Agenda

Meeting Title: BRCP WEM Procedure Review Working Group

Meeting Number: 2024_02_06 – Meeting 2

Date & Time: Tuesday, 6 February 2024 2:00PM – 3:00PM (AWST)

Location: Online, via TEAMS

DMS: D272327

Item		Responsibility	Action	Time
1.	Welcome by Chair	Chair	Noting	3 minutes
1.1	Conflicts of interest			
1.2	Competition law obligations			
1.3	Meeting protocol			
1.4	Meeting apologies/attendance			
2.	Minutes of Meeting 2023_12_18	Chair	Approval	5 minutes
3.	Progress update	Secretariat	Discussion	45 minutes
3.1	Battery chemistry	Jason Dignard		
3.2	Weighted average cost of capital	Jimmy Tran		
3.3	Annuity tilt			
4.	Next steps	Chair	Noting	2 minutes
5.	General business	Chair	Noting	5 minutes
Mee	ting close	Chair		

Please note this meeting will be recorded.

Item 1.2: Competition and consumer law obligations

Members of the MAC's BRCP WEM Procedure Review Working Group (**Members**) note their obligations under the *Competition and Consumer Act 2010* (Cth) (**CCA**).

If a Member has a concern regarding the competition law implications of any issue being discussed at any meeting, please bring the matter to the immediate attention of the Working Group's Chair.

Part IV of the CCA (titled "Restrictive Trade Practices") contains several prohibitions (rules) targeting anti-competitive conduct. These include:

- 1. **Cartel conduct:** cartel conduct is an arrangement or understanding between competitors to fix prices; restrict the supply or acquisition of goods or services by parties to the arrangement; allocate customers or territories; and or rig bids.
- 2. Concerted practices: a concerted practice can be conceived of as involving cooperation between competitors which has the purpose, effect or likely effect of substantially lessening competition, in particular, sharing Competitively Sensitive Information with competitors such as future pricing intentions and this end:
 - a. a concerted practice, according to the ACCC, involves a lower threshold between parties than a contract arrangement or understanding; and accordingly; and
 - b. a forum like the MAC is capable being a place where such cooperation could occur.
- Anti-competitive contracts, arrangements understandings: any contract, arrangement or understanding which has the purpose, effect or likely effect of substantially lessening competition.
- 4. **Anti-competitive conduct (market power)**: any conduct by a company with market power which has the purpose, effect or likely effect of substantially lessening competition.
- 5. **Collective boycotts:** where a group of competitors agree not to acquire goods or services from, or not to supply goods or services to, a business with whom the group is negotiating, unless the business accepts the terms and conditions offered by the group.

A contravention of the CCA could result in a significant fine (up to \$500,000 for individuals and more than \$10 million for companies). Cartel conduct may also result in criminal sanctions, including jail terms for individuals.

Sensitive Information means and includes:

- 1. commercially sensitive information belonging to a Member's organisation or business (in this document such bodies are referred to as an **Industry Stakeholder**); and
- information which, if disclosed, would breach an Industry Stakeholder's obligations of confidence to third parties, be against laws or regulations (including competition laws), would waive legal professional privilege, or cause unreasonable prejudice to the Coordinator of Energy, the State of Western Australia or the Economic Regulation Authority.

Guiding Principles – What not to discuss

In any circumstance in which Industry Stakeholders are or are likely to be in competition with one another, a Member must not discuss or exchange with any of the other Members information that is not otherwise in the public domain about commercially sensitive matters, including without limitation the following:

- The rates or prices (including any discounts or rebates) for the goods produced or the services produced by the Industry Stakeholders that are paid by or offered to third parties;
- 2. The confidential details regarding a customer or supplier of an Industry Stakeholder;
- 3. Any strategies employed by an Industry Stakeholder to further any business that is or is likely to be in competition with a business of another Industry Stakeholder, (including, without limitation, any strategy related to an Industry Stakeholder's approach to bilateral contracting or bidding in the energy or ancillary/essential system services markets);
- 4. The prices paid or offered to be paid (including any aspects of a transaction) by an Industry Stakeholder to acquire goods or services from third parties; and
- 5. The confidential particulars of a third-party supplier of goods or services to an Industry Stakeholder, including any circumstances in which an Industry Stakeholder has refused to or would refuse to acquire goods or services from a third party supplier or class of third party supplier.

Compliance procedures for meetings

If any of the matters listed above is raised for discussion, or information is sought to be exchanged in relation to the matter, the relevant Member must object to the matter being discussed.

