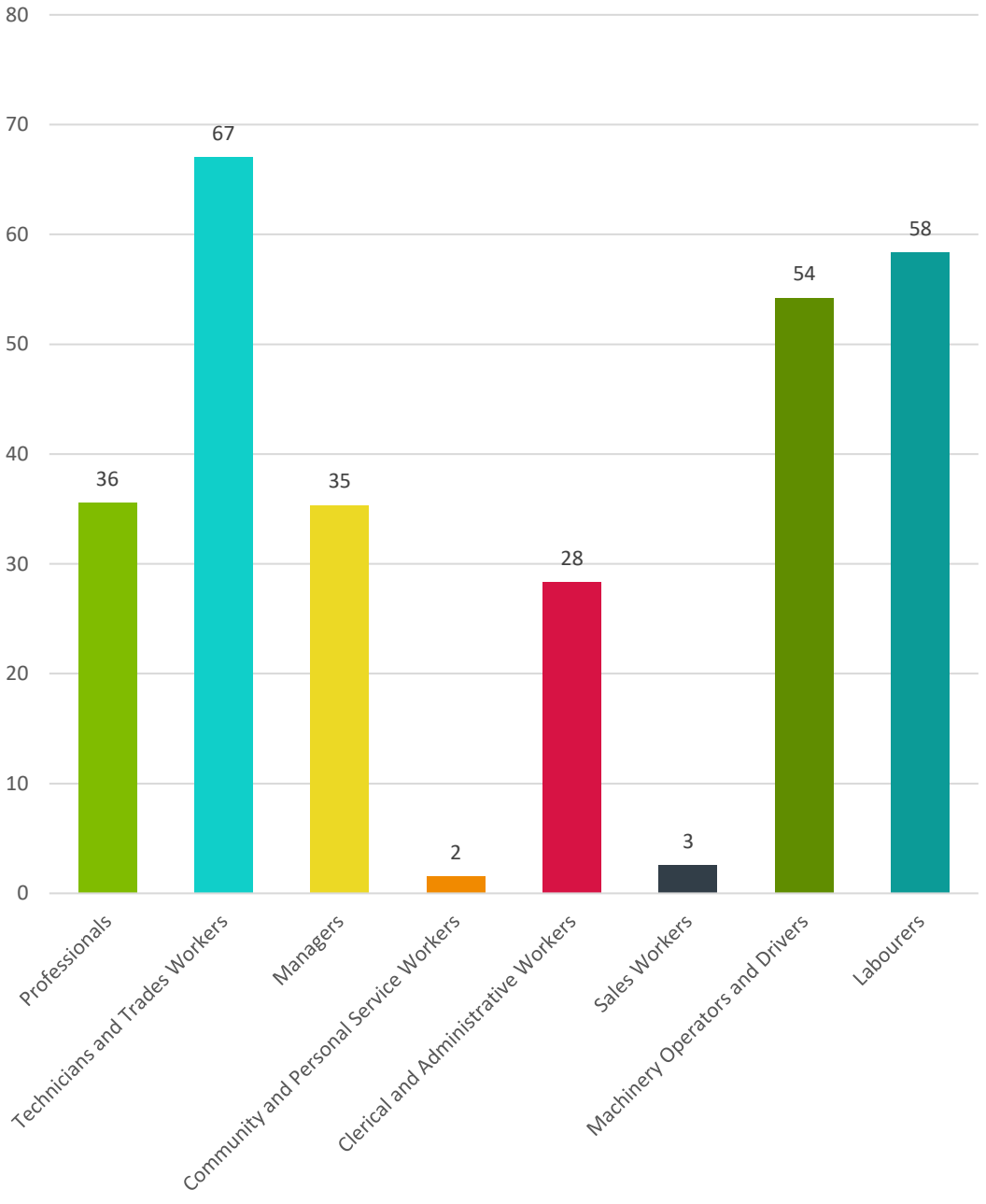
FIGURE 17: DIRECT JOBS CREATED IN CONSTRUCTION AND OPERATION PHASES OF PROJECT MARINUS 2020 - 2050 (JOB YEARS) WITH MAIN OCCUPATIONS SHOWN



Source: SGS Economics and Planning using Ernst & Young (2019) and ABS data on occupation types by industry

The following chart shows the number of direct jobs by main occupation supported at peak construction. Peak construction is forecast to last for a period of three years.

FIGURE 18: DIRECT JOBS CREATED AT PEAK CONSTRUCTION ONLY WITH MAIN OCCUPATIONS SHOWN

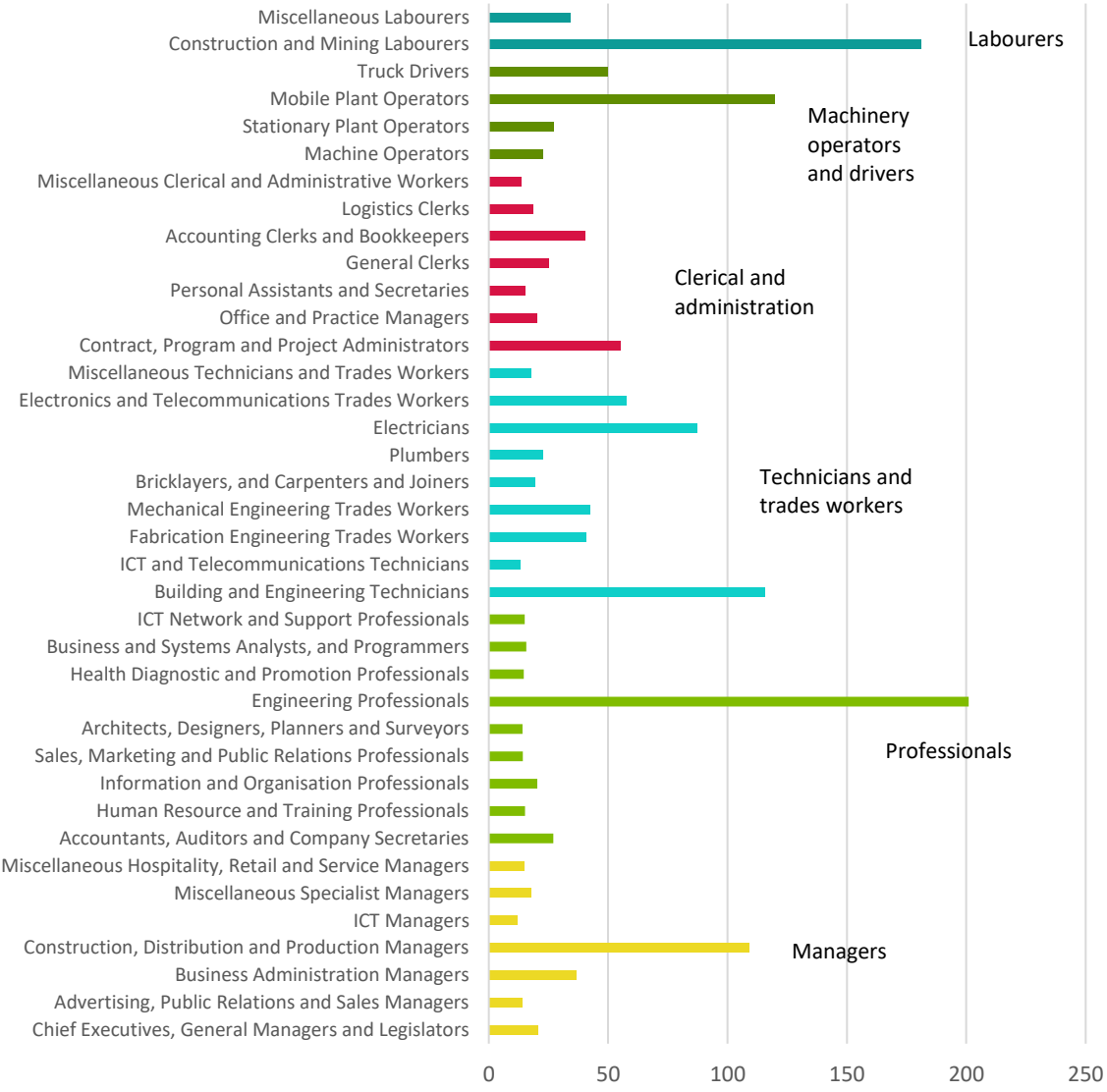


Source: SGS Economics and Planning using Ernst & Young (2019) and ABS data on occupation types by industry

Demand by occupation for construction and operation

Another way to consider jobs created, is the demand for workers that will be generated from different occupations. Ensuring that demand is aligned with the supply of people with those skills helps ensure project and economic development success. The next chart provides a demand estimate for different occupations to construct and operate NWTD[3].

FIGURE 19: DEMAND FOR WORKERS BY OCCUPATION (DIRECT JOB YEARS 2020-2050)^



Source: SGS Economics and Planning using Ernst & Young (2019) and ABS data on occupation types by industry. ^only occupations with ten plus workers demanded are included in the chart. Full dataset can be found in the appendix

[3] The method used to calculate the worker demand by occupation is a rough estimate only, using generalised data for the electricity transmission and non-civil engineering construction industries. More robust estimates should be prepared by the project design and management team to take into consideration the special characteristics of the NWTD project.

Indirect jobs

A broader range of industries see jobs supported by the construction and operation of Project Marinus. Ernst & Young estimated that the construction and planning phase of Project Marinus would create 4,957 indirect job years in Tasmania between 2020 and 2028, peaking at 1,109 per annum from 2025 to 2027.

Once operational, Project Marinus is forecast to create 1,288 indirect job-years between 2025 and 2050 in the state (or 52 full-time jobs supported on average per annum).

These flow-on jobs will accrue in support industries like education and training, accommodation, hospitality, cleaning, retail and medical services, and the supply chains for construction in manufacturing, construction services, engineering, transport, and financial services. The jobs created may not all be new, but the expenditure would support existing employment in the region.

Induced jobs

Induced jobs come along due to the construction and operation of the enabled wind, solar and pumped hydro energy generation developments in the region. As the economic impact, the scale of the induced opportunity is more significant than that of the construction and operation of Project Marinus itself.

Ernst & Young (2019) estimated that under an accelerated transition to renewables scenario:

- The construction of new energy generation induced by Project Marinus would support 4,067 direct and 15,946 indirect job years to 2050
- The operations of the new energy generation induced by Project Marinus would support 5,926 direct and 11,478 indirect job years to 2050

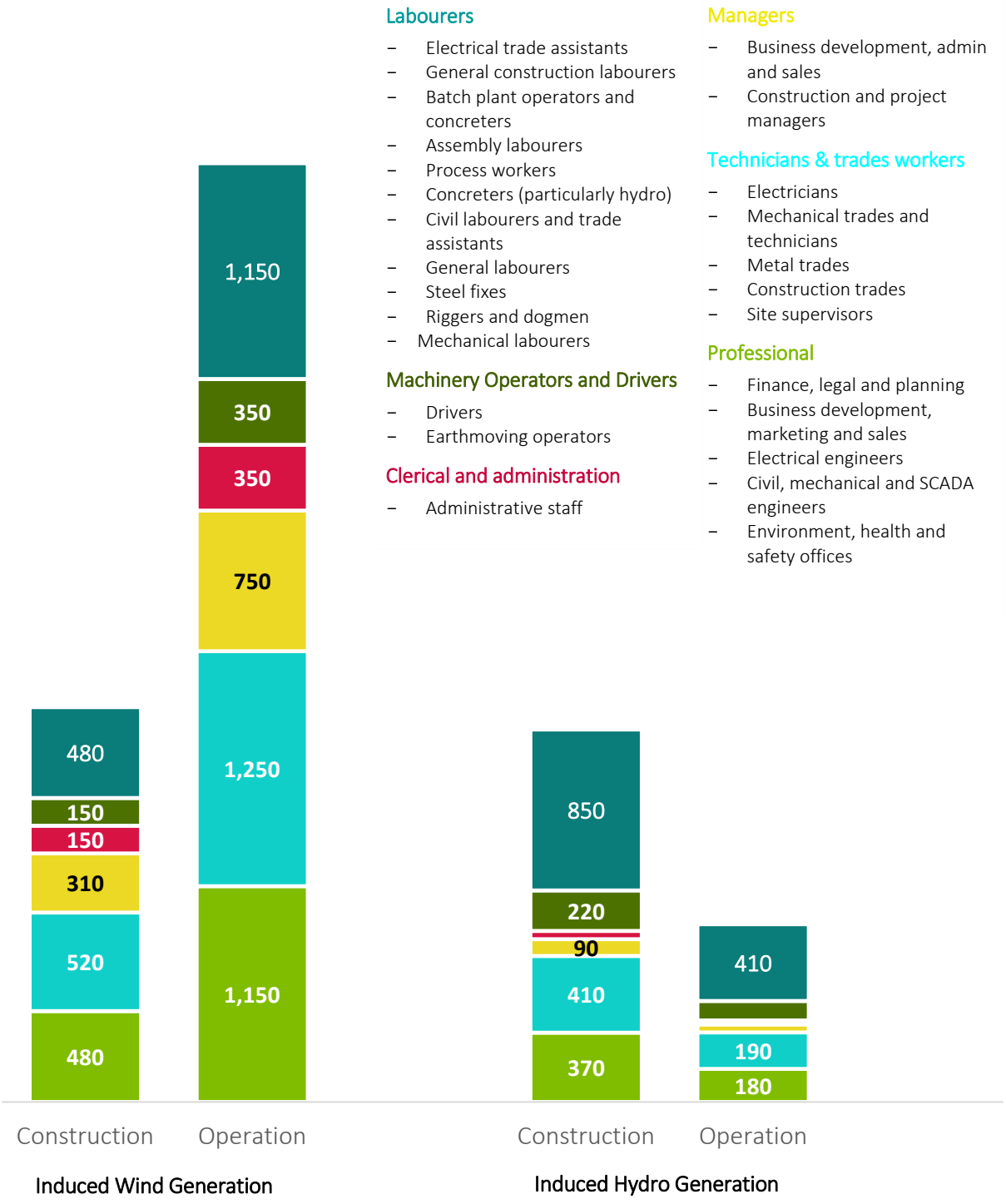
An accelerated transition as modelled by Ernst & Young broadly aligns with the Australian Energy Market Operator's 2019 step change scenario which reflects strong action on climate change and a 90 per cent reduction in emissions from the National Energy Markey on 2016 levels. Project Marinus can be a significant contributor to the reduction in emissions.

