

Your ref: Project Marinus
Our Ref:
Date: Monday, 6 April 2020

Email: team@marinuslink.com.au

To whom it may concern

Re: Marinus Project Assessment Draft Report (PADR) – Basslink Submission

Please find enclosed with this letter a report commissioned by Basslink Pty Ltd (**Basslink**) from ACIL Allen Consulting (**ACIL**) on the PADR.

The ACIL Report compares the approach taken in the Initial Feasibility Study (**IFS**) for Marinus with the different approach taken in the PADR. The ACIL Report identifies various flaws in the PADR, including certain fundamental modelling flaws.

The ACIL Report identifies that:

1. The PADR annualises the costs of Marinus over its **60-year** life but only modelled gross market benefits over **20 years**.
 - a. This is an unreasonable approach, as it heavily overstates the relative size of costs and benefits of Marinus.
 - b. The NPV of annualised costs directly considered in the model are only around 45% of the estimated cost of Marinus.
2. A significant change from the IFS is the increase in fuel cost savings driven by new investment in CCGTs turbines operating at surprisingly high capacity rates.
 - a. These high levels of gas power generation in the PADR are unrealistic because:
 - i. the projected investment is unrealistic, and
 - ii. such generation is unlikely to be economic because of high gas prices and emissions constraints.
 - b. This change from the IFS grossly overstates the fuel cost savings and, therefore, the gross market benefits of Marinus.
3. The demand forecasts used in three of the four main PADR scenarios are bullish and out-of-date. 2018 ESOO is used rather than the 2019 ESOO (which has lower levels of demand). Again, the approach taken overstates the gross market benefits attributable to Marinus.

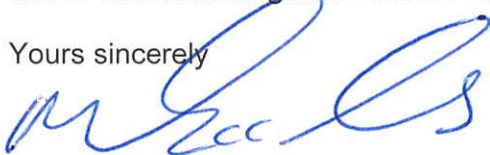
Investment in infrastructure must be value for money to benefit the community. Better value for money infrastructure investments should be considered. The Basslink Interconnector already connects the Tasmania and Victorian transmission networks and has been doing so for nearly 15

years. It is designed for a 40 year life but assessments have been undertaken to extend its operation to a 65 year life. Further, the Basslink Interconnector has capacity for expansion to a bipolar configuration. An effective doubling of the capacity could be possible. Basslink has not been engaged on this specific option, but would open to future discussions about this.

As the owner of a Project of State Significance, Basslink is cognisant of the benefits that value for money infrastructure investment can bring to the Tasmania community both economically and socially. As the only owner and operator of an HVDC facility in Australia we have a highly experienced team. There are many technical, operational and commercial questions that will need to be addressed as consideration of Tasmania's infrastructure needs progresses, and any further consideration is given to Project Marinus. For example, the Basslink Interconnector's configuration, location and capacity are a function of dealing with these currently unaddressed issues, especially environmental considerations.

Basslink is happy to contribute to exploring Tasmania's infrastructure investment options to achieve value for money for the community. We look forward to assisting in these discussions, and to understanding more about Project Marinus as the project develops.

