Attachment 1

Analysis of EY Marinus Link Reports on Gross Market Benefits for the Marinus Link Consumer Advisory Panel

Summary of Observations

There have been 4 studies undertaken by EY between 2018 and 2023 into the gross market benefits flowing from Marinus Link.

Over this time period the estimated gross market benefits from Marinus Link have grown from $845 million for a single 600 MW cable, ($1,169 million for a dual cable development with a capacity of 1200MW) to around $4 billion for a single 750MW cable ($5.2 billion for a dual cable development).

In the earlier EY reports the predominant component of the gross market benefit has been modelled to derive from reduced fuel costs across the NEM. In the latest report capex savings associated with the development of Tasmania's superior renewable resources are a significantly more dominant component of the gross market benefits.

Other components of the gross market benefit play a significantly lesser role in the total than these two components.

As the EY studies have progressed the timing of gross market benefits across the study period have been brought forward considerably. In the latest report, the highest annual benefits are achieved in the early 2030s. In the 2019 PADR report the annual benefits were maximized in the early 2040s, and in the 2021 report annual benefit maximization occurred in the late 2030s.

The bringing forward of the annual benefits from Marinus Link has had the impact of increasing the gross market benefit of Marinus Link due to the reduced impact of discounting on the benefit flow.

While the discount rate has varied significantly across the four EY reports, from a low of 3.8% in the 2018 PADR report to 7% in the latest report, each report has delivered higher gross market benefits for the development.

It is noteworthy that the single cable development assessed in the latest study provides a higher level of gross market benefit than a dual cable option in the 2021 study undertaken by EY, even though the commissioning date has been delayed slightly and the discount rate has increased considerably.

It is unclear how the latest EY report findings have been impacted by the C'wth government's 2030 renewables target of 82%. The latest study is based around Marinus Link being commissioned in 2029/30, a time when there will have had to have been significant renewables development across the NEM and some accelerated coal retirement if the government's target is to be reached. The three earlier EY studies were based around the less prescriptive renewables target of the previous C'wth government.

Observation 1: It would be a trivial task for EY, as it updated its analysis, to provide a comparison table which adjusted the timing, the real dollar base year used, discount rate and assumptions used in subsequent reports to the original 13 November 2018 report. Such an analysis could readily be provided in an appendix. The provision of such an analysis would permit the focus of any updated assessment to be placed on changes to the underlying benefit parameters independent to the timing, real dollar base year used and discount rate adopted.

Observation 2: The initial EY assessment identifies that the Gross Market Benefits of Marinus Link flow predominately to the mainland states. At the same time Marinus Link is considered to deliver economic benefits to Tasmania from the Capex, fixed operation and maintenance (FOM) and variable operating and maintenance (VOM) costs associated with the development and use of its superior renewable resources.

Observation 3: In the 12 month period between the initial EY assessment and the EY PAD report there were obviously some significant changes in the underlying assumptions around the development of Marinus Link as the Gross Market Benefit of the link has increased by in excess of 100% and ranges to a value 304% greater for a 600 MW cable timed for 2026.

Observation 4.1: The impact of delaying construction from 2026 & 2028 to 2028 & 2032 has a limited impact of the gross market benefits of Marinus Link (between 3% and 5.4% lower depending upon the scenario).

Observation 4.2: When comparing a single cable option against a dual cable development (2026 & 2028), the EY analysis shows that the bulk of the benefit (between 61.4% and 76.7% depending upon the scenario) comes from the construction of the first cable.

Observation 5: There is a need for EY to clearly highlight why the gross market benefits are so much higher just a year after its first analysis by detailing what changes have been made to the underlying assumptions.

Observation 6.1: The benefits from Marinus Link identified in this second EY report are very limited for Tasmanian electricity consumers and are largely experienced elsewhere in the NEM. The EY assessment indicates Marinus Link is likely to result in a redistribution of the location and balance of new wind and solar PV capacity; overall more wind capacity is forecast to be built and operated in Tasmania, while solar PV capacity is deferred then ultimately increased on the mainland, mainly in New South Wales and Victoria. The substantial increase in FOM for Tasmania may have an impact on local energy prices.

Observation 6.2: EY state in its PADR Report that "there is an overall increase in cost of supply (i.e. negative benefit) with Marinus Link in Tasmania. Meanwhile, all Mainland regions see a decrease in regional cost of supply due to Marinus Link." This outcome from the report reinforces Observation 6.1.

Observation 7.1: The gross market benefits of Marinus Link from the 2021 EY PACR report are substantially aligned with the findings from the 2019 EY report, suggesting the initial 2018 EY report significantly underestimated the gross market benefits of Marinus Link.

Observation 7.2: In this update to the 2019 EY assessment a greater percentage of the total gross benefit derives from the first cable, with the subsequent cable development delivering a lower return.

Observation 8: The impact of using a lower discount rate has boosted the gross market benefit of those scenarios which assume a slower flow of benefits for Marinus Link. This is especially the case where only a single cable is constructed.

Observation 9: In the case of a dual cable development for Marinus Link the difference between the two reports is minimal, except for the Slow Change scenario, which shows a substantial benefit over the previous report. This could be due to the significantly lower discount rate and timing changes. For the other scenarios, despite the discount rate being lower, the gross market benefits are largely unchanged from the 2019 EY report. Significantly, the Step Change scenario shows a significantly lower gross market benefit that the previous Accelerated Transition scenario.

Observation 10: Timing of the Marinus Link development has only a limited impact on the gross market benefit when compared to the discount rate used.

Observation 11: As with the previous two EY reports it is clear that the predominate benefits derived from the construction of Marinus Link relate to fuel cost savings and savings in capex expenditure. Notable in the slow change scenario is the significant savings in fixed operational and maintenance costs (FOM) if Marinus Link is developed.

Observation 12: It is not obvious from the report why fuel cost savings have diminished since 2019, nor why capex is now (in 2021 compared to 2019) a net benefit from the development of Marinus Link.

Observation 13: The 2021 EY report has not provided a table showing the distribution of gross market benefits between the states and by benefit category. This is a disappointing omission in the 2021 report.

Observation 14.1: It is not clear why the estimated gross market benefits are higher in this analysis. The change in the real dollars used in the analysis will have resulted in higher dollar figures going into the analysis carried out by EY and would reflect underlying CPI changes between 2020 and 2023. While this may have induced a higher number for each element of the analysis, any such increase would also have likely been offset by the impact of the significantly higher discount rate.