In total, by combining job creation in construction and operations of the induced energy generation, there will be 37,416 job years supported. On a per annum basis this equates to 1,496 jobs supported each year from 2025 to 2050. The jobs induced in wind and hydro are across a wide range of occupations and skill levels, as captured in Figure 0 (which shows direct jobs by occupation).

The construction and operation of wind generation will lead to employment for technicians and trades workers (most notably electricians, mechanical trades and technicians, metal trades, construction, trades), labourers and machinery operators. Professional roles include electrical, civil, mechanical and supervisory control and data acquisition (SCADA) engineers and professional roles in finance, legal, planning, business development, marketing and sales. There will also be demand for construction and project managers.

The workers required for pumped hydro are similar to wind, but a smaller number (based on EY estimates), with a slightly different mix of labourers, including concreters, steel fixes, riggers, and dogmen. Hydro also has more jobs in construction than maintenance, the reverse of wind.

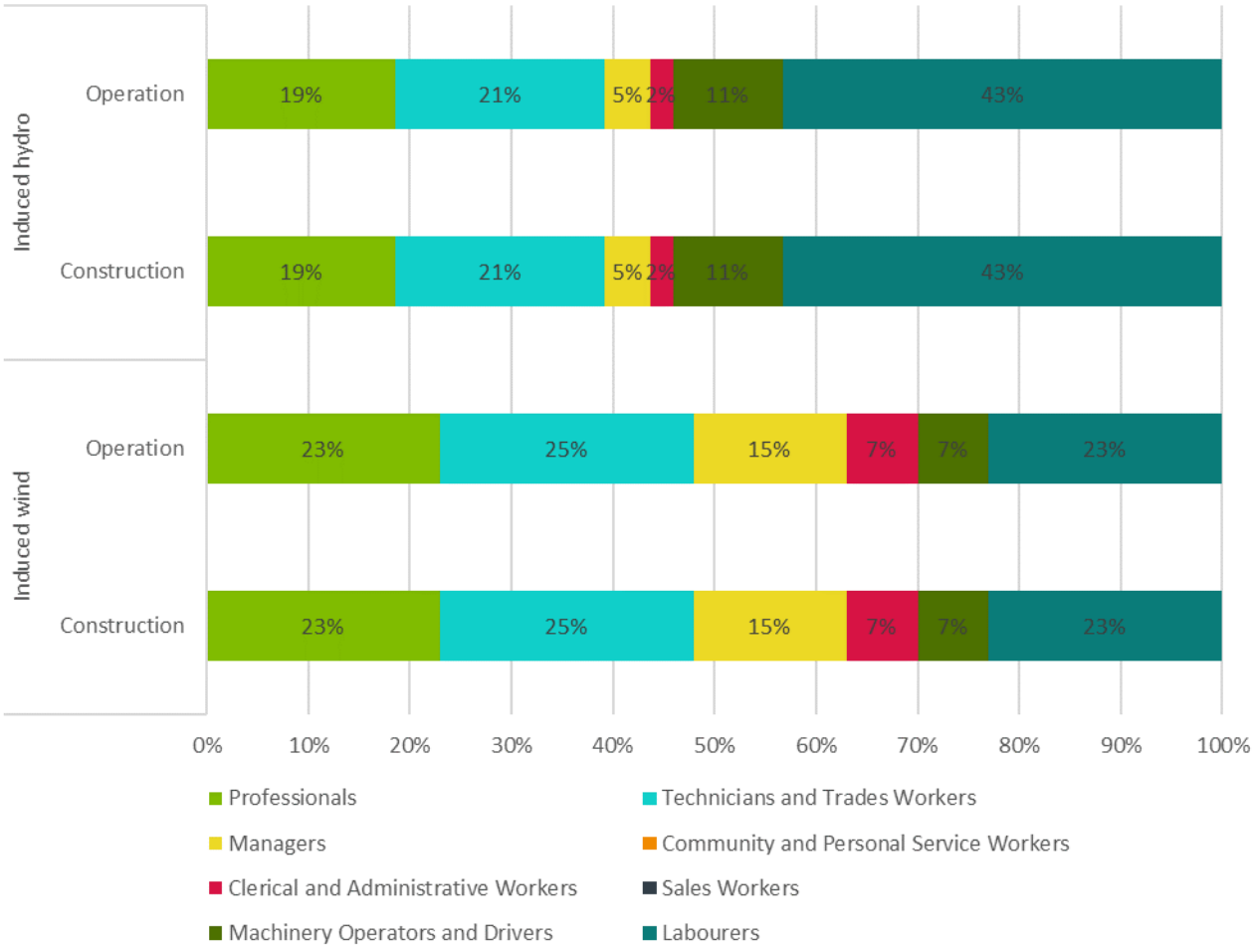
FIGURE 20: DIRECT JOBS IN CONSTRUCTION AND OPERATION SUPPORTED IN WIND AND HYDRO ENERGY GENERATION (JOB-YEARS) INDUCED BY PROJECT MARINUS 2020-2050, UNDER AN ACCELRATED TRANSITION TO RENEWABLES, WITH MAIN OCCUPATIONS SHOWN



Source: SGS Economics and Planning using Ernst & Young (2019) and occupation shares for renewable energy projects from Institute of Sustainable Futures (2020). Full table of results and method can be found in the appendix.

Figure 1 below presents the above data by percentage shares of occupation.

FIGURE 21: JOBS FROM INDUCED INVESTMENT – SHARE BY OCCUPATION TYPE



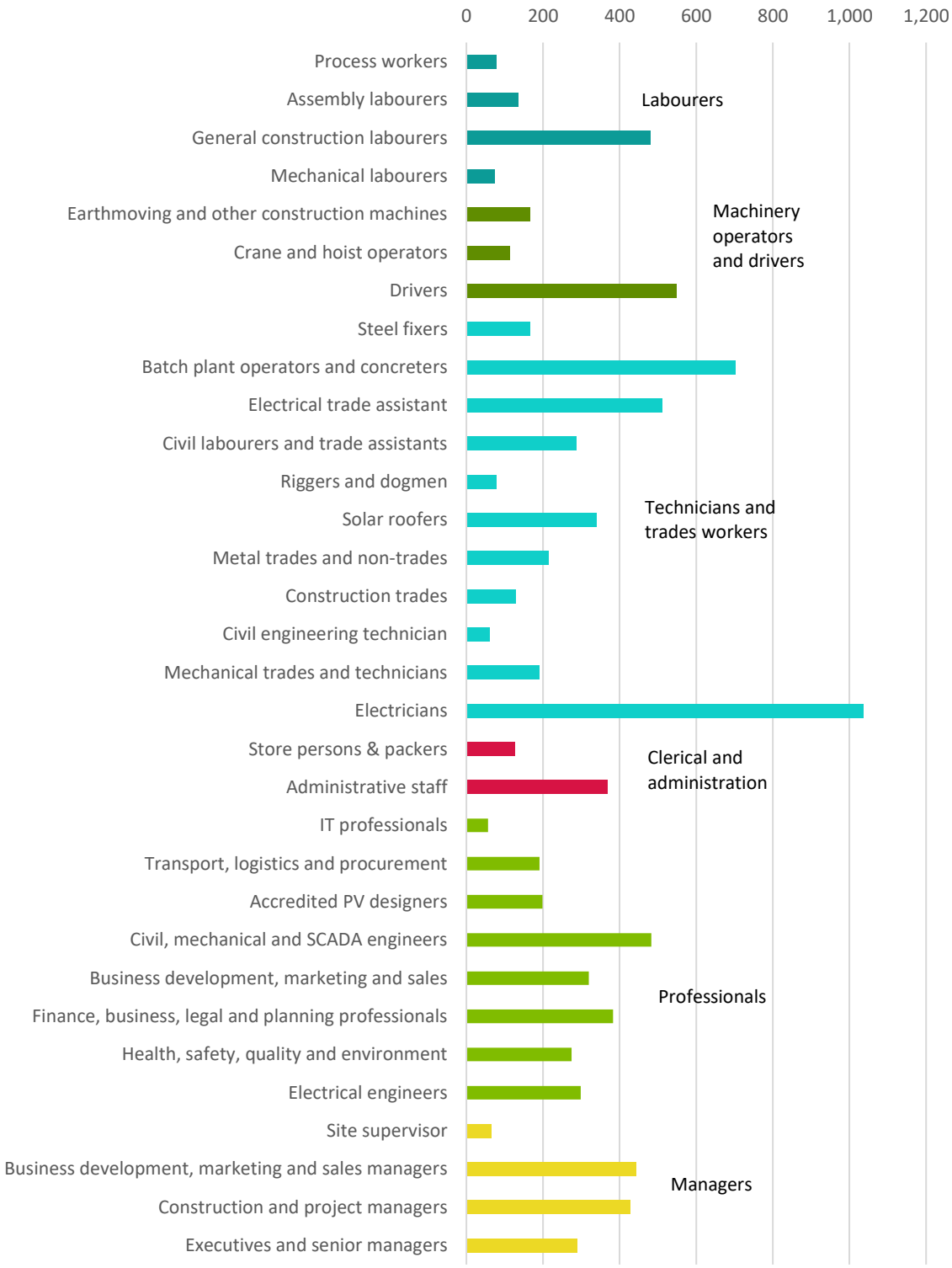
Source: SGS Economics and Planning using Ernst & Young (2019) and occupation shares for renewable energy projects from Institute of Sustainable Futures (2020). Full table of results and method can be found in the appendix

Demand by occupation for induced investments

The next chart (Figure 22) provides a demand estimate for different occupations to construct and operate the induced investments in renewable energy generation[4].

[4] The method used to calculate the worker demand by occupation is a rough estimate only and should be used with caution. The method to calculate occupation demand for NWTD and induced investment is also slightly different, as the estimates rely on different data sources on occupation shares.