Yours sincerely



Malcolm Eccles

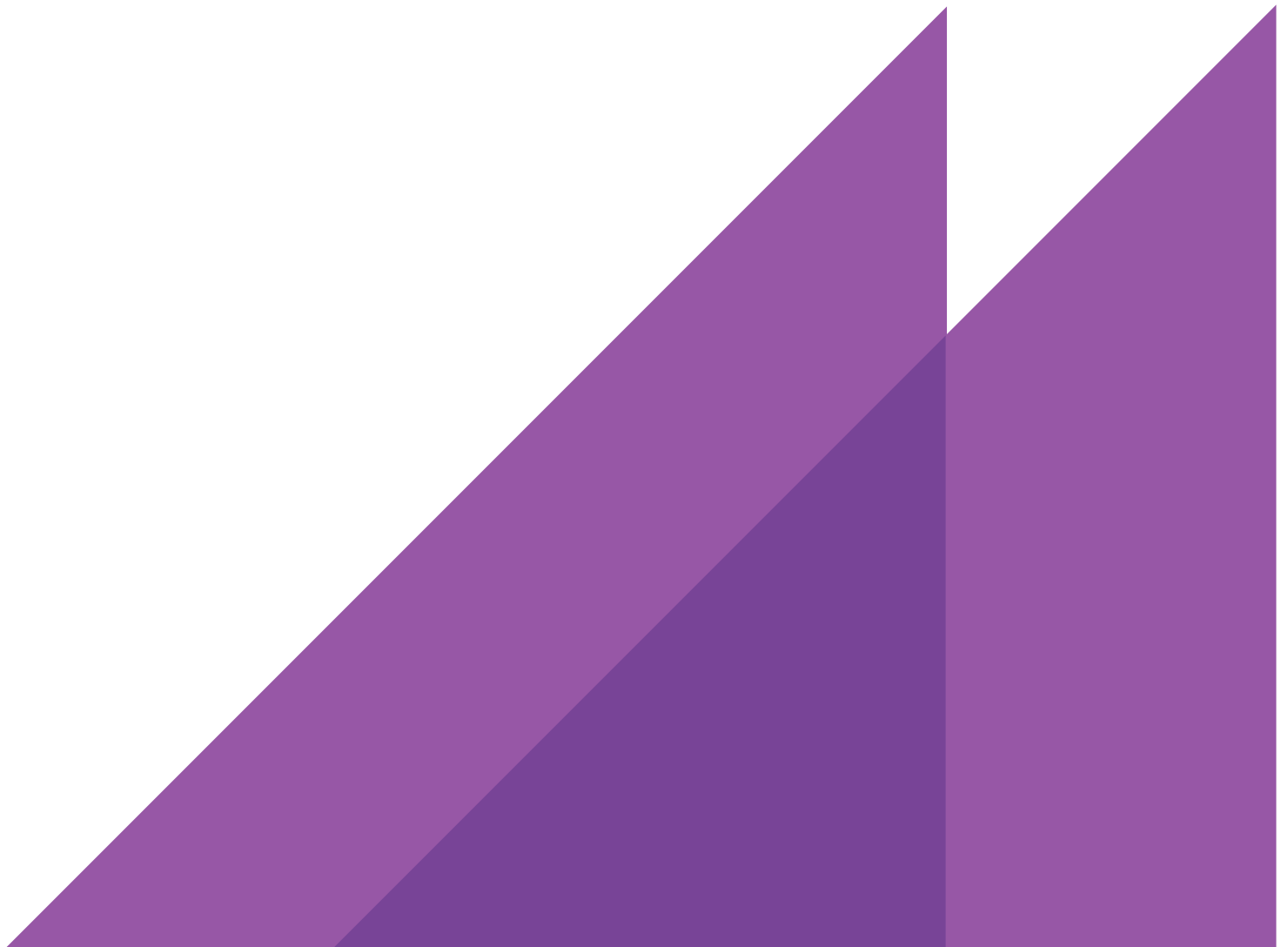
CEO
Basslink Pty Ltd

REPORT TO
BASSLINK PTY LTD
2 APRIL 2020

REVIEW OF PADR ANALYSIS



IN SUPPORT OF
BASSLINK'S SUBMISSION
TO THE PROJECT
MARINUS PADR





ACIL ALLEN CONSULTING PTY LTD
ABN 68 102 652 148

LEVEL NINE
60 COLLINS STREET
MELBOURNE VIC 3000
AUSTRALIA
T+61 3 8650 6000
F+61 3 9654 6363

LEVEL NINE
50 PITT STREET
SYDNEY NSW 2000
AUSTRALIA
T+61 2 8272 5100
F+61 2 9247 2455

LEVEL FIFTEEN
127 CREEK STREET
BRISBANE QLD 4000
AUSTRALIA
T+61 7 3009 8700
F+61 7 3009 8799

LEVEL SIX
54 MARCUS CLARKE STREET
CANBERRA ACT 2601
AUSTRALIA
T+61 2 6103 8200
F+61 2 6103 8233

LEVEL TWELVE, BGC CENTRE
28 THE ESPLANADE
PERTH WA 6000
AUSTRALIA
T+61 8 9449 9600
F+61 8 9322 3955

167 FLINDERS STREET
ADELAIDE SA 5000
AUSTRALIA
T +61 8 8122 4965

ACILALLEN.COM.AU

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1.1 Introduction

ACIL Allen Consulting (ACIL Allen) has been engaged by Basslink Pty Ltd (Basslink) to provide electricity market advisory services regarding the National Electricity Market (NEM) of Australia, in support of Basslink's submission to the Project Marinus RiT-T Project Assessment Draft Report (PADR).

1.2 Background

In December 2017, Project Marinus was established by TasNetworks¹, with funding support from ARENA and the Tasmanian Government, to complete a detailed Feasibility and Business Case Assessment of the proposed Marinus Link. In February 2019, TasNetworks published the Initial Feasibility Study (IFS) for Project Marinus, which contained estimates of the market benefits and indicative costs of the proposed link(s).

In November 2019, TasNetworks published the Project Marinus Project Assessment Draft Report (PADR), which includes a cost-benefit analysis of the proposed Marinus Link as required by that stage in the regulatory (RiT-T) process.

The analysis presented in the PADR attributes very favourable gross market benefits to Marinus Link and positive net market benefits in all of the modelled scenarios. This is in contrast to the IFS, which showed negative net market benefits under most of the scenarios modelled.

1.3 The brief

ACIL Allen has been engaged by Basslink to review the analysis presented in the PADR.

In this report, ACIL Allen highlights the changes in the approach or the input assumptions used in the PADR that have resulted in:

- increases in net market benefits between the IFS and PADR
- increases in gross market benefits between the IFS and PADR.

Additionally, ACIL Allen has provided comments on the reasonableness of:

- the approach taken in the PADR to estimate net market benefits
- the input assumptions used in the PADR market modelling to estimate gross market benefits.

¹ TasNetworks is a Tasmanian Government State owned company that is responsible for electricity transmission and distribution throughout Tasmania.

While some of these comments include quantified estimates and rely on some recent NEM scenario ACIL Allen modelling – ACIL Allen has not undertaken independent RIT-T conforming modelling.



2.1 Core concerns about PADR analysis

Table 2.1 compares key assumptions and results in the IFS and PADR for selected interconnector options and scenarios. The PADR scenarios project significant increases in the net market benefits of Marinus Link compared to the IFS Neutral scenario, because of:

- change in the manner in which the estimated cost of Marinus Link is incurred in the cost benefit analysis used to calculate the net market benefits in the PADR
- higher estimated gross market benefits in the PADR.

The following sections investigate the two points above in more detail.

2.1.1 Lower estimated cost of Marinus Link used in the net market benefits calculation

A fundamental issue that has changed between the IFS and the PADR is in the way that the discounted cash flow modelling has been undertaken and presented. As shown in **Table 2.1**, in the IFS, Marinus Link was estimated to have a capital cost of \$2,198 million for a 1,200 MW link. In the PADR this has been increased to \$2,762 million for a 1,500 MW link. When considered on a \$/MW basis, the total estimated cost to build Marinus Link has not changed significantly between the IFS and PADR as the proposed link size has increased by 20 per cent.

