



**FCAS PRICING INVESTIGATION
DRAFT REPORT**

An investigation of the pricing policies of Hydro Tasmania for the supply of raise contingency frequency control ancillary services to meet the Tasmanian local requirement.

NOVEMBER 2010

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Office of the Tasmanian Economic Regulator

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GLOSSARY

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AETV Power	The trading name of Aurora Energy (Tamar Valley) Pty Ltd
AFMA	Australian Financial Market Association
Aurora Energy	Aurora Energy Pty Ltd
Delayed raise FCAS	Five minute raise contingency FCAS
DIER	Department of Infrastructure, Energy and Resources
ESI Act	<i>Electricity Supply Industry Act 1995</i>
Fast raise FCAS	Six second raise contingency FCAS
FCAS	Frequency control ancillary services
Hydro Tasmania	The trading name of the Hydro-Electric Corporation
IES	Intelligent Energy Systems Pty Ltd
IES Consultation Draft Report	<i>IES, Raise contingency FCAS – contract design and pricing, consultation draft, 15 October 2010</i>
IES Price Control Draft Report	<i>IES, Raise contingency FCAS price control mechanism, draft report, 20 June 2010</i>
IES Price Control Final Report	<i>IES, Raise contingency FCAS price control mechanism, final report, 28 July 2010</i>
ISDA	International Swaps and Derivatives Association, Inc
Issues Paper	<i>OTTER, Notice of intention to declare the supply of raise contingency frequency control ancillary services by Hydro Tasmania as a declared electrical service, Issues Paper, July 2009</i>
NEM	National Electricity Market
NEMDE	National Electricity Market Dispatch Engine
NEO	National Energy Objectives
NER	National Electricity Rules
OTTER	Office of the Tasmanian Economic Regulator

Price Control Regulations	<i>Electricity Supply Industry (Price Control) Regulations 2003</i>
REC	Renewable Energy Certificate
Regulator	The Economic Regulator established under the <i>Economic Regulator Act 2009</i>
Slow raise FCAS	Sixty second raise contingency FCAS
Statement of Reasons	OTTER, <i>Declaration of frequency control ancillary services, statement of reasons</i> , December 2009

EXECUTIVE SUMMARY

The Tasmanian Economic Regulator is empowered under the *Electricity Supply Industry (Price Control) Regulations 2003* to make determinations regulating the prices that may be charged by, and specifies the price controls that may be imposed on, an electricity entity for the supply of a declared electrical service.

In January 2010, the Regulator declared the following services supplied by Hydro Tasmania to be “declared electrical services”:

- fast raise contingency frequency control ancillary service;
- slow raise contingency frequency control ancillary service; and
- delayed raise contingency frequency control ancillary service;

to meet the Tasmanian local requirement.

Following the declaration of the services, the Regulator gave notice of the commencement of the investigation into Hydro Tasmania’s pricing policies in respect of the declared electrical services and consulted on terms of reference for the investigation.

The Regulator has approached the investigation in two steps – (1) the determination of a price control mechanism to be imposed on Hydro Tasmania for the supply of the declared electrical services and (2) the prices that may be charged by Hydro Tasmania.

The Regulator has completed step 1 and decided that the price control mechanism to be imposed on Hydro Tasmania for the supply of the declared electrical services shall be the regulation of Hydro Tasmania’s provision and pricing of FCAS contracts. The Regulator has also made the decision, as part of step 1 that the price determination will be effective for a period of five years from the date of commencement of the determination, subject to the Regulator’s powers of revocation in appropriate circumstances.

This Draft Report has been prepared by the Regulator in accordance with regulation 29(1) of *the Price Control Regulations*. It contains both the Regulator’s decisions arising from step 1 and proposals for the regulation of Hydro Tasmania’s pricing of FCAS contracts (step 2).

The Regulator invites submissions in response to this Draft Report, which includes a consultation paper at Appendix A prepared by the Regulator’s consultant, Intelligent Energy Systems, on the pricing of FCAS contracts. Note, however, that the Regulator has already consulted on the price control mechanism and the period for which the price determination will apply as part of step 1, and has made its decisions in this regard, so will not be re-opening these aspects for further comment.

Submissions should be lodged by 24 November 2010 with the:

Office of the Tasmanian Economic Regulator
GPO Box 770, HOBART TAS 7001

or

Facsimile: 03 6233 5666

or

Email: office@economicregulator.tas.gov.au

Following consideration of submissions, the Regulator will prepare and publish a Final Report and make a declared electrical service price determination to give effect to the Regulator's decisions on the pricing of the services.

To assist informed discussion, the Regulator intends to publish all submissions on the Regulator's website unless the author of the submission requests confidentiality in relation to the submission (or any part thereof). To facilitate the publication of submissions on the Regulator's website, submissions should be made electronically where possible. Those parts of a submission that are requested to be confidential should be submitted as an attachment to that part suitable for publication.

Enquiries concerning this Draft Report should be directed to:

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SUMMARY OF DRAFT DECISIONS AND MATTERS FOR CONSULTATION

The Regulator has decided that the price control mechanism to be applied to Hydro Tasmania shall be the regulation of Hydro Tasmania's provision and pricing of FCAS contracts. The Regulator has also decided that the period of the price determination will be five years from the date of commencement of the determination.

In this Draft Report, the Regulator proposes that the terms and conditions, pricing methodology, and parameters for a general FCAS hedge contract provided by Hydro Tasmania will be those recommended in the *Raise contingency FCAS – contract design and pricing, 15 October 2010, consultation draft* (IES Consultation Draft Report) prepared by Intelligent Energy Services for the Regulator and summarised as follows:

- Hydro Tasmania will be required to offer to other Tasmanian generators a general FCAS hedge contract, designed as a 'safety net' contract, that is not subject to any special conditions (other than conditions relating to self provision and new sources of supply) or exclusions.
- Generators can negotiate price variations for accepting any special conditions or exclusions.
- The method for estimating Hydro Tasmania's costs in providing the declared electrical services will be through the determination of Hydro Tasmania's costs of physically delivering to the spot market the amount of FCAS nominated in the FCAS hedge contract.
- The costs of delivery of the services to the spot market will be determined using the methodology and parameters recommended by IES in Chapter 3 of the IES Consultation Draft Report (attached as Appendix A to this Draft Report).
- The parameter values to be used to determine the contract price and settlements will be those recommended by IES in Chapter 4 of the IES Consultation Draft Report.
- The 'safety net' contract will be for a bundle of the three declared electrical services.
- The contract quantity for each dispatch interval will be based on the generator's actual fast raise FCAS MW liability (based on the generator's output for the dispatch period) capped by a maximum requirement or requirements.

- There will be provision for the quantity specified in the contract to be reduced to the extent that the generator provides its own services.
- Should Hydro Tasmania be able to improve its efficiency in providing the declared electrical services, the pricing methodology will not change.
- The methodology, current values of parameters, standing data and the 'safety net' contract documentation will be published on Hydro Tasmania's website.
- The price of 'safety net' contracts will be fixed for six months and recalculated on a six monthly basis in accordance with the published methodology prior to the commencement of each six month period.
- The determination will commence on 1 January 2011.

The Regulator assumes that standard ISDA documentation and/or associated documentation developed by AFMA that is specific to electricity derivative transactions would be used for FCAS contracts between Hydro Tasmania and Tasmanian generators.

The Regulator is seeking submissions on the above proposals.

1 INTRODUCTION

1.1 Background to the investigation

The Regulator is conducting an investigation into the pricing policies of Hydro Tasmania in respect of its supply of the following services:

- fast raise contingency frequency control ancillary service;
- slow raise contingency frequency control ancillary service; and
- delayed raise contingency frequency control ancillary service;

to meet the Tasmanian local requirement.

This investigation follows the Regulator's decision on 4 January 2010 to declare, in accordance with regulation 19(2) of the *Electricity Supply Industry (Price Control Regulations) 2003* (Price Control Regulations), the above services as "declared electrical services".¹

This investigation is being conducted in accordance with the Price Control Regulations, which provide for regulatory intervention in the pricing of the supply of a good or service by an electricity entity where the Regulator is of the opinion that the electricity entity has substantial market power in the supply of a good or service, and the promotion of competition, efficiency or the public interest warrants that intervention.

In this Draft Report and its appendices, the Regulator:

- (a) confirms that an obligation on Hydro Tasmania to offer hedge contracts for raise contingency FCAS to other Tasmanian generators, where the price methodology, parameters and terms and conditions are approved by the Regulator, is the price control mechanism to be applied in the regulation of the declared electrical services;
- (b) confirms that the period of the determination will be five years from the commencement of the determination; and
- (c) proposes the pricing methodology, parameters, and the basis for setting parameter values, in a general hedge contract to be offered by Hydro Tasmania for the declared electrical services.

The Regulator will take submissions on its proposals in respect of (c) and, following consideration of those submissions, will publish a Final Report on the investigation

¹ OTTER, *Declaration of frequency control ancillary services, statement of reasons*, December 2009

and make a determination that will set out the prices and price control mechanism for a regulatory period of five years.

1.2 Context

This section describes the context in which the Regulator is undertaking its investigation, including national and Tasmanian electricity policy objectives, and the present situation in the National Electricity Market (NEM) and Tasmania with respect to the supply of the declared electrical services.

1.2.1 Tasmanian legislative framework

Electricity Supply Industry Act 1995

The Tasmanian Government's policy objectives are reflected in the *Electricity Supply Industry Act 1995* (ESI Act), which governs the electricity supply industry in Tasmania, and include the promotion of efficiency and competition in the electricity supply industry and the protection of consumers of electricity.

The ESI Act establishes the office of the Regulator, being the three-person body established under the *Economic Regulator Act 2009*. Members of the Regulator are Mr Glenn Appleyard, Mr Alan Smart and Mr Peter Hoult.

Electricity Supply Industry (Price Control) Regulations 2003

The *Electricity Supply Industry (Price Control) Regulations 2003* provide for regulatory intervention in the pricing of the supply of a good or service by an electricity entity where, in the Regulator's opinion, there is substantial market power in the supply of the good or service and where the promotion of competition, efficiency or the public interest warrants that intervention. That intervention is in the form of:

- (a) a declaration of the relevant services as "declared electrical services";
- (b) an investigation of the pricing policies by that entity for the declared electrical services; and
- (c) a determination of the prices that may be charged for, or the price controls that may be imposed on, the entity for the supply of those services.

1.2.2 National energy policy objectives

In 2001, the Council of Australian Governments agreed to a set of core national energy policy objectives and principles to guide future energy policy decision making by jurisdictions and to provide increased certainty for energy users.

Those core objectives include:

Encouraging efficient provision of reliable, competitively priced energy services to Australians, underpinning wealth and job creation and improved quality of life, taking into account the needs of regional, rural and remote areas.²

This objective was further recognised in the following objective contained in the Australian Energy Markets Agreement to which all states are signatories:

The promotion of the long term interests of consumers with regard to the price, quality and reliability of electricity and gas services.³

and reflected in the National Electricity Objective, as stated in the National Electricity Law (NEL)⁴

... to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to –

- (d) price, quality, safety, reliability, and security of supply of electricity; and
- (e) the reliability, safety and security of the national electricity system.

The Regulator considers that this investigation meets these national objectives.

1.2.3 Frequency control ancillary services in the NEM

Frequency control ancillary services (FCAS) are required to maintain the frequency of the power system within frequency operating standards determined by the Australian Energy Market Commission (AEMC).⁵ To maintain frequency, the Australian Energy Market Operator (AEMO) procures FCAS from registered participants registered for one or more of the eight distinct FCAS spot markets in which they wish to provide their services.

This investigation relates to the supply of the three raise contingency FCAS that are required to be available to correct the frequency excursions that may arise from a contingent event that results in a decrease in frequency. Such contingent events include the loss of a generating unit and the loss of a single transmission circuit. The three raise contingency FCAS are:

- fast services, which provide a fast acting response to arrest frequency deviations within the first six seconds of a contingent event;

² Council of Australian Governments' Communiqué – 8 June 2001

³ Australian Energy Market Agreement (as amended) 2 June 2006

⁴ Section 7 NEL.

⁵ Australian Energy Market Commission Reliability Panel, *Tasmanian Frequency Operating Standard Review, Final Report*, 18 December 2008, Appendix A.

- slow services, which provide a slower acting response to stabilise frequency deviations within 60 seconds of the event; and
- delayed services, which provide further stability to the system by returning the frequency to the normal operating band within five minutes.

Generators are paid for being enabled to provide these services whether or not a contingent event occurs.

Generally, AEMO will procure the necessary FCAS from all interconnected regions in the NEM using its NEM Dispatch Engine (NEMDE). As the energy and FCAS markets are strongly related, NEMDE determines the optimal dispatch of energy and FCAS, based on the energy and FCAS bids and offers in the energy and eight FCAS spot markets, to minimise the total cost of energy and FCAS across the NEM.

AEMO recovers the costs of raise contingency FCAS services in the NEM from generators, as raise contingency FCAS requirements are mostly set to manage the loss of a generator on the system. All payments for these services are recovered from generators in proportion to the energy they generate. A generator, therefore, is liable to pay the market price for the three raise contingency services whenever it generates.

Costs for raise contingency FCAS are allocated to the region, rather than globally, where local regional requirements determine the costs of the local FCAS.

1.2.4 Frequency control ancillary services in Tasmania

Contingent events which may influence the requirements for raise contingency FCAS in Tasmania include tripping of the largest generating unit, a single transmission line circuit and/or Basslink. The amounts of each of the services required are usually determined by the type and size of the generators that are connected, the load on the power system, the inertia of the power system and Basslink flows.

Raise contingency FCAS are supplied in the Tasmanian region of the NEM by registered service providers, which comprise Hydro Tasmania (the only registered provider of these services in Tasmania) and mainland suppliers through Basslink.

Basslink is able to provide raise contingency FCAS to cater for contingency events in Tasmania at certain operational levels, through its interconnection with the rest of the NEM, by increasing power transfers into the Tasmanian grid.

However, there are restrictions on the amount of raise contingency FCAS that can be provided via Basslink. The amount is dependent on the margins between Basslink flows and Basslink limits (Basslink provides a continuous rated export

capacity of 600 MW from Tasmania and an import capacity up to a maximum of 480 MW⁶), and a no-go zone (± 50 MW) in which Basslink is unable to transfer FCAS.

When Basslink is at or close to its rated import capacity or its no-go zones, or in the event that Basslink is out of service, the local requirement for raise contingency FCAS to cater for a local contingency event must be supplied from local generators (by increasing their output) or customers (through shedding load), who are registered with AEMO to provide these services. As Basslink is not able to transfer FCAS to cater for its own tripping, around 70 MW of fast raise FCAS must also be enabled locally to cater for its loss while importing. Only Hydro Tasmania can supply the local requirement in these circumstances, being the only participant registered with AEMO in the FCAS markets that can supply raise contingency FCAS in the Tasmanian region.