FIGURE 22: DEMAND FOR WORKERS BY OCCUPATION FOR INDUCED INVESTMENTS (DIRECT JOB YEARS 2020-2050)



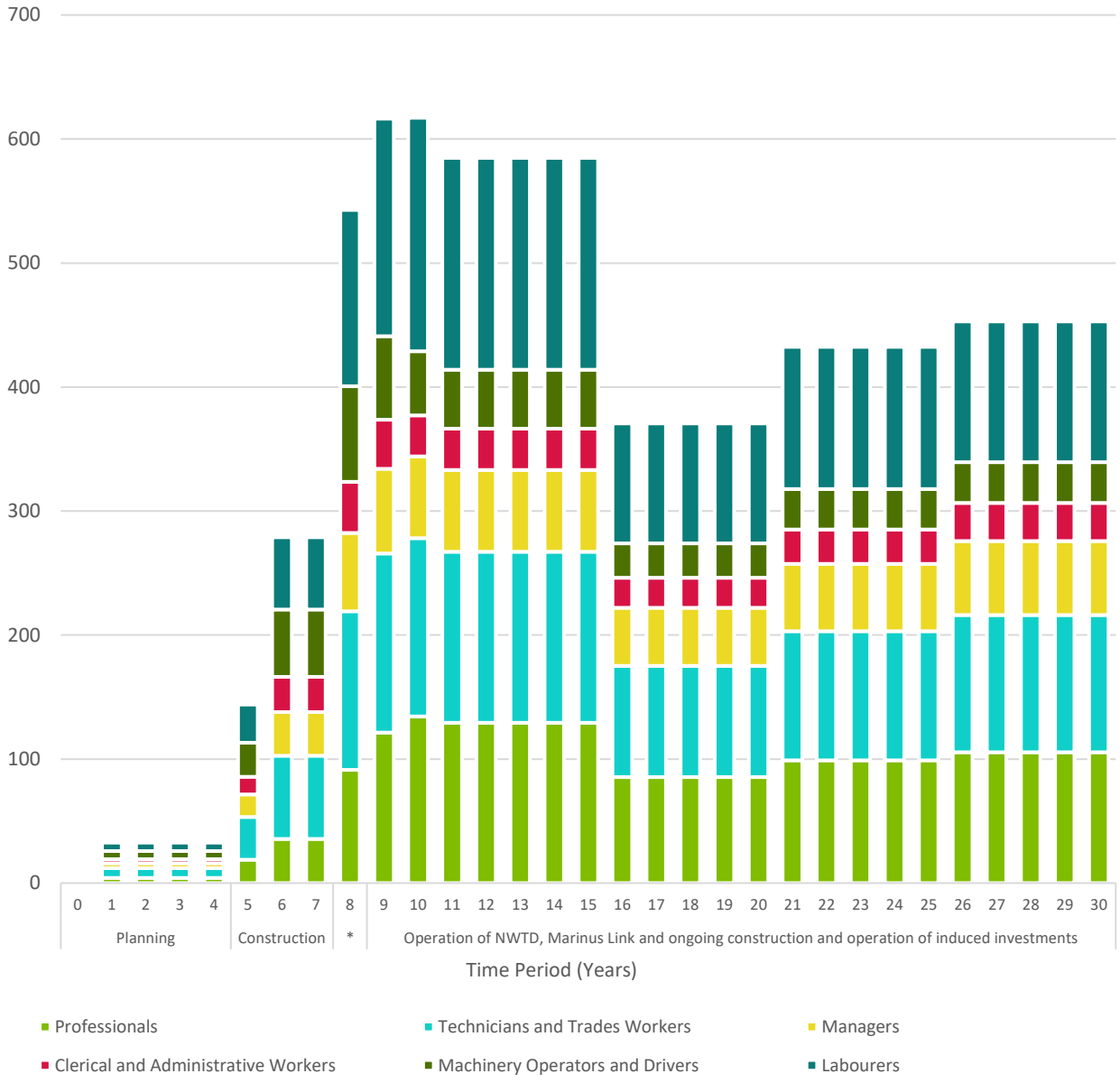
Source: SGS Economics and Planning using Ernst & Young (2019) and occupation shares for renewable energy projects from Institute of Sustainable Futures (2020). Full table of results and method can be found in the appendix.

Timeline of jobs

Figure 203 breaks down the direct jobs supported by year, from 2020, when planning started, through to 2050. Unlike other renewable energy projects, Project Marinus, via operation and induced wind and hydro, allows for a steady and significant pipeline of job opportunities across all skill levels over a long time.

Given the size of the workforce is around 52,500 at present (30,700 working full-time, 17,900 working part-time, 3,900 unemployed), the 600 workers demanded in 2030 accounts for over 1 in 100 jobs in the region, if all positions can be filled locally.

FIGURE 203: TIMELINE OF JOBS SUPPORTED (DIRECT JOBS SUPPORTED PER ANNUM)



SGS Economics and Planning using Ernst & Young (2019). Full table of results and method can be found in the appendix. *In year 8, construction of NWTD is in its final year and the construction and operation of induced investments begins

Jobs supported by skill level and educational qualification

The following figure takes the jobs supported by Project Marinus and recategorises them based on the skill level and training pathway required.

Skill level is gleaned by using ANZSCO skill level from the ABS. In ANZSCO, skill level is defined as a function of the range and complexity of the set of tasks performed in a particular occupation. The greater the range and complexity of the set of tasks, the greater the skill level of an occupation (Australian Bureau of Statistics, 2013).

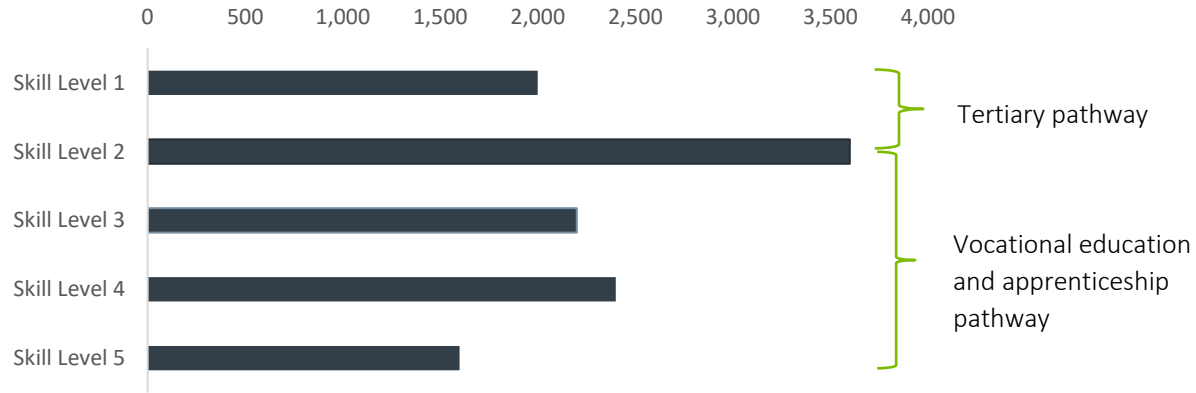
Skill level is measured operationally by the level or amount of formal education and training, the amount of previous experience in a related occupation, and the amount of on-the-job training required. Skill level for occupations and occupation groups is ranked from 1 (most skilled) to 5 (minimal skills required).

Figure 214 shows the skill level and qualification required for the direct jobs supported, with the squares scaled for demand. Across the construction and operation of Project Marinus, and induced wind and hydro energy generation, 11,800 job-years are expected to be created. Around 3,200 job-years will be for labourers classified as being skill level 4 or 5 requiring Certificate I, II or III from a vocational education provider. At the other end of the education spectrum, 2,500 job-years will be created for tertiary-educated professionals, 1,400 for tertiary trained managers and another 2,800 job-years for highly skilled, vocationally trained technicians and trade workers.

Figure 225 shows the broad range of skill levels required and the importance of both tertiary and vocational/apprenticeship pathways for the renewable energy sector in North-West Tasmania.

FIGURE 214: SKILL LEVEL AND QUALIFICATION REQUIRED FOR THE DIRECT JOBS SUPPORTED BY PROJECT MARINUS – CONSTRUCTION, OPERATION, AND INDUCED WIND AND HYDRO TO 2050

FIGURE 225: SKILL LEVEL REQUIRED FOR DIRECT JOBS (JOB YEARS) SUPPORTED BY PROJECT MARINUS TO 2050



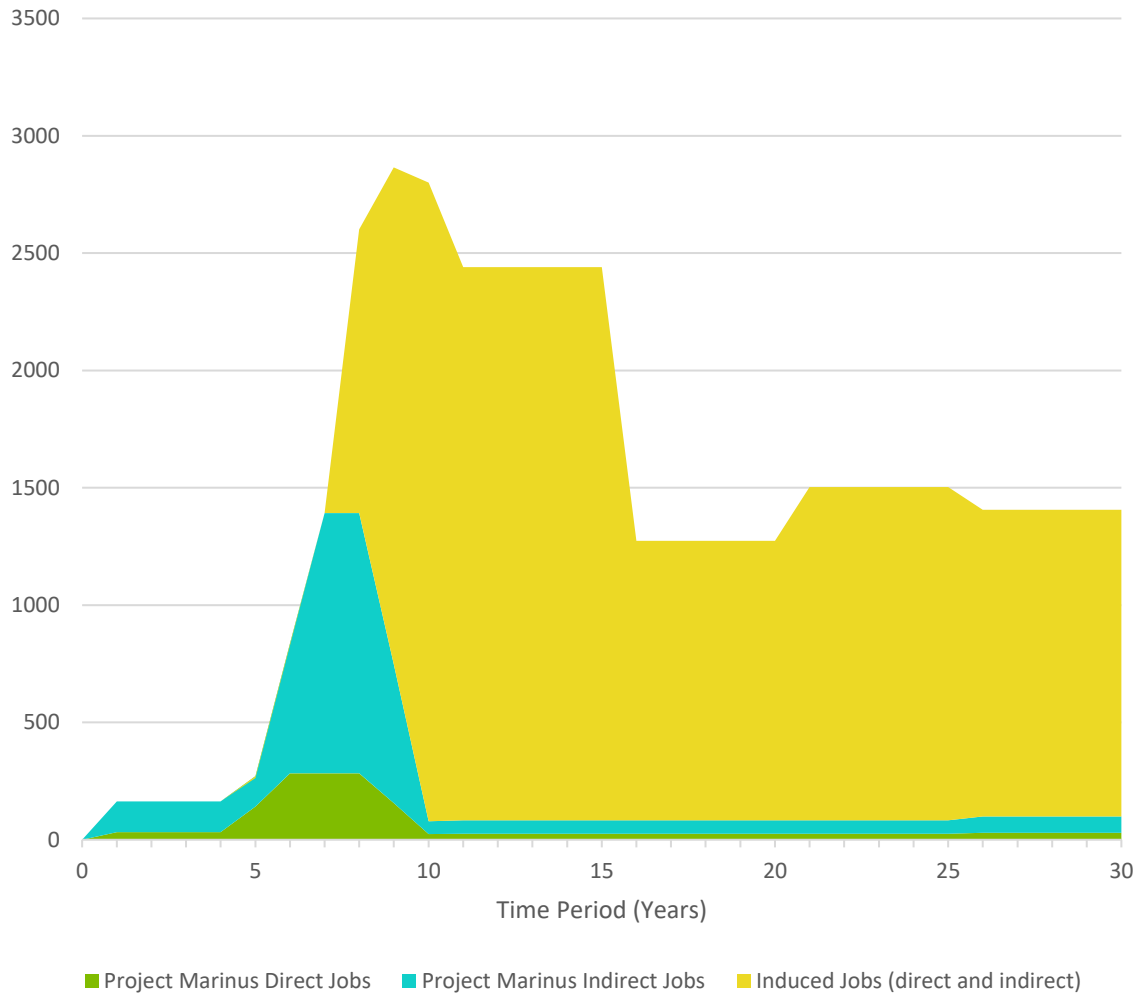
Total jobs

This next figure shows the total number of jobs supported by Project Marinus in Tasmania, both direct and indirect, plus the induced jobs supported. Project Marinus will support jobs well beyond the construction period.

In total, Project Marinus supports 44,517 job years between 2020 and 2050. Four per cent of the jobs are direct, and 12 per cent are indirect, from the construction and operation of Project Marinus. Eighty-four per cent of the jobs created are due to the induced investment in wind and pumped hydro enabled by the development of Project Marinus. The induced investment is a major economic benefit of the project.

The indirect jobs (including those that are induced jobs) are in support industries like education and training, accommodation, hospitality, cleaning, retail and medical services, and the supply chains for construction in manufacturing, construction services, engineering, transport, and financial services. The jobs supported will be across a range of occupations and skill levels.

FIGURE 236: TIMELINE OF JOBS SUPPORTED IN TASMANIA (TOTAL JOBS SUPPORTED PER ANNUM)



SGS Economics and Planning using Ernst & Young (2019). Full table of results and method can be found in the appendix.

4.3 Benefits by theme area

The economic value-add and job creation provide an indication of the scale of the economic opportunity. In addition to those raw economic figures, Project Marinus shapes as a generational investment that can transform the region for decades to come. The Project will generate benefits across the following five themes areas:

1. Workforce development, skills & training: To stimulate and contribute to workforce development and a fair economy by unlocking a pipeline of projects in the renewable energy sector, contributing to decent wages, training opportunities and good working conditions.
2. Procurement & opportunities for local businesses: To deepen local supply chains, support business development, and increase spending and investment in the local economy through procurement processes and decision making.
3. Infrastructure, assets & market benefits: To generate wealth, financial savings and market benefits for residents, local businesses and industry through the provision of more affordable, cleaner, and reliable energy.
4. Local and regional community (social) benefits: To generate flow-on economic, social and environmental benefits for local communities.
5. Public & private sector investment: To encourage and enable additional public and private sector investment in flow-on opportunities in renewable energy, manufacturing and other sectors.

THEME 1: WORKFORCE DEVELOPMENT, SKILLS AND TRAINING

Economic development objective

To stimulate and contribute to workforce development and a fair economy by unlocking a pipeline of projects in the renewable energy sector, contributing to decent wages, training opportunities and good working conditions.

