Review of the Tasmanian Wholesale Electricity Market Regulatory Pricing Framework

**FINAL INTERIM REPORT**

Report to
Tasmanian Government, Department of Treasury and Finance

from
Energy Market Consulting associates

March 2018
This report has been prepared to assist the Tasmanian Government, Department of Treasury and Finance, in its Review of the Tasmanian Wholesale Electricity Market Regulatory Pricing Framework.

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About EMCa

Energy Market Consulting associates (EMCa) is a niche firm, established in 2002 and specialising in the policy, strategy, implementation and operation of energy markets and related network management, access and regulatory arrangements. EMCa combines senior energy economic and regulatory management consulting experience with the experience of senior managers with engineering/technical backgrounds in the electricity and gas sectors.

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1 Introduction

1.1 Introduction

In October 2017, the Tasmanian Government initiated a review of the Tasmanian Wholesale Electricity Market Regulatory Pricing Framework, the primary element of which is the Wholesale Contract Regulatory Instrument (WCRI), to address concerns that the current framework is transferring mainland wholesale electricity price growth and volatility, caused by mainland-only events, to Tasmanian electricity customers.

We have been engaged to assist the Tasmanian Department of Treasury and Finance undertake this review.

Since this review was undertaken, there has been a Tasmanian State election, which returned the Tasmanian Liberals, but with a new energy policy. This paper has evaluated the performance of Tasmania’s wholesale pricing arrangements against the Government’s previous energy policies. The findings and learnings from the analysis for this paper will be adapted to the Government’s new energy policies in stage 2 of this review.

1.2 Scope

The Terms of Reference for the Review states that key Government expectations for the Review are to:

- analyse whether the WCRI is operating as intended according to its original design;
- determine whether the WCRI is producing sub-optimal outcomes or unintended negative consequences;
- investigate the potential to reduce the impact of mainland wholesale price volatility on the WCRI;
- investigate alternative wholesale pricing mechanisms which may meet the Government’s objectives;
• provide options to Government regarding potential improvements to the Tasmanian wholesale electricity market;
• in conducting the Review, retain the confidence of market participants in the stability of the Tasmanian electricity market and any changes to market settings; and
• to assist the government in the preparation and release of a consultation paper in relation to key issues.

For this Interim Report, the project scope did not include consideration of:
• changes to Tasmanian industry structure or ownership; or
• changes to the NEM Rules that would alter economic dispatch and pricing in the Tasmanian Region.

1.3 Approach

We have followed the approach illustrated in the figure below in undertaking our assessment of the WCRI.

Figure 1: Review approach

Each of these steps is discussed below.

Desktop Research

We reviewed relevant reports and analysis identified through desktop analysis, and those flagged by Treasury, Office of the Tasmanian Economic Regulator, and stakeholders.

Analysis, performance evaluation, stakeholder consultation

Analysis

We undertook analysis of spot and contract price data as described in Section 3.
Performance Evaluation

We then assessed the performance of the WCRI against the original Regulatory Pricing Framework Design Principles as required by the Terms of Reference. We also assessed the WCRI against the broader Tasmanian Government Vision for energy policy, which includes objectives relating to customers.

The **Tasmanian Government Vision**, as outlined in the Tasmanian Energy Strategy, is to restore energy as a competitive advantage for Tasmania by:

- delivering affordable energy at competitive and predictable prices that are amongst the lowest in Australia;
- empowering consumer choice;
- ensuring an efficient energy sector that is customer focussed;
- utilising energy to facilitate State growth; and
- maximising Tasmania’s renewable energy opportunities.

The WCRI was developed in accordance with the following design principles:

- market participants should have confidence that they can manage their wholesale risks appropriately in Tasmania;
- the risks of operation in the Tasmanian market should be no greater than those in other jurisdictions in the NEM;
- market participants should have flexibility to manage wholesale market risk using similar business models to those used in other NEM jurisdictions;
- the framework should not unduly constrain Tasmania’s ability to maximise carbon value accessed through Basslink; and
- the reform option should recognise the interaction between spot and contract markets without creating unintended incentives or consequences.

Stakeholder Consultation

We met with the following key stakeholders:

- Tasmanian Department of Treasury and Finance
- Office of the Tasmanian Economic Regulator
- Aurora Energy
- Tasmanian Department of State Growth
- Hydro Tasmania
- ERM Business Energy
We considered written submissions, which were provided by the following stakeholders:

- Climate Capital
- Aurora Energy
- Hydro Tasmania
- Australian Energy Council (AEC)

Findings

In this interim report we make findings from our assessment of the performance of the WCRI to date and also highlight areas for further investigation where we consider there could be scope to make improvements to the WCRI consistent with the Tasmanian Government’s new energy policy. Our findings are based on the analysis, performance evaluation and stakeholder consultation described above.

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1 “Climate Capital is a developer and advisor specialising in renewable energy generation development and investment”

2 “AEC is an industry body representing 21 electricity and downstream natural gas businesses operating in the competitive wholesale and retail energy markets.”
2 Context

2.1 Overview of the Tasmanian Electricity Supply Industry

Tasmania joined the National Electricity Market (NEM) in 2005 and was electrically connected to the mainland electricity grid in 2006 by the undersea interconnector Basslink.

Participation in the NEM, combined with interconnection to the mainland electricity grid has delivered the following benefits to Tasmania:

Reliability and Security - Basslink behaves like a highly flexible generator that can supply 500MW on a continuous basis to Tasmania to help manage reliability and security events in Tasmania.

Economic Benefits - Tasmania is able to import electricity from the mainland when the price is low (typically overnight), and export electricity when the mainland price is high (typically during the afternoon/evening peak).

Government-owned Hydro Tasmania is the dominant generator in Tasmania supplying most of the generation to satisfy Tasmania's peak demand. Hydro Tasmania operates 2,281MW of hydro generation, the 386MW Tamar Valley gas fired generator, flows across Basslink, and is a joint partner in 308MW of wind generation. There are also a small number of privately-owned wind farms operating and under development.

Government-owned Aurora Energy is the dominant retailer in Tasmania. Retail competition was first introduced for very large customers in 2006, and progressively introduced for more customers over the following years, with full retail competition (including small customers) introduced from 1 January 2014. ERM Business Energy is the only new retailer to enter the Tasmanian market and capture a material market share from Aurora Energy. ERM Business Energy does not participate in the residential market. The Tasmanian Government sets a regulated retail price for all
small customers that do not accept a market contract (including for all residential customers).

2.2 Interventions to protect Tasmanian customers from high wholesale electricity prices.

In 2010, the Tasmanian Government established an Expert Panel to undertake a comprehensive review of the Tasmanian Electricity Supply Industry, to evaluate whether NEM entry has delivered the expected benefits to Tasmanian customers arising from increased competition and choice. The Panel found that, amongst other things, Hydro Tasmania’s monopoly position in the Tasmanian market may be viewed as a risk to potential new entrant retailers and it made a number of recommendations to address this potential impediment to retail competition.

One of the Tasmanian Government’s responses to the Expert Panel which is of particular relevance to this review is the introduction of Wholesale market regulation. This and a number of other market interventions that have occurred in recent time in response to specific events, are outlined below.

WCRI

One of the Tasmanian Government’s responses to the Expert Panel review was the introduction of the WCRI to give retailers confidence that they are able to manage wholesale market risk at competitive prices. The WCRI provides Tasmanian retailers access to regulated contracts at prices linked to exchange-traded Victorian forward electricity contract prices. Victorian prices were chosen on the basis that effective competition was delivering efficient prices in Victoria, and also given Victorian spot prices are closely related to Tasmanian spot prices due to the strength of Basslink. The WCRI was designed to supplement the existing wholesale electricity contract market whilst not distorting this or the spot market.

Basslink Outage Rebates

In late 2015, the Tasmanian spot price rose well above its long-term average in response to low Tasmanian rainfall and hence low inflows into Hydro Tasmania’s dams, and also an outage of Basslink that lasted about 6 months. During this period, Hydro Tasmania operated the higher cost Tamar Valley gas fired power station, diesel generators, and released higher value water through its turbines. These factors all contributed to the higher Tasmanian spot prices, despite demand-side measures also being implemented.

During the Basslink outage, regulated contracts under the WCRI provided some protection to customers as these were priced closer to the lower Victorian prices. However, given limited volumes of WCRI contracts, retailers still had to purchase unregulated contracts which from the first quarter of 2016 increased in price significantly due to the elevated spot price. These higher prices were in response to higher generation costs and were a scarcity signal to the market.

Those customers that were required to recontract from the first quarter 2016 were faced with much higher prices than those that contracted on either side of the pricing
event. To protect these particular customers from higher electricity prices, the Tasmanian Government implemented a rebate scheme designed to offset the higher prices, so these customers would pay roughly the price that would likely have applied if Basslink had remained in service.

**Hydro Tasmania Price Discounting**

In 2017, mainland spot prices increased significantly due to the closure of large thermal generators, natural weather events, and elevated gas prices. The Victorian forward contract prices for 2017/18 also increased reflecting the expectation that the spot price in Victoria would remain high throughout 2017/18. The Victorian forward contract prices for 2018/19 are lower reflecting an expectation that spot prices will reduce as new generation comes online.

As Tasmania is connected to the NEM mainland, the spot price in Tasmania increased in line with Victoria.

Whilst Hydro Tasmania’s revenue increased due to higher spot and contract prices, its local generation costs did not substantially change. As such the mainland-only scarcity conditions are likely to have delivered Hydro Tasmania higher profits.

In response to these market conditions, Hydro Tasmania chose to discount its wholesale contract prices in the long-term interests of its customers. This was implemented from 2 May 2017 by adopting the lower 2018/19 Victorian forward contract prices for 2017/18 through its weekly rate card, and later through the WCRI regulated contracts.

**Wholesale Electricity Price Order**

The Tasmanian Government also acted to protect Tasmanian customers from the impact of high mainland wholesale prices through its Wholesale Electricity Price (WEP) Order. This Order applies to regulated retail tariffs and was designed to cap the increase in these tariffs to 2%.

The Order provides a mechanism for the Office of the Tasmanian Economic Regulator to use a wholesale price determined by the Treasurer for setting regulated retail tariffs, in place of the defined practice of using the load following swap price calculated through the WCRI. The Treasurer made a WEP order on 14 June 2017 setting the wholesale price at $83.79/MWh for the 2017/18 regulated retail tariff determination.

Aurora Energy contracts with Hydro Tasmania for its regulated customer load at the WEP order price.

**Community Service Obligation for unregulated small customers**

The WEP Order only applies to customers on regulated retail tariffs. As such, the wholesale price used for pricing competitive small customer contracts would be higher than that for the regulated contracts. This would have incentivised small customers on competitive contracts (only business customers at present) to transition back to a regulated contract. This would have advantaged Aurora Energy, and stymied competition in the small customer market. To address this market distortion, the Government issued a direction in the form of a community service
obligation (CSO) requiring Hydro Tasmania to offer contracts to retailers at the WEP Order price for their Tasmanian load of small customers on market contracts.

Energy Rebates

The WEP Order and CSO apply to small customers only. The Hydro Tasmania price discount reduced the wholesale energy price to a level that was nevertheless still above that for the WEP Order, and many customers contracted their electricity at elevated prices in the months prior to Hydro Tasmania’s discounted contracts. This meant many large customers experienced significant prices increases, whilst others (including small customers) did not.

To address this, the Tasmanian Government introduced Energy Rebates covering the period 1 January 2017 to 30 June 2018. The size of the rebate varied depending upon when the customer recontracted, with the design objective of reducing the wholesale price applying to each customers retail contract to $85/MWh (a cap also applied to the size of the rebate such that not all customers necessarily received an effective wholesale price of $85/MWh).

2.3 Related NEM Policy Initiatives

A number of NEM policy initiatives are relevant to the current review, as follows.

