2022 benchmark reserve capacity price for the 2024/25 capacity year

Draft determination

10 November 2021

Economic Regulation Authority
WESTERN AUSTRALIA

D240500

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Invitation to make submissions

Submissions are due by 4:00 pm WST, Tuesday, 23 November 2021.

The ERA invites comment on this paper and encourages all interested parties to provide comment on the matters discussed in this paper and any other issues or concerns not already raised in this paper.

We would prefer to receive your comments via our online submission form https://www.erawa.com.au/consultation

You can also send comments through:

Email: publicsubmissions@erawa.com.au
Post: Level 4, Albert Facey House, 469 Wellington Street, Perth WA 6000

Please note that submissions provided electronically do not need to be provided separately in hard copy.

All submissions will be made available on our website unless arrangements are made in advance between the author and the ERA. This is because it is preferable that all submissions be publicly available to facilitate an informed and transparent consultative process. Parties wishing to submit confidential information are requested to contact us at info@erawa.com.au.

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Contents

List of appendices

Executive summary

The Economic Regulation Authority has completed its draft determination of the 2022 benchmark reserve capacity price, which is $160,100 per megawatt (MW) per year, applicable to the 2024/25 capacity year.

The wholesale electricity market within the South West Interconnected System (SWIS) has adopted a capacity mechanism to provide price signals for capacity providers to enter the market and ensure there is enough capacity installed in the SWIS to ensure electricity is available when required. The benchmark reserve capacity price (BRCP) is an input to these capacity pricing signals.

The BRCP is used in the calculation of the maximum price that can be offered into a reserve capacity auction, or as an input into the calculation of the reserve capacity price where an auction is not required.[1] The reserve capacity price is the price paid to generators for each megawatt of capacity that they make available in that year.[2] This revenue from capacity payments combines with other revenue from generating electricity and providing essential system services to provide the overall return for investors.

The BRCP is calculated based on an estimate of the cost of a new generator - specified as a 160 MW open cycle gas turbine - connecting to the SWIS to provide additional reserve capacity.[3] The BRCP is estimated through a bottom-up, engineering based cost assessment with the details specified by the BRCP market procedure. This assessment is based on factors including materials prices, costs of labour, interest rates and exchange rates, and changes in these are factored into the BRCP accordingly.

The 2022 BRCP of $160,100 per MW per year (applying to the 2024/25 capacity year) is 5.5 per cent higher than the 2021 BRCP of $151,700 per MW per year. This change is largely due to increases in the forecast price of steel and copper, increases to labour costs in Western Australia and a higher cost of capital from rising interest rates in debt markets. The 2021 BRCP was determined during the COVID-19 pandemic when market prices worldwide were subdued as industrial activity, demand and supply chains were disrupted. As markets have started recovering from the pandemic, prices have risen and driven the increase in the 2022 BRCP. Prices for material and labour used in determining the BRCP have also increased due to supply chain issues and restrictions on the movement of personnel.

The ERA's draft BRCP determination details how the BRCP was calculated as required by the market procedure. The ERA has used data and analysis from independent consultants (GHD, PwC, and an insurance broker), Western Power and Landgate to inform the BRCP calculation. Where applicable, these reports have been published at the same time as this draft determination for stakeholder comment.

The ERA invites submissions to this draft determination. As the Australian Energy Market Operator (AEMO) requires the final BRCP by 10 January 2022, the ERA must determine the final BRCP by December 2021. To meet this deadline, the submission period is for two weeks only, with no extensions possible.

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1 A reserve capacity auction is required when there is insufficient capacity expected to be available in a capacity year. Details on the reserve capacity auction are in Wholesale Electricity Market Rules (WA), 1 November 2021, Rules 4.15 to 4.19.

2 All holders of capacity credits receive capacity payments. Although generators are the largest capacity credit holders, capacity credits can be provided to storage and demand side programmes.

3 Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020. The OCGT must be able to run on liquid fuel.

1. Introduction

The SWIS is a small, geographically isolated electricity system in Western Australia. To ensure a reliable supply of electricity, sufficient electricity generation must be available to continuously meet the demand of consumers, including during emergencies.

The RCM incentivises the supply of electricity generation capacity in the SWIS. The RCM, through capacity payments, pays generators to make generating capacity available regardless of whether the generator actually supplies electricity. These capacity payments are based on the reserve capacity price which is determined by referencing the BRCP.

The BRCP provides an estimate of the marginal cost of providing additional reserve capacity into the SWIS for a capacity year. The BRCP is calculated by conducting a bottom-up, engineering based cost estimate of a reference generator connecting to the SWIS in the relevant capacity year, which is usually two years into the future.

The relevant market procedure requires the BRCP to be based on a 160 MW Open Cycle Gas Turbine (OCGT) with enough fuel to operate for 14 hours continuously at its maximum rated capacity.[4] This includes all costs that are expected to be incurred when developing a power station, which include:

- Fixed operating and maintenance costs for the power station, fuel handling and transmission connection components.
- Land costs.
- Liquid fuel storage and handling facilities.
- Transmission connection costs.
- Other ancillary and infrastructure costs that are normally incurred when developing a power station.
- Allowances for legal, insurance, financing and environmental costs including a contingency margin.

The BRCP is always determined two years in advance and is used to calculate the reserve capacity price that will be paid to capacity credit holders in that year.[5] This draft determination provides market participants with an indicative value of the BRCP for the 2024/25 capacity year.[6] The ERA is interested in stakeholders' opinions on this draft determination.

The BRCP is one input into the process to determine the reserve capacity price. The 2024/25 reserve capacity price is determined based on the amount of excess reserve capacity available in 2024/25 with the BRCP providing an indication of the reserve capacity price as the SWIS approaches zero per cent excess capacity.[7] The greater the excess capacity in 2024/25, the lower the reserve capacity price will be relative to the BRCP. The reserve

4 Exact details of the power station requirements are defined in section 2.1 of the Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020. The power station must be able to operate on distillate fuel. All references in this determination to the OCGT refer to an OCGT that must be able to run on distillate fuel.

5 The BRCP is also used in the calculation of the maximum price that can be offered into a Reserve Capacity Auction if an auction is required. A capacity year starts at 8:00am on 1 October and finishes at 8:00am on 1 October the subsequent year.

6 The 2024/25 capacity year starts at 8:00am on 1 October 2024 and ends at 8:00am on 1 October 2025.

7 The required amount of reserve capacity is based on the reliability standard which is part of the planning criterion in the Wholesale Electricity Market Rules (WA), 1 November 2021, Rule 4.5.9. Excess reserve capacity is based on how much more reserve capacity is being offered into the SWIS relative to the amount required under the planning criterion.

capacity price is the price paid to generators for each megawatt of capacity that they make available in that year.

