The economic contribution of Project Marinus

Marinus Link

October 2023

Building a better working world

Notice

Ernst & Young was engaged on the instructions of Marinus Link ("Client")] to estimate the economic contribution of Project Marinus ("Project")], in accordance with the service order dated 2 August 2023.

The results of Ernst & Young's work, including the assumptions and qualifications made in preparing the report, are set out in Ernst & Young's report dated October 2023 ("Report"). The Report should be read in its entirety including the transmittal letter, the applicable scope of the work and any limitations. A reference to the Report includes any part of the Report.

Ernst & Young has prepared the Report for the benefit of the Client and has considered only the interests of the Client. Ernst & Young has not been engaged to act, and has not acted, as advisor to any other party. Accordingly, Ernst & Young makes no representations as to the appropriateness, accuracy or completeness of the Report for any other party's purposes.

Our work commenced on 02 August 2023 and was completed on 20 October 2023. No further work has been undertaken by EY since the date of the Report to update it, and EY has no responsibility to update the Report to take account of events or circumstances arising after that date. Therefore, our Report does not take account of events or circumstances arising after 20 October 2023.

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Ben Gourlay
Head of Government Relations
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25 October 2023

Building a better working world

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Dear Ben

In accordance with our Engagement Agreement dated 2 August 2023 ("Agreement"), Ernst & Young ("we" or "EY") has been engaged by the Marinus Link ("you" or the "Client") to provide an economic contribution report (the "Services"). The enclosed report (the "Report") sets out the outcomes of our work. You should read the Report in its entirety. A reference to the report includes any part of the Report.

Purpose of our Report and restrictions on its use

Please refer to a copy of the Agreement for the restrictions relating to the use of our Report. We understand that the deliverable by EY will be used for the purpose of understanding the economic benefits of Project Marinus (the "Purpose"). This Report was prepared on the specific instructions of the Marinus Link solely for the Purpose and should not be used or relied upon for any other purpose. This Report and its contents may not be quoted, referred to or shown to any other parties except as provided in the Agreement. We accept no responsibility or liability to any person other than to Marinus Link or to such party to whom we have agreed in writing to accept a duty of care in respect of this Report, and accordingly if such other persons choose to rely upon any of the contents of this Report they do so at their own risk.

Nature and scope of our work

The scope of our work, including the basis and limitations, are detailed in our Agreement and in this Report. Our work commenced on 02 August 2023 and was completed on 20 October 2023. No further work has been undertaken by EY since the date of the Report to update it, and EY has no responsibility to update the Report to take account of events or circumstances arising after that date. Therefore, our Report does not take account of events or circumstances arising after 20 October 2023. In preparing this Report we have considered and relied upon information from a range of sources believed to be reliable and accurate. We have not been informed that any information supplied to us, or obtained from public sources, was false or that any material information has been withheld from us. We do not imply and it should not be construed that we have verified any of the information provided to us, or that our enquiries could have identified any matter that a more extensive examination might disclose. The work performed as part of our scope considers information provided to us and [only a combination / a number of combinations] of input assumptions relating to future conditions, which may not necessarily represent actual or most likely future conditions. Additionally, modelling work performed as part of our scope inherently requires assumptions about future behaviours and market interactions, which may result in forecasts that deviate from future conditions. There will usually be differences between estimated and actual results, because events and circumstances frequently do not occur as expected, and those differences may be material. We take no responsibility that the projected outcomes will be achieved, if any. We highlight that our analysis and Report do not constitute investment advice or a recommendation to you on a future course of action. We provide no assurance that the scenarios we have modelled will be accepted by any relevant authority or third party. Our conclusions are based, in part, on the assumptions stated and on information provided by Marinus Link and other information sources used during the course of the engagement . The modelled outcomes are contingent on the collection of assumptions as agreed with Marinus Link and no consideration of other market events, announcements or other changing circumstances are reflected in this Report. Neither Ernst & Young nor any member or employee thereof undertakes responsibility in any way whatsoever to any person in respect of errors in this Report arising from incorrect information provided by Marinus Link or other information sources used. This letter should be read in conjunction with our Report, which is attached.

Yours sincerely

Lars Rognlien, Associate Partner

Executive summary

Project Marinus – Connecting economies and communities

Project Marinus includes both Marinus Link and the North-West Transmission Developments (NWTD). Marinus Link is a proposed undersea DC transmission link (and telecommunications connector) between Tasmania and Victoria. Construction for Stage 1 of Project Marinus is expected to commence in 2025 and will take around five years to complete.[1]

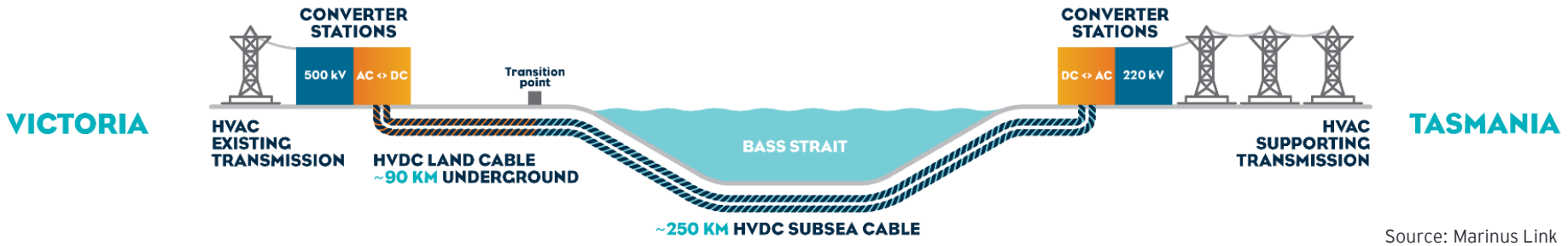
The construction and operations of Project Marinus are expected to provide **$2,094 million** in economic contribution for Tasmania, as well as **$1,781 million** in economic contribution for Victoria.[2] This consists of:

- Stage 1 of Marinus Link, which is expected to provide **$836 million** in economic contribution for Tasmania and **$1,008 million** in economic contribution for Victoria.
- Stage 2 of Marinus Link, which is expected to provide **$641 million** in economic contribution for Tasmania and **$773 million** in economic contribution for Victoria.
- The NWTD, which is expected to provide **$617 million** in economic contribution for Tasmania.

During the peak construction period (2027 to 2029), Project Marinus is expected to support an average of **1,644** jobs per year in Tasmania and **1,675** jobs per year in Victoria, consisting of:

- Stage 1 of Marinus Link, which supports an average of **673** jobs per year in Tasmania and **857** jobs per year in Victoria.
- Stage 2 of Marinus Link, which supports an average of **643** jobs per year in Tasmania and **818** jobs per year in Victoria.
- The NWTD, which supports an average of **328** jobs per year in Tasmania.

In addition, during the peak construction period for Stage 1 only (2025 to 2027), Stage 1 of Marinus Link and the NWTD are expected to support an average of **1,424** jobs per year in Tasmania and **993** jobs per year in Victoria.



Source: Marinus Link

1. Information about Project Marinus' costs and development timeframe were provided by Marinus Link
2. The economic contribution (value add) and job years (used here to represent FTE years) presented are the total impact (direct, indirect and induced). Project Marinus is assumed to be operational from 2030 – 2050 (20 years). All values are in real 2023 AUD. Refer to page 12 for a detailed explanation of the interpretation of economic contribution (value add) and FTE. These numbers are gross consistent with the application of economic contribution analysis.

Overview

This Report

Marinus Link has engaged EY to undertake an assessment of the economic contribution of Project Marinus (which includes both Marinus Link and the North-West Transmission Developments) construction and operating phases. The analysis provided is also intended to assist in quantifying the contribution of any projects that may be enabled by the construction and operations of Marinus Link. Economic contribution is a gross measure rather than a net measure of the contribution of an industry or a project to the economy and does not consider substitution impacts, or what would happen if the relevant industry did not exist, or the relevant project did not occur. The value-add estimates are therefore gross measures, as are employment impacts.

This report is an update to the 2019 report for Marinus Link. This version of the report uses updated multipliers (from 2020-21), and new Project Marinus construction and operating costs provided by Marinus Link. This version of the report also draws from updated energy market modelling from the 2021 Project Assessment Conclusions Report (PACR) submission.

Project Marinus

Project Marinus includes Marinus Link (or the Second Bass Strait DC Interconnector) ("Marinus Link"), along with significant supporting on-island AC transmission upgrades (The North-West Transmission Developments ("NWTD")). Project Marinus is planned to deliver a High Voltage Direct Current (HVDC) electricity transmission connection between mainland Victoria and Tasmania. If built as planned, Marinus Link will complement the existing Basslink interconnector, which began trading energy between Tasmania and Victoria via the National Electricity Market in 2006. Project Marinus is expected to be completed in two stages ("Stage 1" and "Stage 2"). Each stage is expected to take five years to construct. The estimated project cost for Marinus Link (between 2025 and 2030) used in this analysis is $5.9 billion, with a further $0.8 billion for the NWTD (between 2025 and 2030).[1]

Note that updated costs were released for Project Marinus after the completion of the analysis presented in this report. As of September 2023, Marinus Link is estimated to cost between $5 and $5.5 billion. The analysis in this report uses the previous estimated cost of $5.9 billion.

Tasmanian renewable energy projects enabled by Project Marinus

Marinus Link is expected to induce the investment in further renewable electricity generation in Tasmania to meet the growing demand for cleaner energy from the National Electricity Market (NEM). The magnitude of installed capacity (MW) and timeframe is estimated using EY's "Market Model", which forecasts generator dispatch and new builds. This analysis considers two Australian Energy Market Operator (AEMO) 2020 Integrated System Plan scenarios:

- **Central** – this scenario reflects the transition of the energy industry under current policy settings and technology trajectories.
- **Step Change** – under this scenario it is assumed Australia takes strong action on climate change. The NEM targets a 90% reduction in emissions from 2016 levels by 2050. In this scenario, aggressive global decarbonisation leads to faster technological improvements.

The analysis of induced investment in both scenarios focuses on the incremental capacity. That is, the resulting capacity over and above a base case where Marinus Link does not proceed.

Potential Tasmanian Data Hub

Project Marinus also includes the installation of data communications equipment, which is expected to add substantial telecommunications capacity for Tasmania. This report estimates the economic contribution of enabling further data centre capacity, based on MW of additional data hub capacity provided to EY by Marinus Link. These benefits consider the economic contribution of the construction of additional data centre capacity in Tasmania as a result of Project Marinus.

1. This information was provided by Marinus Link. Note that this analysis does not include NWTD costs from 2024, as the modelling period is from 2025-2050.

Economic contribution analysis – value add

Our approach involves using economic contribution analysis to capture the direct effects of an industry (i.e. revenues or output) relevant to Tasmania and Victoria. We then apply an economic multiplier to capture the flow-on (or 'indirect and induced') effects of Project Marinus's construction and operating phases. We applied this same process to the additional renewable energy projects and data centre capacity in Tasmania enabled by Project Marinus. The results in the below table assumes that both Marinus Link and the NWTD are both operational by 2030. The results here are the total over the modelling period (2025 – 2050), have not been discounted and are in real 2023 AUD.

Total estimated value add supported in Tasmania and Victoria as part of construction and operations of Project Marinus and Tasmanian enabled investments, (2025 – 2050), real 2023 $m.

Value add, 2023 $m	Marinus Link - Stage 1		Marinus Link - Stage 2		North-West Transmission Developments	Tasmanian renewable energy projects enabled by Project Marinus[1]				Potential Tasmanian Data Hub[2]
	Tasmania	*Victoria*	*Tasmania*	*Victoria*		*Scenario 1. Central*	*Scenario 2. Step Change*	*Scenario A1. Central - 50% new wind*	*Scenario A2. Step Change - 50% new wind*	
Construction										
Direct	359	359	261	261	277	674	1,255	643	1,768	960
Indirect	197	266	143	193	152	370	688	352	969	526
Induced	154	231	112	168	119	289	539	276	759	412
Subtotal	710	856	515	621	548	1,334	2,481	1,271	3,496	1,899
Operations										
Direct	62	62	62	62	34	38	160	222	254	
Indirect	44	60	44	60	24	31	133	184	211	
Induced	19	30	19	30	10	13	57	79	91	
Subtotal	126	152	126	152	69	82	350	485	556	
Total	**836**	**1,008**	**641**	**773**	**617**	**1,416**	**2,831**	**1,756**	**4,052**	**1,899**

Source: EY analysis of Marinus Link data and the 2021 PACR modelling submission

Note that this analysis does not consider what investments would take place outside Tasmania in the absence of the Marinus Link Project, including any renewable or other generation capacity.

1. As identified in the 2021 PACR modelling submission. These values are driven by the difference in renewable energy projects when comparing each AEMO scenario with and without Project Marinus. The original scenarios (1 and 2) are based purely on the 2021 PACR modelling, while the alternate scenarios (A1 and A2) assume that 50% of all new wind generation as identified in the PACR modelling is enabled by Marinus Link. Further details on these scenarios can be found on page 26.
2. Based on the construction of the additional MW of data centre capacity in Tasmania and not in Victoria, provided by Marinus Link.

Economic contribution analysis - FTE

The results in the table below assumes that both Marinus Link and the NWTD are operational by 2030. The FTE years are the total impact (direct, indirect and induced) from 2025 to 2050. An 'FTE-year' represents one full time equivalent role supported for a full year – for instance, 1,000 FTE-years may be 500 FTE sustained over 2 years, or 100 FTE sustained over 10 years.

Total estimated FTE years supported in Tasmania and Victoria as part of construction and operations of Project Marinus and Tasmanian enabled investments (2025 – 2050)

FTE years	Marinus Link - Stage 1		Marinus Link - Stage 2		North-West Transmission Developments	Tasmanian renewable energy projects enabled by Project Marinus[1]				Potential Tasmanian Data Hub[2]
	Tasmania	*Victoria*	*Tasmania*	*Victoria*		*Scenario 1. Central*	*Scenario 2. Step Change*	*Scenario A1. Central - 50% new wind*	*Scenario A2. Step Change - 50% new wind*	
Construction										
Direct	844	844	613	613	651	1,585	2,949	1,511	4,154	2,256
Indirect	1,330	1,726	966	1,253	1,026	2,499	4,649	2,382	6,549	3,557
Induced	960	1,417	697	1,029	741	1,803	3,354	1,718	4,725	2,566
Subtotal	3,134	3,987	2,275	2,894	2,418	5,886	10,951	5,611	15,429	8,380
Operations										
Direct	124	124	124	124	68	53	224	311	356	
Indirect	149	207	149	207	82	112	478	662	759	
Induced	118	183	118	183	65	84	356	493	565	
Subtotal	391	513	391	513	214	248	1,058	1,466	1,680	
Total	**3,524**	**4,500**	**2,666**	**3,408**	**2,632**	**6,134**	**12,009**	**7,077**	**17,109**	**8,380**

Source: EY analysis of Marinus Link data and the 2021 PACR modelling submission

Note that this analysis does not consider what investments would take place outside Tasmania in the absence of the Marinus Link Project, including any renewable or other generation capacity.

