Decision on the benchmark reserve capacity price to apply in the 2021/22 capacity year

24 January 2019

Economic Regulation Authority
WESTERN AUSTRALIA

DMS197132

Economic Regulation Authority

4th Floor Albert Facey House
469 Wellington Street, Perth

Mail to:
Perth BC, PO Box 8469
PERTH WA 6849

T: 08 6557 7900

F: 08 6557 7999

E: info@erawa.com.au

W: www.erawa.com.au

National Relay Service TTY: 13 36 77
(to assist people with hearing and voice impairment)

We can deliver this report in an alternative format for those with a vision impairment.

Contents

1. Decision

In accordance with clause 2.26 of the Wholesale Electricity Market Rules (18 October 2018) the Economic Regulation Authority (ERA) approves:

- The revised value for the benchmark reserve capacity price for the 2021/22 capacity year of $154,200 per megawatt, as proposed by the Australian Energy Market Operator (AEMO).

In accordance with clause 4.16.8 of the market rules, the approved revised value for the benchmark reserve capacity price will apply with effect from the date and time specified in a notice to be published on AEMO's website.

2. Background

Under the reserve capacity mechanism, AEMO determines the level of reserve capacity required to meet the reliability planning criterion of the Wholesale Electricity Market (WEM).[1] Capacity credits are then assigned to generators and demand-side management resources on the basis of the expected capability of the facilities to contribute to the reliability planning criterion. A price discovery mechanism determines the price of capacity credits and the benchmark reserve capacity price is an input to this mechanism.[2]

Under the market rules, the benchmark reserve capacity price is used to set the maximum price that may be offered in a reserve capacity auction[3] and is also an input in the determination of the administered reserve capacity price if no auction is required.

Clause 4.16 of the market rules requires the ERA to develop a market procedure. This is to specify the method and process AEMO must follow in determining the benchmark reserve capacity price (as explained in more detail in section 3).

The current market procedure requires the benchmark reserve capacity price to be determined based on the annualised capital cost and fixed operating and maintenance costs of a peaking generation facility at the time the capacity is delivered. This is to ensure the system has sufficient generation capacity when the system operator needs capacity to be available, typically when demand is high. A peaking gas plant is assumed to be the marginal capacity resource that will meet the capacity requirement and so is used as the reference technology in the calculation.

AEMO must follow the principles and steps in the market procedure[4,5] to propose and consult on a revised value for the benchmark reserve capacity price. The steps include:

---

1 In clause 4.5.10(b) of the market rules this level of required capacity is referred to as the reserve capacity target.

2 The benchmark reserve capacity price was renamed from the maximum reserve capacity price as a result of amendments to the market rules that commenced on 1 July 2016 as part of the Electricity Market Review.

3 A reserve capacity auction is run if insufficient capacity credits have been allocated to satisfy the reserve capacity requirement. To date, a reserve capacity auction has never been held.

4 Market Procedure: Maximum Reserve Capacity Price https://www.erawa.com.au/cproot/14362/2/Market%20Procedure%20-%20Maximum%20Reserve%20Capacity%20Price.pdf

5 Clause 4.16.3(b) and 4.16.5 of the market rules.

- Preparing, and publishing on its website, a draft report describing how it has arrived at the proposed benchmark reserve capacity price.
- Advertising the draft report in newspapers widely distributed in Western Australia.
- Requesting submissions from all sectors of the energy industry in Western Australia, including end-users.[6]

After considering submissions received on the draft report, AEMO must propose a final revised value for the benchmark reserve capacity price to the ERA for approval. The market rules[7] require the ERA to review AEMO's final report, including all submissions received by AEMO in response to the draft report, and to decide whether to approve a revised value of the benchmark reserve capacity price.

In making its decision, the ERA must only consider whether:

- The revised value for the benchmark reserve capacity price proposed by AEMO reasonably reflects the application of the method and guiding principles described in clause 4.16 of the market rules.
- AEMO has carried out an adequate public consultation process.

The market rules[8] require that, where the ERA rejects a revised benchmark reserve capacity price submitted by AEMO, it must give reasons and may direct AEMO to carry out all or part of the review process under clause 4.16 again. This should be carried out in accordance with any directions or recommendations of the ERA.