The ERA's final determination will be made in December 2021. The final determination will also include the latest updates to figures underlying the Weighted Average Cost of Capital (WACC) and cost escalation estimates. This is so that the final determination is based on the latest available data.

References to the market procedure in this document refer to the BRCP market procedure unless otherwise specified.

Cost and price estimates in this report are in Australian dollars (AUD) excluding Goods and Services Tax, unless otherwise specified.

1.1 Transfer of the BRCP calculation function to the ERA

From 1 July 2021, the ERA became responsible for calculating and determining the BRCP. Prior to that, AEMO was responsible for calculating the BRCP, which was then submitted to the ERA for approval. The BRCP market procedure has not yet been updated to reflect this transfer of responsibilities. Regardless, the ERA has applied the BRCP market procedure as if the market procedure had been updated to show the change of function and has carried out the BRCP determination accordingly.

The BRCP market procedure requires the BRCP power station cost estimate to be based on a 160 MW open cycle gas turbine.[8] This reference generator is not being reviewed in this determination but may be considered in the ERA's next review of the BRCP market procedure, which must be conducted every five years.[9] The ERA's last review of the market procedure was in 2020. However with the implementation of the Government's Energy Transformation Strategy, the BRCP will be reviewed as part of Energy Policy WA's review of the RCM, which could lead to changes to the BRCP and the market procedure.[10]

8 Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020.

9 Wholesale Electricity Market Rules (WA), 1 November 2021, Rule 4.16.9

10 Energy Policy WA provides policy advice to the Government of Western Australia to facilitate the delivery of secure, reliable, sustainable, and affordable energy services to Western Australians.

2. Scope of the BRCP

The BRCP must include all reasonable costs expected to be incurred when developing a power station for the 2024/25 capacity year. The market procedure details how the components of the BRCP must be calculated.[11] The major components are:

- an annualised fixed operating and maintenance component which includes:[12]
  - transmission connection costs
  - land costs
  - fixed fuel costs
  - a margin for other costs including approvals, legal and financing
- the annualised total capital cost of the power plant

To determine the draft 2022 BRCP, the ERA has followed the market procedure and used a combination of public information, and advice from independent consultants, Western Power, and Landgate.

To calculate the BRCP per MW per year, the ERA also has to estimate the quantity of capacity credits the power plant is expected to receive in the 2024/25 capacity year.

By 2024/25, constrained network access will apply in the SWIS. EPWA has already developed and consulted on a framework clarifying how capacity credits or Network Access Quantities (NAQ) will be allocated to generators given the network constraints that may exist in the SWIS. EPWA, Western Power and AEMO are now working to identify the network limit advice and capacity constraint equations for the SWIS, which will then influence the NAQs generators receive, including the calculation of NAQ for the BRCP reference generator.

Further, as noted in section 1.1, EPWA has just begun a review of the Reserve Capacity Mechanism and the method used for calculating the annual BRCP is included as part of this review. The type of reference generator could change as a result of this review, as could the options on where it could connect across the SWIS.

As EPWA releases information on network constraints and any changes to the method for determining the BRCP, the ERA will be able to consider how the BRCP will be calculated in the future, including how the NAQ may affect the capacity credits expected to be received by the reference generator. This may require a change to the BRCP market procedure, for which the ERA will undertake the required review and consultation process.

As this information is not yet available, the ERA has not applied the Network Access Quantity (NAQ) regime to the 2022 BRCP draft determination.

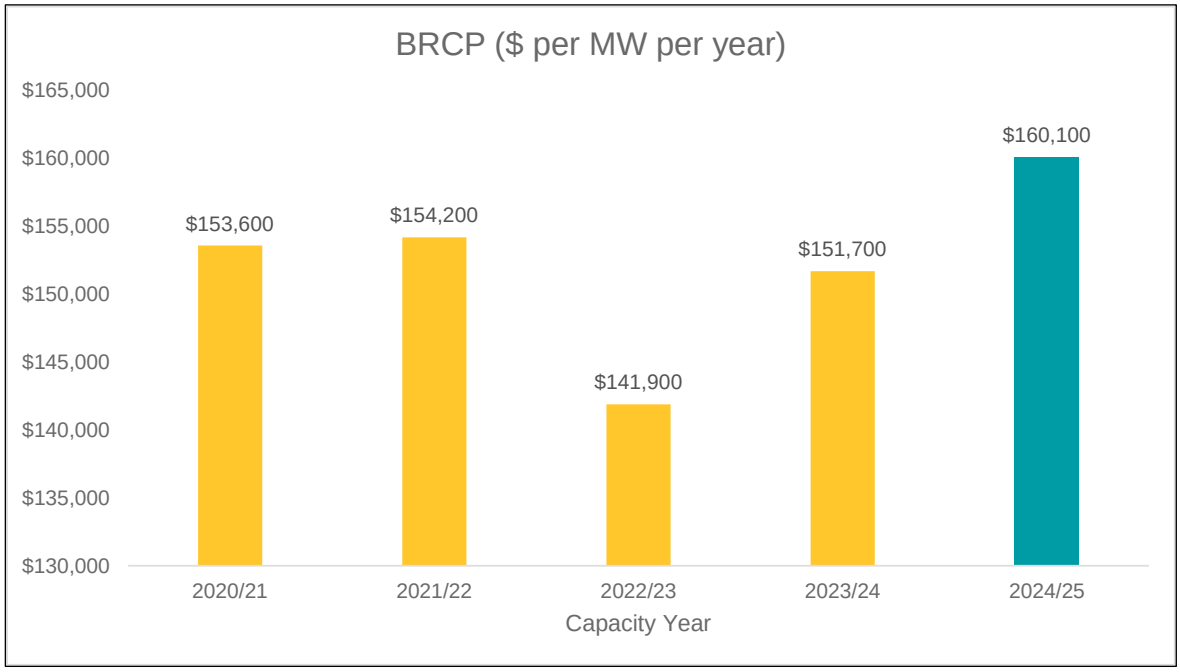
[11] Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020.

[12] The capital cost of the OCGT and the WACC are used to derive the fixed operating and maintenance costs.

3. The BRCP calculation

The ERA has calculated a draft value for the BRCP for the 2024/25 capacity year of $160,100 per MW per year.[13] Figure 1 shows the BRCP since the 2020/21 capacity year and the draft BRCP for 2024/25.

Figure 1: BRCP from 2020/21 by capacity year



Source: AEMO Benchmark Reserve Capacity Price webpage (online) and ERA analysis of BRCP data.