1. As identified in the 2021 PACR modelling submission. These values are driven by the difference in renewable energy projects when comparing each AEMO scenario with and without Project Marinus. The original scenarios (1 and 2) are based purely on the 2021 PACR modelling, while the alternate scenarios (A1 and A2) assume that 50% of all new wind generation as identified in the PACR modelling is enabled by Marinus Link. Further details on these scenarios can be found on page 26.
2. Based on the construction of the additional MW of data centre capacity in Tasmania and not in Victoria, provided by Marinus Link.

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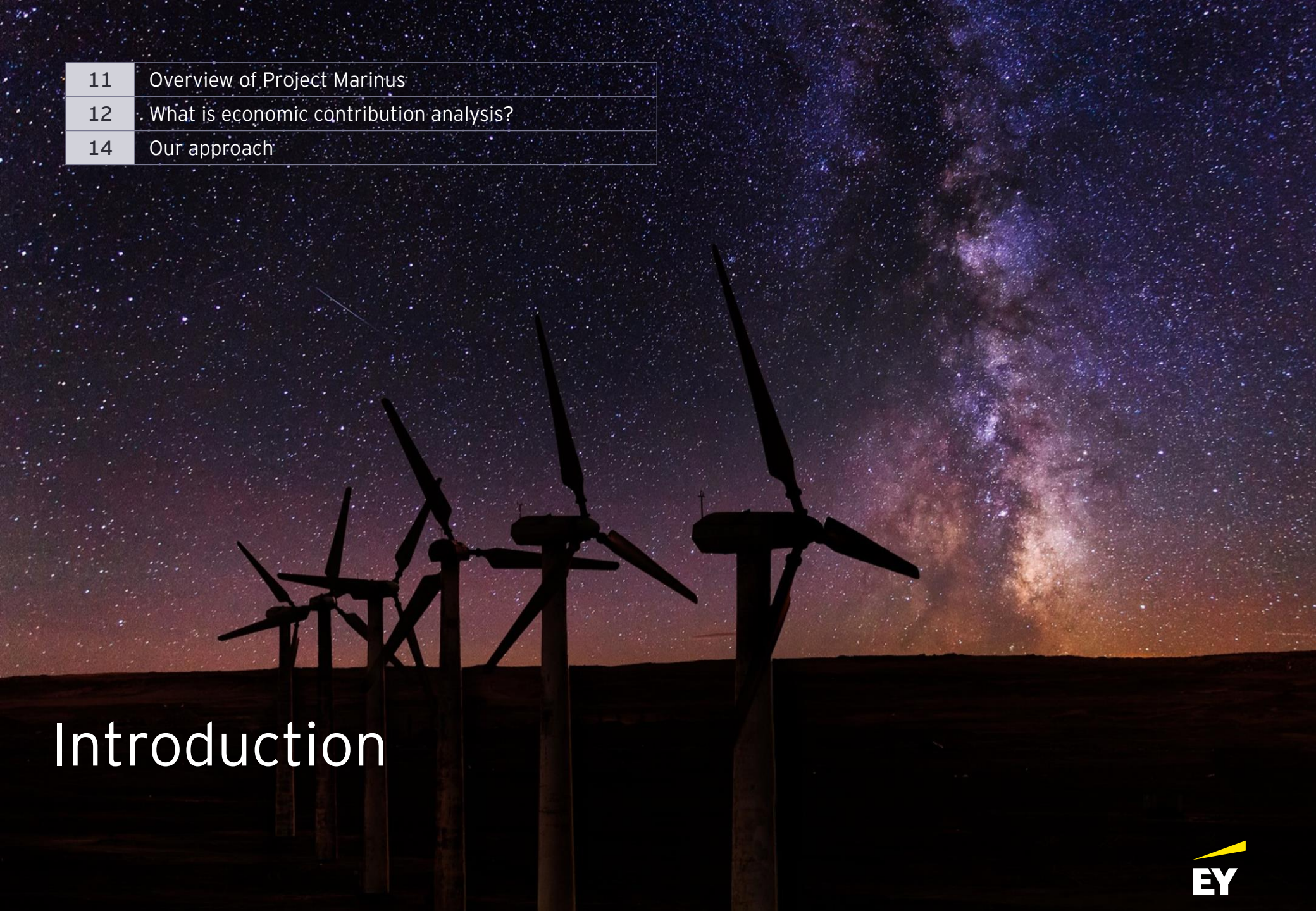


Introduction

Overview of Project Marinus

Project Marinus includes both Marinus Link and the North-West Transmission Developments (NWTD). Marinus Link is a proposed two-cable undersea DC transmission link (and telecommunications connector) between Tasmania and Victoria. The NWTD is a major transmission upgrade in Tasmania. Together, the aim for the NWTD and Marinus Link is to play an integral role in supporting Australia's transition to a clean energy future.

Marinus Link is currently in the design and approvals phase, with a final investment decision expected in late 2024. Stage 1 (cable 1) is expected to begin construction in 2025 and Stage 2 (cable 2) in 2027. Construction on Marinus Link is expected to be completed by 2030. The NWTD is expected to begin construction in 2024 and is also due to be completed in 2030. In total, the construction phase of Project Marinus is expected to cost $6.7 billion real 2023 AUD between 2025 and 2030.[1]

Indicative high-level construction costs, 2025 onwards ($m, real 2023 AUD)

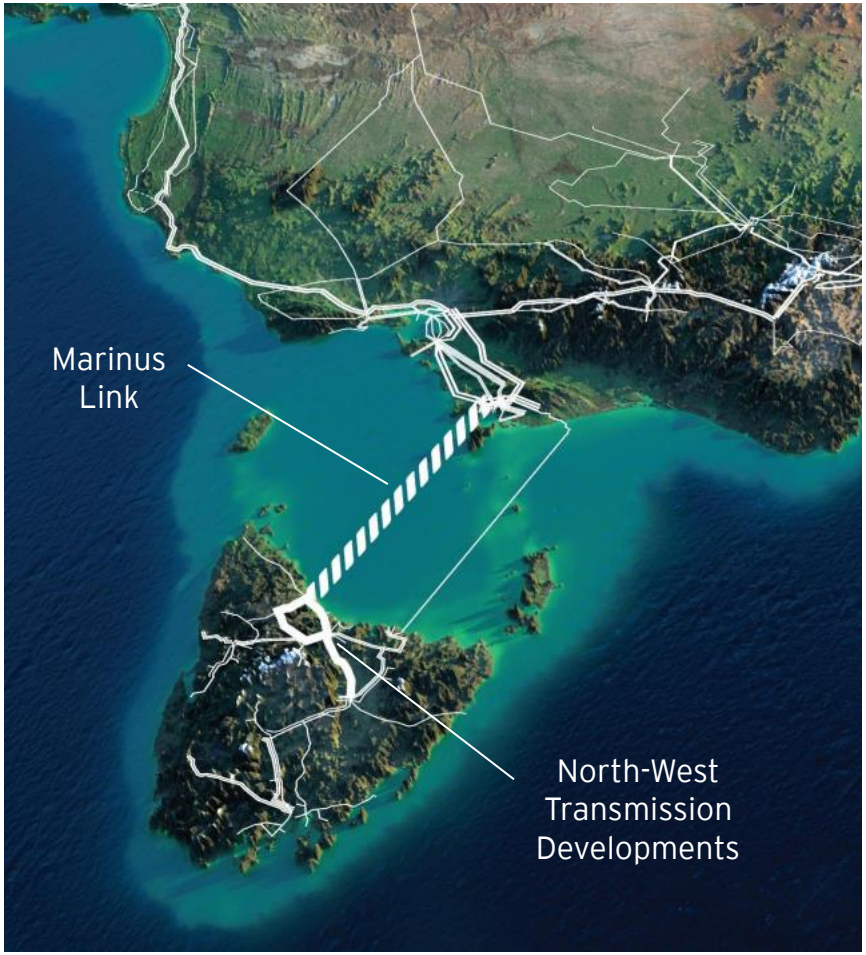
	Tasmania	Victoria
Stage 1	1,637	1,637
Stage 2	1,320	1,320
NWTD	810	-
TOTAL	3,767	2,957

Source: Marinus Link

Indicative annual operating costs ($m, real 2023 AUD)

	Tasmania	Victoria
Stage 1	8.4	8.4
Stage 2	8.4	8.4
NWTD	4.6	-
TOTAL	21.4	16.8

Source: Marinus Link



1. Project Marinus costs and development timeframe were provided by Marinus Link

What is economic contribution analysis?

Economic contribution analysis measures market related direct and indirect expenditure and economic activity generated by a specific industry and / or activity. Direct contribution analysis involves understanding and mapping the contributions directly attributable to an activity (i.e. the construction of Project Marinus). The key direct impacts will come from capital and operating expenditures, employment and tax contributions associated with Project Marinus' construction and operations and the construction and operations of its induced investment. These processes will also directly contribute to value add and jobs.

Indirect economic contribution involves mapping the flow-on impacts from a proposed industry / activity as the direct impacts of the activity flow through the economy. These flow-on impacts are typically reflected through the supply chain effects as more goods and services are demanded and consumption effects where a proportion of wages and salaries paid to workers are spent on consumptions activities.

Economic contribution components

	Direct economic contribution	+ Indirect effect	+ Induced effect	= Total economic contribution
General Definition	Total revenue generated by an industry plus value-add taxes	Flow-on contribution generated by an industry purchasing inputs	Flow-on contribution generated by an industry's employees purchasing goods and services with their income	
Example	Industries earn revenue from selling inputs to Project Marinus' construction and operations	Flow-on (indirect) contribution generated by industries purchasing inputs (e.g. concrete)	Flow-on (induced) contribution generated by industry employees purchasing goods and services (e.g. education)	

Economic contribution is a gross measure rather than a net measure of the contribution of an industry or a project to the economy.

Economic contribution studies do not consider substitution impacts, or what would happen if the relevant industry did not exist, or the relevant project did not occur.

The value-add estimates are therefore gross measures, as are employment impacts.

Some common terms used throughout this report

Gross Value Add (GVA)

Gross value add (GVA) is typically estimated as the market value of goods and services produced, after deducting the cost of goods and services used. It represents the sum of all wages, income and profits generated.

All numbers cited in this report refer to GVA. An economic contribution analysis model is a high-level model with significant simplifying assumptions, and results should be interpreted with this in mind.

When reporting gross value add figures, it is good practice to always describe the period for which the value add figure applies. We use both economic contribution and GVA interchangeably throughout this report.

Full-time equivalent (FTE)

The jobs results presented in this report reflect the gross employment demand that would arise in Tasmania as a consequence of the construction and operations of Project Marinus.

The employment footprint disregards any displacement effects – i.e. it does not make assumptions about whether or not the jobs are net additional. The footprint estimates are suited to understand the overall job opportunities and needs that Project Marinus is expected to generate. The FTE numbers in this report are estimates, based on sector employment multipliers applied to installation costs. FTE year estimates may differ to the actual number of workers directly employed by in any given year.

All jobs in this economic contribution analysis represent "FTE years" – An 'FTE-year' represents one full time equivalent job supported for a full year – for instance, 1,000 FTE years may be 500 FTE jobs sustained over 2 years, or 100 FTE jobs sustained over 10 years.

Good practices when reporting these gross employment figures include:

- Always describing the period for which the FTE figure applies; e.g. "for the construction period" or "for ten years", etc.
- Avoiding phrases that assume economic constraints have already been accounted for, e.g. stating that the Project "supports 10,000 FTE jobs" or "expects to result in" is more accurate than "supports 10,000 new FTE roles"; and being clear that the figures are gross jobs, not net.
- Employment figures should not be added to other projects undertaken in Tasmania.

Our approach

The economic contribution analysis presented in this Report models total construction and operations costs of the following components:

Project Marinus

1. The total capital costs are estimated to be approximately $5.9 billion for Marinus Link (between 2025 and 2030) and $0.8 billion[1] for the NWTD (between 2025 and 2030)
2. Equipment costs (e.g. the transmission cables) were removed from the input costs in the estimation of value add as most of the equipment cost for Marinus Link will be sourced primarily from overseas. This is a conservative assumption.
3. The residual capital cost and total operations cost were then allocated to the jurisdiction where the cost is likely to be incurred. On the advice of Marinus Link, costs were split on an 50/50 basis between Victoria and Tasmania respectively, unless the specific jurisdiction of the cost was identified.
4. Installation and operations multipliers were applied to the residual costs to estimate value add and FTE years supported.

Tasmanian renewable energy projects enabled by Project Marinus

1. The EY 2021 PACR modelling estimated the resulting capacity in Tasmania over and above the base case of no Marinus Link being installed. These were used to estimate incremental capital and operating costs for renewable energy investments in Tasmania. EY did not consider any changes to generation capacity elsewhere in the NEM.
2. Multipliers were then applied to construction and operations costs to determine value add and FTE years supported.

Potential Tasmanian Data Hub

1. Marinus Link provided EY with information about additional data centre capacity as a result of Project Marinus. This was used to estimate the capital cost of data centre construction in Tasmania. The operating cost was not modelled (for more information see Appendix D) and EY did not consider any changes in data centre capacity elsewhere.
2. Multipliers were then applied to construction costs to determine value add and FTE years supported.

Data sources

Data sources used to inform calculations in this report include:

- **Information provided by Marinus Link** – Project Marinus' capital and operating expenditure, as well as estimates of future data centre capacity in Tasmania.
- **Australian National Accounts: Input-Output Tables for 2020-21** – Used to calculate economic multipliers for use in this analysis
- **Marinus Link's 2021 PACR market modelling:** This was produced by EY using EY's energy market model. This modelling provided forecasts of potential investments induced by Marinus Link. This includes information on:
  - Planned investments in renewable energy in MW until 2050 for hydro, solar and wind electricity generation investments in Tasmania;
  - Fixed operating and maintenance costs ($/kw);
  - Variable operating and maintenance costs ($/kw);
  - Capital expenditure costs ($/kW);
- **Turner & Townsends, Data Centre Cost Trends Report, 2022** – used to calculate an estimate of total capital expenditure based on capacity figures provided by Marinus Link.