Observation 14.2: In the 2019 EY report around 35 to 40% of the total gross market benefit accrued from the development of the second cable. In this assessment it is now around 20% of the total gross market benefit.

Observation 15: As the analyses have progressed the benefit of the second cable has dramatically declined under the range of scenarios used by EY in their analysis.

Observation 16.1: As the EY studies have been progressed the predominant gross market benefit of Marinus Link has moved from reduced fuel costs for generators in the NEM (71%

of the gross market benefit in the initial 2018 EY study) to capex savings associated with the NEM being able to access the superior renewable sources available in Tasmania.

Observation 16.2: These higher market benefits in the early 2030s occur during a period where only one cable is available and are likely the cause of lower returns from the second cable. That these capex savings are brought forward in this EY analysis could also explain the greater gross market benefits as the impact of discounting will be lower.

Observation 17: While the quantum of gross market gross market benefits attributable to Marinus Link in this 2023 EY analysis are significantly higher than previously estimated, it is unclear the extent to which the C'wth government's renewables policy has impacted on these outcomes.

Introduction

There have been 4 EY Reports provided to Marinus Link Pty Ltd (MLPL) assessing the Gross Market Benefit of developing the Marinus Link undersea cable. The first was provided on 13 November 2018, with subsequent reports provided on 27 November 2019, 22 June 2021 and the most recent report provided on 29 November 2023. The assessment of Gross Market Benefit does not include the capital costs of construction Marinus Link, nor the operational costs over its life.

In each of these reports EY has used its Time Sequential Integrated Resource Planner (TSIRP) model. This model uses a linear optimisation approach to perform an hourly time sequential least cost long term NEM development optimisation spanning from 2020-21 to 2049-50. Furthermore, the model is closely based on the assumptions from the most recently available AEMO Integrated System Plan.

Each of these reports assesses the Gross Market Benefits of Marinus Link by considering the impacts that the construction of the Marinus Link cable will have on a range of factors including:

- Capex costs of new generation and storage capacity in the NEM;
- total fixed operation and maintenance (FOM) costs of all generation and storage capacity;
- total variable operating and maintenance (VOM) costs of all generation and storage capacity;
- total fuel costs of all generation capacity;
- total cost of voluntary (demand-side participation, DSP) and unserved energy, USE;
- transmission interconnector flow limits between regions and expansion costs associated with REZ development;
- retirement/rehabilitation costs to cover decommissioning, demolition and site rehabilitation; and
- synchronous condenser costs to meet inertia requirements.

Note that the first EY report did not include the benefits associated with the final 3 dot points. The second and third EY assessments also included the impact of transmission and storage losses that would be incurred with and without Marinus Link within the NEM.

The first EY report was built around the development of a single 600MW cable, while subsequent reports were based around either a single 750W cable or twin 750MW cables, providing 1500MW of capacity across Bass Strait.

Each of the EY reports has undertaken the assessment of the Gross Market Benefits using a Net Present Value (NPV) calculation. The NPV in each report has been based around slightly different timings for the commissioning of Marinus Link and use different real dollar base years. The year to which benefits have been discounted to has been changed for each assessment and the discount rate used has also been changed in each assessment in order to reflect the most up to date discount rates.

Sensitivity analysis has also been undertaken by EY on a range of input assumptions used in each report.

Observation 1: It would be a trivial task for EY, as it updated its analysis, to provide a comparison table which adjusted the timing, the real dollar base year used, discount rate and assumptions used in subsequent reports to the original 13 November 2018 report. Such an analysis could readily be provided in an appendix. The provision of such an analysis would permit the focus of any updated assessment to be placed on changes to the underlying benefit parameters independent to the timing, real dollar base year used and discount rate adopted.

The Initial EY Assessment Report

Shown below is the Gross Market Benefit assessment from the 2018 EY report. This report was commissioned by TasNetworks as part of the Marinus Link Initial Feasibility Report.

Table 6: Base Case NPV benefit ($m) by region

Region	Capex	FOM	Fuel	VOM	USE	Total
NSW	92	50	145	28	-	314
QLD	108	20	-51	9	2	88
VIC	307	84	410	60	36	896
SA	139	85	94	24	-2	340
TAS	-559	-180	-	-56	-	-794
Total	87	59	598	66	35	845

This assessment uses real 2018 dollars across a 30 year assessment period to 2050, with the NPV calculated using a 6% discount rate back to 1 July 2020. It shows a Gross Market Benefit for a single 600 MW Marinus Link cable of $845 million.

The table also indicates where these benefits arise. The predominant benefit is in fuel cost savings which arise across the NEM due to the NEM having improved access to Tasmania's renewable resources, both existing and which would be built (hence the $559 million capex cost for Tasmania). The fuel cost saving of nearly $600 million was estimated to represent approximately 1% of the fuel costs at that time.

The assessment also highlights the benefits to the NEM of Tasmania's superior renewable resources. The provision of Marinus Link permitted the development of $559 million of renewables in Tasmania and reduced Capex in the other states by $646 million, while meeting the same demand across the NEM.

Relative to these two benefit elements, other benefits are significantly lower, although the assessment does highlight the increased FOM and VOM costs for Tasmania in meeting needs for the broader NEM.

Observation 2: The initial EY assessment identifies that the Gross Market Benefits of Marinus Link flow predominately to the mainland states. At the same time Marinus Link is considered to deliver economic benefits to Tasmania from the Capex, fixed operation and maintenance (FOM) and variable operating and maintenance (VOM) costs associated with the development and use of its superior renewable resources.

A dual cable development would boost the gross market benefit of Marinus Link to $1.169 million. This indicates that the first cable provides around 70% of the benefits that would flow from 2 cables.

The November 2019 EY PADR Report

Towards the end of 2019 EY provided a further report to MLPL assessing the gross Market Benefits of Marinus Link. This report was provided as part of the Marinus Link Project Assessment Draft Report (PADR). Whereas the initial EY report only considered a single scenario, the 2019 assessment assessed Marinus Link under 5 different scenarios and also a range of construction timelines.