The formula for calculating the BRCP is stated in the market procedure as:[14]

$$BRCP = Annualised\ Fixed\ Operations\ and\ Maintenance + \frac{Annualised\ Capital\ Costs}{Expected\ Capacity\ Credits}$$

A comparison of the indicative draft 2022 BRCP and its components against the approved 2021 BRCP is provided in Table 1.

13 This is required by Wholesale Electricity Market Rules (WA), 1 November 2021, Rule 4.16.

14 Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020, clause 2.10.1

Table 1: Draft 2022 BRCP calculation and comparison with approved 2021 BRCP values

Component	Draft 2022 BRCP	2021 BRCP	Change from 2021
BRCP ($/MW/Year)	**160,100**	**151,700**	**8,400** **+5.5%**
Annualised capital costs ($/Year)	19,007,908	18,222,883	785,025 +4.3%
Annualised fixed O&M costs ($/MW/Year)	34,311	32,028	2,283 +7.1%
Expected capacity credits (MW)	151.12	152.28	-1.16 capacity credits -0.8%

Source: ERA analysis of BRCP data

The breakdown of the different components underlying the annualised capital costs is detailed in Chapter 4 and the annualised fixed operations and maintenance (O&M) costs in Chapter 5. The change in expected capacity credits is discussed in section 5.5.

4. Annualised capital costs of the power station

The annualised capital costs of the reference generator for the 2022 BRCP is $19 million, 4.3 per cent higher than the 2021 BRCP (around $785,000 higher). This is the largest component of the increase in the BRCP and is mostly driven by an increase to power station costs and an increase in financing costs.

Table 2: Annualised capital cost components against approved 2021 BRCP values

Component	Draft 2022 BRCP	2021 BRCP	Change from 2021
Annualised capital cost ($/year)	**19,007,908**	**18,222,883**	**785,025 +4.3%**
Power station cost ($/MW)	844,150	816,437	27,713 +3.4%
Margin (%)	16.21	16.69	Down 48 basis points -2.9%
Transmission cost ($/MW)	186,877	180,927	5,950 +3.3%
Fixed fuel cost ($)	7,283,789	6,915,717	368,072 +5.3%
Land cost ($)	2,657,853	2,404,251	253,602 +10.5%
WACC (%)	5.45	5.20	Up 25 basis points +4.8%
Expected capacity credits (MW)	151.12	152.28	-1.16 capacity credits -0.8%

Source: ERA analysis of BRCP data

Table 2 shows the change in the cost components between the 2021 BRCP and the 2022 draft BRCP. The change in the values do not directly correspond to changes in the BRCP due to the operation of the calculation specified in the BRCP market procedure (see Appendix 4).[15] For example, although land costs have increased by 10.5 per cent, this has a smaller effect on the BRCP than the 3.4 per cent increase in power station costs as the power station component is a larger part of the annualised capital cost component. More details are available in Appendix 4.

The main drivers affecting the BRCP (power station costs and the WACC) are discussed below with the remaining items discussed in Appendix 4.

[15] Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020, clause 2.10.1

4.1 Power station costs

The increase in the power station costs to $844,150 per MW (up 3.4 per cent to 2021) is largely driven by increases in the input costs that make up the total cost of the plant.[16] These are referred to as cost escalation factors and the ERA engaged PwC to forecast the required cost escalation factors for the 2022 BRCP (Table 3).[17]

Table 3: Cost escalation factors for the draft 2022 BRCP by financial year

Cost Escalation Factor	2021/22	2022/23	2023/24	2024/25	2025/26
Labour costs – operations and maintenance (% change)	2.45	2.45	2.70	2.70	2.42
Labour costs – construction (% change)	2.01	2.01	2.26	2.26	1.98
AUD/USD ($)	0.7700	0.7863	0.7663	0.7663	0.7663
Steel price (% change)	20.70	-27.97	-10.21	-6.98	-2.79
Copper price ($ change)	4.40	-8.61	-1.61	-3.84	2.34

Source: Economic Regulation Authority, 2021, 2022 Benchmark Reserve Capacity Price*, Report prepared by PwC (online)*

These cost escalation factors were provided to GHD who calculated the cost escalation factors for the power station (Table 4).

Table 4: Power station escalation factors

Cost escalation	Total applicable power station escalation factor (%)
2021 BRCP[18]	-11.20
2022 BRCP[19]	-2.36

Source: Economic Regulation Authority, 2021, Power station and associated costs*, Report prepared by GHD Advisory, chapter 2 (online)*; and *AEMO, 2020,* 2021 Benchmark Reserve Capacity Price for the SWIS Report – 2021 BRCP for a 160MW OCGT, *Report prepared by GHD advisory, Chapter 2 (online).*

Since the power station must be priced two years in advance, GHD determines the power station escalation factors from the cost escalation factors and applies them to the estimated cost of the power station. The total 2022 BRCP power station escalation factor is higher than the total escalation factor used in the 2021 BRCP. This higher power station escalation factor is driven by the short term increase in steel and copper prices and forecast ongoing longer term growth in labour costs. These are a result of current supply shortages for steel and

16 This is the total capital cost escalated to 1 April 2024 divided by the expected capacity credits of 151.12 MW. Expected capacity credits for the power station is discussed in section 5.5.

17 Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020, section 2.3

18 The -11.20 percent total applicable power station escalation factor is calculated on: 2021 (-7.837 per cent); 2022 (-3.645 per cent); and 2023 (-0.025 per cent) - AEMO, 2020, *2021 Benchmark Reserve Capacity Price for the SWIS Report – 2021 BRCP for a 160MW OCGT*, Report prepared by GHD advisory, Chapter 2, p.3. (online)

19 The -2.36 percent total applicable power station escalation factor is calculated on: 2022 (3.15 per cent); 2023 (-7.53 per cent); and 2024 (2.37 per cent) - Economic Regulation Authority, 2021, *Power station and associated costs*, Report prepared by GHD Advisory, chapter 2 (online).

copper, and restrictions on the movement of personnel due to the pandemic combined with shortages of skilled labour (detailed analysis is provided in PwC's report).[20]

Additionally, the ERA engaged GHD to assess the appropriate machine for the 2022 BRCP. GHD selected the Siemens SGT5-2000E, which is consistent with the machine chosen for the 2021 BRCP, as it most closely matched the power station requirements in the market procedure.[21] The power station met these requirements as it:

- Is an industry standard OCGT power station with a nominal nameplate capacity of 160 MW prior to installing any inlet cooling system.
- Can use distillate for its fuel.
- Has a capacity factor of 2 per cent. This means that the BRCP reference generator is expected to generate 160 MW for 2 per cent of the year.

When determining the capital costs of this power station, GHD made allowance for the other power station requirements which includes:[22]

- Technologies like nitrous oxide burners that are required to demonstrate good practice for developing this type of power station.
- An inlet air cooling system and water receival and storage facilities to allow 14 hours of continuous operation where this would be cost effective.
- The minimum level of equipment or systems required to satisfy the Balancing Facility Requirements.

