



ENERGYQUEST

Review of Cost Efficiency for the APA South West Pipeline Expansion

An independent report prepared by EnergyQuest

for the Australian Energy Regulator

July 2026

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Executive Summary

On 30 October 2025 APA applied to the Australian Energy Regulator (**AER**) to increase capacity on the South West Pipeline (**SWP**) in Victoria.

The AER will determine whether APA's proposal meets the new capital expenditure criteria described in NGR rule 79 and whether associated costs may be rolled into the capital base and recovered through tariffs.

APA's application proposes an investment of \$244 million to expand capacity on the South West Pipeline through compression and targeted early works.

EnergyQuest's independent review finds the estimating approach adopted by APA is appropriate for a Class 4-5 estimate, and the capital estimate is efficient and reflective of current industry benchmarks.

The compression cost component is the dominant cost factor for the preferred option and includes vendor budget pricing that is higher relative to recent market comparators. This can be attributed to underlying market conditions, where gas engines are currently at elevated prices due to demand world wide.

We observe that major construction costs and balance-of-plant package costs are not based on market testing, however this is appropriate given the class of estimate.

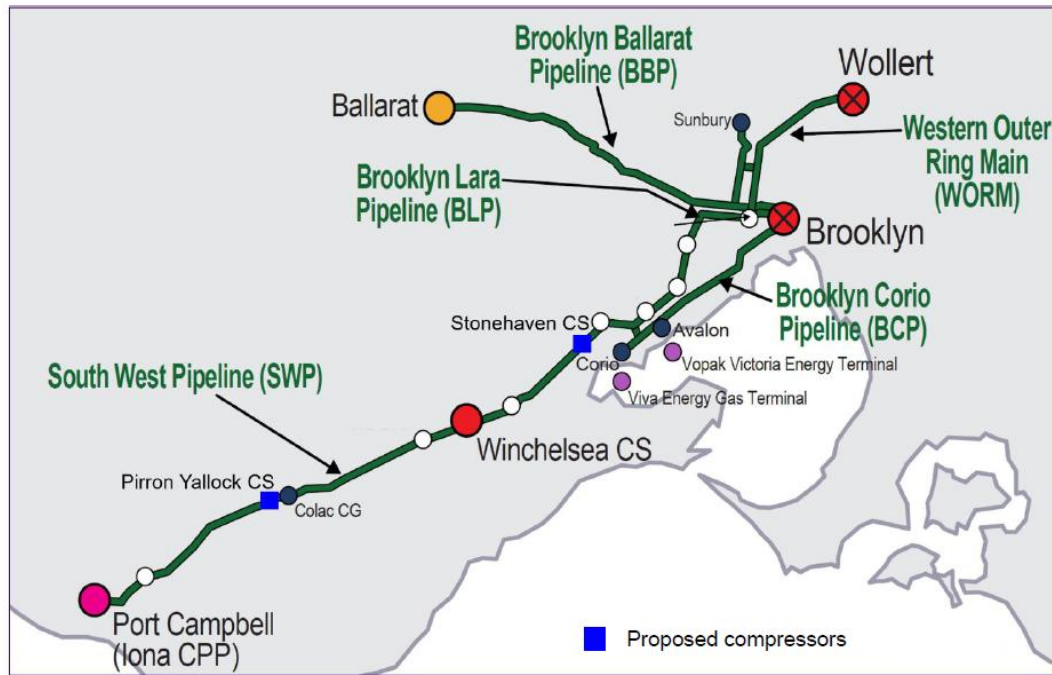
The Early Works estimates are prudent and efficient at this stage of development, subject to further validation as land access, approvals and environmental scopes are refined.



Background

On 30 October 2025 APA applied to the AER to increase capacity on the SWP in Victoria. On 10 April 2026, APA submitted an addendum with revised costs and proposals for early works, including the Brooklyn to Lara pipeline. The updated application proposes A\$244 million capital expenditure.

Figure 1 Map of key Victorian pipelines



Source: AEMO

The AER will determine whether APA's proposal meets the new capital expenditure criteria described in NGR rule 79 and whether associated costs may be rolled into the capital base and recovered through tariffs.