All numbers in this report are in real 2023 million AUD. All years referred to in this report are financial years. Some figures in this report have been rounded for ease of communication. As a result, not all figures will reconcile exactly to totals (e.g. in some tables).

More information about our methodology is included in Appendix A – D.

1. This analysis does not include NWTD costs from 2024, as the modelling period is from 2025-2050.

Project Marinus

Overview of Project Marinus' construction and operating profile

Construction

The construction of Marinus Link is expected to take five years for each link and is staggered.[1] Stage 1 is expected to begin construction in 2025 and Stage 2 is expected to begin construction in 2027. Construction of the North-West Transmission Development is expected to begin in 2024 and finish in 2030, but this analysis only considers 2025 onwards. Broadly, the construction phase requires:

- Purchase of intermediate inputs such as metal and metal alloys, cable and converters and construction materials; and
- Construction, financing and project management services.

Core physical components of the interconnector include:

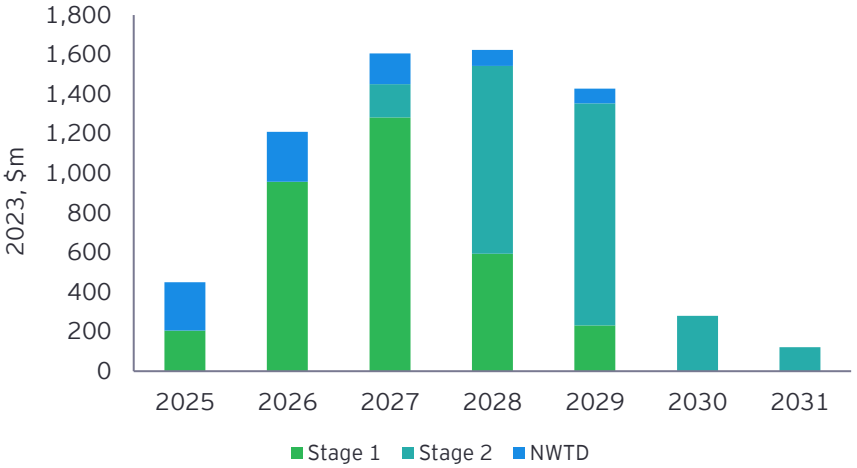
- Two 750 MW DC undersea transmission cables, delivered under a staggered timeframe;
- Transmission line(s) or cable(s) AC which transmit electricity (to and from the undersea cable) over land to converter stations;
- Two converter stations which convert direct current (DC) to alternating current (AC) and vice versa; and
- Augmentation of Tasmanian AC Network to support HVDC Link.

Operations

Project Marinus is expected to begin operations in 2030. Annual operating costs are expected to be $16.8 million per annum in Tasmania and $16.8 million per annum in Victoria for both Marinus Links 1 and 2, with an additional $4.6 million per annum in Tasmania for the NWTD.

Operations of Project Marinus have been modelled from 2030 – 2050.

Construction profile of Project Marinus



Source: EY analysis of Marinus Link data

Operating profile of Project Marinus

	Marinus Link - Stage 1	Marinus Link - Stage 2	North-West Transmission Development
Period included	2030-2050	2030-2050	2030-2050
Annual operating cost (2023, $m)	16.76	16.76	4.60

Source: EY analysis of Marinus Link data

1. Project Marinus costs and development timeframe were provided by Marinus Link

Tasmania - construction of Marinus Link

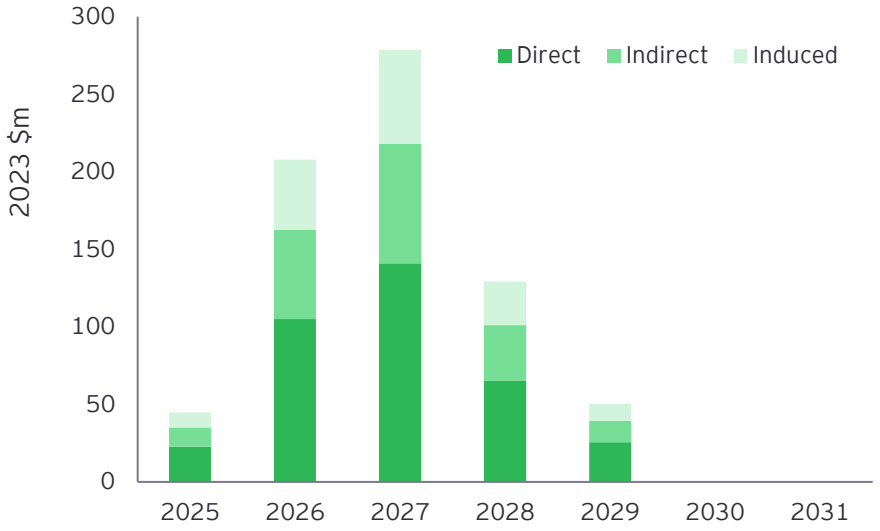
The construction cost of Marinus Link attributable to Tasmania is estimated at $1,637 million for Stage 1 and $1,320 million for Stage 2. The peak year for construction is estimated to be in 2028.

Between 2025 and 2032, construction of Marinus Link Stage 1 is expected to support value add of $710 million (direct, indirect and induced), while Stage 2 is expected to support value add of $515 million (direct, indirect and induced).

Between 2025 and 2032, construction of Marinus Link Stage 1 is expected to support 3,134 FTE years, while Stage 2 is expected to support 2,275 FTE years.

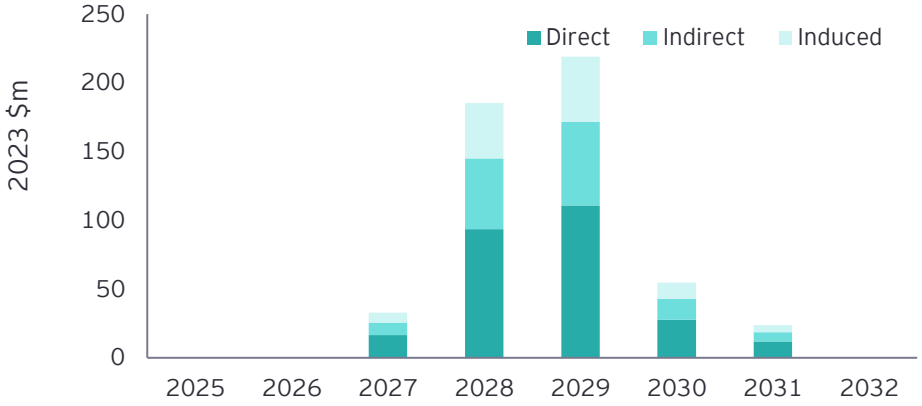
Overall, the construction of Marinus Link in Tasmania is expected to support 1,456 direct and 3,953 indirect and induced FTE years.

Marinus Link - Stage 1 value add in Tasmania



Source: EY analysis of Marinus Link data

Marinus Link - Stage 2 value add in Tasmania



Source: EY analysis of Marinus Link data

FTE years supported in Tasmania during construction of Marinus Link Stage 1 and Stage 2

	2025	2026	2027	2028	2029	2030	2031
Stage 1							
Direct	53	247	331	153	60	0	0
Indirect	84	389	522	242	94	0	0
Induced	60	281	376	174	68	0	0
Stage 2							
Direct			39	220	260	65	28
Indirect			61	347	410	102	44
Induced			44	250	296	74	32
Total							
Direct	53	247	370	373	320	65	28
Indirect	84	389	583	589	505	102	44
Induced	60	281	421	425	364	74	32

Source: EY analysis of Marinus Link data

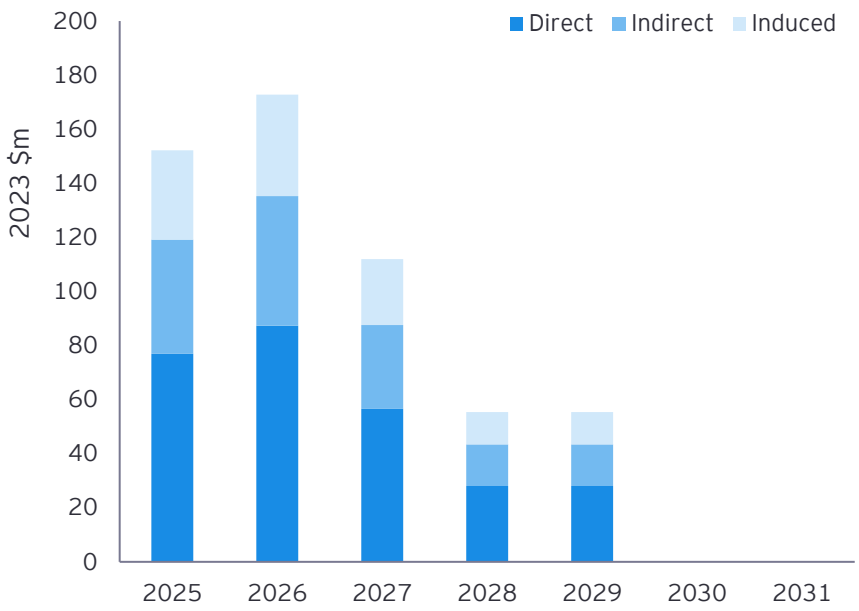
Tasmania – construction of the North-West Transmission Developments

The construction cost of the NWTD is estimated at $810 million. The peak year for construction is estimated to be in 2026.

Construction of the NWTD is expected to support value add of $548 million (direct, indirect and induced) and 2,418 FTE years.

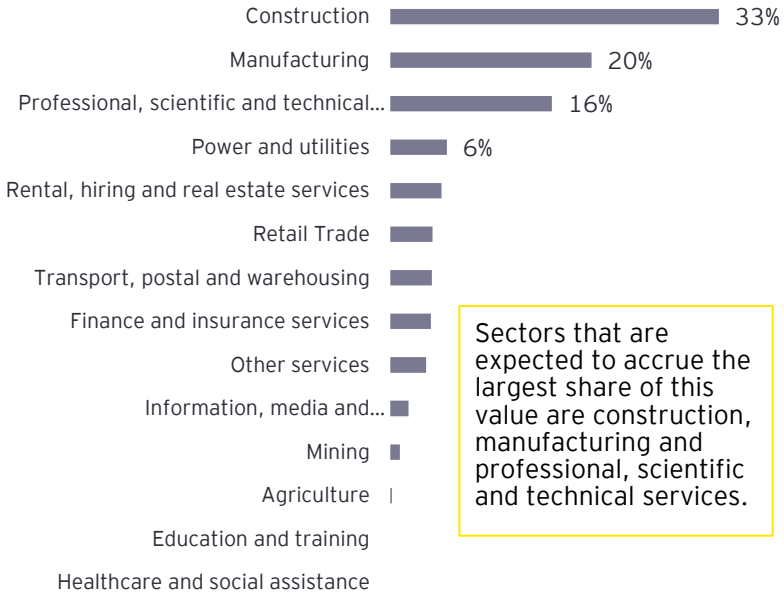
Overall, the construction of the NWTD in Tasmania is expected to support 651 direct and 1,767 indirect and induced FTE years.

NWTD - value add in Tasmania



Source: EY analysis of Marinus Link data

Sectors expected to accrue the largest share of value add (%)



Sectors that are expected to accrue the largest share of this value are construction, manufacturing and professional, scientific and technical services.

Source: EY analysis of ABS data

FTE years supported in Tasmania during construction of NWTD

	2025	2026	2027	2028	2029	2030	2031
NWTD							
Direct	181	205	133	66	66	0	0
Indirect	285	324	210	104	104	0	0
Induced	206	234	151	75	75	0	0

Source: EY analysis of Marinus Link data

Tasmania – Project Marinus operations

The operations cost of Marinus Link Stage 1 and Stage 2 attributable to Tasmania is estimated to be $8.4 million per stage, annually, The operations cost of the NWTD is expected to be $4.6 million annually. Project Marinus is expected to be operational in 2030 and the results here have been modelled out to 2050.

Operating cost of Project Marinus attributable to Tasmania

	Marinus Link - Stage 1	Marinus Link - Stage 2	North-West Transmission Developments
Period included	2030-2050	2030-2050	2030-2050
Annual operating cost (2023, $m)	16.76	16.76	4.60

Source: EY analysis of Marinus Link data

Operations of Marinus Link Stage 1 in Tasmania is expected to support value add of $126 million. Operations of Marinus Link Stage 2 in Tasmania is expected to support value add of $126 million. Operations of the NWTD in Tasmania is expected to support value add of $69 million.

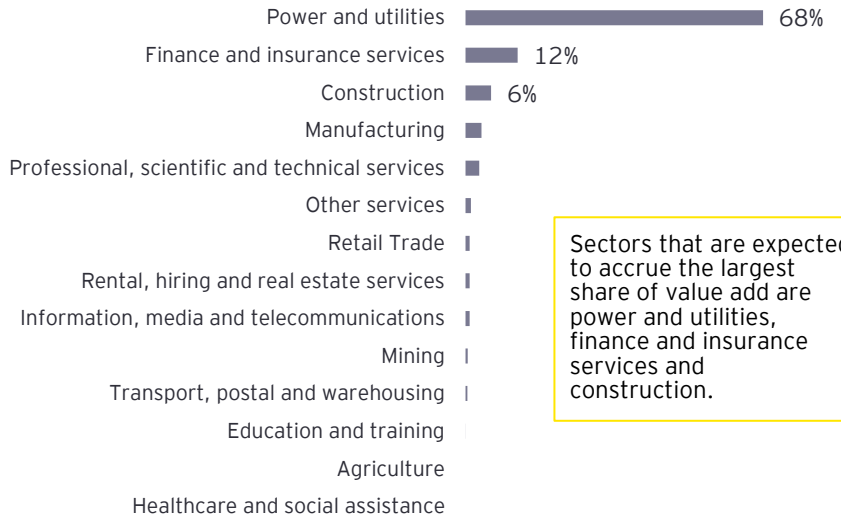
The operations of Marinus Link Stage 1 and Stage 2 are each expected to support 391 FTE years. Operations of the NWTD is expected to support 214 FTE years.