As mentioned earlier in this Draft Report, costs for raise contingency FCAS are allocated to the region, rather than globally, where local regional requirements determine the costs of the local raise contingency FCAS. Under this arrangement, market generators in Tasmania are exposed to higher charges for raise contingency FCAS services than market generators in the rest of the NEM:

- when the local FCAS requirement cannot be met by import of such services over Basslink; or
- where the local requirement is determined by the residual requirements to cater for a trip of Basslink;

and the price offered for the local services exceeds the price in the remainder of the market.

Therefore, where the local regional FCAS requirement determines the cost of the services, Hydro Tasmania receives all the revenue for the provision of the services from local market generators.

1.2.5 Sources of raise contingency FCAS in Tasmania

In Tasmania, the sources of FCAS are via Basslink where an increase in imports will effect an increase in frequency, and Hydro Tasmania generators, registered with AEMO to provide particular FCAS services. For the Hydro Tasmania generators, the generator's governor reacts to the frequency decrease by increasing the MW output. However, the reserving of a MW output for FCAS services is at the expense of producing energy. AEMO co-optimises energy production and FCAS 'enablement' to achieve the least cost solution to meet demand.

⁶ Basslink does not operate at its maximum physical import of 480 MW. In practice, Basslink's import is limited by the amount of interruptible load in the Frequency Control Special Protection Scheme (FCSPS).

Other options for the provision of raise contingency FCAS in Tasmania can be summarised as follows:

- other Tasmanian generators can register with AEMO to provide the particular FCAS services;
- customers can register with AEMO to make their loads available for quick disconnection in response to a decline in frequency; and
- investment in 'stand alone' technologies such as energy storage systems, again registered with AEMO, which can provide a "burst of power" when a frequency decrease is detected and thus contribute to FCAS raise services.

1.3 The investigation process

1.3.1 Declaration of electrical services

The Regulator has declared, by notice in the *Gazette* of 3 February 2010, the following services to be declared electrical services, pursuant to regulation 19(2) of the Price Control Regulations:

- fast raise contingency frequency control ancillary service;
- slow raise contingency frequency control ancillary service; and
- delayed raise contingency frequency control ancillary service;

provided by Hydro Tasmania to meet the Tasmanian local requirement.

In making the declaration, the Regulator is of the opinion that Hydro Tasmania has substantial market power in respect of the above services and the promotion of competition, efficiency and the public interest requires the making of the declaration.

Prior to gazettal, the Regulator published its reasons for making the declaration on 4 January 2010 in its *Declaration of frequency control ancillary services, statement of reasons, December 2009* (Statement of Reasons).

1.3.2 Requirement to investigate

Regulation 23(1) of the Price Control Regulations requires the Regulator to conduct an investigation into the pricing policies of an electricity entity in respect of a declared electrical service.

Before conducting this investigation, the Regulator gave written notice of the investigation to the Treasurer, Minister for Energy and Hydro Tasmania on 3 March 2010 in accordance with regulation 24. The notice:

- specified the purpose of the investigation, that is, to determine the price control mechanism to be imposed on, and prices to be charged by, Hydro Tasmania for the provision of the declared electrical services;
- specified a date of 26 November 2010 for the completion of the investigation;

- gave a period of seven weeks in which written submissions could be made to the Regulator on the terms of reference and any other matters relevant to the investigation; and
- specified, in the terms of reference for the investigation, the matters that the Regulator requested submissions to address.

The Regulator also gave notice of the investigation in the public notices of the *Mercury* on 6 March 2010 and published the notice on the OTTER website: www.economicregulator.tas.gov.au.

1.3.3 Terms of reference

Notice of this investigation and the terms of reference for the investigation, were provided to Hydro Tasmania, the Treasurer and Minister for Energy on 3 March 2010 and published in the *Mercury* newspaper on 6 March 2010. Tasmanian generators and other interested parties were also notified. The notice and terms of reference are reproduced in full in Appendix B.

Under the terms of reference, the Regulator is to investigate and make a determination that regulates the prices that may be charged by, and specifies the price control mechanisms to be imposed on, Hydro Tasmania for the provision of the declared electrical services.

The terms of reference contain those matters that the Regulator will consider in making a declared electrical service price determination, namely those matters listed in regulation 33(2) of the Price Control Regulations that are relevant to this investigation. (The outcome of the Regulator's consideration of each of these matters is reflected in Chapter 5 of this Draft Report.)

The terms of reference also list the manner and terms in which the prices and price control mechanisms may be expressed, namely those matters listed in regulation 18 of the Price Control Regulations. (Refer Chapter 3 of this Draft Report for this list.)

The notice called for submissions from any interested person, body or entity on matters raised in the terms of reference and any other matter relevant to the investigation including Hydro Tasmania's submission to the investigation, submitted to the Regulator on 30 April 2010. Submissions were also received from AETV Power and Aurora Energy.

The terms of reference were amended on 24 September 2010 to extend the date of completion of this Draft Report to 22 October 2010 with a consequential reduction of the period for receipt of submissions on the Draft Report from four weeks to three weeks. A further amendment was made on 27 October 2010 to extend the date for completion of the investigation to 10 December 2010. The Treasurer, Minister for Energy, Hydro Tasmania and other interested parties were notified of this change with the release of this Draft Report on 3 November 2010.

Subsequent to the Regulator's issue of its notice of investigation, there have been several opportunities for interested parties to make submissions. The first

opportunity was provided in the seeking of submissions on the terms of reference and Hydro Tasmania's submission to the investigation. The second opportunity was provided in seeking submissions on the *Raise contingency FCAS price control mechanism, draft report, 18 June 2010* (IES Price Control Draft Report) on a price control mechanism to be applied to Hydro Tasmania in the supply of the declared electrical services. All submissions have been published on the Regulator's website.

As comments made on Hydro Tasmania's submission to the investigation, and comments made on the IES Price Control Draft Report have been taken into account by IES in the preparation of its IES Price Control Final Report, only those submissions on the terms of reference for the investigation have not received a formal response during the process. A summary of the matters raised, and the Regulator's response, are contained at Appendix C.

The Regulator invites submissions in response to this Draft Report, in particular, the IES Consultation Draft Report at Appendix A. Note, however, that the Regulator has already consulted on the price control mechanism and the period for which the price determination will apply, and has made its decisions in this regard, so is not re-opening these aspects for further comment.

1.3.4 Public hearing

When the terms of reference were issued, an obligation existed in regulation 25 of the Price Control Regulations for the Regulator in conducting an investigation, to hold a hearing. However, the Price Control Regulations were amended on 30 June 2010 and now provide the Regulator with discretion as to the conduct of a hearing.

The Regulator notes that public interest in this investigation has been limited, with those parties that are directly affected by the outcome of the investigation, making submissions and meeting with the Regulator's consultants. The Regulator considers that the costs in holding a public hearing outweigh its benefits, there being many opportunities for interested parties (typically Tasmanian generators) to express their views to the Regulator. The Regulator notes that there was considerable interest from local Tasmanian generators in relation to the declaration of the services and, in the absence of any submission to the contrary, assumes that most generators and interested parties are comfortable with the Regulator's approach in the regulation of the services.

Furthermore, during the process, Tasmanian generators were given the opportunity to meet with the Regulator's consultant, Intelligent Energy Systems Pty Ltd (IES), in relation to the pricing of the declared electrical services. Only AETV Power availed itself of the opportunity.

The Regulator has, therefore, decided not to hold a hearing in relation to this matter.

1.3.5 Draft Report

Regulation 29 of the Price Control Regulations requires the Regulator to prepare a draft report in respect of the investigation and allow submissions to be made in respect of the draft report.

The closing date for submissions on this Draft Report is 24 November 2010.

1.3.6 Final report and determination

Submissions received in response to this Draft Report and, in particular, IES's Consultation Draft appended to this Draft Report, will be taken into account by the Regulator in making its final decision, which will be published in a final report in accordance with regulation 30.

The Regulator's Final Report will be published no later than 17 December 2010.

The Regulator will provide copies of the Final Report to the Treasurer, Minister for Energy and Hydro Tasmania, and publish the Final Report on the OTTER website: www.economicregulator.tas.gov.au. Copies of the Final Report will be made available to interested parties on request.

The Regulator will then, as required by sub-regulation 31(1), make a determination that regulates the prices that may be charged by, and specifies the price control mechanisms imposed on, Hydro Tasmania in respect of the declared retail services.

2 APPROACH TO THE INVESTIGATION

The Price Control Regulations require the Regulator to invite submissions in response to a draft report prepared under regulation 29. A consultative process is a feature of the regulatory framework and the Regulator provides extensive opportunity for industry, customers and interested parties to participate in an investigation.

2.1.1 Objectives and principles

The Regulator's objectives in undertaking this investigation and making a determination are to promote efficiency and competition in the Tasmanian electricity supply industry and protect electricity consumers from the adverse effects of the exercise of substantial market power. In achieving this objective, the Regulator has applied the following principles:

- (a) The price control mechanism to be applied to the supply of the declared electrical services will:
 - (a) be consistent with the National Electricity Objective;
 - (b) not be unduly onerous on Hydro Tasmania in its application;
 - (c) have minimal impact, if any, on the wider National Electricity Market; and
 - (d) not require an amendment to the National Electricity Rules nor add complexity to the National Electricity Market dispatch process.
- (b) The price control mechanism to be imposed on, and the prices to be charged by, Hydro Tasmania will:
 - (a) be fair and reasonable;
 - (b) enable Hydro Tasmania to recover its costs for the efficient provision of the declared electrical services;
 - (c) provide market signals that promote efficiency and maximise incentives for other parties to supply raise contingency FCAS in the Tasmanian region; and
 - (d) not impose significant regulatory costs on the Regulator or Hydro Tasmania.

2.1.2 Two step process

Regulation 18 of the Price Control Regulations specifies the manner and terms in which the regulation of prices that may be charged and price control mechanisms may be expressed, without limitation on the Regulator. The Regulator decided on a two-step process leading up to the publication of this Draft Report, namely:

- the determination of an appropriate price control mechanism to be applied to the supply of the declared electrical services by Hydro Tasmania; and
- once that mechanism was established, the pricing of the services.

2.1.3 Price control mechanism

In step 1 of the two step process, the Regulator engaged Intelligent Energy Systems (IES) to advise on an appropriate price control mechanism. IES prepared its IES Price Control Draft Report which recommended the regulation of Hydro Tasmania's provision and pricing of FCAS contracts as the preferred price control mechanism to be applied to Hydro Tasmania in the supply of the declared electrical services. The Regulator consulted on the IES Price Control Draft Report. IES took account of the submissions in preparing its *Raise contingency FCAS price control mechanism, final report, 28 July 2010* (IES Price Control Final Report) and delivered its recommendation to the Regulator. The price control mechanism is discussed in Chapter 3 of this Draft Report.

On 26 July 2010, the Regulator agreed that an obligation on Hydro Tasmania to offer hedge contracts for raise contingency FCAS to other Tasmanian generators, where the price methodology, parameters and terms and conditions are approved by the Regulator, was the appropriate price control mechanism to be applied. The Regulator published the IES Price Control Final Report on its website, together with advice of the Regulator's decision.

2.1.4 Regulated FCAS contract

In the second step of the two-step process, the Regulator engaged IES to develop the terms and conditions, pricing methodology and price parameters for an FCAS contract to be offered by Hydro Tasmania to other Tasmanian generators for the declared electrical services.

Accordingly, IES prepared its *Raise contingency FCAS – contract design and pricing – consultation draft, 15 October 2010* (IES Consultation Draft Report) on this matter for the Regulator which is contained at Appendix A. The Regulator invites comment on any matters contained in the IES Consultation Draft Report which forms part of this, the Regulator's Draft Report.

2.1.5 Period of the determination

In the terms of reference, the Regulator indicated that it would consult stakeholders on the date on which the determination would commence and expire (the regulatory period). The Regulator consulted on this aspect in step 1 of the investigation process, that is, as part of the consideration of an appropriate price control mechanism, and agreed that the determination would have effect for five years from the commencement date of the determination. This matter is discussed in Chapter 6 of this Draft Report.

3 STEP 1 - PRICE CONTROL MECHANISM

Regulation 18 of the Price Control Regulations specifies the terms or manner in which the regulation of prices that may be charged and price control mechanisms may be expressed namely:

- (a) maximum prices or the maximum rate of increase or the minimum rate of decrease in maximum prices;
- (b) average prices or average rates of increase or decrease in average prices;
- (c) pricing policies or principles;
- (d) by reference to a general price index, the cost of production, revenue, a rate of return on assets or any other factor;
- (e) by reference to quantity, location or period of provision of the electrical service;
- (f) by reference to an annual aggregate revenue requirement; and
- (g) any other terms the Regulator considers appropriate.

The Regulator considered that a two stage process was warranted in this investigation, commencing with the determination of an appropriate price control mechanism to apply in the regulation of the declared electrical services, and pursuant to that outcome, the regulation of prices.

The Regulator engaged consultants IES to analyse and advise on the reasonable options for price control mechanisms to regulate the prices that may be charged by Hydro Tasmania for the declared electrical services and advise on the most appropriate option.

In summary, the terms of reference for the consultancy required the consultant to:

- devise a number of potential (candidate) price control mechanisms that could reasonably be applied to regulate the prices of the declared electrical services that might include, but were not limited to options such as:
 - limiting the offer prices that may be submitted by Hydro Tasmania in respect of the declared electrical services;
 - an obligation to offer a specified minimum volume of each service;
 - limiting the revenue that Hydro Tasmania can procure from the declared electrical services over a period of time; and

- financial contracting obligations that will protect the interests of consumers and promote competition in the downstream and upstream markets;
- consider each candidate price control mechanism to ensure that the matters and principles set out in regulation 33(2) could be appropriately addressed, within the scope of the declaration;
- assess each candidate price control mechanism against the additional matters the Regulator requires the consultant to consider taking into account:
 - the links between supply of the various declared electrical services and the supply of energy and other ancillary services;
 - the importance of these links to the long-term efficient supply of energy and the maintenance of frequency standards in Tasmania;
 - the links between the various declared electrical services and energy or other ancillary services through dispatch co-optimisation in the NEM, and the potential impacts from each particular form of price control on overall outcomes given that price control will only apply to some of the services; and
 - any potential consequential impacts on the price and efficiency and adequacy of supply of energy and other ancillary services by third parties resulting from regulation of some services provided by Hydro Tasmania.
- make a recommendation for the most appropriate mechanism;
- detail all key assumptions affecting the advice and the sensitivity of the recommendation to changes in these assumptions;
- provide advice on an appropriate duration for the application of the recommended price control mechanism;
- provide advice on any adjustments to the recommended price control mechanism that may be necessary over the recommended duration of its application and the principles to be applied in making the adjustment.

Further, the Regulator asked IES to consider the following matters in providing its advice:

- (a) that the application of the price control mechanism is consistent with the National Electricity Objective;
- (b) that the application of the price control mechanism not be unduly onerous on Hydro Tasmania;
- (c) that the price control mechanism allows Hydro Tasmania to recover its costs for the efficient provision of the services;
- (d) that the price control mechanism have minimal, if any, impact on the wider National Electricity Market;

- (e) that the application of the price control mechanism not require an amendment to the National Electricity Rules nor add complexity to the dispatch process;
- (f) that the price control mechanism provide market signals that promote efficiency and maximise incentives for other parties to supply raise contingency FCAS in the Tasmanian region;
- (g) that the costs of regulation not be a significant impost on the Regulator or Hydro Tasmania; and
- (h) Hydro Tasmania's present pricing principles for the pricing of its FCAS hedge arrangements.