The 4 scenarios were:

- The **Status Quo** scenario was selected by TasNetworks to represent a central view of the market. It used a national emission reduction target of 28 % below 2005 levels by 2030 and a combination of input data mostly sourced from the Australian Energy Market Operator (AEMO) including 'Neutral' demand forecasts from the *2018 Electricity Statement of Opportunities*, coal retirements as per AEMO's February 2019 planning and forecasting assumptions workbook with updates from AEMO published on 25 June 2019 and generator/storage capital and fuel costs from the AEMO February 2019 planning and forecasting assumptions workbook.
- The **Global Slowdown** scenario applies a set of assumptions reflecting a future world of lower demand forecasts, no emissions reduction target, 'Slow Change' gas fuel cost projections, a delay in KerangLink and Snowy 2.0, and a coal capacity constraint that results in earlier coal plant retirements relative to the Status Quo scenario.
- The **Sustained Renewables Uptake** scenario applies all the same assumptions as the Status Quo scenario, except it is intended that renewable capacity build rates are assumed to be maintained at current levels, reflecting current developer interest. To achieve this outcome, the planned retirement date of coal-fired generators are typically three to five years earlier than the dates modelled in the Status Quo scenario. KerangLink is also assumed to be commissioned earlier.
- **Accelerated Transition to a Low Emissions Future** scenario applies a set of assumptions reflecting a future world of higher electricity demand forecasts, a more stringent national emission reduction target of around 52 % below 2005 levels by 2030, 'Fast Change' gas fuel cost projections, AEMO's '2 degree' capex scenario and earlier commissioning of KerangLink.

For this assessment the discount rate was reduced from 6% to 5.9% and the analysis was undertaken using real 2019 dollars discounted to a base period of 1 July 2025. The impact of a slightly reduced discount rate is considered to have had minimal impact on the assessment and given the low inflation at the time the change from 2018 to 2019 dollar would have also had limited impact. As real 2019 dollars were used in the assessment, using a discounting base period of 1 July 2025 would have also had minimal impact on the results.

As with the initial report, the assessment was carried out using a 30 year study period.

The results of this second EY report commissioned by MLPL are shown below for each scenario on the assumption of a single cable and two differing construction timeframes.

Option	Marinus Link timing	Scenario			
		Global Slowdown	Status Quo	Sustained Renewables	Accelerated Transition
750 MW	2026	2,212	2,237	2,616	4,010
	2028	2,157	2,147	2,467	3,801
600 MW	2026	1,997	1,952	2,271	3,418
	2028	1,940	1,868	2,136	3,240

Observation 3: In the 12 month period between the initial EY assessment and the EY PAD report there were obviously some significant changes in the underlying assumptions around the development of Marinus Link as the Gross Market Benefit of the link has increased by in excess of 100% and ranges to a value 304% greater for a 600 MW cable timed for 2026.

The table highlights that the gross market benefits of a single cable Marinus Link are maximized by early construction of a larger capacity cable.

EY also considered a dual cable option. The gross market benefits estimated by EY for a 1500MW dual cable option are shown below.

Option	Marinus Link timing	Scenario			
		Global Slowdown	Status Quo	Sustained Renewables	Accelerated Transition
1,500 MW	2026 & 2028	2,901	3,398	3,997	6,551
	2027 & 2028	2,869	3,330	3,894	6,452
	2028 & 2030	2,833	3,290	3,795	6,300
	2028 & 2032	2,814	3,231	3,661	6,194
	2030 & 2032	2,728	3,125	3,470	5,980
	2030 & 2034	-	3,054	3,339	-

Again, this analysis highlights the benefits of an early build option for both cables as opposed to a delay in construction. However, much of the analysis presented by EY centres around the construction of the first cable being developed in 2028, with a second cable to follow in 2032. Under this timing option the gross market benefit ranges from $2.814 billion to $6.194 billion.

Observation 4.1: The impact of delaying construction from 2026 & 2028 to 2028 & 2032 has a limited impact of the gross market benefits of Marinus Link (between 3% and 5.4% lower depending upon the scenario).

Observation 4.2: When comparing a single cable option against a dual cable development (2026 & 2028), the EY analysis shows that the bulk of the benefit (between 61.4% and 76.7% depending upon the scenario) comes from the construction of the first cable.

This report from EY highlights that the retirement of coal fired plant in the NEW is the primary driver of generation development under all scenarios. This plant is replaced with a mix of solar PV and wind, behind the meter rooftop PV and battery storage and pumped storage hydro (PSH), batteries and gas fired generation.

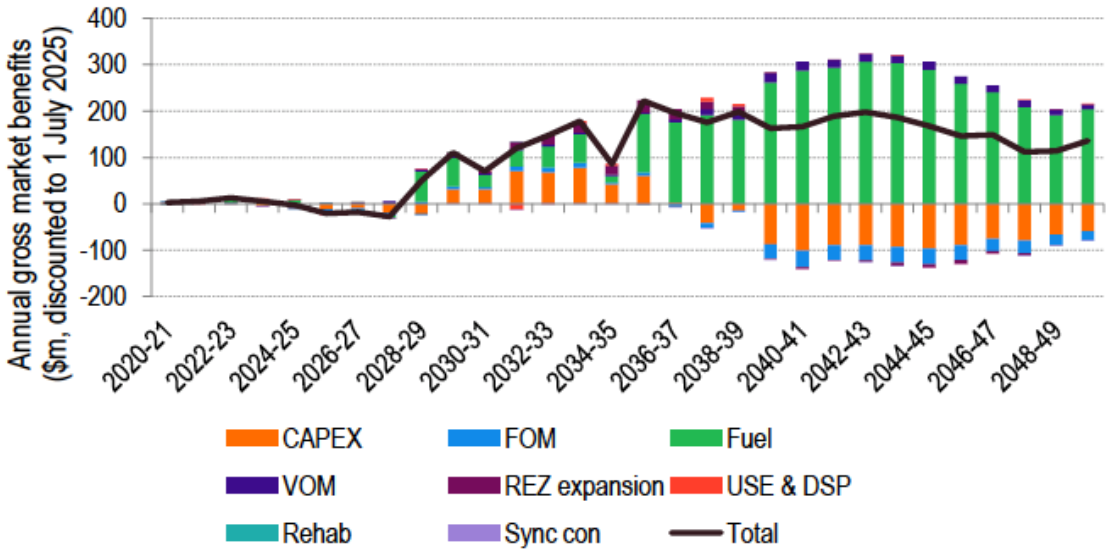
As with the first EY report the availability of renewables from Tasmania to meet demands elsewhere in the NEM are an important driver of the gross market benefit calculation with power flows generally being in a south to north direction with Marinus Link acting to firm mainland states' variable renewable energy sources. It achieves this by storing surplus renewable generation within Tasmania's hydro system and then releasing that power when required by the market.

This leads to more efficient use of existing generation capacity and better investment in new capacity. In particular using Tasmania's hydro capacity, both existing and PSH, is more efficient than for modulating solar PV and wind across the NEM than using mainland batteries or PSH.