Context

Insights from the regional profile showed that:

- Over a fifth of persons with a post-school qualification in the region have a qualification in engineering and related technologies, much higher than the rate across Tasmania as a whole. The region has a strong skills base in manufacturing, agriculture and health care. These skills provide a good base for economic development.
- Professional 'white-collar' skills in information and computer technology (ICT), business, human resources and marketing, arts and media, design, engineering, science and transport are less prominent. There is an opportunity to expand skills in these areas to service businesses locally.
- Skills gaps identified in the region include in civil construction (plant operator, paraprofessional and project management) and engineering (technicians and draftsmen). More broadly digital literacy and ICT skills are required to respond and adapt to the fast pace of implementing new technologies. Leadership, mentoring and project management skills are in high demand.

- Youth unemployment has been an issue for the region, as has unemployment for Aboriginal and Torres Strait Islanders. There is a need to develop training and employment pathways for young and socio-economically disadvantaged people. These groups present as a stock of underutilised talent.
- The University of Tasmania has a growing presence in the region. UTAS is exploring increased opportunities for students with pathways into the current projects and targeting thematic areas around transport, mechanics, renewable energy, and electricity. The University is expanding course offerings at its Burnie campus to include a Bachelor of Engineering Technology.
- The vocational sector provides direct enrolments in trades. Skills Tasmania is rolling out the Energising Tasmania skills and training initiative, with plans to deliver $16.1 million in skills and training to boost Tasmania's renewable energy sector. The Australian Government has also developed an Industry Training Hub and the Career Facilitator in Burnie.
- Barriers to training include limited public transport outside of metropolitan centres and the need to break generational patterns of low educational attainment. Concerns exist with the current electrical qualifications which is considered too long and not properly aligned to industry needs.
- Marinus Link, NWTD and other infrastructure projects in the region need to maximise the extent to which local positions are filled by local job seekers particularly apprenticeship positions. Developing local skills and high-quality training pathways is critical to developing this local workforce.

Benefits

Project Marinus will directly create or support thousands of jobs around design and approvals, construction and operation, plus many more in the induced investments in renewable energy generation projects. The jobs span numerous occupation groups and encompass a variety of career pathways. Many workers will be involved in trades, while others perform essential administrative, technical, and sales functions. Thus, the Project creates an unusually diverse set of career routes for prospective workers.

The benefit of job creation also lies in developing a skilled workforce in the region through the training opportunities on offer via RTO's, TAFE Tasmania and the University of Tasmania. The creation of apprenticeships for young people and opportunities for workers transitioning out of declining industrial sectors is paramount for the region's future prospects. The North-West region has existing regional strength in engineering and manufacturing, which can be built upon.

A criticism of renewable energy projects nationally is that employment opportunities are often short-lived. The focus for the region is to ensure that the employment opportunities generated are long-lasting, secure and create trained employees. This has flow-on social and community benefits like good incomes, population growth and town vibrancy, as explored in the social benefits theme. Jobs created will be skilled and well-paid and will deliver an outstanding workforce for the region for this and other projects in Tasmania and interstate, like the development of the NSW Renewable Energy Zones. To meet this lofty goal, training and skill development and career pathways will be developed. The creation of these pathways is a benefit for the region and the state.

The University of Tasmania, TAFE Tasmania, Skills Tasmania, and the Department of Education are looking to Project Marinus and the induced renewable energy generation to provide demand for high-quality jobs and career pathways for students. These organisations are planning to shape curriculums and course offerings to create the workforce required and provide opportunities to Tasmanians. There are also opportunities to create a renewable energy centre of excellence in North-West Tasmania.

Summary of benefits:

1. The creation of thousands of high-skilled, well-paid careers over the long-term.
2. The creation of apprenticeship pathways for young people and those looking to retrain.
3. The development of the regional workforce for Project Marinus and other opportunities.
4. Project Marinus and renewable energy generation projects create demand for skills and training programs to be developed in the State, which will enable Tasmania and the region to transition to the jobs of the future.

THEME 2: PROCUREMENT AND OPPORTUNITIES FOR LOCAL BUSINESSES

Economic development objective

To deepen local supply chains, support business development, and increase spending and investment in the local economy through procurement processes and decision making.

Context

Insights from the regional profile showed that:

- Past economic development efforts in Australia have not emphasised curating, sustaining and embedding the existing business community around public or private investment opportunities.
- Income injected into a local economy can leak back out as inputs to production are sourced from elsewhere (for instance, using suppliers from a business headquartered interstate). These leakages dilute the economic multiplier effect from investment. Using local businesses and workers for a larger share of inputs to production increases the multiplier effect, and the total economic impact.
- The region has an existing strength in engineering and manufacturing which can be utilised.

Benefits

The infrastructure spending on Project Marinus is an example of public investment injected into a region with flows to local businesses. The design and approvals phase of the project is already injecting money into the local economy.

Project Marinus has a significant and long-term procurement pipeline throughout the Project. As per the principles of community wealth building, anchor institutions like TasNetworks can use their procurement processes and decision making to deepen local supply chains and business development, spending and investment. It is a deliberate leveraging of expenditure towards socially and environmentally valuable practices and outcomes. At the heart of Community Wealth Building is the principle that wealth is broadly held. The development of small and medium-sized, locally owned businesses enables wealth to stay local.

The expenditure required to construct and operate Marinus Link and NWTD will generate positive economic outcomes. But, the greater the role industry and business in the region can have in supplying goods and services for the construction and operations of Project Marinus, the greater the workforce and economic impact. The same principles apply to other renewable energy projects that will be developed in the region, or any other major investments.

The Tasmanian Renewable Energy Action Plan (TREAP) sets out clear objectives and actions to transform Tasmania into a global Renewable Energy Powerhouse. Section 3.4 of the TREAP refers specifically to procurement & opportunities for local businesses. The aim is to maximise local Tasmanian business and employment opportunities for renewable energy projects. Ensuring the widest participation by Tasmanian businesses in renewable energy projects is a key priority for Government. That means ensuring that renewable energy projects, where possible, will generate employment and opportunities for local businesses.

Summary of benefits:

1. The development of Project Marinus and renewable energy generation will see significant money expended in the region.
2. The creation of procurement guidelines for projects can trap more money in the local community than a 'typical' infrastructure project where local wealth generation is not deeply considered.
3. TasNetworks will lead by example and recruit other anchor institutions to the cause of promoting local economic development through procurement and capacity building.

THEME 3: INFRASTRUCTURE, ASSETS AND MARKET BENEFITS

Economic development objective

To generate wealth, financial savings and market benefits for residents, local businesses and industry through the provision of more affordable, cleaner, and reliable energy.

Context

Insights from the regional profile showed that:

- Mining, manufacturing, and agricultural processing are the major export sectors in the region. All three are highly energy intensive and would benefit from reliable, affordable and clean energy.
- Growth in manufacturing in Tasmania is strongly linked to the overall brand of Tasmania, which is small-scale, high quality, clean and green.
- Manufacturing is transitioning to more advanced methods, which requires strong ICT capabilities and excellent telecommunication infrastructure
- Tasmania as the least digitally included of Australia's eight states and territories and within Tasmania, the West and North-West region is the least digitally connected region in Tasmania

Benefits

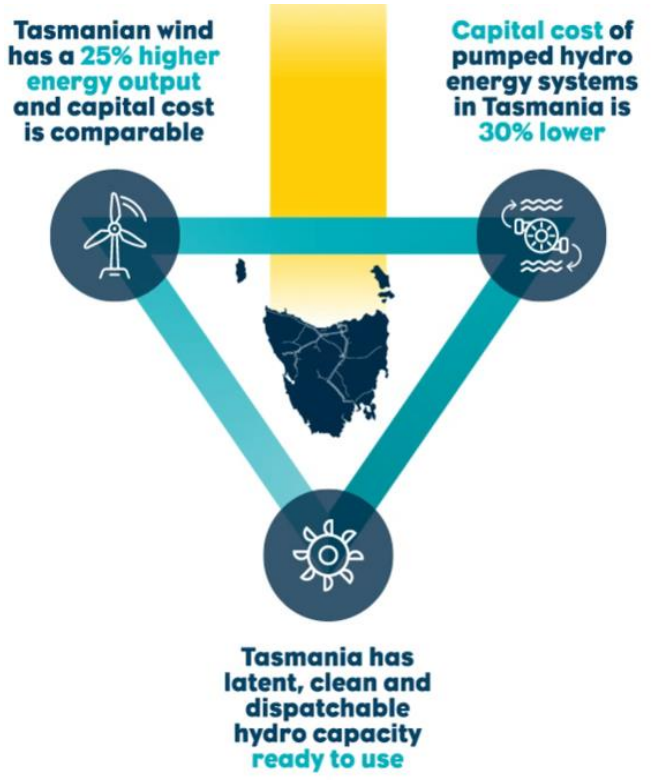
Marinus Link will connect NW Tasmania's renewable energy generation and storage resources to the National Electricity Market via Victoria. Project Marinus is the trigger that opens the market for Tasmanian energy to the national market. The proposed NWTD will increase NW Tasmania's network capacity and ensure the power system is ready to take on future renewable energy and storage developments.

Marinus Link also means excess energy generated by Victorian renewables could be transferred to Tasmania and stored in pumped hydro energy storage facilities, ready to be used when needed, enabling more low cost, reliable and clean energy.

Australia must and will transition to an energy network based on renewables. Modelling conducted by Project Marinus suggests that Marinus Link, Tasmanian pumped hydro and on-island renewable development is part of a least-cost NEM solution to alternative generation sources.

Marinus Link is projected to lower costs for all consumers by unlocking cost-effective Tasmanian dispatchable generation as the national energy market transitions. Marinus Link can exert downward pressure on wholesale electricity price by introducing additional dispatchable capacity replacing marginal and coal-powered generators.

FIGURE 247: MARINUS LINK UNLOCKS COST EFFECTIVE ENERGY GENERATION



The transition to a low carbon economy is an opportunity to produce other goods in better ways. It has been estimated that low emissions technologies could position Australia to generate over $30 billion a year of new export revenue from energy-intensive, low-emissions products by 2040 (Department of Industry, Science, Energy and Resources , 2020). The mineral processing and manufacturing sectors can produce carbon-free goods and materials in high demand by the rest of the world. Many energy-intensive industries currently threatened by high electricity prices can see revival and expansion in a low carbon economy. The North-West region is well-placed to make this transition given Marinus Link and its existing infrastructure, skills and industry base.

The transition can also have significant branding benefits for Tasmanian businesses through the ongoing development of Tasmania's clean and green image, including in agriculture and tourism.

Marinus Link will also increase the optical fibre routes across the Bass Strait for greater telecommunication diversity and security between Tasmania and mainland Australia. Increased connectivity provides exciting opportunities for local innovators and entrepreneurs.

Summary of benefits:

1. Project Marinus unlocks large scale renewable energy generation in Tasmania, connecting to the national energy market.
2. Project Marinus is projected to lower costs for all consumers in the region. This financial saving can be spent in the local economy and relieves cost-of-living pressures.

3. Project Marinus will unlock the supply of affordable carbon-free energy attracting new or expanded energy-intensive businesses looking for comparative advantage.
4. Clean energy contributes to Tasmania's branding, which has benefits for North-West Tasmanian businesses, including in agriculture and tourism.

THEME 4: LOCAL AND REGIONAL COMMUNITY BENEFITS

Economic development objective

To generate flow-on economic, social and environmental benefits for local communities.

Context

Insights from the regional profile showed that:

- Growing a local economy needs to go beyond simple measures of the growth of gross domestic product (GDP) and the number of jobs. A well-functioning economy also needs to include a just distribution of wealth and opportunity.
- The workforce participation rate in the region is low. A low participation rate points to an aging population, disengagement from the workforce and socio-economic disadvantage.
- The unemployment rate in the region has spent most of the past decade above the Tasmanian and Australian rates, but it has fallen in recent years. Unemployment is still high in Burnie and Devonport. A reduction in unemployment will have large social benefits for the region.
- Wage incomes in the region have barely risen in real terms and incomes are lower than across Tasmania generally. Low rates of wage growth have been a national trend over the past decade.
- Incomes from business ownership and investments are also low. There is a need to generate more wealth for individuals in the region via the ownership of businesses and investments and increase wage growth.

Benefits

Project Marinus and investments in renewable energy generation will create economic activity in the region. Economic activity enables a higher standard of living for people through employment, higher wages and business opportunity. It also means higher government revenues and more money to spend on better quality services and infrastructure for the community. By significantly contributing to a robust regional economy with key export strengths, a skilled regional workforce with good employment opportunities, a growing regional services base, and vibrant small businesses, Project Marinus can make a large contribution to the region.

