Electricity Supply Industry Expert Panel

Basslink: Decision making, expectations and outcomes

Information Paper

December 2011

Electricity Industry Panel - Secretariat

GPO Box 123
Hobart TAS 7001
Telephone: (03) 6232 7123
Email: contact@electricity.tas.gov.au
http://www.electricity.tas.gov.au

December 2011

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GLOSSARY

ACCC	Australian Competition and Consumer Commission
AEI	Australian Energy International (Basslink) Consortium
APV	Annualised Present Value
BDA	Basslink Development Agreement
BDB	Basslink Development Board
BDSC	Basslink Development Steering Committee
BFF	Basslink Facility Fee
BOA	Basslink Operations Agreement
BPL	Basslink Pty Ltd
BSA	Basslink Services Agreement
CCGT	Combined Cycle Gas Turbine
CIGRE	International Council on Large Electricity Systems
CPI	Consumer Price Index
CPs	Conditions Precedent
DC	Direct Current
EPC	Engineering, Procurement & Construction
FCAS	Frequency Control Ancillary Services
GW	Giga Watt
GWh	Giga Watt Hours
HEC	Hydro Electric Commission
HVDC	High Voltage Direct Current
IBG	Investment Banking Group
IES	Intelligent Energy Systems
IRR	Inter Regional Revenue
JAP	Joint Advisory Panel
MOU	Memorandum of Understanding
MRET	Mandatory Renewable Energy Target
MW	Mega Watt
MWh	Mega Watt Hours
NAB	National Australia Bank
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NGIL	National Grid International Ltd
NPV	Net Present Value
OCGT	Open Cycle Gas Turbine
PwC	Price Waterhouse Coopers
RECs	Renewable Energy Certificates
SEC	State Electricity Commission of Victoria
SOEBs	State Owned Electricity Businesses
SPS	System Protection Scheme
TPA	Trade Practices Act

Foreword

In June 2010, the Tasmanian Government announced that it would establish an independent expert panel to conduct an investigation into, and provide guidance to Parliament on, the current position and future development of Tasmania's electricity industry. The Electricity Supply Industry Expert Panel was established under the *Electricity Supply Industry Expert Panel Act 2010*, and granted wide ranging information gathering powers to enable it to perform its intended function, as set out in its Terms of Reference.

Amongst other things, the Panel's Terms of Reference require it to investigate and report on major infrastructure development decisions affecting the electricity sector and the impact that those decisions have had on electricity prices in Tasmania and on the financial position of the State-owned electricity businesses (SEOBs).

In its published Statement of Approach, the Panel took this reference to include decisions regarding major infrastructure to encompass Basslink, the undersea cable linking the Tasmanian and Victorian electricity grids. This paper sets out information pertaining to the processes, decisions and expectations of the State Government and Hydro Tasmania in relation to the project and examines the extent to which the outcomes achieved by Basslink to date have been consistent with the original expectations.

Specifically, the paper sets out factual information and analysis regarding:

- the circumstances and reasoning that persuaded the Government of the need for Basslink and of its status as a project of State significance;
- the processes by which the private sector developer for Basslink was chosen;
- the business case that informed Hydro Tasmania's decision to commit to the development of Basslink; and
- the extent to which the project has met the expectations established by the Government and Hydro Tasmania since it was commissioned in 2005-06.

In preparing this paper the Panel has engaged in extensive discussions with a range of stakeholders, including senior representatives of Hydro Tasmania, both past and present, the operators of Basslink, and members of the Basslink Development Board. The Panel has also used its information gathering powers to access a range of documents pertaining to the development of Basslink. Those documents included briefings provided to Cabinet, Hydro Tasmania board papers and meeting minutes, copies of independent advice obtained by the Department of Treasury and Finance, various iterations of Hydro Tasmania's business case for Basslink, the Basslink Services Agreement and other commercial arrangements between Hydro Tasmania and Basslink Pty Ltd.

While issues of commercial sensitivity and Cabinet confidentiality preclude the release of the aforementioned source material, or detailed references to its content, the Panel has been able to arrive at its own, independent and fully informed understanding of the circumstances and decisions which led to Basslink's construction, as well as the link's performance since it became operational in April 2006.

Executive Summary

When the Rundle Liberal Government announced in 1997 its intention to proceed with the development of an undersea interconnector linking the Tasmanian and Victorian electricity grids, the idea of a submarine cable across Bass Strait was not new. The economic and technical feasibility of interconnection had been considered numerous times by the Hydro-Electric Commission and others over the preceding 50 years, but never managed to gain the support needed for it to become a reality.

However, the end of large scale hydro electric development in Tasmania and the need to secure the next electricity supply option for the State, along with the long-standing issue of hydrological risk management and the development of the National Electricity Market, led the Rundle Government to seek expressions of interest through a competitive selection process for a private sector party to develop Basslink, and to progress the project as a Project of State Significance. Basslink was to form a central element that enabled a package of electricity sector reforms to be implemented.

While aspects of the proposed reforms, such as the sale of the HEC's transmission, distribution and retail businesses, did not survive the change of Government that occurred in 1998, the incoming Bacon Labor Government endorsed the development of an undersea interconnector, and the process that had been set in motion to find a private sector developer for Basslink continued. The new Government did, however, revise the previous Government's goals and strategic objectives for Basslink to the following:

- improve the security of electricity supply and reduce the exposure to drought conditions in Tasmania;
- provide Tasmania with access to electricity prices determined competitively in the NEM;
- provide a means by which electricity generated in Tasmania can be sold into the NEM and provide a new source of peak generating capacity in the NEM;
- ensure that, through a competitive selection process, the cost of Basslink to users is minimised; and
- ensure that the returns to the State from the State Owned Electricity Businesses are maximised.

While many within the community appear to hold the view that Basslink was proposed on the basis that it was predominantly, or solely, intended to be used to enable the sale of electricity from Tasmania to Victoria, it is clear from the Government's strategic objectives that, from the outset, the link was intended to be used as a net supply option for Tasmania in times of low hydrological inflows (drought), as well as net exports in times of high inflows.

Once the initial commitment to Basslink was made, the Basslink project had a lengthy gestation period, during which a selection process was conducted to find a private sector developer for the link.

The two final proposals to emerge from the competitive process both involved commercial arrangements between Hydro Tasmania and the proposed developer to fund the project. The option of the interconnector being developed as a 'regulated link' and funded through transmission charges was not considered viable by developers.

Hydro Tasmania examined the business case for interconnection repeatedly. The business case evolved significantly during the project's development, and the early iterations considered by Hydro Tasmania were markedly different from the business case that underpinned the final decision to proceed with Basslink.

For example, between the Board of Hydro Tasmania agreeing in February 2000 to enter into a preliminary non-binding agreement with private sector developers to build, own and operate Basslink and Hydro Tasmania issuing a notice to proceed in November 2002, the projected cost of constructing Basslink increased from approximately $500 million to almost $875 million – much of the increase driven by the outcomes of the joint Commonwealth, Victorian and Tasmanian environmental assessment process. The identified commercial benefits of Basslink for Hydro Tasmania, as the counterparty to the development, also evolved over time as the opportunities from interconnection became better understood.

The business case for Basslink was regularly reviewed by the Board of Hydro Tasmania, which subjected the business case to scrutiny independently of Hydro Tasmania's management. The Basslink project was also reviewed by the State Government and independent expert advisers on multiple occasions, in the wider context of energy reform.

Those investigations repeatedly showed Basslink to be a positive commercial proposition for Hydro Tasmania's business, even with the significant increase which occurred in the project's cost. Basslink's ability to add value to Hydro Tasmania's business was also assessed as being robust to the likely range of sensitivities which reflected the key risks to the business case.

Accordingly, the Hydro Tasmania Board made a commercial decision that, having regard to the risks and returns associated with the project, it was in the best interests of Hydro Tasmania to proceed with the development of Basslink.

The consultants engaged by the Department of Treasury and Finance to consider the range of risks associated with the Basslink project from the State's perspective highlighted that the State Government was not in a strong position to influence or control the key financial risks arising from the project – namely national market pricing outcomes and hydrology. However, they also highlighted that without Basslink, and in the face of new on-island gas-fired generation, the outlook over the following ten years was for a decline in Hydro Tasmania's returns to Government.

It was also noted that the State Government had flagged Basslink as a strategically important project for Tasmania, and that it was intended to facilitate further development of Tasmanian wind resources, reduce drought risk and introduce competition into the Tasmanian electricity supply industry.

Hydro Tasmania's business case for Basslink was driven primarily by the arbitrage opportunities made possible by interconnection with Victoria. Over 50 per cent of the anticipated revenue gains factored into the business case were attributed to the ability to buy in energy to meet Tasmanian demand at times of low prices in Victoria, and then sell the same volume of electricity over the link when Victorian prices were higher than Tasmania's. While arbitrage would, by definition, have no impact on the total volume of electricity generated by Hydro Tasmania, it was expected to have a significant positive impact on the value of that energy because of the flexibility available in the timing of its generation.

Arbitrage alone was not, however, expected to cover the ongoing cost of Basslink, and Hydro Tasmania identified a number of other sources of value which it believed would make the link commercially viable from its perspective. These included the opportunity to sell capacity contracts in Victoria, value from the additional yield that Hydro Tasmania expected to be able to generate as a result of improvements in its capacity to manage its water storages, as well as the revenue derived from the creation and sale of additional Renewable Energy Certificates as the result of that improvement in yield. Two other primary financial benefits were the value of net 'exports' of electricity, that is, the net difference between north and south bound flows of electricity across Basslink, and the ability to transition major industrial pricing to market-related levels.

The final November 2002 business case showed that, if the base-case's assumptions held, the Basslink project would produce an estimated Net Present Value (NPV) to Hydro Tasmania of around $260 million ($2002), with a benefit/cost ratio of 1.44:1. The business case also considered a wide range of sensitivities around the base-case which had both positive and negative impacts on the net value of the link to Hydro Tasmania.

Although Basslink is expected to have an economic life of up to 40 years, given the often conflicting public perceptions regarding the financial performance of Basslink, the Panel has examined the extent to which the link's performance to date has measured up against Hydro Tasmania's expectations regarding the commerciality of the project.

In the first five full years of the link's operation, Basslink's financial performance has not fulfilled the expectations contained in the final business case on a number of fronts. This is largely a reflection of hydrological factors. Other assumptions that underpinned the final business case, such as the projected differences between Victorian peak and off peak prices, have been borne out by experience to date.

Hydrological issues were consistently recognised as one of the key risks in the Basslink business case. Variations in the yield from Hydro Tasmania's water catchments were expected, and it was recognised that low inflow levels would impact on a number of components of Basslink's trading value, particularly Hydro Tasmania's plans to be a net 'exporter' of energy and the creation of additional Renewable Energy Certificates (RECs).

In this sense, the low hydrological inflow sequences that occurred prior to and immediately after Basslink's commissioning reflect the anticipated variability in the value created for Hydro Tasmania by Basslink. The return to more typical hydrological inflows in recent years has resulted in financial outcomes for Hydro Tasmania associated with Basslink that have been more consistent with the expectations in the final business case.

Taking into account only the direct realised benefits attributable to Basslink, Hydro Tasmania's overall Basslink-related costs have been around $130 million ($ nominal) greater than the actual revenue benefits that it has generated since Basslink began delivering energy in April 2006.

Illustrating the importance of hydrology in driving these outcomes, in 2009-10 and 2010-11, with inflows at more typical levels, the direct realised revenues associated with Basslink were around $25 million in excess of Hydro Tasmania's overall Basslink-related costs.

In its evaluation of Basslink's performance, Hydro Tasmania looks beyond the direct costs and benefits identified in the business case and considers a number of indirect sources of value that it attributes to Basslink. Those additional sources of value are based on a comparison of the outcomes made possible by Basslink with the hypothetical outcomes that might have been realised had Hydro Tasmania been required to supply Tasmania's electricity needs over the past five years without interconnection.

In the absence of Basslink, Hydro Tasmania assumes that the shortfall in the capacity of its hydro generation schemes to meet Tasmania's demand for electricity would have been met using a combination of natural gas fired generation – owned and operated by Hydro Tasmania – and, in times of extremely low inflows into Hydro Tasmania's storages, negotiated load shedding by major industrial customers. The Hydro Tasmania analysis then compares the estimated costs associated with such a scenario with the actual costs of the energy supplied through Basslink, and concludes that Basslink has enabled Hydro Tasmania to avoid costs in excess of $300 million since the link commenced commercial operations.

Taking both direct and indirect sources of value together, Hydro Tasmania concludes that over the period 2006-07 to 2010-11 the average net benefit of Basslink to its business is in excess of $40 million per annum.

The Panel has developed its own estimates of the alternative supply costs that may have arisen in the absence of Basslink. Like Hydro Tasmania, the Panel considered that the use of natural gas fired generation to meet the shortfall in the capacity of hydro-generation to meet on-island demand was the most plausible alternative to Basslink. However, the Panel also considered a second scenario involving the use of large-scale wind generation to meet the State's electricity needs.

The Panel has estimated that when compared with its gas scenario, Basslink resulted in lower wholesale energy costs for Tasmania of around $200 million over the period 2007 to 20111, and approximately $350 million when compared with the hypothetical wind scenario.

On this basis, Basslink has – as Hydro Tasmania contends – enabled Tasmania's demand for electricity to be met at a materially lower wholesale energy cost than would have been the case under either of the two alternative scenarios evaluated. If not for Basslink, the prolonged dry period experienced by Tasmania in the middle of the previous decade would have had far more severe negative financial consequences for Hydro Tasmania than the trading losses associated with Basslink to date. The drought would also have had potentially undesirable consequences for customers, to the extent that the higher wholesale energy prices that would have been likely in the Tasmanian market without Basslink in place would have been passed on.

When the indirect benefits of Basslink (as a net supply option during times of drought, for example) are added to the trading performance of the link, the financial benefits of Basslink to Hydro Tasmania in the first five years of its operation are positive, despite the under-performance of the trading outcomes, relative to the business case.

In reaching this conclusion, a deliberately conservative approach has been applied to the valuation of the benefits to Hydro Tasmania that can be attributed to Basslink. For example, a number of sources of value that Hydro Tasmania includes in its own analysis of the contribution Basslink makes to its business have been excluded from consideration, such as an uplift in the contract prices struck with energy intensive industrial customers.

While these benefits may have enhanced Hydro Tasmania's financial performance they have not been ascribed as direct Basslink value by the Panel. The analysis also does not consider yet-to-be-realised financial benefits that Basslink could deliver, such as the ability of Hydro Tasmania to build storages in anticipation of the introduction of carbon pricing and the realisation of that value in the coming years.