Marinus Link is also considered by EY to unlock wind capacity in Tasmania providing the NEM access to a superior wind resource.

As with the original EY assessment the dominant source of benefit from Marinus Link relate to fuel cost savings. This is shown in the chart below by the green shading in the bars.

Figure 1: Forecast annual gross market benefit[21] of Marinus Link 1,500 MW, stage 1 2028, stage 2 2032, Status Quo scenario; millions real June 2019 dollars discounted to 1 July 2025



The analysis also highlights the capex benefits flowing from Marinus Link due to the NEM being able to access the superior wind resources available in Tasmania. While these are shown as negative orange bars above they are smaller capex investments than if Marinus

Link were not established and the NEM was more dependent upon the wind resources on the mainland.

EY state that "*The forecast gross market benefits illustrated in Figure 1 flow from the changes in the NEM capacity mix . . . . . In overall terms, Marinus Link accrues benefits through a reduced need to operate existing and develop new high fuel cost gas-fired generation on the mainland. This energy is forecast to be replaced by firm hydro capacity from existing conventional hydro and new PSH in Tasmania. This is the primary driver of benefits in the forecast*."

The table below summarises the gross market benefits from a under the Status Quo scenario.

Table 16: Summary of forecast gross market benefits by category and region of Marinus Link 1,500 MW, stage 1 2028, stage 2 2032, Status Quo scenario; millions real June 2019 dollars discounted to 1 July 2025

Region	Capex	FOM	Fuel	VOM	REZ expansion	USE / DSP	Rehab	Sync cons	Total
NSW	1,000	204	359	99	101	-17	0	0	1,746
QLD	38	23	124	15	9	-2	-2	0	205
VIC	699	100	3,269	280	-26	16	-1	0	4,337
SA	375	82	256	36	25	17	-1	0	790
TAS	-2,786	-708	-180	-181	16	0	0	-6	-3,846
Total	-674	-300	3,827	249	124	14	-4	-6	3,231

The above table highlights where the gross market benefits of Marinus Link are observed under the Status Quo scenario. When compared to the original EY assessment from 2018 of Marinus Link the gross market benefits flowing from the development of Marinus Link are significantly higher than originally indicated by EY:

- the capex saving for NSW is more than 10 times estimated just one year earlier;
- the capex cost for Tasmania is 5 times higher;
- the fuel savings for Victoria are 8 times greater; and
- overall fuel cost savings are more than6 times higher.

In two areas there are significant cost impacts for the NEM from the development of Marinus Link when compared to the initial EY report. These are:

- overall there are no capex savings within the NEM from the development of Marinus Link, primarily due to the nearly 6 times increase in capex for Tasmania; and
- FOM costs are higher largely due to a 7 fold increase in FOM within Tasmania.

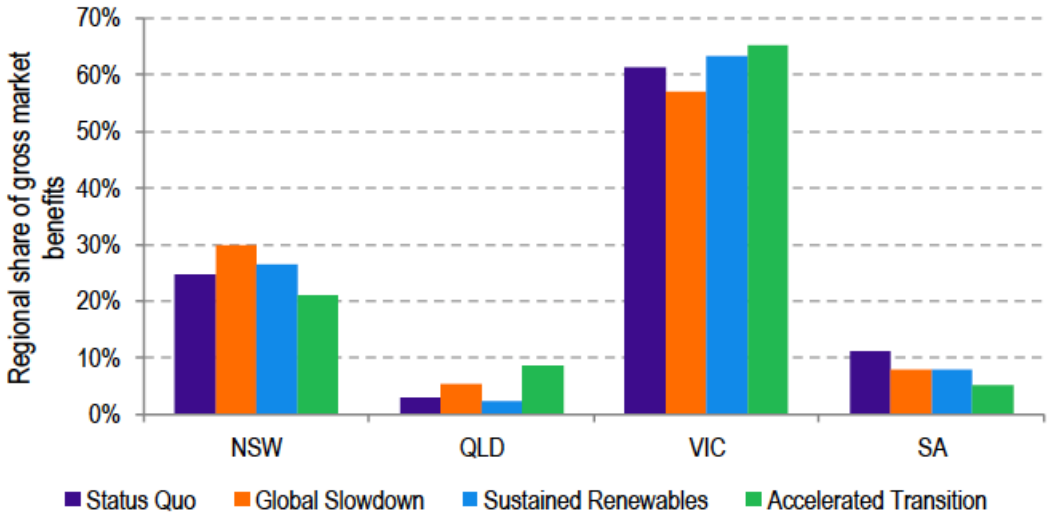
Observation 5: There is a need for EY to clearly highlight why the gross market benefits are so much higher just a year after its first analysis by detailing what changes have been made to the underlying assumptions.

Observation 6.1: The benefits from Marinus Link identified in this second EY report are very limited for Tasmanian electricity consumers and are largely experienced elsewhere in the

NEM. The EY assessment indicates Marinus Link is likely to result in a redistribution of the location and balance of new wind and solar PV capacity; overall more wind capacity is forecast to be built and operated in Tasmania, while solar PV capacity is deferred then ultimately increased on the mainland, mainly in New South Wales and Victoria. The substantial increase in FOM for Tasmania may have an impact on local energy prices.

The chart below outlines the geographical spread of the gross market benefit for Marinus Link across the mainland jurisdictions of the NEM. EY state in this report (page 112) that "*there is an overall increase in cost of supply (i.e. negative benefit) with Marinus Link in Tasmania. Meanwhile, all Mainland regions see a decrease in regional cost of supply due to Marinus Link*."

Figure 77: Mainland regions' share of forecast gross market benefits of Marinus Link 1,500 MW, stage 1 2028, stage 2 2032



Observation 6.2: EY state in its PADR Report that "there is an overall increase in cost of supply (i.e. negative benefit) with Marinus Link in Tasmania. Meanwhile, all Mainland regions see a decrease in regional cost of supply due to Marinus Link." This outcome from the report reinforces Observation 6.1.

The June 2021 EY PACR Report

After a further 18 months EY are back with their Project Assessment Conclusions Report (PACR) where they again undertake an assessment of the gross market benefits of Marinus Link using their TSIRP model with some updates to the scenarios assessed, input data used and assumptions adopted.

Significantly, the discount rate used is much lower at either 3.8% for the Slow Change scenario and 4.8% for the remaining 4 scenarios. The timing of the development of Marinus Link is also adjusted slightly. Where 2026 was used in the 2019 assessment, the start has been delayed to 2027. And where the second cable was proposed for 2032 previously it has been brought back to 2031.