IES prepared its IES Price Control Draft Report for the Regulator which was circulated to interested parties for comment. Submissions were received from Hydro Tasmania, AETV Power and Mr Mark B Lively. These submissions are published on the OTTER website. IES considered and responded to these submissions in preparing its IES Price Control Final Report for the Regulator.

3.1 IES recommendations on a price control mechanism

In providing advice on an appropriate price control mechanism, IES considered various price control mechanisms to impose on Hydro Tasmania in the delivery of raise contingency FCAS, and settled on three broad approaches for analysis. The following reflects IES's conclusions in respect of these approaches:⁷

The imposition of an obligation to offer a specified minimum volume of each service (at any price) would serve only to create certainty that at least that volume is offered. This is considered unnecessary as it is ultimately AEMO's responsibility to ensure that these services are available.

Limiting the revenue that Hydro Tasmania can procure from the declared services over a period of time is potentially a relatively simple remedy to apply however the revenue cap would need to be determined and once in place Hydro Tasmania would have an incentive to achieve it. Further it provides less certainty to generators exposed to FCAS spot prices as there will not necessarily be a close correspondence between the revenue cap and their FCAS exposure.

After considered analysis, IES does not recommend regulating the offer price of the service. While noting that under particular circumstances, such regulation would disadvantage Hydro Tasmania in the conduct of its market operations, the principal reason for not favouring this option is that the FCAS and energy markets are interrelated and so regulation of the FCAS offer price by itself will not necessarily succeed in preventing Hydro Tasmania from achieving high FCAS prices through the pricing of its energy market dispatch offers. IES does

⁷ IES Price Control Final Report, p. 35.

not support the direct regulation of the FCAS price through for example the application of a jurisdictional price cap as this interferes with market settlements and works against the objective of reducing jurisdictional differences in the application of the NEM Rules. Further IES considers that what the application of a price cap is designed to achieve is more effectively obtained by means of a financial contract referenced to the spot price of the service concerned.

IES concluded that “the regulation of Hydro Tasmania’s provision and pricing of FCAS contracts should be the preferred price control mechanism.”⁸ IES also concluded that the Regulator should approve a general contract design and that pricing parameters be determined in advance on a periodic basis and, further, that the opportunity cost of foregone generation should be valued as “the sum of the foregone electricity value, based on an appropriate water value or proxy, and the expected foregone REC value”.⁹

Regulator’s decision

The Regulator considered IES’s findings and conclusions to be sound and given that no interested party supported an alternative price control mechanism to the regulation of FCAS contracts, other than Mr Lively¹⁰, agreed that the appropriate price control mechanism for the regulation of the declared electrical services was the regulation of Hydro Tasmania’s provision and pricing of FCAS contracts.

Other matters

In preparing its report on a preferred price control mechanism, IES was asked to consider Hydro Tasmania’s submission¹¹ to the investigation which reflects Hydro Tasmania’s principles for the pricing of its current FCAS hedge arrangements.

IES made an observation in its IES Price Control Draft Report¹², to which Hydro subsequently responded in a submission¹³, that the costs of providing system inertia via synchronous condenser operation should not be included as FCAS costs for the purpose of determining a regulated hedge contract price.

The Regulator notes that a key issue around system inertia is that traditional generation technologies that can supply inertia are being displaced by wind

⁸ IES Price Control Final Report, p. ii.

⁹ IES Price Control Final Report, p. 10.

¹⁰ In his submission to the IES Price Control Mechanism Draft Report, Mr Lively proposed an alternative pricing mechanism for regulation FCAS rather than contingency FCAS. Contingency FCAS is the subject of this investigation.

¹¹ Hydro Tasmania submission to the investigation, 30 April 2010

¹² IES Price Control Draft Report, p.3.

¹³ Hydro Tasmania submission on IES Price Control Draft Report, 9 July 2010

generation which contributes little or no inertia to the power system and/or Basslink imports. This reduced inertia results in a greater requirement for fast raise FCAS.

In the IES Price Control Mechanism Final Report, IES expressed the view that the costs of operating generator units in synchronous condenser mode are incurred primarily through Hydro Tasmania pursuing its own commercial objectives (and not for providing benefits generally to the Tasmanian power system), as a means of “increasing flow limits on Basslink and thereby maximising the value of its physical energy trading opportunities”.¹⁴

This view is supported in a submission by the Department of Infrastructure, Energy and Resources (DIER) to the AEMC’s consultation on a proposed Network Support and Control Ancillary Services Rule Change, in which the following statements were made:

If system inertia falls below levels that are a function of Tasmanian demand, the allowable level of Basslink is reduced. This has the effect of providing greater Tasmanian access to global raise services at times that otherwise would potentially require increased quantities of raise services concurrent with a potential shortage of supply of those services.

Generation is able to anticipate this constraint and, in responding to commercial incentives, provide system inertia by placing into service plant that would not be otherwise scheduled by the National Electricity Market Dispatch Engine (NEMDE).¹⁵

IES further commented:

To the extent to which Hydro Tasmania views this operation as a contribution to the provision of, or a lessening of the requirement for an ancillary service, Hydro Tasmania could pursue compensation by offering the service explicitly by participating in the appropriate market arrangement as a provider of the service. To the extent to which Hydro Tasmania believes the appropriate market arrangement does not presently exist, Hydro Tasmania could actively advocate its establishment.¹⁶

In considering the above, the Regulator agrees with IES that Hydro Tasmania’s costs in providing system inertia should not be included as FCAS costs for the purpose of determining a regulated hedge contract price. The Regulator notes that the Australian Energy Regulator (AER) also shares this view.¹⁷

¹⁴ IES Price Control Final Report p. 11.

¹⁵ Inertia Issues Working Group, Discussion Paper attached to DIER submission, p. 12.

¹⁶ IES Price Control Final Report, p. 11.

¹⁷ Letter from the AER to OTTER, 28 October 2010.

The Regulator also notes that Hydro Tasmania considers that the costs incurred by Hydro Tasmania as a result of the regulation process should be included as a cost component in the pricing of the declared electrical services. “This includes the costs of the investigation charged to Hydro Tasmania directly by the Regulator and the costs incurred internally as a result of the regulation”.¹⁸

The Regulator is of the view that as Hydro Tasmania’s practices necessitated the Regulator’s declaration of the services, the costs of the investigation and subsequent costs in implementing the determination should be borne by Hydro Tasmania and not other Tasmanian generators.

¹⁸ Hydro submission to the IES Price Control Draft Report, 9 July 2010, p. 3.

4 STEP 2 – CONTRACT DESIGN

Having accepted the IES recommendation that the regulation of Hydro Tasmania's provision and pricing of FCAS contracts be the preferred price control mechanism, the Regulator sought advice on the design of the contracts themselves.

In summary, the terms of reference for this second consultancy were to:

- establish the terms and conditions, pricing methodology and parameters for a general FCAS contract in which the price for the supply of the declared electrical services reflects the opportunity cost of provision of the services in terms of foregone revenue in the energy and Renewable Energy Certificate (REC) markets where:
 - the terms and conditions, pricing methodology, parameters and prices are to be reflected, where appropriate, in Hydro Tasmania's existing template contract for hedges, being the International Swaps and Derivatives 2002 Master Agreement, Hydro Tasmania's Schedule to the 2002 Master Agreement, and "Confirmation" document; and
 - the values of the input parameters can, to the greatest extent possible, be objectively determined.
- note the information provided by Hydro Tasmania in its submission to the IES Draft Report, entitled Hydro Tasmania Submission on IES Draft Report on Raise Contingency FCAS – Price Control Mechanism, which describes Hydro Tasmania's hedge pricing principles including its cost components, and subsequent presentation by Hydro Tasmania to the Regulator on 26 July 2010;
- detail all key assumptions affecting the pricing methodology, parameters, terms and conditions and the sensitivity of changes in these assumptions;
- advise on the principles and methodology for a six monthly adjustment of the pricing inputs, price parameters and/or price methodology in advance of their application in an FCAS contract;
- consider the means by which rare events, such as Basslink and Gordon Power Station outages should be treated, if at all, in the pricing of the services; and
- advise on the extent to which confidentiality should be attached to the pricing of each of the parameters.

In undertaking this work the consultant was to take into account of relevant matters set down in regulation 33 of the *Electricity Supply Industry (Price Control) Regulations 2003* namely:

- the cost of providing the declared electrical service;
- the principle that consumers of the declared electrical services should be protected from the adverse effects of the exercise of substantial market power by an electricity entity in relation to prices, pricing policies and standards of service in respect of the provision of the declared electrical services;
- the principle that there is a need for efficiency in the provision of the declared electrical services for the purpose of benefiting the public interest through a reduction in the cost of providing the declared electrical service;

4.1 IES consultation draft report – contract design and pricing

Following appropriate tendering arrangements, IES was awarded the second consultancy.

As required by the terms of reference, IES has provided the Regulator with a paper (IES Consultation Draft Report) which details how IES has determined the opportunity cost of being enabled to provide the declared electrical services.

The Regulator has chosen to consult on the IES Consultation Draft Report as part of the consultation on the Regulator's Draft Report given that the price control mechanism has already been established by the Regulator with the pricing of the services being the key aspect to be finalised.

The IES Consultation Draft Report is reproduced in full in Appendix A.

In this Draft Report, the Regulator proposes that the terms and conditions, pricing methodology, and parameters for a general FCAS hedge contract provided by Hydro Tasmania will be those as recommended in the IES Consultation Draft Report.

The Regulator proposes that:

- Hydro Tasmania will be required to offer to other Tasmanian generators a general FCAS hedge contract, designed as a 'safety net' contract, that is not subject to any special conditions (other than conditions relating to self provision and new sources of supply) or exclusions.
- Generators can negotiate price variations for accepting any special conditions or exclusions.
- The method for estimating Hydro Tasmania's costs in providing the declared electrical services will be through the determination of Hydro Tasmania's costs of physically delivering to the spot market the amount of FCAS nominated in the FCAS hedge contract.
- The costs of delivery of the services to the spot market will be determined using the methodology and parameters recommended by IES in chapter 3 of the IES Consultation Draft Report.

- The parameter values to be used to determine the contract price and settlements will be those recommended by IES in Chapter 4 of the IES Consultation Draft Report.
- The 'safety net' contract will be for a bundle of the three declared electrical services.
- The contract quantity for each dispatch interval will be based on the generator's actual fast raise FCAS MW liability (based on the generator's output for the dispatch period) capped by a maximum requirement or requirements.
- There will be provision for the quantity specified in the contract to be reduced to the extent that the generator provides its own services.
- The pricing methodology will not change should Hydro Tasmania be able to improve its efficiency in providing the declared electrical services.
- The methodology, current values of parameters, standing data and the 'safety net' contract documentation will be published on Hydro Tasmania's website.
- The price of 'safety net' contracts will be fixed for six months and recalculated on a six monthly basis in accordance with the published methodology.

The Regulator seeks comment on these proposals or any other matter contained in the IES Consultation Draft Report.

4.2 Contract documentation

The Regulator understands that where parties hedge with Hydro Tasmania, over-the-counter (OTC) derivatives documentation is used that has been developed by the International Swaps and Derivatives Association Inc (ISDA). ISDA is an international organisation that has developed standard documentation for world-wide application by participants in OTC derivatives markets.¹⁹ The standard ISDA documentation used by Hydro Tasmania comprises:

- a Master Agreement (the current version is 2002) which sets out the on-going legal and credit relationship between the parties and provides that each transaction into which the parties will enter will be governed by that master agreement (ideally, this ISDA Master Agreement can be used for multiple transactions with the same party, for example an energy hedge transaction and an FCAS hedge transaction);
- a Schedule to the Master Agreement, which provides for amendments to the Master Agreement and additional contract provisions negotiated between the

¹⁹ For detailed information on ISDA documentation, refer to ISDA, *User's Guide to the 1992 ISDA Master Agreements (1993 Edition)*

parties (for example, a credit support annexure to manage particular credit issues); and

- a Confirmation which documents the negotiated economic terms of the particular transaction (the Australian Financial Market Association (AFMA) publishes recommended forms of Confirmation for electricity derivative transactions).

Where two parties have entered into an ISDA Master Agreement and negotiated relevant contract provisions in the Schedule, then each time they enter into a transaction only the Confirmation needs to be negotiated.

The Regulator understands that standard ISDA documentation would be used for FCAS hedges between Hydro Tasmania and other Tasmanian generators as it is widespread industry practice to use this documentation which alleviates the need for separate, comprehensive agreements to be established. Parties may also use associated documentation developed by AFMA that is specific to electricity derivative transactions.

5 MATTERS CONSIDERED

In making a declared electrical service price determination, the Regulator is required, in accordance with regulation 33(2) to consider several matters. The following summarises the Regulator's consideration of these matters to date in the course of this investigation:

(a) The cost of providing the declared electrical service

The costs of providing the declared electrical services has been considered in the IES Consultation Draft Report, where IES has estimated Hydro Tasmania's costs per MWh in delivering to the FCAS spot market. In this respect, IES has estimated the opportunity costs of providing slow and delay FCAS (determined to be zero or little cost) and the opportunity cost of providing fast raise FCAS in terms of reduced generation efficiency and consequential additional water consumption. Following the consideration of submissions on the IES Consultation Draft Report and this, the Regulator's Draft Report, the regulated costs of providing the services will be reflected in the Regulator's Final Report and determination.

(b) Any interstate or international benchmarks for prices, costs, revenues and return on assets in bodies providing a service similar to the declared electrical service

The Regulator notes that the time-weighted average prices for raise contingency FCAS for the period 1 January to 25 October 2010 in mainland NEM jurisdictions for raise contingency FCAS is of the order of \$0.85, \$0.49 and \$1.01 per MWh, for fast, slow and delayed FCAS respectively.²⁰ These prices reflect the dominance of thermal generating units that are cheap sources of the services and in plentiful supply. In Tasmania, there is one registered supplier and fast raise services are not as readily available from hydro generation. Average prices in Tasmania for the same period were \$12.83, \$0.63 and \$1.08 per MWh for each of the respective services.

The Regulator is pricing the services to reflect actual costs through an estimate of the opportunity cost of foregone energy and RECs revenue in the provision of the declared electrical services. Therefore, interstate or international benchmarks are not relevant in the pricing of the declared electrical services using this methodology.

(c) The principle that consumers of the declared electrical service should be protected from the adverse effects of the exercise of substantial market power by an electricity entity in relation to prices, pricing policies and standards of service in respect of the provision of the declared electrical service

²⁰ Global Roam, *NEM Review*

It is in the regulation of prices through the pricing of an FCAS contract that will ensure that generators, which cannot negotiate suitable terms and conditions and price with Hydro Tasmania, can defer to the regulated pricing of the 'safety net' contract.