4.2 WACC

The cost of capital represents the minimum return that a company must earn on an existing asset to satisfy its creditors, owners, and other providers of capital. A WACC weights a company's cost of capital in line with its debt to equity financing structure. For the BRCP, the WACC is used to estimate the financing costs of the power station and represents the long-term required rate of return when determining the power station's annualised cost. Consequently, small changes in the WACC can have a large effect on the BRCP as the power station's life is projected over 50 years.

The indicative WACC for this draft determination is 5.45 per cent, which is 25 basis points higher than the 2021 BRCP WACC (5.2 per cent). The increase in the WACC is the second largest driver of the draft 2022 BRCP increase.

4.2.1 Updated annual WACC

The ERA has reviewed and calculated the annual WACC components including the nominal risk free rate and the debt risk premium.[23] For the 2022 BRCP, the indicative nominal pre-tax rate of return is 5.45 per cent (see Table 5). This is higher than the 5.2 per cent nominal WACC

[20] Economic Regulation Authority, 2021, *2022 Benchmark Reserve Capacity Price,* Report prepared by PricewaterhouseCoopers (online).

[21] Economic Regulation Authority, 2021, *Power station and associated* costs, Report prepared by GHD Advisory, chapter 3 (online).

[22] Ibid.

[23] The WACC components are required to be reviewed by the ERA are in Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020, section 2.9.

for last year's BRCP calculation.[24] The main driver of this change is the increase in the nominal risk free rate (up 34 basis points) and is discussed in more detail below.

The WACC for the BRCP will be updated in the ERA's final determination for the BRCP to account for changes in the WACC's components.

Table 5: Indicative WACC for the draft 2022 BRCP

Parameter	Draft 2022 BRCP value	2021 BRCP value[25]
WACC		
Nominal pre-tax WACC (%)	**5.45**	**5.20**
Cost of equity parameters		
Nominal risk free rate (%)	1.14	0.80
Equity beta	0.83	0.83
Market risk premium (%)	5.90	5.90
Pre-tax return on equity (%)	7.10	6.70
Cost of debt parameters		
Nominal risk free rate (%)	1.14	0.80
Debt risk premium (%)	1.729	2.040
Debt issuance costs (%)	0.100	0.100
Pre-tax return on debt (%)	2.97	2.94
Other parameters		
Debt proportion (gearing) (%)	40	40
Franking credits (gamma) (%)	50	50
Corporate tax rate (%)	30	30

Source: ERA analysis of BRCP data

4.2.1.1 Nominal risk free rate

The risk free rate is the return an investor expects from investing in an asset with no risk. The market procedure requires the ERA to use 10-year Commonwealth Government bonds as a proxy for risk free assets in Australia to estimate a long-term risk free rate of return.[26] This aligns the WACC to represent a long-term rate of return for the capital costs of the BRCP

[24] AEMO, 2021, *Final Report: 2021 Benchmark Reserve Capacity Price for the 2023-24 Capacity Year*, p.4.

[25] Ibid, p.23.

[26] Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020, clause 2.9.7. To calculate the risk free rate, the market procedure uses indicative mid rates published by the Reserve Bank of Australia. Where there are no Commonwealth Government bonds with a maturity of exactly 10 years the ERA interpolates the risk free rate on a straight line basis

power station. The BRCP WACC calculation uses a nominal risk free rate, which includes the market's inflation expectations.

As an indicative figure for this draft determination, the ERA's estimate for the nominal risk free rate is 1.14 per cent.[27] This is higher than the 0.80 per cent nominal risk free rate calculated by AEMO in the 2021 BRCP.[28] This indicative figure is provided to give market participants an idea of the nominal risk free rate that the ERA will use in its final determination. The ERA's final determination nominal risk free rate may differ depending on changes to financial conditions since this draft figure was calculated.

4.2.1.2 Debt risk premium

The debt risk premium is the return above the risk free rate that lenders require to compensate them for lending funds to a firm. The debt risk premium compensates debt holders for the possibility of default by the issuer and is closely aligned with the risk of the business. The market procedure requires the ERA to assess bonds that have a credit rating of a BBB (or equivalent).[29] A bond's credit rating reflects the probability of default of the issuer which is the risk that the bondholder bears. The ERA's approach to determining the debt risk premium for the BRCP is detailed in Appendix 6.

As an indicative figure for this draft determination, the ERA's estimate of the debt risk premium is 1.729 per cent.[30] This is lower than the 2.040 per cent debt risk premium calculated by AEMO in the 2021 BRCP.[31] This change is due to changes in credit markets for these debt instruments. This indicative figure is provided to give market participants an idea of the debt risk premium that the ERA will use in its final determination. The debt risk premium for the ERA's final determination may differ depending on changes to debt markets since the draft figure was calculated.

4.2.1.3 Corporate tax rate

The ERA has reviewed the corporate tax rate, which has not changed from 30 per cent.

4.3 Other capital cost components

The other components making up the power station costs, including land costs and fixed fuel costs, did not significantly contribute to the increase in power station capital costs. These components are covered in Appendix 4 and are in line with but marginally higher than the 2021 BRCP values.

27 The nominal 1.14 per cent risk free rate is based on a 20-trading day averaging period up to 31 August 2021.

28 AEMO, 2021, *Final Report: 2021 Benchmark Reserve Capacity Price for the 2023-24 Capacity Year*, p.23.

29 Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020, clause 2.9.7(h).

30 The debt risk premium of 1.729 per cent is based on a 20-trading day averaging period up to 31 August 2021.

31 AEMO, 2021, *Final Report: 2021 Benchmark Reserve Capacity Price for the 2023-24 Capacity Year*, p.23.

5. Annualised fixed O&M costs

The draft annualised fixed operating and maintenance costs for the 2022 BRCP is $34,311 per MW per year, up 7.1 per cent from the 2021 BRCP ($32,028 per MW per year). This is mostly due to increases in the generation O&M costs, asset insurance costs and Western Power's network access and charges.