Given the focus of its Terms of Reference, the Panel has not sought to undertake an assessment of the impact that Basslink has had on the wider Tasmanian economy. Accordingly, this assessment of Basslink has not considered the benefits for the Tasmanian economy that might be attributed to interconnection. For example, Hydro Tasmania contends[1] that the security of supply provided by Basslink has provided a number of large energy intensive businesses with the confidence to invest in upgrades of their Tasmanian production facilities and enter into new long term contracts.

Finally, a number of stakeholders have asserted that regulated customers are effectively underwriting Basslink. Having examined the detailed financial performance of Basslink from Hydro Tasmania's perspective, as well as transmission network pricing in Tasmania, and having regard to the way in which prices for regulated customers are set, the Panel concludes that regulated customers are not paying for Basslink through their electricity prices.

[1] Hydro Tasmania's confidential submission to the Panel, "*Basslink and trading performance*".

1. The case for interconnection

In April 1997, as part of a broader statement of intent[2], the then Tasmanian Premier, Hon Tony Rundle MHA, announced a number of major policy initiatives relating to Tasmania's future energy strategy. One of those initiatives was a commitment to proceed with the development of Basslink, an undersea interconnector linking the Tasmanian and Victorian electricity grids. The Government also announced its intention to break up the Hydro-Electric Corporation into separate generation, transmission and distribution/retail businesses, with a view to selling the transmission, distribution and retail businesses, and using the proceeds to retire Government sector debt.

The State Government's announcement regarding Basslink was strongly supported by the Victorian and Commonwealth Governments[3], both of which undertook to assist and cooperate with the Tasmanian Government in its development of the link.

The idea of a submarine cable linking Tasmania with interstate electricity grids was not new. Labor MHR Arthur Calwell mooted the idea in Federal Parliament in April 1943 and interconnection had been the subject of informal discussions between the Hydro-Electric Commission (HEC) and State Electricity Commission of Victoria (SEC) during the 1950s. In the early 1960s the HEC Commissioner Sir Allan Knight decided to investigate the feasibility of an undersea cable across Bass Straight, as an alternative to ongoing calls for Hydro Tasmania to consider thermal – and even nuclear – power generation as a means of increasing the State's capacity to generate electricity.[4]

Interconnection of the Tasmanian and Victorian electricity grids was again examined during the 1980s, with a focus on identifying the perceived economic benefits of energy exchange between an energy-constrained hydro power system in Tasmania and Victoria's mainly capacity-constrained thermal power system, as well as mitigating the risk of drought on the Tasmanian power system. In the early 1990s the HEC and SEC collaborated on a series of feasibility studies, including a real-time simulation of how a national energy market might operate. The simulation ran for six months and at its conclusion showed an imaginary Basslink cable yielding the HEC a paper profit of $47 million.

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2 Directions Statement

3 For example, the Call for Expressions of Interest from developers released by the BDB contains statements of support from the Prime Minister and the Victorian Premier and both jurisdictions agreed to the joint assessment process to facilitate the project.

4 See "Lifeblood – Tasmania's Hydro Power" by Roger Lupton, Focus Publishing Pty Ltd.

In 1997 there were a number of considerations that prompted the Tasmanian Government and its agencies to revisit the idea of interconnection. These included:

- the end of large scale hydro electric development in Tasmania and the need to identify the next electricity supply option for Tasmania;
- proposals for a National Electricity Market (NEM), which would require physical interconnection of the Tasmanian and Victorian electricity grids should Tasmania decide to participate in that market;
- the desire to further examine the hydrological risk management potential of Basslink (commonly referred to as 'drought proofing[5]');
- concerns about the economic and financial impacts on the State should a major energy consumer decide to cease operations in Tasmania;
- the need to evaluate the extent to which the State Government's reform agenda for the electricity supply industry in Tasmania would position the Tasmanian electricity market for competition with and without interconnection; and
- the need to examine the potential contribution of interconnection to achieving the Government's stated objective of ensuring that Tasmanian businesses and electricity users generally have access to competitively priced electricity.

The Basslink Development Steering Committee (BDSC) was established in June 1997 to advise the Government on the economic, technical and environmental feasibility of Basslink, with a view to having an interconnector built and operated as a private sector project that would see the link operational within four years. The BDSC's November 1997 report to Government included the following findings:

- interconnection with Victoria was technically feasible, and would benefit from the major technological advances which had occurred as a result of an increasing number of undersea connectors being installed around the world;
- Basslink would be economically viable, with proponents indicating that the development cost was likely to range between $350 and $400 million for a 300MW interconnector;
- Basslink could be progressed as either a regulated or 'non-regulated' interconnector under the National Electricity Code[6];
- there was widespread interest in Basslink from Australian and overseas private sector companies, in both the regulated and non-regulated business models;

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5 The Tasmanian Government's subsequent decision to direct Aurora Energy to acquire the partially completed Tamar Valley Power Station from Babcock and Brown Power in 2008 suggests that Basslink was later considered not to 'drought proof' Tasmania sufficiently.

6 Under a regulated model the development and operating costs of an interconnector are recovered from customers via network transmission charges. Under the non-regulated alternative, the interconnector is classified as a Market Network Service Provider (MNSP) and those same costs are recouped via revenue earned through participation in the market from Inter-Regional Revenue (IRR) settlements, which are the price differences between the two regions the link connects, multiplied by the volume of electricity the link carries.

- Basslink could be constructed and operational by March 2002;
- for the project to succeed, the support (non-financial) of the Tasmanian and Victorian Governments, in areas such as environmental approvals and negotiations with national electricity bodies like NEMMCO[7], would be critical; and
- the construction and operation of Basslink would have to be considered and approved through a public assessment process.

Based on these findings, the BDSC recommended that the Tasmanian Government, with the agreement of the Victorian Government, should – as soon as practicable – call for Expressions of Interest from potential proponents in the development of Basslink as either a regulated or non-regulated interconnector.

The Tasmanian Government accepted the BDSC's recommendations in December 1997 and, in February 1998, established the Basslink Development Board (BDB) to take the lead role, on behalf of the State, in facilitating the development of Basslink as a commercial opportunity[8] in the NEM. The BDB's responsibilities would also include conducting the selection process to identify a preferred proponent to take the project forward.

Having made the commitment to Basslink and established the BDB to facilitate its development, Premier Rundle called an early election. A change in Government ensued and the incoming Bacon Labor Government endorsed the development of Basslink, and the process that had been set in motion to find a private sector developer for Basslink continued. The new Government did, however, revise the previous Government's goals and strategic objectives for Basslink to the following:

- improve the security of electricity supply and reduce the exposure to drought conditions in Tasmania;
- provide Tasmania with access to electricity prices determined competitively in the NEM;
- provide a means by which electricity generated in Tasmania can be sold into the NEM and provide a new source of peak generating capacity in the NEM;
- ensure that, through a competitive selection process, the cost of Basslink to users is minimised; and
- ensure that the returns to the State from the State owned electricity businesses are maximised.

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7 National Electricity Market Management Company

8 The Expression of Interest document refers to 'a commercially viable business, developed in the NEM within a Build, Own, Operate framework' without 'any financial contribution by the Government, either direct or contingent.

2. The search for a developer

The search for a private sector developer to construct and operate Basslink began with the release of a Call for Expressions of Interest by the Basslink Development Board in July 1998. The Call closed several months later in September, with 14 national and international consortia responding.

From those expressions of interest, four proponents[9] were short-listed to respond to a detailed Project Brief prepared by the BDB. The Project Brief was released in December 1998 with proponents required to submit their responses by October of the following year.

The Project Brief provided to the short-listed proponents specified a number of minimum technical requirements for Basslink. Those requirements included:

- a continuous transfer capacity both to and from Tasmania of at least 200MW, although proponents could submit proposals involving higher transfer capacities;
- a minimum design life of 40 years;
- a cable failure rate of less than 1 in 10 years;
- a maximum number of five unplanned interruptions per annum;
- implementation, by the proponent, of load and/or generation reduction systems to protect the integrity and stability of the Tasmanian power system in the event of a sudden unplanned interruption to the flow of power over Basslink[10]; and
- the availability of spare cable and cable repair facilities that would enable a cable failure to be repaired within two months.

The proponents were free to lodge proposals for progressing Basslink as either a regulated or non-regulated interconnector. While the BDB facilitated the proponents' discussions with each of the State Owned Electricity Businesses (SOEBs)[11] and undertook various studies (the results of which were made available to the successful proponents), it was made clear that there would be no financial contribution to the project by the State, either direct, indirect or contingent.

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9 The four short listed proponents were Australian Energy International (Basslink) Consortium, Taslink Consortium, National Grid International Ltd and South East Australia Link Consortium. With the agreement of the BDB, the South East Australia Link Consortium withdrew its bid in January 1999, after one of its members pulled out and the remaining members were unable to recruit a replacement.

10 Without a System Protection Scheme (SPS) Basslink imports to Tasmania would have been limited to around 100 MW during certain periods of the day, while exports to Victoria would also be limited under certain Tasmanian hydro generation scenarios.

11 The former Hydro Electric Commission was disaggregated on 1 July 1998, creating separate generation, transmission and distribution/retail businesses (Hydro Tasmania, Transend and Aurora Energy).

Following evaluation by the BDB of the three remaining proponent's responses to the Project Brief, two final short-listed proponents[12] were chosen in November 1999 - Australian Energy International (Basslink) Consortium (AEI) and National Grid International Ltd (NGIL). Each was asked to finalise its project development arrangements with the State, as well as any commercial and other arrangements required with Tasmania's SOEBs (principally Hydro Tasmania), with a view to the BDB evaluating their final proposals in February 2000.

In preparing their final proposals, misgivings about the level of sovereign and counter-party risk associated with the development of Basslink as a non-regulated interconnector prompted the short-listed proponents to seek clarification of the future direction of the Tasmanian electricity market, in particular the likely structural arrangements for the newly created Hydro Tasmania.[13] Both proponents were of the view that a non-regulated development would face significant hurdles if the structural changes to Hydro Tasmania being considered by Government at the time resulted in counter-parties whose financial standing and risk management capabilities could not support a project the size and scale of Basslink.

In their discussions with the BDB, the proponents also expressed doubts regarding the development of Basslink as a regulated interconnector. Their concerns related, in part, to the uncertainty and lack of clarity associated with the market benefits test[14] applied by NEMMCO under the National Electricity Code to applications for new interconnectors, which Basslink would be required to satisfy in order for the link's operators to receive regulated revenue, as well as the lengthy approval process. Accordingly, the BDB engaged consultants, Intelligent Energy Systems (IES), to advise whether the economic benefits provided to Tasmanian and Victorian electricity consumers by Basslink would 'pass' the market benefits test.[15]

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[12] The two short listed proponents were Australian Energy International Basslink Consortium (AEI) and National Grid International Ltd (NGIL).

[13] The Tasmanian Government had commissioned a review of the structure of the HEC's generation and system control functions which culminated in a report in May 1999 (the Garlick Report) which recommended the establishment of three independent trading generators within the HEC parent entity. The Government did not accept the report's recommendation.

[14] The purpose of the market benefit test was to assess the merits of proposed investments in regulated electricity networks, in terms of their economic costs and benefits, in order to ensure that there were not more cost effective alternatives to the capital expenditure being proposed.

[15] IES concluded that Basslink would have difficulty passing the economic benefits test, and that if it did, it would be Victorian rather than Tasmanian customers that would meet the bulk of the regulated revenue payments. It was considered by proponents that this would decrease the likelihood of a regulated Basslink meeting with regulatory approval, particularly in Victoria, thus reducing the commercial attractiveness of developing Basslink as a regulated interconnector. Further, the economic benefit test did not consider the same range of factors that were taken into account by Hydro Tasmania when establishing whether there was a commercial basis for the project.

During this stage of the selection process Aurora Energy withdrew from direct negotiations with both proponents for the purchase of Basslink import capacity. As a result, Hydro Tasmania agreed to become the lead negotiator in the commercial negotiations with the short-listed proponents regarding both export and import capacity.

To overcome possible concerns on the part of the Australian Competition and Consumer Commission (ACCC) regarding the impact on competition of Aurora Energy's withdrawal from the negotiations, Hydro Tasmania included in the commercial agreements with proponents a provision which allowed assignment of all or part of the import capacity to Aurora Energy, plus a commitment to make any capacity not taken up by Aurora Energy available to the market.[16]

The selection criteria against which the two short listed proponents' proposals were evaluated by the BDB consisted of a 'Business Delivery' related criterion and an Economic Benefits (net economic Impact on Tasmania) criterion. Both criteria were detailed in the information provided to the competing proponents, as were the weightings to be used by the BDB in evaluating their proposals.

2.1. The proposals

The final NGIL and AEI bids submitted to the BDB for evaluation in February 2000 both proposed the development of Basslink as a monopole HVDC[17] link operating at 400kV DC, with subsea electrodes and earth providing the return path for the DC current. Both proponents proposed to install a fibre optic telecommunications cable, to be laid with the main Basslink cable. The telecommunications cable would not be part of the Basslink facilities, however, and would be funded and developed by the proponents to provide a separate revenue stream, independent of the revenues arising from the Basslink project.

[16] Aurora Energy subsequently continued to negotiate with Hydro Tasmania, resulting in the parties entering into a Memorandum of Understanding in December 1999 which envisaged Aurora Energy contracting for some of Basslink's import capability prior to the project's financial close. Those negotiations were ultimately unsuccessful, with Aurora Energy making a commercial decision not to proceed.

[17] High Voltage Direct Current

Both bids also met the minimum technical requirements set by the BDB and both proposals required the development of a System Protection Scheme (SPS) to enable the proposed transfer capability to and from Tasmania to be realised without affecting the integrity and stability of the Tasmanian power system, should there be a sudden unplanned interruption to Basslink's power flow.[18]

Despite these similarities, there were, however, clear points of difference between the two proposals. While NGIL offered a cable with a continuous rating of 480 MW and a short term dynamic rating of up to 600MW for periods of up to ten hours per day, AEI offered a cable with a continuous capacity of 600MW, but no short term dynamic rating capacity.

There were also differences in the costs of the two proposals. While the total cost of the project under both proposals was in the order of $500 million and the total costs quoted by the two developers were within ten per cent of each other, the cost of NGIL's proposal was lower than the AEI proposal and NGIL's initial facility fee was substantially lower than that proposed by AEI. AEI's higher facility fee was also to be indexed by CPI in the out years, whereas NGIL proposed that its facility fee be indexed at a discounted rate, based on a percentage of the movement in the CPI.

The AEI costing did, however, include an amount for assuming the foreign exchange and interest rate risk associated with the construction of the project, which represented a large proportion (35 per cent) of the cost differential between the two proposals. Under the NGIL proposal, no allowance was made for assuming either risk, leaving the exposures for Hydro Tasmania to manage.