If, despite the objection, discussion of the relevant matter continues, then the relevant Member should advise the Working Group's Chair and cease participation in the meeting/discussion and the relevant events must be recorded in the minutes for the meeting, including the time at which the relevant Member ceased to participate.

Item 1.3: Meeting protocol

- 1. Attendees are encouraged to keep their video on.
- 2. Please place your microphone on mute, unless you are asking a question or making a comment.
- 3. Please state your name and organisation when you ask a question.
- 4. Please keep questions/comments relevant to the agenda item being discussed.
- 5. If there is not a break in discussion and you would like to say something, you can 'raise your hand' or type your question/comment in the meeting chat.
- 6. Questions and comments can also be emailed to market.monitoring@erawa.com.au after the meeting.
- 7. The meeting will be recorded to assist with drafting minutes. Minutes will be circulated to Members for comment prior to being finalised.

Item 2: Minutes of Meeting 2023_12_18





Minutes

Meeting Title: BRCP WEM Procedure Review Working Group

Meeting Number: 2023_12_18

Date & Time: Monday, 18 December 2023 2:00PM-3:00PM (AWST)

Location: Online, via TEAMS

Attendees: Dr Matt Shahnazari Economic Regulation Authority (Working Group Chair)

Wesley Medrana Synergy

Oscar Carlberg Alinta Energy

Hari Sridhar Transalta Corporation

Tessa Liddelow Shell Energy

Gerry Devereux Australian Energy Market Operator

Vincent Chye AGL/Perth Energy
Dimitri Lorenzo Bluewaters Power

Noel Schubert WA Expert Consumer Panel

Jake Flynn Collgar Renewables
Dora Guzeleva Energy Policy WA

Lipakshi Dhar Economic Regulation Authority
Richard Cheng Economic Regulation Authority
Jesse Barker Economic Regulation Authority
Lachlan Bunyan Economic Regulation Authority

Apologies: Ben Tan Tesla Holdings

DMS: D271855

1. Welcome

The Working Group Chair, Shahnazari, opened the meeting at 2:00pm.

- Working Group Members did not raise any conflicts of interest or competition law issues.
- The Chair noted the attendance as listed above.
- The Chair explained that the Market Advisory Committee established the Working Group to advise the Economic Regulation Authority (ERA) on its review of the Wholesale Electricity Market (WEM) Procedure documenting how to determine the Benchmark Reserve Capacity Price (BRCP).
- The Chair emphasised that the ERA's Governing Body is the ultimate decision maker on the review of the BRCP Procedure. The Working Group has an advisory role.

2. Project scope and timeline

Dhar provided an overview of the BRCP mechanism and why the ERA has commenced a review of the BRCP Procedure following recent changes to the WEM Rules. This included:

- The introduction of Flexible Capacity, which will require the ERA to determine two BRCPs each year (a Peak BRCP and a Flexible BRCP).
- The Coordinator of Energy's determination of the Benchmark Capacity Providers.

Dhar provided a timeline of the ERA's review, with an expected completion date of 1 July 2024.

Schubert queried whether the Coordinator of Energy's determination states if the location of the Benchmark Capacity Providers are based on a greenfield site or existing site. Guzeleva stated that the Benchmark Capacity Provider is assumed to be in an uncongested network location, near either Kwinana or Pinjar, connected via a 330 kV line to the network.

3. Topics for BRCP Procedure review

Dhar provided an overview of topics the ERA may consider in its review of the BRCP Procedure. Dhar noted that the purpose of this meeting was to summarise the topics, and future Working Group meetings will focus on specific topics for discussion and feedback from Members.

3.1 Aim of the BRCP Procedure

Dhar outlined the following aims and objective of the review:

- Ensure that the Coordinator of Energy's determination on the Benchmark Capacity Providers is reflected in the BRCP Procedure.
- The Procedure provides enough guidance to the ERA for undertaking a technical bottom-up cost evaluation to determine the Peak BRCP and Flexible BRCP.
- Support the Reserve Capacity Mechanism to provide appropriate investment signals to attract capacity in the South West Interconnected System (SWIS).
- Provide certainty to industry on how the ERA will determine the Peak BRCP and Flexible BRCP.
- Balance providing certainty to investors and Market Participants whilst be flexible enough to adapt to changing market conditions.

Dhar sought feedback on the level of granularity that Market Participants would expect in the updated BRCP Procedure. Carlberg noted that the level of granularity will depend on the different parts of Procedure and comments will be provided when each part is discussed.