TasNetworks has already identified an opportunity to take its community investment beyond mitigating risk toward shared value by solving societal issues (TasNetworks, 2021). TasNetworks are Tasmanian and part of the community it is looking to benefit. TasNetworks recognises that jobs will only be perceived as a benefit if they are jobs for the local community. The organisation and stakeholders need to be seen to be actively working to upskill the community. Similarly, how the Project is delivered, in terms of its environmental and financial impact (housing costs), will be critical.

Economic restructuring and growing inequality between regions mean that many regional communities have not shared in the prosperity growth of Australia over recent decades. There is an opportunity to use the project and investments in renewable energy to contribute towards addressing existing social issues, including low local employment opportunities, particularly for younger people. There can be a focus on delivering high-quality jobs, not simply a high number of jobs. Good job quality considers economic (pay and benefits) and social factors like workplace social support and cohesion, voice and representation, health, safety, wellbeing, and work-life balance.

Project Marinus and the development of renewable energy is an opportunity to provide inspiration and confidence in the economic and social future of the region. The community can be at the forefront of a changing economy, becoming a world leader in delivering clean energy in the least impactful, most beneficial way. In addition, local and regional community benefits can include direct and indirect economic community investment (i.e., sponsorships, partnerships, benefit-sharing etc.). Local Councils will benefit from population growth, local jobs and business investment opportunities.

Summary of benefits:

1. Project Marinus provides inspiration and confidence of a promising economic future for the region.
2. Economic development leads to higher incomes from individuals and families, allowing them to live happier and healthier lives and for better, more vibrant communities.
3. Economic development allows for greater government revenues which can be reinvested in community and social projects and services.
4. TasNetworks will directly contribute funds and grants to individuals and community groups through Community Investment and Community Benefit Sharing.

THEME 5: PUBLIC AND PRIVATE SECTOR INVESTMENT

Economic development objective

To encourage and enable additional public and private sector investment in flow-on opportunities in renewable energy, manufacturing and other sectors.

Context

Insights from the regional profile showed that:

- Burnie and Ulverstone have strong manufacturing bases and Burnie and Devonport are two key ports for the movement of freight in and out of Tasmania.
- The economic value of mining and manufacturing has grown only slightly in terms of economic value over the past decade. There is need for the development of new industry opportunities.

Benefits

Project Marinus will unlock the potential for Tasmania's Battery of the Nation ambition and induce private investment. Tasmania will lead the way as the country transitions to a low-emission, renewable energy-based economy. The investment will be induced in new renewable energy generation in wind, solar and pumped hydro. It has been estimated that the induced investments could total 3,156 to 4,130 MW of additional generation (Ernst & Young Australia, 2019). This additional generation is expected to

be incrementally installed after the completion of Marinus Link and presents as a significant driver of economic development through the construction and operation of this new energy capacity.

Project Marinus and renewable energy generation developments also offer an opportunity to grow the manufacturing sector in the region. There can be opportunities through the supply chain to manufacturers to provide components for Marinus Link, NWTD and wind, solar and hydro energy generation. The renewable energy sector has four major elements to its value chain: equipment manufacturing and distribution, project development, construction and installation, operations and maintenance. Private investment can be encouraged across all. The most challenging but with the highest economic pay-off is equipment manufacturing. Opportunities could include:

- Manufacture of components for transmission and generation
- The research and development of enabling technologies for distributed energy, such as microgrids
- Development of mining value chain, from mining to making, such as batteries

Private investment opportunities extend more broadly to businesses who can service the workforce of Project Marinus and the induced energy generation including accommodation, hospitality and retail, education and professional services.

Summary of benefits:

1. Project Marinus unlocks additional public and private sector investment in the new renewable energy generation creating further and large economic development opportunities.
2. Project Marinus will generate business investment opportunities to grow or set up in the supply chain either directly (e.g. manufacture of components or construction services) or indirectly (e.g. the provision of accommodation or hospitality to the workforce).

5. Economic Development Opportunities for the North-West Region

Capturing the benefits as outlined in the previous chapter will require coordination and action by regional partners. The co-design process for this Paper enabled these discussions to occur to identify the opportunities for the benefits to be realised.

The following table outlines the economic development objectives, the identified opportunity or need and the rationale as to why these opportunities and needs are important within the community.

TABLE 2: ECONOMIC DEVELOPMENT OBJECTIVES & RATIONALE BASED ON IDENTIFIED OPPORTUNITIES

Objectives What do we want to achieve?	Opportunities What is the identified opportunity or need?	Rationale Why is this important?
THEME 1: WORKFORCE DEVELOPMENT, SKILLS & TRAINING		
Objective #1 To stimulate and contribute to workforce development and a fair economy by unlocking a pipeline of projects in the renewable energy sector, contributing to decent wages, training opportunities and good working conditions.	1.1 An organisation responsible for workforce development and coordination	The task ahead of the region's stakeholders to develop the conditions for the economic benefits to be realised stemming from Project Marinus and other major investments is incredibly complex. Having an organisation to plan, coordinate and execute policy with the multitude of stakeholders is critical. TasNetworks is but one critical player in the economic development fortunes of North-West Tasmania.
	1.2 Promote the long-term career opportunities	Career opportunities need to be visible and approachable for locals. It's essential to begin articulating the career opportunities becoming available in the region as soon as possible and in detail. That includes talking to students in schools as they will be the workforce for the renewable energy sector in the future and developing recruitment portals. Many other organisations are already operating in this space so it's important that engagement and new effort is done collaboratively and leverage existing efforts.
	1.3 Develop and improve skill development pathways	For major infrastructure projects like NWTD, skill development pathways need to be expanded and developed. Many regional stakeholders have a role to play, including expanding industries in the region who must drive the creation of the workforce they need. Training and education pathways are challenging to implement and get right. The deployment of skill development pathways needs to occur many years in advance of the construction phase beginning, to account for the time it takes to complete courses, which can be four or five years in length for highly skilled roles. Planning and development of these pathways therefore needs to be occurring now. The first step is mapping out the workforce needs in detail

Objectives What do we want to achieve?	Opportunities What is the identified opportunity or need?	Rationale Why is this important?
		across all energy and infrastructure projects in the region. Regional partners from industry, education and government then need to work together to develop and expand pathways. Without a local workforce, the project's economic impact will be severely diminished as workers will need to be imported. Importing a workforce (perhaps FIFO) would be challenging given competition with Renewable Energy Zones across the country. Not getting the workforce training pathways correct would present a significant barrier for economic development off the back of NWTD and other major projects in the region.
	1.4 Expand the regional workforce	The region's existing workforce is likely not large enough to fulfil Project Marinus' demand for workers, let alone the other energy infrastructure projects in the region and state. Therefore, there is a need to increase participation rates across the region by assisting and inspiring people who are currently disadvantaged or face barriers to participation. Barriers to participation include intergenerational disadvantage, gender discrimination, access to transport and a lack of 'soft skills' critical to employability. Increasing the participation rate also has important social benefits for the region. Furthermore, local businesses should be supported to retain and invest in their current employees. Another way to expand the regional workforce is to attract new skilled residents to fill workforce gaps. However, in order for this to be effective, social infrastructure barriers within the North West region must be addressed. There is a critical need to provide social infrastructure to support local workforce and population growth. The major gap in social infrastructure is an adequate supply of housing, but public transport and health and education services can also be enhanced. The responsibility for this infrastructure planning and provision lies outside of industry and local government control. Local industry leaders and local government needs to advocate for coordinated social infrastructure provision as a critical need to support industry and enable economic development. Without expanding the size of the workforce, renewable energy projects risk taking workers from existing businesses and industries, dampening economic and business development across the region.
	1.5 Coordinate regional workforce	There is a large pipeline of investment induced by Project Marinus. With an aim to create careers, and the limited timeframe of construction for each individual project, there is an opportunity to create and share a regional workforce across projects providing

Objectives What do we want to achieve?	Opportunities What is the identified opportunity or need?	Rationale Why is this important?
	development and deployment	employment across decades. If planned correctly, instead of competing projects, a skilled workforce can be available for each subsequent renewable energy project in the region. All sectors can benefit from upskilling and increasing the regional talent pool. The task ahead of the region's stakeholders to develop the conditions for the economic benefits to be realised stemming from Project Marinus and other major investments is incredibly complex. Having an organisation to plan, coordinate and execute policy with the multitude of stakeholders is critical. TasNetworks is only one of many critical players in furthering the economic development of North West Tasmania.
	1.6 Be a model project proponent, driving local economic and social benefits for the region	The renewable energy sector, and TasNetworks, can be a model of regional economic development and leadership where the money spent can have an outsized local impact, compared to projects without a local wealth building focus. TasNetworks can lead by framing core economic development principles for the way projects will roll out in a region, with strong regional and community benefits in mind.
THEME 2: PROCUREMENT & OPPORTUNITIES FOR LOCAL BUSINESSES		
Objective #2 To deepen local supply chains, support business development, and increase spending and investment in the local economy through procurement processes and decision making.	2.1 Promote the business procurement opportunities	For businesses to prepare for the opportunity, they need to be aware of and understand their potential role. Communication with the region's businesses needs to happen early, with opportunities clearly mapped out for businesses of all sizes. Developing a process for engaging and including small businesses that might not think they have the capacity is crucial to their participation.
	2.2 Develop procurement processes to localise spending benefits	TasNetworks are developing a procurement strategy, as can other major project proponents. There may also be opportunities to develop a contract with the Head Contractor that includes targets on job creation, local employment, and apprenticeships. The policies and targets developed by project proponents in the region will set the scene for economic development through emphasising local content, social procurement and Aboriginal and Torres Strait Islander participation.
	2.3 Lift local business capacity and capability	For many of the region's businesses to participate in the pipeline of renewable energy projects being developed, there is a need to support them in lifting their capacity. There is an opportunity to lift the quality of the product and services businesses provide, increase the size of the business to take on more work (many businesses in the region are at capacity), and assist businesses to overcome barriers to tender for work. A best-practice model worth replicating is the procurement process developed by Tasmania's defence industry (through Department of State Growth).

Objectives What do we want to achieve?	Opportunities What is the identified opportunity or need?	Rationale Why is this important?
		A barrier is that the business structure in the region includes some highly skilled, large businesses and many smaller contractors. As a result, there is a missing middle of medium-sized businesses that can take advantage of the opportunity.
	2.4 Expand business and government collaboration, partnerships and networks	Businesses do better when they learn from and support each other. There is a need to develop a culture of shared expertise for joint development. Businesses can work in partnerships to contribute their expertise to renewable energy projects. A minor piece of work can be financially sustaining for smaller businesses. Joint ventures have had limited success in the past but would be a promising avenue for capturing procurement spending in the region.
THEME 3: INFRASTRUCTURE, ASSETS & MARKET BENEFITS		
Objective #3 To generate wealth, financial savings and market benefits for residents, local businesses and industry through the provision of more affordable, cleaner and reliable energy.	3.1 Continue to explore, confirm and communicate the local benefits	The infrastructure benefits of a transition to a low-carbon energy grid and cheaper electricity prices are national benefits. None-the-less, there are regional opportunities like enabling the ongoing investment in a clean, green regional economy. There is also an opportunity to increase the telecommunications capacity of the regions. These benefits need to be constantly communicated to build support for the project. There are doubts in the community around the validity of claims of cheaper energy prices and a feeling that infrastructure being developed locally sees local costs with the benefits flowing to the whole country (i.e. the costs outweigh the benefits at a local level in the North West region). There is a need to counter this narrative by clearly communicating that although Tasmania 200% renewable target and Marinus Link project supports national benefits, there are a range of important local benefits that can be captured i.e. environmental benefits, lower power prices etc.
THEME 4: LOCAL AND REGIONAL COMMUNITY BENEFITS		
Objective #4 To generate flow-on economic, social and environmental benefits for local communities.	4.1 Focus on creating an enduring economic legacy	Promoting and celebrating the long-term region-building and prosperity story of the renewable energy developments is an opportunity to grow excitement and support. Implementing projects with lasting social benefits means that there can be an enduring economic legacy from the investments (the post-war hydro schemes held up as an example project to follow). The long-term prosperity story is fundamental as the region has nationally significant communities of disadvantage and is looking for economic revitalisation.
	4.2	The construction of NWTD may include the development of infrastructure, including roads, buildings, worker accommodation

Objectives What do we want to achieve?	Opportunities What is the identified opportunity or need?	Rationale Why is this important?
	Utilise supporting infrastructure for community benefit	and easements. These developments can have a second life as community infrastructure, such as handing over worker housing to a social housing provider. The supporting infrastructure investment can create ongoing economic returns over decades.
	4.3 Share benefits with the community	As community members themselves, there are opportunities for proponents like TasNetworks to share project benefits directly with its community for social benefit. Opportunities include developing community benefit-sharing frameworks, community investment programs and funds, and local sponsorships.
THEME 5: PUBLIC & PRIVATE SECTOR INVESTMENT		
Objective #5 To encourage and enable additional public and private sector investment in flow-on opportunities in renewable energy, manufacturing and other sectors.	5.1 Build the region's green industry brand	There is an opportunity for the region to have a clean, green energy brand that attracts businesses seeking a comparative advantage through a low carbon footprint. This extends to energy-intensive industries like manufacturing. The region's existing industry capabilities and heritage mean that the region can develop a globe leading proposition for industry and business attraction.
	5.2 Enable flow-on industry investment	Enabling infrastructure and settings need to be in place for flow-on industry investment to occur off the back of investments in Marinus Link and clean energy. Enabling infrastructure supports business development and investment includes transport and logistics infrastructure, industrial land supply and digital connectivity. Enabling flow-on investment also extends to promoting the region's green industry brand and exploring business development opportunities like manufacturing parts for the renewable energy sector or circular economy and recyclables.