The scenarios assessed have also been updated. There are now 5 separate scenarios:

- **Central** (similar to Status Quo from the 2019 EY Report): The pace of transition from thermal generation to renewables is determined by current federal and state-based renewable energy policies followed by installation on an economic basis.
- **Slow Change** (similar to Global Slowdown): Reflective of a future with lower demand due to the retirement of large industrial loads across Australia and therefore residential PV representing a larger proportion of meeting underlying demand. Slower reduction in capital cost for wind, solar PV and large-scale grid-connected battery storage.
- **High DER** (also similar to Status Quo): A faster uptake of customer-led transition of the NEM in the form of more rooftop PV, behind-the-meter batteries and electric vehicles (EVs).
- **Fast Change** (similar to Sustained Renewables): Coordinated national action to reduce emissions leading to an acceleration in the reduction of cost for wind, solar PV and large-scale batteries.
- **Step Change** (similar to Status Quo from the 2019 EY Report): Accelerated coordination of national action to reduce emissions. Rapid uptake of customer-led transition of the NEM in the form of rooftop PV, behind-the-meter batteries and EVs.

Beginning with a single cable option the gross market benefits are now estimated by EY to range from $2.277 billion to $3.557 billion for a 600MW cable.

Table 1: Forecast market benefits of Marinus Link for different size and timing options, millions real June 2020 dollars discounted to 1 July 2020

		Scenario				
		Slow Change	Central	High DER	Fast Change	Step Change
30-year carbon budget:		No explicit carbon budget			2,068 Mt CO_2-e	1,325 Mt CO_2-e
750 MW	2027	2,802	2,676	2,676	2,839	4,179
600 MW	2027	2,283	2,281	2,277	2,425	3,557

Comparing the earlier 2019 estimates to the 2021 estimates for the 600MW cable, now constructed in 2027 rather than 2026, provides the following increases:

- Slow Change vs Global Slowdown => 17.68%
- Central or High DER vs Status Quo => 16.85%
- Fast Change vs Sustained Renewables => 6.8%
- Step Change vs Accelerated Transition => 4.1%

EY also updated its assessment of a dual cable development as shown below.

Again, the estimates of the gross market benefit are higher than just 18 months earlier. In the discussion of the 2019 EY report above, the reference timing used was 2028 & 2032 for the first and second cables. The comparison shown in the dot points below is based on a 2028 & 2031 construction timeline. This provides the following outcomes:

- Slow Change vs Global Slowdown => 52.3%
- Central or High DER vs Status Quo => 3.0%

- Fast Change vs Sustained Renewables => 0.85%
- Step Change vs Accelerated Transition => -11.4%

Table 1: Forecast market benefits of Marinus Link for different size and timing options, millions real June 2020 dollars discounted to 1 July 2020

		Scenario				
		Slow Change	Central	High DER	Fast Change	Step Change
30-year carbon budget:		No explicit carbon budget			2,068 Mt CO_2-e	1,325 Mt CO_2-e
Option	Marinus Link timing	Discount rate: 3.8 %	Discount rate: 4.8 %			
1,500 MW	2027 & 2029	4,405	3,420	3,425	3,679	5,655
	2027 & 2030	4,384	3,416	3,421	3,673	5,627
	2028 & 2031	4,270	3,385	3,388	3,630	5,490
	2031 & 2034	3,876	3,241	3,237	3,432	5,014
	2034 & 2037	3,414	2,903	2,875	3,040	4,336
1,200 MW	2027 & 2029	3,986	3,250	3,262	3,481	5,195
	2027 & 2030	3,952	3,244	3,256	3,473	5,159

Unpacking these changes provides some interesting observations.

Observation 7.1: The gross market benefits of Marinus Link from the 2021 EY PACR report are substantially aligned with the findings from the 2019 EY report, suggesting the initial 2018 EY report significantly underestimated the gross market benefits of Marinus Link.

Between 63.6% and 78.2% of the total gross market benefits of Marinus Link relate to the development of the first cable. Maximum gross benefit from Marinus Link is derived from the rapid construction of the second cable. The longer the delay in constructing the second cable the lower the gross market benefit of Marinus Link.

Observation 7.2: In this update to the 2019 EY assessment a greater percentage of the total gross benefit derives from the first cable, with the subsequent cable development delivering a lower return.

Observation 8: The impact of using a lower discount rate has boosted the gross market benefit of those scenarios which assume a slower flow of benefits for Marinus Link. This is especially the case where only a single cable is constructued.

Observation 9: In the case of a dual cable development for Marinus Link the difference between the two reports is minimal, except for the Slow Change scenario, which shows a substantial benefit over the previous report. This could be due to the significantly lower discount rate and timing changes. For the other scenarios, despite the discount rate being lower, the gross market benefits are largely unchanged from the 2019 EY report. Significantly, the Step Change scenario shows a significantly lower gross market benefit that the previous Accelerated Transition scenario.

Tucked away on page 61 of the 2021 EY report are two tables showing the impact of changing the discount rate under each scenario on the basis of a 2027 & 2030 construction timeframe.

Table 5: Forecast market benefits of Marinus Link 1,500 MW, stage 1 2027, stage 2 2030, discount rate sensitivities; millions real June 2020 dollars discounted to 1 July 2020

Sensitivity	Slow Change	Central	Fast Change	High DER	Step Change
3.80 % WACC	NA[69]	3,940	4,193	3,981	6,258
6.80 % WACC	2,711	2,512	2,895	2,510	4,553

Table 6: Differences in forecast market benefits of Marinus Link 1,500 MW, stage 1 2027, stage 2 2030, discount rate sensitivities; millions real June 2020 dollars discounted to 1 July 2020

Sensitivity	Slow Change	Central	Fast Change	High DER	Step Change
3.80 % WACC	NA[69]	524	520	560	631
6.80 % WACC	-1,673	-904	-778	-910	-1,074