Value add and FTE years supported in Tasmania during operations of Project Marinus

	Marinus Link - Stage 1		Marinus Link - Stage 2		North-West Transmission Developments	
	Value add (2023, $m)	FTE	Value add (2023, $m)	FTE	Value add (2023, $m)	FTE
Annual						
Direct	3.0	5.9	3.0	5.9	1.6	3.2
Indirect	2.1	7.1	2.1	7.1	1.2	3.9
Induced	0.9	5.6	0.9	5.6	0.5	3.1
Total (2030-2050)						
Direct	62	124	62	124	34	68
Indirect	44	149	44	149	24	82
Induced	19	118	19	118	10	65

Source: EY analysis of Marinus Link data

Sectors expected to accrue the largest share of value add (%)



Sectors that are expected to accrue the largest share of value add are power and utilities, finance and insurance services and construction.

Source: EY analysis of ABS data

Victoria - construction of Marinus Link

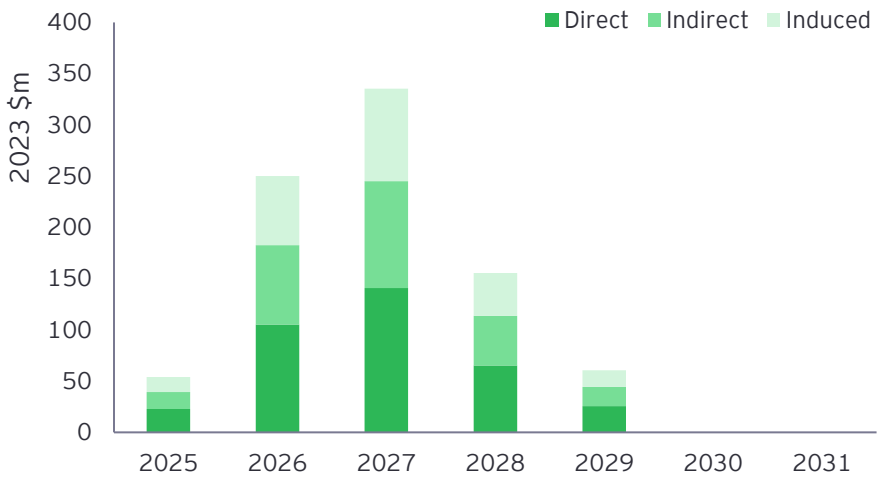
The construction cost of Marinus Link attributable to Victoria is estimated at $1,637 million for Stage 1 and $1,320 million for Stage 2. The peak year for construction is estimated to be in 2028.

Between 2025 and 2032, construction of Marinus Link Stage 1 is expected to support value add of $856 million (direct, indirect and induced) and while construction of Marinus Link Stage 2 is expected to support value add of $621 million (direct, indirect and indirect).

Between 2025 and 2032, construction of Marinus Link Stage 1 is expected to support 3,987 FTE years. Construction of Marinus Link Stage 2 is expected to support 2,894 FTE years.

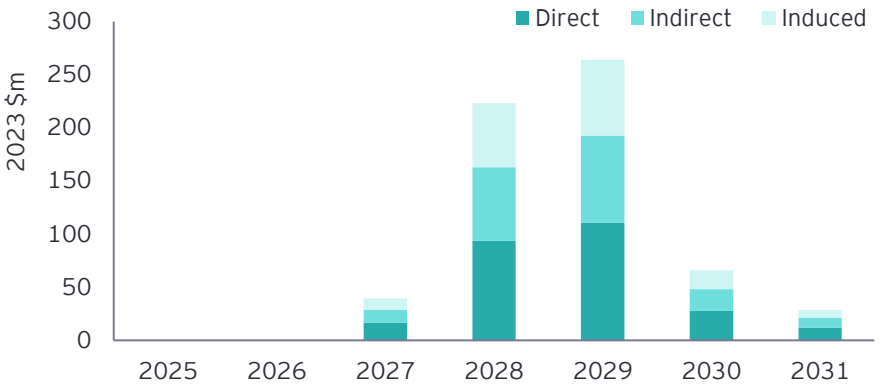
Overall, the construction of Marinus Link in Victoria is expected to support 1,456 direct and 5,425 indirect and induced FTE years.

Marinus Link - Stage 1 value add in Victoria



Source: EY analysis of Marinus Link data

Marinus Link - Stage 2 value add in Victoria



Source: EY analysis of Marinus Link data

FTE years supported in Victoria during construction of Marinus Link Stage 1 and Stage 2

	2025	2026	2027	2028	2029	2030	2031
Stage 1							
Direct	53	247	331	153	60	0	0
Indirect	109	505	677	314	122	0	0
Induced	89	414	555	257	100	0	0
Stage 2							
Direct			39	220	260	65	28
Indirect			80	450	533	133	58
Induced			65	370	437	109	47
Total							
Direct	53	247	370	373	320	65	28
Indirect	109	505	756	764	655	133	58
Induced	89	414	621	627	538	109	47

Source: EY analysis of Marinus Link data

Victoria – Marinus Link operations

The operations cost of Marinus Link Stage 1 and Stage 2 attributable to Victoria is estimated to be $7.5 million per stage, annually. Project Marinus is expected to be operational in 2030 and the results here have been modelled out to 2050 for both Stage 1 and Stage 2.

Operations cost of Project Marinus attributable to Victoria

	Marinus Link - Stage 1	Marinus Link - Stage 2
Period included	2030-2031	2030-2032
Annual operating cost attributable to Victoria (2023, $m)	8.4	8.4

Source: EY analysis of Marinus Link data

Operations of Marinus Link Stage 1 in Victoria is expected to support value add of $152 million and 513 FTE years.

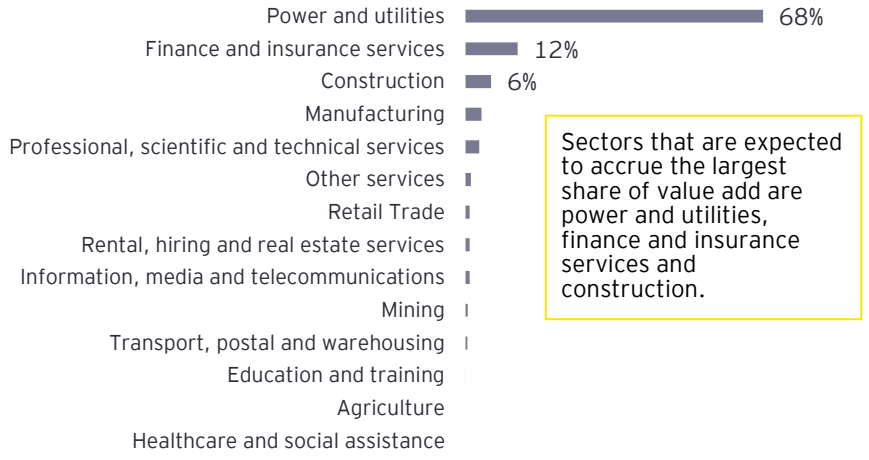
Operations of Marinus Link Stage 2 in Victoria is expected to support value add of $152 million and 513 FTE years.

Value add and FTE years supported in Victoria during operations of Project Marinus

	Marinus Link - Stage 1		Marinus Link - Stage 2	
	Value add (2023, $m)	FTE	Value add (2023, $m)	FTE
Annual				
Direct	3.0	5.9	3.0	5.9
Indirect	2.9	9.9	2.9	9.9
Induced	1.4	8.7	1.4	8.7
Total (2030-2050)				
Direct	62	124	62	124
Indirect	60	207	60	207
Induced	30	183	30	183

Source: EY analysis of Marinus Link data

Sectors expected to accrue the largest share of value add (%)



Source: EY analysis of ABS data

Project Marinus – peak construction FTE

During the peak construction period (2027 to 2029), Project Marinus is expected to support:

- 443 direct and 1,202 indirect and induced FTE years per year in Tasmania
- 354 direct and 1,320 indirect and induced FTE years per year in Victoria

FTE years supported in Tasmania during peak construction of Project Marinus

FTE years	2027	2028	2029	Total (2027-2029)	Total per year (2027 – 2029)
Stage 1					
Direct	331	153	60	544	181
Indirect	522	242	94	858	286
Induced	376	174	68	619	206
Stage 2					
Direct	39	220	260	519	173
Indirect	61	347	410	819	273
Induced	44	250	296	591	197
NWTD					
Direct	133	66	66	265	88
Indirect	210	104	104	417	139
Induced	151	75	75	301	100
Tasmania Total (Stage 1, Stage 2 and NWTD)	1,867	1,632	1,434	4,933	1,644

Source: EY analysis of Marinus Link data

FTE years supported in Victoria during peak construction of Project Marinus

FTE years	2027	2028	2029	Total (2027-2029)	Total per year (2027 – 2029)
Stage 1					
Direct	331	153	60	544	181
Indirect	677	314	122	1,113	371
Induced	555	257	100	913	304
Stage 2					
Direct	39	220	260	519	173
Indirect	80	450	533	1,063	354
Induced	65	370	437	872	291
Victoria Total (Stage 1 and Stage 2)	1,747	1,764	1,513	5,024	1,675

Source: EY analysis of Marinus Link data

FTE years supported in Tasmania and Victoria during peak construction of Stage 1 of Marinus Link (and NWTD)

FTE years	2025	2026	2027	Total (2025-2027)	Total per year (2025 – 2027)
Tasmania - Stage 1	197	917	1,229	2,342	781
Tasmania - NWTD	672	762	494	1,929	643
Tasmania Total (Stage 1 and NWTD)	869	1,679	1,723	4,271	1,424
Victoria Total (Stage 1)	251	1,166	1,563	2,980	993

Source: EY analysis of Marinus Link data

Tasmanian investments enabled by Project Marinus

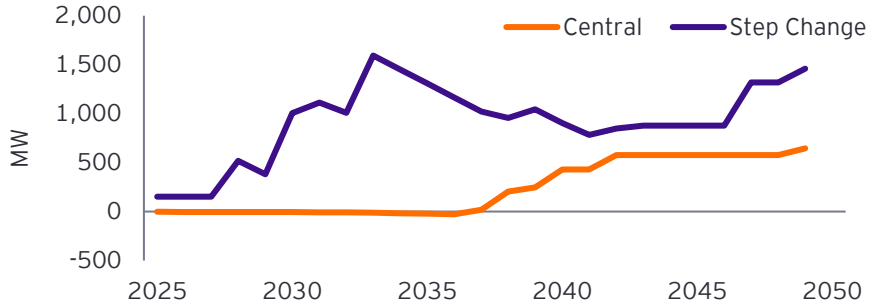
Overview of Tasmanian renewable energy projects enabled by Project Marinus

Project Marinus is expected to induce further renewable electricity generation in Tasmania to meet the growing demand for cleaner energy from the Australian electricity market. The installation magnitude (MW) and timeframe was estimated using EY's "market model", which forecasts generator dispatch and new builds. This modelling was included in the 2021 PACR submission and considers two AEMO 2020 Integrated System Plan scenarios:

- **Central** – this scenario reflects the transition of the energy industry under current policy settings and technology trajectories.
- **Step Change** – under this scenario Australia takes strong action on climate change. The national energy market (NEM) targets a 90% reduction in emissions from 2016 levels by 2050. In this scenario, aggressive global decarbonisation leads to faster technological improvements.

The analysis of induced investment in both scenarios was focused on the incremental capacity. That is, the resulting capacity in Tasmania over and above either the base case of no Marinus Link being installed, or result with Marinus Link. There are also differences in construction timelines with and without Marinus Link

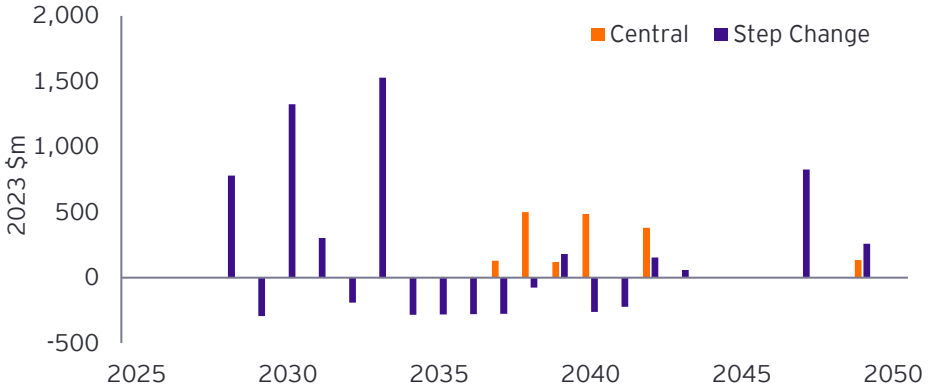
Incremental Tasmanian generation capacity, with Project Marinus vs. Base Case



Source: EY analysis of the 2021 PACR modelling submission

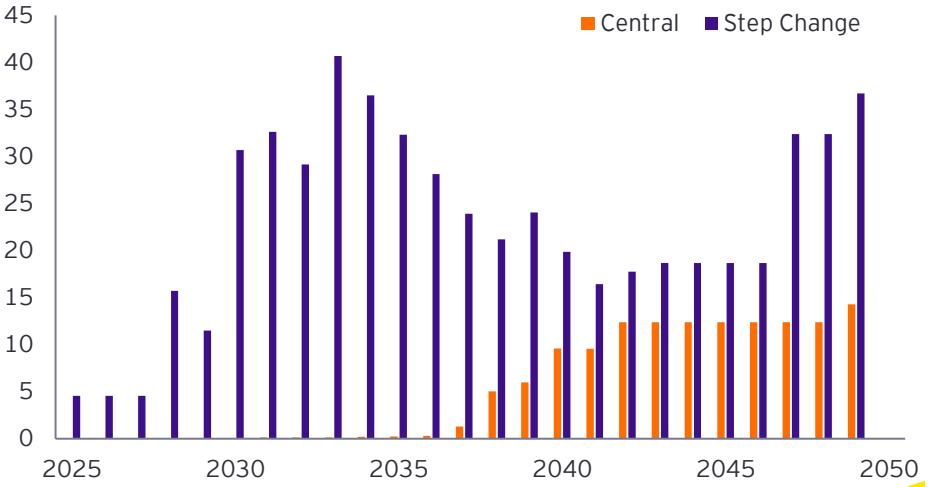
Note: When comparing the base case to the scenario with Marinus Link there is differences in both total capacity and construction timelines. When the base case builds capacity at a later date, the line above falls. When additional construction (over the base case) is built, the line rises.