The operating and maintenance costs consist of five parts: generation O&M costs, switchyard O&M costs, transmission line O&M costs, asset insurance costs, and network charges. These are costs expected to be incurred in operating and maintaining the reference generator annually and are detailed in Table 6.[32]

Table 6: Comparison of draft 2022 BRCP annualised fixed O&M costs to approved 2021 BRCP values

Component	2022 BRCP draft	2021 BRCP	Change from 2021
Annualised fixed O&M costs ($/MW/year)	**34,311**	**32,028**	**2,283 +7.1%**
Generation O&M costs ($/MW/year)	15,318	13,931	1,387 +10.0%
Switchyard O&M costs ($/MW/year)	576	544	32 +5.8%
Transmission line O&M costs ($/MW/year)	36	34	2 +5.7%
Asset insurance costs ($/MW/year)	6,792	6,477	315 +4.9%
Fixed network access and ongoing charges ($/MW/year)	11,590	11,041	5.0% +549

Source: ERA analysis of BRCP data

5.1 Generation O&M cost

Generation O&M costs are based on a single gas turbine that can deliver a nominal 160 MW of electricity using diesel fuel with an operating life of up to 60 years and a 2 per cent capacity factor as required by the market procedure.[33] An allowance for balance of plant costs is included, which includes items like the servicing of pumps, water plants, fire systems, etc.

The increase in generation O&M cost is largely driven by the increase in labour costs (see Table 3) for services including plant operations, electrical sub-contractors, and engineering support.[34] Partially offsetting the increase was the decrease in balance of plant costs, which are calculated as a portion of the capital cost of the power station. Since the non-escalated

[32] These fixed operation and maintenance costs have been escalated to 1 October 2024.

[33] This excludes costs of gas connections.

[34] Economic Regulation Authority, 2021, *Power station and associated* costs, Report prepared by GHD Advisory, section 4.3 (online) – for details of these costs.

capital cost of the power station is lower than the amount for the 2021 BRCP, this resulted in lower balance of plant costs.[35]

5.2 Asset insurance costs

The asset insurance costs cover power station asset replacement, business interruption and public and products liability insurance. To maintain consistency with previous insurance estimates for the BRCP, the ERA sourced the insurance quote from an independent insurance broker, one of the leading global insurance brokers with expertise in power generation insurance, particularly in Western Australia.[36] The asset insurance cost components are in Table 7.

Table 7: Comparison of draft 2022 BRCP asset insurance costs to approved 2021 BRCP values

Component	Draft 2022 BRCP	2021 BRCP	Change from 2021
Asset insurance costs ($/MW/Year)	6,792	6,477	315 +4.9%
Asset replacement insurance ($/Year)	666,727	632,734	33,993 +5.4%
Business interruption insurance ($/Year)	207,431	192,330	15,101 +7.9%
Public and products liability insurance ($/Year)	140,246	150,364	-10,118 -6.7%

Source: ERA analysis of BRCP data

Asset insurance costs for the draft 2022 BRCP increased by 4.9 per cent to $6,792 per MW per year compared to those in the 2021 BRCP. This is mostly due to the increase in the cost of the power station.

The asset replacement cost increased due to a higher power station cost and an increase in the cost of insurance for asset replacement for a 160 MW OCGT generator.[37] Additionally, the terrorism levy increased as the calculation was changed to be an average over the six land regions assessed under the BRCP.[38] This change was made to provide a more accurate assessment of the terrorism risk of a generator being constructed in any of these six regions. As some of these regions have a higher terrorism risk due to being located closer to other physical properties such as business and industrial area, when averaged over the six regions,

35 This is not to be confused with the capital cost of the power station (see Chapter 4) which has increased relative to the 2021 BRCP. This is because that capital cost has been escalated based on the cost escalation factors in section 4.1. The calculation of the balance of plant costs is not based on the escalated capital cost of the power station.

36 The insurance broker is the same broker used by AEMO for determining past BRCPs. For confidentiality, the broker has requested to not be named.

37 This power station costs are the escalated figures up to 1 October 2024.

38 These regions are Collie, Kemerton Industrial Park, Pinjar, Kwinana, North Country (Eneabba and Geraldton) and Kalgoorlie – Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020, clause 2.7.1.

the overall terrorism levy is higher. The terrorism levy is assessed on the generator's replacement and business interruption costs.[39]

The increase in power station costs consequently led to an increase in the business interruption insurance.

The decrease in public and products liability insurance is due to a fall in the price of this insurance, which was overestimated in the 2021 BRCP.

5.3 Fixed network access and ongoing charges

The other main contributor for the increase in fixed O&M costs is the increase in Western Power's fixed network access and ongoing charges to $11,590 per MW per year; an increase of 5 per cent, or $549 per MW per year, compared to the 2021 BRCP value ($11,041 per MW per year).

Network access charges were estimated using Western Power's network access tariffs data from the 2021/22 price list.[40] The Transmission Reference Tariff 2 (TRT2) is applicable to generators.

In line with AEMO's previous practice, the ERA applied the highest unit price from across the six regions prescribed in the market procedure.[41] This highest unit price is the Muja Power Station substation and the ERA used the base tariff for this site to estimate the fixed network access charges. The transmission use of system charges is based on the cost to Western Power of that generator's use of the SWIS and is dependent on factors including the location, transmission line-length and the complexity of the grid connection.

The other two input component costs are:

- control system service charges – this is the general overhead of Western Power's control system costs applied to generators proportionately per kilowatt.
- transmission metering service charges – a fixed daily charge per revenue meter.

Table 8: Comparison of draft 2022 BRCP fixed network and ongoing charges to approved 2021 BRCP values

Component	Draft 2022 BRCP	2021 BRCP	Change from 2021
Control system service charge ($/year)	121,349	118,390	2,959 +2.5%
Transmission metering ($/year)	3,209	3,271	-62 -1.9%
Use of system charge ($/year)	1,519,625	1,460,700	58,925 +4.0%

39 The business interruption insurance premium was assessed of $24 million of business interruption insurance.

40 Western Power, 2021, *2021/22 Price List*, (online) [accessed 20 October 2021].

41 These regions are Collie, Kemerton Industrial Park, Pinjar, Kwinana, North Country (Eneabba and Geraldton) and Kalgoorlie – Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020, clause 2.7.1.

Component	Draft 2022 BRCP	2021 BRCP	Change from 2021
Total annual Western Power charges ($)	1,644,183	1,582,361	61,822 +3.9%
Cost per MW per year[42]	11,590	11,041	549 +5.0%

Source: ERA analysis of BRCP data

These costs were calculated as of July 2021 with the total cost per MW figure escalated by the forecast inflation rates to 1 October 2024 as required by the market procedure.

5.4 Other operating and maintenance components

The other components making up the fixed operating and maintenance costs (switchyard O&M and the transmission line O&M) did not significantly contribute to its increase. These components are covered in Appendix 5 and are in line with but marginally higher than the 2021 BRCP values.

5.5 Expected capacity credits

The expected capacity credits for a 160 MW open cycle gas turbine entering the SWIS is 151.12 MW, after accounting for site conditions. This is based on analysis provided by GHD that assessed different generators and recommended a suitable proxy for the reference generator (see section 4.1). The reference generator's expected capacity credits were determined based on the net output of the generator when adjusted for site conditions as required by the market procedure.[43]

As discussed in Chapter 2, the NAQ regime has not been applied to the 2022 BRCP draft determination, as it is not yet finalised.