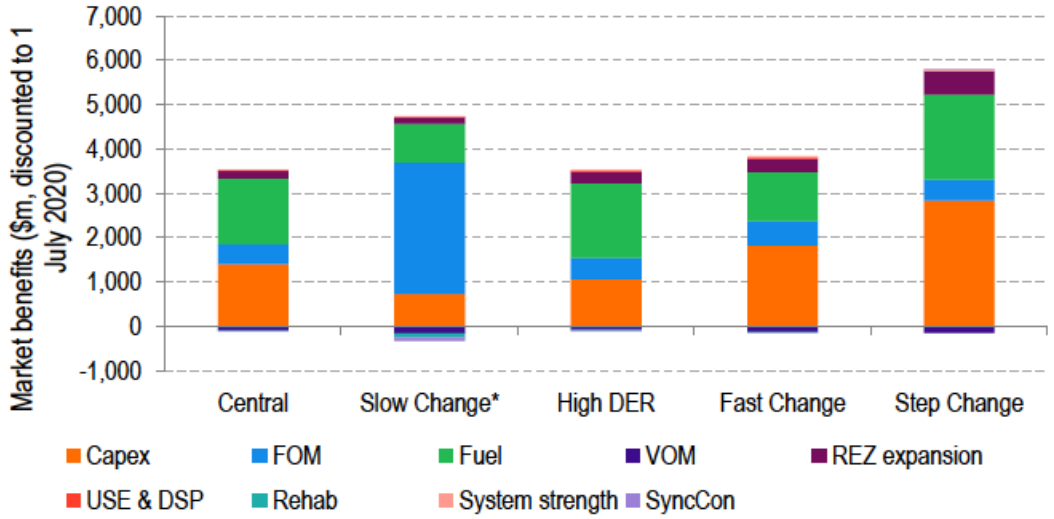
Observation 10: Timing of the Marinus Link development has only a limited impact on the gross market benefit when compared to the discount rate used.

The significant impact of discount rate on the gross market benefits are shown below. The table compares the results from this report with those recorded in the 2019 second EY report for 2028 & 2030 construction timeframe with its 5.9% discount rate.

	3.8% Discount Rate	6.8% Discount Rate
Slow Change vs Global Slowdown	54.7%	-4.3%
Central or High DER vs Status Quo	19.8%	-23.6%
Fast Change vs Sustained Renewables	9.1%	-23.7%
Step Change vs Accelerated Transition	-1.0%	-27.7%

The chart below shows the distribution of gross market benefits derived from the development of Marinus Link under each scenario.

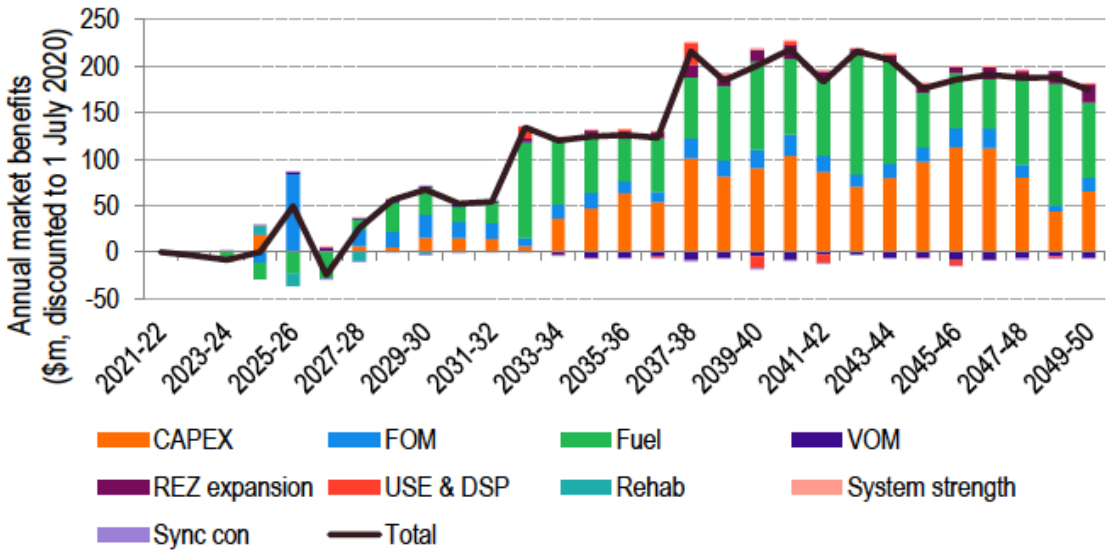
Figure 1: Forecast market benefits of Marinus Link 1,500 MW, stage 1 2027, stage 2 2029; millions real June 2020 dollars discounted to 1 July 2020. (*Slow Change uses a discount rate of 3.8 % while other scenarios use 4.8 %.)



Observation 11: As with the previous two EY reports it is clear that the predominate benefits derived from the construction of Marinus Link relate to fuel cost savings and savings in capex expenditure. Notable in the slow change scenario is the significant savings in fixed operational and maintenance costs (FOM) if Marinus Link is developed.

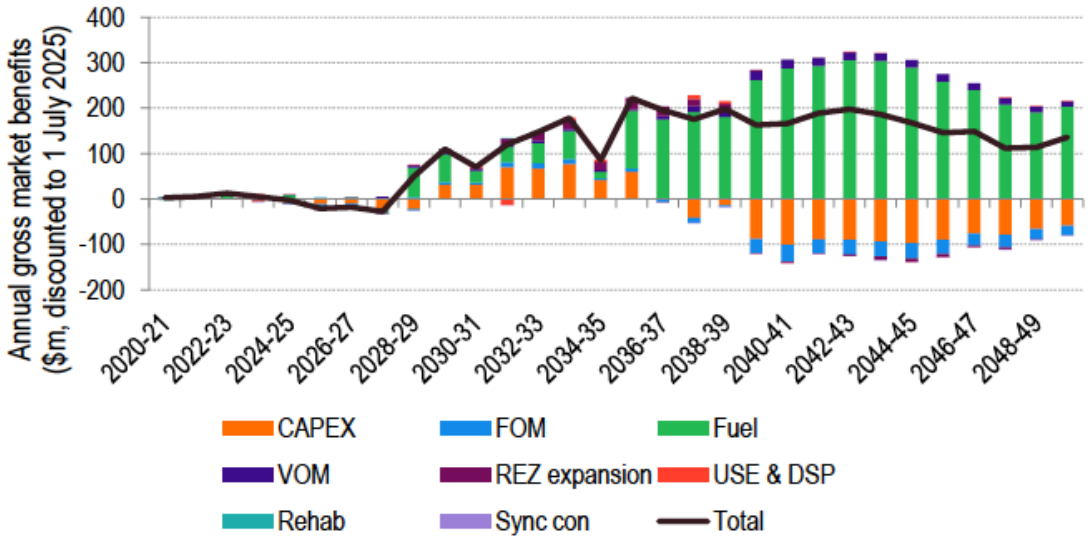
The chart below shows how gross market benefits are envisaged to flow over time following the development of Marinus Link under the Central Scenario.