In providing this safety net for Tasmanian generators, generators will be able to pay a fair and reasonable price for the services and not be inhibited indirectly in their energy generation by Hydro Tasmania's bidding behaviour in the raise contingency FCAS markets. Furthermore, this safety net contract provides certainty for new entry generators which may have been deterred from setting up in the State for the same reason.

- (d) The principle that the distribution tariff for small customers belonging to a particular class (other than the distribution tariff relating to the supply of electricity to small customers on King Island or Flinders Island) is to be uniform, regardless of where in mainland Tasmania the customer is supplied with electricity**

This matter is not relevant to this investigation.

- (e) The degree of competition in the electricity supply industry that is relevant to the provision of the declared electrical service**

The Regulator has established that there is presently no competition in the provision of raise contingency FCAS to meet the local requirement in Tasmania. To the extent that an existing or new generator can provide some of the local Tasmanian requirement itself, IES has proposed that there be provision for the quantity of the services in the safety net contract to be reduced. Were an efficient new supplier able to substantially remove its dependence on Hydro Tasmania to meet all of Tasmania's requirements, then the Regulator would consider a revocation of the declaration of the services (refer Chapter 6 for detail on the revocation of a declaration).

- (f) The principle that there is a need for a reasonable return (including the payment of dividends) on the assets of an electricity entity**

The cost of providing the declared electrical services is being recognised as Hydro Tasmania's foregone revenue in the energy and REC markets. The revenue that Hydro Tasmania receives in the energy market reflects a reasonable return on the assets of Hydro Tasmania and is, therefore, reflected in the cost of providing the declared electrical services.

- (g) The principle that there is a need for efficiency in the provision of the declared electrical service for the purpose of benefiting the public interest through a reduction in the cost of providing the declared electrical service**

The pricing of the services will be determined by reference to Hydro Tasmania's foregone revenue in the energy and REC markets using a methodology that has been devised by the Regulator's independent experts, and parameter values that are objectively determined. This should ensure that the exercise of substantial

market power in the pricing of the services will be removed, meaning that Tasmanian generators should incur only a fair and reasonable FCAS liability which will be reflected in generators' costs in supplying energy to the market, which in turn should be reflected in the spot and contract markets for energy. This should translate to retailers and ultimately consumers of electricity paying no more than the economic cost of the supply of the energy.

(h) The effects of inflation

The effects of inflation will be reflected in relevant FCAS pricing parameters. Therefore, the effects of inflation do not need special attention in this investigation.

(i) The principle that there is a need for the electricity entity to be financially viable

Regulated hedge contract prices reflect Hydro Tasmania's actual costs in providing the declared electrical services and will not, therefore, affect Hydro Tasmania's financial viability.

(j) The impact on pricing policies of any borrowing, capital, dividend and taxation or tax equivalent obligations of the electricity entity, including obligations to renew or increase assets

The Regulator notes that, in Hydro Tasmania's submission to the investigation of 30 April 2009, Hydro stated that the impact "is not expected to be material".

(k) The quality of the provision of the declared electrical service

This matter is not relevant to the investigation.

(l) Any ministerial charter, licence or obligation under the Act or the regulations that applies, or is likely to apply, to the electricity entity

There are no matters under these instruments that are relevant to this investigation, other than the requirement under the Price Control Regulations for the costs of this investigation to be met by Hydro Tasmania.

(m) The Tasmanian Electricity Code

There are no provisions of the Tasmanian Electricity Code that are relevant to the investigation.

(ma) The National Electricity Rules

The price control mechanism is by means of regulated FCAS hedge contracts between Hydro Tasmania and other Tasmanian generators and therefore operates independently of the market and AEMO's administration. This application of this mechanism does not interfere with the operation of the NEM. The National Electricity Rules are therefore not relevant to the consideration of this matter.

(n) Any costs (including capital expenditure) incurred by the electricity entity at the direction of the Regulator

There are no directions made by the Regulator to Hydro Tasmania that are relevant to this determination.

(o) The public interest

The regulated FCAS hedge contract removes the potential for Hydro Tasmania's substantial market power to be exercised (such as in the events of April 2009), promotes competition for the services (in removing a barrier to other generators to enter the energy market), promotes efficiency and, in meeting both these criteria, the public interest will be served.

(p) Any other matter the Regulator considers relevant.

Other matters considered relevant by the Regulator have been included in the terms of reference of each consultancy and have been addressed accordingly.

6 DURATION OF THE PRICE DETERMINATION

The Price Control Regulations do not specify a minimum or maximum time period for the duration of a price determination (the regulatory period). The Regulator originally suggested that the regulatory period be of three years duration.²¹ However there were strong views expressed in submissions made to the Regulator's *Notice of intention to declare the supply of raise contingency frequency control ancillary services by Hydro Tasmania as a declared electrical service, Issues Paper, July 2009* (Issues Paper) and terms of reference for this investigation that the regulatory period should be as long as possible and, in particular, that a declaration period of three years is insufficient for providing price signals to prospective new entrant generators which are long-term and significant capital investments.

In its consideration of an appropriate price control mechanism, IES was asked to give its views on the period over which price controls should be in place. In preparing its IES Price Control Final Report, IES considered, among other things, the likelihood that relevant circumstances could change over the regulatory period and considered a regulatory period of five years as appropriate.

There is generally a benefit in making a determination period longer rather than shorter as a longer period ensures a greater degree of price stability and predictability for customers. Longer price paths also reduce the level of regulatory uncertainty. Power generation plants are long-term investments and the prospect of expiry or revocation of the declaration would not provide sufficient confidence for an investment of large amounts of capital.

Regulator's decision

The Regulator is not seeking further comment on the duration of the regulatory period as this was considered in the consultation on a price control mechanism and has agreed that the period of the determination will be of five years from the commencement of the determination. However, the Regulator proposes that the determination commence on 1 January 2011 and seeks submissions on this proposal.

The Regulator proposes that the determination commence on 1 January 2011 and seeks submissions on this proposal.

²¹ Office of the Tasmanian Economic Regulator, *Notice of intention to declare the supply of raise contingency frequency control ancillary services by Hydro Tasmania as a declared electrical service, Issues Paper, July 2009*

6.1 Cessation of a declared electrical service price determination

Regulation 34 of the Price Control Regulations specify the circumstances in which a declared electrical service price determination ceases to have effect. The key circumstances are when a declaration to which the determination applies has been revoked; and the expiry of the determination (in this case, at the end of five years). These are discussed below.

6.1.1 Revocation of a declaration

Regulation 21 of the Price Control Regulations provides for the Regulator to revoke a declaration of a declared electrical service if the Regulator is of the opinion:

- (a) that no electricity entity providing the declared electrical service has substantial market power in respect of the declared electrical service; or
- (b) that the declaration is no longer required for the promotion of competition, efficiency or the public interest.

This means that the Regulator can, of its own volition, examine the circumstances in which the declaration applies during the regulatory period and determine whether a declaration is still required.

The process for such a review is stipulated in regulation 19 and is, in effect, the same process as used when the Regulator is consideration making a declaration. That is, the Regulator would give notice of its intention to revoke the declaration together with reasons for doing so, take submissions on the matter, and make a decision.

6.1.2 Expiry of the price determination

The imminent expiry of a price determination is a trigger for a review as to whether the declared electrical service declaration is still required.²² It does not necessarily mean that the declaration will be revoked but will mean that if the declaration is not revoked, then a declared service pricing investigation must be undertaken.

6.1.3 Other grounds for revocation of a price determination

There are also other grounds for revocation. The Regulator may revoke a determination in circumstances described in regulation 36, which essentially relates to the determination having been made on the basis of false or misleading information; that there is a material error in the determination; or the determination has a materially adverse impact on the entity due to an event outside the entity's control.

²² Regulation 23 provides for the Regulator to invite submissions no later than six months before the determination expires on whether the declaration of a declared electrical service should be revoked.

APPENDIX A – IES CONSULTATION DRAFT REPORT

RAISE CONTINGENCY FCAS – CONTRACT DESIGN AND PRICING

15 October 2010

Consultation Draft

Executive Summary

Reason for Review

On 24 July 2009, the Tasmanian Energy Regulator (Regulator) gave written notice of an intention to declare the supply of raise contingency frequency ancillary services (fast raise, slow raise and delayed raise) by Hydro Tasmania to meet the Tasmanian local requirement as declared electrical services. This was followed in December 2009 with the publication of its “Statement of Reasons”. The Regulator considers that Hydro Tasmania has substantial market power in the supply of the defined services and the promotion of competition, efficiency and the public interest warrants the declaration of the defined services.

The Regulator has commenced, in accordance with the requirements of the Electricity Supply Industry (Price Control) Regulations 2003, the process for making a determination that regulates the prices that may be charged by, and specifies the price control mechanisms imposed on, Hydro Tasmania for raise contingency frequency control ancillary services (FCAS) to meet the Tasmanian local requirement. At the commencement of the process the Regulator decided to conduct the review in two stages.

Stage 1

As part of Stage 1 of the review, Intelligent Energy Systems (IES) was retained by the Regulator to analyse and advise on the reasonable options for price control mechanisms to regulate the prices for the FCAS services. IES recommended the regulation of Hydro Tasmania’s provision and pricing of FCAS hedge contracts as the most appropriate price control mechanism to regulate the declared electrical services (being raise contingency frequency control ancillary services supplied by Hydro Tasmania to meet the Tasmanian local requirement). The Regulator adopted the IES recommendation.

Stage 2

As part of Stage 2 of the review, the Regulator has retained IES to design the terms and conditions, price methodology and parameters for a general FCAS hedge contract that will be offered by Hydro Tasmania to other Tasmanian generators for raise contingency FCAS (the three raise FCAS products) supplied by Hydro Tasmania to meet the Tasmanian local requirement. These FCAS hedge contracts will be regulated for a period of five years.

Scope of Stage 2

Under the scope of the Stage 2, IES is required to

- establish the terms and conditions, pricing methodology and parameters for a general FCAS hedge contract in which the price for the supply of the declared electrical services reflects the opportunity cost of provision of the services in terms of foregone revenue in the energy and Renewable Energy Certificate (REC) markets where:



- the terms and conditions, pricing methodology, parameters and prices are to be reflected, where appropriate, in Hydro’s existing template contract for hedges, being the International Swaps and Derivatives 2002 Master Agreement, Hydro Tasmania’s Schedule to the 2002 Master Agreement, and “Confirmation” document; and
 - the values of the input parameters can, to the greatest extent possible, be objectively determined.
- take account of the Final Report prepared by IES, in so far as it is relevant to this consultancy;
- note the information provided by Hydro Tasmania in its submission to the IES Draft Report, entitled Hydro Tasmania Submission on IES Draft Report on Raise Contingency FCAS – Price Control Mechanism, which describes Hydro Tasmania’s hedge pricing principles including its cost components, and subsequent presentation by Hydro Tasmania to the Regulator on 26 July 2010;
- detail all key assumptions affecting the pricing methodology, parameters, terms and conditions and the sensitivity of changes in these assumptions;
- advise on the principles and methodology for a six monthly adjustment of the pricing inputs, price parameters and/or price methodology in advance of their application in an FCAS hedge contract;
- consider the means by which rare events, such as Basslink and Gordon Power Station outages should be treated, if at all, in the pricing of the services (for example, should a risk premium be paid to Hydro Tasmania, over and above its opportunity costs, to limit its risk exposure, or should rare events be excluded from the general contract; and
- advise on the extent to which confidentiality should be attached to the pricing of each of the parameters; in doing so, the consultant is to advise whether disclosure of the price could affect Hydro Tasmania’s competitive position in the Tasmanian market or the National Electricity Market or is considered to be commercially sensitive for some other reason.

Principal Findings

In accordance with its scope, IES has established the terms and conditions, pricing methodology and parameters for a general FCAS hedge contract in which the price for the supply of the declared electrical services reflects the opportunity cost of provision of the services in terms of foregone revenue in the energy and Renewable Energy Certificate (REC) markets. The general hedge contract has been designed as a “safety-net contract” with the aim of providing a high quality hedge not subject to any special conditions (other than those concerned with self provision and new sources of supply) or exclusions. A pricing methodology has been developed, along with pricing parameters and the basis for setting each parameter value. The pricing methodology aims to be transparent and the



proposed basis for determining each parameter value is meant to be as objective as possible.

The Final Report by IES on the first stage of the investigation “Raise Contingency FCAS – Price Control Mechanism”, 28 July 2010, concluded that “the regulation of Hydro Tasmania’s provision and pricing of FCAS contracts should be the preferred price control mechanism”. IES also concluded that the Regulator should approve a general contract design and that pricing parameters be determined in advance on a periodic basis rather than set by Hydro Tasmania and subject to limited disclosure. IES recognised the opportunity cost of foregone generation as the proper basis for pricing and that this should be valued as “the sum of the foregone electricity value, based on an appropriate water value or proxy, and the expected foregone REC value”. The methodology developed by IES in stage 2 is consistent with these conclusions. IES also expressed the view in its stage 1 Final Report that the cost to Hydro Tasmania of providing system inertia (by running certain generator units in synchronous condenser mode) should not be included as a cost for the purpose of pricing FCAS hedge contracts. Accordingly, our proposed methodology does not provide for the inclusion of this cost.

IES has considered the information provided by Hydro Tasmania in its submissions and presentations to the Regulator in respect of stage 1 of the investigation. Our views on these submissions and presentations are set out in our stage 1 Final Report.

In this report we set out all key assumptions affecting the pricing methodology, parameters, terms and conditions and highlight the sensitivity of changes in these assumptions. We also indicate the basis for setting each parameter on a period basis in advance of their application in an FCAS hedge contract.

With respect to rare events which might take the form as exclusions in the contract, we have proposed that the safety-net contract not include such exclusions leaving counterparties to negotiate separately for their inclusion.

We do not consider that confidentiality should be attached to any of the pricing parameters or standing data we have specified or identified. We do not believe that Hydro Tasmania’s competitive position in the Tasmanian market or the National Electricity Market is likely to suffer any material detriment by disclosing any of these parameter values and identified standing data generally.

Summary Recommendations

IES recommends that

- the general hedge contract serve as a “safety-net” contract providing a high quality hedge with no exclusions, and that generators be encouraged (but not required) to negotiate price discounts in respect of any exclusions and special conditions they are willing to accept;
- the adoption of the pricing methodology set out in this report along with the identified parameters and proposed basis of setting parameter values;



- the methodology, current values of parameters, standing data and “safety-net” contract documentation be published on Hydro Tasmania’s website.



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Glossary

Term	Definition
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AETV	Aurora Energy Tamar Valley
AGC	Automatic Generation Control
FCAS	Frequency Control Ancillary Services
IES	Intelligent Energy Systems
LRAC	Long Run Average Cost
LRMC	Long Run Marginal Cost
NCAS	Network Control Ancillary Services
NEM	National Electricity Market
NEMDE	National Electricity Market Dispatch Engine
OTTER	Office of the Tasmanian Economic Regulator
REC	Renewable Energy Certificate
SRMC	Short Run Marginal Cost
WACC	Weighted Average Cost of Capital

1 Introduction and Scope

1.1 Reason for Review

On 24 July 2009, the Tasmanian Energy Regulator (Regulator) gave written notice of intention to declare the supply of raise contingency frequency ancillary services (fast raise, slow raise and delayed raise) by Hydro Tasmania to meet the Tasmanian local requirement as declared electrical services. This was followed in December 2009 with the publication of its “Statement of Reasons”. The Regulator considers that Hydro Tasmania has substantial market power in the supply of the defined services and the promotion of competition, efficiency and the public interest warrants the declaration of the defined services.