3.2 Implications of Coordinator's determination

Dhar outlined key points from the Coordinator of Energy's determination on the Benchmark Capacity Providers:

• Both Benchmark Capacity Providers (for peak and flexible capacity) are based on a 200MW / 800MWh Lithium-ion battery energy storage system (that is a 200 MW capacity for 4 hours).

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- The location of these Benchmark Capacity Providers is in an uncongested network location, near either Kwinana or Pinjar, connected via 330 kV line to the network.
- Assumes a gross Cost of New Entry (CONE) approach to determining the Flexible BRCP and Peak BRCP.¹

3.3 Method to estimate the cost of the Benchmark Capacity Providers

Dhar explained the BRCP Procedure must provide guidance on determining the BRCPs on a dollar/megawatt (of Capacity Credit) per year basis. This requires the BRCP Procedure to document how the underlying components of the Benchmark Capacity Providers' annualised capital cost and annualised fixed operation and maintenance (O&M) costs are determined.

Dhar outlined the Working Group's scope to consider appropriate methods for estimating these costs for a BESS, whether there are any differences for calculating these costs between Peak and Flexible Benchmark Capacity Providers, and whether the current method of cost escalation is appropriate.

Carlberg and Schubert supported the ERA engaging a consultant that specialises in grid-scale batteries to support this review, given the complexities of BESS technologies.

3.4 Cost recovery period

Dhar explained the process of annualising capital and fixed O&M costs, which requires an estimate of an appropriate cost recovery period to annualise costs over. Dhar sought feedback on an appropriate recovery period.

- Carlberg commented that investors would expend significant capital outlay, given the size of the BESS (200MW / 800MWh), and are likely to seek a cost recovery period of ten years or less. A longer period would likely make the cost of borrowing too expensive and the project less viable.
- Schubert added that a shorter recovery period would result in a larger BRCP, when compared to a longer recovery period, which would flow through to increased consumer costs.

Guzleva queried how the change in the technology of the Benchmark Capacity Provider – from an open cycle gas turbine (OCGT) to a BESS – drives the difference in cost recovery period for the BRCP.

- Carlberg explained that the size of capital outlay for a BESS relative to an OCGT, and the associated borrowing costs for a much larger capital outlay, is a major driver.
- The Chair stated that BESS are not a mature technology and that there is greater uncertainty relative to a more mature technology (such as an OCGT).
 This uncertainty must be considered in developing the costs of the Benchmark Capacity Providers.

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A gross CONE approach assumes little revenue is received from energy market operations, with most of the Benchmark Capacity Provider's revenue coming from RCM capacity payments.

3.5 Discount rate

Cheng provided an overview of the current method in the BRCP Procedure that uses a weighted average cost of capital (WACC) as the discount rate to annualise the fixed O&M cost and capital expenditure components of the BRCP. Cheng sought feedback on the appropriateness of the WACC.

Cheng also explained how advancements in technology may lower the cost of BESS in the future, which can result in lower BRCPs determined in the future. This may affect future BESS investment decisions. Cheng sought feedback on a 'tilted annuity' approach to address this issue.

The Chair noted that using a nominal WACC in the annualisation process inherently assumes that the cost remains constant in real terms. However, given expectations of falling battery costs, a nominal WACC may not adequately compensate investors and thus not provide sufficient investment signals to increase capacity in the SWIS.

Chye suggested the Working Group consider the appropriateness of a fixed price period, given that projects are financed at the point of the project being approved. Chye further explained that one of the challenges with investing in long term assets is the misalignment between the project investment being financed based on a point-in-time expectation of capital expenditure, while the costs are recovered on a year-to-year fluctuating BRCP which is based on market prices that have changed since the BRCP was determined. Chye noted this can lead to drastically different risk profiles, cost of capital and hurdles in approving project finances.

- Schubert asked whether a fixed price period where the BRCP is fixed at a certain price for a certain number of years – would be appropriate to reduce uncertainty for investors. Chye added that a fixed period changes the uncertainty faced by investors.
- The Chair queried how the BRCP can account for uncertainty and if a fixed price period is appropriate, and whether it will be applicable to all investors.

Guzleva reiterated her query regarding the difference between investing in the current OCGT technology and the new BESS technology.

Chye agreed with earlier comments that the capital outlay of a BESS relative to
the current OCGT is a significant factor. Chye noted the existing BRCP
Procedure has a misalignment between typical project financing and bankability
considerations, given the fixed rate period of five years and the risk profiles of
investing in BESS. Chye considered this issue is more pertinent with the change
in technology, given the cost per megawatt for a BESS is significantly higher
while receiving the same capacity credit.