Figure 26: Forecast annual market benefits[57] of Marinus Link 1,500 MW, stage 1 2027, stage 2 2029, Central scenario; millions real June 2020 dollars discounted to 1 July 2020



This chart clearly shows the fuel cost savings due to Marinus Link. Of particular note in this chart is the extent of fuel cost savings after 2030. It is interesting to compare this flow of gross market benefits with that estimated in the 2019 EY report, from a similar scenario, which is shown below.

Figure 26: Forecast annual gross market benefits[168] of Marinus Link 1,500 MW, stage 1 2028, stage 2 2032, Status Quo scenario; millions real June 2019 dollars discounted to 1 July 2025



While I have only considered the Central and Status Quo scenarios in the analysis a similar outcome exists when other scenarios are compared.

Comparing these two charts indicate lower fuel cost savings in the 2021 EY report when compared to the estimates made in 2019. The charts also show very different outcomes in relation to savings in renewable energy capex. In the 2019 EY report capex across the NEM was forecast to increase, while by 2021 savings in capex virtually match savings in fuel costs.

While this outcome may have been suspected with the renewable energy policy changes introduced by the incoming Labor government, both reports pre-date the May 2022 election.

Observation 12: It is not obvious from the report why fuel cost savings have diminished since 2019, nor why capex is now (in 2021 compared to 2019) a net benefit from the development of Marinus Link.

Observation 13: The 2021 EY report has not provided a table showing the distribution of gross market benefits between the states and by benefit category. This is a disappointing omission in the 2021 report.

The November 2023 EY Assessment of Gross Market Benefits

With passage of 18 months and updated capital cost estimates now in the public arena, EY have prepared their 4th estimate of the gross market benefits flowing from the development of Marinus Link. In this analysis 3 scenarios have been tested and EY have pointed out that while "*some scenario names may overlap with the Marinus Link Regulatory Investment Test for Transmission (RIT-T) by TasNetworks, such as the Step Change scenario, the underlying assumptions are different.*"

This adds another layer of complexity in understanding how the gross market benefit estimates have changed over time. The three scenarios assessed are:

- **Step Change**: Decarbonisation efforts that support Australia's share in limiting global temperature rise to below 2˚C compared to pre-industrial levels. This scenario uses significant transport electrification, as well as developing hydrogen production or low emissions alternatives to support domestic industrial loads. This is a refinement of the 2021 AEMO IASR Step Change scenario.
- **Progressive Change**: Aims to meet Australia's current Paris Agreement commitment of 43% emissions reduction by 2030 and net zero emissions by 2050. However, this scenario is hindered by a reduction in industrial loads, higher technology costs and supply chain challenges. Assumed Tasmanian load is lowest in this scenario.
- **Green Energy Exports**: Very strong decarbonisation domestically and global, including the strong use of electrification, green hydrogen and biomethane. This is a refinement of the 2021 AEMO IASR Hydrogen Superpower scenario. Assumed Tasmanian load is highest in this scenario.

In assessing each of these scenarios EY has sought to include the C'wth government's 82% renewables target. The results of the analysis for the various scenarios, timing options and cable alternatives are shown in the table below. It should be noted that in this analysis by EY, real June 2023 dollars have been used, discounted to July 2023. In the 2021 EY analysis 2020 dollars formed the basis of the analysis, with discounting to July 2020. The discount rate has been significantly increased from 4.8% to 7%.

Table 1: Overview of scenarios with associated forecast gross market benefits for Marinus Link; millions real June 2023 dollars discounted to 1 July 2023

Marinus Link size	Marinus Link timing	Step Change	Progressive Change	Green Energy Exports	Scenario weighted average[10]
1,500 MW	2029-30 & 2031-32	4,336	6,038	6,395	5,359
	2029-30 & 2033-34	4,224	5,953	6,164	5,241
	2029-30 & 2035-36	4,105	5,812	5,914	5,093
750 MW	2029-30	3,502	4,691	4,768	4,191

While these scenarios are not directly comparable to those used in the previous EY reports, what is clearly evident is that the estimated gross market benefits are significantly higher than those estimated just 18 months earlier. The level of gross market benefits associated with a single 750 MW cable are now in the same general ball-park as those previously associated from a 1500 MW twin cable development.

Observation 14.1: It is not clear why the estimated gross market benefits are higher in this analysis. The change in the real dollars used in the analysis will have resulted in higher dollar figures going into the analysis carried out by EY and would reflect underlying CPI changes between 2020 and 2023. While this may have induced a higher number for each element of the analysis, any such increase would also have likely been offset by the impact of the significantly higher discount rate.

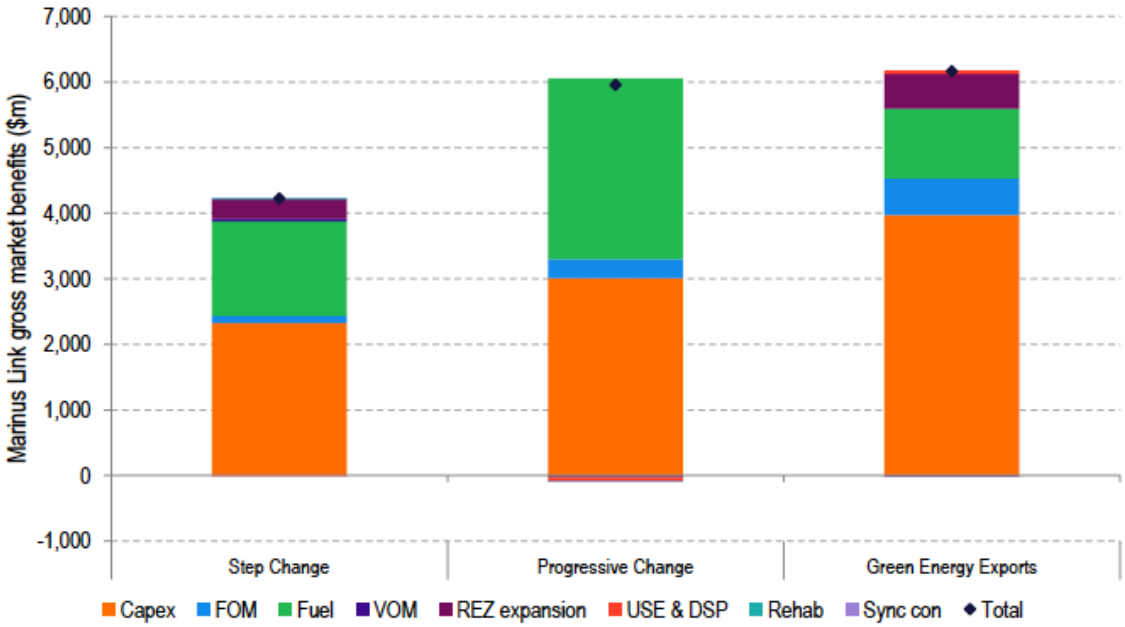
When the gross market benefit of the single cable is compared to the gross market benefit of a dual cable, this 2023 analysis shows a significantly greater benefit coming from the construction of the first cable. It now ranges between 74.6% to 80.8%. Any delay in constructing the second cable simply accelerates the percentage of the total gross market benefit which comes from the initial cable development with over 80% of the gross market benefits flowing from the initial cable if the construction of the second cable is delayed by as little as 4 years.