However, gross market benefits in the PADR Status Quo are \$2,418 million compared with \$1,468 million in the IFS Neutral case. Ernst and Young (EY) modelled the market benefits to 2049-50 even though the asset life is set at 60 years (ending in 2088 to 2092). Rather than model the project costs as they occur prior to the commissioning of the asset, TasNetworks represented the costs of Marinus Link in the PADR as an annualised payment (annuity). The annualised payment was based on a 60-year asset life. As the market benefits are only available to 2049-50, the discounted cash flow modelling ended in 2049-50 – effectively 20 years of the asset life (averaging the first and second stages). Therefore, the NPV of the annualised costs directly considered in the model are only \$1,271 million (refer **Table 2.1**), around 45 per cent of the estimated total cost of the project.

The market benefits are also calculated to 2049-50 and are compared only with the annualised costs to 2049-50. This approach implies that the market benefits post 2049-50 occur in the same ratio and incidence as those up to 2049-50 in NPV terms (same ratio of project benefits to project costs) and that the project benefits are actually greater in NPV terms post 2050. Applying this ratio, TasNetworks are in effect claiming gross market benefits for the life of the project are \$5,250 million with \$2,832 million of gross market benefits accruing post 2049-50. If this is not the case, then either the full 60 year cost benefit analysis should be provided showing all costs and benefits or a much higher proportion of costs should be brought forward pre-2050 to coincide with the period in which the larger proportion of benefits occur.

Almost all the market benefits are associated with less fuel usage and a reduction in variable operating costs for thermal power stations. By 2049-50, it would be expected that almost all thermal plant would be retired regardless of whether Marinus Link was built. Therefore, we would expect little or no gross market benefits associated with changes in thermal dispatch post 2049-50.

This highlights a fundamental flaw in the approach taken by TasNetworks as it heavily overstates the relative size of benefits of the asset.

2.1.2 Higher estimated gross market benefits in the PADR

A significant change between the IFS and the PADR is that estimated gross market benefits are significantly higher in the PADR (all scenarios). Ernst and Young (EY) modelled the gross market benefits to 2049-50 under four key scenarios - Status Quo, Global Slowdown, Sustained Renewables Uptake and Accelerated Transition to a Low Emissions Future. The resulting estimated gross market benefits in these PADR scenarios are between 45 per cent and 200 per cent higher than gross market benefits in the earlier IFS Neutral scenario.

Table 2.2 below shows the components of gross market benefits under each PADR scenario and compares these to the IFS Neutral scenario. The largest contributor to gross market benefits in the scenarios is fuel cost savings. That is, the cost of gas, coal and diesel consumed by thermal generation displaced by renewable and pumped hydro generation – aided by the introduction of Marinus Link. For example, estimated gross market benefits from fuel cost savings are as high as \$2.7 billion in the Status Quo scenario and \$3.1 billion in the Sustained Renewables Uptake scenario, which is around three times the estimated \$0.9 billion in the IFS Neutral scenario.