EnergyQuest was engaged by the AER to undertake an independent review of the efficiency of costs proposed by APA in its application for the South-West Pipeline expansion. The aim of the independent review is to assess whether the cost estimates presented by APA are;

- a) consistent with those a prudent, efficient operator would reasonably incur, and
- b) supported by appropriate assumptions, quantities and unit rates.

This review evaluated capital cost estimate items that were material and could impact the AER's determination. It also assessed APA's core justifications for the capital expenditure.

Assessment criteria

NGR Rule 79 provides the following criteria for assessing new capital expenditure:

Rule 79 New capital expenditure criteria

(1) Conforming capital expenditure is capital expenditure that conforms with the following criteria:



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(a) the capital expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services in a manner consistent with the achievement of the national gas objective; and

(b) the capital expenditure must be justifiable on a ground stated in subrule (2); and

(c) the capital expenditure must be for expenditure that is properly allocated in accordance with the requirements of subrule (6).

(2) Capital expenditure is justifiable if:

(a) the overall economic value of the expenditure is positive, subject to subrule (3); or

(b) the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; or

(c) the capital expenditure is necessary:

(i) to maintain and improve the safety of services; or

(ii) to maintain the integrity of services; or

(iii) to comply with a regulatory obligation or requirement; or

(iv) to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity); or

(v) to contribute to meeting emissions reduction targets through the supply of services; or

(d) the capital expenditure is an aggregate amount divisible into 2 parts, one referable to incremental services and the other referable to a purpose referred to in paragraph (c), and the former is justifiable under paragraph (b) and the latter under paragraph (c).

We have assessed APA's costs estimates on the basis of NGR Rule 79. APA's cost estimates are at Class 4/5 maturity meaning that the costs are estimated with an uncertainty range.

Cost efficiency review

Scope of Review

The scope of the review considered the following areas:

- Assessment of the overall cost build-up and key cost drivers,
- Review of the major cost categories (materials, labour, construction, engineering, contingencies),

Benchmarking of total and unit costs against comparable pipeline projects,

- Evaluation of underlying assumptions, quantities, and unit rates,
- Review of the procurement strategy and delivery model to the extent they influence cost efficiency,
- Identification of areas of potential inefficiency and key cost risks,

APA provided EnergyQuest with a number of reports, cost estimate spreadsheets and vendor pricing information in order to perform the review. The information sources are recorded in Appendix A.

Summary of costs

A number of options were presented in the original application and business case in October 2025. After stakeholder engagement by AER, AEMO and APA and an adjustment to the scope of the solution, APA's preferred project option for expansion of the SWP capacity is via compression and undertaking early works on adjacent infrastructure. The addition of two new compressor stations at Stonehaven and Irrewillipe are the highest cost items in the overall cost estimate.

The current preferred option has been presented to the AER as shown in Table 1.

Table 1 Preferred option costs

Project	Costs Proposed
SWP compression	\$211.0M
Extra compressor pad	\$1.7M
Early works Brooklyn to Lara Pipeline	\$15.1M
Early works SWP looping	\$16.0M
Total (rounded up)	\$244.0M

Source: APA

APA has stated the accuracy of the estimates are between Class 5 (-20% / +100%) to Class 4 (-15% / +50%) under the AACE estimate classification framework. APA notes a number of items have a better accuracy compared to others given they are either vendor quotes or actual costs from the recent projects in NSW (ECG2) and Victoria (Winchelsea).

Analysis of main cost components

SWP compression

The costs for the compression component of the project have been provided by APA and summarised in Table 2 below.

Table 2 Compression costs

SWPx cost components (excluding corporate overhead)	\$ Millions	Proportion of total cost
Project Management	9.11	4.5%
Access & Approvals	3.52	1.8%
Engineering	9.08	4.5%
Procurement	84.7	42.1%
Construction	87.11	43.3%
Commissioning	7.48	3.7%
TOTAL	201.0	100.0%

Source: APA

Corporate overhead of \$9.3 million and the extra compressor pad costs were excluded from the compression cost breakdown provided.

APA have provided a budgetary quote on a confidential basis for the Stonehaven site (1 x Mars100 Compressor GT unit [Doc Ref #7]). These equipment costs are allocated to the Procurement line item.