Indicative capital costs for additional generation enabled by Project Marinus



Source: EY analysis of the 2021 PACR modelling submission

Indicative operating costs for additional generation enabled by Project Marinus



Source: EY analysis of the 2021 PACR modelling submission

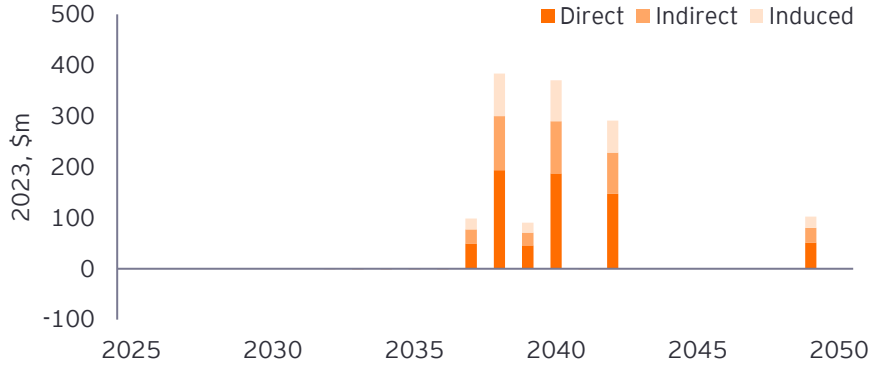
Tasmania – construction of renewable energy projects enabled by Project Marinus

Total construction cost of the renewable energy projects enabled by Project Marinus under the Central scenario is estimated at $1,744 million. The peak year for construction is estimated to be in 2038. Total construction cost of the renewable energy projects enabled by Project Marinus under the Step Change scenario is estimated at $3,573 million. The peak year for construction is estimated to be in 2033.

Under the Central scenario, construction is expected to support value add of $1,334 million (direct, indirect and induced). Under the Step Change scenario, construction is expected to support value add of $2,481 million (direct, indirect and induced).

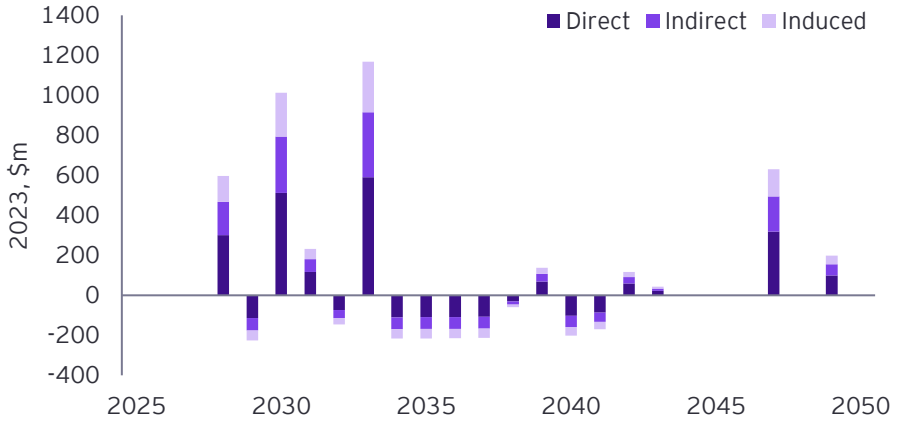
Under the Central and Step Change scenarios, renewable energy projects enabled by Project Marinus are expected to support 5,886 FTE years and 10,951 FTE years. Overall, under the Central scenario, the construction of additional renewable generation in Tasmania is expected to support 1,585 direct and 4,301 indirect and induced FTE years. While under the Step Change scenario the construction of additional renewable generation in Tasmania is expected to support 2,949 direct and 8,002 indirect and induced FTE years.

Value add during construction of renewable energy projects in Tasmania – Central scenario



Source: EY analysis of the 2021 PACR modelling submission

Value add during construction of renewable energy projects in Tasmania – Step Change scenario



Source: EY analysis of the 2021 PACR modelling submission

FTE years supported in Tasmania during construction of renewable energy projects enabled by Project Marinus, by scenario

	2025-2030	2031-2035	2036-2040	2041-2045	2046-2050
Central					
Direct	1	-3	1,120	345	122
Indirect	1	-5	1,767	543	192
Induced	1	-3	1,274	392	139
Step Change					
Direct	1,647	978	-651	-11	986
Indirect	2,597	1,542	-1,026	-18	1,554
Induced	1,873	1,113	-740	-13	1,121

Source: EY analysis of the 2021 PACR modelling submission

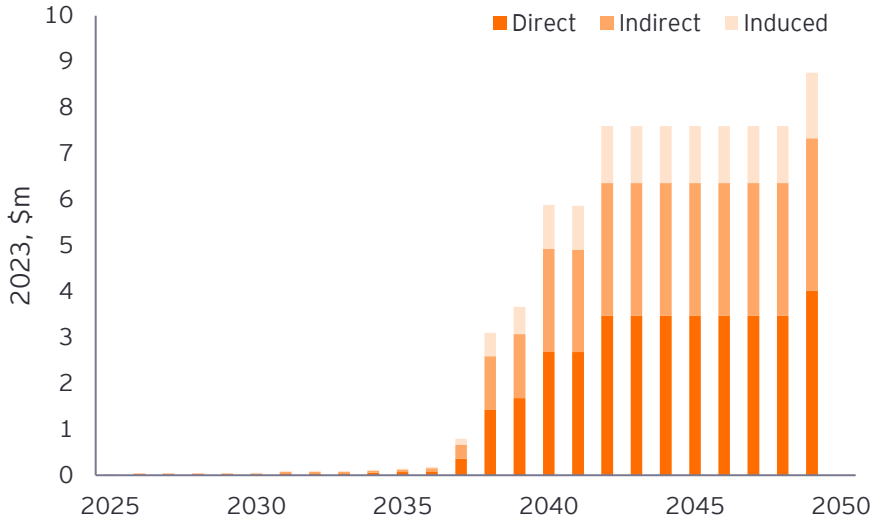
Tasmania – operations of renewable energy projects enabled by Project Marinus

The operations cost (out to 2050) of the renewable energy projects enabled by Project Marinus under the Central scenario is estimated to be $134 million. The operations cost (out to 2050) of the renewable energy projects enabled by Project Marinus under the Step Change scenario is estimated to be $573 million.

Under the Central and Step Change scenarios, the operations of additional renewable energy projects in Tasmania are expected to support value add of $73 million and $31 million (direct, indirect and induced).

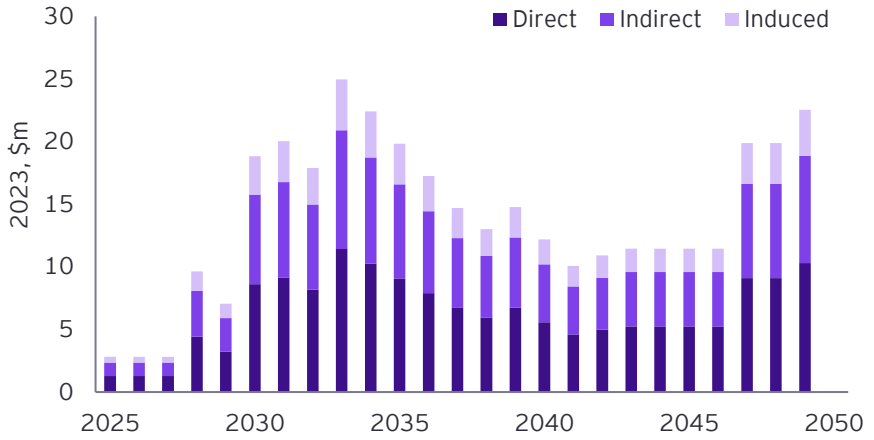
Central scenario is expected to support and 248 FTE years, while the Step Change scenario is expected to support 1,058 FTE years.

Value add during operations of renewable energy projects in Tasmania – Central scenario



Source: EY analysis of the 2021 PACR modelling submission

Value add during operations of renewable energy projects in Tasmania – Step Change scenario



Source: EY analysis of the 2021 PACR modelling submission

FTE years supported in Tasmania during operations of renewable energy projects enabled by Project Marinus, by scenario

	2025-2030	2031-2035	2036-2040	2041-2045	2046-2050
Central					
Direct	0	0	9	23	20
Indirect	0	1	19	49	43
Induced	0	1	14	37	32
Step Change					
Direct	28	67	46	35	47
Indirect	60	144	98	76	101
Induced	45	107	73	56	75

Source: EY analysis of the 2021 PACR modelling submission

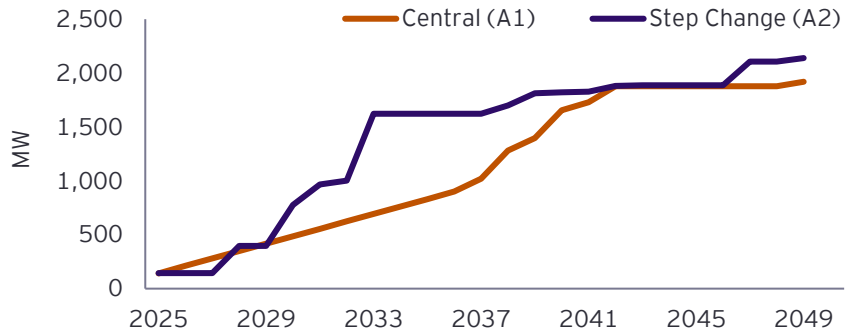
Tasmania – construction of renewable energy projects enabled by Project Marinus – **alternate scenarios**

The renewable energy investments identified by the PACR energy market modelling assume that any announced construction or policy positions (e.g. the 200% Tasmanian renewable energy target) are met in the base case (i.e., without Marinus Link). This assumption may be conservative and does not recognise how many new projects will be planning to sell excess capacity into Victoria using the Marinus Link, and will thus be unlocked due to the development of the Marinus Link project.

To represent an upper bound of enabled projects, we have estimated alternate versions of the Central and Step Change scenarios where only half of all new wind generation in Tasmania (as identified in the PACR modelling) would go ahead in the absence of Marinus Link. The amount of pumped hydro generation capacity remains the same as in the original scenarios.

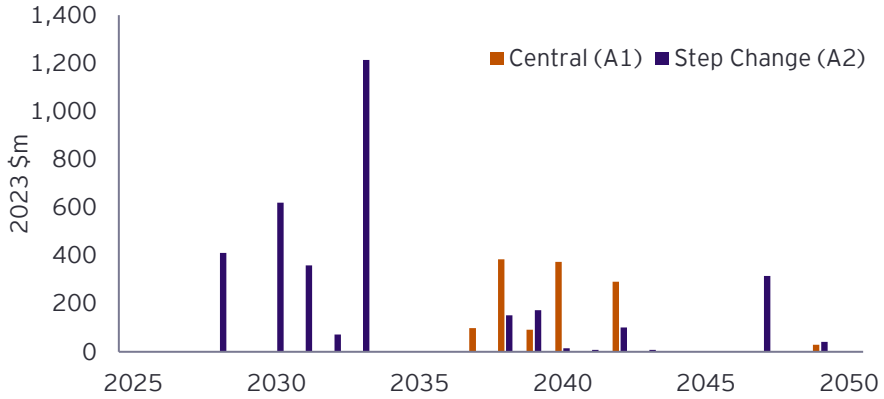
Under the alternate Central and alternate Step Change scenarios, construction of renewable energy projects enabled by Marinus Link results in total value add of $1,271 million and $3,496 million. The alternate Central scenario is also expected to support 5,611 total FTE years. While the alternate Step Change scenario, construction of renewable energy projects enabled by Marinus Link is expected to support 15,429 total FTE years.

Incremental Tasmanian generation capacity, with Project Marinus vs. Base Case, assuming 50% of all new wind capacity is enabled by Marinus Link



Source: EY analysis of the 2021 PACR modelling submission

Total value add during construction of renewable energy projects in Tasmania by alternate scenario



Source: EY analysis of the 2021 PACR modelling submission

FTE years supported in Tasmania during construction of renewable energy projects enabled by Project Marinus, by alternate scenario

	2025-2030	2031-2035	2036-2040	2041-2045	2046-2050
Central (A1)					
Direct	0	0	1,128	346	36
Indirect	0	0	1,779	546	57
Induced	0	0	1,283	394	41
Step Change (A2)					
Direct	1,227	1,956	404	141	425
Indirect	1,934	3,084	638	223	671
Induced	1,396	2,225	460	161	484

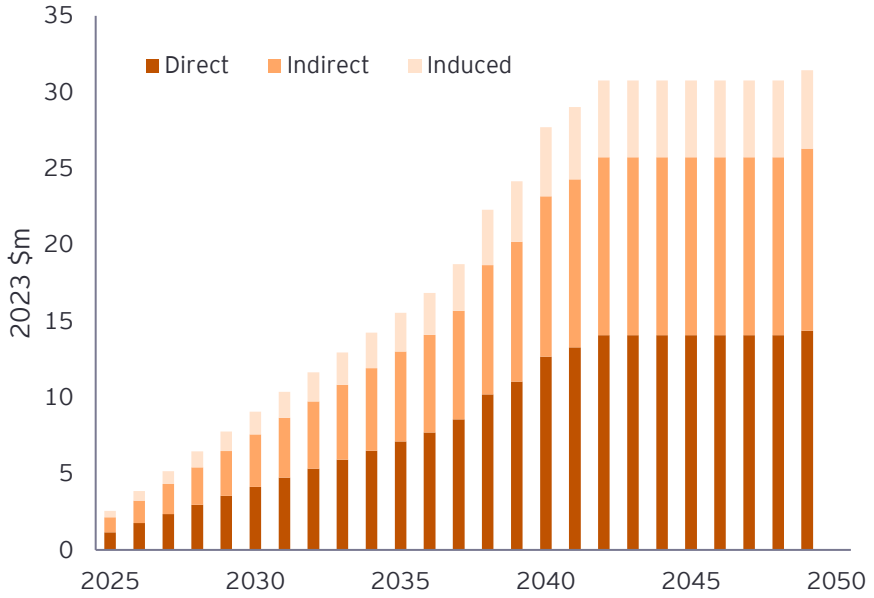
Source: EY analysis of the 2021 PACR modelling submission

Tasmania – operations of renewable energy projects enabled by Project Marinus – **alternate scenarios**

Under the alternate Central scenario, operations of renewable energy projects enabled by Marinus Link is expected to result in total value add of $485 million, which grows to $556 million under the alternate Step Change scenario.