[42] Includes escalation by forecast inflation.

[43] See Economic Regulation Authority, 2021, *Power station and associated* costs, Report prepared by GHD Advisory, section 3.4 (online); and Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020, clause 2.3.1.

Appendix 1 List of Tables

Appendix 2 List of Figures

Appendix 3 Components of the draft 2022 BRCP compared to 2021 BRCP

Table 9 is a consolidation of the different components of the BRCP in a single table.

Table 9: Comparison of the draft 2022 BRCP and 2021 BRCP capital costs

Component	Draft 2022 BRCP	2021 BRCP	Change from 2021
Expected capacity credits (MW)	151.12	152.28	-1.16
Weighted Average Cost of Capital	5.45%	5.20%	25 basis points
Power station cost ($/MW)	844,150	816,437	27,713
Margin for legal, financing, and other costs	16.21%	16.69%	Down 48 basis points
Transmission Costs ($/MW)	186,877	180,927	5,950
Fixed Fuel Costs ($)	7,283,789	6,915,717	368,072
Land Costs ($)	2,657,853	2,404,251	253,602
Generation O&M cost ($/MW/year)	15,318	13,931	1,387
Switchyard O&M cost ($/MW/year)	576	544	32
Transmission Line O&M cost ($/MW/year)	36	34	2
Asset Insurance Costs ($/MW/year)	6,792	6,477	315
Fixed Network Access and ongoing charges ($/MW/year)	11,590	11,041	549
Total Capital Costs ($)	**191,441,579**	**186,622,114**	**4,819,465**
Annualised capital costs ($/Year)	**19,007,908**	**18,222,883**	**785,025**
Annualised fixed O&M ($/MW/year)	**34,311**	**32,028**	**2,283**
BRCP ($/MW/Year)	**160,100**	**151,700**	**8,400**

Source: ERA analysis of BRCP data

Appendix 4 Annualised capital costs

The formula for calculating the capital costs is:[44]

$$CAPCOST = ((PC \times (1 + M) + TC) \times CC + FFC + LC) \times (1 + WACC)\hat{}0.5$$

Table 10: Comparison of the draft 2022 BRCP and 2021 BRCP capital costs

Component	Draft 2022 BRCP	2021 BRCP	Change from 2021
Power station cost (PC) ($/MW)	844,150	816,437	27,713
Margin for legal, financing, and other costs (M) (%)	16.21	16.69	Down 48 basis points
Transmission Costs (TC) ($/MW)	186,877	180,927	5,950
Expected capacity credits (CC) (MW)	151.12	152.28	-1.16
Fixed Fuel Costs (FFC) ($)	7,283,789	6,915,717	368,072
Land Costs (LC) ($)	2,657,853	2,404,251	253,602
Weighted Average Cost of Capital (WACC)	5.45%	5.20%	25 basis points
Total Capital Costs ($)	**191,441,579**	**186,622,114**	**4,819,465**
Annualised capital costs ($/Year)	**19,007,908**	**18,222,883**	**785,025**

Source: ERA analysis of BRCP data

This appendix covers the other components that contributed to the increase in the power station capital costs detailed in Chapter 4. The following components did not contribute significantly to the increase in power station capital costs and are detailed in this appendix and Table 11.

[44] Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020, clause 2.10.1

Table 11: Other annualised capital cost components against 2021 BRCP values

Component	Draft 2022 BRCP	2021 BRCP	Change from 2021
Margin	16.21%	16.69%	Down 48 basis points -2.9%
Transmission Cost ($/MW)	186,877	180,927	5,950 +3.3%
Fixed Fuel Cost ($)	7,283,789	6,915,717	368,072 +5.3%
Land Cost ($)	2,657,853	2,404,251	253,602 +10.5%

Source: ERA analysis of BRCP data

Margin cost (M)

The 'M' margin includes costs for regulatory approval, financing, contingencies and legal.[45] This margin is added as a fixed percentage of the capital cost of developing the power station and is 16.2 per cent for this draft determination. This is lower than last year's BRCP M margin as the non-escalated capital cost of the power station is lower which lowers the M margin accordingly.

Transmission costs

Western Power estimated the shallow connection costs for the 2022 BRCP at $24.2 million or $186,877 per MW. Shallow connection costs include the construction of a substation, two kilometres of overhead line and the associated easement for that line.[46] The increase of 3.3 per cent is driven by increases in land, substation, and transmission line costs. The substation and transmission line increases reflect the increases in the cost of materials like steel and copper and increases in labour costs for constructing and installing the equipment. The land costs increased in line with the increase in land costs for the 2022 BRCP (discussed below).

Western Power provided an independently audited report to verify the accuracy of their estimates as the underlying data is confidential and cannot be published. Western Power's report is available on the ERA's website accompanying the release of this draft determination.

Fixed fuel costs

Fixed fuel costs are estimated at $7.3 million for the 2022 BRCP, 5.3 per cent higher than for the 2021 BRCP. This increase is due mostly to the recovery of the diesel price which fell significantly in 2020 due to COVID-19.

45 Full details are in Economic Regulation Authority, 2021, *Power station and associated* costs, Report prepared by GHD Advisory, section 6 (online).

46 The ERA provided the land costs to Western Power for their calculation. The land costs are from Economic Regulation Authority, 2021, *Land values for the 2022 Benchmark Reserve Capacity Price*, Report prepared by Landgate (online).

The fixed fuel costs include the development and construction of an onsite liquid fuel storage and supply facility with supporting infrastructure. In addition, 14 hours of fuel is added to the costs as required by the market procedure and includes the cost of delivery and any excise rebate.

Land costs

The land costs provided by Landgate for the six regions assessed under the market procedure increased to $2.7 million for the 2022 BRCP. This was $253,602 higher than the 2021 BRCP land costs, due to increases in land costs in the Pinjar, Kwinana, and Kalgoorlie regions. Landgate's assessment is available on the ERA's website.[47]

The hypothetical land sites were assessed for each region (Collie, Kalgoorlie, Kemerton Industrial Park, Kwinana, North Country, and Pinjar) that would be suitable for the BRCP reference generator. These valuations were made as at 30 June 2021 with the ERA applying the applicable transfer duty. The per hectare cost for the BRCP is averaged over the regions and escalated to 1 April 2024.

[47] Economic Regulation Authority, 2021, *Land values for the 2022 Benchmark Reserve Capacity Price*, Report prepared by Landgate (online).

Appendix 5 Other operating and maintenance costs

This appendix covers the other components that contributed to the increase in the fixed operating and maintenance costs detailed in Chapter 5 and are detailed in Table 12.