Key observations on the estimate are offered below:

- The estimate is a 'top-down approach' rather than a 'bottom up' approach, and there is no further detailed information.
- APA's estimation methods (described in response IR1 question 5) are reasonable. A bottom-up method for project management, engineering and commissioning is however generally preferred to a top-down approach
- The allowance of 4.5% of total cost for project management appears high relative to the size and scale of this project, however this can be explained by reference to the accuracy of the estimating, and there is also an absence of other owners costs in the estimate (i.e. overhead, cost of working capital, feed and pre-feed costs).
- Procurement costs of \$84.7 million include compressor supply. With compressors representing just over half of procurement costs. The residual amount of cost is reasonable for balance of plant equipment which typically includes valves, pipework instruments and other gas process equipment.
- The Solar Turbines quotes appear reasonable. However, the current Stonehaven quote for a Mars 100 unit is significantly above the June 2023 ECG pricing. This reflects tightening gas turbine supply, driven by strong demand from buoyant activity in other energy sub-sectors (power generation, data centres) and hence increasing pressure on OEM supply chains. We have observed similar escalations across recent power projects in the NEM and SWIS. In our view, this creates a material risk of further cost escalation.
- Construction cost estimates are based on Contractor (East Coast Grid) rates that APA have observed and have access to from past projects. APA has not yet market-tested major construction packages (tender/ECI). Given national infrastructure demand and premiums



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currently being sought by contractors, we expect that the final construction costs estimate have the potential to be higher than what has been presented.

Extra compressor pad

The justification for the compressor pad expenditure appears reasonable and costs are appropriate for the required civil infrastructure.

Given this cost item is less than 2% of total cost we have not examined the cost breakdown any further.

Early works SWP looping

The costs for the early works program for looping of the SWP component of the project have been provided by APA and summarised in Table 3.

Table 3 Early works costs - SWP looping component

Item	Costs (\$ million)
Project Management	\$0.63
Access & Approvals	\$15.05
Engineering	\$0.18
Procurement	\$0.01
Construction	\$0.15
Commissioning	-
Total	\$16.0 million

Source: APA

APA state this cost estimate has been prepared using best available information from similar and historic projects. A detailed breakdown for Access & Approvals was also provided in [Doc Ref #9].

Key observations and comments on these costs are offered below:

- Access & Approvals are the key cost driver for SWP Looping Early works. Private land access agreements and Option Fees Payment are significant and have been determined by historic costs from Western Outer Ring Main (WORM). As Access & Approvals (landowner agreements and option fees) are the primary driver in this cost item, APAs use of WORM's final historical costs are appropriate.

APA have applied a simple parametric estimate of the cost per landowner inclusive of legal fees, which is prudent for this level of estimating accuracy.

- EPBC offsets are based on historical costs from WORM. We consider there is a minor risk of escalation with this item based on the submission documentation. There are areas of native vegetation and listed species habitat that could potentially be disrupted and hence may increase costs. In comparison to early works on the BLP, the vegetation on SWP is less complex and problematic. The obligation to secure offsets is determined by a regulated assessment process and our understanding is the obligation would occur early in the process.
- Ecological Assessment (inc. VQA & Targeted Surveys) costs appear to be low for a 90km easement length however APA have clarified that a large amount of desktop data and an



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amount of real survey data exists for the entire SWP easement and hence only some areas will require field survey.

- APA's existing desktop and survey data reduce the need for full-length surveys, so there are no material concerns identified for the SWP looping early-works cost estimate.

Early works Brooklyn to Lara Pipeline (BLP)

The costs for the early works have been provided by APA and summarised in Table 4.

Table 4 Early works costs – Brooklyn to Lara Pipeline

Item	Costs (\$M)
Project Management	\$0.76
Access & Approvals	\$13.79
Engineering	\$0.31
Procurement	\$0.01
Construction	\$0.21
Commissioning	-
Total	\$15.1M

Source: APA

APA state this cost estimate has been prepared using best available information from similar and historic projects, notably the WORM project for biodiversity offsets. A detailed breakdown for Access & Approvals was also provided in [Doc Ref #10].