Devereux asked if there is a scenario where the BRCP Procedure includes a specific discount rate for a fixed price period, and a different discount rate for those using a BRCP that can change year to year.

3.6 Transmission costs

Cheng provided an overview of the current process of determining transmission costs in the BRCP Procedure, which relies on Western Power to use actual costs or a prescribed estimation process in lieu of actual costs. Cheng sought feedback on an appropriate method for determining transmission costs.

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- Carlberg stated that Western Power's transmission cost forecasts would be appropriate given their significant experience with transmission in the SWIS.
- Schubert agreed with Mr Carlberg's comments and that actual costs can be appropriate, particularly for greenfield sites.

3.7 Network Access Quantity (NAQ)

Cheng stated that the ERA Secretariat's initial analysis indicates there will be no effect of the NAQ on the expected capacity credits assigned to the Benchmark Capacity Provider, and is therefore unlikely to be required in the BRCP Procedure.

 Guzleva, Carlberg and Devereaux agreed that NAQ would be difficult to apply in determining the BRCP, particularly when the network is unconstrained. It is highly likely that the new entrants would locate their capacity provider in an unconstrained network location.

4. Next steps

There were no additional questions or comments.

4.1 Date of next meeting

The Chair noted the next meeting date will be provided in early 2024. Future meetings will be focused on specific topics for feedback.

5. General business

No general business was discussed.

6. Meeting closed at 3:00PM

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Item 3: Progress update



Item 3. Progress update

Battery chemistry, WACC and annuity tilting (accelerated depreciation) – For discussion

Jason Dignard Jimmy Tran Principal Regulatory Advisor ERA Principal Analyst ERA

Executive Summary

Purpose: provide information on major capital matters being considered as part of the BRCP review, along with indicative working positions for comment and consultation.

BRCP consists of multiple "building blocks" that form the revenue requirement to compensate a proponent for providing capacity services.

- Capital charges are one of those building blocks, being the return of (depreciation) and return on (rate of return) capital.
- The capital charge methodology requires some review for the move to a BESS, along with how it will be updated annually

Matters being considered:

- What are the costs of the reference technology (what is the choice of BESS chemistry)?
- What is the rate of return required for a BESS investment?
- What is the profile of cashflows for capital charges that provides investment incentives?



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1) Capital costs – Reference technology – BESS chemistry

Capital costs represent a major component of the BRCP. BESS systems are relatively more capital-intensive investments and differentiated than the previous reference technology.

BESS technology and capital costs have been rapidly changing:

- BESS chemistries have been evolving rapidly, which impacts their capital cost and capabilities.
- While the lithium BESS technology has been set, there are many sub chemistries.
- Traditional nickel-based lithium chemistries have been common in the past, while LFP chemistries have been increasingly successful (through its lower cost and operating characteristics).

Considerations

- The BRCP is a single administered price. To arrive at a point estimate, the ERA could:
 - Estimate one current prominent chemistry type. Should the lowest cost chemistry be chosen?
 - Estimate multiple technology types and take some approach to consolidate multiple numbers into a single price.



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2) The rate of return

To undertake an investment, investors must be confident they can recover equity and debt funding costs.

The rate of return provides for funding costs required by investors to provide investment capital for the project. This compensates investors for the risk of committing funds.

 Usually done on the basis of calculating debt and equity costs on a benchmark basis and weighting those costs to form a weighted average cost of capital (WACC)

Considerations

- Continuation of the previous form of the rate of return?
- Are the rate of return parameters still appropriate for the risk associated with a BESS?
- How should it be applied throughout time (annual updates or fixed)?



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2a) The rate of return – Form

Indicative working position:

Continue with the form of the rate of return used from past BRCP.

Currently the BRCP is provided on a nominal pre-tax WACC basis

Australian regulators generally calculate the rate of return via WACC, the weighted average of debt and equity costs. For the BRCP:

- A nominal basis is used as investors require compensation for the effect of inflation.
- The pre-tax basis is used as there are many different corporate structures that can impact the actual tax paid by generator.
- Return on equity (R_F) and debt (R_D) defined as below.

WACC_{Pre Tax Nominal} =
$$\underbrace{\frac{D}{V} \times R_D}_{\text{Return on debt component}} + \underbrace{\frac{E}{V} \times \frac{R_E}{1 - t(1 - \gamma)}}_{\text{Return on equity component}}$$

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 $R_E = r_f + \beta \times (R_M - R_f)$

 $R_D = r_f + \text{Debt Risk Premium} + \text{Issuance Costs}$

2b) The rate of return – Parameters

Indicative working position:

Parameters to remain the same as current BRCP.