National Energy Guarantee

The Energy Security Board’s (ESB) National Energy Guarantee (NEG) requires retailers to meet two targets including ‘a reliability guarantee’ and ‘an emissions guarantee’. The ESB released a consultation paper on 15 February 2018 seeking feedback on ‘the best way for retailers to contract with, or directly invest in, generation, storage or demand response so:

- There is a minimum amount of dispatchable energy available to meet consumers’ needs and keep the system reliable, and
- The average emission levels of electricity they sell to consumers actually helps to meet emission reduction commitments set by the Australian Government.’

Given that Tasmania’s generation fleet is predominantly zero emission and dispatchable, it will be important for changes to wholesale pricing arrangements in Tasmania to be developed consistent with the rules for the NEG to ensure the value of Tasmanian generation is maximised.

The ESB is due to present a high-level design paper to the COAG Energy Council in late April and following further stakeholder consultation provide a final detailed design to the COAG Energy Council for decision in mid-2018.

Basslink Export Limit

Basslink Pty Ltd (BPL) has voluntarily reduced the export limit of Basslink from 630MW to 500MW (continuous rating of the cable) in response to findings from an investigation into the December 2015 failure of the interconnector. The

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investigation, conducted by DNV GL for Hydro Tasmania, found that on occasions the cable had been operated in a manner that exceeded its design limits resulting in degradation of the cable.

DNV GL noted operational changes and equipment upgrades that could enable the Basslink export limit to be increased above the interim limit of 500MW.

We note the owner of BPL’s interest in selling the Basslink interconnector and would expect either BPL or a new owner to implement measures to enable the export limit to be increased to allow greater exports to the mainland.

Battery of the Nation

Hydro Tasmania’s Battery of the Nation initiative is at the feasibility stage and involves studies into augmenting Hydro Tasmania’s hydro system including pumped hydro energy storage and developing additional wind farm capacity. This, combined with a TasNetworks study into building a second interconnector, has the potential to increase Tasmania’s capability to export clean and dispatchable electricity to the mainland.

AEMO reviews and initiatives

AEMO is undertaking a range of initiatives, both supply and demand side, to strengthen the security and reliability of the NEM. These initiatives may put downward pressure on Victorian spot prices in the mid-term. This is reflected in lower Victorian forward contract prices for 2018/19.
3 Assessment of the effectiveness of the WCRI

The Terms of Reference for this review requires us to:

- analyse whether the WCRI is operating as intended according to its original design; and
- determine whether the WCRI is producing any sub-optimal outcomes;

In undertaking this assessment, we have analysed trends in spot and contract prices, taken into account feedback from stakeholders, and undertaken our own independent assessment against the evaluation criteria.

3.1 Spot and Contract Price Trends

All energy traded through the NEM is settled through the spot market. Generators make offers to supply and are dispatched to meet demand at rolling five-minute dispatch intervals. Financial settlements (and the spot price) are based on a 30-minute trading interval. Variability of demand and supply conditions can result in significant fluctuations of the spot price.

The contract market provides a forward projection of spot market price and the means to lock in and manage the risk associated with the inherent volatility of spot market prices. The prices and volatility of the spot market in the present, and forecasts of market conditions, and future demand and supply scenarios feed into forward projections of contract prices and the price offered by generators. This price offered may include a risk premium for the uncertainty of those projections and reflect the scarcity of contracts available to meet demand.
**Spot Price**

As Tasmania is connected to the Victorian region of the NEM via Basslink, Tasmanian spot prices are related to Victorian spot prices most of the time, with differences reflecting the cost of transport between the regions and the average direction of flow (i.e. whether Tasmania is on average a net energy exporter or importer with respect to Victoria). Only where transmission constraints apply do spot prices between the two regions diverge significantly. As the dominant generator in Tasmania, Hydro Tasmania’s bid strategy will influence directional flow of energy between Tasmania and Victoria and the constrained spot price in Tasmania when transmission constraints apply. That strategy will be shaped by Hydro Tasmania’s management of water reserves to meet energy demand throughout the year and the relative high and low Tasmanian prices optimise the value of that energy exchange between the regions.

The figure below illustrates this relationship over most of the past four years. Prices separated in late 2015 as low rainfall required Hydro Tasmania to use higher value water and thermal generators, and subsequently the Basslink outage occurred. The Tasmanian pool price followed the Victorian pool price higher in 2017 due to the mainland scarcity events. We note the average Tasmanian price was higher than the Victorian price in early 2017 because Tasmania was predominantly importing during this period. Both Tasmanian and Victorian spot prices have been in decline in the second half of 2017 as the market responds to address mainland scarcity.

![Figure 2: Monthly chart of average Tasmanian and Victorian spot prices](image)

The close relationship between the Tasmanian and Victorian spot prices as demonstrated above, was an important consideration for selecting Victorian forward contract prices as a key input for the WCRI, as is discussed further later in this report.

**Basslink Analysis**

The figure below illustrates average monthly flows across the Basslink interconnector and corresponding Tasmanian/Victorian price variance. The figure shows the cyclical nature of the interconnector flows, consistent with annual inflows into Hydro Tasmania’s storages.
The figure below, shows average annual Tasmanian/Victorian price variance and average annual Basslink flow on a 30-minute Trading Interval basis. This shows that on average Tasmania imports overnight when mainland prices are low, and exports (or imports less) during the day when mainland prices are higher. This will vary throughout the year and reflect the management of storage reserves and the Victorian spot price (i.e. if water storage is very high Tasmania might export for all Trading Intervals, whereas if water storage is very low Tasmania might import for all Trading Intervals).

The 2017 average daily profile for interconnector flow is similar to other years, however the overall curve shifts up and down depending on water availability.

**Contract Prices**

The three foundation contracts used by the WCRI to value all Tasmanian wholesale contracts are the Victorian ASX Baseload Swap, Peak Swap and Baseload Cap for the four quarters in a year.

Contracts may be purchased up to 3 years before the period of energy use. The price offered for that contract will reflect any variation in spot prices in the present and the outlook for spot prices in the period of energy use to which the contract applies. Therefore, the price of a contract purchased at one time may be materially different to the price offered at another later time.

The contracting strategy of a retailer or wholesale customer will consider the timing of contract purchases to cover part or all its energy needs. The timing of purchase is an important part of this strategy to firstly ensure the timely coverage of forecast customer demand, to optimise the price of contracted supply and to manage the volume risk of new customers and an existing portfolio customer demand. Different combinations of contracts will provide alternative and optimal coverage of energy supply. Each combination will address specific volume, price and time of use exposure risk.
The release of contracts will not permit coverage of the whole portfolio of customer energy needs committed to a retailer in a single week or month. The portfolio of contracts to cover demand will be built over the three-year window these contracts are offered. Nevertheless, the timing of contracted energy purchased by a retailer (building coverage of its portfolio earlier or deferring to later) will impact the overall price to its customer portfolio, the price received by the retailer and offered to a new unregulated customer and the demand for contracts under the WCRI pricing regime. Below we use Q2 2017 contract pricing to provide an overview of contract prices produced by the WCRI from 2015 to 2017.

The WCRI mechanism and the pricing for other quarters is examined in more detail in Section 3.2.

Baseload Swap

The following figure compares the price for WCRI Baseload Swap, Hydro Tasmania Rate Card Baseload Swap and Victorian Reference Baseload Swap for Q2 2017.

The WCRI price is flat throughout most of the period and the Rate Card price closely follows the WCRI price, except for the final five months. In November 2016 to March 2017 the prices for these contracts climb steeply. The Tasmanian Rate Card and WCRI prices for Q2 2017 were generally at a premium of around $15/MWh to the Victorian reference baseload swap price. By March 2017 this premium had increased to around $22/MWh.

Figure 5: Q2 2017 WCRI, Rate Card and Victorian Reference Baseload Swap Price

Peak Swap

The following figure compares the price for WCRI Peak Swap and Victorian Reference Peak Swap for Q2 2017.

A similar pattern to the Q2 2017 Baseload Swap. The WCRI price is flat throughout most of the period, except for the final five months where the prices for both contracts climb steeply. Hydro Tasmania Rate Card Peak Swap data was not available in a format comparable to the WCRI quarterly pricing. The WCRI prices

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4 The peak swap data provided included weekly prices on a financial year and calendar year basis.
for Q2 2017 were generally at a premium of around $25/MWh to the Victorian Reference Peak price.

Figure 6: Q2 2017 WCRI, Rate Card and Victorian Reference Peak Swap Price

![Chart showing Q2 and Q4 prices for WCRI, Rate Card, and Victorian Reference Peak Swap](chart-image)

**Baseload Cap**

The Baseload Cap is a significant component of Baseload and Peak Swap valuation. The WCRI Baseload Cap price is based on a calculated new entrant Peaker Capacity Value. This value is adjusted each quarter by a capacity risk factor scaling mechanism.

The capacity risk is a function of the 3-year highest quarterly load less the 12-year average non-major hydro storage levels calculated for each quarter. As Victorian prices rise the capacity risk factor is used to scale the calculated new entrant Peaker Capacity Value and allocate its value across the four quarters in a year.\(^5\)

The WCRI calculates the highest capacity risk to be in Q2 (April to June quarter) and the lowest capacity risk in Q4 (October to December quarter). This designs into the WCRI a different capacity risk, and hence price profile, compared to Victorian Reference Baseload Cap Prices in each of the four quarters. A premium or discount to Tasmanian Baseload Cap prices would contribute to a premium or discount on Tasmanian Baseload and Peak Swap valuations. The figures below compare prices for the WCRI Baseload Cap, Hydro Tasmania Rate Card Baseload Cap, and Victorian Reference Baseload Cap, for Q2 2017 (which has the highest new entrant Peaker Value scaling) and Q4 2017 (which has the lowest new Entrant Peaker Value scaling).

In Q2 2017, the WCRI price is flat throughout most of the period and the Rate Card price closely follows the WCRI price. In the final five months the prices for both contracts climb steeply. The Tasmanian WCRI and Rate Card prices for Q2 2017 are at a premium of around $11/MWh to the Victorian reference Baseload Cap price.

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\(^5\) After scaling, the weighted average of the four quarters remains equal to the calculated new entrant Peaker Capacity Value. Consequently, the Tasmanian Baseload Cap value for a quarter and the weighted average total value for the year can significantly deviate from Victorian prices. This variance to Victorian Prices is more significant in high Victorian Price periods (large scaling) than in low Victorian Price periods (low scaling). This is examined in more detail in Section 3.2.
A very different picture emerges for Q4 2017 WCRI Baseload Cap, as shown below. The adjustments to the new entrant Peaker Capacity Value, which set the WCRI Baseload Cap price in each quarter, are initially at a premium to the Victorian Reference Cap price. As the Victorian Reference Baseload Cap price rises, the WCRI Baseload Cap price is being adjusted down. The premium is eroded and becomes a discount to the Victorian Reference Cap price.

The calculated new entrant Peaker Capacity Value and the risk factor scaling adjustments to this value in different quarters are key drivers in WCRI pricing of contracts. The cause and impact on the pricing of contracts is examined more closely in Section 3.2.

**Baseload Capped Swap (calculated)**

The Baseload Swap is equal to the Baseload Capped Swap plus the Baseload Cap. The Baseload Capped Swap is the “energy” component of a swap. It is the value of
the swap applying to all spot prices below $300/MWh\(^6\). The Baseload Cap is the “capacity” value of the swap. It is the value of the swap applying to all spot prices above $300/MWh\(^7\). The Baseload Capped Swap is calculated by netting the price of the Baseload Swap and the Baseload Cap.

The following figure compares the price for WCRI Capped Swap, Hydro Tasmania Rate Card Capped Swap and Victorian Reference Capped Swap for Q2 2017. It compares the “energy” component of the swap in isolation from the Baseload Cap premiums observed in the previous Baseload and Peak Swap analysis.

For Q2 2017, as shown in the figure below, the WCRI price is flat throughout most of the period and the Rate Card price closely follows the WCRI, except for the final five months where the prices for both contracts climb steeply. The WCRI and Rate Card prices for Q2 2017 closely follow the Victorian reference Baseload Capped Swap price at a premium of around $4/MWh. The WCRI Capped Swap pricing has no scaling or hydrological (energy supply) risk factor adjustments.