6. TasNetworks' Role

TasNetworks, as the proponent of Marinus Link and NWTD, is committed to being a driver of economic development, as well as a collaborator and supporter. The aim is to achieve the largest economic and social benefits for the communities in which the Marinus Link and NWTD infrastructure will reside, but also contribute to a long-lasting positive economic legacy.

TasNetworks hopes the release of this paper will support the development of a coordinated and cooperative approach to economic development from the investments flowing into the region. The opportunities and barriers discovered in the co-design process are too large and complex for TasNetworks to capture and overcome alone.

Given the scale of the project, the nature of the challenges and opportunities facing the economy, it is important to be clear about TasNetworks' agency and the impact it can make.

TasNetworks can provide a range of services directly to support economic development opportunities in the North-West region. These services include providing employment opportunities and infrastructure, promoting the opportunity and the region, as well as implementing procurement strategies or community benefit sharing frameworks.

However, many of the opportunities are out of TasNetworks' direct control as an organisation and require a more holistic approach by all stakeholders in the region.

In some cases, TasNetworks will facilitate the economic development outcomes through building partnerships, promoting opportunities, and building the capacity of community members and organisations. For these actions, TasNetworks will not be in a position to provide directly, but can bring key stakeholders together and facilitate or contribute to the outcomes required.

TasNetworks can also advocate on behalf of the community for outcomes including funding, the delivery of services or infrastructure that are not the direct responsibility of regional partners to deliver but are important to realising the economic benefits of the project. TasNetworks can also advocate for behaviours and actions generated from community and businesses.

TasNetworks has developed an internal Action Implementation Plan, to identify how the organisation and the development of Project Marinus can contribute to economic development in the region under the five theme areas.

TasNetworks' Action Implementation Plan will be a tool for provision, advocacy and facilitation. Opportunities for TasNetworks to provide direct support and services will be identified as provisioning actions. Areas outside of direct control (such as the behaviour of businesses or State Government policy decisions) are also be included in the Implementation Plan, but, as described above, TasNetworks will have a facilitative or advocacy role, working with the relevant partners.

TABLE 3: TASNETWORKS' INFLUENCE

Role	Responsibilities
Provide	TasNetworks delivers services and infrastructure directly, directly creates employment opportunities, develops policy, and performs critical business support roles such as procurement strategies, and promotion of opportunities.
Facilitate	TasNetworks facilitates outcomes for its community through building partnerships, promoting opportunities, and building the capacity of community members and organisations.
Advocate	TasNetworks advocates on behalf of the community for funding and delivery of services or infrastructure that are not the responsibility of local stakeholders to deliver but critical to enable the economic benefits of NWTD to flow.

7. Regional Action Plan

The next series of tables present key actions for the region to pursue. The actions have been distilled from the opportunities, needs and rationale outlined in the previous chapter. These actions have emerged from stakeholder engagement and co-design sessions that have taken place in the region. The tables also identify the regional and State partners who can collaborate in delivering the actions.

The actions are prioritised from high to low:

H = Higher priority to advance as soon as possible	M = Moderate priority	L = Lower priority that can take longer to advance

The economic development objectives, opportunities and actions in this document have been captured at a point in time and may be subject to future change and focus as the Project progresses.

THEME 1: WORKFORCE DEVELOPMENT, SKILLS AND TRAINING

Objective #1: To stimulate and contribute to workforce development and a fair economy by unlocking a pipeline of projects in the renewable energy sector, contributing to decent wages, training opportunities and good working conditions.

TABLE 3: WORKFORCE DEVELOPMENT SKILLS AND TRAINING – OPPORTUNITIES & ACTIONS

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
1.1 An organisation responsible for workforce development and coordination	1.1.1 Regional stakeholders to create a dedicated organisation tasked with overseeing the critical and complex task of workforce development and deployment for Project Marinus and other major projects in	H	Facilitate	ML, Skills Tas, DOE, TasTAFE, UTAS, SG, OCG, RDA

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
	Tasmania (including the provision of the supporting social infrastructure)			
1.2 Promote the long-term career opportunities	1.2.1 Define the career opportunities in the renewable energy sector over time (linked to actions 1.2.2 & 1.3.2 below)	H	Facilitate	ML, Skills Tas, DOE, TasTAFE, UTAS, NETTS, ITH, Hydro, CCF, NECA, Keystone
	1.2.2 Clearly communicate the job, skill development and training opportunities of Project Marinus and renewable energy developments with key target audiences (linked to actions 2.2.1, 3.1.1, 4.1.1 & 5.1.1)	H	Provide	Skills Tas, ReCFIT, WNWW, ML, project proponents
	1.2.3 Support the development of a centralised jobs portal for the renewable energy sector	M	Facilitate	ML, Skills Tas, ReCFIT, Hydro
	1.2.4 Explore the development of curriculum aligned material for engagement with schools, students, parents and teachers around the renewable energy future	M	Facilitate	DoE, TasTAFE, Hydro, ML
	1.2.5 Design and implement a Scholarship Program to encourage school leavers to pursue a career in the renewable energy sector	H	Provide	ITH, DOE, TasTAFE, NW Secondary Schools

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
1.3 Develop and improve skill development pathways	1.3.1 Map out skill demand over-time and breakdown by occupation for NWTD, induced investments and flow-on opportunities and share with education, skills and training partners (linked to action 1.2.1 above)	H	Facilitate	ML, Hydro, Keystone, Skills Tas
	1.3.2 Define the education / training pathways to careers in renewable energy sector (linked to action 1.2.1 above)	H	Facilitate	DOE, TasTAFE, UTAS, ITH, NETTS, CCF, Skills Tas, WNWW
	1.3.3 Explore and develop innovative 'blended' education pathways for vocational and tertiary education into the industry	H	Facilitate	DoE, RTOs, TasTAFE, Skills Tas, Beacon, ITH, NETTS
	1.3.4 Increase the number of supervisors and teachers to increase the capacity of the training system to take on more apprentices in Tasmania	M	Advocate	TasTAFE, Skills Tas, CEC (interstate learnings)
	1.3.5 Define TasNetworks' future role as an RTO in Tasmania providing critical high voltage transmission and / or localised, customised training	H	Provide	Skills Tas, TasTAFE, NECA
	1.3.6	H	Advocate	DOE, RTOs, TasTAFE, Skills Tas, UTAS, BECRC, WNWW

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
	Develop a Renewable Energy Training Centre of Excellence in the North West region of Tasmania			
1.4 Expand the regional workforce	1.4.1 Plan for, coordinate and deliver social infrastructure to support a larger workforce in the region (linked to actions 3.1.2, 4.1.3 & 4.1.4 below)	H	Advocate	Councils, State Gov, Aus Gov, RDA, CCA, ML, WNWW
	1.4.2 Build partnerships and leverage existing outreach efforts and programs to directly reach, communicate with and encourage participation of diverse groups	H	Facilitate	Beacon, WNWW, YFCC, DOE, NWIIG, TWA, BW, ML, project proponents
	1.4.3 Engage with the Tasmanian Aboriginal Community and affiliated organisations and groups to promote job and training opportunities	H	Facilitate	Tasmanian Aboriginal Community representatives, WNWW, ML, project proponents
	1.4.4 Build partnerships and leverage existing youth mentoring programs in the lead-up to construction with an aim to assist young adults to be 'work ready'	H	Facilitate	Beacon, BW, GTOs, TWA, TTW, TYEA, YFCC, WNWW, ML, project proponents
	1.4.5 Build partnerships and leverage existing programs to provide proponents with guidance and advice to assist gender equity and diversity in the workforce	H	Facilitate	NWIIG, ParentsNext, TTW, TWA, Beacon, BW, WNWW

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
1.5 Coordinate regional workforce development and deployment	1.5.1 Develop initiatives that smooth out construction peaks and troughs across major projects state-wide, alleviate competitive tensions between local businesses, encourage collaboration and build commitment in businesses to invest in staff and training	M	Advocate	ML, project proponents, Hydro, DSG, Keystone, AWNW, WNWW, NECA, CCF, State Gov, ReCFIT, TMEC
	1.5.2 Work with partners to understand the opportunities for skill and resource sharing nationally to address skill gaps in areas of niche expertise	M	Advocate	CEC, ML, NECA, CCF, Skills Tas
	1.5.3 Develop a centralised planning device to facilitate workforce redeployment within the renewable energy and related sectors in the region	M	Advocate	Skills Tas, AWNW, WNWW, TMEC, ML, project proponents
	1.5.4 Develop a micro-credentialing scheme making it easy for life-long learning and career switching into the renewable energy industry and between projects	M	Advocate	Skills Tas, TasTAFE, RTOs, UTAS, Keystone, CCF
1.6 Be a model project proponent, driving local economic and social benefits for the region	1.6.1 Be open and transparent with data between renewable energy and major infrastructure projects in the region	H	Advocate	Skills Tas, Keystone, Project proponents, Skills Tas, ML, project proponents
	1.6.2	H	Advocate	Keystone, Skills Tas, ReCFIT, CEC

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
	Expand skill demand forecasts (like SOFIA) to include broader range of renewable energy projects in the region			
	1.6.3 Be an active member of industry groups and programs in the region	H	Provide	ML, project proponents
	1.6.4 Learn from other Renewable Energy Zones and major projects and collaborate to promote best practice workforce development	M	Facilitate	BBAMZ, CEC, Energy Vic, Snowy Hydro, Energy Vic, ML, project proponents
	1.6.5 GBEs and State-owned companies to collaborate and position themselves as role models for effective hiring and training programs in the state	M	Provide, Facilitate	GBEs, SOCs

THEME 2: PROCUREMENT AND OPPORTUNITIES FOR LOCAL BUSINESSES

Objective #2: To deepen local supply chains, support business development, and increase spending and investment in the local economy through procurement processes and decision making.

TABLE 4: PROCUREMENT AND OPPORTUNITIES FOR LOCAL BUSINESSES – OPPORTUNITIES & ACTIONS

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
2.1 Promote the business procurement opportunities	2.1.1 Clearly communicate the local content opportunities with key target audiences (linked to actions 1.2.2, 3.1.1, 4.1.1 & 5.1.1)	H	Provide	ICN, ML, project proponents
	2.1.2 Identify where opportunities for SME participation align with local capability (linked to action 1.2.1) and communicate the forecast opportunities with local businesses	H	Facilitate	ICN, Skills Tas, WNWW, ML, project proponents
	2.1.3 Use renewable energy development to demonstrate the benefits of social procurement and increase project opportunities for social enterprises	H	Advocate	ST, BW, ML, project proponents
2.2 Develop procurement processes to localise spending benefits	2.2.1 Develop procurement strategies to localise spending in major projects	H	Provide	ML, project proponents
	2.2.2 Develop a range of non-financial procurement evaluation criteria	H	Provide	ML, project proponents

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
2.3 Lift local business capacity and capability	2.3.1 Understand the barriers to local SME participation, including the barriers created by complex procurement processes	H	Facilitate	ML, project proponents, BEC, DSG, AusIndustry
	2.3.2 Create opportunities for local businesses to build their capacity and capability	H	Facilitate	BEC, DSG, AusIndustry, TCCI, WNWW
	2.3.3 Promote the local renewable energy supply chain to new proponents entering the region	H	Advocate	DSG, OCG, ReCFIT, ICN
2.4 Expand business and government collaboration, partnerships and networks	2.4.1 Pursue (and leverage existing) industry, academic and government partnerships to encourage local business development	M	Facilitate	Industry, DSG
	2.4.2 Bring businesses together through events and forums (like meet the buyer) and provide introductions for firms who could collaborate	H	Provide, Facilitate	ICN, DSG, CoC, Head contractor, Industry

THEME 3: INFRASTRUCTURE, ASSETS AND MARKET BENEFITS

Objective #3: To generate wealth, financial savings and market benefits for residents, local businesses and industry through the provision of more affordable, cleaner and reliable energy.