Prior to the proponents submitting their final proposals to the BDB, Hydro Tasmania had negotiated arrangements with both proponents to limit cost 'pass throughs'. Both proponents noted, however, that they were unable to quantify certain costs until, amongst other things, the outcomes arising from the development approvals process were known, and that those costs would need to be added to the project's cost when determining the final cost to complete at the point of financial close. In particular, potential changes to the project scope and costs that could arise from the joint Commonwealth, Victorian and Tasmanian assessment process[19] were considered likely to have a potentially significant impact on the cost to complete the project.

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[18] Without protective measures in place, a sudden and unexpected outage of Basslink whilst carrying energy in either direction would have serious ramifications for Tasmania's electricity system. For example, if energy is flowing into Tasmania from Victoria and the link 'trips', the failure creates an immediate imbalance between the supply of, and demand for, electricity that could cause widespread system disruption, unless either the shortfall in the production of electricity can be rectified in time or the demand for electricity can be curtailed. The System Protection Scheme uses controlled load shedding by major industrial users of electricity and/or generation interruption to ensure that supply and demand remains balanced in the event of a link failure. Without the SPS, the volume of electricity able to be carried into Tasmania by Basslink would be limited to the capacity of the largest on-island generator available to instantly match the loss of Basslink. This would mean Basslink's import capacity would be limited to just over 140MW, instead of up to 500MW.

[19] The JAP process was established by the three jurisdictions concerned as a means of expediting the environmental and regulatory approvals required for the project.

While the arrangements struck with the two proponents by Hydro Tasmania in relation to pass throughs were subtly different, both included scope to negotiate an increase in the annual facility fee to reflect the impact of higher costs arising as a result of the development approvals process.

Both proponents also indicated that the 24/25 month timeframe specified for completion could be affected by outcomes of the development approvals process, as well as other HVDC projects being developed at that time in other parts of the world[20] which, if approved, could impact on the capacity of their nominated cable suppliers to meet the delivery timelines assumed in the proponents' project plans.

One other significant difference between the proposals from NGIL and AEI was their level of 'completeness', in terms of the commercial agreements reached with Hydro Tasmania and the project development arrangements made with the State. While NGIL and Hydro Tasmania had agreed on key contractual conditions, including the price of accessing Basslink's capacity, a similar commercial agreement had not been reached with AEI, and significant differences remained between the negotiation positions of AEI and Hydro Tasmania in relation to a range of fundamental issues and contract conditions.

2.2. The final selection process

The assessment process and associated BDB deliberations, including confirmation of the weightings assigned by the BDB to each of the proponents' proposals, were overseen and monitored by an independent Probity Auditor. The BDB also engaged a number of specialist advisers to assist in the evaluation of the proponents' proposals, and obtained advice from the Department of Treasury and Finance on the proposed contractual arrangements with the SOEBs, and the impact of the proponents' proposals on the Tasmanian Government's fiscal strategy.

Treasury's advice to the BDB was that while both proposals were consistent with the Government's reform agenda, in the absence of major changes, AEI's proposal should not be considered as an alternative to the NGIL proposal. The NGIL proposal was considered by Treasury to provide better fiscal outcomes for the State than the AEI proposal, in terms of its potential to generate profits for Hydro Tasmania and returns to the State Government.

While not a participant itself in the assessment process, Hydro Tasmania also briefed the BDB on the status of its Basslink business case studies, prior to the BDB commencing its evaluation of the final bids.

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[20] If it had proceeded, the 1 000MW Bakun HVDC project from Sarawak to Malaysia would have tied up the subsea cable manufacturing capacity of ABB and Pirelli for up to two years, as well as the limited number of cable transport and cable laying vessels.

Drawing on its own analysis of the two competing proposals, as well as independent advice obtained from Macquarie Bank, which had global experience in the energy sector, Hydro Tasmania had formed the view that the commercial returns likely to be delivered under the AEI proposal were not commensurate with the undertakings that Hydro Tasmania would be required to make as the counter party to the proposed 25 year commercial agreement, and that only the NGIL bid proposal was acceptable.

The BDB's own evaluation of the NGIL and AEI proposals, based solely on the BDB's selection criteria and weightings, also clearly showed the NGIL proposal to meet the selection criteria to a higher standard than AEI's proposal.

The BDB's recommendation to select NGIL as the preferred developer of Basslink went to Government on 25 February 2000. Cabinet, at its meeting on 28 February 2000, accepted the BDB's recommendation that NGIL be selected as the Government's preferred proponent to build, own and operate Basslink and gave its authority for the State to be a party to the project's contractual documents, particularly the Basslink Development Agreement (BDA), which was the commercial agreement that bound NGIL to deliver the project in accordance with the Project Requirements.

2.3. Achieving Financial Close

Following the selection of NGIL as Basslink's developer, changes occurred in the roles played by a number of the parties involved in the task of delivering Basslink.

NGIL established Basslink Pty Ltd (BPL) as a special purpose project vehicle to take the project forward. As a consequence, the agreements entered into by NGIL on 29 February 2000 were novated to BPL on 21 March 2000.

Having successfully completed the selection of a proponent to develop Basslink, the BDB's role changed to one of ensuring that the obligations of the developer, BPL, and the State, under the BDA, were met and that the project reached financial close as soon as possible. The BDB also continued to coordinate the key public communications and stakeholder management issues associated with Basslink.

The BDA was the primary contract governing the design, construction, installation and commissioning of Basslink. The BDA was conditional on the satisfaction of various Conditions Precedent (CPs), with the State, Hydro Tasmania and BPL each having responsibility for meeting a number of CPs.

One of those CPs was the requirement for BPL to obtain the necessary environmental and regulatory approvals from the three jurisdictions impacted by the project: the Tasmanian and Victorian Governments and, as the subsea cable would be laid across Bass Strait in waters under the Commonwealth's jurisdiction, the Australian Government. The three jurisdictions had already agreed in April 1999 to establish a single combined assessment process, facilitated by an independent Joint Advisory Panel (the JAP) made up of representatives from each jurisdiction.

By February 2002, due to a number of factors including potential outcomes from the JAP's environmental assessment process, significant changes had occurred in the project's scope, cost and risk profile. As a result, the parties to the development decided that it was no longer practical to separate the State's responsibility for delivery of the infrastructure under the BDA from the commercial, financial and business case issues involving Hydro Tasmania. Therefore, it was agreed that a changed governance structure was required in order to enable Hydro Tasmania and BPL to negotiate directly on key project matters.

Consequently, in April 2002 the State Government and Hydro Tasmania entered into a Memorandum of Understanding (MOU) appointing Hydro Tasmania as the State's Agent with respect to the Basslink project. In this capacity, Hydro Tasmania was authorised to discharge all of the State's obligations and exercise all of the State's rights under the BDA, and any other agreements pertaining to the project.

As a result, Hydro Tasmania was able to negotiate directly with BPL in relation to the project, including variations in the project's scope and cost. Most importantly, however, under the terms of the MOU, Hydro Tasmania – together with BPL – became responsible for, or party to, any significant decisions that might impact on the continued technical and commercial viability of the project.

An important issue facing the parties in their efforts to satisfy the CPs in the BDA was whether to seek ACCC authorisation of the Basslink Services Agreement (BSA) between Hydro Tasmania and BPL, in order to avoid the possibility of a future challenge to the BSA under Part IV[21] of the Trade Practices Act (TPA). The concerns about a possible challenge had their origins in the terms of the BSA itself, which – in return for a 'facility fee' paid to BPL by Hydro Tasmania – provided Hydro Tasmania with all of the market revenues earned by BPL from the flow of electricity in either direction across Basslink, along with certain rights that would enable Hydro Tasmania to determine how the link would be offered in the market. Given Hydro Tasmania's position as the sole generator in Tasmania at that time, there were reservations that the BSA might be seen by the ACCC as substantially lessening competition.

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[21] Part IV of the *Trade Practices Act 1974* dealt with the use of market power for anti-competitive purposes, amongst other things. The Trade Practices Act has been superseded by the *Competition and Consumer Act 2010*.

Hydro Tasmania and NGIL jointly considered the risks to the project from the potential unwinding of elements of the BSA[22] as an outcome of the ACCC's authorisation process against the risks of the ACCC subsequently challenging the agreement under the TPA and decided not to seek ACCC authorisation of the BSA. However, the ACCC was asked to undertake a legal review of the BSA, including market enquiries, with a view to providing the parties to the BSA with a 'letter of comfort'. This the ACCC did, although it reserved the right to bring proceedings against the parties to the contract if it subsequently came to the conclusion that the effect of the BSA was to substantially lessen competition.

Basslink Services Agreement (BSA)

The BSA between Hydro Tasmania and Basslink Pty Ltd commenced when Basslink was commissioned on 28 April 2006. The BSA establishes the rights and obligations of both parties with respect to the operation of Basslink. Basslink earns revenue for its owners in a similar way to generators in the NEM, by bidding into the spot market its capacity to deliver energy, with the returns determined by price differences and the energy flows between Victoria and Tasmania. The BSA provides for the owners of Basslink to swap that market-based revenue for an agreed fixed facility fee plus performance-related payments, which consolidated annually via monthly payments. The agreement also gives Hydro Tasmania the rights to control the way in which Basslink Pty Ltd bids its interconnector capacity, although these provisions have been partly curtailed by Tasmanian legislation. The initial term of the BSA was set at 25 years, with an option to extend the term for a further 15 years.

2.4. Cost implications of the joint approvals process

The CP that had the most impact on the project's scope, its cost and its delivery timeframe, was the gaining of the required environmental and development approvals. In order to obtain those approvals, BPL (in consultation with the State and Hydro Tasmania) was required to make major changes to the interconnector's design, including the provision of a metallic return (in lieu of sea electrodes) to provide the return path for the DC current.[23] Significant changes to the underground and overhead transmission route in Victoria were also made as a result of opposition to the construction of overhead transmission lines in Victoria.

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[22] Had the ACCC insisted, for example, that BPL contract with another counter-party, other than Hydro Tasmania, in relation to the southward bound Inter-Regional Revenues, the project would have been likely to stall, as the revenue from southbound flows of electricity were crucial to Hydro Tasmania's Basslink business case.

[23] The use of a metallic return, rather than less costly electrodes, was made a condition of approval by the Joint Advisory Panel, with the aim of reducing the level of stray current emanating from the cable and, therefore, any impact the cable's operation might have on the marine environment, commercial fisheries and surrounding metallic infrastructure. Aside from the increased cost, the use of a metallic return was also expected to result in higher transmission losses and, therefore, reduce Basslink's trading value to Hydro Tasmania on an ongoing basis.

The changes resulted in a major increase in the cost to complete the project, and delayed both the project's start and completion dates, which had further consequences in terms of Basslink's cost.[24] When combined with other variations imposed by external stakeholders, such as changes to the subsea cable's burial regime required by marine insurers to reduce the risk of damage from fishing activity along the Victorian coast, changes to Basslink's design were beginning to threaten the viability of the project and the strength of Hydro Tasmania's business case.

By November 2001, increasing concerns about the viability of the Basslink project saw Hydro Tasmania, BPL and BPL's UK parent, National Grid, undertake an intense period of review, investigation, joint work programs, cost analysis and renegotiation, which culminated in the signing of two Heads of Agreement (Commercial and Telecoms) in early May 2002. The Agreements confirmed the viability of the project and the parties' commitment to making Basslink a reality, but extended the project delivery period from the 24 months specified in the original Project Brief to 33 months. Based on the assumption that financial close would be achieved in December 2002, the extended timeframe would see Basslink commencing commercial operations in early 2005.

The Commercial Heads of Agreement detailed the agreed changes to the project's scope and the associated increases in capital cost, the increases in project development costs, the increased costs associated with the revised subsea burial regime and the increased construction and marine insurance costs arising from the disruptions in worldwide insurance markets following the terrorist attacks on New York City on September 11, 2001.

The total increase in Basslink's cost from the selection of NGIL as the preferred proponent was in the order of $250 million, taking the estimated total cost to complete the project – to the point at which commercial operations would commence – to around $750 million.

The increase was comprised of a $204 million increase in Engineering, Procurement and Construction (EPC) contractor and related costs and a $35 million increase in project costs not included in the EPC contract. The largest single contributor to the increase in the project's cost was the provision of the metallic return that the JAP had made a prerequisite of the project gaining the required environmental and development approvals.

[24] The Basslink Development Board's environmental consultants, based on their experience of other major projects, estimated that the JAP process should have been completed by November or December 2000, i.e. around 10 months after selection of the preferred proponent. The process took some 30 months to complete, with the final JAP Report issued in June 2002, resulting in a significant increase in BPL's project development costs and an extension of the project completion timeline.

Many of the cost increases agreed to and listed in the May 2002 Commercial Heads of Agreement were not yet fixed, however, with some unable to be finalised until the conclusion of the JAP process. Others were to be finalised closer to the time of financial close, with the result that the final cost of completion was higher again than the total cost described in the Commercial Heads of Agreement. In order to gauge the full impact that the outcomes from the JAP process and other externalities had on the cost of Basslink, the following table presents a breakdown of the major contributors to the increase in the cost of Basslink listed in the Heads of Agreement, but based on the final cost to complete.

Table 1 - Increases in Basslink costs to complete

Cost factor	Additional cost $ million
Metallic return	93
Changes in route	48
Undergrounding in Victoria	14
Changes to subsea cable burial	46
Engineering, Procurement and Construction[25] cost escalation	35
Construction insurance	54
Development costs not included in the Engineering, Procurement and Construction contract	39
TOTAL	329

Source: Schedule 1 of the Agreed Financial Model, Hydro Tasmania

The Heads of Agreement (Telecoms) also detailed an agreement reached by the parties under which Hydro Tasmania would underwrite the risks of a shortfall in the telecommunications revenue associated with the 12 pair fibre optic cable which BPL would lay as part of the bundled subsea cable. Hydro Tasmania's obligation was to meet any revenue shortfall (up to $2 million per annum for 15 years) if the revenue earned from the sale of dark fibre capacity to telecommunications carriers fell short of $3 million per annum.

The date for financial close was set at 31 May 2002, although in late May 2002, following approval by both Boards, the date for financial close was extended to 31 December 2002, to allow time for a number of outstanding commercial matters to be resolved and the project's legal documentation to be completed.

[25] NGIL had contracted with Siemens and Pirelli (now Prysmian) to design, construct and commission Basslink.

3. Hydro Tasmania's business case for Basslink

Hydro Tasmania's business case for Basslink evolved through a process of iterative development that began in earnest in 1999 and concluded only when final agreement was reached with BPL and the Board of Hydro Tasmania issued a Notice to Proceed in November 2002.