Figure 9: Q2 2017 WCRI, Rate Card and Victoria Reference Baseload Capped Swap Prices

The $15/MWh premium on Q2 2017 WCRI Baseload Swap above the Victorian Reference Price would appear to arise from the $11/MWh premium on WCRI Baseload Cap and the $4/MWh premium on Baseload Capped Swaps.

**Market Events – 2017 Hydro Tasmania WCRI Intervention**

In 2017, mainland spot prices increased significantly due to the closure of large thermal generators, natural weather events, and elevated gas prices.

For Q2 2018, as shown in the figure below, the Victorian forward contract prices for 2017/18 increased reflecting the expectation that the spot price in Victoria would remain high throughout 2017/18.

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\(^6\) The Baseload Capped Swap pays the purchaser spot price less the agreed price for all spot prices less than $300/MWh. The market value of the Baseload Capped Swap is the weighted average of all spot prices below $300/MWh.

\(^7\) The Baseload Cap pays the purchaser the spot price less $300/MWh for all spot prices greater than $300/MWh. The market value of the Baseload Cap is the weighted average of all spot prices below $300/MWh.
In response to these market conditions, Hydro Tasmania chose to discount its wholesale contract prices in the long-term interests of its customers. In May 2017, a step drop in prices can be observed, reflecting Hydro Tasmania’s decision to discount prices. Shortly after this discount was applied, Hydro Tasmania withdrew its published Rate Card. Until the intervention in May 2017, the Tasmanian Rate Card and WCRI prices for Q2 2018 remained at a premium of around $10/MWh to the Victorian Reference Baseload Swap Value.

Figure 10: Q2 2018 WCRI, Rate Card and Victoria Reference Baseload Swap Price

Market Events – 2015/16 Tasmanian Drought & Basslink Outage

In late 2015, the Tasmanian spot price rose well above its long-term average in response to low Tasmanian rainfall and low inflows into Hydro Tasmania’s dams. This was followed by the outage of Basslink that lasted another 6 months.

For Q2 2016, as shown in the figure below, the Rate Card price reflects a growing expectation of higher Tasmanian prices in Q2 2016. However, the WCRI price remained low, being linked to the Victorian prices that were not impacted in the WCRI mechanism by the Basslink outage. The drought conditions did not appear to materially impact the WCRI mechanism or to reflect any additional risk to energy supply or supply security arising from the Basslink outage. Demand and hydrological risk scaling will influence WCRI Baseload Cap pricing but only when Victorian Reference Baseload Cap prices are high. In cases such as this, judgement was exercised by the Regulator, as he has the ability under the ESI Act (43M) to take into supply disruptions.

The Tasmanian Rate Card and WCRI prices for the period were generally at a premium of around $16/MWh to the Victorian reference baseload swap price.
### The WCRI Price Mechanism

The WCRI pricing mechanism comprises the valuation of nine energy market products. As shown below, each product has a mathematical relationship to the other. The two key relationships between swap products apply:

1. a) Swap = Capped Swap + Cap
2. b) Baseload = Sum of the time weighted ratio of Peak and Off-Peak

The relationship between a Swap, Capped Swap and Cap or each product is shown below.

### Table 1: WCRI Pricing Mechanism - mathematical relationship between products

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Peak</th>
<th>Off-Peak</th>
<th>Baseload</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSV = Sum of time weighted ratio of OSV and PSV</td>
<td>Peak Swap Value (PSV)</td>
<td>Off-Peak Swap Value (OSV)</td>
<td>Baseload Swap Value (BSV)</td>
</tr>
<tr>
<td>BCSV = Sum of time weighted ratio of OCSV and PCSV</td>
<td>Peak Capped Swap Value (PCSV)</td>
<td>Off-Peak Capped Swap Value (OCSV)</td>
<td>Baseload Capped Swap Value (BCSV)</td>
</tr>
<tr>
<td>BCV = Sum of time weighted ratio of OCV and PCV</td>
<td>Peak Cap Value (PCV)</td>
<td>Off-Peak Cap Value (OCV)</td>
<td>Base Load Cap Value (BCV)</td>
</tr>
</tbody>
</table>

In the figure below, the valuation of those nine products is sourced from three published Victorian ASX reference prices (in green): the Baseload Reference Swap Value (BRSV), the Baseload Reference Cap Value (BRCV) and the Peak Reference Swap Value (PRSV).
Using these Reference Prices\(^8\) (in green) as inputs, like a Sudoku puzzle, the WCRI Price mechanism applies the core relationship between each product (in blue) and regulated assumptions on the price inputs (in yellow) to determine a quarterly Victorian Reference price for all nine market products. In simple terms the relationship used in determining each Victorian Reference price is shown below:

**Table 2 WCRI Pricing Mechanism – Victorian reference contract price calculation**

<table>
<thead>
<tr>
<th>VIC Ref Price</th>
<th>Swap</th>
<th>Capped Swap</th>
<th>Cap</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseload</td>
<td>Baseload Reference Swap Value (BRSV)</td>
<td>Baseload Reference Capped Swap Value (BRCSV) = BRSV - BRCV</td>
<td>Baseload Reference Cap Value (BRCV)</td>
<td>BRSV = BRCSV + BRCV</td>
</tr>
<tr>
<td>Off-Peak</td>
<td>Off-Peak Reference Swap Value (ORSV) = time weighted ratio of BRSV and PRSV</td>
<td>Off-Peak Reference Capped Swap Value (ORCSV) = ORSV - ORCV (subject to conditions)(^9)</td>
<td>Off-Peak Reference Cap Value (ORCV) = Schedule 1 Reference Cap Value = 0.002</td>
<td>ORSV = ORCSV + ORCV</td>
</tr>
<tr>
<td>Peak</td>
<td>Peak Reference Swap Value (PRSV)</td>
<td>Peak Reference Capped Swap Value (PRCSV) = time weighted ratio of BRCSV and ORCSV</td>
<td>Peak Reference Cap Value (PRCV) = time weighted ratio of BRCV and ORCV</td>
<td>PRSV = PRCSV + PRCV</td>
</tr>
</tbody>
</table>

The WCRI Mechanism then adjusts the Victorian Reference Prices for exogenous factors applicable to the Tasmanian market and re-applies the same relationship rules to determine the equivalent WCRI contract price for each product. These adjustments apply to the following WCRI contract values:

- Baseload Cap Value – equal to the calculated value of the new entrant Peaker Capacity Value is adjusted in each quarter by capacity risk factor (a function of quarterly load maximums and distributed non-major storage levels times the flexible portion of a calculated annual baseload reference cap value).
- Off-Peak Capped Swap Value – which is adjusted for a calculated Off-Peak import price premium and Off-Peak marginal loss factors
- Peak Capped Swap Value – which is adjusted for calculated Peak price premium and Peak marginal loss factors
- Off-Peak Cap Value – which is set by the Office of the Tasmanian Economic Regulator under Schedule 1 of the WCRI at $1.14/MWh. The Victorian Reference Off-Peak Cap Value is set to $0.002/MWh.

The WCRI equivalent (in blue in the figure below) to the three Victorian ASX reference prices are calculated using these adjustments - the Quarterly Baseload

---

\(^8\) ASX Victorian d-cypha trade quarterly for Baseload Reference Swap Value (BRSV), Baseload Reference Cap Value (BRCV) and the Peak Reference Swap Value

\(^9\) Subject to baseload and peak swap open interest conditions
Swap Value, the Baseload Cap Value and the Peak Swap Value. Any departure from Victorian Reference contract pricing will relate to these four adjustments.

In simple terms the calculations are shown below:

**Table 3 WCRI Pricing Mechanism – WCRI contract price calculation**

<table>
<thead>
<tr>
<th>TAS Price</th>
<th>Swap</th>
<th>Capped Swap</th>
<th>Cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseload</td>
<td>Baseload Swap Value = BCSV + BCV</td>
<td>Baseload Capped Swap Value (BCSV) = time weighted ratio of PCSV and OCSV</td>
<td>Baseload Cap Value (BCV) = Maximum (risk adjusted Peaker Capacity Value and OCV)</td>
</tr>
<tr>
<td>Off-Peak</td>
<td>Off Peak Swap Value = OCSV + OCV</td>
<td>Off-Peak Capped Swap Value (OCSV) = ORCSV + O/P loss factor + O/P import premium</td>
<td>Off Peak Cap Value (OCV) = Schedule 1 Cap Value = $1.14/MWh</td>
</tr>
<tr>
<td>Peak</td>
<td>Peak Swap Value = PCSV + PCV</td>
<td>Peak Capped Swap Value (PCSV) = PRCSV + peak loss factor + peak import premium</td>
<td>PCV = time weighted ratio of BCV and OCV</td>
</tr>
</tbody>
</table>

The uptake of WCRI contracts is influenced by stakeholder valuation of Tasmanian hedge products, pricing expectations for spot energy in Victoria and Tasmania and the energy traded across the Basslink interconnector. The rules of the WCRI seek to manage the uptake of the WCRI contracts and control any over-subscription.

Signs that the WCRI has departed from the fundamental relationship and links to the Victorian market are when:
- the Hydro Tasmania rate card prices have significantly departed from the WCRI price;
- the WCRI reaches the limits of its subscription; or
- the Rate Card had to be suspended due to significant departures from Victorian contract market prices.

The following analysis focuses on the key areas of variation between the Victorian Reference Price and the equivalent WCRI Contracts.

**Baseload Cap Valuation**

From the above analysis the treatment of Baseload Cap Valuation is a key input to the valuation of the Peak and Baseload Swap Valuations. Without exploring the complexity of each calculated element, Figure 12 below identifies the key driving factors and their impact on quarterly Baseload Cap pricing.

The Baseload Cap price calculation in any quarter is reduced to:
*Baseload Cap Value = Peaker Capacity Value + capacity risk flex scale adjustment*\(^{10}\)

As seen in Box 1, this capacity risk flex scale adjustment is based on movements in the flexible portion of calculated annual baseload reference cap value, however that adjustment is scaled such that the time-weighted average annual Baseload Cap Value for any four quarters is equal to the new entrant Peaking Capacity Value.

\(^{10}\) See Box 1 - capacity risk flex scale adjustment = \(ABRCV\text{flex} \times (FSF-1)\)
Box 1: Baseload Cap Valuation

The Baseload Cap Value is dependent on a complex quarterly adjustment which has four key elements:

- Flex Scale Factor (FSF) is a time weighted average of the calculated maximum and minimum of the calculated capacity risk for each quarter. The capacity risk is a function of the 3-year highest quarterly load less the 12-year average non-major hydro storage levels calculated for each quarter;
- Flexible portion of Annual Baseload Reference Cap Value (ABRCV<sub>flex</sub>) is the time weighted average of the Victorian Reference Baseload Cap less the smallest Victorian Reference Baseload Cap Value in that and the next three quarters;
- Discounted new entrant Peaker Capacity Value (PCV); and
- Off-Peak Cap Value (OCV)

The Baseload Cap calculation is:

\[ \text{Baseload Cap Value} = \max (\text{FSF} \times \text{ABRCV}_{\text{flex}} + \text{PCV} - \text{ABRCV}_{\text{flex}}, \text{OCV}) \]

The OCV value is a floor when the calculated Baseload Cap is negative. For all other times the Baseload Cap calculation reduces to:

\[ \text{Baseload Cap Value} = \text{PCV} + (\text{ABRCV}_{\text{flex}} \times (\text{FSF} - 1)) \]

The scaling of FSF is such that the time-weighted average Annual Baseload Cap Value (shown by diamonds in red) for any four quarters at the same ABRCV<sub>flex</sub> value is equal to the new entrant Peaking Capacity Value. The marginal increase above $8/MWh is a floor price preventing a negative cap price.

This capacity risk flex scale adjustment (ABRCV<sub>flex</sub> * (FSF-1)) is a calculated increase and decrease to the Peaker Capacity Value in any quarter.

By this approach the WCRI Baseload Cap may change significantly for any one quarter however the time weighted average Annual Baseload Cap Value is generally equal to the new entrant Peaking Capacity Value. This gives rise to significant premiums and discounts on Victorian Reference Cap pricing for each quarter.