Table 12: Comparison of draft 2022 BRCP annualised fixed O&M costs to approved 2021 BRCP values

Component	2022 BRCP draft	2021 BRCP	Change from 2021
Switchyard O&M cost ($/MW/year)	576	544	32 +5.8%
Transmission Line O&M cost ($/MW/year)	36	34	2 +5.7%

Source: ERA analysis of BRCP data

Switchyard operating and maintenance costs

The estimated switchyard O&M cost ($576 per MW per year) did not significantly contribute to the increase in the annualised fixed O&M costs for the draft 2022 BRCP. The increase is based on the change in cost escalation factors, particularly the increase in labour costs (see Table 3).[48]

The switchyard O&M costs are derived from the isolator on the high voltage side of the generator's transformer and does not include any generator transformer or switchgear costs. These costs are based on the annual charge for connection assets and includes estimates of overheads, machine hire and labour for maintenance services. Details are available in GHD's report.[49]

Transmission line operating and maintenance costs

The estimated transmission line O&M cost ($36 per MW per year) did not significantly contribute to the increase in annualised fixed O&M costs for the draft 2022 BRCP. The increase is based on the change in cost escalation factors for both materials and labour (see Table 3).[50]

The transmission line O&M is derived from a transmission line that is assumed to be a single circuit 330 kilovolt construction with two conductors per phase with a 60-year asset life. The line can transport up to 200 megavolt amperes with a power factor of 0.8.

48 Economic Regulation Authority, 2021, *Power station and associated* costs, Report prepared by GHD Advisory, sections 2.4 and 4.3 (online) – discusses how the cost escalation for switchyard O&M is derived and applied.

49 Economic Regulation Authority, 2021, *Power station and associated* costs, Report prepared by GHD Advisory, section 4.4 (online).

50 Economic Regulation Authority, 2021, *Power station and associated* costs, Report prepared by GHD Advisory, sections 2.4 and 4.3 (online) – discusses how the cost escalation for switchyard O&M is derived and applied.

Appendix 6 Weighted average cost of capital

The weighted average cost of capital (WACC) is a calculation of a company's cost of capital in which each component of capital, debt, and equity, is proportionately weighted.

When calculating the BRCP, the WACC is used in:

- Estimating initial financing costs, which are added into the reference power station's capital expenditures. This accounts for project financing costs before the commissioning of the power station and the realisation of revenues from participation in the WEM.
- Converting the power station's capital costs into an annualised cost that can be recovered over the assumed life of the power station. In this annuity approach, the WACC represents a long-term required rate of return over the life of the asset.

Calculation of the WACC in the market procedure

Section 2.9 of the market procedure provides direction on how the WACC for the BRCP is to be calculated.[51]

Specifically, steps 2.9.6 and 2.9.7 detail the high-level framework to be used:

2.9.6 [ERA] shall compute the WACC on the following basis:

(a) The WACC shall use the Capital Asset Pricing Model (CAPM) as the basis for calculating the return to equity.

(b) The WACC shall be computed on a Pre-Tax basis.

(c) The WACC shall use the standard Officer WACC method as the basis of calculation.

2.9.7 The pre-tax Officer WACC shall be calculated using the following formulae:

$$WACC_{\ nominal} = \frac{1}{(1 - t(1 - \gamma))} R_e \frac{E}{V} + R_d \frac{D}{V}$$

Where:

(a) R_e is the nominal return on equity (determined using the Capital Asset Pricing Model) and is calculated as:

$$R_e = R_f + \beta_e \times MRP$$

Where:

R_f is the nominal risk free rate for the Capacity Year;

β_e is the equity beta; and

MRP is the market risk premium.

(b) R_d is the nominal return on debt and is calculated as:

$$R_d = R_f + DM$$

[51] Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020, section 2.9.

Where:

R_f is the nominal risk free rate for the Capacity Year;

DM is the debt margin, which is calculated as the sum of the debt risk premium (DRP) and debt issuance cost (d).

(c) t is the benchmark rate of corporate income taxation, established at either an estimated effective rate or a value of the statutory taxation rate;

(d) γ is the value of franking credits;

(e) $\frac{E}{V}$ is market value of equity as a proportion of the market value of total assets;

(f) $\frac{D}{V}$ is market value of debt as a proportion of the market value of total assets;

(g) The nominal risk free rate, for a Capacity Year is the rate determined for that Capacity Year by [ERA] on a moving average basis from the annualised yield on Commonwealth Government bonds with a maturity of 10 years:

- using the indicative mid rates published by the Reserve Bank of Australia; and
- averaged over a 20-trading day period;

(h) The debt risk premium, DRP, for a Capacity Year is a margin above the risk free rate reflecting the risk in provision of debt finance. This will be estimated by [ERA] as the margin between the observed annualised yields of Australian corporate bonds which have a BBB (or equivalent) credit rating from Standard and Poor's and the nominal risk free rate. [ERA] must determine the methodology to estimate the DRP, which in the opinion of [ERA] is consistent with current accepted Australian regulatory practice.[52]

(i) If there are no Commonwealth Government bonds with a maturity of 10 years on any day in the period referred to in step 2.9.7(g), [ERA] must determine the nominal risk free rate by interpolating on a straight line basis from the two bonds closest to the 10 year term and which also straddle the 10 year expiry date.

(j) If the methods used in step 2.9.7(i) cannot be applied due to suitable bond terms being unavailable, [ERA] may determine the nominal risk free rate by means of an appropriate approximation.

From this year, the market procedure requires the ERA to estimate the WACC. The annual review involves two sets of components listed in steps 2.9.3:

- Annual components, which require review each year and comprise the risk free rate, debt risk premium and corporate tax rate.

[52] Given observed issues with Bloomberg data, the ERA has adopted an alternative 'Bond-Yield Approach' to establishing the DRP and has applied this since its Final Decision on revisions proposed by WA Gas Networks (WAGN) to the access arrangement for the Mid West and South West gas distribution systems in 2011. This methodology was broadly upheld on appeal to the Australian Competition Tribunal in June 2012.

- Structural components, which are fixed in the market procedure and remain constant between the five-yearly reviews of the BRCP by the ERA. As part of the annual review, the ERA may review and determine values for structural components that differ from those specified in the market procedure if it considers that a significant economic event has influenced those components. These structural components include the market risk premium, equity beta, debt issuance costs, franking credit value and gearing ratio.