The Regulator has commenced, in accordance with the requirements of the Electricity Supply Industry (Price Control) Regulations 2003, the process for making a determination that regulates the prices that may be charged by, and specifies the price control mechanisms imposed on, Hydro Tasmania for raise contingency frequency control ancillary services (FCAS) to meet the Tasmanian local requirement.

1.2 Stage 1 and 2 of the Review

At the commencement of the process the Regulator decided to conduct the review in two stages.

Stage 1

As part of Stage 1 of the review, Intelligent Energy Systems (IES) was retained by the Regulator to analyse and advise on the reasonable options for price control mechanisms to regulate the prices for the FCAS services. IES recommended the regulation of Hydro Tasmania’s provision and pricing of FCAS hedge contracts as the most appropriate price control mechanism to regulate the declared electrical services (being raise contingency frequency control ancillary services supplied by Hydro Tasmania to meet the Tasmanian local requirement). The Regulator adopted the IES recommendation.

Stage 2

As part of Stage 2 of the review, the Regulator has retained IES to design the terms and conditions, price methodology and parameters for a general FCAS hedge contract that will be offered by Hydro Tasmania to other Tasmanian generators for raise contingency FCAS (the three raise FCAS products) supplied by Hydro Tasmania to meet the Tasmanian local requirement. These FCAS hedge contracts will be regulated for a period of five years.

1.3 Scope of Stage 2

Under the scope of the Stage 2, IES is required to



- establish the terms and conditions, pricing methodology and parameters for a general FCAS hedge contract in which the price for the supply of the declared electrical services reflects the opportunity cost of provision of the services in terms of foregone revenue in the energy and Renewable Energy Certificate (REC) markets where:
 - the terms and conditions, pricing methodology, parameters and prices are to be reflected, where appropriate, in Hydro's existing template contract for hedges, being the International Swaps and Derivatives 2002 Master Agreement, Hydro Tasmania's Schedule to the 2002 Master Agreement, and "Confirmation" document; and
 - the values of the input parameters can, to the greatest extent possible, be objectively determined.
 - take account of the Final Report prepared by IES, in so far as it is relevant to this consultancy;
 - note the information provided by Hydro Tasmania in its submission to the IES Draft Report, entitled Hydro Tasmania Submission on IES Draft Report on Raise Contingency FCAS – Price Control Mechanism, which describes Hydro Tasmania's hedge pricing principles including its cost components, and subsequent presentation by Hydro Tasmania to the Regulator on 26 July 2010;
 - detail all key assumptions affecting the pricing methodology, parameters, terms and conditions and the sensitivity of changes in these assumptions;
 - advise on the principles and methodology for a six monthly adjustment of the pricing inputs, price parameters and/or price methodology in advance of their application in an FCAS hedge contract;
 - consider the means by which rare events, such as Basslink and Gordon Power Station outages should be treated, if at all, in the pricing of the services (for example, should a risk premium be paid to Hydro Tasmania, over and above its opportunity costs, to limit its risk exposure, or should rare events be excluded from the general contract; and
- advise on the extent to which confidentiality should be attached to the pricing of each of the parameters; in doing so, the consultant is to advise whether disclosure of the price could affect Hydro Tasmania's competitive position in the Tasmanian market or the National Electricity Market or is considered to be commercially sensitive for some other reason.

1.4 Principal Findings

In accordance with its scope, IES has established the terms and conditions, pricing methodology and parameters for a general FCAS hedge contract in which the price for the supply of the declared electrical services reflects the opportunity cost of provision of the services in terms of foregone revenue in the energy and Renewable Energy Certificate (REC) markets. The general hedge contract has



been designed as a “safety-net contract” with the aim of providing a high quality hedge not subject to any special conditions or exclusions. A pricing methodology has been developed, along with pricing parameters and the basis for setting each parameter value. The pricing methodology aims to be transparent and the proposed basis for determining each parameter value is meant to be as objective as possible.

The Final Report by IES on the first stage of the investigation “Raise Contingency FCAS – Price Control Mechanism”, 28 July 2010, concluded that “the regulation of Hydro Tasmania’s provision and pricing of FCAS contracts should be the preferred price control mechanism”. IES also concluded that the Regulator should approve a general contract design and that pricing parameters be determined in advance on a periodic basis rather than set by Hydro Tasmania and subject to limited disclosure. IES recognised the opportunity cost of foregone generation as the proper basis for pricing and that this should be valued as “the sum of the foregone electricity value, based on an appropriate water value or proxy, and the expected foregone REC value”. The methodology developed by IES in stage 2 is consistent with these conclusions. IES also expressed the view in its stage 1 Final Report that the cost to Hydro Tasmania of providing system inertia (by running certain generator units in synchronous condenser mode) should not be included as a cost for the purpose of pricing FCAS hedge contracts. Accordingly, our proposed methodology does not provide for the inclusion of this cost.

IES has considered the information provided by Hydro Tasmania in its submissions and presentations to the Regulator in respect of stage 1 of the investigation. Our views on these submissions and presentations are set out in our stage 1 Final Report.

In this report we set out all key assumptions affecting the pricing methodology, parameters, terms and conditions and highlight the sensitivity of changes in these assumptions. We also indicate the basis for setting each parameter on a period basis in advance of their application in an FCAS hedge contract.

With respect to rare events which might take the form as exclusions in the contract, we have proposed that the safety-net contract not include such exclusions leaving counterparties to negotiate separately for their inclusion. However we do consider it appropriate to include conditions relating to self provision and new sources of supply.

We do not consider that confidentiality should be attached to the pricing of any of the parameters we have specified. We do not believe that Hydro Tasmania’s competitive position in the Tasmanian market or the National Electricity Market is likely to suffer by disclosing these parameter values generally.

1.5 Structure of Report

The report is structured as follows:

- Chapter 2 addresses the principal contract design features,



- Chapter 3 specifies the contract pricing methodology,
- Chapter 4 identifies the inputs required by the pricing methodology and proposes the basis for setting the value of each; and
- Chapter 5 provides summary recommendations.



2 Principal Contract Design Features

2.1 Introduction

The FCAS contract will be structured as a forward commodity contract (swap contract). Under such contracts, counterparties exchange fixed for floating price payments in respect of a defined notional quantity.

Relevant terms include the specification of fixed and floating prices, designation of the fixed and floating price payers, contract duration in terms of effective date and termination date, and any special conditions or exclusions.

2.2 “Safety Net” Contract

IES recognises that the number of possible standard contract designs is potentially large, and that in practice counterparties can be expected to have strong incentives to negotiate around particular terms and conditions. Clearly it will be impracticable to anticipate all the desirable contract variations and regulate the price in each case. Consequently, IES considers it appropriate to regulate the price of a single “safety net” contract. This particular design should

- serve as an effective hedge of FCAS exposure for the buyer of the contract, and
- should not be subject to any special conditions or exclusions.

In this way, the price control mechanism will provide a reference price for a high quality hedging product.

The “safety net” contract will be for all raise contingency products, although IES is of the view that the cost of Hydro Tasmania providing other than the 6s raise service is not significant. Further, IES considers that

- the pricing of the “safety net” contract should be highly transparent with a relatively simple underlying pricing methodology and relatively few pricing parameters and assumptions.

While the “safety net” contract will be a high quality hedging product, IES considers that its availability should not be an impediment to any possibility of achieving a more efficient risk transfer between counterparties. Accordingly, IES is of the view that the party seeking to hedge its FCAS exposure, should be encouraged (but not required) to negotiate with Hydro Tasmania in relation to particular additional terms, conditions and exclusions with a view to achieving a lower price for the service consistent with its risk preferences. Should the parties fail to negotiate a mutually satisfactory commercial contract, Hydro Tasmania will be required to offer the party the “safety net” contract.



2.3 Bundled Contract

The “safety net” contract will be for a bundle of 6s raise, 60s raise and 5 minute raise FCAS. This is because the provision of the 6s raise service by Hydro Tasmania results in the provision of the other services as well, due to the nature of Hydro Tasmania’s generation plant.

In section 3.2, IES concludes that providing the 6s raise FCAS service dominates the costs of providing all of the three raise contingency services and that the 60s raise and 5 minute raise services can be delivered largely as by-products of Hydro Tasmania’s dispatch for energy and 6s raise FCAS. Consequently, we recommend that the contract quantities be bundled quantities for all three raise contingency services.

2.4 Notional Quantity

The notional quantity could be defined potentially in various ways. It could be for example a specified fixed quantity for all periods or for each defined period. It could be a forecast quantity set at the beginning of a defined period with or without the facility for periodic renomination.

In our view, the notional quantity defined in the “safety net” contract ought to reflect the buyer’s actual liability. In this way it serves as an effective hedge for the buyer, while avoiding the creation of an exposure which Hydro Tasmania, as the seller, may be unable to manage in the physical market. For the purpose of calculating the fixed price for a contract, the buyer will need to provide Hydro Tasmania with indicative requirements. In our opinion, this will reasonably include a maximum requirement or maximum requirements¹ which will serve to cap actual quantity. Pricing then will be based on indicative requirements communicated to Hydro Tasmania in good faith. Settlement will be based on actual requirements capped by the specified maximum requirement.

Since the “safety net” contract will be for a bundle of 6s raise, 60s raise and 5 minute raise FCAS the quantities for each of the services will be related. The ratio of the maximum requirement quantities for these services will be:

1.0 MW 6 second raise : 1.75 MW 60 second raise : 2.0 MW 5 minute raise.

The actual quantity determined in the hedge will be based on the actual liability based on the generator’s output for the dispatch period. This being:

Hedge quantity for service = Minimum (Cap quantity for service, actual liability).

IES’s recommendation that the contract quantities be bundled quantities for all three raise contingency services leads to several possibilities for the determination of the contract quantity for each dispatch interval. These are:

- Determine the contract quantity based on the 6s raise service MW liability;

¹ The maximum requirements could be by some time periods such as peak or off peak periods or quarters or both.



- Determine the contract quantity based on the average of the 6s raise liability, 60s raise liability / 1.75 and the 5 minute raise liability / 2.0; and
- Determine the contract quantity based on the maximum of the 6s raise liability, 60s raise liability / 1.75 and the 5 minute raise liability / 2.0.

The options above all assume that the actual liabilities are below the cap quantities for each of the services. IES recommends that the first option is used because the 6s raise service is the by far the most costly local service in Tasmania.

2.5 Self Provision

IES recognises that Hydro Tasmania's ability to support these contracts in practice will be subject to the existence and operations of other FCAS providers. Consistent with the safety-net contract functioning as an effective hedge for the buyer on one hand, and not creating unmanageable exposures for Hydro Tasmania on the other, there ought to be provision for the quantity specified in this contract to be reduced to the extent the buyer provides services of its own (self provision).

IES expects that this would be done based on the spot market quantities that the counterparty to Hydro Tasmania is dispatched for rather than a reduction in the cap quantity based on the counterparty's capability to provide the 6s raise service. Under this arrangement Hydro Tasmania is hedging the contracting party to the degree that they have an exposure to FCAS raise contingency costs subject to cap on quantities.

2.6 New Supplier

There are two main scenarios regarding a new supplier entering the market to providing contingency raise FCAS. These are:

1. The new supplier can provide some of the local Tasmanian requirements but is not sufficiently capable for OTTER to remove the declaration regarding the provision of FCAS by Hydro Tasmania; and
2. The new supplier is sufficiently capable for OTTER to remove the declaration regarding the provision of FCAS by Hydro Tasmania. This would occur if the new supplier could substantially remove the dependency on Hydro Tasmania to provide the service. For instance if a new supplier could provide 100 MW of 6s raise FCAS then they could meet all of Tasmania's requirements most of the time. The new supplier could be a new generator or an interruptible load which could be instantaneously tripped. In the case of the interruptible load it would only need to be 50 MW to be deemed to be providing 100 MW of 6s raise because of the way 6s raise capability is defined by AEMO².

² The amount of 6s raise that a source can provide is based on the average amount of additional power which can be provided or the average amount of consumption which can be reduced multiplied by two. In the case of a generator whose output has to be ramped up then the average amount of power provided will be roughly half of the maximum amount of power provided. Hence, when multiplied by two will equal the maximum amount of additional power provided 6s after the contingency occurred. For a load that can be instantly tripped then the average will equal the maximum and the amount of 6s will be twice the reduction.



In the case of scenario 1, the contract design and pricing methodology would remain the same. In the case of scenario 2, OTTER would rescind the declaration and at this point the “safety net” contracts should terminate. However, there may be some short delay between when the new provider starts operating and when the declaration is rescinded. During this period the “safety net” contracts would remain in force and Hydro Tasmania would be expected to bid into the spot market in such a way so as to manage this risk.

2.7 Hydro Tasmania Production Efficiency Improvements

The last form of new supply is the case when Hydro Tasmania improves its own ability to deliver FCAS contingency services. This improvement could be the result of investment in existing generation plant. In this case nothing would change regarding existing or new contracts. The methodology would remain the same. In particular, the assumptions about lost power generation due to running at inefficient generation levels would remain the same. The reason for this approach is to give Hydro Tasmania the same incentives as any other provider to improve its efficiency in providing FCAS.

2.8 Contract Duration, Termination, and Repricing

Generators can expect that “safety net” contracts with a high degree of transparency around pricing principles will be available until the end of the five year determination period, or until the Regulator decides the supply of the relevant services is competitive and therefore the “safety net” contracts are no longer required.

While the determination period is five years, IES does not consider it necessary that the price of “safety net” contracts be fixed for the full period or for any period longer than a year. However IES does consider that the price should be fixed for six months and notes that transparency around methodology and assumptions will assist in informing interested parties as to the likely range of future “safety net” contract prices.

To provide this transparency, IES suggests that the methodology be published on the Hydro Tasmania website together with assumptions for the current and previous pricing periods.

The price of the “safety net” contract will be recalculated on a six monthly basis according to the published methodology and current published assumptions prior to the commencement of each six month period.

3 Contract Pricing Methodology

3.1 Introduction

IES's preferred method for estimating Hydro Tasmania's cost for providing an FCAS hedge is to determine Hydro Tasmania's costs of physically delivering to the spot market the amount of FCAS that is nominated in the hedge contract. In a sense this mimics the operation of a competitive market in the longer term in that the value of a swap contract should roughly correspond to the average spot price which in turn should roughly correspond to the costs of delivering that spot market service.

Determining a generator's costs of providing various FCAS raise contingency services is not as clear cut as it might seem. The FCAS services and energy are joint products from the same generator and hence the provision of one service affects the provision of the others. Thus to estimate the cost of providing a raise service requires an understanding of how providing this service affects the provision of energy and other FCAS and what are the associated opportunity costs.