Key observations and comments on these costs are offered below;

- Access & Approvals are the key cost driver for BLP Early works. Similar to SWP, private land access agreements and Option Fees Payment are significant and have been determined by historic costs. We cannot comment on their reasonableness or landowner sentiment toward gas pipeline projects. APA used WORM as a comparator and adjusted for a larger number of landowners which is reasonable.
- APA have explained the assumptions used to determine landowner costs in their Q&A responses of 17 June 2026. It is noted there are more landowners to be negotiated with compared to the WORM project. APA benchmarked other project legal costs per landowner.
- EPBC offsets and are based on historical costs and there is risk of escalation with this item. We observe the WORM projects final end costs were used as a basis for this costing. APA advise the BLP is similar to WORM in terms of terrain and topography. We consider this is appropriate for comparison.
- Detailed Assessment & Surveys (assuming ecological surveys) cost appears highly overstated for 44km easement length when compared to SWP looping early works. The EES allowance for BLP appears high relative to its 44 km easement, and APA attributes this to greater native vegetation complexity.



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SWP Looping

APA proposed an alternate solution option 3 in their original 2025 business case. The SWP partial looping solution is an additional 39 km and 49 km of installed pipeline upstream and downstream of Winchelsea compressor station.

The costs for the proposed partial looping component of the project were provided by APA and summarised in Table 5. Note this is the only breakdown of costs provided.

Table 5 Looping component costs

	2025	2026	2027	2028	2029	Total
Project Management	0.5	3.1	3.1	3.1	2.5	12.3
Land & Approvals	1.7	10.6	10.6	10.6	50.1	83.6
Design			1.9	1.4		3.3
Procurement			4.5	40.9		45.4
Construction					169	169.4
Commissioning & Handover					1.3	1.4
Corporate Overhead	0.1	0.7	1.0	2.8	11.2	15.8
Total (\$m)	2.3	14.4	21.1	58.8	234.6	331.2

Source: APA

Key observations and comments on these costs are:

- APA state the cost estimate is subject to a higher level of uncertainty compared to the compressor option. Their estimating methodology has been prepared using best available information from the recent WORM project.
- Construction is the key cost driver for the looping option which accounts for over 50% of the cost estimate. APA state pipeline looping procurement costs are based on recent actuals (\$/tonne), while construction rates have been rationalised using as built benchmarks from the WORM project.
- Our recent project observations suggest pipeline raw materials are not in shortage but fabrication and construction are likely areas where cost increases will occur given the current infrastructure market. Similar to the compression option, APA has not yet market-tested construction packages (tender/ECI).
- The use of WORM's final historical costs for Land and Approvals are appropriate for the basis of estimating for SWP.



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Based on current benchmarks calculated from recent gas transmission projects, the SWP looping compares as shown in Table 6

Table 6 SWP looping comparison

	State	Length km	CAPEX \$M	Unit rate \$M/km
Bulloo Interlink	QLD	340	800	2.35
WORM*	VIC	51	293	5.74
Confidential 1 (new proposal)	-	205	400 - 600	1.95 - 2.93
Northern Goldfields	WA	579	460	~1.0
SWP		88	331	3.7

*WORM final cost includes easements and various delay costs for Wollert compressor 6.

Source: EnergyQuest analysis

APA have stated they anticipate challenges with major crossings such as the Moorabool River and Barwon River along the SWP looping route. Terrain challenges were encountered on the WORM project. The calculated benchmark for SWP is close to the WORM benchmark which gives us confidence the SWP estimate has taken terrain and location factors into account.

High level benchmarking

Historical and peer-market benchmarking provides an empirical baseline to evaluate cost estimates by comparing projected expenditure against recent precedents.

APA have provided data on recent compressor projects. We have summarised that data and included overall costs in Table 7 on the compression component only given its materiality to the overall cost.

Table 7 Compression component costs

	Wollert U6	Winchelsea U2	ECG Stage 2	SWP
State	Victoria	Victoria	NSW & Qld	Victoria
Project type	Brownfield Expansion (add unit)	Brownfield Expansion (add unit)	Greenfield (Multi stage expansion)	Greenfield (& some brownfields)
OEM Unit	1 x Centaur 50	1 x Taurus 60	2 x Mars 100	2 x Mars 100
Year commenced	2018	2022	2022	2026 (est)
Output MW	4.5	5.7	11.1	11.1
Cost	\$45.5m	\$53.6m	\$144m (\$72m ea)	\$201m (\$100m ea)
\$M/MW ratio	10.11	9.40	6.49	9.05

Source: APA

APA provided justification for the cost variations between facilities utilising Mars 100 machines compared to smaller units.