Step 2.9.8 of the market procedure details the parameters that the CAPM must use as variables each year (see Table 13):

Table 13: CAPM parameters for the BRCP calculation

CAPM Parameter	Notation	Review frequency	Value
The following variables are to be determined			
Nominal risk free rate (%)	R_f	Annual	
Debt risk premium (%)	DRP	Annual	
Corporate tax rate (%)	t	Annual	
The following variables are specified in the market procedure			
Market risk premium (%)	MRP	5-Yearly	5.90
Asset beta	β_a	5-Yearly	0.5
Equity beta	β_e	5-Yearly	0.83
Debt issuance costs (%)	d	5-Yearly	0.100
Franking credit value	γ	5-Yearly	0.50
Debt to total assets ratio (%)	$\frac{D}{V}$	5-Yearly	40
Equity to total assets ratio (%)	$\frac{E}{V}$	5-Yearly	60

Source: ERA analysis of BRCP data

Updated annual WACC

The ERA has reviewed and calculated the annual components listed in the market procedure, including the nominal risk free rate and the debt risk premium.

Nominal risk free rate

The risk free rate is the return an investor would expect when investing in an asset with no risk. This is the rate of return an investor receives from holding an asset with a guaranteed payment stream. Since there is no likelihood of default, the return on risk free assets compensates investors for the time value of money.

The market procedure uses Commonwealth Government bonds as the proxy for risk free assets in Australia for estimating the risk free rate of return. To calculate the risk free rate, the market procedure uses indicative mid rates published by the Reserve Bank of Australia.

Where there are no Commonwealth Government bonds with a maturity of exactly 10 years the ERA interpolates the risk free rate on a straight line basis.

The use of a 10-year term for the risk free rate is to reflect a long-term rate of return for the capital costs of the reference generator. This is consistent with the purposes of the BRCP calculations and aligns the WACC to represent a long-term rate of return for the capital costs over the life of the reference plant.

The BRCP process uses a nominal risk free rate, which includes a component for the market expectations of inflation.

As an indicative figure for the draft determination, the ERA estimates a nominal risk free rate of 1.14 per cent.[53] This is higher than to 0.80 per cent risk free rate calculated in the 2021 BRCP for the 2023-2024 capacity year.[54]

The nominal risk free rate will be updated in the ERA's final determination for the BRCP to account for future changes to financial conditions.

Debt risk premium

The debt risk premium is the return above the risk free rate that lenders require to compensate them for lending funds to a firm. The debt risk premium compensates debt holders for the possibility of default by the issuer.

The debt risk premium is closely aligned with the risk of the business. When issuing debt in the form of bonds, a credit rating can be assigned that reflects the probability of default of the issuer, and therefore the risk present in that entity's bonds. The market procedure requires the use of a BBB (or equivalent) credit rating from Standard and Poor's.[55]

The ERA uses a "revised bond yield approach" to determine the debt risk premium at a point in time by: [56, 57]

- Determining the benchmark sample, which requires identifying a sample of relevant corporate bonds that have a BBB credit rating (or equivalent).[58]
- Converting the bond yields from the benchmark sample into Australian dollar equivalent yields.
- Calculating an average Australian dollar equivalent bond yield for each bond across the averaging period.

53 The nominal 1.14 per cent risk free rate is based on a 20-trading day averaging period up to 31 August 2021.

54 AEMO, 2021, *Final Report: 2021 Benchmark Reserve Capacity Price for the 2023-24 Capacity Year*, p.23.

55 Market Procedure: Benchmark Reserve Capacity Price, 9 November 2020, clause 2.9.7(h).

56 Economic Regulation Authority, *Final Gas Rate of Return Guidelines Explanatory Statement*, December 2018, Chapter 10.

57 Economic Regulation Authority, *Final Determination 2018 and 2019 Weighted Average Cost of Capital for the Freight and Urban Networks and Pilbara Railways*, August 2019, Chapter 7.3.

58 The market procedure details that a benchmark generator for the purposes of BRCP having a credit rating of BBB.

- Estimating yield curves on the bond data by applying various techniques including Gaussian Kernel, Nelson-Siegel and Nelson-Siegel-Svensson techniques.[59]
- Estimating the 10-year cost of debt by averaging the three yield curves of 10-year cost of debt based on the techniques used in the previous step.
- Calculating the debt risk premium by subtracting the 10-year risk free rate (or base rate) from the 10-year cost of debt.

The ERA calculates the latest value of the debt risk premium over the specified averaging period each year for the BRCP.

As an indicative figure for the draft determination, the ERA estimates a debt risk premium of 1.729 per cent.[60] This is lower than the 2.040 per cent debt risk premium calculated in the 2021 BRCP for the 2023-2024 capacity year.[61]

The debt risk premium will be updated in the ERA's final determination for the BRCP to account for changes to debt markets.

Corporate tax rate

The ERA has reviewed the corporate tax rate which has not changed from the 30 per cent rate.

Updated BRCP WACC

This section provides an illustrative rate of return for the BRCP based approach detailed in the market procedure and the 20-trading day averaging period to 31 August 2021 (as a placeholder).

For the 2022 BRCP, the indicative nominal pre-tax rate of return is 5.45 per cent (see Table 14). This is higher than the 5.20 per cent nominal WACC for last year's BRCP calculation.[62]

The rate of return for the BRCP will be updated in the ERA's final determination for the BRCP to account for changes in the WACC's components.

[59] The Gaussian Kernel method recognises that the observed spreads on bonds with residual maturities close to the target tenor (or maturity) contains more relevant information for estimation. The Nelson-Siegel model captures many of the typical observed shapes that the yield curve assumes over time. As an extension of the Nelson-Siegel model, the Nelson-Siegel-Svensson method incorporates additional flexibility to more precisely capture the movement of the yield curve in a more volatile market.

[60] The debt risk premium of 1.729 per cent is based on a 20-trading day averaging period up to 31 August 2021.

[61] AEMO, 2021, *Final Report: 2021 Benchmark Reserve Capacity Price for the 2023-24 Capacity Year*, p.23.

[62] Ibid, p.4.

Table 14: Indicative WACC for the 2022 BRCP

Parameter	2021 value[63]	Indicative 2022 value
Cost of equity parameters		
Nominal risk free rate (%)	0.80	1.14
Equity beta	0.83	0.83
Market risk premium (%)	5.90	5.90
Pre-tax return on equity (%)	6.70	7.10
Cost of debt parameters		
Nominal risk free rate (%)	0.80	1.14
Debt risk premium (%)	2.040	1.729
Debt issuance costs (%)	0.100	0.100
Pre-tax return on debt (%)	2.94	2.97
Other parameters		
Debt proportion (gearing) (%)	40	40
Franking credits (gamma) (%)	50	50
Corporate tax rate (%)	30	30
Weighted Average Cost of Capital		
Nominal pre-tax WACC (%)	**5.20**	**5.45**

Source: ERA analysis of BRCP data

[63] Ibid, p.23.