TABLE 2.1 HIGH LEVEL MARKET BENEFITS COMPARISON

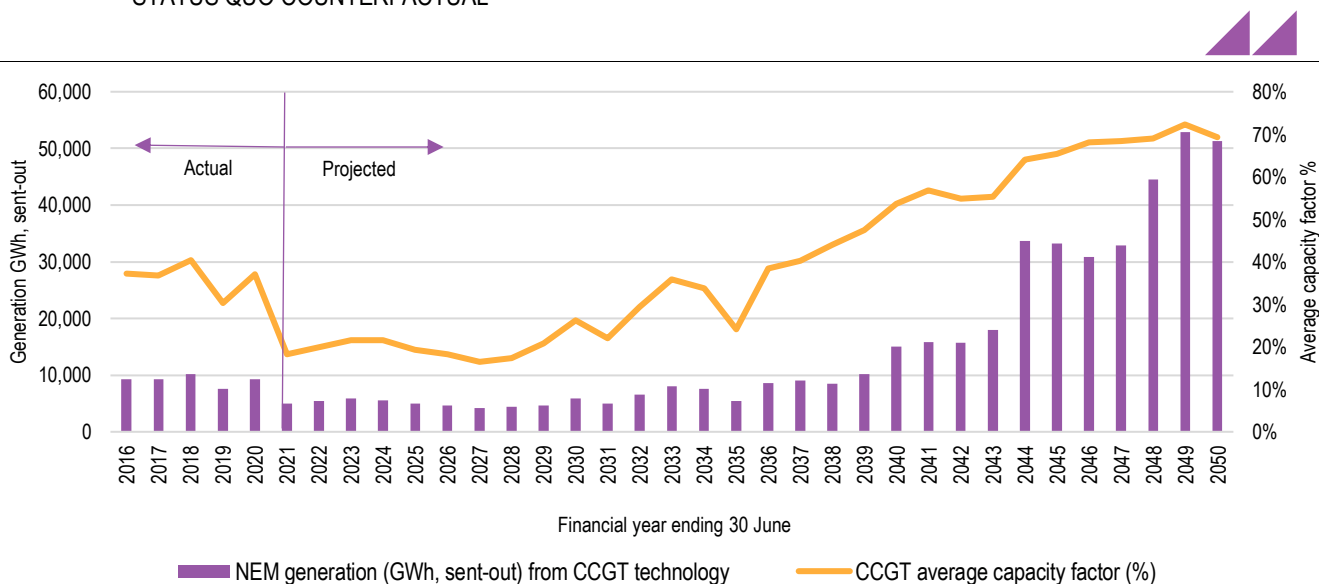
Scenario	IFS - Neutral	PADR – Status Quo	PADR - Global Slowdown	PADR – Sustained Renewables Uptake	PADR – Accelerated Transition	Weighted average PADR (d)
Key assumptions						
Link option (a)	Marinus 1200 Staggered	Option 7 (1,500 MW)	Same as Status Quo	Same as Status Quo	Same as Status Quo	Same as Status Quo
Present value year	2025	2019	Same as Status Quo	Same as Status Quo	Same as Status Quo	Same as Status Quo
Real or nominal \$	Real 2017	Real 2019	Same as Status Quo	Same as Status Quo	Same as Status Quo	Same as Status Quo
Period over which market benefits are included	2020-21 to 2049-50	2020-21 to 2049-50	Same as Status Quo	Same as Status Quo	Same as Status Quo	Same as Status Quo
Discount rate (pre-tax real)	6%	5.90%	Same as Status Quo	Same as Status Quo	Same as Status Quo	Same as Status Quo
Key results						
Gross market benefits \$ million	\$1,468	\$2,418	\$2,122	\$2,722	\$4,517	\$2,945
TasNetworks' estimate of the total capital cost of Marinus Link \$ million	\$2,198	\$2,762	\$2,762	\$2,762	\$2,762	\$2,762
TasNetworks' estimate of the total capital cost of Marinus Link used in the net market benefits calculation \$ million (c)	\$2,198	\$1,271	\$1,271	\$1,271	\$1,271	\$1,271
TasNetworks' estimate of net market benefits \$ million	(\$730)	\$1,147	\$851	\$1,451	\$3,246	\$1,674
<p>(a) 'Marinus 1200 Staggered' is an option in the IFS of 600 MW in July 2025 and an additional 600 MW in July 2028; 'Option 7' is the PADR's preferred option of 750 MW in 2028 and an additional 750 MW in 2032.</p> <p>(b) Other sources of market benefits estimated in the IFS and PADR include ancillary services, renewable expansion transmission costs and unserved energy.</p> <p>(c) In the PADR, the estimate of the cost of Marinus used in the net market benefits calculation was adjusted to an annualised estimate for the period to 2050, which is much smaller than the total cost estimate</p> <p>(d) Equal weighting across all four PADR scenarios</p> <p>SOURCE: IFS, PADR</p>						

TABLE 2.2 GROSS MARKET BENEFITS, BY CATEGORY

Scenario	IFS - Neutral	PADR – Status Quo	PADR - Global Slowdown	PADR – Sustained Renewables Uptake	PADR – Accelerated Transition	Weighted average PADR (b)
Key assumptions						
Link option (a)	Marinus 1200 Staggered	Option 7 (1,500 MW)	Same as Status Quo	Same as Status Quo	Same as Status Quo	Same as Status Quo
Present value year	2025	2019	Same as Status Quo	Same as Status Quo	Same as Status Quo	Same as Status Quo
Real or nominal \$	Real 2017	Real 2019	Same as Status Quo	Same as Status Quo	Same as Status Quo	Same as Status Quo
Period over which market benefits are included	2020-21 to 2049-50	2020-21 to 2049-50	Same as Status Quo	Same as Status Quo	Same as Status Quo	Same as Status Quo
Discount rate (pre-tax real)	6%	5.90%	Same as Status Quo	Same as Status Quo	Same as Status Quo	Same as Status Quo
Key results						
NEM Capital Costs	\$64	(\$478)	\$176	(\$651)	\$924	(\$7)
NEM Fixed Operating Costs	\$87	(\$212)	(\$61)	(\$194)	(\$57)	(\$131)
NEM Fuel Costs	\$904	\$2,713	\$1,679	\$3,115	\$2,644	\$2,538
NEM Variable Operating Costs	\$71	\$177	\$158	\$190	\$87	\$153
Other Costs (a)	\$342	\$219	\$172	\$264	\$920	\$394
Gross market benefits \$ million	\$1,468	\$2,418	\$2,122	\$2,722	\$4,517	\$2,945
(a) Other costs include, Renewable Expansion Transmission Costs, Unserved Energy, Rehabilitation Costs, Synchronous Condensers and Ancillary Service Benefits.						
(b) Equal weighting across all four PADR scenarios						
NOTE: SUM OF THE PARTS MAY NOT EQUAL THE TOTALS, DUE TO ROUNDING.						
SOURCE: IFS, PADR						

Gross market benefits from fuel cost savings in each of the PADR counterfactual scenarios (no Marinus Link) are largely dependent on projected new investment in large amounts of combined cycle gas turbines (CCGTs) operating at surprisingly high capacity factors over the period 2039-40 to 2049-50. For example, in the PADR Status Quo counterfactual, projected new investment in CCGT over the period 2039-40 to 2049-50 is around 6,000 MW of new CCGT. By 2049-50, total CCGT capacity in the NEM is projected to grow to around 8,500 MW and generate a total of around 51,200 GWh (sent-out) per annum, as shown in **Figure 2.1** and **Figure 2.2**.