3.2 FCAS Opportunity Costs

Determining the opportunity cost of being enabled to provide raise FCAS services is not always straight forward. There are three distinct situations which could result in different opportunity costs.

The first situation is when the unit's energy output is not altered by the amount of FCAS raise services for which it is enabled. In this case the unit's energy dispatched is not changed from what it would have been had no FCAS raise service been enabled. Thus the generator's energy output is not changed. In the case of a hydro-electric generation unit, its water use and any other variable costs have not changed. Consequently, in this case the opportunity cost of being enabled is zero. On the rare occasions that the contingency service is required, the generator may have an increased output but this should be largely compensated through the energy spot market.

The second situation is when the unit's energy output is altered by the amount of FCAS raise services for which it is enabled. In this case the unit's energy dispatched is changed from what it would have been had no FCAS raise service been enabled. Because the generator's energy output is changed, its water use and any other variable costs will have changed as well. Additionally, the unit may have its energy market dispatch reduced to provide raise FCAS.

The third situation is when the unit is dispatched primarily to provide FCAS and the energy output is really just a result of providing FCAS. In this case the unit's energy dispatched is changed from being zero and the unit being offline to a positive energy dispatch in order to provide the desired FCAS raise service. In this case the unit may suffer two opportunity costs. The first one is due to being



dispatched to an inefficient energy target to provide the required service. The second one is the opportunity cost of being dispatched to a non zero value in the energy market when the generator did not want the unit to be dispatched in the energy market at all. For example if the generator had a fuel cost or marginal water value of \$50/MWh and was dispatched in the energy market when the spot price was \$30/MWh it would be losing \$20/MWh in the energy market.

The opportunity costs of providing each of the raise contingency services: 6 second raise, 60 second raise and five minute raise are likely to be different for Hydro Tasmania. We will look at each service in turn.

3.2.1 5 minute raise service

For the 5 minute raise services the opportunity costs would be zero or very small because the services can be provided by units that are on line and operating around their optimal energy dispatch points³. The most efficient output for most units is somewhere between 80% and 90% of the unit's maximum output. Thus units operating at the most efficient points have the ability to provide additional output following a contingency. Any additional amounts of this service required would be provided by units which are being dispatched to provide the 6 second raise service. Thus given that Hydro Tasmania has to provide an amount of 6 second raise service there should be no additional cost to Hydro Tasmania of providing the 5 minute raise service.

3.2.2 60s raise service

Like the situation for the 5 minute raise service, the 60 second raise service would generally be provided by units on line and operating at their optimal energy dispatch points. Any additional amounts of this service required would be provided by units which are being dispatched to provide the 6 second raise service. Thus given that Hydro Tasmania has to provide an amount of 6 second raise service there should be no additional cost to Hydro Tasmania of providing the 60 second raise service.

3.2.3 6s raise service

The 6 second raise service is the most difficult for a hydro generator to supply. In most power systems this service is provided by steam based thermal generation. Many of Hydro Tasmania's units can supply little or no 6s FCAS and many of the others can only supply small amounts when they are significantly backed off and operating at significantly lower water use efficiencies. However the Gordon and John Butters power station units can supply significant amounts of 6 s FCAS relatively efficiently in the Tasmanian system.

³ In other hydro systems with units that can start faster than Hydro Tasmania's some of the 5 minute service could be provided by units which are offline but armed to start with an under frequency event.



3.3 Hydro Tasmania’s Opportunity Cost of Providing 6s Raise

3.3.1 Approach

IES’s approach to determining the opportunity cost of providing the 6s raise service is to split the problem into two parts.

- The first part is concerned with determining the physical opportunity cost of providing the 6s raise service in terms of reduced generation efficiency and the consequential additional water consumption.
- The second part is concerned with valuing the additional water use associated with providing the 6s raise service.

3.3.2 Physical Opportunity Costs of Providing 6s FCAS

The two power stations which can provide substantial amounts of 6s raise service are John Butters and Gordon. Both of these power stations have units which can operate at relatively low outputs and provide substantial amounts of 6s raise. However, the operation at low output levels does come at the price of reduced efficiency with which water is converted from potential energy to electrical energy. Figure 1 and Figure 2 show the efficiency curves for John Butters and Gordon units. Note that at very low outputs the generation efficiencies of these units drop from around 90% at the most efficient points to 20% to 40% at very low outputs.

Figure 1 John Butters Unit Generation Efficiency Curve

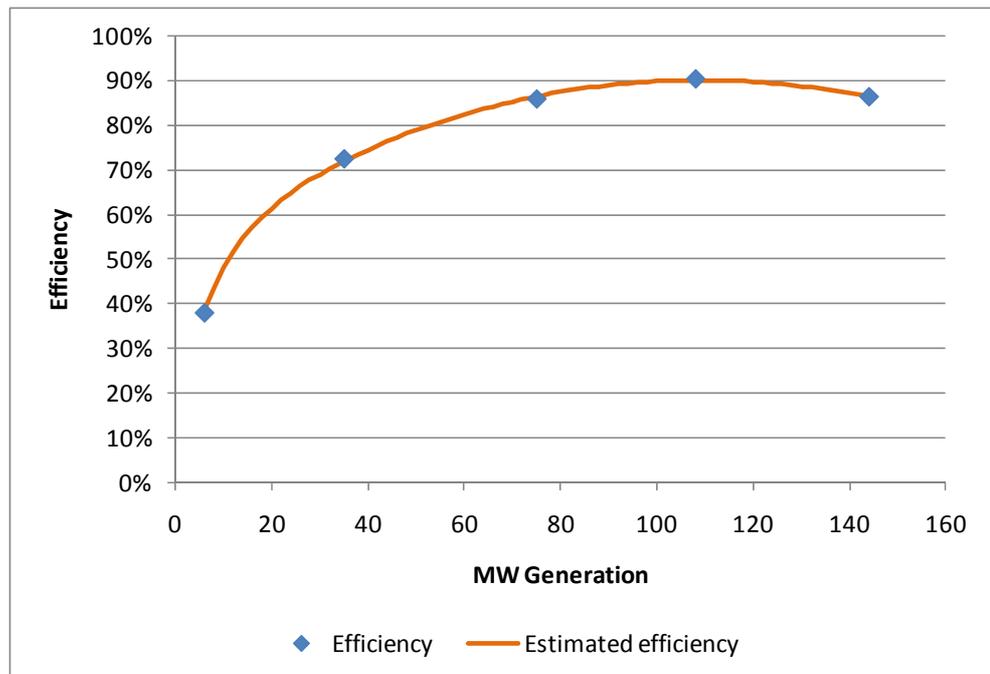


Figure 2 Gordon Units Generation Efficiency Curve

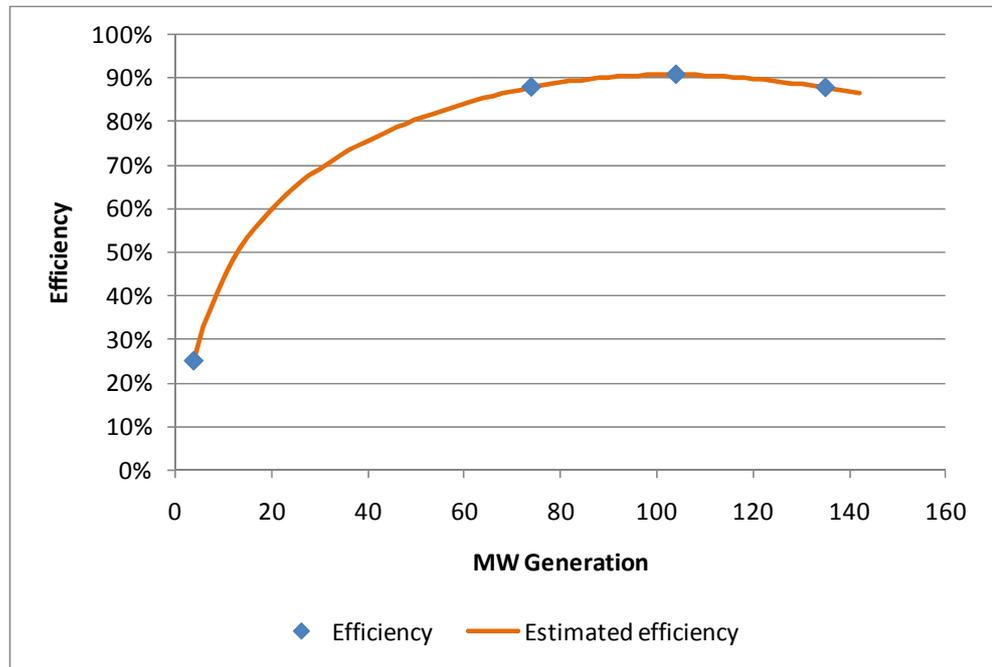


Figure 3 and Figure 4 show the maximum amounts of 6s raise that can be provided versus MW power output. The figures also show the opportunity costs in terms of water power losses incurred when operating away from the most efficient generation points. Please note that the Gordon information is for when just one unit is operating.

Figure 3 John Butters 6s Raise Capability and Water Power Losses Due to Operating Away from Maximum Efficiency Point

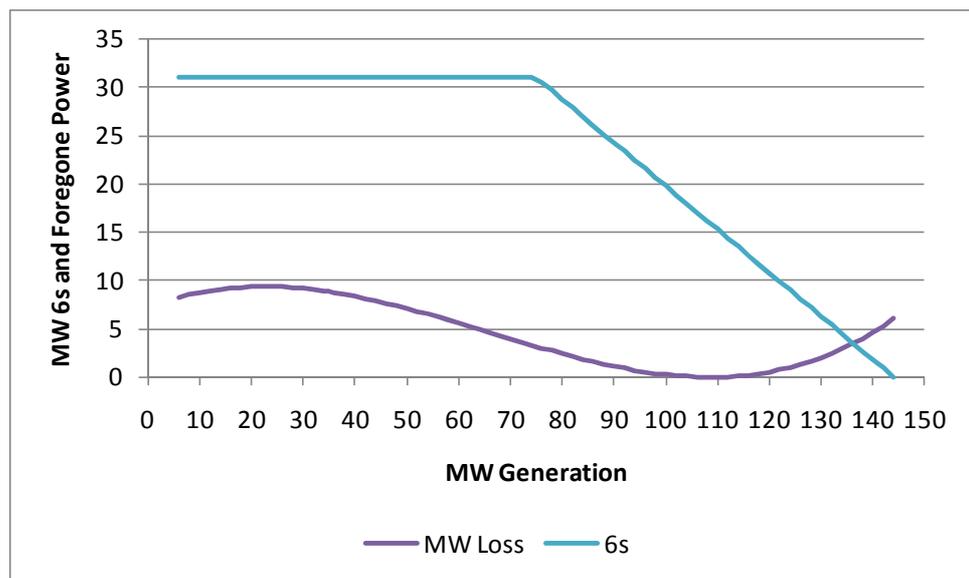
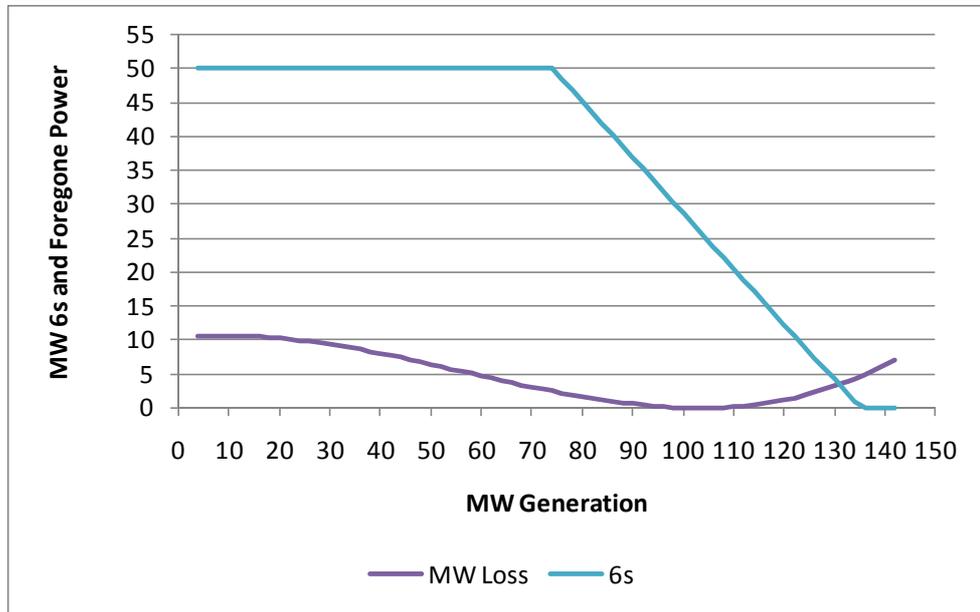


Figure 4 Gordon 6s Raise Capability and Water Power Losses Due to Operating Away from Maximum Efficiency Point



The amount of 6s raise that can be provided from Gordon power station does not increase linearly with the additional units operating. This is because the units share a common pipeline (penstock) which with increasing flows diminishes the speed with which the units can increase their outputs. The maximum amount of 6s raise that can be supplied from Gordon is as follows:

Number of units committed	Maximum MW 6s raise ⁴
1 unit running	50 MW
2 units running	87 MW
3 units running	100 MW

IES combined the information on the amount of 6s raise service and the water power opportunity costs versus power output to produce a supply curve for providing 6s raise. IES’s model assumed the increasing amounts of 6s raise were being supplied by only John Butters and Gordon power stations.

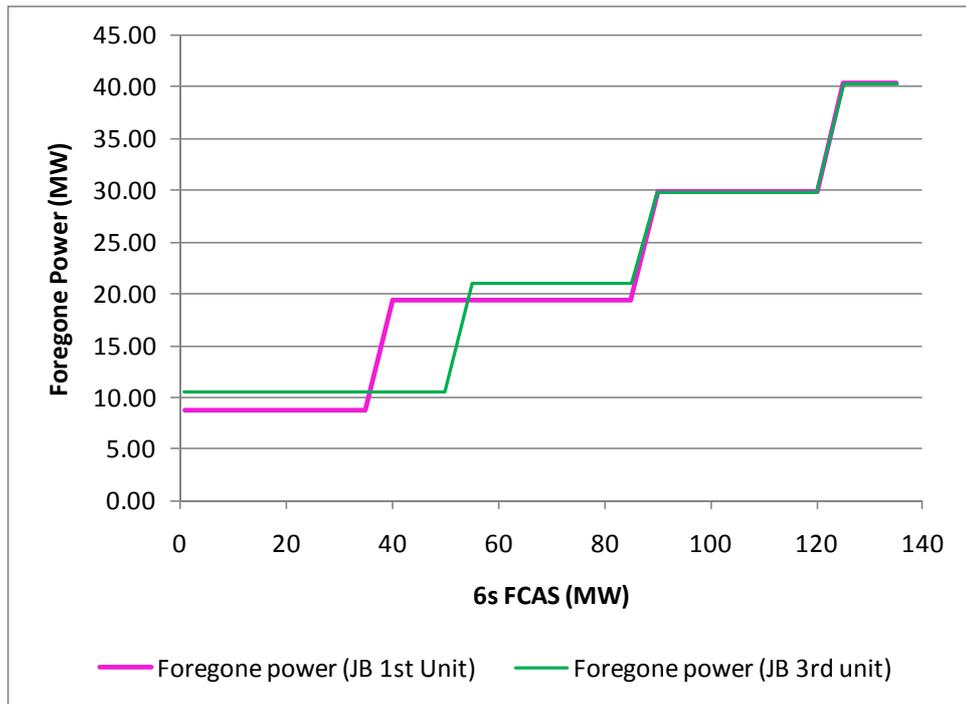
Figure 5 shows a graph of the forgone power versus amount of 6s raise provided. There are two lines: the pink line is the FCAS supply curve when John Butters power station has the first unit committed to run to provide 6s FCAS and then additional units are committed from the Gordon power station to meet increasing amounts of 6s FCAS as required. The green line is for when units from Gordon power station are committed first. The staircase appearance of these lines is due to additional FCAS requiring additional units being committed and these units providing blocks of additional 6s raise at no additional cost once the unit has

⁴ These figures are based on a mid range of operating heads



been committed. These supply curves have been constructed on the basis that the FCAS is being required at the time of Basslink imports and that the power generation and consequent water use at Gordon and John Butters is to be minimised at these times.