WACC Parameter	Notation	Current Update Frequency	2024 BRCP Value	Comment
Return on Equity		·		
Nominal risk-free rate	r _f	Annual	4.69%	Long run return on a risk free asset as proxied by 10 year Govt Bonds
Market Risk Premium	MRP	5-Yearly	5.9%	Long run expected risk premium of the market portfolio as calculated by the ERA
Equity beta	βе	5-Yearly	0.83	Expected covariance of equity returns relative to the market, the compensated risk factor of the CAPM as derived from the asset beta and gearing
Equity to total assets	E/V	5-Yearly	60.0%	Expected capital structure of the project, measuring the amount of equity invested relative to debt
Return on Debt				
Nominal risk-free rate	R_{f}	Annual	4.69%	Long run return on a risk free asset as proxied by 10 year Govt Bonds
Debt risk premium	DRP	Annual	2.15%	Risk premium for debt investors to lend funds for a given credit risk
Issuance costs	d	5-Yearly	0.1%	Expected transaction costs involved in issuing debt
Creditrating		5-Yearly	BBB	Expected credit rating for the project from a ratings agency (eg S&P, Moodys)
Debt to total assets	D/V	5-Yearly	40.0%	Expected capital structure of the project, measuring the amount of debt invested relative to equity
Other parameters				
Corporate tax rate	t	Annual	30.0%	Corporate tax rate as per the ATO
Gamma	γ	5-Yearly	0.5	Expected taxation adjustment due to dividend imputation



WACC_{Pre Tax Nominal} =
$$\underbrace{\frac{D}{V} \times R_D}_{\text{Return on debt component}} + \underbrace{\frac{E}{V} \times \frac{R_E}{1 - t(1 - \gamma)}}_{\text{Return on equity component}}$$

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2c) The rate of return – BESS parameters

Indicative working position:

Update WACC parameters for BESS risk.

What are the new WACC parameter values for a BESS project?

- Are the risks of the construction, operation and revenues of a BESS different from that of a traditional peaking gas generator (the prior reference technology)?
- Does the fact that a BESS is a relatively new technology elevate its risk?
- What are the appropriate WACC parameters for a BESS?

Considerations

- Based on the risk of a BESS, what is an appropriate value for:
 - The credit rating
 - Equity premium (equity beta x market risk premium)
 - Gearing

(currently BBB)

(currently $0.83 \times 5.9\% = 4.9\%$)

(currently 40% debt)

2d) The rate of return – Parameter updates

Indicative working position:

Annual updates to remain the same as current BRCP.

WACC Parameter	Notation	Current Review Frequency	2024 BRCP Value			
Return on Equity						
Nominal risk-free rate	Rf	Annual	4.69%			
Market Risk Premium	MRP	5-Yearly	5.9%			
Equity beta	etae	5-Yearly	0.83			
Equity to total assets	Ε/V	5-Yearly	60.0%			
Return on Debt						
Nominal risk-free rate	Rf	Annual	4.69%			
Debt risk premium	DRP	Annual	2.15%			
Issuance costs	d	5-Yearly	0.1%			
Creditrating		5-Yearly	BBB			
Debt to total assets	D/V	5-Yearly	40.0%			
Other parameters						
Corporate tax rate	t	Annual	30.0%			
Gamma	γ	5-Yearly	0.5			

BRCP procedure currently conducts annual updates on some parameters, while others are fixed until the next review

WEM rules now require ERA to not fix any values that are expected to change year on year.

The risk free rate and debt risk premium move more directly with market conditions and are updated annually. The other parameters are more stable.

Considerations

- Which parameters should be fixed?
 - Trade-off between stability and predictability with market reflective information



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3) Cashflow profiles

Investors expect to receive the return of (depreciation) and return on (rate of return) capital invested in a project over its life.

Capital costs can be recovered under the following methods:

- 1. Straight-line annuity (equally amounts for every project year) Consistent with current BRCP approach.
- Accelerated (brought forward, positive tilt).
- Deferred (pushed back, negative tilt).

Capital recovery can be set such that each method will have the same present value, but with different recovery profiles.

Methods can be chosen based on project specific characteristics.

Considerations

Which method is appropriate to incentivise BESS investment?