FIGURE 2.1 NEM GENERATION (GWH, SENT-OUT) AND AVERAGE CAPACITY FACTOR (%) FROM CCGT TECHNOLOGY - PADR STATUS QUO COUNTERFACTUAL



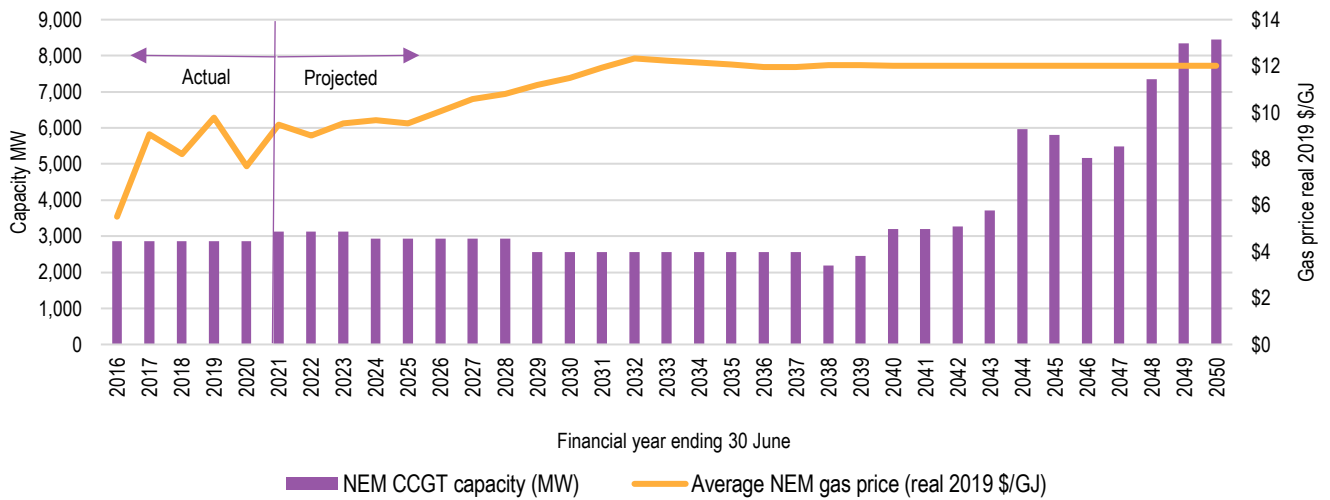
Note: Actual data up to and including 31 January 2020; projections thereafter.

SOURCE: AEMO, PADR

For context, total CCGT capacity in the NEM is currently around 2,800 MW, which is a third of the amount assumed by 2049-50 in the Status Quo counterfactual (refer **Figure 2.2**). Annual sent-out generation from CCGT technology in the NEM is currently around 9,200 GWh per annum operating at around 37 per cent average annual capacity factor. Since 2016, CCGT average capacity factors have declined due to a number of reasons including the high cost of gas, which has increased by as much as \$4/GJ, in real terms, since 2016 and more recently, the increased volatility of electricity spot prices associated with renewable entry, which makes it less profitable to sustain the operation of CCGT plant.

In the PADR scenarios, gas prices are projected to increase from current levels of around \$9/GJ to around \$12/GJ in real terms by 2031-32, as shown in **Figure 2.2**. Coupling these assumed gas prices and the likely emissions target by 2050 requiring curtailment of emissions well beyond those projected in the PADR counterfactual cases (which is discussed in more detail later), leads ACIL Allen to conclude that the new investment in CCGTs projected by EY is highly unlikely and the projected operation of these CCGT at high capacity factors would also be highly unlikely. Therefore, we consider that this central component of the projection, on which most of the gross market benefits hang, is fundamentally flawed.

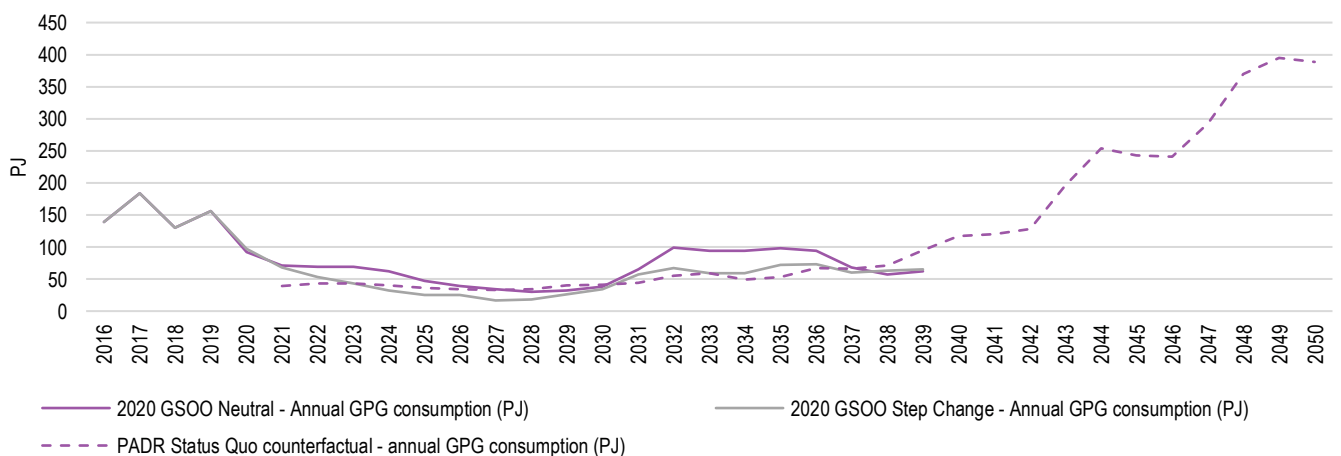
FIGURE 2.2 NEM CAPACITY (MW) FROM CCGT TECHNOLOGY AND AVERAGE GAS PRICES (REAL 2019 \$/GJ) – PADR STATUS QUO COUNTERFACTUAL