Figure 5 Supply Curves: Foregone Power versus 6s Raise

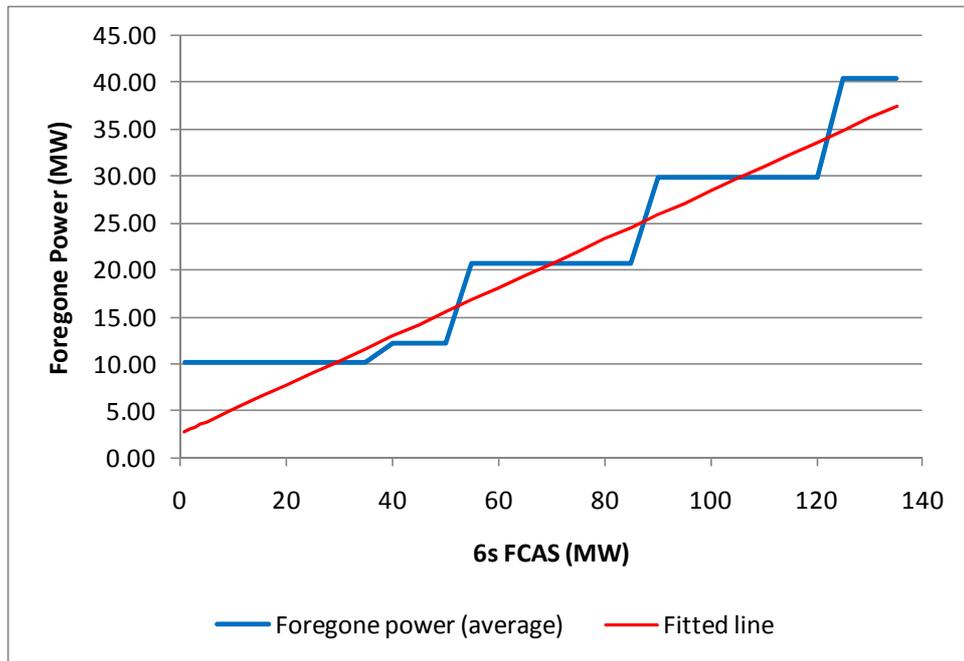


If we assume that for 20%⁵ the time the John Butters unit is operating to provide 6s raise FCAS when there is a Tasmanian requirement for a local 6s raise service, then the expected opportunity cost for foregone power is the blue line in Figure 6. This line is just a weighted combination of the two lines in the previous graph. The red line is a fitted straight line which is based on the average amount of foregone power per MW of 6s raise for a 85 MW requirement. This is equivalent to 0.26 MW of foregone power per 1 MW of 6s raise supplied. This line has an intercept of 2.6 MW. This intercept can be interpreted as a fixed cost of providing 6s raise.

⁵ The figure of 20% was supplied by Hydro Tasmania.



Figure 6 Average Supply Curve: Foregone Power versus 6s Raise



3.3.3 Calculation of the Value of Foregone Power Generation

Conceptually calculating the value of forgone power generation is simply a matter of determining the amount of forgone power and valuing this in terms of lost generation and REC sales. However there are a number of input values (parameters) to this calculation that need to be considered and sourced. These include:

- A price for the foregone generation;
- A price for the foregone RECs;
- A probability that the foregone water power output would have produced RECs;
- The relative proportion of the time that John Butters would be providing 6s raise FCAS and as a consequence expected foregone generation at John Butters and Gordon; and
- The proportion of the time water released from Gordon and John Butters respectively could be attributed to the need to meet environmental flow requirements.

3.3.4 Value of Lost Electricity Sales

The value of the lost electricity sales in the future could be approximated by a number of methods including the following:

- Using the Victorian prices for a one year flat swap or futures contract;



- For example the average price of the d-cypha SFE Australian Electricity Futures market⁶ base contract for the following twelve months at a predetermined date or at the time of the contract, for instance the prices on the last business day prior to the commencement of the contract.
- Using the Victorian prices for a one year peak period swap contract;
 - For example the average price of the d-cypha peak contract for the following twelve months at a predetermined date or at the time of the contract.
- The long run average cost of generation; and
- The long run marginal cost of generation.

IES favours using the price for a one year Victorian peak swap contract starting from the next quarter.

3.3.5 Value of Lost Renewable Energy Certificate Sales

The value of the lost renewable energy certificates in the future could be approximated by the futures price for RECs to be delivered in January the following year as reported by Next Generation Energy Solutions (Nextgen) in their Green Room publication at the time of the contract or at a predetermined date.

3.3.6 Probability of RECs

Because the baselines for pre 1997 hydro plant reflect their long term average outputs, one would expect that, due to the nature of the variability of inflows into hydro storages, that RECs should be produced in 50% of years over the long term. Depending on the state of storage levels, for some years the probability will be higher than 50% and in other years the probability will be lower than 50%.

3.3.7 John Butters Operation in Providing FCAS

Hydro Tasmania has suggested that the unit at John Butters would be providing 6s raise FCAS 20% of the time when there is a local Tasmania requirement. Such a number could be validated by historical NEM data.

The proportion of the time that John Butters is providing 6s raise does not affect the calculation greatly, never the less IES suggests that this proportion be determined based on the historical percentage using the last 12 months of operations. This information can be obtained from NEM published data.

3.3.8 Environmental Flows

If there are requirements for environmental flows and to satisfy these requirements necessitates units at Gordon or John Butters operating at low or inefficient outputs then it could be argued that the provision of 6s raise in these cases does not increase the amounts of water released and hence does not result in Hydro Tasmania incurring any additional opportunity costs.

⁶ The electricity futures contract prices are available on d-cyphaTrade's website: http://d-cyphatrade.com.au/market_futures/vic#A



Hydro Tasmania has informed IES, that the operation of John Butters is not affected by environmental flows but Gordon is. In the case of Gordon there is a minimum flow required of 10 cubic metres per second (m³/s or cumec) during the summer months and 20 cubic metres per second during the winter months.

A 10 cumec flow corresponds to a Gordon unit operating at 5 MW and providing 50 MW of 6s raise. A 20 cumec flow corresponds to a Gordon unit operating at 21 MW and providing 50 MW of 6s raise.

Thus during months of the summer period, none of the water passed through the turbines of a second unit could be attributable to environmental flows. Thus the marginal provision of FCAS from a second unit during this period would have no reduction in opportunity cost due to environmental flows.

For the winter months the situation is different. During these months a second unit could be run at 5 MW and this would satisfy the 20 cumec environmental flow requirement. The opportunity cost of running the second unit compared to just running one unit is 21 MW – 10 MW = 11 MW. Whereas if there had been no environmental flow requirement then the opportunity cost for running two units at 5 MW would have been 2 x 10.5 MW = 21 MW. Thus the requirement for environmental flows has reduced the lost opportunity by 10 MW which as a percentage is 10/21 = 48%. Consequently if we assume that there are 6 months of the summer regime and 6 months of the winter regime of environmental flows, this gives an estimate that 25% of the lost power due to providing FCAS at Gordon power station would have been required to satisfy environmental flows anyway.

3.3.9 Example Calculation of the Variable Opportunity Cost

The following is an example of a calculation of the opportunity cost to Hydro Tasmania of providing 6s raise FCAS. The calculation determines the amount of foregone generation per MW 6s raise provided. For this calculation IES has assumed that the total Tasmanian requirement for 6s raise is 80 MW and the assumed parameters for energy and REC prices etc are in Table 1. Some of the values, such as REC and energy prices, are for illustrative purposes and do not accurately represent the current values. John Butter’s 36 MW capability is its registered value rather than its operating capability of around 31 MW.

Table 1 Model Input Parameters

	<i>John Butters providing FCAS with Gordon</i>	<i>Gordon alone providing FCAS</i>
Proportion of the time	20%	80%
Energy Price (\$/MWh)	60	60
Proportion of lost water power needed for environmental flows anyway	0%	25%
REC price	40	40
Probability of RECs	50%	50%



In order to supply 80 MW of 6s raise FCAS, either John Butters (36 MW 6s raise) and one Gordon units (50 MW 6s raise) need to be operating or two Gordon units (87 MW 6s raise) need to be operating. If we assume that John Butters is only running for 20% of the time then to meet an FCAS requirement of 80 MW would require an average of 7.2 MW from John Butters and 72.8 MW from Gordon.

Table 2 Estimated Average MW Provision of 6s Raise FCAS

	<i>John Butters</i>	<i>Gordon</i>
John Butters Priority	36.0	44.0
Gordon Priority	0.0	80.0
Weighted average	7.2	72.8

Given the average provision of FCAS it is possible to determine the water power foregone per MW of FCAS service provided under the regimes of using John Butters and Gordon versus Gordon only, see Table 3. The average amount of power foregone to supply 1 MW of FCAS is 0.022 MW + 0.237 MW = 0.259 MW. That is, to supply 1 MW FCAS has an opportunity cost of about 0.26 MW of power.

Table 3 Estimated Foregone Generation (MW) per MW of FCAS Provided

	<i>John Butters</i>	<i>Gordon</i>
MW of foregone generation per MW 6s raise for each unit	0.24	0.26
MW of forgone generation on average for the portfolio of John Butters and Gordon combined	0.022	0.237

Under the assumptions presented in Table 1, including the estimate that 25% of the provision of 6s raise from Gordon does not incur any additional costs due to the requirements for environmental flows, the estimated opportunity cost for provision of 6s raise FCAS is about \$16/MWh. How this figure is determined is outlined in Table 4.

Table 4 Opportunity Cost per MW FCAS (\$/MW per hour)

	<i>John Butters</i>	<i>Gordon</i>	<i>Total</i>
MW foregone per MW FCAS once environmental flows are considered	0.022	0.178	0.199
Price per MWh foregone (\$/MWh)	80	80	
Opportunity cost (price) per MW FCAS (\$/MWh)	1.74	14.21	15.95



3.3.10 Allocation of Fixed Opportunity Cost

There is always some arbitrariness in allocating fixed costs but some attempt needs to be made otherwise Hydro Tasmania will be systematically under compensated if the linear approximation of FCAS opportunity costs is used. IES suggests that the fixed cost be allocated based on the maximum hedge quantity the generator wishes to contract for (the hedge quantity cap) and the expected total Tasmanian requirements at the times when the generator’s liability is near its maximum.

The fixed cost (intercept of the straight line) is approximately 2.6 MW per hour comprising on average 0.5 MW of John Butters and 2.1 MW of Gordon based on the John Butters operating 20% of the time. When the impacts of environmental flows are considered and the assumptions in the earlier tables are used, this results in an hourly cost of approximately \$165 (\$164.80). This in turn gives an annual fixed cost of about \$1,000,000 per annum (\$1,010,551 per annum) assuming that Basslink is importing approximately 70% of the time. For more details see

Table 5 Fixed Opportunity Cost Calculation

	<i>John Butters</i>	<i>Gordon</i>	<i>Total</i>
MW foregone due to fixed losses once environmental flows are considered	0.48	1.58	2.06
Price per MWh foregone (\$/MWh)	80	80	
Opportunity cost (price) for fixed losses (\$/h)	38.68	126.11	164.80
Annual cost (\$)	237,216	773,335	1,010,551

For a generator requiring a cap of X MW and the generator’s maximum exposure occurring when the total Tasmanian liability is expected to be about Y MW, then the generator would pay a contribution to the fixed costs of:

$$(X / Y) \times \text{Total annual fixed cost}$$

For a 30 MW cap and an expected Tasmanian requirement of 130 MW this would be approximately \$233,000 per annum (\$233,204 per annum).

3.3.11 Example Calculation of Variable and Fixed Cost Components of a Contract

Under the assumptions

- that a generator had an average liability of 10 MW for 6s raise over all time periods;
- that this generator needed to be hedged for up to 30MW at the time of Basslink imports; and
- Basslink imports occurred 70% of the time



then this would result in an approximate annual cost to the generator of

- fixed cost = \$233,000 per annum (\$233,204 per annum);
- variable cost = 10 MW x \$15.95 / MWh x 8760 h = \$1,397,049 per annum
- total cost = \$1,630,253 per annum.



4 Settlements and Parameter Values

The key parameter values required to determine a contract price and settlements are presented in Table 6. This table also presents the suggested source or method of determining these parameter values.