The early business cases considered by Hydro Tasmania were markedly different from the business case that eventually underpinned the final decision to proceed with Basslink. In early 2000, Hydro Tasmania's analysis was primarily focussed on the energy trading value of Basslink, as the most tangible benefit to its business, although discussion of the business case noted that its sensitivity to 'wet' and 'dry' inflow sequences, amongst other things, meant that the project was not easy to justify on the basis of trading value alone.

Nonetheless, the Basslink business case considered at the February 2000 meeting of the Hydro Tasmania Board showed a positive Net Present Value (NPV) based solely on the arbitrage value[26] obtained from Basslink. The avoided costs from not having to operate the Bell Bay thermal power station to provide drought support were also taken into account. A number of other potential sources of value identified by Hydro Tasmania were noted but not taken into account in examining the financial case for the project, despite some of them being potentially significant in terms of their positive financial contribution.

The other benefits identified by Hydro Tasmania, but not quantified in the February 2000 business case, were:

- revenue from the sale of additional Renewable Energy Certificates (RECs) associated with the development of wind generation and increased yield from Hydro Tasmania's existing hydro generation portfolio that Basslink would facilitate, over and above the baseline established for Hydro Tasmania as part of the Mandatory Renewable Energy Target (MRET) scheme;
- the value extracted from the market as the national renewable energy requirement impacted on energy pricing within the NEM;
- profits from energy hedging products (insurance products, such as caps that could be sold to retailers in the NEM);
- the sale of Frequency Control Ancillary Services (FCAS) into the NEM;

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[26] Arbitrage is the practice of taking advantage of a temporal price difference between two or more markets, with the difference between the market prices providing a source of additional profit. In practice, with Basslink, arbitrage involves Hydro Tasmania holding back its production of electricity at times of low prices in Victoria, allowing electricity to flow southward into Tasmania as a substitute for hydro generation, and then later producing that same volume and selling it into Victoria at a higher value, in the process displacing generation in Victoria. There are no 'net' energy flows under this arbitrage regime as it involves matching the highest priced exports with the lowest priced imports for equal volumes of energy. Basslink can also act as a supply option for either Victoria or Tasmania, however this reduces the periods of time available for arbitrage.

- the increases in yield and revenue from the use of cloud seeding; and
- strategic benefits, including greater flexibility in hydro and wind generation capacity utilisation and the avoidance of stranded assets in the event of the loss of a major industrial load and/or the introduction of gas fired generation into Tasmania.

The cost of construction used in the February 2000 business case was also significantly lower than would ultimately prove to be the case, being based on figures submitted by NGIL and AEI through the competitive bidding process that did not reflect the additional costs that were an outcome of the joint approvals process.

It had previously been recognised that the outcomes of the development approvals process may have an impact on the project's costs, with this being one of the principal risks to the business case. Sensitivity analysis undertaken in 2000 showed that, at that time, it was expected that the value to Hydro Tasmania of energy trading via Basslink would exceed the annual cost of the link for the majority of years. Negative values occurred when hydrological inflows were low, resulting in Basslink being used as a net source of supply and reducing the trading value of the link, although Hydro Tasmania noted in its briefing to the Board that the negative impact on trading value caused by a dry inflow sequence would be offset by the avoidance of costs that would otherwise be required to meet demand requirements.

The Board accepted the business case and concluded that it would enter into commercial arrangements that would take the project through the development and approval process. It was on the basis of the February 2000 business case that Hydro Tasmania entered into the preliminary, but non-binding, agreement with NGIL to build, own and operate Basslink.

The decision by the Hydro Tasmania Board in May 2002 to reaffirm its commitment to Basslink was based on a complete re-examination of the business case for interconnection. That analysis took into account the increased project costs detailed in the Commercial Heads of Agreement, the imminent availability of natural gas in Tasmania and the conversion of the Bell Bay Power Station from oil to natural gas, and the Woolnorth wind farm development.

The May 2002 Basslink business case was tabled at the June 2002 meeting of Hydro Tasmania's Board, and showed that:

- the business case for Hydro Tasmania had 'tightened', relative to earlier assessments;
- there had been a reduction in the risk associated with the project's development as a result of obtaining environmental and planning approval;
- the variability of returns to Hydro Tasmania and, consequently, the State Government had increased; and

- the risk profile had also changed, with both Hydro Tasmania and the State having to accept more non-construction risk, such as underwriting the telecommunications revenue generated by the fibre optic cable laid with Basslink.

The business case concluded that the increased risk was acceptable and would be actively managed wherever possible.

While opportunities for arbitrage still represented over half of the revenue that Hydro Tasmania expected to realise through Basslink, the May 2002 business case took in a wider range of revenue streams for Hydro Tasmania, without which the now significantly higher cost of construction would have made the project commercially unviable.

The business case took into account the following revenue streams:

- an increase in revenue associated with the arbitrage opportunities made possible by Basslink;
- the value of the additional yield that Hydro Tasmania expected to be able to generate as a result of improvements in its capacity to manage its water storages (i.e. reduced spill in periods of high inflows when on-island demand is not sufficient to use the available energy);
- the revenue derived from the creation and sale of additional RECs as the result of improved yield; and
- the net 'export' of electricity, that is, the difference between northern and southern-bound flows of electricity.

This last item, while not as critical to the business case as arbitrage, was a nonetheless important source of potential revenue for Hydro Tasmania, particularly early in the cable's operational life, when it was assumed that positive cash flows would be generated from the 'selling-down' of some of the water reserves that had been required as a buffer for hydrological risk management in the absence of Basslink.

In terms of the ongoing costs associated with Basslink, the following expenses and negative revenue outcomes were taken into consideration:

- the Basslink facility fee;
- the costs of hedging[27] against movements in interest rates and foreign currency exchange rates, in terms of the impact that these variables might have on the facility fee;
- the payment of a $50 million 'security deposit', essentially an up-front contribution to lower the annual ongoing cost; and
- the impact of on-island sales lost to gas and wind generation, noting that the value of the energy sales lost to gas and wind was offset by exporting the surplus energy associated with the lost sales.

The May 2002 business case also assumed that gas-fired generation would be operational and result in surplus generation being available for export.

The May 2002 business case showed that, on what Hydro Tasmania termed an Annualised Present Value (APV)[28] basis, Basslink would return to Hydro Tasmania the equivalent of an annuity of $11 million per annum over the life of the BSA. Further, if two other revenue sources – which had been evaluated but not included in the February 2000 business case – were added, the estimated return to Hydro Tasmania attributable to Basslink increased to an annualised PV of $24 million. The two other sources of revenue in question were revenue from the sale of insurance products (cap contracts) in the Victorian market and increases in the revenue associated with the renewal of major industrial customer contracts.

The following chart shows the relative contributions that the various sources of value identified by Hydro Tasmania in the May 2002 business case were expected to make to the net annual value of Basslink for Hydro Tasmania. As can be seen from the chart, the revenue associated with arbitrage was expected to be the largest single contributor to the viability of Basslink by a significant margin, although not sufficient to cover the cost of the link in its own right.

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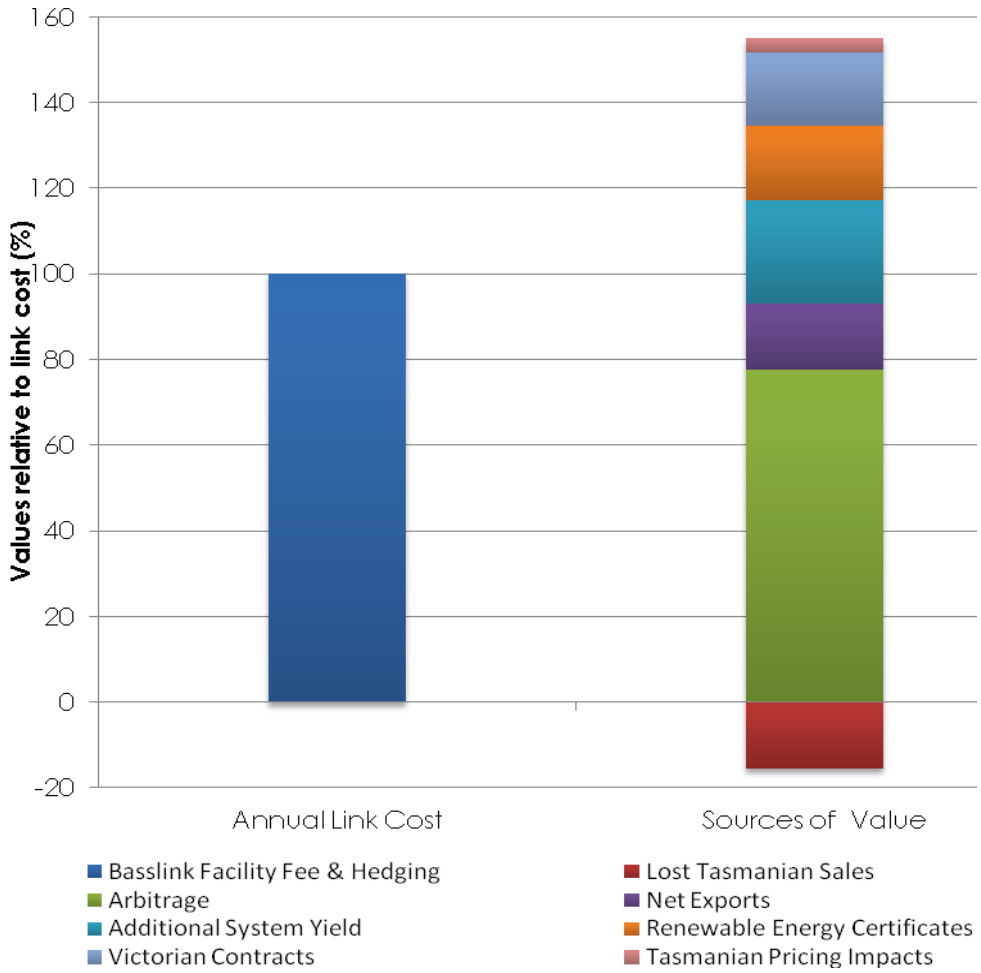
[27] In finance, a hedge is a position established in one market in an attempt to offset exposure to the price risk of an equal but opposite obligation or position in another market — usually, but not always, in the context of a business's commercial activity. For example, one of the oldest means of hedging against risk is insurance to protect against financial loss due to accidental property damage or loss. Between 7 March 2000 and 29 November 2002, Hydro Tasmania entered into a number of foreign exchange and interest rate hedging transactions, prior to entering into firm contracts in relation to the construction of Basslink.

[28] Given the potential variability in the annual trading outcomes generated by Basslink, the Hydro Tasmania Board sought a measure to examine 'typical' annual outcomes. The Board utilised the concept of Annualised Present Value (APV), which Hydro Tasmania defines as the annuity that would generate the same Net Present Value (NPV) as the variable net cash-flows (revenue less costs) projected to be generated by Basslink. For example, a positive cash flow over four years of $80, $50, $100, $120 might yield an NPV of $287 and, based on the same discount rate, an APV of $86. APV is not a commonly used measure but, for the purposes of presentation, the Panel has elected to use APV throughout this paper as an accurate representation of the advice provided to the Board of Hydro Tasmania at the time.

Figure 1 - Basslink business case - sources of value, relative to cost



Source: Basslink Business Case: May 2002, Hydro-Electric Corporation
Notes: Quantums are not shown on the chart as information is commercial- in-confidence. Data are shown on this basis to illustrate the relative shares of elements of the business case.

The May 2002 business case and its underlying assumptions were also 'stress tested', by applying different scenarios for growth in the Tasmanian load, alternative hydrological inflow sequences, different Victorian price spreads and delays in the commencement of Basslink's commercial operation, Bell Bay repowering and planned wind developments in Tasmania.

The sensitivity analysis confirmed that the project returns were robust to the likely range of sensitivities. The worst case hydrological inflow sequence analysed reduced the annualised PV of $24 million to $3 million, while the worst case Victorian price scenario analysed reduced the annualised PV from $24 million to $19 million. In terms of cash flow, analysis based on the May 2002 business case concluded that the cash flows generated by Basslink would be strongly positive in the initial years following Basslink becoming operational.

The projected cash flows reflected expectations about the state of Hydro Tasmania's water storages at the time Basslink would be commissioned and the expectation that Basslink would enable Hydro Tasmania to run down its inventory of water in order to generate net sales from Tasmania without compromising its defences against low inflows.[29]

There has been some public comment that Basslink was proposed on the basis that it was predominantly, or solely, intended to be used to enable the sale of electricity from Tasmania to Victoria, and that the link's use as a net supply option for Tasmania in recent years indicates that Basslink has failed to achieve its purpose. These views are at odds with the grounds on which both the State Government and Hydro Tasmania proceeded with the project. The Hydro Tasmania business case clearly anticipated that Basslink would be used for net supply in times of low inflows, as well as net exports in times of high inflows.

The May 2002 business case also confirmed that, under the BSA, Hydro Tasmania would receive both the 'export' and 'import' IRRs[30] in exchange for the payment of the Basslink Facility Fee (BFF). The BFF would be subject to a commercial risk sharing arrangement with BPL being rewarded with a significantly higher fee when the arbitrage value provided by the link was high, provided the maximum dynamic transfer capacity was available during periods of high Victorian prices. Conversely, the BFF could be substantially reduced if the link's dynamic transfer capacity was not fully available during these high priced periods or the arbitrage value was low. In this way, the ongoing cost to Hydro Tasmania of Basslink would be a function of the spread between peak and off-peak electricity prices in Victoria.

Although the State Government had stated previously, in the Expression of Interest document released by the Basslink Development Board in July 1998, that there would be no financial contribution to the project by the State, by mid 2002 Hydro Tasmania had entered into ongoing discussions with the Government regarding a number of financial issues, including:

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[29] While the business case noted that outcomes in individual years would be influenced by hydrological inflows, the February 2000 business case had assumed a starting storage level of over 60 per cent, with sensitivity analysis being conducted for opening storage levels based on materially lower than average, and higher than average scenarios. By May 2002, however, below average rainfall had resulted in Hydro Tasmania's water storages falling to be just under 30 per cent of capacity, and by the time Basslink became operational at the end of April 2006, storage levels had only recovered to 33 per cent. The reduction in value arising from the difference in starting storages has been estimated by Hydro Tasmania to be in the order of $115m.

[30] Inter Regional Revenue (IRR) is the revenue Basslink earns from the market, being the value of the price difference between the Tasmanian and Victorian system marginal prices multiplied by the volume of electricity flowing across Basslink.