In a low-priced environment the WCRI Baseload Cap Value converges to the Peaker Capacity Value of around $9.3/MWh. In a high-priced environment the WCRI Baseload Cap value for each quarter diverges to a scaled value above and below that new entrant Peaker Capacity Value.
The significance of this aspect of the calculation is that the Baseload Cap price in each quarter, as shown in the figure below, bears little relationship to the underlying Victorian Baseload Reference Cap Value.

Table 4: Baseload Cap Valuation – Difference between 2018 WCRI and Victoria prices

<table>
<thead>
<tr>
<th></th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCV</td>
<td>1.14</td>
<td>17.10</td>
<td>12.38</td>
<td>4.18</td>
<td>8.72</td>
</tr>
<tr>
<td>BRCV - Vic</td>
<td>34.9</td>
<td>5.4</td>
<td>5.5</td>
<td>9.75</td>
<td>13.80</td>
</tr>
<tr>
<td>Difference (TAS-VIC)</td>
<td>-20.93</td>
<td>11.42</td>
<td>5.90</td>
<td>-3.86</td>
<td>-1.80</td>
</tr>
</tbody>
</table>

Review of the Peaker Capacity Value has been suggested in Aurora Energy’s submission. Our analysis shows that the Peaker Capacity Value is significant in setting the Baseload Cap Value by which all quarterly Baseload Cap Value prices are calculated. This provides a material premium on WCRI prices when Victorian prices are low, and a ceiling to pricing at calculated annual baseload cap when Victorian prices are high. Under the higher priced regime, we observe material premiums and discounts on individual quarterly Baseload Cap Value values (compared to Victorian pricing).

A change of this Peaker Capacity Value in the WCRI, in a high price environment will have little impact on this divergence of pricing with the Victorian contract reference market values.

We observe a WCRI premium on Q2 2017 Victorian Reference Baseload Cap Prices of around $11/MWh. 2017/18 WCRI Baseload Cap pricing for other quarters is examined below.

Figure 12: 2017/18 Baseload Cap WCRI, Rate Card and Victoria Reference Price

Quarter 3 2017 Baseload Cap

A higher flex scale factor (1.53 in 2018) in this quarter will increase the BCV above the Peaker Cap Value by 0.53 times ABRCV_{flex}.

Quarter 4 2017 Baseload Cap

A low flex scale factor (0.11 in 2018) in this quarter will drive BCV down below the Peaker Cap Value by 0.89 times ABRCV_{flex}.
Quarter 1 2018 Baseload Cap

A low flex scale factor (zero in 2018) in this quarter will drive BCV down below the Peaker Cap Value by 1.0 times $\text{ABRCV}_{\text{flex}}$.

Quarter 2 2018 Baseload Cap

A high flex scale factor (2.53 in 2018) in this quarter will drive the BCV up above the Peaker Cap Value by 1.53 times $\text{ABRCV}_{\text{flex}}$.

The Baseload Cap Valuation methodology is likely to continue to present challenges for the WCRI in a high-price environment. The premium the WCRI delivers in a low-priced environment may also warrant review. The analysis shows that Peak Cap Value may not be a sustainable benchmark for Baseload Cap Value pricing in its current form. The Flex Scale Factor mechanism which incorporates a time-weighted average mix of maximum and minimums of annualised demand, water storage and reference pricing is being tested by a transitional and high-price environment.

As shown earlier during a drought period in Tasmania, the WCRI flex factor, based on a time-weighted average mix of maximum and minimums of annualised demand and water storage, did not provide a material price response to falling water storages. As we have seen, Hydro Tasmania could not rely on the WCRI for pricing of the Rate Card. The WCRI contract allocation mechanism is being challenged when it is required to manage the supply of regulated swap and cap products and to contain their oversubscription at prices below the Rate Card and traded contract prices.

This has not diminished the role of the WCRI and its achievements in providing a market-based benchmark for contract pricing and a mechanism underpinning the supply of regulated and unregulated contracts. However, the complexity of the WCRI price adjustment mechanism, its capacity to respond to transitional market developments and the implicit premium to pricing it has delivered over time could be an area for targeted review.

Import Premiums and Marginal Loss Factors

Import Premium Adjustments and Marginal Loss Factors are calculated and added to the WCRI price of Peak and Off-Peak Capped Swaps. They comprise the following major elements:

- Baseload Import Price Premium (BIPP) which is calculated as the difference of Victorian Reference Peak and Off-Peak Capped Swaps times the square of the percentage of time imports occur in that quarter;
- Off-Peak Import Price Premium (OIPP) is the Baseload Import Price Premium divided by the larger of the percentage of off-peak hours in the quarter, or the percentage of time importing in the quarter;
- Peak Import Premium (PIPP) is the Baseload Import Price Premium divided by the larger of the percentage of peak hours in the quarter, or the percentage of time importing in the quarter;
- Off-Peak Marginal Loss Factor Adjustment (OMLFA) is a function of the calculated Average Off-Peak Marginal Loss Factor times the Off-Peak Reference Capped Swap Value; and
- Peak Marginal Loss Factor Adjustment (PMLFA) is a function of the calculated Average Peak Marginal Loss Factor times the Peak Reference Capped Swap Value.

The WCRI Peak (PCSV) and Off-Peak (OCSV) Capped Swap calculations are:

\[
OCSV = ORCSV + OMLFA + OIPP + OCV
\]
\[
PCSV = PRCSV + PMLFA + PIPP + PCV
\]

The WCRI Baseload Capped Swap Value is the time-weighted ratio of Peak Capped Swap and Off-Peak Capped Swap. The calculated WCRI Baseload Capped Swap includes all Marginal Loss Factor and Import Premium Price adjustments.

Using WCRI published price data the Baseload Capped Swap\(^\text{11}\) for WCRI, we compared the Rate Card and Victorian Reference Prices. The Import Premiums and Marginal Loss Factor contribution to the Baseload Capped Swap is the margin between the WCRI and Victorian Reference Price. This is shown in the figure below for each quarter in 2017/18.

**Figure 13: 2017/18 Baseload Capped Swap WCRI, Rate Card and VIC Reference price**

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Baseload Capped Swap</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q3 2017</td>
<td>The WCRI and Rate Card tracks the Victorian Reference price closely with a premium of around $3/MWh.</td>
<td></td>
</tr>
<tr>
<td>Q4 2017</td>
<td>The WCRI and Rate Card track the Victorian Reference price at a premium of around $10/MWh to October 2016.</td>
<td></td>
</tr>
</tbody>
</table>

\(^{11}\) Calculated by netting the Baseload Swap Value and Baseload Cap Value.
Quarter 1 2018 Baseload Capped Swap
The WCRI and Rate Card tracks the Victorian Reference price at a premium of around $6/MWh to May 2017

Quarter 2 2018 Baseload Capped Swap
The WCRI and Rate Card tracks the Victorian Reference price at a discount around $1.3/MWh to May 2017

From May 2017, the Baseload Capped Swap WCRI and Victorian Reference Price comparisons reflect the intervention of Hydro Tasmania on 2018 pricing. Until this intervention the WCRI and Rate Card prices closely tracked the Victorian Reference prices. WCRI pricing for 2019 had no intervention by Hydro Tasmania. A similar analysis of Q2 2019 Baseload Capped Swap in the figure below shows the WCRI price once again tracking the Victorian Reference price at a margin around $8/MWh.

Figure 14: Q2 2019 WCRI, Rate Card and VIC Reference Baseload Capped Swap price

The margin between the WCRI price and Victorian Reference prices reflects the Import Premiums and Marginal Loss Factor adjustments. This in general delivers a premium to WCRI prices. A snapshot of 2019 WCRI Capped Swap Prices reveals the Off-Peak Import Premium Price (OIPP) is the major contributor to this margin.
Our analysis indicates that Import Price Premiums and Marginal Loss Factors are not particularly significant to Tasmanian Swap Pricing and the emergent WCRI pricing issues associated with Baseload Cap Price. While a premium generally emerges from these adjustments, the Baseload Capped Swap, which is the “energy” component of Baseload Swaps, remains closely linked to Victorian Reference prices.

**Tasmanian and Victoria Spot Analysis**

Using NEM 2017 spot data, the difference between the Tasmanian and Victorian spots prices is compared by calculating the value of all nine market products. To explore the linkage of Tasmania and Victorian prices, we calculated the difference between WCRI and Victorian Reference prices for each product.

A sample of this analysis is shown below for the Baseload Swap, the Peak Swap and the Baseload Cap. We observe that Tasmania is trading at a premium to Victoria spot prices in Q1 and Q2. Tasmania is also trading at a small premium to Victoria spot price cap values in Q2 and Q4.

**Table 5:** NEM 2017 Q1-Q4 Tasmania-Victoria spot price difference for the calculated value of Baseload Swap, Peak Swap and Baseload Cap products.

<table>
<thead>
<tr>
<th>2017 SPOT TAS - VIC ($/MWh)</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseload Swap</td>
<td>18.88</td>
<td>9.35</td>
<td>-4.17</td>
<td>-0.01</td>
</tr>
<tr>
<td>Peak Swap</td>
<td>6.85</td>
<td>3.05</td>
<td>-6.76</td>
<td>-1.77</td>
</tr>
<tr>
<td>Baseload Cap</td>
<td>-0.34</td>
<td>2.66</td>
<td>0.09</td>
<td>1.97</td>
</tr>
</tbody>
</table>

Reviewing WCRI 2018 contract data, we compared the difference between Tasmanian and Victorian contract prices. A snapshot was drawn from 28 March 2017 WCRI published contract data prior to Hydro Tasmania intervention in WCRI pricing. A sample of this analysis is shown below for the Baseload Swap, the Peak Swap and the Baseload Cap. We observe that Tasmania WCRI contracts are trading at a premium to Victoria reference contract prices in Q2 and Q3, but that Tasmania is trading at a significant discount to Victoria contract prices Q1 and Q4.
This is consistent with the previous analysis. The calculation of the Tasmanian caps based on Peaker Capacity Value and the flex scaling factor adjustment between quarters is driving a significant variance in cap pricing. These variances are carried into Peak and Baseload swap prices. This variation in cap pricing is not observed in the spot market.

For completeness, we have provided the same analysis for 2019 WCRI pricing. A snapshot was drawn from 17 October 2017 WCRI published contract data. A similar pattern emerges. The major difference again is the WCRI valuation of Baseload Caps.

The recent history for Q1 2019 Baseload Swap prices is shown below. The price movements of the Rate Card between the WCRI and Victorian Reference price suggest Hydro Tasmania is constrained in using the WCRI as a benchmark for Rate Card pricing if it requires a substantial discount to prices that are traded in the Victorian market. If the Rate Card trades at a premium to the WCRI this in turn has implications for the demand, scaling and supply of WCRI regulated contracts.
Peaker Capacity Values

Previous analysis shows that in a low-priced environment the BCV converges to the Peaker Capacity Value. As Victorian prices rise, the BCV calculation scales BCV for each quarter above and below the Peaker Capacity Value. We have shown that the scaling delivers an annual BCV\textsuperscript{12} equal to the Peaker Capacity Value\textsuperscript{13}.

Under a low-price regime our analysis shows this has resulted in a premium to Victorian pricing. Under higher priced regimes, because of flex factor scaling, material premiums and discounts emerge on the BCV calculated for each quarter. The calculated BCV in any quarter bears little relationship to the underlying Victorian Baseload Reference Cap Value.

In its submission, Aurora Energy has suggested that changes to some non-market related inputs may reduce WCRI price outcomes without increasing risk to retailers. “The WCRI methodology recognises that Tasmania has fewer capacity constraints than Victoria. It sets cap prices at the long-run marginal cost of new entrant generation rather than linking directly to Victorian cap prices.”

The long-run marginal cost of new entrant generation is calculated using input cost assumptions and an assumed year for the generation to be built. Aurora Energy suggests “investigating the extension of the current assumed 10-year requirement for new generation”.