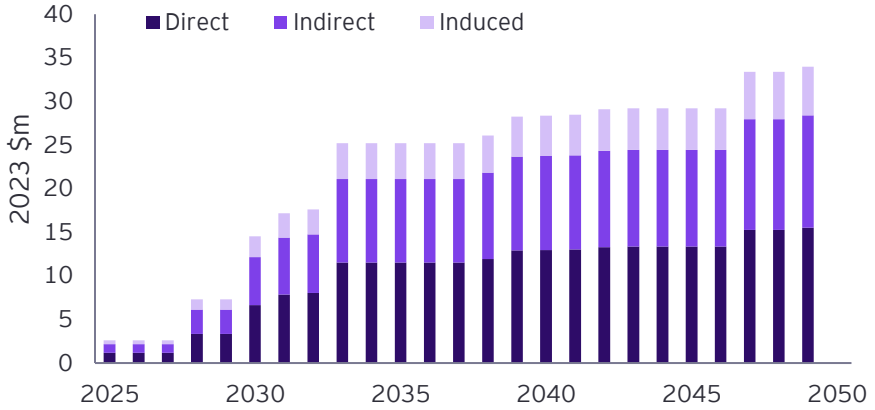
Under the alternate Central and alternate Step Change scenario, operations of renewable energy projects enabled by Marinus Link are expected to result in 1,466 and 1,680 total FTE years.

Value add during operations of renewable energy projects in Tasmania – Central (A1) scenario



Source: EY analysis of the 2021 PACR modelling submission

Value add during operations of renewable energy projects in Tasmania – Step Change (A2) scenario



Source: EY analysis of the 2021 PACR modelling submission

FTE years supported in Tasmania during operations of renewable energy projects enabled by Project Marinus, by alternate scenario

	2025-2030	2031-2035	2036-2040	2041-2045	2046-2050
Central (A1)					
Direct	22	41	70	97	79
Indirect	48	88	150	208	169
Induced	35	66	111	155	126
Step Change (A2)					
Direct	24	71	85	93	83
Indirect	51	151	182	198	177
Induced	38	112	135	148	132

Source: EY analysis of the 2021 PACR modelling submission

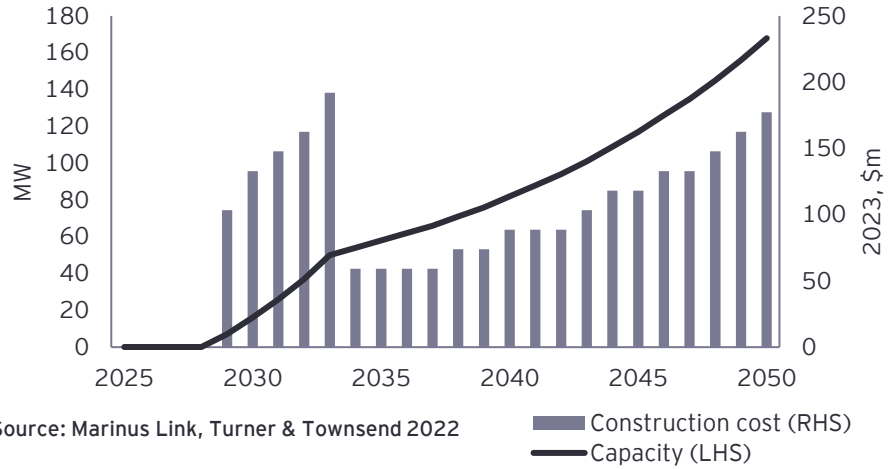
Tasmania – construction of additional data centre capacity enabled by Project Marinus

Project Marinus is also expected to enable telecommunications investment for Tasmania. This investment has been quantified (in terms of MW of additional data hub capacity) and provided to EY by Marinus Link. The calculation is included in Appendix D. These results consider the economic contribution of the construction of additional data centre capacity in Tasmania as a result of Project Marinus.

Total construction cost of the additional data centre capacity enabled by Project Marinus is estimated at $2,483 million. We have not modelled operating costs from the data centres enabled by Project Marinus. Typically the operating cost of a data centre is around 95% electricity, the contribution of which is already counted as part of the additional renewable energy projects,

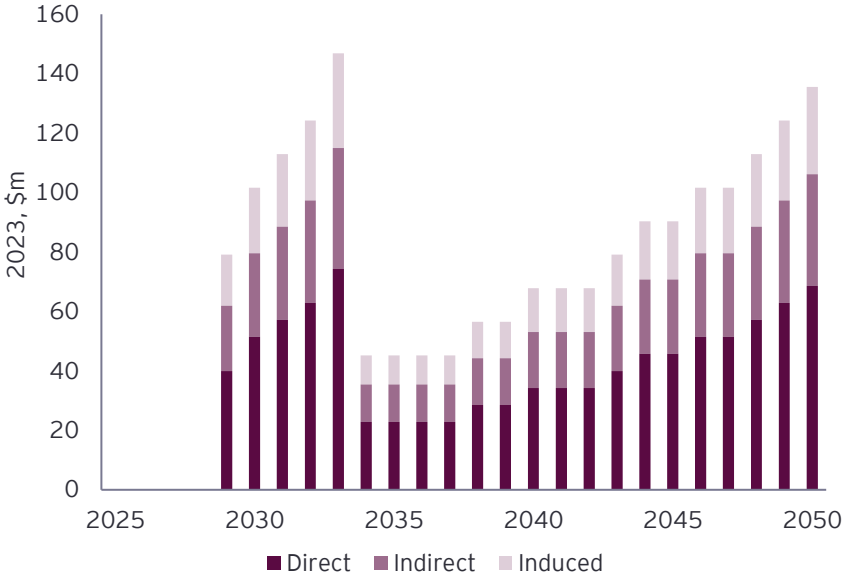
Construction is expected to support value add of $1,899 million (direct, indirect and induced) and 8,380 FTE years. Overall, the construction of additional data centre capacity in Tasmania is expected to support 2,256 direct and 6,124 indirect and induced FTE years.

Additional Data Centre Capacity (and associated capital costs) enabled by Project Marinus



Source: Marinus Link, Turner & Townsend 2022

Value add during construction of additional data centre capacity in Tasmania

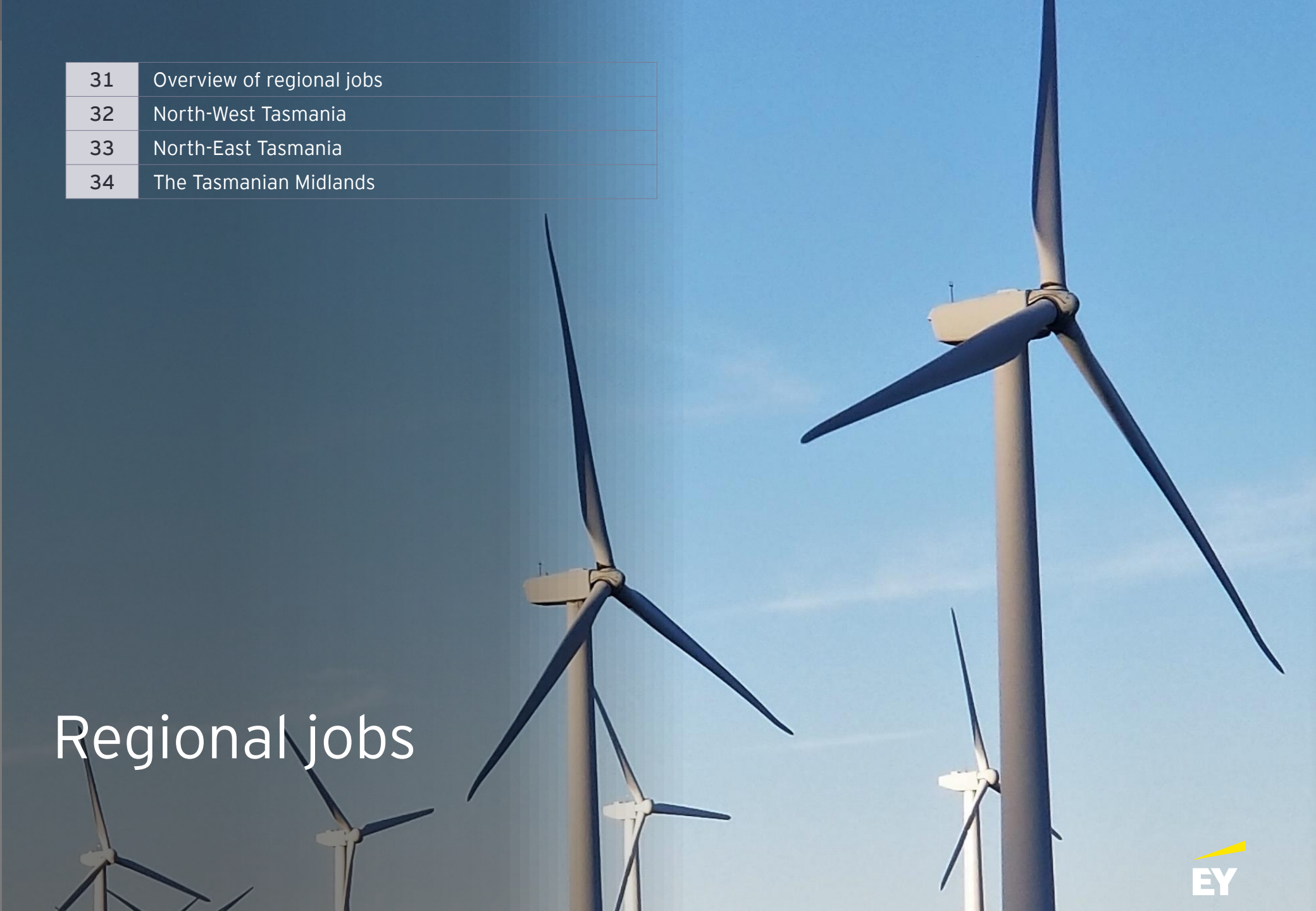


Source: EY analysis of Marinus Link data

FTE years supported in Tasmania during construction of additional data centre capacity enabled by Project Marinus

	2025-2030	2031-2035	2036-2040	2041-2045	2046-2050
Direct	215	564	322	470	685
Indirect	339	889	508	741	1,080
Induced	244	642	367	535	779

Source: EY analysis of Marinus Link data



Regional jobs

Overview of regional jobs

Many local economies are expected to benefit from the construction and operations of Project Marinus and the enabled renewable energy projects. The contribution of Marinus Link is modelled in North West Tasmania but it is likely that some would flow state-wide. This section considers the employment impacts on North-West Tasmania, North-East Tasmania and the Tasmanian Midlands.

In order to capture the total direct and indirect economic contribution of Marinus Link and the induced investment to these regions, the analysis attributes the expected increase in generation capacity to each region. The methodology used to estimate this apportionment can be found in Appendix C. These results are broken down and discussed on the next three pages.

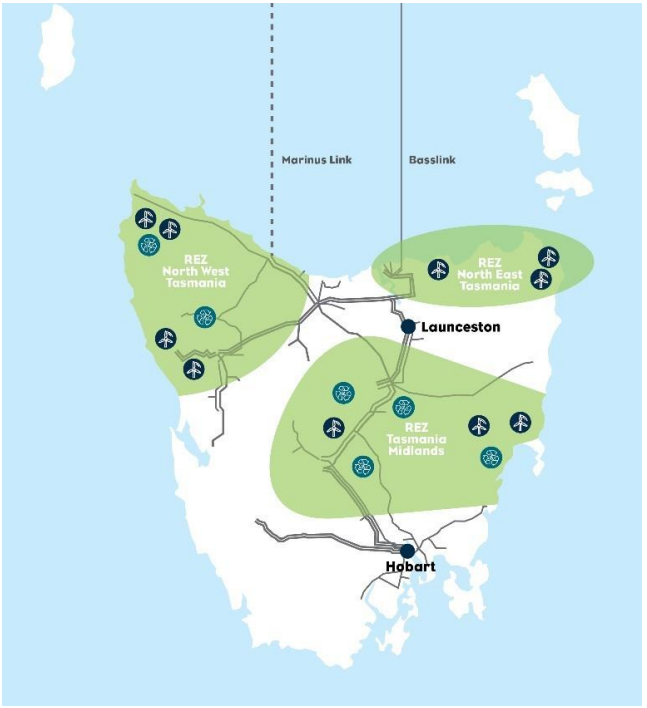
Total FTE attributable to each region[1] for construction and operations of Project Marinus and enabled renewable energy projects

	Marinus Link	North-West Transmission Developments	Renewable energy projects enabled by Project Marinus	
			Central	*Step Change*
North-West Tasmania				
Construction	4,923	2,201	5,152	10,618
Operations	80	17	1,311	1,888
North-East Tasmania				
Construction			-4,249	-4,666
Operations			-962	-787
The Tasmanian Midlands				
Construction			2,500	4,453
Operations			165	725

Source: EY analysis of the 2021 PACR modelling submission and Marinus Link data

1. The FTE expected to be attributable to each region do not add up to the total jobs expected for the whole of Tasmania (as quoted earlier in this report) This is driven by construction and operating jobs flowing to regions not captured in the regional investment analysis, which are represented by the unshaded areas in the map to the right.

Indicative renewable investment locations in Tasmania



Source: TasNetworks

North-West Tasmania

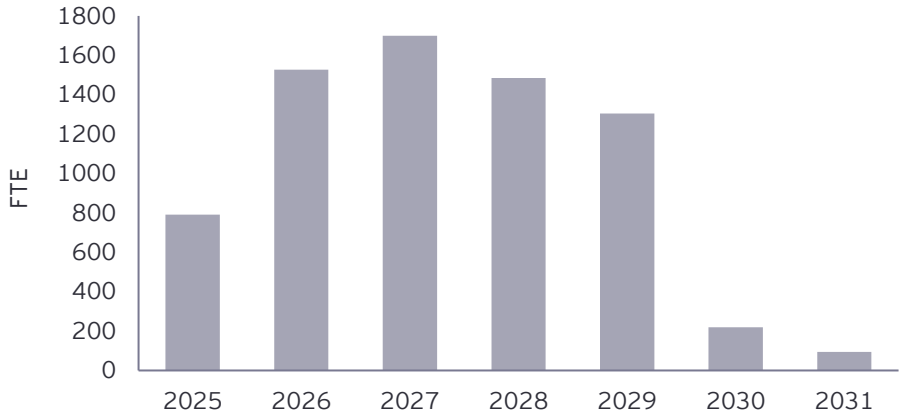
North-West Tasmania is renowned for its high quality national parks and nature reserves. The indicative Tasmanian connection point of Marinus Link is located in the Burnie area, a town in North-West Tasmania. As such, Marinus Link is expected to support construction and operations jobs in the region.