Note: Actual data up to and including 31 January 2020; projections thereafter. Actual gas prices are the average of Victorian and STTM quarterly gas market prices.
 SOURCE: AEMO, PADR

Notably, the recently released AEMO 2020 Gas Statement of Opportunities (GSOO) shows NEM gas from power generation (GPG)² is projected to only reach levels of around 65 PJ per annum by 2039, as shown in **Figure 2.3**. The GSOO projection is consistent with ACIL Allen’s current reference case for the NEM. The ACIL Allen off-the-shelf reference case projects modest growth in GPG between 2040 and 2050 – increasing by around 50 per cent over the decade. In contrast and as an example, in the PADR Status Quo counterfactual, GPG is projected to be 120 PJ in 2039-40 (180 per cent of the GSOO projection) and then growing rapidly to 390 PJ in 2049-50 (230 per cent growth). This would represent around half of underlying domestic gas demand in Eastern Australia at that time. The current GSOO estimates and ACIL Allen’s reference case projections of GPG are consistent with the view that the PADR counterfactual projections significantly overestimate the fuel savings and therefore, the gross market benefits.

FIGURE 2.3 GAS FOR POWER GENERATION (PJ) – 2020 GSOO AND PADR STATUS QUO COUNTERFACTUAL



Note: PADR annual GPG consumption in PJ assumes a heat rate of 7.58 GJ/MWh
 SOURCE: AEMO 2020 GSOO, PADR

² All NEM outcomes used in the 2020 GSOO modelling are consistent with AEMO’s 2020 Draft ISP.

Using the Status Quo scenario as an example, emissions trajectories in the NEM are assumed to decline from 93 million tonnes in 2039-40 to 55 million tonnes of CO₂-e in 2049-50 (representing around 70 per cent reduction in NEM emissions compared with 2005 levels). This is significantly less than the low-end expectation that emissions must be at least 80 per cent below 2005 levels by 2050. At a combustion emissions intensity of 394.66 kg CO₂-e/MWh, emissions from projected CCGTs would contribute around 20 million tonnes of CO₂-e in 2049-50 in the Status Quo counterfactual, which represents around 11 per cent of 2005 emissions and leaving only 15 million tonnes for other plant to emit to meet the minimum 80 per cent target in 2049-50. Notably, the EY projections accept that the NEM does not meet this target – questionably breaching an important constraint.

However, even if it was reasonable to accept the breaching of this emissions constraint (which ACIL Allen considers it is not), emissions must be assumed to decline further such that by no later than 2070, NEM emissions would be expected to be zero (ACIL Allen considers this is more likely to be by 2060). For example, assuming a linear decline in the emissions trajectory post 2049-50, emissions would be expected to reach zero by 2064-65, meaning that all of the CCGT which is committed in the period 2039-40 to 2049-50 would be prematurely retired starting not long after 2050. ACIL Allen expects that most of CCGT investment that is projected to occur after 2039-40 would be unprofitable over their life cycle due to early retirement in accordance with the emissions constraints.³ Therefore, we consider that the assumption to build around 6,000 MW of new CCGT capacity from 2039-40 in the Status Quo counterfactual is inconsistent with any realistic emissions targets assumed in this scenario.

In summary, ACIL Allen expects that the projected investment in CCGT is unrealistic with any reasonable assessment of the likely utilisation of CCGT and the expected emissions constraints. In this environment, it is unlikely that CCGT investments would achieve an economic return, and therefore it is unlikely that they would be committed as a new investment.

Even though the other PADR scenarios have some differences compared with the Status Quo scenario, ACIL Allen's conclusions in relation to the likely investment in CCGT and hence Marinus link fuel cost savings in the other scenarios are equally applicable.

For example, the PADR Sustained Renewables Uptake and Accelerated Transition counterfactual scenarios assume significant levels of gas power generation in the period from 2020-21 to 2049-50 of around 630,000 GWh and 465,000 GWh, respectively, as shown in **Table 2.3**. These scenarios project a reduction in gas power generation during this period of around 103,000 GWh and 97,000 GWh, respectively, aided by the introduction of a 1,500 MW Marinus Link. This equates to projected fuel cost savings in the Sustained Renewables Uptake and Accelerated Transition scenarios of \$3,115 million and \$2,644 million, respectively, in 2019 present value terms.

Table 2.3 shows the PADR scenario projected fuel cost savings for each PADR scenario and the weighted average used in the PADR. In addition, the projected fuel cost savings under an alternative scenario are shown based on a level of gas power generation in the period from 2020-21 to 2049-50 of around 99,700 GWh. This latter scenario is consistent with the AEMO 2020 GSOO and ACIL Allen's reference case view⁴ of the NEM over this period. Under this significantly lower level of gas power generation, the implied reduction in gas power generation aided by the introduction of a 1,500 MW Marinus Link is expected to be much lower ~ 18,900 GWh. Using similar gas price assumptions, the present value of gross market benefits from fuel cost savings under this alternative future is around \$520 million, which is a fraction of the benefits estimated in the PADR scenarios.

Therefore, we expect that the gross market benefits associated with gas cost savings in the post 2039-40 period are heavily overstated, due to an unrealistically high level of assumed gas power generation.

³ EY modelled a least-cost dispatch and development plan for the NEM spanning 30 years from 2020-21 to 2049-50. It is not clear whether the profitability of new investment in the NEM occurring towards the end of the period to 2049-50 is assessed across the full life cycle of the generator.