We have examined the Peaker Capacity Value sensitivity to a range of input assumptions using the WCRI model. The following table summarises our findings.

Table 7  Peaker Capacity Value - WCRI valuation sensitivity to input assumptions

<table>
<thead>
<tr>
<th>2018-19</th>
<th>Original</th>
<th>Change</th>
<th>MAX</th>
<th>MIN</th>
<th>AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Quarter</td>
<td>2027</td>
<td>2037</td>
<td>-0.72</td>
<td>-0.69</td>
<td>-0.70</td>
</tr>
<tr>
<td>Pre-Tax Real WACC</td>
<td>5.5%</td>
<td>8.9%</td>
<td>3.39</td>
<td>3.24</td>
<td>3.32</td>
</tr>
<tr>
<td>Forecast Inflation Rate</td>
<td>2.5%</td>
<td>2.4%</td>
<td>-0.12</td>
<td>-0.10</td>
<td>-0.11</td>
</tr>
<tr>
<td>Real Total Capital Cost</td>
<td>1073</td>
<td>1062</td>
<td>-0.09</td>
<td>-0.08</td>
<td>-0.08</td>
</tr>
<tr>
<td>Real Annual Operating cost</td>
<td>10.13</td>
<td>18.7</td>
<td>0.38</td>
<td>0.94</td>
<td>0.96</td>
</tr>
</tbody>
</table>

For the variations considered, the largest variation was Pre-Tax WACC. Extending the Construction Quarter to 20 years under the WCRI Peaker Capacity Value formula reduced the value by $0.7/MWh. A change in Peaker Capacity Value will only raise or lower the ceiling provided by the calculated Annual BCV. At a lower Peaker Capacity Value, a contract price premium will still emerge if prices in Victoria fall and the premiums and discounts on cap and swap contracts calculated for each quarter would continue if prices remain high.

The flex scaling factor is dependent on time weighted sum products of annualised and long-term demand, water storage and annual baseload cap pricing for its determination. The flex scaling factor adjustments, without intervention, have been found inadequate in responding to low water reserve conditions, interconnector

\textsuperscript{12} Annual BCV is the time weighted average of the quarterly BCV.

\textsuperscript{13} At an ABRCV\textsubscript{uni} above the Peaker Cap Value, the calculated annual BCV price increases marginally due intervention to prevent negative BCV values in the quarterly pricing.
disruption and emergent high Victorian prices without materially departing from the Victorian contract pricing and the trading dynamics of a linked Victorian Spot Market.

A review of the Peaker Capacity Value and flex scaling methodology could identify changes that may meet Aurora Energy and Tasmanian Government policy objectives to “reduce the cap price and moderate wholesale electricity prices calculated under the current WCRI whilst not undermining the relationship between contract and spot markets.” Enhancing these links to contract and spot markets in calculating cap pricing could allow moderate adjustments to prices, however any policy initiatives to materially adjust prices would still require measures outside the operation of the WCRI.

We consider that the Peaker Capacity Value role in setting BCV adds an uncontested premium to WCRI pricing at low Victorian prices. When Victorian Reference Caps are high, the scaled reallocation of a calculated new Peaker Capacity Value between quarters is problematic (when correlated and added to Victorian energy “capped swap” prices) and challenging (when this applies a discount and arbitrage to Victorian prices). We note that intervention to discount the WCRI resulted in over-subscription of the WCRI for regulated contract pricing and departure by Hydro Tasmania from using the WCRI as a benchmark for unregulated Rate Card contract pricing.

The WCRI and use of Victorian Reference prices have provided an effective benchmark and upper limit on Hydro Tasmania’s pricing. However, Hydro Tasmania is likely to price and receive the benefit without challenge from any premium offered by the WCRI and Victorian Reference Pricing, whichever is the greater.

Net System Load Following Swaps

Net System Load Following (NSLF) Swaps have not been included at this stage of analysis. A review of NSLF Swaps requires a more complex understanding of the Victorian and Tasmanian system load profiles and the contract building blocks used to price these contracts. The premiums implicit in the WCRI and effects of the scaling mechanism identified above will flow into pricing of NSLF products. This will have a significant impact where baseload cap pricing is a material component to their valuation.

3.3 Assessment of the WCRI against the evaluation criteria

The Terms of Reference for the Review states that one of the key Government expectations for the Review is to:

- analyse whether the WCRI is operating as intended according to its original design.

To address this point, we have assessed the performance of the WCRI against the original design principles for the WCRI. For this point we have also assessed the performance of the WCRI against the Tasmanian Government Vision. We consider the Tasmanian Government Vision to be important in this evaluation because the original design principles did not include a principle relating to customer prices. It should be noted that the Tasmanian Government Vision has been developed subsequent to, and under a different Government, to when the original design
principles were established, and as such the WCRI was not specifically designed to contribute towards the Tasmanian Government Vision.

We have summarised our assessment in the tables below and have set out our full assessment below each table.

**Design Principles**

The table below sets out the original WCRI design principles and evaluates the performance of the WCRI against these principles.

<table>
<thead>
<tr>
<th>Principle</th>
<th>EMCa Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Market participants should have confidence that they can manage their wholesale risks appropriately in Tasmania.</td>
<td>Existing market participants have confidence that they can appropriately manage wholesale risk in Tasmania. This is due to both the WCRI and the good behaviour of Hydro Tasmania. Whilst there is no guarantee that this good behaviour will continue, we consider that Hydro Tasmania is likely to be responsive to political pressure, pressure from customers, and competition law. Although we have not identified specific concerns, new entrant participants might have concerns regarding wholesale market risk in Tasmania due to the complexity of the WCRI and the volume and scaling rules.</td>
</tr>
<tr>
<td>2. The risks of operation in the Tasmanian market should be no greater than those in other NEM jurisdictions.</td>
<td>Retailers are able to source a sufficient volume of contracts (primarily unregulated) to cover their customer load, similar to other jurisdictions. Given limited volume of WCRI contracts, retailers rely on the good behaviour of Hydro Tasmania to make contracts available on reasonable terms. Although we have not identified specific concerns, new entrant participants might consider risks of operation to be higher in Tasmania due to the complexity of the WCRI and the volume and scaling rules.</td>
</tr>
<tr>
<td>3. Market participants should have flexibility to manage wholesale market risk using similar business models to those used in other NEM jurisdictions.</td>
<td>The WCRI is designed to allow the unregulated contract market to function like in other jurisdictions. The WCRI offers a limited range of contract types, and at times Hydro Tasmania also limits the types of contracts it offers. There are limited inter-regional risk management products available which limits trading with mainland counterparties, and 2-way prices are not offered to enable retailers to easily sell a contract back to Hydro Tasmania if a customer is lost.</td>
</tr>
</tbody>
</table>
4. The framework should not unduly constrain Tasmania’s ability to maximise carbon value accessed through Basslink.

We have not identified any constraints to Tasmania’s ability to maximise carbon value accessed through Basslink.

However, as noted above, limited competition and limited inter-regional trading could be impacting on investment in renewables in Tasmania.

5. The reform option should recognise the interaction between spot and contract markets without creating unintended incentives or consequences.

We have not observed the WCRI negatively impacting the interaction between the Tasmanian spot and contract markets.

However, we note that the role of Peaker Capacity Value in WCRI pricing has delivered, possibly unintended, a price premium for WCRI contracts above the market price. This has generally resulted in higher wholesale electricity prices in Tasmania compared to Victoria.

Design Principle 1: Market participants should have confidence that they can manage their wholesale risks appropriately in Tasmania

Existing market participants have indicated that they have confidence in their ability to manage wholesale risk in Tasmania.

We observed a good working relationship between Hydro Tasmania and Tasmanian retailers. Retailers indicated that they are able to obtain competitively priced contracts from Hydro Tasmania and expressed no concerns that this may change in the future. Retailers did comment that during 2017, contracts on offer have been more limited because of Hydro Tasmania’s decision to withdraw its Rate Card, however retailers are still able to get contracts to manage both existing and new customers.

The retailers indicated a preference for unregulated contracts using Hydro Tasmania’s Rate Card over the regulated WCRI contracts. Retailers find the unregulated contracts more flexible, have a longer validity period, and are better aligned with their processes for making offers to customers. The retailers generally only use the full volume of WCRI contracts offered when the price is lower than Hydro Tasmania’s Rate Card (such as during the Basslink outage).

The volume of WCRI contacts is insufficient to cover each retailer’s full customer load, and so the retailers must also use unregulated contracts which are generally priced on Hydro Tasmania’s Rate Card. Given there is little competition in the Tasmanian contract market, the retailers are heavily reliant on Hydro Tasmania’s good behaviour to offer competitive prices. Our analysis shows that the prices offered by Hydro Tasmania on its Rate Card closely follow the WCRI prices and
have only materially exceeded the WCRI prices during the 2015 Basslink outage (which is appropriate given local supply scarcity).

The WCRI prices have provided a reference price for Hydro Tasmania to base its unregulated prices on. Although there is little competitive pressure on Hydro Tasmania to base its unregulated contract prices on WCRI prices, we consider it is likely that Hydro Tasmania is responsive to political pressure, pressure from customers, and competition law, which would give retailers confidence in their ability to manage wholesale market risk.

An unintended consequence appears to be that the policy implementation and role of Peaker Capacity Value in WCRI pricing has delivered a benchmark price premium for Tasmanian contracted electricity (see Section 3.2).

We have not spoken to potential new entrant retailers. However, we expect that they may consider wholesale market risk to be high, possibly due to the complexity of the WCRI, scaling rules, and unfamiliarity with dealing with Hydro Tasmania. We consider that it would be helpful to speak to retailers that have considered entering the Tasmanian market to understand their reasons for not entering.

Design Principle 2: The risks of operation in the Tasmanian market should be no greater than those in other NEM jurisdictions

Existing market participants have indicated that they don’t consider wholesale market risk is any greater in Tasmania than other NEM jurisdictions.

We consider that risk is higher in Tasmania because retailers rely on the good behaviour of a benevolent monopolist in Hydro Tasmania to supply competitively priced contracts to meet volume requirements in addition to WCRI volumes, and also sovereign risk of relying on the Tasmanian Government not to detrimentally change the WCRI.

Past performance can be a good predictor of future performance, and it would appear that Hydro Tasmania is under suitable pressure (as discussed above) to continue to offer retailers competitively priced contracts.

As discussed above, we have only interviewed retailers currently operating in the Tasmanian market. Other retailers that have considered but chosen not to participate in the Tasmanian retail market may consider the risks of operating in the Tasmanian market are higher than those in other NEM jurisdictions.

Design Principle 3: Market participants should have flexibility to manage wholesale market risk using similar business models to those used in other NEM jurisdictions

The WCRI offers a limited range of contract types, and at times Hydro Tasmania also limits the types of contracts it offers. This limits the flexibility of the Tasmanian electricity contract market and limits the choices available for retailers to manage customer loads.

In Tasmania there are limited inter-regional risk management products available. This limits the opportunities for retailers to use mainland hedge positions to manage Tasmanian customer load, and limits opportunities for Tasmanian independent generators to sell the output of their generating units to the mainland.
The WCRI contracts, and the Hydro Tasmania Rate Card, do not offer 2-way prices to enable retailers to easily sell a contract back to Hydro Tasmania if a customer is lost.

The above limitations do not impact on retailers’ ability to hedge their load, but they do reduce the efficiency by which retailers can hedge their load compared to mainland retailer operations.

**Design Principle 4: The framework should not unduly constrain Tasmania’s ability to maximise carbon value accessed through Basslink**

We have not identified any constraints due to the WCRI to Tasmania’s ability to maximise carbon value accessed through Basslink.

One renewable energy developer and advisor, Climate Capital, responded to the Issues Paper and did not indicate that the WCRI is constraining Tasmania’s ability to maximise carbon value through Basslink. They did however indicate that a lack of firming products is a barrier to investment in Tasmania and proposed an obligation on Hydro Tasmania to offer such products. Increased retail competition and inter-regional risk management products may also assist renewable energy proponents.