Observation 14.2: In the 2019 EY report around 35 to 40% of the total gross market benefit accrued from the development of the second cable. In this assessment it is now around 20% of the total gross market benefit.

Observation 15: As the analyses have progressed the benefit of the second cable has dramatically declined under the range of scenarios used by EY in their analysis.

In all scenarios, and as was also the case in the previous three EY analyses, the forecast benefits for Marinus Link are primarily driven by capex savings across the NEM, and by mainland fuel cost saving in electricity generation. This is shown in the chart below.

Figure 1: Composition of forecast total gross market benefits of Marinus Link stage 1 2029-30 and stage 2 2033-34; millions real June 2023 dollars discounted to 1 July 2023

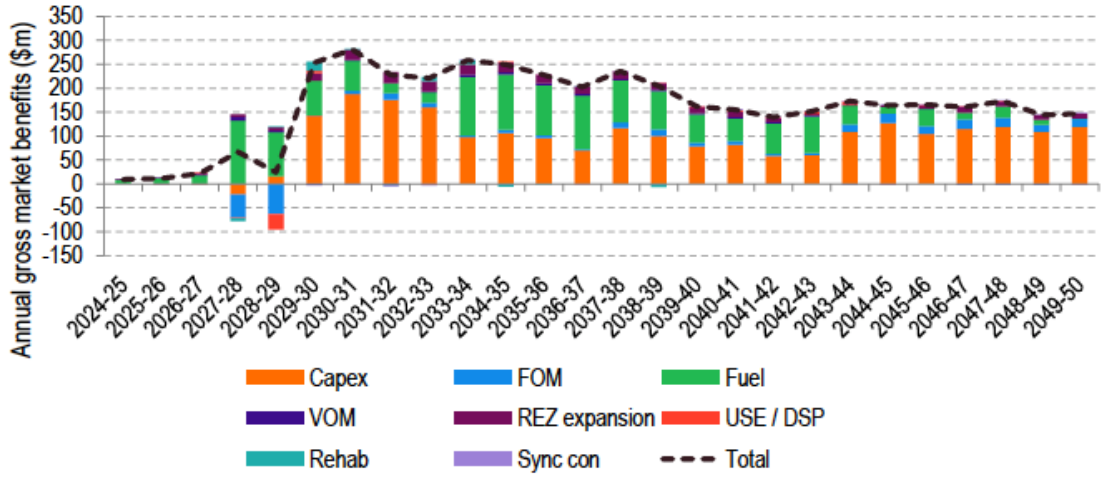


When compared to the gross market benefits reported in the previous 2019 EY study it is apparent from the chart above that an increasing share of the gross market benefits are now a result of capex savings and not lower fuel costs for non-renewable generators. EY note that capex and fuel have remained the predominant components of the gross market benefit, but did not highlight that capex was now considered to dominate. Other elements of the gross market benefit have a limited impact on the total.

Observation 16.1: As the EY studies have been progressed the predominant gross market benefit of Marinus Link has moved from reduced fuel costs for generators in the NEM (71% of the gross market benefit in the initial 2018 EY study) to capex savings associated with the NEM being able to access the superior renewable sources available in Tasmania.

The flow of gross market benefits across the study period are shown in the chart below.

Figure 15: Annual Marinus Link market benefit forecast for Step Change scenario, Marinus Link stage 1 2029-30 and stage 2 2033-34; millions real June 2023 dollars discounted to 1 July 2023



What is interesting about this chart is the level of benefit flowing predominately from capex between 2029/30 and 20333/34. It is likely this benefit is related to the contemporaneous development of wind resources in Tasmania and the delay in or abandonment of renewable projects on the mainland as the second Marinus Link cable is being constructed. EY make specific comment on this pre-emptive development in Tasmania. Also of note is that significant fuel cost savings in the NEM are not presumed to flow until the second cable is in place.

In the 2021 EY report, which was carried out before the C'wth government implemented a policy of 82% renewables by 2030, it was estimated that the capex and fuel cost savings would be around $200 million per annum from 2037 onwards, and this was based around construction of the first cable in 2027 and the second in 2029. In the period up to 2037 fuel cost and capex savings were less than $150 million per annum.

However, in this latest EY report, where the first cable is not constructed until the C'wth governments 82% renewable target has been reached, and the second cable is delayed until 2033/34, Marinus Link is delivering annual gross market benefits of between $200 and $250 million until around 2037 and then around $150 million there after.

While the quantum of gross market benefits achieved over the period being modelled are similar, the timing of those gross market benefits has been flipped, with greater gross market benefits estimated to flow in the early years of the development.

Observation 16.2: These higher market benefits in the early 2030s occur during a period where only one cable is available and are likely the cause of lower returns from the second cable. That these capex savings are brought forward in this EY analysis could also explain the greater gross market benefits as the impact of discounting will be lower.

One point EY seem to overlook is the extent of renewable development that will need to occur within the NEM over the period 2024 to 2030 if the government's 82% renewable goal is to be reached by 2030. In its modelling there are few capex savings identified during the

period relating to the construction of the first Marinus Link cable. This would suggest that over the next few years the possibility of Marinus Link will have little impact of which renewable projects are chosen across the NEM in order to meet the government's target for renewable generation.

However, once the first cable is in place the modelling seems to indicate that the next tranche of renewable developments will utilise Tasmania's superior renewable resources while the second cable is constructed. Then, once it is in place, the NEM will experience reduced fuel costs as a result of being able to access not only increased and lower cost renewables from Tasmania, but also being able to utilise Tasmania's hydro resources to provide firming capacity in the NEM.

Observation 17: While the quantum of gross market gross market benefits attributable to Marinus Link in this 2023 EY analysis are significantly higher than previously estimated, it is unclear the extent to which the C'wth government's renewables policy has impacted on these outcomes.