North-West Tasmania is identified as a location for potential pumped hydro and wind generation capacity enabled by Project Marinus.

Construction of Project Marinus is expected to support 4,923 FTE years in North-West Tasmania, with between 5,152 and 10,618 additional FTE supported as a result of the construction of renewable generation capacity (depending on the scenario).

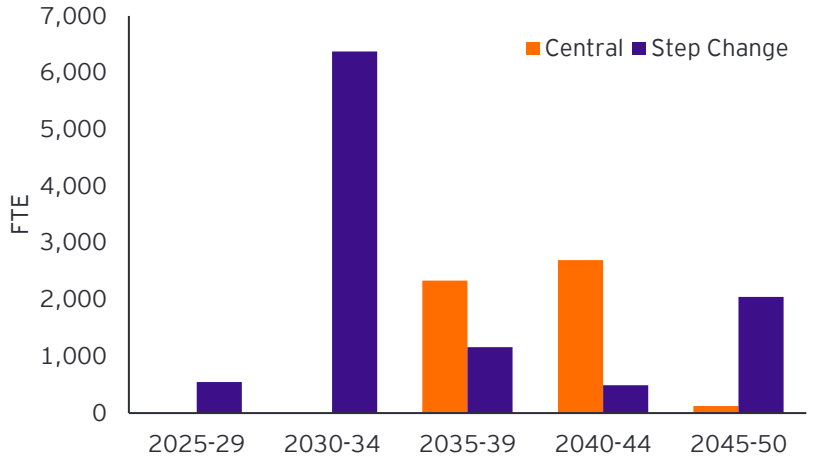
The operations of Project Marinus are expected to support 80 FTE in North-West Tasmania, while between 1,311 and 1,888 operations FTE are expected to result from renewable energy generation enabled by Project Marinus.

FTE years supported in North-West Tasmania during construction of Project Marinus



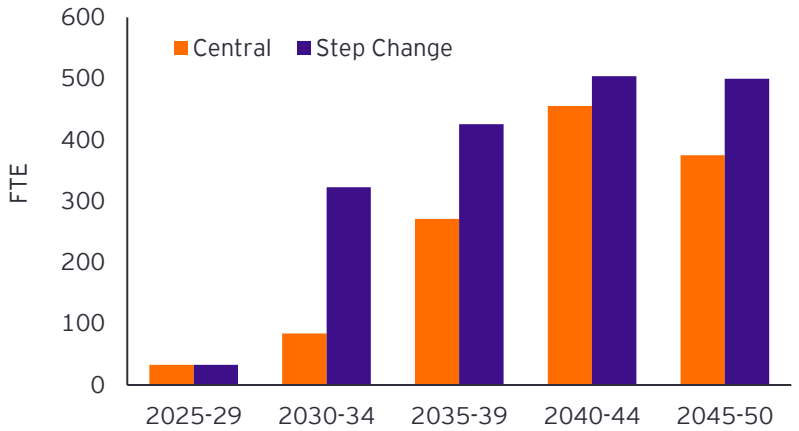
Source: EY analysis of Marinus Link data

FTE years supported in North-West Tasmania during construction of renewable energy projects enabled by Project Marinus



Source: EY analysis of the 2021 PACR modelling submission

FTE years supported in North-West Tasmania during operations of renewable energy projects enabled by Project Marinus



Source: EY analysis of the 2021 PACR modelling submission

North-East Tasmania

North-East Tasmania is characterised by its rich arts and cultural heritage and diverse natural landscape. North-East Tasmania has already been identified as a suitable location for increased wind generation capacity.

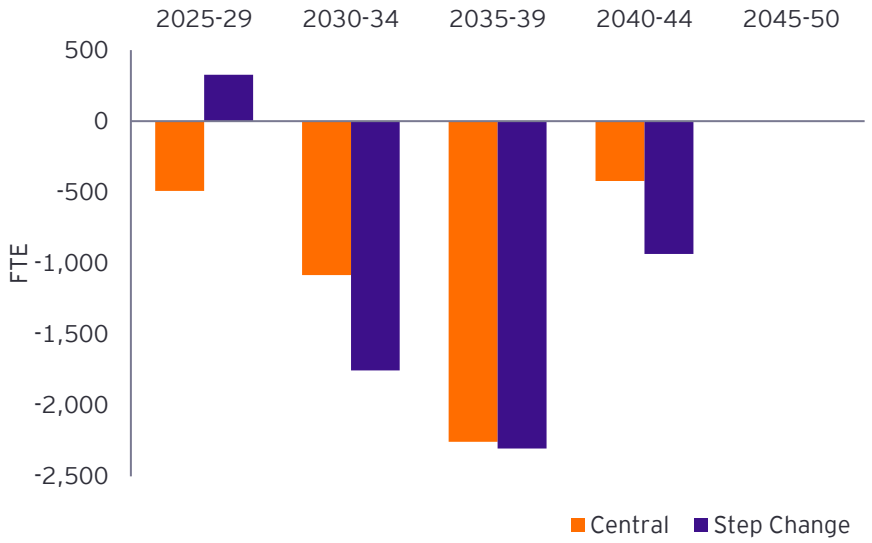
However, according to the PACR modelling Project Marinus shifts capacity away from North-East Tasmania and into Nort-West, resulting in reductions in construction and operations FTE under both the Central and Step Change scenarios.

Reduction in total FTE attributable to North-East Tasmania based on a redistribution of generation capacity enabled by Project Marinus

	Renewable energy projects enabled by Project Marinus	
	Central	*Step Change*
North-East Tasmania		
Construction	-4,249	-4,666
Operations	-962	-787

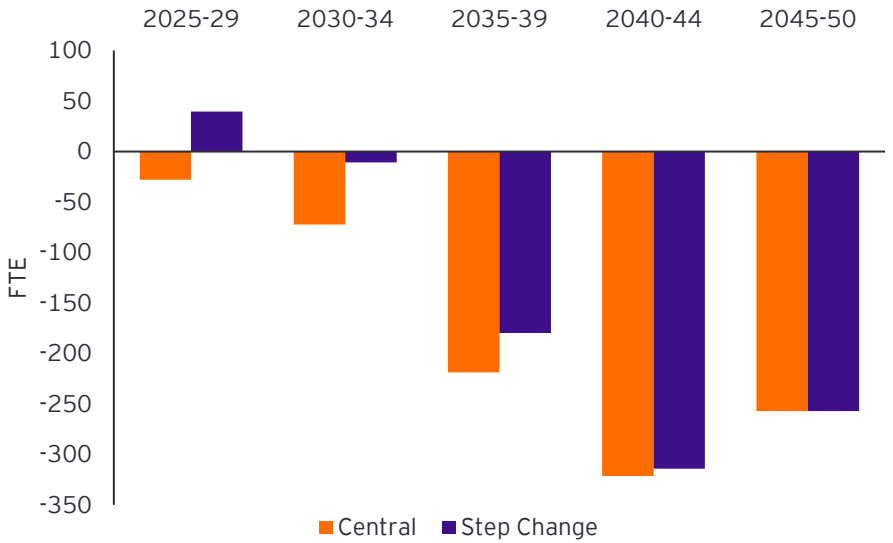
Source: EY analysis of the 2021 PACR modelling submission

Reduction in FTE years in North-East Tasmania due to lost construction of renewable energy projects



Source: EY analysis of the 2021 PACR modelling submission

Reduction in operational FTE years in North-East Tasmania due to a reduction in generation capacity



Source: EY analysis of the 2021 PACR modelling submission

The Tasmanian Midlands

The Tasmanian Midlands is replete with prominent national parks and excellent natural resources. The Tasmanian Midlands have been identified as a location for potential pumped hydro and wind generation capacity enabled by Project Marinus.

Under the Central scenario, construction of additional generation capacity supports 2500 FTE years between 2025 and 2050.

Under the Step Change scenario, construction of additional generation capacity supports 4,453 FTE years between 2025 and 2050.

Under the central scenario, operations of the additional generation supports 165 FTE years, while under the Step Change scenario this becomes 725 FTE years.

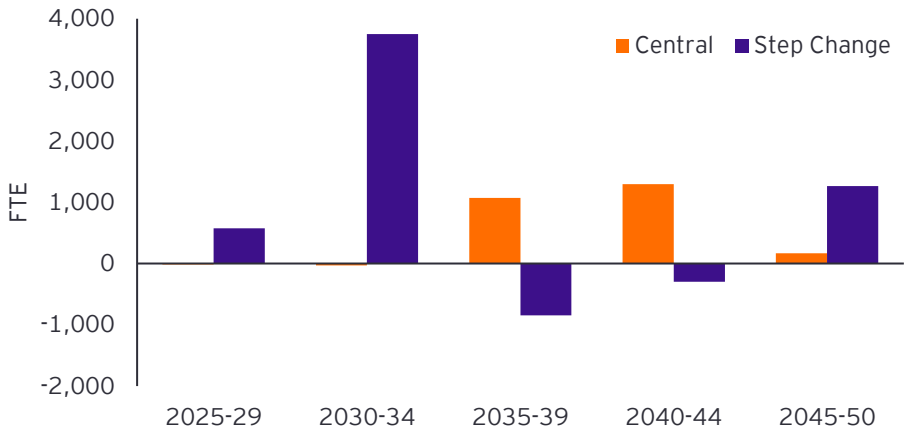
Under the Step Change scenario, there are some negative FTE values between 2035 and 2044. This represents shifting construction timelines with and without Marinus Link. Under the Step Change scenario, with Marinus Link there are more FTE years supported between 2030 and 2034 due to earlier construction timelines. In contrast, between 2035 and 2039, there is less construction with Marinus Link when compared to the base case (without Marinus Link).

FTE years supported in the Tasmanian Midlands by renewable energy projects enabled by Project Marinus

	Renewable energy projects enabled by Project Marinus	
	Central	*Step Change*
The Tasmanian Midlands		
Construction	2,500	4,453
Operations	165	725

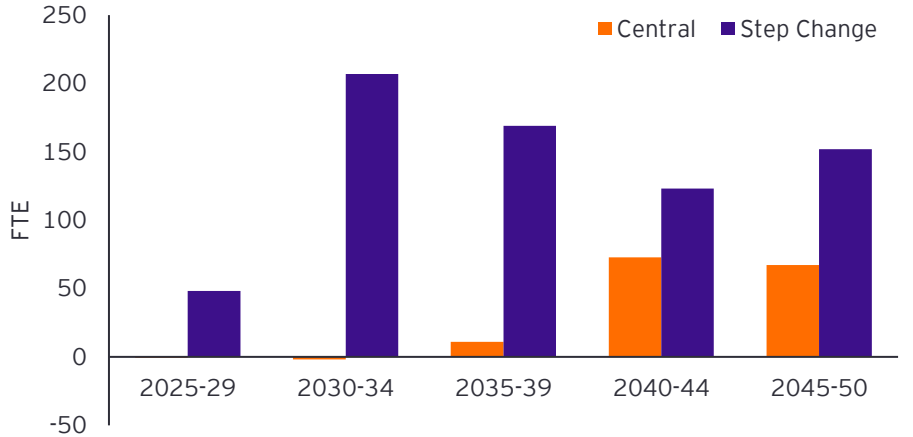
Source: EY analysis of the 2021 PACR modelling submission

FTE years supported in the Tasmanian Midlands during construction of renewable energy projects enabled by Project Marinus

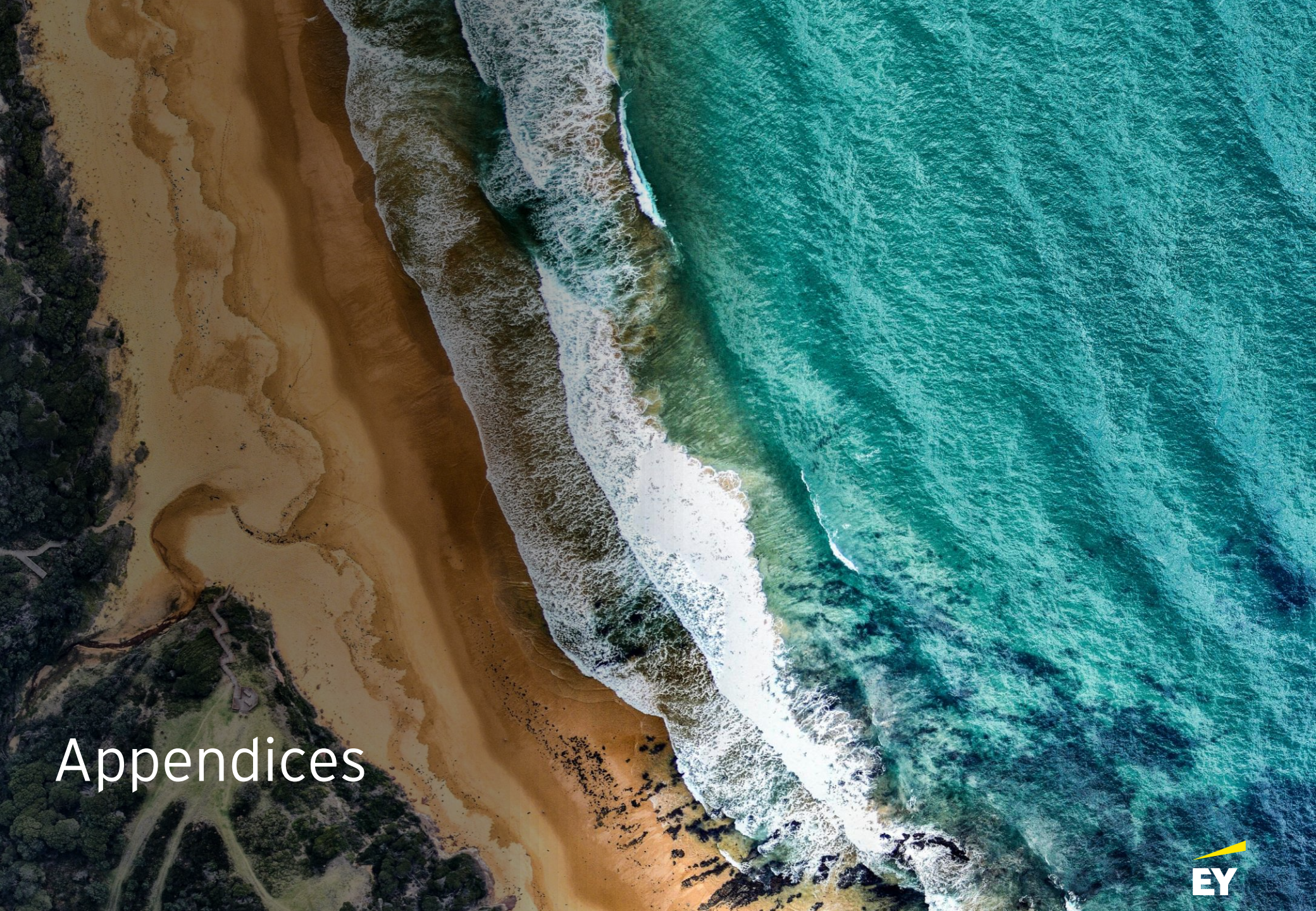


Source: EY analysis of the 2021 PACR modelling submission

FTE years supported in the Tasmanian Midlands during operations of renewable energy projects enabled by Project Marinus