⁴ Under similar gas price and emissions trajectory assumptions as the Status Quo and Sustained Renewables Uptake scenarios.

TABLE 2.3 IMPLIED FUEL COST SAVINGS UNDER AN ALTERNATIVE SCENARIO

	PADR – Status Quo	PADR - Global Slowdown	PADR – Sustained Renewables Uptake	PADR – Accelerated Transition	Weighted average PADR	Alternative - lower gas - scenario (~ACIL Allen reference case)
Total gas power generation (GWh) assumed in the counterfactual (without Marinus Link) 2020-21 to 2049-50	463,302	389,773	630,619	465,846	487,385	99,781
Reduction in gas power generation (GWh) aided by the introduction of a 1,500 MW Marinus Link 2020-21 to 2049-50	98,505	70,740	103,907	97,995	92,787	18,996
Present value of gross market benefits from fuel cost savings (real 2019 \$ million, in 2019 PV terms)	\$2,713	\$1,679	\$3,115	\$2,644	\$2,538	\$520

SOURCE: PADR, ACIL ALLEN ANALYSIS

2.2 Review of input assumptions in the PADR

Table 2.4 below shows the key input assumptions used in the market modelling to estimate gross market benefits of Marinus Link and the estimated net market benefits under the PADR four main scenarios – Status Quo, Global Slowdown, Sustained Renewables Uptake and Accelerated Transition to a Low Emissions Future as well as the IFS – Neutral scenario.

ACIL Allen has reviewed the input assumptions used in the market modelling to estimate gross market benefits under the PADR scenarios.

The key area of concern is the demand forecast used as an input to the modelling. The demand forecasts used in the PADR scenarios have been superseded as they are based on AEMO's 2018 ESOO. Three of the four main PADR scenarios utilise demand forecasts which are considerably higher than the latest 2019 ESOO forecasts (refer **Figure 2.4**). The Status Quo and Sustained Renewables Uptake scenarios are based on the 2018 ESOO Neutral demand forecast which is approximately 10 per cent higher by 2039-40 than the 2019 ESOO Central scenario. The Accelerated Transition scenario is based on the 2018 ESOO Fast scenario demand forecast, which is approximately 20 per cent higher by 2039-40 than the 2019 ESOO Central scenario.

Gross market benefits are generally positively correlated with demand. That is, the higher the demand forecast, the more generating capacity is projected to be required to meet the forecast energy and peak demand requirements of the NEM – thereby increasing the projected system costs of the NEM and increasing the projected opportunity for Project Marinus to displace projected higher cost generation in other regions of the NEM with projected lower cost generation in Tasmania. This relationship is broadly supported by lower gross market benefits under the Global Slowdown scenario, which is the only scenario of the four main PADR scenarios which utilises a significantly lower demand forecast.

The gross market benefits/ demand forecast relationship is supported by lower gross market benefits in the PADR Partial ISP Update sensitivity, which uses a lower demand forecast similar to the later 2019 ESOO Central demand forecast⁵.

The Partial ISP update sensitivity results in a reduction in the Status Quo *gross market benefits* by \$710 million or around 30 per cent. In addition, present value *net market benefits* attributable to Marinus Link decrease from \$1,147 million to \$437 million, representing a \$710 million reduction or 62 per cent decrease in the present value of net market benefits. This sensitivity also resulted in a delay in the optimal timing of Marinus Link, with the first stage delayed by one year (from 2028 to 2029) and the second stage delayed by 3 years (from 2032 to 2035).

In summary, ACIL Allen considers the demand forecasts utilised in three of the four main PADR scenarios unreasonable and likely to overstate the market benefits of Project Marinus.

⁵ The Partial ISP Update sensitivity is based on the Status Quo scenario with the following changes – lower demand forecast, a doubling of the total aggregate potential generation capacity of all REZ and over 60 per cent increase in the pumped hydro potential across the NEM.