All annual values in this paper represent capacity years, unless otherwise noted.[9]

3. Summary of the market procedure

The benchmark reserve capacity price is calculated by undertaking a technical, bottom-up cost evaluation of the entry of a new 160 megawatt (MW) open cycle gas turbine generation facility in the South West Interconnected System (SWIS) in the relevant capacity year.

The calculation of the 2021/22 benchmark reserve capacity price is based on the assumption that the benchmark power plant would begin operating on 1 October 2021. Capital costs are escalated to 1 April 2021 and fixed operation and maintenance costs are escalated to 1 October 2021.

6 Clause 4.16.6 of the market rules.

7 Clause 2.26.1 of the market rules.

8 Clause 2.26.2 of the market rules.

9 A capacity year is a period of 12 months commencing at the start of the trading day on 1 October each year.

The benchmark reserve capacity price comprises the:

- Capital cost of building a 160 MW open cycle gas turbine power station with an inlet cooling system in the SWIS,[10] including a margin to cover legal, approval, financing and other costs and contingencies.[11]
- Costs of connecting the power station to the transmission system.[12]
- Costs of building liquid fuel storage and handling facilities.[13]
- Land cost for developing and constructing the power station.[14]
- Cost of funding, estimated by a weighted average cost of capital.[15]
- Fixed operation and maintenance costs of the power station and transmission facilities.

Using these parameters, the market procedure provides methods for estimating annualised fixed operating and maintenance and annualised capital costs, which are used in calculating the benchmark reserve capacity price.[16]

4. The ERA's assessment

Consistent with the approach in previous years, AEMO undertook a review of the benchmark reserve capacity price for 2021/22 and on 10 October 2018[17] released a draft report for public consultation. Prior to the close of the consultation period on 24 October 2018, AEMO received two submissions: one from Perth Energy, and one from Merredin Energy (refer to section 4.4).

On 29 November 2018, AEMO provided its final report to the ERA. This proposed a benchmark reserve capacity price of $154,200 per MW per year for 2021/22;[18] 0.4 per cent higher than the benchmark reserve capacity price for 2020/21.

Table 1 provides a summary of the calculated values of input parameters used to estimate the benchmark reserve capacity price, and compares calculated values for 2021/22 and 2020/21 as shown in AEMO's final report.

AEMO's final report states that the decrease in escalation factors, such as commodity and labour indices, has been offset by increases in the weighted average cost of capital (WACC) and power station capital costs.[19] These combined changes resulted in the benchmark reserve

[10] Expressed in Australian dollars per MW and as determined in step 2.3 of the market procedure.

[11] Step 2.8 of the market procedure.

[12] Step 2.4 of the market procedure.

[13] Step 2.6 of the market procedure.

[14] Step 2.7 of the market procedure.

[15] Step 2.9 of the market procedure.

[16] Step 2.10 of the market procedure.

[17] See AEMO's website, Draft Report: 2019 Benchmark Reserve Capacity Price for the 2021/22 Capacity Year, https://www.aemo.com.au/-/media/Files/Electricity/WEM/Reserve_Capacity_Mechanism/BRCP/2019/Draft-report/Draft-Report-2019-BRCP-for-the-2021-22-Capacity-Year.pdf

[18] In its draft report AEMO estimated that the benchmark reserve capacity price for the 2021/22 capacity year is $153,200 per MW. Similar to the calculations in previous reviews, AEMO updated the benchmark reserve capacity price in its final report to the ERA based on more recent estimate of debt risk premium, a component of the WACC.

[19] Power station costs increased due to a decrease in the Australian to United States dollar exchange rate.

capacity price remaining broadly consistent with the benchmark reserve capacity price for 2020/21.

The ERA has reviewed AEMO's draft and final reports, its benchmark reserve capacity price calculation spreadsheets, and public submissions received in response to its AEMO's draft report. The ERA has also reviewed reports from consultants GHD and PricewaterhouseCoopers, commissioned by AEMO for the review.

The ERA has provided detailed reviews of the calculation process in its previous decisions. This approach replicated much of the information in AEMO's final reports.

In this review, the ERA found the approach to evaluating many of the inputs to the proposed benchmark reserve capacity price were unchanged from previous years. These lines are shaded in Table 1, and details on the calculation of these inputs are already provided in AEMO's final report.