Source: EY analysis of the 2021 PACR modelling submission



Appendices

Glossary

Term	Description
Direct economic contribution	Total revenues generated by an industry, plus any applicable value-add taxes
Economic contribution	The total direct effects of an industry (revenue plus any value-add taxes), plus the flow-on (indirect) effects. The flow-on effects are captured by applying an economic multiplier. It is important to note that economic contribution is a gross measure rather than a net measure of the contribution of an industry. Economic contribution studies do not consider substitution impacts, or what would happen if the relevant industry ceased to exist
Gross Output	Market value of goods and services produced
Value Add	Market value of goods and services produced, after deducting the cost of goods and services used. This represents the sum of all wages, income and profits generated
Direct effect	The direct impact resulting from the construction and operation of Marinus Link
Indirect effect	Flow-on (Indirect) contribution generated by an industry as it purchases input goods and services generating revenue for other businesses
Induced (or consumption) effect	Flow-on (Indirect) contribution generated by an industry as its employees spend their wages and salaries on household consumption, providing revenue for other businesses
Economic multiplier	Used to estimate the total economic contribution of an industry by multiplying the direct contribution. The economic multiplier incorporates the additional economic contribution generated by the 'Direct' economic contribution, which is the sum of the industrial effect and the consumption effect
Employment contribution	The total direct employment effects of an industry (total employees), plus the flow-on (indirect) effects. The flow-on effects are captured by applying an employment multiplier
Employment multiplier	Used to estimate the total economic contribution of an industry by multiplying the direct contribution. The employment multiplier incorporates the additional employment contribution generated by the 'Direct' employment contribution
FTE years	An 'FTE-year' represents one full time equivalent role supported for a full year – for instance, 1,000 FTE-years may be 500 FTE sustained over 2 years, or 100 FTE sustained over 10 years.

Appendix A – Regional input-output multiplier calculations

Economic contribution analysis measures market related direct and indirect expenditure and economic activity generated by a specific industry and/or activity. This is done by using Input-Output (IO) multipliers. To assess the regional impacts, the Australian IO table must be disaggregated and then used for the multiplier calculation.

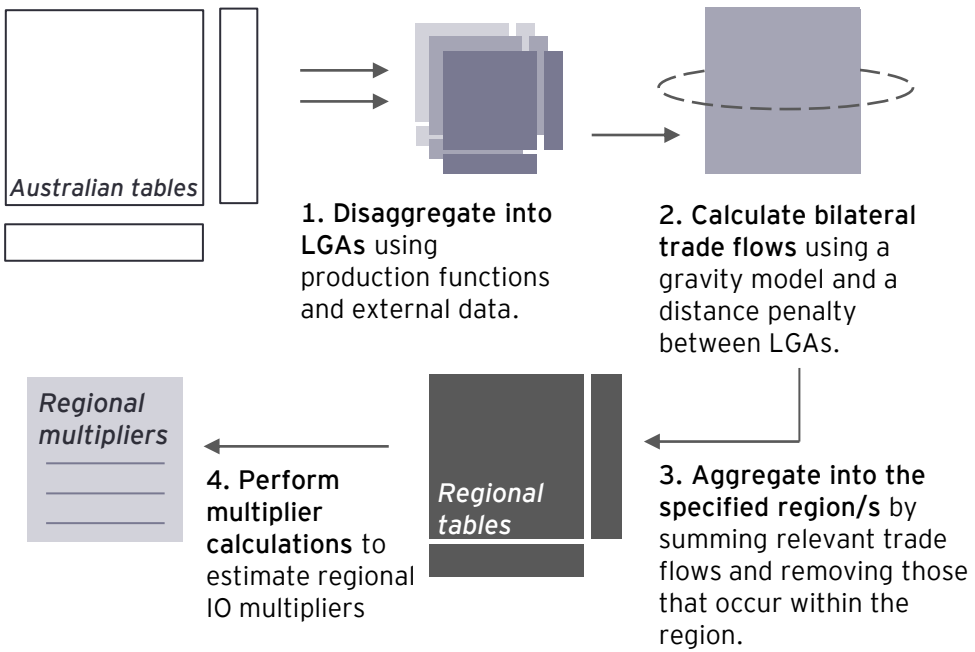
Methodology for calculating regional input-output multipliers

1. Disaggregate the Australian table into local government areas (LGAs) using production functions along with the following splits:
    A. Industry output is split by LGA/Input-Output Industry Group (IOIG) sector employment data.
    B. Industry demands are determined by the commodity output combined with production functions.
    C. Household and Government consumption is split according to the LGA population.
    D. Commodity usage for capital formation is split according to Gross Regional Product (GRP).
    E. Foreign imports/exports and inventories are split according to production shares.
    F. Domestic imports/exports are set to zero and solved using the gravity model.
2. Calculate the bilateral trade flows utilising a gravity model and a penalty matrix made using the distances between LGAs. The greater the distance, the lower the trade flows, all else equal.
3. To aggregate the specified region containing several LGAs, the model procedure adds up the individual LGA tables and removes trade that occurs between LGAs within the region.
4. Calculate regional IO multipliers using regional tables.

Data Sources

- **Australian National Accounts: Input-Output Tables for 2020-21** - Table 2 and 3
- **Australian Bureau of Statistics (ABS)** - Employment for each LGA by Input-Output Industry Group (IOIG)

Regional input-output multiplier calculations



Appendix B - Project Marinus cost apportionment methodology

Marinus Link provided EY with a construction and operations cost breakdown, including items split within the following broad cost categories:

- Cable costs;
- Substation costs;
- Network integration costs; and
- Project costs.

These cost items did not refer to a specific geographic location. EY has split them 50/50 between Victoria and Tasmania, as directed by Marinus Link. The tables below summarise this approach.

Indicative high-level construction costs, 2025 onwards ($m, real 2023 AUD)

	Tasmania	Victoria
Stage 1	1,637	1,637
Stage 2	1,320	1,320
NWTD	810	-
TOTAL	3,767	2,957

Source: EY analysis of Marinus Link data

Marinus Link provided EY with ongoing operations costs for both Stage 1 and 2. These have also been apportioned equally between Tasmania and Victoria.

Indicative annual operating costs ($m, real 2023 AUD)

	Tasmania	Victoria
Stage 1	8.4	8.4
Stage 2	8.4	8.4
NWTD	4.6	-
TOTAL	21.4	16.8

Source: EY analysis of Marinus Link data

This analysis assumes that the cables are internationally sourced. Therefore, equipment costs have not been included in the economic contribution calculation (see table directly below). The total value of equipment has been assumed based on the percentage of spend on equipment included in the 2019 report.

Construction cost, 2025 onwards ($m, real 2023 AUD) attribution

Cost category	Tasmania	Victoria
Total cost apportioned to each region	3,767	2,957
Internationally sourced equipment	1,447	1,354
Cost of Project Marinus used in this analysis	2,319	1,603

Source: EY analysis of Marinus Link data

Appendix C – Estimating Tasmanian renewable energy projects enabled by Project Marinus

Marinus Link is expected to enable investment in further renewable electricity generation in Tasmania to meet the growing demand for cleaner energy from the NEM. For the analysis in this report EY used the installation magnitude (MW) and timeframe of additional investment in Tasmania from the 2021 PACR submission by EY's market modelling team. The impacts to any other state in Australia were not considered. The analysis in this report considers two of the AEMO 2020 Integrated System Plan scenarios:

- **Central** – this scenario reflects the transition of the energy industry under current policy settings and technology trajectories.
- **Step Change** – under this scenario Australia takes strong action on climate change. The national energy market (NEM) targets a 90% reduction in emissions from 2016 levels by 2050. In this scenario, aggressive global decarbonisation leads to faster technological improvements.

Any changes to capacity are presented as the marginal effects of Marinus Link on the base case, which already considers for capacity expansion and investment. As a result any negative amounts across the time series are caused by construction occurring in the base case that would be brought forward and accelerated with Marinus Link.

Operating costs are annual payments based on the amount of capacity installed. Some negative operating costs were modelled, as they were either a result of:

- Less physical capacity installed overall compared to the No Marinus Case for certain technologies
- Less physical capacity installed in some years compared to the No Marinus Case, despite the overall capacity remaining unchanged for certain technologies.

Summary of physical capacity and construction costs in Tasmania enabled by Project Marinus

	Difference in physical capacity in 2050 (MW)	Total construction cost (2022 – 2050, $m)
Central		
Wind	0	73
Pumped Hydro	645	1,484
Step Change		
Wind	583	1,152
Pumped Hydro	876	2,037

Regional jobs

The below table outlines the distribution of energy technology between regions in Tasmania. Pumped Hydro has been evenly split between North West Tasmania and the Tasmanian Midlands due to the expected distribution of AEMO scenario assumptions. Wind technology will be expanded across the various Renewable Energy Zones in North West, North East and Midland Tasmania, leading to the allocation shown below.

Proportions of each generation technology type from AEMO ISP data

	North West Tasmania	North-East Tasmania	The Tasmanian Midlands
Pumped Hydro	50%	-	50%
Wind	33%	33%	33%

1. Note that numbers have been rounded for ease of reference

Source: EY analysis of AMEO data

Appendix D – Estimating construction of additional data centre capacity in Tasmania enabled by Project Marinus

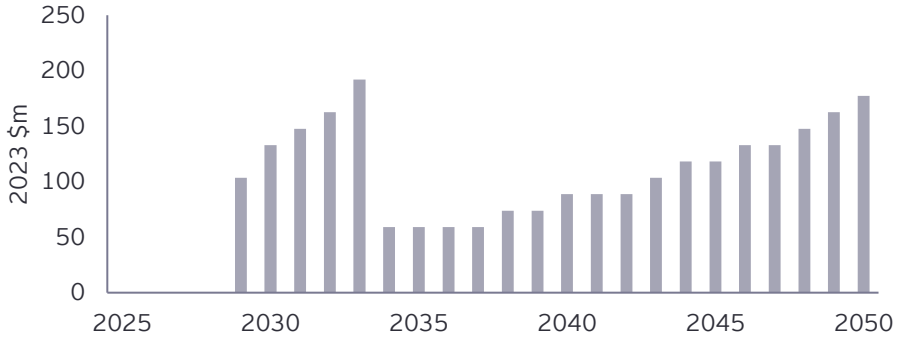
Project Marinus is expected to unlock telecommunications benefits in Tasmania, based on the growing demand for data centre capacity across Australia. Marinus Link provided EY with information about additional data centre capacity in Tasmania as a result of Project Marinus. EY did not consider any outflows of data centre capacity from Victoria

The Turner & Townsends, Data Centre Cost Trends Report, (2022) was used to calculate an estimate of total capital expenditure based on the capacity figures provided by Marinus Link. As Tasmania was not included in the report, the construction cost per watt of data centre capacity for Melbourne was used to estimate construction costs.

Cost per watt of data centre capacity in Melbourne = **$8.8 USD**

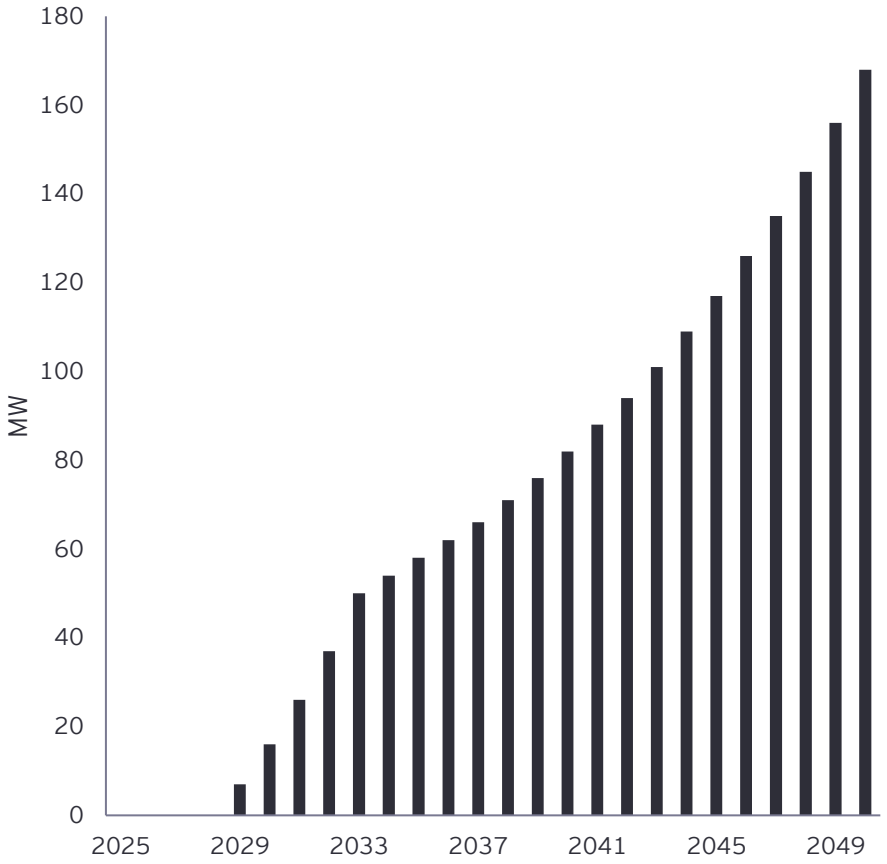
Multipliers were then applied to construction costs to determine value add and FTE years supported. We have not modelled operating costs from the data centres enabled by Project Marinus. Typically the operating cost of a data centre is around 95% electricity, the contribution of which is already counted as part of the additional renewable energy projects,

Construction cost of additional data centre capacity in Tasmania



Source: EY analysis of Marinus Link and Turner & Townsend data

Additional data centre capacity in Tasmania enabled by Project Marinus



Source: EY analysis of Marinus Link data

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