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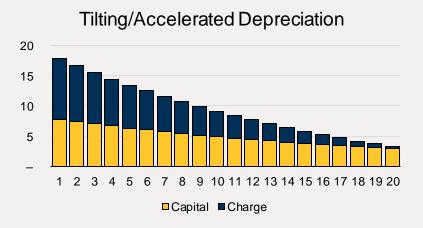
3) Cashflow profiles – Examples

Different methods result in different profiles which are illustrated below:

Note: Annuity parameters are chosen for illustrative purposes and are still to be determined for the BESS BRCP

- The Straight-Line Annuity is consistent with the current BRCP approach and is the simplest.
- A Tilted Annuity allows the flexibility of bringing forward cashflows, and has been used in environments of technology innovation.

Straight-Line Annuity 20 15 10 5 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 © Capital © Charge





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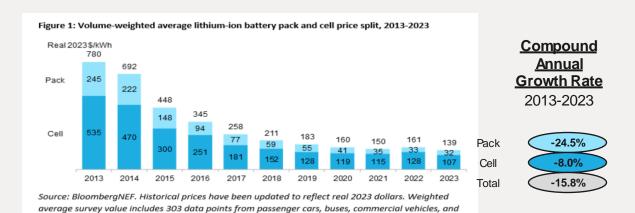
3) Cashflow profiles – BESS capital cost trends

Unlike the traditional reference technology, the capital cost of batteries have been falling significantly:

There has been large historic reductions in battery prices.

stationary storage.

- Further reductions are likely from the move to LFP chemistries, reduced commodity prices and increasing production scale.
- The downward trend is expected to continue, but may be volatile and uneven.



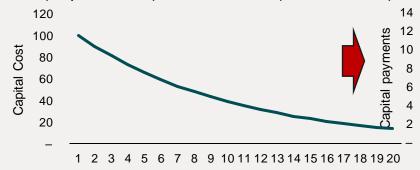


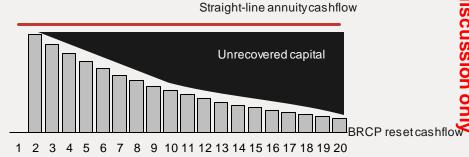
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3) Cashflow profiles – Effect of capital cost trends

The move to a BESS reference technology creates a new problem of cashflow recovery under the current straight line annuity approach as annual resets distort intertemporal cashflow profiles.

 As illustrated below, using a straight-line annuity approach that is updated annually to reflect current (expected lower) costs means that investors do not recover their required return of (depreciation) and return on (rate of return) over the life of the project.



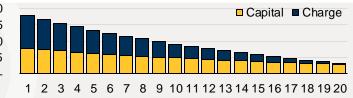


Considerations

 Does the cashflow profiles of capital cost need to be brought forward to recognise the risk of future cost reductions in BESS?



3) Cashflow profiles – The tilted annuity



Under expected declining capital costs due to technology, a tilted annuity could be used until costs stabilise, whereupon a straight-line method can be adopted again.

Pros

- Brings forward capital recovery to account for expected future technological changes.
- Encourages investments in capacity by improving the opportunity to recover capital costs.

Cons

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- Dependent on expectation of capital cost reduction being realised.
- Potential bias if a higher first year annuity amount is continually used to roll forward without ever exposing proponents to later lower annuity amounts.

Considerations

- Are investor incentives to invest in BESS reduced under a straight-line annuity? Does a tilted annuity make sense?
- Does the tilt factor need to be updated annual (due to difficulty of forecasting future capital costs)?



Summary of matters under consideration

To calculate the capital cost component of the BRCP, ERA needs to calculate an annualised cost via an annuity.

The ERA's considerations relates to best determining the components of an annuity that can be implemented.

What are the costs of the reference technology?

- The BRCP is a single administered price. To arrive at a point estimate, the ERA could:
 - Estimate one current prominent chemistry type. Should the cheapest chemistry be chosen?
 - Estimate multiple technology types and take some approach to consolidate multiple numbers into a single price.

What is the rate of return required for a BESS BRCP

- Indicative working position is:
 - To continue with the current BRCP form of the rate of return.
 - To update the rate of return parameters to be appropriate for the risk associated with a BESS.
 - To update annually the same parameter as the current BRCP.

What is the profile of cashflows for capital charges

- Which annuity method appropriately provides incentives?
- Does the cashflow profiles of capital costs need to be brought forward to recognise the risk of future capital cost reductions in BESS?
- Does a tilted annuity make sense?
- Should the tilt factor be updated annually?



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thank you

Ask any questions



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