TABLE 5: INFRASTRUCTURE, ASSETS AND MARKET BENEFITS – OPPORTUNITIES & ACTIONS

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
3.1 Continue to explore, confirm and communicate the benefits	3.1.1 Communicate the local and State benefits of hosting nationally significant renewable energy infrastructure in terms of reduced energy costs, increased reliability, enabling local investment and economic opportunities, and leading the nation in climate change mitigation (linked to actions 1.2.2, 2.1.1, 4.1.1 & 5.1.1)	H	Provide	ML, ReCFIT
	3.1.2 Given that Project Marinus and the induced investments benefit the entire National Electricity Market, work with stakeholders to advocate for and secure commonwealth Government funding for key community infrastructure and projects (linked to action 1.4.1 above)	H	Advocate	Councils, CCA, State Gov, RDA, Aus Gov, ML, project proponents
	3.1.3 Work with market participants to identify any further specific actions outside of the project delivery	M	Facilitate	ML, project proponents
	3.1.4	L	Provide	ML, OCG

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
	Further define and communicate the fibre-optic benefit and opportunity to Tasmania from Project Marinus			

THEME 4: LOCAL AND REGIONAL COMMUNITY BENEFITS

Objective #4: To generate flow-on economic, social and environmental benefits for local communities.

TABLE 6: LOCAL AND REGIONAL COMMUNITY BENEFITS – OPPORTUNITIES & ACTIONS

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
4.1 Focus on creating an enduring economic legacy	4.1.1 Incorporate the long-term, generational legacy story of the renewable energy opportunity in emotive branding and community engagement (linked to actions 1.1.2, 2.1.1, 3.1.1 & 5.1.1)	H	Provide	ML, project proponents, State Gov
	4.1.2 Support opportunities to embed new arrivals into the community and mitigate against a FIFO mindset forming	M	Facilitate	ML, project proponents, Councils
	4.1.3 Understand the current housing supply profile for the region and define the impact NWTD and the induced investments may have (linked to action 1.4.1 above)	H	Facilitate	RDA Tas, CCA, Councils, State Gov, Project proponents, ML
4.2 Utilise supporting infrastructure for community benefit	4.2.1 Explore increased use of easements on community land	M	Provide	
	4.1.2 Explore adaptable housing options for project workforce (linked to action 4.1.3 above)	H	Facilitate	Councils, State Gov, project proponents, ML

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
4.3 Share benefits with the community	4.3.1 Develop and implement a Community Benefit Sharing (CBS) framework for NWTD	M	Provide	Youth Panel
	4.3.2 Develop and implement a Community Investment Program for NWTD	H	Provide	
	4.3.3 Explore the benefits of a Regional Enhancement Fund whereby renewable energy proponents within the region contribute funding to support ambitious and strategic projects or initiatives for the benefit of the regional community	L	Facilitate	ML, project proponents, RDA Tas
	4.3.4 Develop the State Government's Renewable Energy Coordination Framework	H	Facilitate	ReCFIT, State Gov

THEME 5: PUBLIC AND PRIVATE SECTOR INVESTMENT

Objective #5: To encourage and enable additional public and private sector investment in flow-on opportunities in renewable energy, manufacturing and other sectors.

TABLE 7: PUBLIC AND PRIVATE SECTOR INVESTMENT – OPPORTUNITIES & ACTIONS

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
5.1 Build the region's green industry brand	5.1.1 Develop narratives around the social, economic and environmentally beneficial growth opportunities for Tasmania that are consistent across government and industry (linked to actions 1.2.2, 2.1.1, 3.1.1 & 4.1.1)	H	Facilitate	ReCFIT, State Gov, Brand Tas, ML, Industry, Councils
	5.1.2 Develop and deploy a business decarbonisation transition support strategy to assist industry/businesses that have high carbon outputs from sources other than energy to further decarbonise the local economy	M	Advocate	ReCFIT, TFGA, TMEC
	5.1.3 Advocate for the attraction of new industry / businesses to Tasmania that wish to operate with a low carbon footprint using clean, green energy	M	Advocate	Councils, OCG
5.2 Enable flow-on industry investment	5.2.1 Share learnings through the design & approvals and construction phases with other project proponents and industry participants in the region	M	Provide	ML, project proponents

Opportunities Identified opportunity or need	Actions What actions are required to achieve this?	Priority	TasNetworks' role	Proposed delivery partners*
	5.2.2 Increase the attractiveness of the region for private investment into the supply chains of the renewable energy sector and build confidence	H	Advocate	Councils, OCG, State Gov
	5.2.3 Develop circular economy opportunities within the renewable energy and transmission sectors in Tasmania	H	Advocate	Councils, State Gov, RDA Tas, LGAT
	5.2.4 Identify existing capacity of local manufacturing businesses to participate in transmission and generation manufacturing	H	Advocate	ICN, State Gov
	5.2.5 Identify, foster and promote emerging business leaders, innovators and entrepreneurs in the renewable energy industry and its supply chains	M	Advocate	State Gov, ReCFIT, Councils, CoC

*Proposed delivery partners were identified during the co-design process with regional stakeholders. A glossary of partner organisations can be found in the appendix.

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Appendix

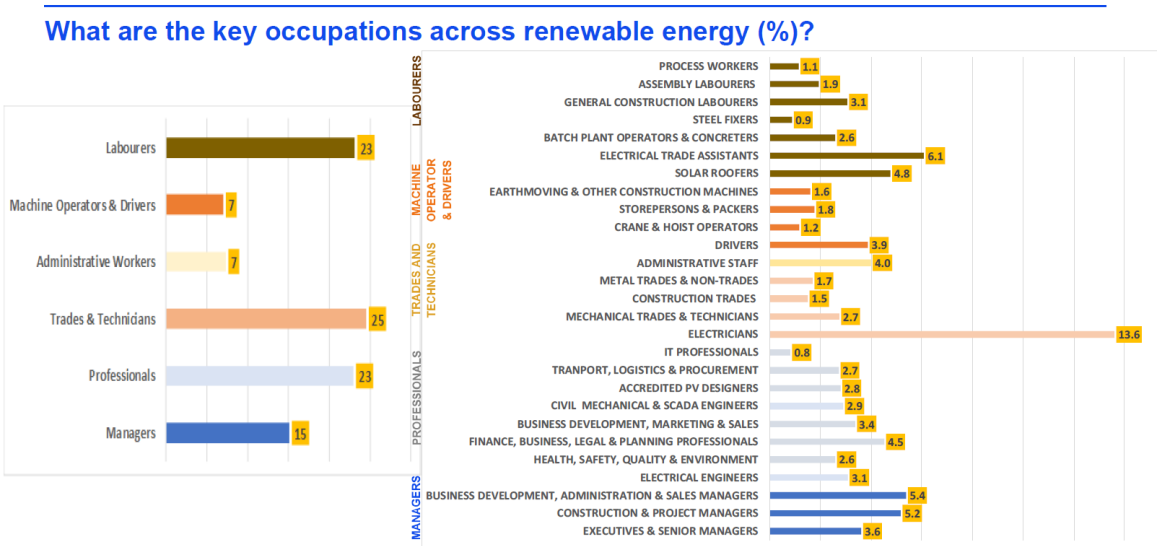
Induced jobs results and method

To calculate the occupation type and number of jobs for the induced energy generation, SGS followed the following steps:

1. Took the estimates for the number of direct jobs from the Earnst & Young report on the economic contribution of Marinus Link (Ernst & Young Australia, 2019)
2. Collected research by the Institute of Sustainable Futures (Institute of Sustainable Futures, 2020), who have estimated occupation shares for renewable energy projects in Tasmania (Figure 25), including for pumped hydro. The Institute of Sustainable Futures analysis is available at *https://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-futures/renewable-energy-employment-australia*
3. The total number of direct jobs as estimated by Earnt & Young were multiplied by the occupation shares (1-level) as shown on the left-hand side of the figures below, to give the number of jobs by occupation type
4. The right-hand side of the figures were then used to add context

Given the assumptions used, the estimates should be considered as an approximate measure. The results of the exercise are shown in Table 4.

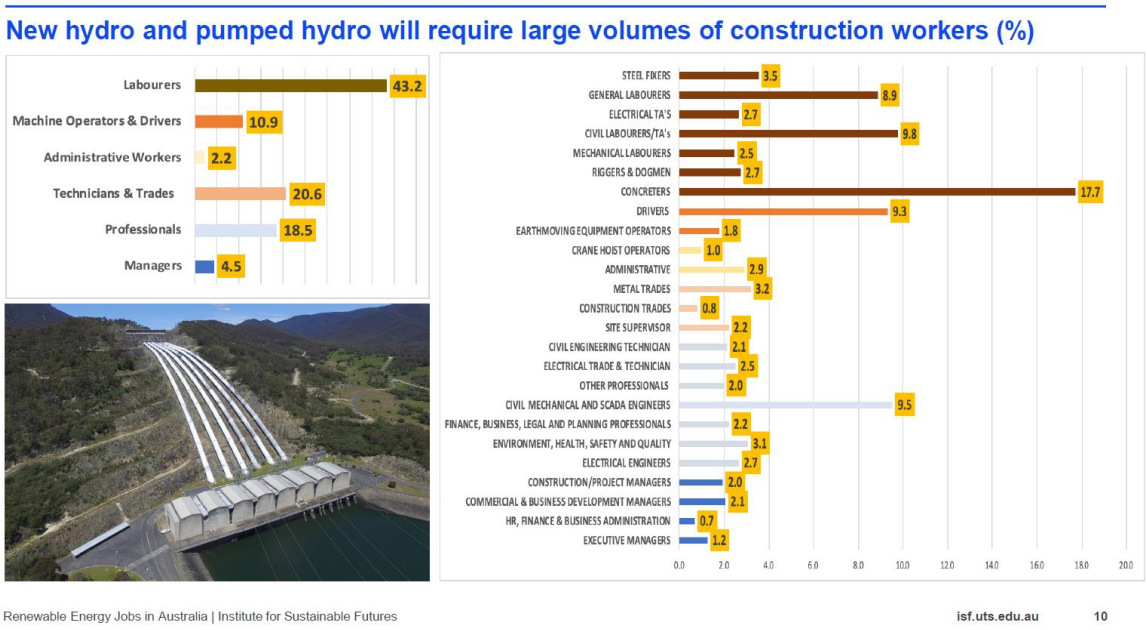
FIGURE 25: OCCUPATION ESTIMATES CALCULATED BY THE INSTITUTE OF SUSTAINABLE FUTURS FOR TASMANIA



Note: the figures are an average for each occupation in the Step Change Scenario 2020-2035 across Australia. Some of the minor occupations have not being included in the detailed figure.

Source: Institute of Sustainable Futures (2020). Renewable Energy Employment in Australia, Tasmania Summary

FIGURE 26: OCCUPATION ESTIMATES CALCULATED BY THE INSTITUTE OF SUSTAINABLE FUTURS FOR PUMPED HYDRO IN TASMANIA



Source: Institute of Sustainable Futures (2020). Renewable Energy Employment in Australia, Tasmania Summary

TABLE 4: SGS ESTIMATES OF JOB YEARS BY OCCUPATION SUPPORTED

	Project Marinus		Induced Wind		Induced Hydro	
Occupation type	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Professionals	159	219	482	1,146	368	175
Technicians and Trades Workers	299	158	524	1,246	407	194
Managers	158	85	314	748	89	42
Community & Personal Service Workers	7	1	0	0	0	0
Clerical and Administrative Workers	126	92	147	349	44	21
Sales Workers	11	7	0	0	0	0
Machinery Operators and Drivers	242	7	147	349	216	103
Labourers	261	5	482	1,146	854	408
Total direct job years	**1,263**	**573**	**2,095**	**4,984**	**1,978**	**943**

The direct job estimates by occupation for Marinus Link were developed using the same method as the induced jobs, except the occupation splits were sourced from ABS data on the electrical transmission (for operation) and heavy and civil engineering construction (for construction) industries.