For brevity when preparing this decision paper, the ERA has not provided additional comment on the evaluation of these inputs. Instead, the decision paper focuses on where there has been either a change in the calculation or where changes may be implemented to enhance the estimation of the benchmark reserve capacity price. There are three instances of these, where AEMO:

- Improved the calculation of insurance costs by using the average of several quotes.
- Improved the selection of corporate bonds for the calculation of debt risk premium.
- Calculated land costs by including an extra sample in the North Country region. The ERA has made a recommendation on how this calculation could be improved.

Table 1. Main components of the benchmark reserve capacity price, proposed for 2021/22 compared to those approved for 2020/21

Parameter	Units	Proposed benchmark reserve capacity price and calculated values for 2021/22	Approved benchmark reserve capacity price and calculated values for 2020/21	Reason for change (when compared to the 2020/21 benchmark reserve capacity price)
Benchmark reserve capacity price	**$/MW/year**	**154,200**	**153,600**	**Combined effect of the change in underlying parameters.**
Power station expected capacity credit allocation	MW	151.4	151.4	N/A
Weighted average cost of capital	%	5.35	5.21	The estimate of the risk-free rate is slightly higher than that used in the previous review of the benchmark reserve capacity price, resulting in an increase in the value of WACC.
Power station costs	$/MW	843,379	846,751	The estimated capital cost of the reference power station has decreased by 0.4 per cent compared to last year's cost due to lower escalation factors, which was partly offset by a lower exchange rate.
Factor for legal, financing, approvals, contingencies and other costs	%	17.15	17.12	The margin is similar to last year's value.
Transmission connection works	$/MW	179,028	174,749	Transmission connection costs increased by 2.4 per cent. The increase in the costs is partly due to an increase in the escalation factor applied by Western Power.[20]
Fixed fuel costs	$	7,109,638	6,969,444	The fixed fuel cost estimate increased by two per cent. This is mainly due to a seven per cent increase in the price of delivered diesel.
Land costs	$	2,295,991	2,394,088	Land costs have decreased by 4.1 per cent. This is due to a decrease of 6.7 per cent, 4.8 per cent and 3.8 per cent in the value of land in the Pinjar, Kwinana and Geraldton regions respectively.
Total capital cost	$	191,011,923	190,747,133	Combined effect of the change in components of capital cost.
Annualised capital cost	$/year	18,835,625	18,644,285	Combined effect of the change in components of capital cost.
Annualised fixed operation and maintenance cost	$/MW/year	29,776	30,437	Generation operating and maintenance costs increased by 0.15 per cent. Switchyard and transmission line costs increased by 4.7 per cent and 5.4 per cent respectively. This increase was due to an increase in the connection cost operating and maintenance escalation factors. This year's estimate of insurance costs has decreased by 13.2 per cent. This was due to AEMO using an average of several insurance quotes, as compared to a single quote used last year. Fixed network access and on-going charges did not change.

[20] For confidentiality reasons, other components of the transmission cost are not available to assess their variation over years.

4.1 Insurance costs

Insurance costs are a component of fixed operating and maintenance costs. The market procedure stipulates that annual insurance costs are to be estimated at 1 October in year three of the relevant reserve capacity cycle. For the 2021/22 benchmark reserve capacity price this is 1 October 2021. The market procedure does not provide any guidelines for the calculation of insurance costs other than the insurance should cover power station asset replacement, business interruption and public and products liability insurance as required under network access arrangements with Western Power.

AEMO obtained insurance quotes from several independent insurance brokers. The insurance costs quoted varied considerably between brokers.[21] AEMO calculated an average of all the quotes and used this for the insurance cost within the fixed operating and maintenance parameter of the benchmark reserve capacity price calculation. The asset insurance costs are escalated to 1 October 2021 using the consumer price index escalation factor, to provide an annualised value of $4,672.49 per MW per year.

This year's estimates have decreased by 13.2 per cent compared to the previous year. This is a significant decrease and resulted from AEMO's revised approach to calculating insurance costs. AEMO considered this to be more representative of the current insurance market conditions.