- payment of the $50 million Security Deposit being contemplated by Hydro Tasmania;
- a proposal that the State take on Hydro Tasmania's commitment under the Heads of Agreement (Telecoms) to underwrite the telecommunications revenue associated with the optical fibre cable being buried with the interconnector (which represented a potential cost of up to $2 million per annum for 15 years);
- BPL's requirement for the State to guarantee (should Hydro Tasmania default) the floating interest portion of the BFF; and
- an acknowledgement from the State that the operational insurance cost pass through arrangement Hydro Tasmania was proposing to enter into under an Insurance Concession Deed with BPL were necessary, given the state of the world wide insurance market.

Draft letters to the responsible Shareholder Ministers detailing Hydro Tasmania's requests in relation to these issues were attached to the May 2002 business case considered at the June 2002 Board meeting.

Cabinet subsequently agreed to Hydro Tasmania's requests at its 11 November 2002 meeting.

3.1. Independent advice obtained by Hydro Tasmania

In addition to the analysis undertaken within Hydro Tasmania, Hydro Tasmania's Board obtained two third-party reviews of the May 2002 business case, one from the Investment Banking Group (IBG) and the other from the National Australia Bank (NAB). In addition, other specialist external advisers were engaged to review particular business case assumptions, such as the assumptions made about Victorian prices.

The advice of both IBG and NAB focused on the pass-through arrangements that had been agreed to by Hydro Tasmania in relation to the cost of subsea cable burial and insurance, and noted the risk to the project's viability posed by increases in those (and other) costs. IBG also noted that the positive benefit of Basslink to Hydro Tasmania now relied on new or improved revenues from a number of sources, and that without these the May 2002 business case would show a negative result.

3.2. Independent advice obtained by the State Government

The Department of Treasury and Finance also sought independent advice, from Price Waterhouse Coopers (PwC), regarding: the impact of Basslink on returns to Government; the risk to the State should Basslink proceed (in both the 'with gas' and 'without gas' scenarios;) and whether the State should accede to the requests from Hydro Tasmania regarding the proposed insurance arrangements, the $50 million security deposit, the underwriting of BPL's telecommunications revenue and the floating interest rate component of the facility fee.

The review by PwC was not the first time during the evolution of the project that the State Government had sought independent advice in relation to the risks to Government associated with energy reform options, including Basslink.[31]

The PwC report highlighted the need to consider the project from the perspective of its net present value, and to take into account the variability in financial outcomes on a year-by-year basis, which would be largely driven by hydrology. PwC cautioned that focusing on a single "APV" figure to justify proceeding with the project, as Hydro Tasmania's business case did, disguised the variability that existed in some of the estimated benefits.

In particular, PwC noted the potential for the positive cash flows associated with the export of surplus energy in the first decade of Basslink's operation to be reduced, or even reversed, if the hydrological inflows included in the assumptions underpinning Hydro Tasmania's base case – which used a historic inflow sequence – were not achieved.[32]

The PwC report also considered the range of risks associated with the Basslink project from the State's perspective. In light of the potential variability in Hydro Tasmania's financial performance, highest amongst those risks was the risk to the State Government's fiscal strategy, in terms of the returns to Government from Hydro Tasmania. The PwC report highlighted that the State Government was not in a strong position to influence or control the key financial risks arising from the project.

In relation to the risks faced by Hydro Tasmania, PwC's opinion was that the key financial risks identified in earlier assessments of the business case for Basslink remained. The risk associated with Victorian price spread was rated by PwC as one of the highest risks, while the level of hydrological risk to the business case and Hydro Tasmania's role as payer of the operational insurance costs for Basslink were considered key exposures.

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[31] The review by PwC was led by Mr John Martin, a partner in PwC and former partner with Oakvale Capital Limited, which had previously been engaged by the State Government, through the Department of Treasury and Finance, to conduct reviews of earlier iterations of Hydro Tasmania's Basslink business case, and provide advice regarding the impact on the financial returns to Government and risks for the State should the Basslink project proceed. The previous reviews had also examined NEM entry and the impacts that the introduction of natural gas in Tasmania would have. Prior to the re-examination of the business case for Basslink in May 2002, reviews were undertaken of the February 2000, August 2000 and March 2001 business cases.

[32] As discussed above, this is, in fact, what ultimately transpired, with a series of below average inflow sequences in the years immediately prior to Basslink becoming operational impacting on Hydro Tasmania's ability to capture the planned early cash flows.

PwC also noted that the annualised NPV calculation used by Hydro Tasmania as the basis for its decision to continue with the development of Basslink did not consider two cost elements in its assessment of the business case: the value of the security deposit ($50 million) and the foreign exchange and interest rate hedges that had been entered into by Hydro Tasmania in mid 2000, in an attempt to reduce the financial risks to the project ahead of financial close. PwC agreed with Hydro Tasmania's treatment of the hedge positions as 'sunk costs' from a decision making point of view.

The PwC report concluded that if these two cost elements were added back into the business case, to give the overall cost of Basslink to Hydro Tasmania, the estimated annualised NPV for Hydro Tasmania was reduced by $9.5 million.

Given that its brief was to consider the implications of Basslink for the State, and not just Hydro Tasmania, PwC contended that it was important to recognise that without Basslink, and in the face of new on-island generation fired with natural gas, the projected outlook was for a decline in Hydro Tasmania's returns to Government over the following ten years. In addition, the report noted that the State Government had flagged Basslink as a strategically important project for Tasmania, given that it would facilitate further development of Tasmanian wind resources, reduce drought risk and introduce competition into the Tasmanian Electricity Supply Industry.

In conclusion, PwC's advice was that a case could be made for the State Government to support Hydro Tasmania's business case by endorsing Hydro Tasmania's payment of the $50 million security deposit, providing the guarantees required by BPL and agreeing to act as payer of the Basslink operational insurance costs. The report noted, however, that in taking on these obligations the Government would be providing considerably more direct support for energy reform than had originally been envisaged.

3.3. Notice to proceed

A final update of the business case for Basslink was tabled at the September 2002 Hydro Tasmania Board meeting. The September 2002 business case included adjustments to the May 2002 business case arising from the fixing of the subsea burial costs and greater certainty regarding construction insurances. The Basslink revenue sources had also been reviewed, with the aid of 'dynamic temperature' modelling, which simulated the dynamic capability of Basslink and the impact that this would have on the daily bidding of Basslink.

The revised calculations based upon a more comprehensive study of the two key drivers of Basslink value, Victorian price volatility and inflow variability, resulted in a substantial increase in the estimated value of arbitrage opportunities, which in the May 2002 business case had represented over half of the revenue Hydro Tasmania expected to earn from Basslink.

As in previous business case updates, there were increases in the project's cost, but again they were more than offset by increases in the estimated values of other Basslink revenue sources. The net result was a revised APV of $26 million per annum, an increase of $2 million per annum over the May 2002 business case.

Hydro Tasmania also undertook a final detailed risk assessment, which included identification of the risks to Hydro Tasmania if Basslink were not to go ahead, as well as the risks if Basslink proceeded.

It was noted in a presentation of the September 2002 business case to Hydro Tasmania's Board that, once final legal advice on the amended project documents had been received, the Board should be in a position at its November meeting to issue a notice to proceed, as it was unlikely that there would be any further changes to the business case.

Accordingly, the Board resolved to accept the Basslink business case as a commercially sound basis for authorising the Corporation to enter into the 25 year BSA, subject to the satisfactory resolution of the outstanding issues in a manner that did not result in a significant adverse impact on the business case, and subject to formal approval of the final business case. Hydro Tasmania's CEO was also given the authority to negotiate a further financial commitment to the project in order to obtain the required extension of the Engineering, Procurement & Construction (EPC) contract end date.[33]

The key tasks for the Hydro Tasmania Board at its November 2002 meeting were to receive an updated September 2002 business case and consent to the Corporation entering into the suite of amended project documents.

The updated business case showed that the link's net value had increased to an APV of $29 million, $5 million higher than the figure included in the September 2002 business case.

The Board of Hydro Tasmania resolved that the Corporation would "*take all necessary steps*" to discharge its obligations under the amended project documentation tabled at the meeting, noting that "*it is the commercial judgement of the board"* that the Basslink Project, as negotiated and presented to the Board, "*will be advantageous to the conduct, promotion and attainment of the objects of the business of the Corporation".*[34]

In order for Hydro Tasmania and BPL to reach final agreement on the cost to complete Basslink – which still had not been resolved and by that time stood at around $850 million – the Board also authorised the CEO to negotiate a further increase to reach financial close.

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[33] Hydro Tasmania's final risk assessment identified that BPL had failed to conclude negotiations for an extension to the EPC contract with Pirelli and Siemens, giving rise to the possibility that the EPC contract could be terminated.

[34] Minutes of a Meeting of Directors of Hydro Electric Corporation (ABN 48 072 377 158) ("Corporation") at Hobart on the twentieth day of November 2002.

A further special Board meeting was scheduled for 27 November 2002 to enable the CEO to report back to the Board on the final negotiations and the impact (if any) on the 'final' business case. At that meeting, the Board was advised that the negotiations to reach agreement on the final Cost to Complete, while close to resolution, would require the Board to authorise a further increase in negotiating limits, to allow for finalisation of construction insurances, and this was provided.

The final negotiations took place on 27 November 2002 and the Board of Hydro Tasmania met again on the following day, where they were advised that agreement had been reached on the outstanding items, including the Cost to Complete.[35]

With the inclusion of foreign exchange and interest rate movements and the agreed final negotiated costs, the Board was advised that:

- the annual cost of Basslink to Hydro Tasmania would, on an APV basis, be $64 million, comprising a Basslink facility fee of $57 million, plus $7 million in hedging costs (in net terms) and Hydro Tasmania's project related costs; and
- the estimated APV of Basslink to Hydro Tasmania now stood at $28 million, which represented a benefit/cost ratio of 1.44:1.

Based on confidential information provided by Hydro Tasmania, including details of the projected cash flows associated with Basslink over its first 20 years of operation and the discount rate used by Hydro Tasmania in calculating its APV measure of Basslink's value, it is estimated that an APV of $28 million (2002$) equated to a NPV of approximately $260 million (2002$).

With the negotiated business case parameters being acceptable to the Board and legal advice having been received that confirmed the amended projects documents as suitable for execution, the project documents were duly executed and a Notice to Proceed issued to the State Government on 29 November 2002, resulting in the Basslink project becoming unconditional.

BPL also issued a Notice to Proceed on 29 November 2002 to its EPC contractors, the Tas-Vic Consortium (Siemens and Pirelli), to commence work on the project.

3.4. Project completion

BPL's project plan had Basslink commencing commercial operation by late 2005. However, a number of major incidents occurred during construction, delaying the commissioning process.

[35] There would still be some pass-through of costs allowed, such as subsea burial costs, which were not fixed at that time.

While BPL requested an extension in the project's due date, claiming that these events were beyond its reasonable control (i.e. force majeure), the claims were not accepted by the Project Inspector, with the result that BPL was required to pay $5 million in liquidated damages and there was no increase to the projected cost to complete the project from Hydro Tasmania's perspective.

The incidents, which included damage to transformers in transit from Germany (requiring replacements to be built and shipped to Australia) and several incidents during burial of the subsea cable, resulted in a five month delay in the project's completion, with the result that Basslink did not commence commercial operation until midnight on 28 April 2006, some three years later than the originally proposed commencement date of April 2003. However, from the time of financial close, the project was delivered on schedule, except for the delay caused by the transformer damage during shipping.

The total cost to complete at the commencement of commercial operations in April 2006 was $874 million, including the agreed contribution towards the cost of subsea burial of the cable.

4. Basslink's Performance - Physical

An important aspect of Basslink's performance is its operational performance.

The operation of Basslink is governed by two main contracts, the Basslink Operations Agreement (BOA) and the BSA. Both agreements specify a range of operational requirements, some of which can be traced back to the technical requirements set out in the Project Brief used as part of the selection process to choose a developer for Basslink. The two agreements are, however, independent of each other and the performance obligations in both are different.

The BOA is the contractual mechanism between the State of Tasmania and the operators of Basslink, the primary focus of which is ensuring that an interconnector is available to the State for a period of 40 years. As such, the BOA has no financial incentives or penalties relating to the link's performance.

The BSA, on the other hand, which is the agreement between Hydro Tasmania and BPL establishing the rights and obligations of both parties with respect to the operation of Basslink, includes a number of financial incentives relating to the link's performance, in terms of its availability.

The requirements regarding the operational performance of Basslink set out in both agreements are summarised below.

Basslink Operations Agreement

The principal features of the BOA are:

- a minimum availability of 97 per cent, and a performance target of 97.5 per cent (excluding *force majeure* events), assessed on a rolling 12 month basis and taking into account unavailability due to both planned and unplanned outages[36];
- a cable failure frequency not exceeding once in ten years;
- a maximum of five unplanned interruptions to transfers across Basslink per annum (excluding interruptions that last for less than 500 milliseconds); and
- a maximum repair time per cable failure of two months (not including failures caused by *force majeure* events).

Under the BOA, sub-standard performance can also have potentially significant consequences for the operators of the link.[37]

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[36] The final business case for Basslink assumed availability of 97 per cent and allowed for 50 hours a year of unplanned outages.

[37] Details of these arrangements have not been provided in this paper for reasons of commercial confidentiality.