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Key observations and comments on these costs are offered below;

- **Equipment scale and market context:** Mars 100 machines are approximately double the size of the Taurus and Centaur machines. A cost correlation can be established across the Victorian projects however there is a significant increase currently estimated for SWP compared to ECG for same Mars100 units. This can be somewhat explained by SWP being proposed and delivered in a higher cost market environment.
- **Alignment with industry benchmarks:** Referencing AEMO's cost guidance, 'Gas Infrastructure Cost: Building Block costs for gas infrastructure report (May 2025)' the cost range for a compression facility is \$3 million/MW to \$6.4 million/MW of installed compression power based on industry rules of thumb for class 5 estimates.

The APA ratios and the SWP are noticeably higher than the benchmarks in the report. At the current level of estimating accuracy, the observed differences can be explained by cost escalations, and nomenclature differences. It is probable that rapid supply chain pressures and volatile fuel costs over the last nine months are the primary drivers of these increases.

- **Early works benchmarking:** Early works estimates are not readily suited to high-level benchmarking in the same manner as compression facilities, given the inherently variable nature of land access, terrain, geotechnical conditions, environmental constraints, vegetation clearing requirements and approval pathways. APA's reliance on unit rates and recent project experience as a basis for estimating early works costs is, in our view, a reasonable and pragmatic approach.

APA basis of estimate

APA has stated that the accuracy of the estimates falls between Class 5 (-20% / +100%) and Class 4 (-15% / +50%) under the AACE estimate classification framework and reflects the current level of engineering definition for the SWP project.

FEED and detailed engineering design have not yet commenced and APA notes it has tailored its approach to the specific gas transmission context, rather than applying generic AACE ranges mechanically.

In the APA business case and supporting information the downside range has been narrowed because the main risk is considered to be cost escalation rather than cost underrun.

We observe the basis of estimate has adopted techniques that are appropriate at this stage of development, including:

- **Direct vendor engagement:** Sourcing budgetary pricing from compressor providers;
- **Internal cost intelligence:** APA internal cost intelligence such as pre-award rates to inform cost assumptions;
- **Parametric estimating:** Using internal historical data and pre-award rates to inform cost assumptions, and
- **Historical benchmarking:** Benchmarking against recent compression projects.

APA states it has made adjustments for project-specific factors such as timing, risk, and site conditions however the references are not readily identifiable.



Overall, the approach is appropriate because it transparently signals that the estimates are subject to uncertainty, while also explaining that some cost components have a higher confidence level than would normally be expected for a Class 5 estimate stage.

Key cost risks

The principal cost risk in the SWP estimate is escalation above the current base estimate, and in our view this risk is high because the project remains at a Class 4 / Class 5 stage with limited engineering definition and no specific market testing of the construction scope.

At this level of maturity, important assumptions regarding scope, quantities, constructability, delivery methodology and contractor pricing have not yet been fully validated, which means there is a material likelihood, in our view, that costs will increase as engineering progresses and market engagement occurs.

Contractor and supplier pricing are material components of the estimate and will be critical to reaching FID, particularly in a market affected by broader energy infrastructure delivery pressures, supply chain constraints and fuel cost volatility.

While APA's use of recent comparable project information, including WORM, is reasonable and consistent with the actions of a prudent operator at this stage, it does not remove the uncertainty created by the absence of direct market testing.



Assumptions and limitations

We have focused on items that individually exceed 2% of total cost or collectively represent 5% of the cost build-up to ensure focus on items with regulatory significance.

Class 2 detailed cost estimate breakdowns were not available from APA for the SWP compression component of the cost estimate.

Conclusion

Our review indicates that APA's proposed capital expenditure for the SWP Expansion project has been developed using estimating methodologies that are generally appropriate for a Class 4 or Class 5 estimate and consistent with the actions of a prudent operator at this stage of project definition. We have not identified evidence of material systemic inefficiency in the estimating approach. In our view the cost estimate is efficient.

In our opinion, once developed to a Class 2 level of definition, the compression option is likely to resolve upward.

The use of vendor budget pricing for key compression equipment, internal cost intelligence from recent projects (such as WORM and Winchelsea Upgrade), and comparable project data to inform early works costs is broadly consistent with prudent industry practice.