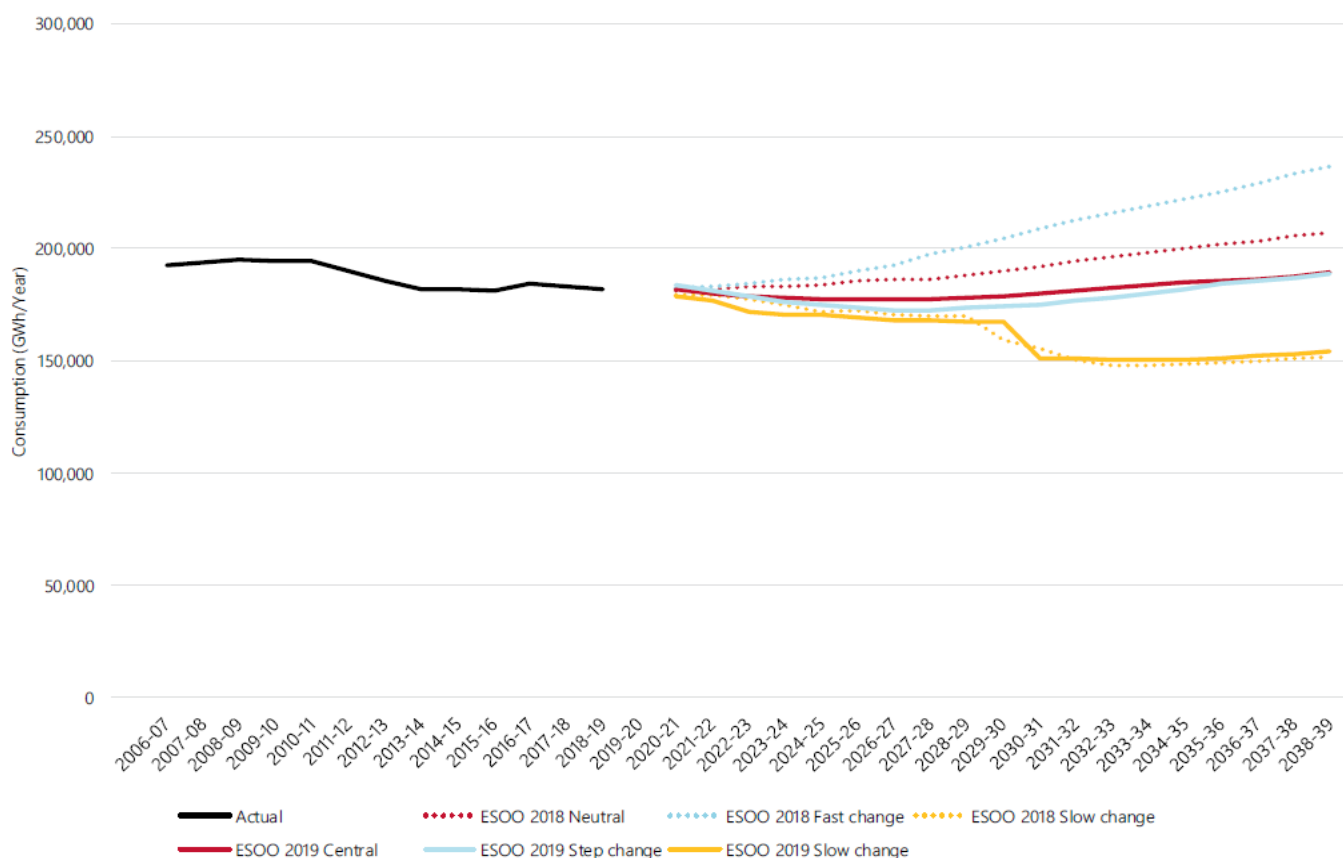
TABLE 2.4 HIGH LEVEL INPUT ASSUMPTIONS COMPARISON

Scenario	IFS - Neutral	PADR – Status Quo	PADR – Global Slowdown	PADR – Sustained Renewables Uptake	PADR – Accelerated Transition to a Low Emissions Future
Demand	AEMO Mar 2018 EFI Neutral (AEMO 2018 ISP Neutral)	AEMO Aug 2018 ESOO Neutral (AEMO Feb 2019 ISP Neutral)	AEMO Aug 2018 ESOO Slow (AEMO Feb 2019 ISP Slow scenario with Neutral uptake of rooftop PV and domestic storage)	Same as Status Quo	AEMO Aug 2018 ESOO Fast (AEMO Feb 2019 ISP Fast scenario with Neutral uptake of rooftop PV and domestic storage)
Gas prices	AEMO 2018 ISP Neutral	AEMO Feb 2019 ISP Neutral	AEMO Feb 2019 ISP Slow	Same as Status Quo	AEMO Feb 2019 ISP Fast
Coal prices	AEMO 2018 ISP	AEMO Feb 2019 ISP	Same as Status Quo	Same as Status Quo	AEMO Feb 2019 ISP
Emissions target	28% below 2005 levels by 2030 and 70% below 2016 levels by 2050. No explicit emissions mechanism.	Same as IFS Neutral	No target	Same as Status Quo	52% below 2005 levels by 2030 and 90% below 2016 levels by 2050. No explicit emissions mechanism.
VRET and QRET policy	Not modelled	VRET of 40 % of Victorian demand from renewables by calendar year 2025. QRET of 50 % of Queensland demand from renewables by calendar year 2030.	No target	Same as Status Quo	Same as Status Quo
Snowy 2.0 and KerangLink	Not modelled	Snowy 2.0 enters in 2026-27. KerangLink commissioned in 2030-31.	Snowy 2.0 enters in 2029-30. KerangLink commissioned in 2032-33.	Snowy 2.0 enters in 2026-27. KerangLink commissioned in 2027-28.	Snowy 2.0 enters in 2026-27. KerangLink commissioned in 2029-30.
Other comments				Sustained Renewables Uptake is generally the same as Status Quo but assumes earlier coal-fired power station closures.	

Notes: AEMO = Australia Energy Market Operator; ISP = Integrated System Plan; EFI = Electricity Forecasting Insights

SOURCE: IFS, PADR

FIGURE 2.4 NEM OPERATIONAL CONSUMPTION (GWH) FOR ALL SCENARIOS – 2019 ESOO COMPARED TO 2018 ESOO



SOURCE: AEMO 2019 ESOO

2.3 Conclusions

Based on our review of the analysis undertaken in the PADR, we consider the approach used by TasNetworks to annualise the costs of the interconnector over the 60-year life of the asset and only model gross market benefits over 20 years of the life of the asset unreasonable, as it heavily overstates the relative size of costs and benefits of the asset.

We also consider the high levels of gas power generation assumed in the PADR market modelling assumption unrealistic because gas power generation is unlikely to be committed over the period modelled as it is unlikely to be economic because of high gas prices and emissions constraints. This assumption grossly overstates the magnitude of fuel cost savings and therefore the gross market benefits of Project Marinus.

Additionally, we consider the demand forecasts used in three of the four main PADR scenarios bullish and out-of-date and they overstate the gross market benefits attributable to Project Marinus.

ACIL ALLEN CONSULTING PTY LTD
ABN 68 102 652 148
ACILALLEN.COM.AU

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