Basslink Services Agreement

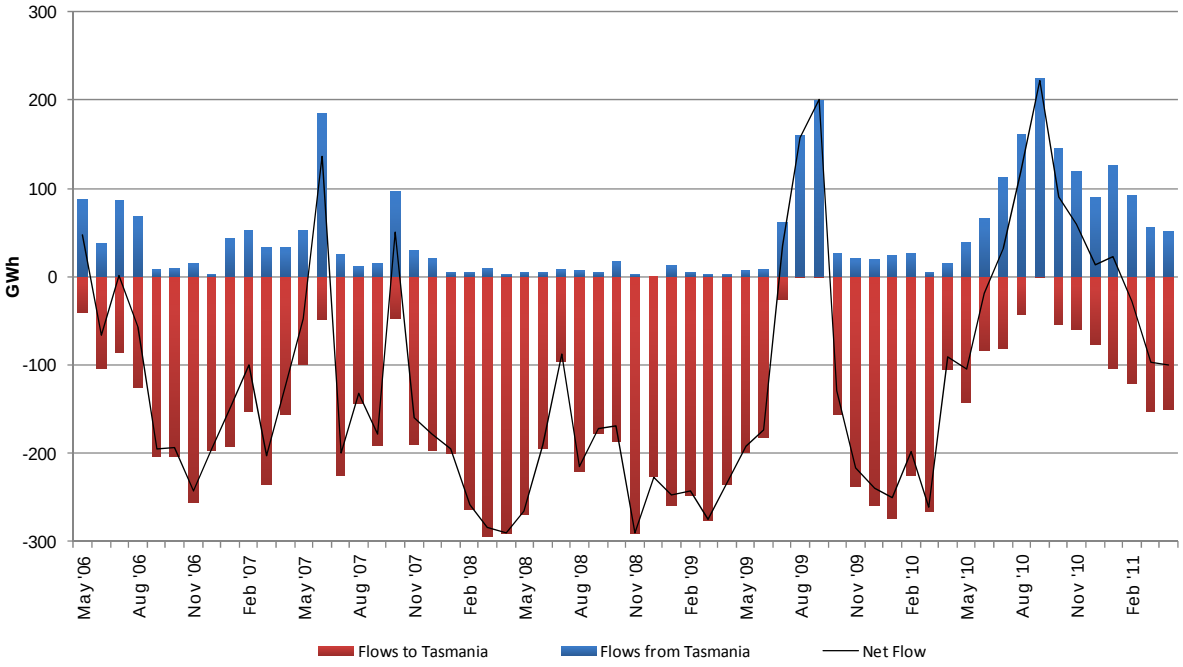
The principal features of the BSA are:

- a minimum availability of 97 per cent, assessed on a calendar year basis, along with financial penalties for BPL if the interconnector's availability is below that level;
- a financial incentive to the operator of the link if the cable is 100 per cent available during the Victorian summer (see *Incentive availability payments*); and
- a commercial risk sharing mechanism that distributes the financial consequences of changes in the arbitrage opportunities made available through Basslink, which has the effect of incentivising the operator to ensure the link is 100 per cent available during times of high Victorian spot market volatility (see *Commercial risk sharing payments*).

4. Energy transfers

Figure 2 shows the flows of electricity to and from Tasmania via Basslink on a monthly basis since the cable began commercial operations in 2006, as well as the net balance of those north and south bound flows, which, until 2010-11, had consistently seen the net 'importation' of electricity into Tasmania.

Figure 2 - Basslink Energy Flows (Monthly)



Source: Hydro Tasmania

Table 2 summarises the annual flows of electricity in each direction over Basslink since the cable was commissioned in late April 2006. Reflecting the below-average inflows into Hydro Tasmania's water storages in the years immediately prior to and following Basslink commencing commercial operation, Basslink has thus far been used as a net supply option for Tasmania, rather than a means of selling electricity into Victoria. With the gradual return to more typical rainfall totals in recent years, 2010-11 was the first year in which north bound flows of electricity over Basslink exceed southward flows.

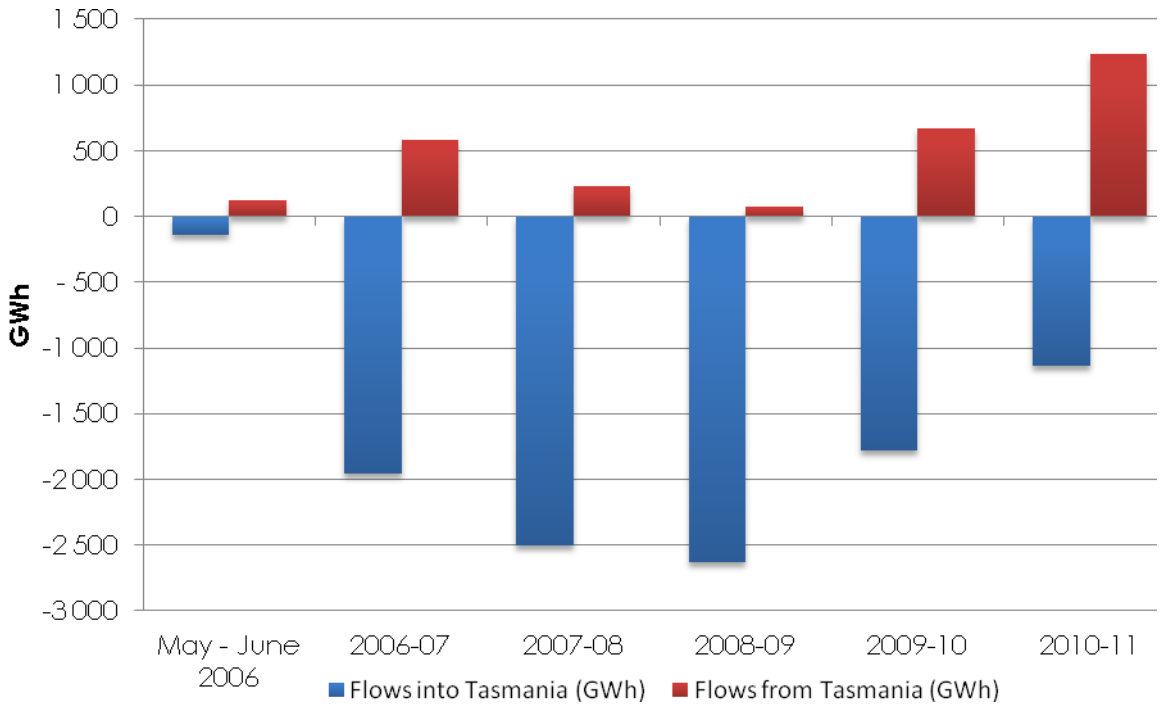
Table 2 - Annual Basslink Flows

	Flows to Tasmania (GWh)	Flows from Tasmania (GWh)	Net Flow (GWh)	Direction of net flows
May - June 2006	144	125	19	South
2006-07	1 954	584	1 371	South
2007-08	2 506	227	2 279	South
2008-09	2 632	72	2 560	South
2009-10	1 785	669	1 116	South
2010-11	1 132	1 232	100	North
Total	10 153	2 909	7 245	South

Source: Hydro Tasmania

The annual northward and southbound flows detailed in Table 2 – Annual Basslink Flows are presented graphically in Figure 3.

Figure 3 - Annual Basslink Flows



Source: Hydro Tasmania

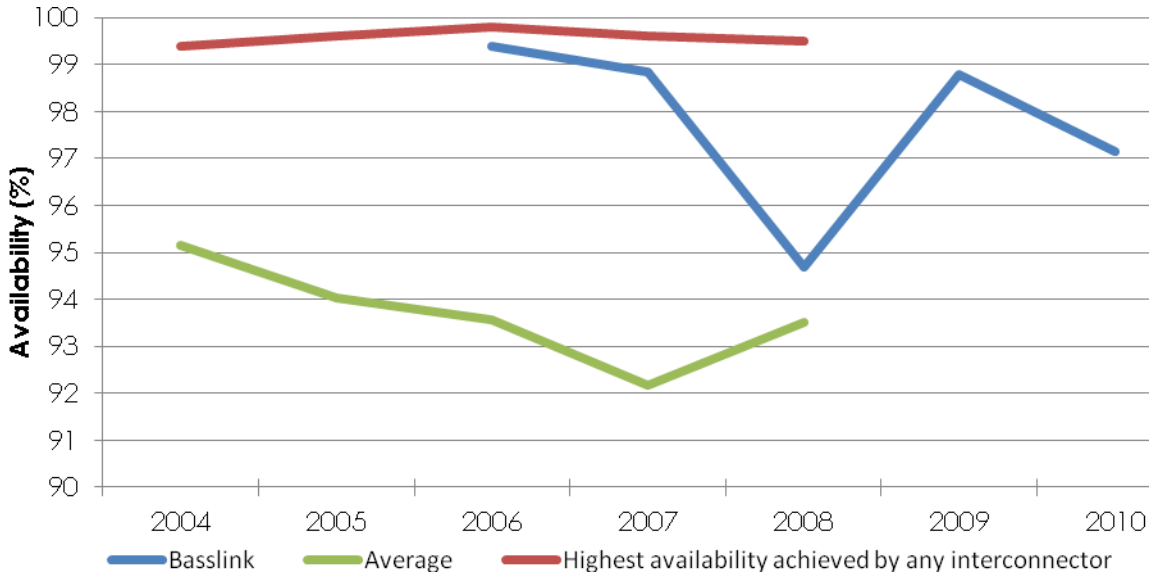
Low yields from Hydro Tasmania's water catchments have meant that Basslink, to date, has not delivered the level of energy 'exports' expected in the business case. Interconnection was, however, proposed on the basis that it would be used both for the purpose of net supply in times of low inflows and net exports in times of high inflows. The net flow of energy over Basslink to date has, therefore, been consistent with its intended function, even if the overall direction of those flows has not resulted in the net 'export' of energy during the early years of the cable's operational life that was factored into the final Basslink business case.

4.2. Availability

Overall, Basslink's physical performance since it began operating commercially in April 2006, in terms of its availability, has generally been consistent with the targets set out in the BOA and the BSA. Data provided by both Hydro Tasmania and BPL indicate that the link's average availability has been around 97.5 per cent, noting that availability has been assessed on both a calendar year basis and a rolling 12-month basis, depending on the agreement against which performance is being measured.

It is useful to put the performance of Basslink in this regard into a wider context. The International Council on Large Electrical Systems (CIGRE) conducts an annual survey of the reliability of over 30 High Voltage Direct Current (HVDC) systems throughout the world, including Basslink. Figure 4 shows that, since Basslink was commissioned in 2006, its performance – in terms of its availability – has been above the average of the other interconnectors included in the survey and, with the exception of 2008 and to a lesser extent 2010, amongst the best performing HVDC systems.

Figure 4 - Basslink availability

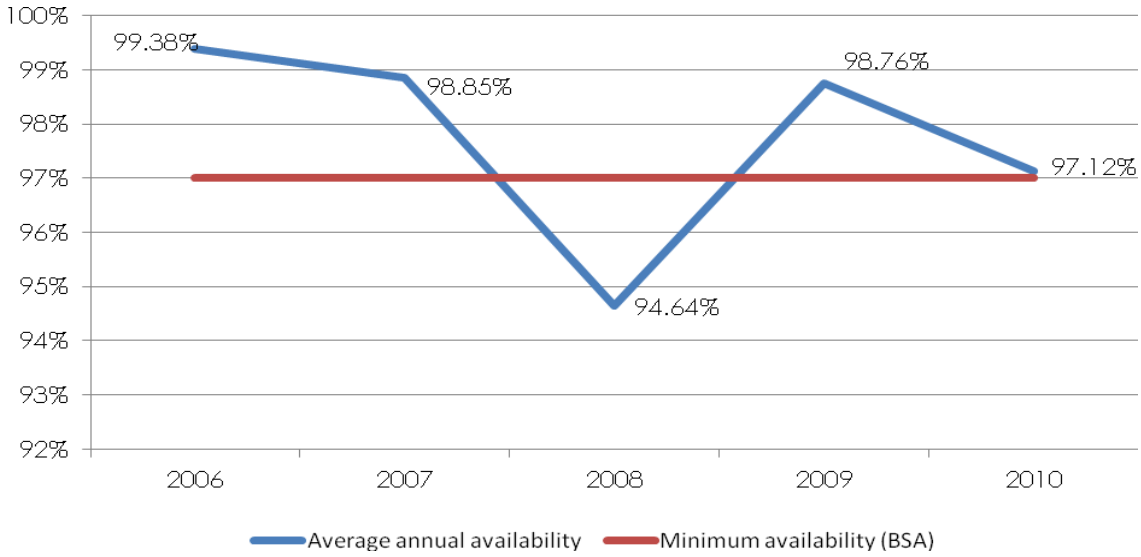


Sources: *A survey of the reliability of HVDC systems throughout the world* (Various), CIGRÉ; Basslink reliability reporting using CIGRÉ Protocol 346 for Reporting the Operational Performance of HVDC Transmission Systems, Basslink Pty Ltd.

There have, however, been periods when the availability of the link has been below the levels set out in the BOA and BSA, although only the link's performance against the standard in the BSA has had financial ramifications in terms of the cost of the link to Hydro Tasmania.

This was particularly the case in calendar year 2008, when Basslink's availability was below the 97 per cent required under the BSA, at 94.7 per cent (see Figure 5), resulting in a reduced Basslink Facility Fee. It is noted that despite the deterioration in availability that occurred in 2008, the total amount of energy transmitted in calendar year 2008 was higher than in either 2007 or 2009, even though availability in both those years was above the BSA standard.

Figure 5 - Basslink availability – calendar year basis



Source: Basslink Pty Ltd

Hydro Tasmania contends that the reduced capacity to 'import' electricity associated with the link's diminished availability in 2008 also had significant operational and financial impacts for its business, outcomes which were exacerbated by drought conditions that saw Hydro Tasmania's water storages drop to 16.5 per cent of capacity in June 2008.[38] [39]

As with any interconnector, particularly monopole links (like Basslink) that lack the redundancy provided by a second HVDC cable, Basslink's availability has been affected by planned and unplanned outages, although scheduled outages typically have less impact on the performance of the power system in question than unscheduled outages, because they are usually undertaken during periods of reduced system load or when a reduction in availability can be tolerated.

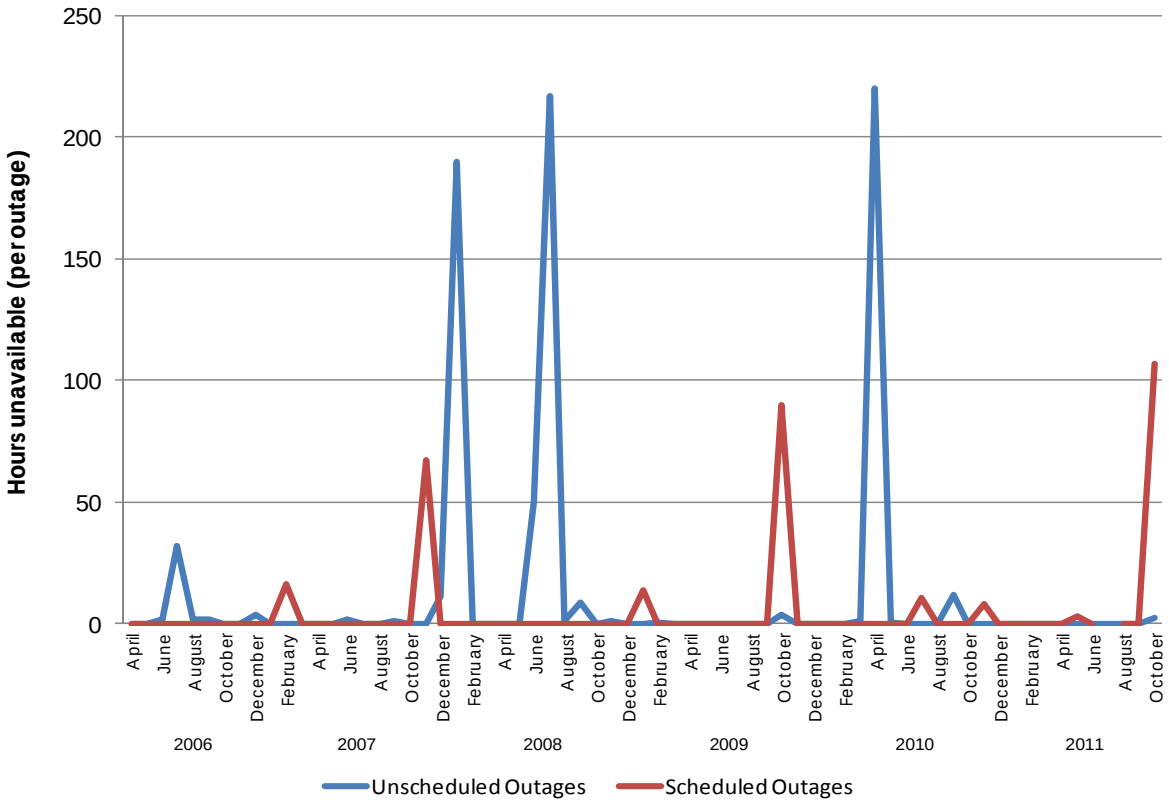
Figure 6 shows the unscheduled and scheduled outages that have occurred since Basslink was commissioned in 2006. The chart shows that there have been a small number of comparatively 'major' unplanned outages. To put those outages in context, the unplanned outage that began on 31 December 2007 lasted eight days and the unscheduled outage that occurred in July 2008 lasted nine days, as did the outage in April 2010.