AEMO's revised approach of calculating an average insurance cost is reasonable. The estimation of insurance costs based on several quotes can provide a better indication of such costs, when compared to a single quote that can vary between insurance brokers. However, instead of using the average of quotes, AEMO could use the lowest quote among the quotes it received. This could better represent investors' practice of shopping around for the lowest insurance cost.

4.2 Land costs

Step 2.7 of the market procedure states that AEMO must retain Landgate under a consultancy agreement to provide valuations on parcels of industrial land. The analysis must include six regions within the SWIS where generation projects are most likely to be proposed and should provide a broad cross-section of options.[22]

Landgate assesses the land sites for each region in or near existing industrial estates for land that would be suitable for the development of a power station. Landgate provided its estimate of the cost of each land parcel as at 30 June 2018, excluding transfer duty. AEMO added the applicable transfer duty to each land parcel cost.

Landgate used three-hectare sites for all locations except Kemerton, where the smallest available lot was five hectares. For the North Country region, Landgate included the value of two subregions: Geraldton and Eneabba. AEMO informed the ERA that the choice of two land sites in the North Country region is due to the large size of that region when compared to other

[21] See AEMO website, *Draft Report: 2019 Benchmark Reserve Capacity Price for the 2021/22 Capacity Year, 2018*, p14-15, https://www.aemo.com.au/-/media/Files/Electricity/WEM/Reserve_Capacity_Mechanism/BRCP/2019/Draft-report/Draft-Report-2019-BRCP-for-the-2021-22-Capacity-Year.pdf

[22] The market procedure specifies the six regions as Collie, Kemerton Industrial Park, Pinjar, Kwinana, North Country and Kalgoorlie.

regions specified in the market procedure. The use of an average value over two land sites better represents the average value of land in the North Country region.[23]

AEMO then calculated the mean of the value of the seven parcels of land provided by Landgate and escalated the average land cost to 1 April 2021.

AEMO's approach to using two land sites from the North Country region is reasonable and is not inconsistent with the market procedure. The market procedure allows AEMO to include additional locations if it considers appropriate.

However, with two sites included for the North Country, the average land value result will be weighted more heavily towards the land value in this region relative to other regions. Samples from the North Country region were the least expensive across all regions and will have skewed the results downwards.

The calculation method could alternatively estimate the average of the two land values in the North Country region first and then estimate the land cost value by taking an average of land costs in the remaining five regions and the average land cost estimated for the North Country region.

If land costs had been calculated using this approach, they would have been around $338,000 higher than those estimated by AEMO. Using the lower land costs as calculated by AEMO gives a reduction in the benchmark reserve capacity price by $226 per MW or $34,000 based on the capacity of the benchmark generator. While this is not a material change, the ERA recommends AEMO consider its averaging approach to yield a more balanced valuation across the regions in future years.

4.3 Estimation of the debt risk premium

Debt risk premium is a component of the WACC.[24] The market procedure stipulates that AEMO should determine the debt risk premium based on the margin between the observed annual yields of Australian corporate bonds that have a BBB (or equivalent) credit rating from Standard and Poors, and the nominal risk-free rate.

To calculate the debt risk premium, AEMO used the calculation method that has been adopted by the ERA since 2015.[25] It is based on a bond yield method that uses a larger sample of bonds issued by entities whose country of risk is identified as Australia on Australian and international markets.

In its reviews of the benchmark reserve capacity price for 2019/20 and 2020/21, the ERA identified many duplicate bonds in the sample of bonds used to calculate yields, and recommended AEMO rectify this issue in its future reviews of the benchmark reserve capacity

[23] AEMO's reserve capacity market team, 'RE: ERA 2019 Benchmark Reserve Capacity Price Comments' [email], 21 December 2018.

[24] The ERA notes comments from AEMO and PricewaterhouseCoopers that an increase in the risk free rate between years has driven the slight increase in WACC used to calculate benchmark reserve capacity price 2021/22.

[25] For instance, the ERA has adopted the revised bond yield approach in its Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System in September 2015; Final Decision on Proposed Revisions to the Access Arrangement for the Dampier to Bunbury Natural Gas Pipeline 2016-2020 in June 2016; and Final Decision on Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline in July 2016.

price.[26] In response, AEMO's consultant, PricewaterhouseCoopers, removed duplicate bonds in the calculation of debt risk premium for the calculation of the benchmark reserve capacity price for 2021/22.