**Design Principle 5: The reform option should recognise the interaction between spot and contract markets without creating unintended incentives or consequences**

We have not found any evidence of the WCRI distorting the spot or unregulated contract markets. We have observed the spot market respond to market events as it is designed to do, and the WCRI appears to support the unregulated contract market by providing a transparent reference price.

However, while we note the policy implementation and role of Peaker Capacity Value in WCRI pricing, this has delivered a price premium for WCRI contracts above the market price. This has generally resulted in higher wholesale electricity prices in Tasmania compared to Victoria, which we expect is unintended.

### Tasmanian Government Vision

The Government’s vision, as outlined in the Tasmanian Energy Strategy, is to restore energy as a competitive advantage for Tasmania consistent with the principles set out in the table below. The table below evaluates the performance of the WCRI against these principles, with the caveat however that the WCRI is not intended to be the sole vehicle for delivering the Tasmanian government’s energy policy outcomes. It should be noted that the Tasmanian Government Vision has been developed subsequent to, and under a different Government, to when the original design principles were established.

<table>
<thead>
<tr>
<th>Government Vision</th>
<th>EMCa Assessment</th>
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<tr>
<td>1. Delivering affordable energy at competitive and predictable</td>
<td>The WCRI has not consistently delivered affordable energy at competitive and predictable prices amongst the lowest in Australia. A number of</td>
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prices that are amongst the lowest in Australia

| 2. Empowering consumer choice | The WCRI has not delivered greater consumer choice. ERM Business Energy operated in Tasmania before the WCRI was implemented. We have not identified any direct evidence to suggest that wholesale price risk is an impediment to new entrant retailers and, even if it is, it may be but one of several factors. However, the fact is there is not yet workable competition or genuine customer choice in Tasmania, particularly at the mass market level. |

| 3. Ensuring an efficient energy sector that is customer focussed | We have not observed material inefficiencies in the operation of the Tasmanian energy sector due to the design of the WCRI. We have not observed any factors relating to the WCRI that influence how customer-focused businesses are. However, we would expect businesses to be more customer focused with more competition in the retail market – see principle 2 above. |

| 4. Utilising energy to facilitate State growth | The WCRI did not protect customers on market contracts from high wholesale prices (above Hydro Tasmania’s efficient cost of generation). These high wholesale costs contributed to high retail prices that would have reduced the economics of many Tasmanian businesses (note: mainland NEM |
customers have also seen high price rises). The Tasmanian Government intervened with rebates to reduce energy costs for unregulated customers.

5. Maximising Tasmania’s renewable energy opportunities

- We have not observed any material impact on renewable energy opportunities.

### Principle 1: Delivering affordable energy at competitive and predictable prices that are amongst the lowest in Australia

The WCRI has not consistently delivered affordable energy at competitive and predictable prices that are amongst the lowest in Australia. As discussed in Section 3.2, role of Peaker Capacity Value in WCRI pricing delivers a price premium for WCRI contracts above the Victorian market price. This has generally resulted in higher wholesale electricity prices in Tasmania compared to Victoria.

Tasmania has experienced two high price events since the introduction of the WCRI, the first was during the 2015/16 drought and Basslink outage, and the second was during the 2017 mainland supply scarcity event. The performance of the WCRI during each of these events is discussed below.

#### 2015/16 Drought & Basslink Outage

During the combined drought and Basslink outage at the end of 2015 and beginning of 2016, wholesale prices rose substantially in Tasmania. As illustrated in Figure 1, the Tasmanian spot price increased significantly during this period, while the Victorian spot price remained close to its long-term average. This price divergence is expected given Tasmania was no longer electrically connected to the mainland. We have not analysed whether the high spot prices were efficient, but the NEM is designed so that prices rise during supply scarcity events to incentivise generators in the short term to make higher cost plant available for dispatch (in this case Tamar Valley and diesel generators), to incentivise investment in additional generation in the longer term to increase capacity available (in the case of Tasmania which is energy constrained, this would mean investment in non-hydro generators such as wind or gas), and to incentivise demand response.

As illustrated in Figure 11, swap contract prices moved consistent with the movement in the spot prices. The Rate Card price reflects a growing expectation of higher Tasmanian spot prices in Q2 2016. However, the WCRI price remains low, being linked to Victorian contract prices that were not impacted in the WCRI mechanism by the Basslink outage.

Given the WCRI contract prices were significantly lower than the Rate Card prices, the WCRI contracts were over-subscribed and the WCRI scaling rules were activated. We have concerns regarding WCRI volume and scaling, and these are discussed in Section 4.

Regulated contracts provided under the WCRI provided some protection to customers as these were priced closer to the lower Victorian prices. However, given
limited volumes of WCRI contracts, retailers still had to purchase higher priced unregulated contracts and they passed those higher costs to customers.

To protect customers who were recontracting during this period from higher electricity prices, the Tasmanian Government implemented a rebate scheme, so that these customers would pay the price that would likely have applied if Basslink had remained in service.

2017 Mainland Supply Scarcity Event

During the mainland supply scarcity event in 2017, mainland spot prices increased significantly in response to a tightening supply demand balance and heightened gas prices. Given Tasmania's connection to Victoria, Tasmania's spot price rose in unison with the Victorian spot price. WCRI prices also rose given that they are based predominantly on Victorian forward contract prices. These higher wholesale prices were passed to customers in higher retail prices.

During this period of elevated prices, Hydro Tasmania's generation costs did not significantly change.

Hydro Tasmania responded in the long-term interests of its customers by discounting its Rate Card prices. This had the effect of creating an arbitrage opportunity for traders, and Hydro Tasmania experienced unwanted interest from mainland participants. Given that the discount was intended to benefit its customers in Tasmania, Hydro Tasmania withdrew its rate card, offered the discount through the WCRI, and offered the discount to Tasmanian retailers where they could demonstrate that the contract was intended for a Tasmanian customer.

The wholesale price following the Hydro Tasmania discount was still resulting in significant retail price increases for Tasmanian customers, and the Tasmanian Government intervened with energy rebates designed to limit retail price changes during this event to modest increases only.

Conclusion

In conclusion, the WCRI has not consistently delivered competitive and predictable prices amongst the lowest in Australia. Being linked to Victorian prices, the WCRI delivered price stability at a reasonable level during the period of Victorian price stability. However, when Victorian prices increased in level and volatility in 2017, Tasmanian Government intervention was required to curtail retail price growth due to elevated wholesale prices.

The WCRI has not delivered predictable prices, although we note predictable prices is a challenge in the current market environment. Prices have increased with little notice, and then prices have reduced through rebates, which were also not predictable.

As discussed further at Principle 3, these heightened wholesale prices are not necessarily inefficient, however growth and volatility in the wholesale prices impacting on retail prices is not consistent with the Tasmanian Governments vision for competitive and predictable prices amongst the lowest in Australia.
Principle 2: Empowering consumer choice

The WCRI has not delivered greater consumer choice. There have been no new retailers enter the Tasmanian market since the introduction of the WCRI, noting that ERM Business Energy operated in Tasmania before the WCRI was introduced.

We have not identified any direct evidence to suggest that wholesale risk is an impediment to new entrant retailers. Retailers currently operating in Tasmania consider that they can adequately manage wholesale risk, largely due to their confidence that Hydro Tasmania will continue to offer fair and competitively priced contracts. We have not spoken to any businesses that have assessed the risks of entering the Tasmanian market as a new retailer.

Wholesale risk may be a factor for retailers choosing not to establish themselves in the Tasmanian market, for the reasons outlined by the Expert Panel\textsuperscript{14}, but it is likely to be just one of many reasons.

Greater competition in the retail market is also likely to drive further innovation in tariff and product offerings.

Principle 3: Ensuring an efficient energy sector that is customer focussed

We have not observed material inefficiencies in the operation of the Tasmanian energy sector as a direct result of the design of the WCRI.

Operational Efficiency

We have not observed any negative impacts from the WCRI on the operational efficiency of the spot market. The higher Tasmanian spot prices during the 2015 and 2017 supply scarcity events are appropriate and the market responded consistent with the NEM design with higher prices to incentive generators to make additional generation available for dispatch and to incentivise demand curtailment. Although the 2017 event was due to mainland supply scarcity only, Tasmania benefits from being part of the national market, and as such price signalling in Tasmania to address mainland scarcity is appropriate and an efficient outcome from being part of a national market.

Dynamic Efficiency

We have also not directly observed any negative impacts from the WCRI on the dynamic efficiency of the spot market, although we have concerns that the WCRI may not be maximising dynamic efficiency to the extent possible. We have observed that investment in wind farms appears lower in Tasmania than the mainland, despite Tasmania having an excellent wind resource, a large fast start hydro generation system to manage intermittency, an energy deficit, and risks to island supply if Basslink is out of service for a prolonged period. It would seem that Tasmania could have captured more of the Federal Government’s renewable energy subsidy schemes (e.g. ARENA grants, RECs, etc). Whilst we note that there are currently two wind farms under construction, and studies into increasing interconnector and hydro capacity by Government owned corporations, the lack of private investment to date might be due to difficulties experienced by wind farm

\textsuperscript{14} Reference
proponents in securing power purchase agreements due to the lack of wholesale market competition in Tasmania.

**Sovereign Risk**

We have not observed any concerns regarding sovereign risk, however we note that it is relatively easy for the Tasmanian Government to make a change to WCRI which could be seen as a risk to participants. The Tasmanian Government has only made relatively minor changes to the WCRI since its introduction which appear to have been well received by Participants. Stakeholders are consulted on changes to the WCRI. We consider that the Tasmanian Government should keep the WCRI rules as unchanged as possible to give investors’ confidence in the stability of the wholesale pricing arrangements in Tasmania to back long-life projects.

**Customer Focused**

Finally, we have not observed any factors relating to the impact of the WCRI on how customer focused Tasmanian electricity business are. Although we would expect businesses to be more customer focused with more competition in the retail market (see Principle 2 above).

**Principle 4: Utilising energy to facilitate State growth**

The WCRI did not protect all unregulated customers from wholesale price growth and volatility.

Tasmania’s large industrial customers generally agree to long-term contracts directly with Hydro Tasmania so are less likely to be impacted by temporary increased in wholesale prices. The wholesale price growth and volatility is more likely impact small to medium enterprises, specifically those businesses that need to renegotiate a contract during a period of elevated price.

As previously discussed, the Tasmanian Government intervened to protect customers from this wholesale price growth and volatility, using other instruments.

Without the Government intervention, the wholesale price growth and volatility would have been factored in to businesses decisions regarding growth and expansion. In this regard, the WCRI might not have contributed to facilitating State growth to the extent that it could have.

**Principle 5: Maximising Tasmania’s renewable energy opportunities**

We have not observed the WCRI directly impacting investment in renewable energy or the export of renewable energy to the mainland. Although as discussed at Principle 3, we consider that the WCRI may not be maximising Tasmania’s renewable energy opportunities. This could warrant further investigation.

### 3.4 Stakeholder Submissions

Throughout our investigation, we met with the following external stakeholders:

- Hydro Tasmania;

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15 In addition to Tasmanian Government stakeholders.
• Aurora Energy; and
• ERM Business Energy.

In addition, written submissions to the Issues Paper were received from:

• Australian Energy Council (AEC);
• Climate Capital;
• Hydro Tasmania; and
• Aurora Energy.

Stakeholders are generally supportive of the WCRI, and are supportive of it remaining stable, transparent, and market-based to deliver certainty and efficient outcomes to existing participants and investors.

Hydro Tasmania and Aurora Energy both caution against making wholesale changes to the WCRI in the current environment given the current uncertainty of future national energy policy and given that current elevated NEM wholesale prices may be temporary.

Hydro Tasmania and the AEC both suggest using government rebates to address temporary increases in wholesale prices, as preferable to making changes to the WCRI. Aurora Energy said that if any intervention is contemplated by Government to manage wholesale price volatility, this should occur outside of the wholesale market regulatory pricing framework.