The most significant planned outage visible in Figure 6 occurred in October 2009, as part of a biennial preventative maintenance program, and lasted for four days.

[38] Source: Hydro Tasmania submission to the Panel

[39] Measures were taken by Hydro Tasmania to address this fall in performance, resulting in the improvement seen in 2009.

Figure 6 - Basslink outages



Source: Basslink Pty Ltd

Aside from the immediate impact that unscheduled outages have on Hydro Tasmania's capacity to trade electricity, under the terms agreed to as part of the System Protection Scheme (SPS), unplanned interruptions that have occurred while electricity has been flowing southward into Tasmania and triggered the shedding of major industrial load under the SPS have, on a number of occasions, continued to constrain flows over Basslink into Tasmania –even after the operation of the link has been restored.

This is because the arrangements put in place with some of the industrial users of electricity which are willing to interrupt production in order to protect Tasmania's electricity grid have, in the past, included provisions which prevented them being called upon to do so within a period after their most recent load shedding event. This arrangement meant that the level of load shedding available under the SPS could potentially be reduced, sometimes for weeks, following an outage of Basslink when 'importing' energy, constraining the link's capacity to deliver energy into Tasmania and impacting on the value of Basslink to Hydro Tasmania. The impact of this constraint would be greatest when the restriction on southward flows coincided with periods of high demand in Tasmania and low prices in Victoria. The Panel understands that re-negotiation of the terms under which some industrial entities participate in the SPS has reduced the limitations on further load shedding following an SPS trigger.

4.3. Financial impacts of availability

As well as being crucial to the creation of value for Hydro Tasmania, the physical performance of Basslink impacts on the ongoing cost of Basslink to Hydro Tasmania and, consequently, the revenue earned by Basslink's operator.

As noted earlier, the Basslink Facility Fee (BFF) paid by Hydro Tasmania is subject to risk sharing arrangements that reward BPL with an increased fee (via *Commercial risk sharing payments*) when the arbitrage value provided by the link is high, provided the interconnector is fully available during periods of high Victorian prices. Conversely, those same arrangements substantially reduce the BFF if the link is not fully available during these high priced periods, or if the arbitrage value is low. The potential impacts on the BFF are material to both Hydro Tasmania and BPL, in that the fee can be varied within a 40 per cent range under the risk sharing arrangements.

The commercial risk sharing arrangements have resulted in Hydro Tasmania paying an increased BFF in only one of the link's first six years of operation (calendar year 2007). In that year, the price volatility in the Victorian spot market was such that Hydro Tasmania made additional payments equivalent to 25 per cent of the BFF for that year, the maximum amount payable under the terms of the BSA. This reflects that the arbitrage value available to Hydro Tasmania was high, providing it with the financial capacity to fund the additional payments.

Cumulatively, however, to the end of September 2011 Hydro Tasmania has been a net beneficiary from the risk sharing arrangements in the BSA since it commenced delivering energy in 2006.

5. Basslink's Performance - Financial

There is considerable stakeholder interest in understanding how commercially successful Basslink has been since it commenced operation and the impact it has had on Hydro Tasmania's commercial performance. It should be recognised, however, that care needs to be exercised when evaluating the commercial viability of a long term infrastructure project early in its economic life.

Nonetheless, it is constructive to examine the extent to which the performance of the project to date conforms to the expectations set out in Hydro Tasmania's final business case. Accordingly, this section of the paper presents an assessment of the outcomes which have been realised to date by Basslink from two perspectives:

(a) a comparison with the final business case for interconnection developed by Hydro Tasmania; and

(b) a comparison with a 'counterfactual' outcome – by considering what might have been the path of the Tasmanian energy sector had Basslink not gone ahead.

Consistent with the Panel's Terms of Reference, which require it to consider the implications of major infrastructure projects on customer prices, the Panel has not examined the wider economic impacts of Basslink for Tasmania, such as the effect that perceptions within the business community of lower hydrological risk and greater security of supply have had on business confidence and investment decisions.[40]

5.1. Basslink's performance against the business case

For any commercial entity, the fundamental purpose of capital investment is to invest in projects that yield a positive net present value to the business, which is a function of the amount and timing of the future cash flows associated with the investment. Assessing the viability of a capital investment requires the variables which impact on those cash flows, as well as the cash flows themselves, to be forecast over the life of the project.

However, the process of forecasting, even in the short term, is inherently uncertain and the long-term nature of capital investment decisions introduces still greater levels of uncertainty.

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[40] The May 2002 Basslink Business Case identified a range of benefits for Tasmania that would be provided by Basslink, and noted that Basslink was consistent with Hydro Tasmania's obligations to foster social and economic development under its Ministerial Charter. While the Hydro Tasmania Board was aware when it made its final commitment to Basslink of the broader considerations that made Basslink a project of State significance, those wider impacts were not part of the business case for interconnection and there is no evidence that these considerations were central to Hydro Tasmania's commercial decision making.

In the case of Basslink, which required a minimum 25 year commitment by Hydro Tasmania, the business case incorporated assumptions about a range of variables, including long-term projections of the likely inflows into Hydro Tasmania's water catchments (and their potential variability), the outlook for Victorian electricity prices and growth in the Tasmanian load, as well as the availability and capacity of the link itself.

The final business case endorsed by the Board of Hydro Tasmania in November 2002 took into account a range of costs (see Box 3) and benefits to Hydro Tasmania's business that could be directly attributed to Basslink, in order to calculate the link's net value to Hydro Tasmania.

That value was calculated on the basis of cash flows projected over a period of 20 years, which were then reduced to a single annual figure, representing the annuity that would return Hydro Tasmania the same Net Present Value as the Basslink project. Hydro Tasmania referred to this figure as an APV. On this basis, in the final business case the link's net value to Hydro Tasmania was estimated to be $28 million per annum, expressed in 2002 dollars.[41]

[41] About $36 million in 2011 prices

Box 3: What are Hydro Tasmania's Basslink costs?

Observations that Hydro Tasmania has a 'locked in' facility fee of over $90 million per annum are not correct, although the overall cost of Basslink to Hydro Tasmania has, in some years, been in excess of $90 million since the link was commissioned. To better inform public discussion of the costs and benefits of Hydro Tasmania's Basslink investment, it is useful to clarify the costs that are involved and the nature and quantum of the payments made by Hydro Tasmania and Basslink Pty Ltd (BPL).

The following items make up the cost of Basslink to Hydro Tasmania:

Basslink Facility Fee

The BFF is paid by Hydro Tasmania to BPL in exchange for the rights to the variable inter-regional revenues accruing to Basslink through the NEM arrangements. While the BFF is indexed, the level of indexation is such that the fee declines in real terms over the life of the Basslink Services Agreement. It is the largest of Hydro Tasmania's Basslink-related costs.

Commercial risk sharing payments

These payments are paid either by Hydro Tasmania to BPL or BPL to Hydro Tasmania, depending on the value of arbitrage opportunities presented by price volatility in the Victorian spot market. The risk sharing payments are highly variable and can have a material impact on the cost of Basslink to Hydro Tasmania, with the facility fee able to vary within a 40 per cent range.

Incentive Availability payments

Incentive availability payments are paid to BPL by Hydro Tasmania depending on the availability of Basslink at certain times of the year and at predefined Victorian spot market prices that may provide Hydro Tasmania with arbitrage opportunities. The amount of the payment made in any given year is variable, and is based on interconnector availability and spot market prices during the Victorian summer peak period. Incentive availability payments are relatively small compared to the facility fee (around 2 per cent).

Insurance costs

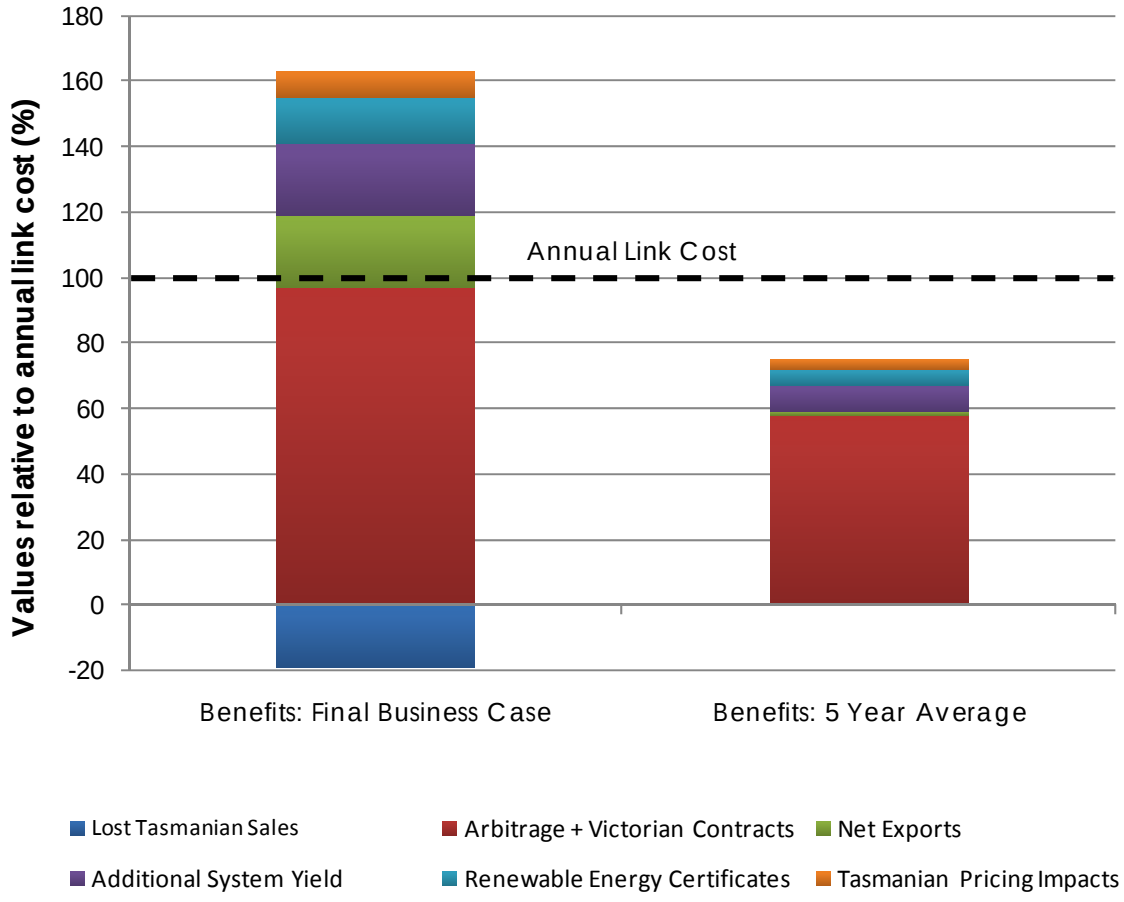
Hydro Tasmania funds the costs of marine insurance for Basslink. Owing to the particular features of the insurance market at the time of financial close, which was enduring a period of instability in the wake of the terrorist attacks on New York in September 2001, it was agreed that operational insurance costs above those already factored into the BFF would be paid as an ongoing operational cost pass through. The costs of insurance are variable but relatively minor in the context of the BFF (in the order of 2-4 per cent).

Financial costs

Paid by Hydro Tasmania to financial institutions for products to cover aspects of the costs associated with Basslink that vary over time with movements in financial markets. These are highly variable and can be significant, relative to the BFF (e.g. in one year over the period 2005-06 to 2010-11, hedge costs were equivalent to around 43 per cent of the facility fee).

Figure 7 illustrates the relative contributions to Basslink's net value, in real terms, by the various direct costs and direct revenue benefits on a similar basis to the business case for Basslink, based on the average outcomes that have been observed over the first five full years of the cable's operational life. When compared with the sources of value factored into the final December 2002 business case it becomes clear that, on a number of fronts, Basslink's financial performance is yet to fulfil the expectations contained in the final business case.

Figure 7 – Benefits of Basslink to Hydro Tasmania, 2006-07 to 2010-11 compared with business case, % of Basslink-related costs



Source: Hydro Tasmania

Notes: Quantums are not shown on the chart in monetary terms as the information is commercial-in-confidence. 'Victorian Contract' benefits have been captured in the arbitrage value, whereas these were separately identified in the business case (and in Figure 1). The benefits are expressed as a proportion of the Basslink-related costs in each case and, as such, are not directly comparable. For example, in the business case, arbitrage benefits coupled with Victorian contract value was expect to be broadly similar to the Basslink-related costs, whereas, in the first 5 years, these benefits were equivalent to around 60% of costs.

The benefits derived by Hydro Tasmania from Basslink have been heavily influenced by the prolonged period of below average rainfall that occurred during the past decade. Basslink has been used as a net supply option for Tasmania for most of its operational life to date – northward flows of electricity exceeded the flow of energy into Tasmania for the first time in 2010-11. The low level of inflows, particularly in the lead-up to Basslink commencing commercial operations and in the first three years of trading, had a number of impacts:

- the revenue contribution from net exports were substantially less than anticipated;
- the contributions from increased system yield and the accompanying creation of additional Renewable Energy Certificates were less than anticipated in the business case; and
- with Basslink heavily utilised as a supply option for Tasmania, the availability of the link to be used for arbitrage purposes was also diminished.[42]

Hydro Tasmania had anticipated that the outcomes in individual years from interconnection would be influenced by hydrological inflows. However, between the decision to proceed with Basslink and the commencement of commercial operations only three and a half years later, successive years of substantially below average rainfall meant that Hydro Tasmania's expectations regarding the state of its water storages at the time Basslink would be commissioned turned out to be significantly over stated.