For the looping option, the cost estimate has been based on previous APA projects most notably lessons learned from WORM. In our opinion, the cost data presented suggests a class 5 estimate. In the absence of market testing and limited engineering definition and relying on high level benchmarking, the cost estimate for looping is efficient.

The estimate is subject to a range of uncertainty consistent with a Class 4 or Class 5 estimate. This is most significant for the compression and construction components, where market testing has not yet been undertaken and where supplier, contractor and fuel cost pressures continue to present material upside risk.

The capital cost estimate is judged to be efficient based on current industry benchmarks and the available engineering definition for this stage of the regulatory process.

Observation 1

The cost estimates presented in the business case as the basis for a regulatory determination are Class 4-5.

A Class 2 estimate or better would ordinarily be required to support an investment decision of this nature.

Observation 2

An investment-grade cost estimate, if considered necessary for the purposes of the AER's determination, could be achieved through completion by APA of further FEED engineering studies, procurement and cost development work.



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Appendix A - Documents Reviewed

Ref	Document	Author	Date Received
1	South-West Pipeline Expansion Proposal Business Case – 17 October 2025	APA	29 May 2026
2	Application under NGR Rule 80 - Expansion of the VTS South-West Pipeline – 30 October 2025	APA	29 May 2026
3	Addendum to APA VTS Rule 80 Application - 10 April 2026	APA	29 May 2026
4	South-West Pipeline Expansion Options Assessment Report – 24 February 2026	AEMO	29 May 2026
5	Position Paper APA's rule 80 application for South-West Pipeline	AER	29 May 2026
6	Public Forum Slides - APA Victorian Transmission System Advance capex application for expansion of the South-West Pipeline – 11 December 2025	AER	29 May 2026
7	APA Stonehaven Qty 1 Mars100-C45_Budgetary Commercial Proposal_260202 - 20260508 – Confidential	APA	9 June 2026
8	APA_ECGE Stg3a_MW244_Mars 100S-C652_Commercial Proposal_230609 - 20260508 – Confidential	APA	9 June 2026
9	SWP_Early Works Cost_Partial Looping - 20260508 – Confidential	APA	9 June 2026
10	BLP_Early Works Cost_Full_Loopng - 20260508 – Confidential	APA	9 June 2026
11	APA VTS – AER SWP Rule 80 IR1 –Q5 Q7 18 May 2026.pdf – Confidential	APA	9 June 2026

Appendix B - Meetings Held

Date	Meeting / Purpose	Key Topics Discussed
9 June 2026	Internal Kick off Meeting with AER	SoW, schedule, preliminary cost information.
11 June 2026	Q&A Session 1 with APA and AER	Forecasts, Basis of Estimate, follow-up written clarifications register.
18 June 2026	Q&A Session 2 with APA and AER	Early Works costs, Biodiversity offsets.

References

1. Australian Energy Market Commission (AEMC) n.d., **National Gas Rules, rule 79: New capital expenditure criteria**, viewed 16 June 2026 [<https://energy-rules.aemc.gov.au/ngr/504/323195>]
2. Australian Energy Market Operator (AEMO) 2025, **Gas Infrastructure Cost: Building Block costs for gas infrastructure**, AEMO, viewed 17 June 2026 [https://www.aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2025/2025-gas-infrastructure-options-report/2025-gas-infrastructure-costs-report.pdf].

Abbreviations

AACE	Association for the Advancement of Cost Engineering
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
APA	APA Group
BLP	Brooklyn to Lara Pipeline
ECG	East Coast Grid compressor station project
ECG2	East Coast Grid Stage 2
ECI	Early Contractor Involvement
EES	Environmental Effects Statement
EPBC	Environment Protection and Biodiversity Conservation
FEED	Front End Engineering Design
FID	Final Investment Decision
GJ	gigajoule (1 billion joules or 10^9)
GT	gas turbine
IR1	Information Request 1
MW	megawatt
NEM	National Electricity Market
NGR	National Gas Rules
OEM	Original Equipment Manufacturer
PJ	petajoule (1 quadrillion joules or 10^{15})
SWIS	South West Interconnected System
SWP	South West Pipeline
TJ	terajoule (1 trillion joules or 10^{12})
TWh	terawatt hour (1,000 GWh)
VQA	Vegetation Quality Assessment
VTs	Victorian Transmission System
WORM	Western Outer Ring Main