Submissions include suggestions for a number of small changes to the WCRI. Hydro Tasmania suggests addressing issues with scaling, the pricing of regulated cap contracts, and standing offer prices. Aurora Energy suggests changes to cap pricing and volumes under the WCRI. Climate Capital suggests that Hydro Tasmania be obliged to offer firming products to support new projects.
4 Key Findings

This section outlines the key findings from our investigation of the effectiveness of the WCRI. It draws on our evaluation of the WCRI against the original design principles and Tasmanian Government Vision, stakeholder feedback, and our analysis and investigations. This includes findings where we consider that the WCRI might be producing suboptimal or unintended results.

4.1 Original Design Intent

The WCRI was designed to allow Tasmanian Market Participants to manage wholesale market risk in a market dominated by a single generator, being Hydro Tasmania.

Aurora Energy and ERM Business Energy, the two current Tasmanian Retailers, both indicated that they are able to effectively manage wholesale market risk in Tasmania.

Submissions were not received from any retailers that have evaluated entering the Tasmanian retail market. Climate Capital, a developer and advisor specialising in renewable energy generation and investment, indicated in its submission that major changes to the WCRI are not required\(^6\).

While we have identified some sub-optimal outcomes, overall the WCRI has performed well against its original design principles. The WCRI has provided existing Tasmanian market participants confidence that they are able to appropriately manage wholesale market risk in the Tasmanian market through a market-based mechanism and has also provided a benchmark for the pricing of unregulated contracts in Tasmania.

\(^6\) Although it did suggest an obligation on Hydro Tasmania to provide firming products to support new investments in generation.
However, we are concerned that prospective Tasmanian market participants (both retailers and generators) may not be confident that the WCRI is sufficient to manage the risk of Hydro Tasmania’s market power. As discussed further below, this could be due to the WCRI volume and scaling rules, and the considerable complexity of the WCRI which creates transparency issues for those not very familiar with the instrument. These issues may create barriers to entry for new entrant participants, and thus protect incumbents. With the introduction of the the National Energy Retail Law and National Energy Retail Rules establishing nationally consistent regulation for electricity retailing, and Australia’s large electricity retailers merging their systems, processes and labour resources seamlessly across mainland NEM jurisdictions delivering cost efficiencies, wholesale market risk might now be a primary impediment to new participants entering the Tasmanian Market. This should be explored further with prospective new entrant participants.

Finding 1: Performance against original design principles

Overall the WCRI has performed well against its original design principles and has provided existing Tasmanian market participants confidence that they are able to appropriately manage wholesale market risk in the Tasmanian market.

We consider there would be merit in further exploring whether prospective new entrant market participants have equal confidence in the WCRI, and whether wholesale market risk is a material impediment to market entry.

4.2 Tasmanian Government Vision for Energy

Our assessment of the WCRI against the principles set out in the Tasmanian Government Vision for energy reveals that the WCRI has not consistently contributed to the delivery of affordable, competitive and predictably priced energy, and the promotion of state growth.

Tasmanian wholesale electricity prices rose during the 2016 Basslink outage and during the 2017 mainland supply scarcity event. During the 2017 mainland scarcity event, wholesale electricity in Tasmania was priced above the average cost of production in Tasmania\(^\text{17}\) which would have resulted in higher profits for Hydro Tasmania. The higher Tasmanian wholesale prices during the 2016 Basslink outage reflect Hydro Tasmania’s higher generation costs during that event, and the higher wholesale prices during this event may not have resulted in higher profits for Hydro Tasmania.

These higher wholesale electricity prices flowed to higher retail electricity prices for customers re-contracting during these periods. The Tasmanian Government

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\(^\text{17}\) We consider the long-term average Tasmanian wholesale price to be a reasonable proxy for Tasmanian cost of supply.
intervened through rebates to protect customers from these higher wholesale electricity prices.

It is a reasonable policy objective for Tasmanian customers to benefit from the competitive cost of generation supplied by Hydro Tasmania, and to seek to smooth out short-term price volatility.

The Tasmanian Government’s approach to using rebates to reduce the impact of elevated wholesale prices is less distortionary than directly intervening in wholesale pricing. However, we note that these rebate programs were reactionary, and were implemented some time after high prices started impacting customers. By this point, some customers may already have made long-lasting investment and operational decisions in response to the higher prices.

Tasmania benefits from its electrical connection to the mainland and its participation in the NEM, in terms of reliability and security, access to low priced energy during non-peak times, and its ability to sell high priced energy and capacity to the mainland at peak times. The WCRI was not designed to keep wholesale prices low. Capping wholesale prices at below efficient market prices can create arbitrage opportunities that may benefit mainland market participants at the expense of Tasmanian customers and may distort efficient market operation and investment signals.

We observe that Hydro Tasmania’s unregulated contract prices generally follow the WCRI prices, sometimes at a discount. The WCRI is serving as a benchmark for unregulated contract pricing.

Enhancing links to contract and spot markets in calculating cap pricing could allow moderate adjustments to prices, as discussed below in Section 4.2. However, any policy initiatives to materially reduce prices should be undertaken outside the operation of the WCRI and wholesale market to preserve the benefits of the market linkage. We consider that this is best achieved through the Tasmanian Government’s rebate program, which we note could often be funded through increased Hydro Tasmania profits and dividends linked to the high price events.
If rebates are adopted as a policy mechanism, these should be predictable by design and not burdensome to efficient market operations.

### Finding 2: Performance against Tasmanian Government Vision

The WCRI has not consistently contributed to the delivery of affordable, competitive and predictably priced energy, and which can be utilised to promote state growth, consistent with the Tasmanian Government Vision.

The WCRI was not specifically designed to keep wholesale prices low, and in our opinion neither should it. Initiatives to materially reduce customer prices should be undertaken outside the operation of the WCRI and wholesale market to preserve the benefits of the market linkage. This is best achieved through a formalised government rebate program, which is designed to be predictable for participants and customers, non-discriminatory and non-burdensome.

Addressing the issues discussed below will also contribute towards achieving the Tasmanian Government Vision.

### 4.3 Unintended negative consequences or sub-optimal outcomes

The WCRI transforms the Victorian prices by a complex set of adjustments that are intended to meet pricing policy and market design objectives for a Tasmanian market. However, these have led to some unintended price outcomes, specifically:

- The mechanism for valuation of baseload caps has led to a premium on WCRI prices under low Victorian prices and problematic discounts and premiums on individual quarter prices as higher prices in Victoria emerge; and
- The role of Peaker Capacity Value in setting a fixed value and ceiling on the baseload cap valuation. This is not consistent with maintaining the link with Victorian prices and has proved challenging for benchmarking Rate Card pricing of unregulated contracts.

#### Issues with the Peaker Capacity Value

We consider that the Peaker Capacity Value role in setting Baseload Cap Values is problematic for WCRI pricing and as a benchmark for unregulated Rate Card contract pricing. The Peaker Capacity Value is applied as a ceiling and target value for valuing the Baseload Cap Value. This approach to WCRI pricing is a departure from its linkages to Victorian Reference Contract Prices.

Subject to review, this value could remain a set point at which premiums and discounts may apply to Victorian Reference Contract Values. This is a fundamental
departure from the absolute value it currently sets for pricing Baseload Cap Contracts.

**Issues with the Flex Scaling Factor**

The calculation of the Baseload Cap Value applies a Flex Scaling Factor adjustment to each quarter which delivers an annual Baseload Cap Value\(^{18}\) equal to the Peaker Capacity Value. The scaling is a function of the time weighted average of annualised and long-term demand and water storage and applied to the flexible portion of a calculated annual average baseload cap (maximum less minimum average). This is then used to scale up and down the Peaker Capacity Value for each quarter. The time weighted average of the four quarters is always targeted at an average annual Baseload Cap Value equal to the Peaker Capacity Value\(^{19}\).

In a low-price environment, the WCRI calculates a Tasmanian Baseload Cap Value at a premium to the Victorian Baseload Reference Value. As higher Victorian prices emerge the flex scaling is driving material premiums and discounts to the underlying Victorian reference price in each quarter. As shown in the figure below, the Baseload Cap Value in each quarter bears little relationship to the underlying Victorian price. Intervention by Hydro Tasmania did not resolve this divergence in pricing. The WCRI ceased to be a benchmark price for unregulated contracts, leading to oversubscription of the WCRI and the suspension of Rate Card.

*Figure 18: Q417 Baseload Cap - WCRI, Rate Card and Victoria prices*

The flex scaling factor adjustment has also been found inadequate in responding to low water reserve conditions and interconnector disruption.

**Modifying the Peaker Capacity Value and Flex Scaling Factor mechanisms in the WCRI**

We consider that a review of the Peaker Capacity Value and Flex Scaling Factor methodologies is likely to identify changes that would reduce the cap price and

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18 Annual BCV is the time weighted sum product of the quarterly BCV

19 The recent regulatory intervention has placed a floor price of equal to the regulated Off-Peak Cap Value ($1.14/MWh) to avoid a negative value in any quarter. The calculated Annual Average Baseload Cap Value may marginally exceed the Peaker Capacity when this is floor price applies.
moderate wholesale electricity prices calculated under the current WCRI whilst not undermining the relationship between contract and spot markets.

The potential for adjustments to reflect market scenarios is possible. Moderate adjustments to reflect energy, capacity, interconnection disruption and demand risks are possible. This should be designed so as to apply premiums and discounts to market-based pricing but not to create material arbitrage opportunities or inefficient market pricing.

**Simplifying the Baseload Cap Value pricing methodology**

The strong links of an interconnector limit the premiums and discounts that can be offered by the WCRI. The intended precision of the current WCRI Baseload Cap Value pricing methodology may not be warranted, and instead some less complex adjustments could be introduced to maintain linkages to market based pricing. Alternatives may be available to address market scenarios and the circumstances where the WCRI is oversubscribed due to a mismatch with Hydro Tasmania’s prices. The Rate Card would be free to respond to market pricing but remain in contact with Victorian and WCRI pricing. Ideally the WCRI and Victorian Reference pricing will provide a range (equivalent to a buy-sell spread) in which rate card prices can flourish and be benchmarked.

Enhancing the links to contract and spot markets in calculating cap pricing would allow moderate adjustments to prices, however any policy initiatives to materially adjust prices would still require measures outside the operation of the WCRI.

**Issues with application of Flex Scaling Factor to Baseload Cap Value**

All Flex Scaling adjustment to Victorian Pricing has targeted the Baseload Cap Value. The Flex Scaling Factor is based on a time-weighted average of annualised and long-term demand and water storage data. As noted this scaling has not applied directly to Victorian Reference Contract Values, but instead is used to scale the Peaker Capacity Value for calculation of Baseload Capacity Value.

Factor adjustments for market scenarios including demand, water storage and capacity risks should distinguish between the impacts and risk to energy supply and capacity adequacy. Constraints on energy supply are more likely to apply premiums and discounts to peak and baseload capped swap values; while capacity adequacy issues are more likely to apply premiums and discounts to peak and baseload cap values.

The present WCRI approach to lump all risks into Baseload Cap valuation is flawed. Under a drought scenario the price of energy is likely to rise, while there remains adequate capacity at short notice to provide continuity of supply and ensure prices are capped below $300/MWh.
Recommended actions on Peaker Capacity Value, Flex Scaling Factor methodology and Baseload Cap Value

We recommend the following actions to resolve issues with the Peaker Capacity Value, and with the Flex Scaling Factor and its impact on the Baseload Cap Value:

- Review of the Peaker Capacity Value and flex scaling methodology to introduce changes that reduce the cap price and moderate wholesale electricity prices calculated under the current WCRI whilst not undermining the relationship between contract and spot markets.

- Review the present WCRI approach that lumps all capacity and energy supply risks into the Baseload Cap Value. Adjustments should apply premiums and discounts that moderate peak and baseload capped swap values based on energy supply risks and peak and baseload cap values based on capacity risks. Adjustments should not undermine the fundamental relationship between contract and spot markets and the link to Victorian market pricing.

Finding 3: Peaker Capacity Value and Baseload Cap Value

The Peaker Capacity Value role and the capacity risk factor adjustments to value in each quarter in setting Baseload Cap Values are adding premiums and discounts to WCRI contract prices, creating volatility on a quarter by quarter basis. This is breaking down the linkage to Victorian market pricing.