4.4 Public consultation process

On 10 October 2018, AEMO published a draft report on the 2021/22 benchmark reserve capacity price and called for submissions by 24 October 2018. AEMO received submissions from Perth Energy and Merredin Energy.

Perth Energy was concerned that the annualised fixed operating and maintenance costs have decreased mainly due to a decrease in insurance premiums compared to the 2020/21 benchmark reserve capacity price. This was inconsistent with Perth Energy's own experience of a small increase in insurance premiums from last year.

It is possible that a market participant's observed cost differs from the average value estimated by AEMO because different insurance brokers may charge different premiums based on the insured asset risk. AEMO's revised approach of calculating an average insurance cost is reasonable. However, as explained in section 4.1, it can be improved further by using the lowest quote obtained.

Perth Energy was also concerned about the accuracy of the WACC estimation method in the market procedure. Perth Energy considered that this method needs to be reviewed as it does not accurately reflect the generation investment risk in the market. However, Perth Energy agreed that AEMO should follow the method set in the market procedure until such a time as the ERA conducts its five-yearly benchmark reserve capacity price review.[27]

Merredin Energy considered that the use of a 160 MW open cycle gas turbine as the reference power station is not consistent with expected growth in peak demand in the wholesale electricity market. Merredin Energy argued that this choice of reference technology will increase price volatility and potentially deter new investment in the market. Merredin Energy also considered that AEMO's estimate of the WACC was reasonable but argued that it does not reflect the current cost of financing a power station over its life.[28] Merredin Energy stated that the market procedure for the calculation of the benchmark reserve capacity price is no longer consistent with the intent of the market rules and should no longer be used.

A suitably designed market procedure provides confidence in the market and facilitates investments in generation capacity. It is important that AEMO does not deviate from the market procedure to ensure that investors' decisions are not undermined. The market rules provide for a periodic review of the market procedure to ensure it suitably serves the objectives of the market.

During this and previous reviews and consultation processes, market participants and AEMO provided feedback and raised concerns about the method for calculating the benchmark reserve capacity price. The ERA will address concerns about the benchmark reserve capacity

[26] Despite the inclusion of duplicate bonds, the ERA decided to approve the 2020/21 benchmark reserve capacity price considering that the sampling error had very minor effect on the estimated benchmark reserve capacity price and AEMO did not have sufficient time to remedy the issue.

[27] Under clause 2.26.3 of the market rules the ERA reviews the market procedure for calculating the benchmark reserve capacity price.

[28] Merredin Energy argued that the nominal return on debt should reflect current market rates similar to that estimated by AEMO plus longer-term rates that are likely to eventuate. Merredin Energy stated that this is similar to the method adopted by the Independent Pricing and Regulatory Tribunal in New South Wales.

price calculation method in its next review of the market procedure expected to commence in the second quarter of 2019.

In anticipation of changes in the reserve capacity mechanism and its potential implications for the benchmark reserve capacity price calculation, the ERA has delayed its review of the market procedure since 2016. Recently, the Public Utilities Office published a draft recommendations paper outlining its proposed recommendations on potential reforms to the reserve capacity pricing arrangements.[29] The ERA will consider changes to the reserve capacity mechanism in its next review of the method used to calculate the benchmark reserve capacity price.

5. Conclusion

The ERA is satisfied that AEMO has met the requirements of the market rules in proposing the benchmark reserve capacity price for the 2021/22 capacity year for the following reasons:

- The proposed revised value of the benchmark reserve capacity price reasonably reflects the application of the method and guiding principles described in clause 4.16 of the wholesale electricity market rules.
- AEMO has carried out an adequate public consultation process.

Based on the above assessment, the ERA approves the proposed revised value for the benchmark reserve capacity price for the 2021/22 capacity year of $154,200 per MW per year. The approved revised value for the benchmark reserve capacity price will apply with effect from the date and time specified in a notice to be published on the AEMO's website.

[29] See Public Utilities Office website, *Improving Reserve Capacity pricing signals – a proposed capacity pricing model*, 2018, https://www.treasury.wa.gov.au/uploadedFiles/Site-content/Public_Utilities_Office/Industry_reform/Draft-Recommendations-Report-Improving-Reserve-Capacity-pricing-signals.PDF