The next two tables provide more depth on job creation/demand by occupation type, again using the same method as above. These estimates should be used with extreme caution. The method used to calculate the worker demand by occupation is a rough estimate only, using generalised data for the electricity transmission and non-civil engineering construction industries. More robust estimates should be prepared by the project design and management team to take into consideration the special characteristics of the NWTD project

TABLE 5: SGS ESTIMATES OF JOB YEARS BY OCCUPATION SUPPORTED 2020-2050 (GREATER DETAIL)

Occupation (3-digit level from ABS)	Operation	Construction
Managers, nfd	2	5
Chief Executives, General Managers and Legislators	7	14
Farmers and Farm Managers	0	0
Specialist Managers, nfd	2	5
Advertising, Public Relations and Sales Managers	7	7
Business Administration Managers	17	20
Construction, Distribution and Production Managers	27	82
Education, Health and Welfare Services Managers	0	0
ICT Managers	9	3
Miscellaneous Specialist Managers	7	10
Hospitality, Retail and Service Managers, nfd	0	0
Accommodation and Hospitality Managers	0	1
Retail Managers	1	2
Miscellaneous Hospitality, Retail and Service Managers	6	9
Professionals, nfd	6	1
Arts and Media Professionals, nfd	0	0
Arts Professionals	0	0
Media Professionals	1	1
Business, Human Resource and Marketing Professionals, nfd	1	0
Accountants, Auditors and Company Secretaries	15	12
Financial Brokers and Dealers, and Investment Advisers	2	0
Human Resource and Training Professionals	8	7
Information and Organisation Professionals	15	5
Sales, Marketing and Public Relations Professionals	10	4
Design, Engineering, Science and Transport Professionals, nfd	1	0
Air and Marine Transport Professionals	0	1
Architects, Designers, Planners and Surveyors	4	10
Engineering Professionals	109	92
Natural and Physical Science Professionals	4	4
Education Professionals, nfd	0	0

School Teachers	0	0
Tertiary Education Teachers	1	1
Miscellaneous Education Professionals	0	0
Health Professionals, nfd	0	0
Health Diagnostic and Promotion Professionals	4	11
Health Therapy Professionals	0	0
Medical Practitioners	0	0
Midwifery and Nursing Professionals	0	0
ICT Professionals, nfd	3	1
Business and Systems Analysts, and Programmers	13	3
Database and Systems Administrators, and ICT Security Specialists	7	2
ICT Network and Support Professionals	13	2
Legal, Social and Welfare Professionals, nfd	0	0
Legal Professionals	2	1
Social and Welfare Professionals	0	1
Technicians and Trades Workers, nfd	2	4
Engineering, ICT and Science Technicians, nfd	2	1
Agricultural, Medical and Science Technicians	0	1
Building and Engineering Technicians	35	81
ICT and Telecommunications Technicians	11	2
Automotive and Engineering Trades Workers, nfd	0	2
Automotive Electricians and Mechanics	1	8
Fabrication Engineering Trades Workers	0	41
Mechanical Engineering Trades Workers	3	39
Panelbeaters, and Vehicle Body Builders, Trimmers and Painters	0	1
Construction Trades Workers, nfd	0	1
Bricklayers, and Carpenters and Joiners	0	20
Floor Finishers and Painting Trades Workers	0	2
Glaziers, Plasterers and Tilers	0	2
Plumbers	0	23
Electrotechnology and Telecommunications Trades Workers, nfd	2	1
Electricians	52	35
Electronics and Telecommunications Trades Workers	36	22
Food Trades Workers	0	1
Skilled Animal and Horticultural Workers, nfd	0	0
Animal Attendants and Trainers, and Shearers	0	0
Horticultural Trades Workers	1	6
Other Technicians and Trades Workers, nfd	0	0

Hairdressers	0	0
Printing Trades Workers	0	0
Textile, Clothing and Footwear Trades Workers	0	0
Wood Trades Workers	0	0
Miscellaneous Technicians and Trades Workers	12	5
Community and Personal Service Workers, nfd	0	0
Health and Welfare Support Workers	0	1
Carers and Aides, nfd	0	0
Child Carers	0	0
Education Aides	0	0
Personal Carers and Assistants	0	0
Hospitality Workers	0	2
Protective Service Workers, nfd	0	0
Defence Force Members, Fire Fighters and Police	0	3
Prison and Security Officers	0	1
Sports and Personal Service Workers, nfd	0	0
Personal Service and Travel Workers	0	0
Sports and Fitness Workers	0	1
Clerical and Administrative Workers, nfd	0	0
Office Managers and Program Administrators, nfd	0	0
Contract, Program and Project Administrators	32	23
Office and Practice Managers	4	16
Personal Assistants and Secretaries	7	8
General Clerical Workers, nfd	0	0
General Clerks	6	19
Keyboard Operators	3	4
Inquiry Clerks and Receptionists, nfd	0	0
Call or Contact Centre Information Clerks	5	3
Receptionists	3	5
Numerical Clerks, nfd	0	0
Accounting Clerks and Bookkeepers	11	30
Financial and Insurance Clerks	1	0
Clerical and Office Support Workers	3	3
Other Clerical and Administrative Workers, nfd	0	0
Logistics Clerks	10	9
Miscellaneous Clerical and Administrative Workers	8	6
Sales Workers, nfd	0	0
Sales Representatives and Agents, nfd	0	0

Insurance Agents and Sales Representatives	3	5
Real Estate Sales Agents	1	0
Sales Assistants and Salespersons	3	5
Sales Support Workers, nfd	0	0
Checkout Operators and Office Cashiers	0	0
Miscellaneous Sales Support Workers	0	0
Machinery Operators and Drivers, nfd	1	8
Machine and Stationary Plant Operators, nfd	0	1
Machine Operators	1	22
Stationary Plant Operators	1	27
Mobile Plant Operators	1	119
Road and Rail Drivers, nfd	0	2
Automobile, Bus and Rail Drivers	0	4
Delivery Drivers	0	0
Truck Drivers	0	50
Storepersons	4	9
Labourers, nfd	0	8
Cleaners and Laundry Workers	1	25
Construction and Mining Labourers	0	181
Factory Process Workers, nfd	0	0
Food Process Workers	0	0
Packers and Product Assemblers	1	1
Miscellaneous Factory Process Workers	0	5
Farm, Forestry and Garden Workers	1	6
Food Preparation Assistants	0	1
Other Labourers, nfd	0	0
Freight Handlers and Shelf Fillers	0	1
Miscellaneous Labourers	2	32
Total	573	1263

FIGURE 27: SGS ESTIMATES OF JOB YEARS BY OCCUPATION SUPPORTED FOR INDUCED INVESTMENTS 2020-2050 (GREATER DETAIL)

Direct jobs from EY Report	Hydro	Wind
Process workers	0	78
Assembly labourers	0	135
General construction labourers	260	219
Steel fixers	102	64
Batch plant operators and concreters	517	184
Electrical trade assistant	79	432
Civil labourers and trade assistants	286	0
Mechanical labourers	73	0
Riggers and dogmen	79	0
Solar roofers	0	340
Earthmoving and other construction machines	53	113
Store persons & packers	0	127
crane and hoist operators	29	85
Drivers	272	276
Administrative staff	85	283
Metal trades and non-trades	93	120
Construction trades	23	106
Site supervisor	64	0
Civil engineering technician	61	0
Mechanical trades and technicians	0	191
Electricians	73	963
IT professionals	0	57
Transport, logistics and procurement	0	191
Accredited PV designers	0	198
Civil, mechanical and SCADA engineers	277	205
Business development, marketing and sales	79	241
Finance, business, legal and planning professionals	64	319
Health, safety, quality and environment	91	184
Electrical engineers	79	219
Business development, marketing and sales managers	61	382
Construction and project managers	58	368
Executives and senior managers	35	255

Glossary of partner organisations

Abbreviation	Organisation
Aus Gov	The Australian Government
AusIndustry	AusIndustry (part of the Australian Government Department of Industry, Science, Energy & Resources and offer a range of grant and funding programs for the development of Australian businesses)
AC	Area Connect (Flexible transportation that serves smaller and more remote communities in Tasmania created and developed by Community Transport Services Tasmania)
AWNW	Advance West North West (association that seeks to maximise the opportunity for all Tasmanians, particularly the capabilities, skills and trades located in the West and North-western part of our state, to engage with the burgeoning and growing renewable energy sector)
BBAMZ	Bell Bay Advanced Manufacturing Zone (industry based economic development group working in collaboration with government and community to support growth, investment and business diversification in the George Town and Tamar Valley region)
Beacon	Beacon Foundation (supports young people to successfully transition from education to meaningful employment)
BEC	Business Enterprise Centres (funded by Tasmanian Gov Department of State Growth and providing business advice to local businesses)
BHAC	Brumby Hill Aboriginal Corporation (offers a holistic service to meet the employment needs of indigenous people in Tasmania)
BW	Burnie Works (collective impact initiative contributing in the areas of education, employment, justice, child youth families and wellbeing)
Blue Economy CRC	Blue Economy Cooperative Research Centre (based at UTAS in Launceston, does industry research on aquaculture, marine renewable energy, maritime engineering, environmental assessments and policy and regulation)
CatholicCare	CatholicCare Tasmania (The primary social services agency of the Catholic Church across Tasmania)
CCA	Cradle Coast Authority
CCF	Civil Contractors Federation
CEC	Clean Energy Council (peak body for the clean energy industry in Australia)
CoC	Local Chambers of Commerce (including TCCI, Business Northwest, Central Coast Chamber of Commerce)

Abbreviation	Organisation
Councils	Local Government bodies located in the NW region
DoE	Tasmanian State Department of Education
DHHS	Tamanian Department of Health & Human Services
DPAC	Tasmanian Department of Premier & Cabinet
DPIPWE	Tasmanian Department of Primary Industry, Parks, Water & Environment
DSG	Tasmanian Department of State Growth
Energising Tas	Energising Tasmania (Skills Tasmania program to develop a skilled workforce equipped with the expertise needed for the Battery of the Nation initiative and, more broadly, the renewable energy and related sectors in Tasmania)
Energy Vic	Energy Victoria (State Government body delivering the REZs in Victoria including Gippsland)
GBEs	Government Business Enterprises (Sustainable Timber, Hydro, Motor Accident Insurance Board, Port Arthur Historic Site, Public Finance Corporation, the Public Trustee)
GTOs	Group Training Organisations
Head contractor	Successful tendered head contractor appointed by TasNetworks to deliver the NWTD project
HIA	Housing Industry Association (has a Youthbuild program for secondary students)
Hydro	Hydro Tasmania
ICN	Industry Capability Network Tas (part of Tasmanian State Gov Department of State Growth)
ITH	Industry Training Hub (Burnie)
Keystone	Keystone Tasmania (the Tasmanian Building and Construction Industry Training Board. Created SOFIA a workforce modelling dashboard)
LGAT	Local Government Association of Tasmania
ML	Marinus Link Pty Ltd
NECA	National Electrical & Communications Association
NETTS	National Energy Technician Training Scheme (delivered by Programmed Skilled Workforce)
NWIIG	NW Industry Inclusion Group (aims to drive inclusive growth through the participation of women in industry across the North West coast of Tasmania)

Abbreviation	Organisation
NW Secondary Schools	Secondary and senior secondary schools located in the NW region
OCG	Office of the Coordinator General (part of Tasmanian State Gov Department of State Growth)
ParentsNext	ParentsNext (An Australian Government support service for parents with children under 6 to help with study and work goals)
Project Proponents	Proponents of major renewable energy and infrastructure projects proposed for the NW region
RACI	Royal Australian Chemical institute Tasmania (has a large focus on science outreach activities)
RAW	Rural Alive and Well
RDA	RDA Tasmania (an Australian Government initiative established to encourage partnership between all levels of government to enhance the growth and development of Australia's regional communities)
ReCFIT	Renewables, Climate and Future Industries Tasmania (State Government)
RTOs	Registered Training Organisations
SENTAS	Social Enterprise Network Tasmania
SJAH	St Joseph Affordable Homes (Social enterprise delivering social and affordable homes with training and employment opportunities including an in-house apprenticeship scheme)
Skills Tas	Skills Tasmania (administers the Tasmanian traineeship and apprenticeship system) and Energising Tasmania
Snowy Hydro	Snowy Hydro 2.0 (the largest committed renewable energy project in Australia)
SOCs	State-owned Companies (Aurora Energy, Metro Tas, Tasmania Irrigation, Tas Ports, Tasmania Railway, TasRacing, TT-Line)
ST	Social Traders
SLT	Sustainable Living Tasmania (non-profit organisation focussed on education and advocacy for sustainability)
TAC	Tasmanian Aboriginal Centre (represents the political and community development aspirations of the Tasmanian Aboriginal community)
TasTAFE	TasTAFE

Abbreviation	Organisation
TMEC	Tasmanian Minerals, Manufacturing and Energy Council
TN	TasNetworks
TTW	Transition to Work employment services (an Australian Government service which helps young people into work (including apprenticeships and training) or education)
TWA	Tradeswomen Australia
TYEA	Tasmanian Youth Employment Alliance (provides a Youth Navigator program which helps young school leavers find opportunities in further education, training, and jobs)
UTAS	The University of Tasmania (has a campus in Burnie)
YFCC	Youth, Family & Community Connections Inc. (not for profit community organisation that provides a range of services to young people, families and individuals across the North West Coast and West Coast of Tasmania)
Youth Panel	TasNetworks Youth Panel responsible for co-designing the Community Benefit Sharing framework for NWTD
WNWW	West North West Working - Regional Jobs Hub (State Government service working with job seekers to address barriers to work, including skills and transport)

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