Table 6 Parameter Values

Parameter	Purpose	Value
Generator turbine efficiencies	Calculation of foregone generation	Standing data provided by Hydro Tasmania
Generator FCAS capabilities	Calculation of FCAS provision and foregone generation	Standing data provided by Hydro Tasmania (can also be obtained from NEM FCAS standing data)
Proportion of the time John Butters is supplying FCAS for local Tasmanian requirement	Calculation of FCAS provision and foregone generation	Average of previous 12 months of historical data (can be obtained from NEM dispatch data)
Energy price	Used to value foregone generation	D-Cypha price for 1 year peak swap contract starting next quarter
REC price	Used to value foregone generation	Most recent REC spot price corresponding to an actual transaction reported by NextGen in their Green Room publication
Probability of power station generating RECs	Used to value foregone generation	Agreed to use 50% probability
Proportion of foregone generation required for environmental flows	Used to value foregone generation	By calculation with Hydro Tasmania supplying environmental flow requirements and water releases versus generation output curves



Parameter	Purpose	Value
Proportion of the time Tasmania is importing and has a local FCAS requirement Or Proportion of the time Tasmania has a local FCAS requirement	Used to allocate fixed cost component of opportunity costs	Average of previous 12 months of historical data (can be obtained from NEM dispatch data to determine which periods that Basslink exports were less than 50MW) Or Average proportion of time over the previous 12 months that Tasmania had a local requirement over, say, 5 MW
Maximum FCAS hedge quantity (cap)	Used for calculating contract price (fixed cost component)	Nominated by purchaser of contract
Actual FCAS liability for dispatch period used in hedging contract	Used for calculating settlement payments	Quantity determined by 6s liability and maximum hedge quantities for other services determined by scaling these amounts
FCAS quantity scalars	Used for calculating settlement payments	Hydro Tasmania has suggested a ratio of 1 MW 6s : 1.75 MW 60s : 2 MW 5 min
FCAS hedged quantity	Used for calculating settlement payments	<ul style="list-style-type: none"> • Minimum(cap, actual 6s liability – self provision) • Minimum(1.75 x cap, actual 60s liability – self provision) • Minimum(2 x cap, actual 5 min liability – self provision)
Self provision	Used for calculating settlement payments	Actual amounts enabled for contingency raise services in NEM dispatch

As discussed earlier, the “safety net” contract would be a bundled contract for all raise contingency services. As such there could be a number of ways that the bundled price could be split up between the individual services. However this is not really a problem. To illustrate how settlements can work assume that the amounts of FCAS that the generator has contracted for are in the ratio of 1.0 MW of 6s : 1.75 MW of 60s : 2.0 MW of 5 min. Assume that the generator has a cap



of Qcap MW of 6s raise and an actual 6s liability of Q6s then the settlement for this 5 minute period would be such that the buyer pays Hydro Tasmania:

Fixed cost component per dispatch interval + Q6s x variable cost per MW FCAS

- Q6s x spot price 6s – Q60s x spot price 60s – Q5min x spot price 5min

If any of the quantities of the services exceeded the scaled cap amounts then the actual quantities would be reduced to the capped amounts.



5 Summary Recommendations

IES recommends that

- the general hedge contract serve as a “safety-net” contract providing a high quality hedge with no exclusions, and that generators be encouraged (but not required) to negotiate price discounts in respect of any exclusions and special conditions they are willing to accept;
- the adoption of the pricing methodology set out in this report along with the identified parameters and proposed basis of setting parameter values;
- the methodology, current values of parameters, standing data and “safety-net” contract documentation be published on Hydro Tasmania’s website.



APPENDIX B- NOTICE OF INVESTIGATION AND TERMS OF REFERENCE

Investigation of Hydro Tasmania's pricing policies in the provision of raise contingency frequency control ancillary services to meet the Tasmanian local requirement

Background

Regulation 23 of the *Electricity Supply Industry (Price Control Regulations) 2003* requires the Regulator to conduct an investigation into the pricing policies of an electricity entity in respect of a declared electrical service. This investigation follows the Regulator's decision to declare certain services provided by Hydro Tasmania as declared electrical services. The background and reasons for that decision are contained in the Regulator's *Declaration of Frequency Control Ancillary Services - Statement of Reasons - December 2009*.

The Price Control Regulations establish the procedural framework to be followed by the Regulator in conducting pricing investigations.

Sub-regulation 24(1) requires that, before conducting a pricing investigation, the Regulator give notice of the investigation. Such a notice is to be provided in writing to the Minister and each electricity entity providing the declared electrical service that is the subject of the investigation. Notice is also required to be published in such daily Tasmanian newspapers as the Regulator considers appropriate.

This notice, containing the terms of reference for the investigation, is issued pursuant to regulation 24 of the Price Control Regulations.

Purpose of the pricing investigation and services to be investigated

The purpose of this investigation is to investigate and make a determination that regulates the prices that may be charged by, and specifies the price control mechanisms imposed on, Hydro Tasmania for the provision of the following declared electrical services:

- fast raise contingency frequency control ancillary service;
- slow raise contingency frequency control ancillary service; and
- delayed raise contingency frequency control ancillary service;

to meet the Tasmanian local requirement.

Matters to be considered

Regulation 33(2) of the Price Control Regulations contains a range of matters that must be considered by the Regulator in conducting price investigations:

- (a) the cost of providing the declared electrical service;
- (b) any interstate or international benchmarks for prices, costs, revenues and return on assets in bodies providing a service similar to the declared electrical service;
- (c) the principle that consumers of the declared electrical service should be protected from the adverse effects of the exercise of substantial market power by an electricity entity in relation to prices, pricing policies and standards of service in respect of the provision of the declared electrical service;
- (d) the degree of competition in the electricity supply industry that is relevant to the provision of the declared electrical service;
- (e) the principle that there is a need for a reasonable return (including the payment of dividends) on the assets of an electricity entity;
- (f) the principle that there is a need for efficiency in the provision of the declared electrical service for the purpose of benefiting the public interest through a reduction in the cost of providing the declared electrical service;
- (g) the effects of inflation;
- (h) the principle that there is a need for the electricity entity to be financially viable;
- (i) the impact on pricing policies of any borrowing, capital, dividend and taxation or tax equivalent obligations of the electricity entity, including obligations to renew or increase assets;
- (j) the quality of the provision of the declared electrical service
- (k) any ministerial charter, licence or obligation under the Act or the regulations that applies, or is likely to apply, to the electricity entity;
- (l) the Tasmanian Electricity Code;
- (m) any costs (including capital expenditure) incurred by the electricity entity at the direction of the Regulator; and
- (n) the public interest.

The Regulator may also consider any other matter that he considers to be relevant.

Prices and price control mechanisms

Regulation 18 specifies the manner and terms in which the prices and price control mechanisms may be expressed. These include, but are not limited to:

- (a) maximum prices or the maximum rate of increase or the minimum rate of decrease in maximum prices;
- (b) average prices or average rates of increase or decrease in average prices;
- (c) pricing policies or principles;
- (d) by reference to a general price index, the cost of production, revenue, a rate of return on assets or any other factor;
- (e) by reference to quantity, location or period of provision of the declared electrical service;
- (f) by reference to a maximum revenue;
- (g) any other terms the Regulator considers appropriate.

As part of the investigation, and prior to the publication of a Draft Report in respect of the investigation, the Regulator will consult on an appropriate price control mechanism to be imposed on Hydro Tasmania.

Price determination

After completing the Final Report in respect of the investigation, the Regulator will make a determination, pursuant to regulation 31 of the Price Control Regulations, that regulates the prices that may be charged by, and specifies the price control mechanisms imposed on, Hydro Tasmania in respect of the declared electrical services during the period specified in that determination.

Period for price determination

The Regulator has yet to determine the date on which a determination will commence and expire. The Regulator will consult stakeholders on this matter during the investigation.

Objective and principles

The Regulator's objectives in undertaking this investigation and making a determination are to promote efficiency and competition in the Tasmanian electricity supply industry and protect electricity consumers from the adverse effects of the exercise of substantial market power. In achieving this objective, the Regulator will apply the following principles:

- (q) The price control mechanism to be applied to the supply of the declared electrical services will:
 - (e) be consistent with the National Electricity Objective;
 - (f) not be unduly onerous on Hydro Tasmania in its application;
 - (g) have minimal impact, if any, on the wider National Electricity Market;
 and

- (h) not require an amendment to the National Electricity Rules nor add complexity to the National Electricity Market dispatch process.
- (r) The price control mechanism to be imposed on, and the prices to be charged by, Hydro Tasmania will:
 - (e) be fair and reasonable;
 - (f) enable Hydro Tasmania to recover its costs for the efficient provision of the declared electrical services;
 - (g) provide market signals that promote efficiency and maximise incentives for other parties to supply raise contingency FCAS in the Tasmanian region; and
 - (h) not impose significant regulatory costs on the Regulator or Hydro Tasmania.

Date for completion of the investigation

The Regulator will complete the investigation by 26 November 2010 and publish the Final Report on that date.

Following completion of the Final Report, the Regulator will:

- provide a copy of the Final Report to:
 - the Minister for Energy;
 - the Treasurer; and
 - Hydro Tasmania, as the body providing the declared electrical services which is the subject of the investigation;
- publish the report on the OTTER website;
- notify in newspapers of the availability of the report; and
- make available copies of the Final Report to relevant stakeholders and members of the public on request.

Conduct of the investigation

The conduct of the investigation must include reasonable regulatory accountability through transparency and public disclosure of regulatory processes and the basis of regulatory decisions. The Regulator will do this through the publication of decisions and reasons for those decisions.

Submissions

Submissions will be sought on relevant matters contained in the Notice of Investigation and terms of reference, Hydro Tasmania's submission, any published consultants' reports and the Regulator's Draft Report. The Regulator will provide

reasonable notice of the call for submissions in accordance with the Regulator's *Consultation Policy and Procedures of the Tasmanian Economic Regulator, Version 2, 2009*.

Submissions must be made in writing and may be lodged by email to office@economicregulator.tas.gov.au or by mail to OTTER at GPO Box 770, Hobart, Tasmania, 7001.

Submissions will be published on the OTTER website. If a person making a submission does not wish that submission, or a part or parts of it, to be placed on the website, the submission must indicate which part or parts are to be excluded. Confidential submissions will be treated in accordance with the Regulator's *Policy on the Treatment of Confidential Submissions*.

Draft Report

Pursuant to regulation 29 of the Price Control Regulations, at an appropriate time during the price investigation, the Regulator will make available a Draft Report and take public submissions in respect of the Draft Report.

Public hearings

Pursuant to regulation 25, the Regulator will conduct a public hearing in regard to the investigation.

Notification

Notification of the publication of reports relating to this investigation will be given on the *What's New* page of the OTTER website www.economicregulator.tas.gov.au. Interested parties may subscribe, through the *What's New* page, to receive automatically generated emails when notices are published on *What's New*. In addition, publication of the Final Report will be notified in the newspapers.

Process and timetable for the investigation

(1) Notice of, and terms of reference for, the investigation	(2) 6 March 2010
(3) Hydro Tasmania's submission to the investigation published	(4) 30 April 2010
(5) Public submissions on the terms of reference and Hydro Tasmania's submission close	(6) 21 May 2010
(7) Consultant's report recommending price control mechanisms to be applied to Hydro Tasmania's provision of the declared electrical services published	(8) 18 June 2010
(9) Public submissions on consultant's report close	(10) 9 July 2010
(11) Publication of investigation Draft Report	(12) No later than 8 October 2010
(13) Public hearing	(14) Within one week of closing date for submissions
(15) Closing date for submissions on Draft Report	(16) Four weeks from date of publication of Draft Report
(17) Investigation completed and investigation Final Report published	(18) No later than 26 November 2010
(19) Determination of prices to be charged by, and price mechanisms imposed on, Hydro Tasmania	(20) No later than 24 December 2010
(21) Commencement of Determination	(22) Yet to be established

APPENDIX C – SUBMISSIONS ON THE TERMS OF REFERENCE

It is a requirement of regulation 24 of the Price Control Regulations that the Regulator give notice of the investigation and include matters on which the Regulator would like submissions to address. The Regulator gave notice on 3 March 2010.

Submissions were received from Hydro Tasmania, AETV Power and Aurora Energy, noting that submissions from AETV Power and Aurora Energy also included comments on Hydro Tasmania's submission to the investigation. These latter comments were considered by IES in preparing its IES Price Control Final Report and are not further addressed here. All submissions have been published on the Regulator's website: www.economicregulator.tas.gov.au.

The following summarises the Regulator's response to comments on the notice of the investigation and its accompanying terms of reference.

6.1.1 AETV Power

AETV Power observed that it would be unrealistic to expect the investigation to result in enticing new entrants to the Tasmanian electricity market just to provide FCAS. However, there is potential to promote competition between Tasmanian generators for these services and create greater efficiency in the Tasmanian electricity market as a whole.

AETV Power made further comment on the principles in the terms of reference that the Regulator will apply in order to achieve its objectives. Firstly, AETV Power considered that the ability of Hydro Tasmania to recover its efficient costs in providing the declared electrical services should reflect economic efficiency in an economic sense. AETV Power considered that the actual costs of supply together with a reasonable return would be an appropriate approach to determining the 'efficient' costs of supply.

Regulator's response

In the IES consultancy on the design and pricing of the FCAS hedge contracts, IES has estimated Hydro Tasmania's costs of physically delivering to the spot market the volume of FCAS specified in the hedge contract. These include the physical opportunity costs of being enabled for fast raise contingency FCAS²³ in terms of reduced generation efficiency and consequential additional water consumption and

²³ IES concluded in its draft report that the opportunity costs for the provision of slow and delayed raise contingency FCAS would be zero or very small.

valuing that additional water consumption. The Regulator considers that this is an appropriate approach to determining the economically efficient costs of supply.

6.1.2 Aurora Energy's submission

Aurora considered that the Terms of Reference provided a suitable framework for conducting the investigation. However, it expressed concerns that a three-year regulatory period, as proposed in the Regulator's Issues Paper²⁴ would be "insufficient for providing appropriate market signals to prospective new generators". Aurora advocated the maximum period of time possible being specified in the declaration together with a review mechanism.

Furthermore, Aurora expressed the following concern:

The Terms of Reference for the Investigation provide objectives and principles that, while seeking to facilitate incentives for additional FCAS providers as well as introducing fairness, do not explicitly focus on a resolution to the factors which supported the initial declaration. In this context it is important that the Terms of Reference maintain a pathway towards removal of the need for the declaration.

Regulator's response

The Price Control Regulations do not specify a minimum or maximum period for a price determination. However, it is implicit in regulation 30 of the Price Control Regulations that the period of the determination is to be specified in the Regulator's investigation Final Report. The Price Control Regulations also provide a review mechanism. The Regulator agrees that a three year regulatory period is not sufficient and has resolved that a five year determination period will apply. This is discussed further in Chapter 6.

The Regulator's declaration of the services is based on the Regulator's opinion that Hydro Tasmania has substantial market power in the supply of the services and that the promotion of competition, efficiency and the public interest warrant the declaration.

Placing a price on the services will promote more equitable dealings in the market for these services as, irrespective of the price in the spot market for the services, generators will pay no more than the reasonable costs of the provision of the services by virtue of the regulated hedge contract (although they may choose to negotiate with Hydro Tasmania to increase their exposure for a lesser price). The FCAS hedge contract provides a 'safety net' such that generators will not bear the brunt of Hydro Tasmania's bidding strategy such as that employed in April 2009.

²⁴ Office of the Tasmanian Economic Regulator, *Notice of intention to declare the supply of raise contingency frequency control ancillary services by Hydro Tasmania as a declared electrical service, Issues Paper, July 2009*, OTTER, 2009

The FCAS hedge will provide a baseline against which other Tasmanian generators can more readily determine whether to enter the FCAS market themselves particularly if they can deliver the services more efficiently.

Hence, in the Regulator's opinion, the regulated FCAS hedge contract removes the potential for market power to be exercised (such as in the events of April 2009), promotes competition for the services (in removing a barrier to other generators to enter the energy market)²⁵, promotes efficiency and, in meeting both these criteria, the public interest will be served through potentially lower electricity prices.

6.1.3 Hydro Tasmania submission

Hydro Tasmania did not specifically comment on the terms of reference in its submission. However, Hydro Tasmania's submission to the investigation was the primary means of informing the Regulator of its present price policies and has been a key input to the investigation.

²⁵ For further discussion on this point, refer OTTER Issues Paper.