Consideration should be given to reviewing the WCRI Baseload Cap Value pricing methodology to avoid unsustainable price variability and divergence from the linkage to Victorian prices.

Operation of WCRI during Basslink outages

When the WCRI is linked to Victorian market prices, the WCRI price is unlikely to materially distort efficient market operations and/or investment. However, this market link fails when the Basslink interconnector is out of service for a prolonged period, such as the event in the first half of 2016. When Basslink is out of service, the Tasmanian market operates completely independently to the Victorian market (and the rest of the NEM), with different market forces at play.

During this event the Tasmanian spot price and Hydro Tasmania rate card prices climbed considerably compared to the Victorian prices (indicating supply scarcity in Tasmania), and meanwhile the WCRI prices remained at the much lower Victorian prices. WCRI prices were below Hydro Tasmania’s generation costs for the prolonged period of time. This resulted in the WCRI being oversubscribed, and although not an original design objective, the WCRI also became in-effective as a benchmark for Rate Card pricing of unregulated contracts.
An alternative approach would be to not link the WCRI to the Victorian Market when Basslink is out of service for a prolonged period of time and to implement an alternative benchmark to pricing contracts affected by this market disruption. An adjustment based on alternative generation costs would cap the impact for uncontracted market customers exposed to higher spot prices. With a predefined trigger and price setting methodology, this could be implemented under the ESI Act (43M) which currently allows the Regulator to take into account supply disruptions. This approach may accommodate circumstances including a long-term failure of the interconnector. If further policy intervention were required, this could be implemented by a predictable and equitable rebate scheme.

**Finding 4: Operation of WCRI during Basslink outages**

It is not economically efficient to link WCRI prices to Victorian prices during a prolonged Basslink outage when the Tasmanian market is decoupled from the Victorian market. Consideration should be given to developing an alternative pricing methodology to apply during prolonged Basslink outages.

### 4.4 Other Design Matters

#### Scaling

When the WCRI is over-subscribed (which historically has been rare but occurs when WCRI prices are significantly below the unregulated contract rates), the WCRI scaling rules apportion contract volumes between eligible retailers.

The scaling rules apportion WCRI contract volumes based on each retailers’ share of small customer load. This results in Aurora Energy receiving the majority of WCRI contracts because it serves the majority of Tasmania’s small customers, including all residential customers on standing tariffs.

There is a disconnect between the allocation of the WCRI contracts, and the use of the WCRI contracts which is to manage wholesale market risk of customers on market contracts (i.e., not customers on standing offer contracts which are managed by a separate bilateral contract). This disconnect also exists for volume calculations.

The scaling methodology is heavily biased towards Aurora Energy to the disadvantage of ERM Business Energy and any new entrant retailer that does not offer products in the residential market.

The scaling methodology is a potential barrier to new entrant retailers. A retailer looking to enter the Tasmanian market to supply commercial customers will not have access to WCRI contracts, which increases risk for that retailer and also could place the retailer at a competitive disadvantage during periods when the WCRI contracts are priced lower than unregulated contracts.
Consideration should be given to amending the WCRI scaling methodology to better align the allocation of the WCRI contracts with the customer load that the WCRI contracts are used to manage. An alternative to using the market share of small customer load is recommended.

**Finding 4: Scaling**

The WCRI scaling rules are biased towards Aurora Energy due to its large number of customers on standing offer contracts, despite WCRI contracts not being used to manage wholesale market risk for these customers. This may be a barrier to new entrant retailers.

Consideration should be given to amending the WCRI scaling methodology to better align the allocation of WCRI contracts with the customer load that the WCRI contracts are used to manage.

**Complexity**

The adjustments made to the Victorian contract prices to deliver the WCRI prices are complex (as illustrated in Attachment 1) and have been found to diminish the links to market-based pricing.

Some stakeholders advised us that they are not familiar with many of the adjustments within the WCRI methodology; rather, they focus on the inputs that they have found to materially impact the WCRI prices.

The complexity of the WCRI pricing methodology and adjustments that diminish its links to market-based pricing could be a barrier to new entrant retailers and generators, who may consider this complexity and uncertainty of pricing to be a risk. As such, the complexity may have benefited incumbents, who through direct experience understand how the WCRI works and can explore its pricing inefficiencies.

Simplifying the WCRI pricing methodology would have the effect of increasing transparency and certainty of outcomes for potential new entrants. This could focus on delivering prices that are predictable and reliable, if not technically pure.

**Finding 5: WCRI simplification**

Consideration should be given to simplifying the WCRI pricing methodology, which would have the effect of increasing transparency and certainty of outcomes for potential new entrants.

The WCRI contracts are too inflexible and the validity period is too short to be a preferred hedging contract for retailers.

Retail contract negotiations with customers require offers to be made with reasonable validity periods. These require prices to match customer load profiles that may be significantly different to the system load profile.
There are only four WCRI contracts offered, and the validity period is just 2 hours. The uncertainty of pricing and receiving a needed WCRI product mix gives retailers fewer options to hedge customer load than is offered by Hydro Tasmania through its unregulated contracts (Hydro Tasmania offers a 5-day validity period on its Rate Card), and considerably fewer profile options than are available to retailers in other NEM jurisdictions. This is one of the main reasons why retailers prefer to use unregulated contracts to manage customer load in Tasmania. It would not be efficient for retailers to only use WCRI contracts (if volumes permitted) to manage their Tasmanian positions.

Introducing greater flexibility and choice of WCRI contracts would increase regulatory and compliance costs, for what we would consider to be limited benefit given retailers are comfortable using unregulated contracts. The WCRI is acting as an effective safety net and reference point for unregulated contract pricing, and for that purpose we don’t consider that changes to the WCRI contracts are warranted.

There may however be merit in considering extending validity periods for WCRI contracts if this can be achieved at little cost and risk to Hydro Tasmania.

Finding 6: Validity periods

Consideration should be given to extending validity periods for WCRI contracts to improve price certainty, if this can be achieved at little cost to Hydro Tasmania.

Market Participant Access to Inter-Regional Contracts

We believe the interests of the competitive market in Tasmania would be best served if inter-regional trade with Victoria was expanded through the introduction of inter-regional contracts to manage price risk between regions. This would provide participants in Tasmania greater scope to trade with mainland counter-parties which would significantly increase competition in the wholesale electricity contracts market.
Inter-regional contracts could be based on a pre-determined share of settlement residues (discussed below) or could be a financial product offered by Hydro Tasmania or another party.

### Inter-regional Settlement Residues

Between mainland NEM regions, the inter-regional settlement residues are received by the Australian Energy Market Operator and auctioned to market participants. Residues exist across an interconnector because electricity is bought in one region at a lower price and sold into the other region at a higher price. Settlements residues accrue in each direction of energy transfer. The settlement residue in any period is calculated by AEMO based on the spot price in each region, marginal loss factors, interconnector capacity and flows. For this reason, the settlement residues are auctioned, and a prospective purchaser bids for a share of this residue.

Hydro Tasmania receives all interconnector settlement residues across Basslink. Inter-regional contracts are not offered by Hydro Tasmania or accessible to market participants. Constraints may apply that may limit Hydro Tasmania’s capacity to offer or auction the market settlement residue it receives for Basslink operations. As a DC link Hydro Tasmania has control of interconnector flows, however we understand Hydro Tasmania does not actively offer bid prices to dispatch the Interconnector. Nevertheless, Hydro Tasmania still has considerable influence on these flows as a dominant generator in the Tasmanian Region.

The settlement residues provide a natural hedge to spot energy sold to and purchased from the Victorian region.

On 31 July 2005, the Tasmanian Treasurer issued a Ministerial Notice requiring Hydro Tasmania to sell southbound Basslink inter-regional-settlement residues. At that time there was very little interest in this product and the sale of inter-regional settlement residues was discontinued.

The Tasmanian market was very different in 2005 compared to today. Since 2005, the retail electricity market in Tasmania has been opened to full retail competition, but only ERM Business Energy has entered the Tasmanian retail market to serve business customers only. There has been little investment in new renewable generation, despite Tasmania having an energy deficit. Most of the Federal Government subsidies have gone of mainland renewable energy investment.

Availability of inter-regional contracts would give new entrant retailers and new entrant generators a greater choice of contract counter-parties. This would reduce wholesale market risk and might entice new entrants into the Tasmanian Market.

We acknowledge that there are design and implementation complexities to introducing inter-regional contracts. We also acknowledge that there seems to be little appetite for the introduction of inter-regional contracts from incumbent participants, and as such the product may only be used if new participants entered the Tasmanian market.
We consider there is merit in re-evaluating inter-regional contracts in Tasmania, to assess whether the benefit of lower barriers to entry for new participants outweighs the cost of introducing inter-regional contracts.

Finding 7: Inter-regional risk management

Consideration should be given to facilitating the introduction of inter-regional contracts to manage inter-regional price risk. This would lower the barriers to entry for new participants, improve access to competitive contract purchases and sales to market participants, and increase competition to incumbent participants.
5 Conclusion

We find that the WCRI has achieved its original design objective, that is to provide Tasmanian market participants an instrument that allows them to manage wholesale market risk in the Tasmanian market.

We have concerns that prospective new entrant market participants may not share this confidence in the WCRI, given they are potentially disadvantaged by the WCRI price premiums, WCRI complexity, and WCRI scaling rules. The WCRI may therefore not be assisting to increase competition in the Tasmanian market as originally envisaged. Given the WCRI’s existing price premium and complexities, including its dominant allocation to Aurora Energy based on its small customer load (and which is not actively competed), we consider that the WCRI could better contribute to the Tasmanian Government’s Vision of affordable, competitive and predictable prices for customers.

We consider there is merit in exploring the following improvements to the Tasmanian Wholesale Electricity Market Regulatory Pricing Framework, that will not jeopardise the benefits of the market linkage to the mainland NEM regions:

1. Design a predictable rebate scheme that will give customers confidence that they will be protected from mainland price volatility.
2. Modify the adjustments in the WCRI methodology, which result in price premiums, problematic price variability and divergence from the linkage to Victorian prices, such as the Peaker Capacity Value role in setting Baseload Cap Values.
3. Developing an alternative pricing methodology, that is not linked to Victorian prices, to apply during prolonged Basslink outages.
4. Amend the WCRI scaling methodology to better align the allocation of WCRI contracts with the customer load that the WCRI contracts are used to manage.
5. Simplify the WCRI pricing methodology, which would have the effect of increasing transparency and certainty of outcomes, especially for potential new entrants.

6. Extend the validity periods for WCRI contracts to improve price certainty, where this can be achieved at little risk to Hydro Tasmania.

7. Facilitate the introduction of inter-regional risk management products, to lower the barriers of entry to new retailers, improve access to competitive contract purchases and sales to market participants, and increase competition to Hydro Tasmania and Aurora Energy.

Regulatory certainty is highly valued in markets. The above potential improvements should be carefully explored to ensure the benefits will outweigh the costs before implementation. Current NEM initiatives should also be considered in the timing and design of any amendments to the Tasmanian Wholesale Electricity Market Regulatory Pricing Framework.

### 5.1 Next Steps

The next phase of the WCRI review involves developing to solutions to address the issues identified in this report. This may also involve deeper analysis of some targeted issues to support solutions such as:

- The role of the flex scale factor mechanism and peaker capacity value in setting Baseload Cap Values; and
- Net System Load Following Swaps, price used for the retail price determination for standing offer contracts.

Clarification of the Government’s new energy policy will be required to identify changes in focus and priorities compared to the previous energy policy. The analysis in this report will support the development of solutions to deliver the Government’s new energy policy. Clarification of policy will provide direction to find the appropriate balance between providing market signals to deliver operational and dynamic efficiency in the Tasmanian market, and mechanisms to ensure Tasmanian customers benefit from the low cost of on island renewable generation.
Attachment 1 – Illustrative WCRI Flow Chart
Wholesale Contract Regulatory Instrument
Part 3 – Pricing Methodology – Q218