As a result of the lower than expected 'opening' water storage levels, Hydro Tasmania was prevented from running down its inventory of water in the initial years following Basslink becoming operational in order to generate energy for 'export' and income. Hydro Tasmania estimates that the value forgone due to the difference between the opening inventory of water assumed in the business case and that which was observed is in the order of $115 million.

If only the realised costs and benefits directly attributable to Basslink and factored into the business case are taken into account[43], then Basslink's overall cost to Hydro Tasmania is approximately $134 million ($ nominal) higher than the realised direct financial benefits it has delivered since the interconnector was commissioned in April 2006.

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[42] As discussed above, arbitrage refers to the use of Basslink on a balanced trade basis, where electricity is effectively purchased from Victoria at low prices (ie. water is conserved) and sent from Tasmania when prices are high (that conserved water used). If Basslink is used as a net supply option, purchases from Victoria are necessarily of a greater volume than sales to Victoria, and the arbitrage opportunity is reduced.

[43] These financial benefits being arbitrage, net exports, the value of enhanced system yield and REC associated with the yield and increases in major customer prices.

Hydro Tasmania contends that the average financial performance of Basslink (leaving aside the avoided cost considerations discussed below) thus far understates Basslink's future trading potential, and is essentially the result of consecutive years of extremely low inflows into Hydro Tasmania's water storages, which coincided with a NEM wide drought. The Panel accepts that this view is reasonable.

It is also the case that Hydro Tasmania's estimates of Basslink's benefits, presented in Figure 7 above, make no allowance for the value of the increased inventory of energy now in storage, which to some extent has been enabled by the use of southward flows of energy across Basslink to support the recovery of Hydro Tasmania's water storages. Further, no additional value is currently ascribed to any potential commercial gains associated with the introduction of a 'carbon price' by the Australian Government. In this context, the financial snapshot provided above is conservative.

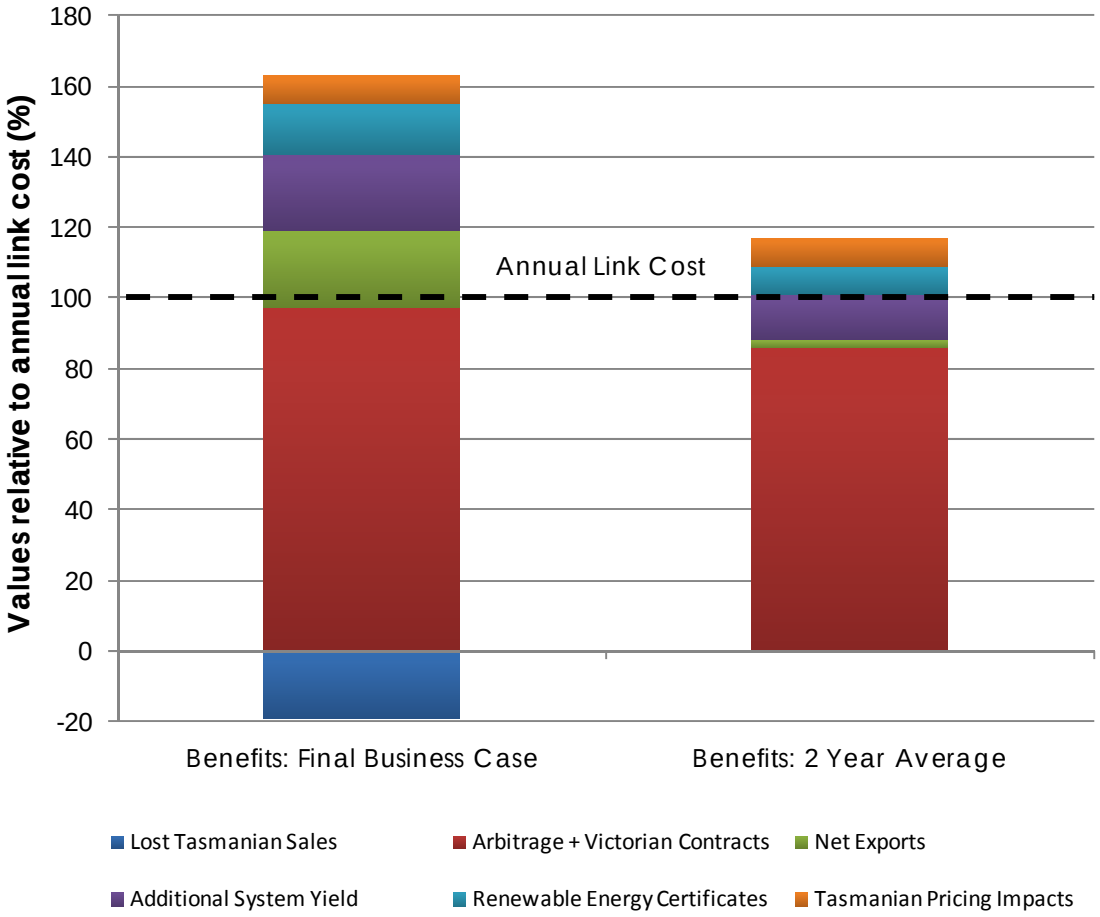
While the initially difficult trading conditions experienced in the years immediately following the link commencing operations did not feature in the base business case[44], the fact that those years have been followed by an ongoing improvement in both water inflows and the trading performance of Basslink is nonetheless consistent with Hydro Tasmania's overarching expectations regarding the variability of Basslink's performance over time, particularly in relation to hydrology.

Further, when Basslink's average performance over the two most recent years of operation is examined, a different picture of the link's value to Hydro Tasmania emerges, one that more closely resembles the expectations contained in the final business case for interconnection. In 2009-10 and 2010-11, Basslink generated financial returns in excess of costs for Hydro Tasmania approaching $30 million. This result lends support to Hydro Tasmania's argument that the average performance of Basslink to date understates the link's potential in the future, as does the fact that it was achieved with only a small contribution (in 2010-11) from net transfers of electricity to Victoria ('net exports'), though with only two years of post-drought data to hand, it is too soon to make firm conclusions.

Figure 8 compares the financial benefits from Basslink to Hydro Tasmania with those included in the final business case. Figure 8 demonstrates that the return to more typical hydrological inflows in recent years has resulted in the performance of Basslink displaying a closer resemblance to the business case, with scope for further improvement with regard to the level of export income able to be realised in the future as a result of the rebuilding of water storages, as well as carbon pricing.

[44] As discussed above, Hydro Tasmania did conduct extensive sensitivity tests, which included hydrological scenarios with relatively dry early years.

Figure 8 – Benefits of Basslink to Hydro Tasmania, 2009-10 to 2010-11 compared with business case, % of Basslink-related costs



Source: Hydro Tasmania

Notes: Quantums are not shown on the chart as information is commercial in confidence. 'Victorian Contract' benefits have been captured in the arbitrage value, whereas these were separately identified in the business case (and in Figure 1). The benefits are expressed as a proportion of the Basslink-related costs in each case, and as such are not directly comparable. For example, in the business case, arbitrage benefits coupled with Victorian contract value was expect to be broadly similar to the Basslink-related costs, whereas, in the past 2 years, these benefits were equivalent to close to 90% of costs.

5.2. Basslink's contribution to supply reliability

Just as the financial performance of Basslink has been impacted negatively by low inflows into the Hydro Tasmania's catchments, inversely, the benefits of interconnection have been demonstrated through the contribution of Basslink to meet Tasmania's electricity needs.

This is a key consideration is examining the overall performance of the project, as the magnitude of any net avoided costs through Basslink represent material financial benefits to Tasmania.[45]

While it is impossible to know exactly what might have transpired had Basslink not been developed, such an approach is consistent with the analysis undertaken by Hydro Tasmania when originally developing the business case for Basslink. In addition to the costs and benefits of Basslink, this approach also examined Hydro Tasmania's likely future without interconnection.

5.2.1. Hydro Tasmania's analysis

The central feature of Hydro Tasmania's view of the Tasmanian energy market without Basslink is that Hydro Tasmania's dams and hydro-electric power stations would have been unable to meet the demand for electricity in Tasmania, in terms of total consumption.

This assessment is based on the fact that Hydro Tasmania's ability to generate electricity is constrained by the availability of water, rather than the capacity of its power stations. The yield from Hydro Tasmania's water catchments between 2006-07 and 2010-11 was insufficient to meet the demand for electricity over the same period. The situation would also have been exacerbated by the fact that, by 2006, Hydro Tasmania's long-term water storages had already been depleted by low inflows, particularly in 2004-05, to the point that there was limited capacity to draw down on those inter-year storages in order to make up for the lower yields being achieved from run-of-river and intermediate storages.[46]

Based on the demand for electricity seen in Tasmania in the years since Basslink was commissioned, Hydro Tasmania estimates that between 2006-07 and 2009-10 there would have been a shortfall in the capacity of hydro-generation to meet on-island demand of just over 7 000 GWh. To put that shortfall into perspective, the total demand for electricity on mainland Tasmania is typically around 10 800 GWh per annum.[47] In the absence of Basslink, this shortfall would have had to be met by other means.

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[45] In practice, the distribution of these benefits is a function of how any higher costs would have been distributed between Hydro Tasmania and customers.

[46] Hydro Tasmania's 32 power stations are fed by three types of water 'storage'. 'Run of river' power stations generate electricity whenever water is available, as there is limited capacity to store water for later use. Intermediate storages cycle from full to empty over the course of a year and provide some scope for Hydro Tasmania to choose when to produce electricity (or retain water). Long-term storages (e.g. Lake Gordon and Great Lake) fill and empty over a long period and have storage capabilities substantially in excess of their annual inflows.

[47] Tasmanian Energy Supply Industry Performance Report 2009-10, OTTER

Hydro Tasmania has provided the Panel with a view on how that demand may have been met in the absence of Basslink. Hydro Tasmania's scenario assumes that this would have required investment in gas-fired generation in Tasmania (by Hydro Tasmania) as well as, in times of extremely low inflows into Hydro Tasmania's storages, negotiated load shedding by major industrial customers.[48]

Hydro Tasmania estimates that the combined cost of these two approaches to making up the shortfall in hydro electric generation and balancing Tasmania's supply and demand for electricity would have been in the order of $640 million over the period 2006-07 and 2010-11. Approximately 80 per cent of that expenditure reflected the costs (including fixed and variable costs) of generating 6 400 GWh of electricity using a combination of combined and open cycle gas generation, with the balance being the cost of load shedding by major industrial customers.

To determine the level of savings that could be attributed to Basslink, Hydro Tasmania offsets the cost of the energy actually sourced via Basslink (ie net southward flows) to supply Tasmania's load during each year over the period against the estimated costs of new gas fired generation and industrial load buyback.

On this basis, Hydro Tasmania concludes that the avoided costs of additional generation plant and load interruption fees over the five years that Basslink has been in operation would have been in the order of $314 million, in nominal terms. Table 3 sets out the method used by Hydro Tasmania to calculate the costs to its business avoided by Basslink being in operation.

Table 3 Hydro Tasmania's estimates of Tasmanian energy supply costs avoided by Basslink, $ million nominal

	$ million
Hypothetical estimated cost of additional gas-fired energy (fixed and variable costs)	513
Hypothetical estimate of industrial load buyback	125
Total cost under 'no Basslink' scenario	*638*
Less	
Actual cost of net inflows of energy to Tasmania via Basslink	324
Avoided costs	**314**

Source: Hydro Tasmania

[48] This is viewed as a credible outcome given that there is precedent for this response to low storage levels.

Noting the earlier assessment that the direct costs of Basslink were in excess of the realised revenue benefits up until 2009-10, if the avoided costs calculated in Table 3 are also considered a financial benefit, Hydro Tasmania contends that Basslink has been a source of substantial value to its business. Hydro Tasmania's submission on the Issues Paper provides an estimate in excess of $40 million per annum ($nominal).[49]

Taking that argument and accepting Hydro Tasmania's estimates of the avoided costs, without Basslink, Hydro Tasmania's net earnings would have been reduced by $180 million.

Table 4 Net benefit of Basslink to Hydro Tasmania, using the Hydro Tasmania counterfactual

	$ million
Direct financial consequences of Basslink	(134)
Plus - Avoided costs (from Table 3)	314
Net benefit of Basslink	**180**

5.2.2. The Panel's analysis

The Panel has undertaken its own analysis of the potential 'avoided cost' benefits of Basslink in order to test the reasonableness of Hydro Tasmania's assessment, noting that it is not possible to be definitive about how the Tasmanian energy sector would have evolved in the absence of Basslink. The details of this analysis are in Appendix 1.

In brief, two potential scenarios were examined to develop a view as to the potential cost implications for Tasmania's electricity sector had Basslink not been progressed, in order to compare this with the outcomes observed under the present Basslink arrangements. Those two scenarios were:

- electricity needs being met by new gas-fired generation; and
- electricity needs being met by the development of large-scale wind generation – the technical feasibility of which has not been tested.

In examining both cases, the Panel has assumed that observed electricity demand over the period was the level of demand that would have applied under the alternative scenarios.[50]

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[49] Hydro Tasmania's estimate of $40m pa benefit is on a different basis to the Panel's calculation of $180 million over the period owing to a difference in the estimated revenues and costs arising from the project.

[50] This is a simplifying assumption. It is arguable that demand may have been at a lower or higher level, but the Panel considers this a reasonable basis for the analysis. It is the same assumption made by Hydro Tasmania in its analysis.

Gas-fired generation

The Panel's gas thermal generation scenario assumes that two 200MW combined cycle gas facilities would have been built in Tasmania to meet emerging electricity needs, commissioned in 2003 and in 2010.[51] The Panel considers that this would have delivered savings in capital expenditure that took place in Tasmania over this period, including the conversion of the Bell Bay Power Station to gas and the investment in the three Pratt and Whitney open-cycle units that were acquired by Hydro Tasmania in 2005 to provide drought support.

Table 5 Panel estimates of Tasmanian energy supply costs avoided by Basslink - Gas Scenario, $nominal

	$ million
Panel estimated cost of additional gas-fired energy	604
less savings from avoided capital investment	75
plus estimate of industrial load buyback	Nil
Total cost under Panel's gas-fired 'no Basslink' scenario	*529*
Less	
Actual cost of net inflows of energy to Tasmania via Basslink	324
Avoided costs from Basslink	**205**

The Panel's analysis leads to conclusion similar to that reached by Hydro Tasmania, which is that Basslink has enabled Tasmanian demand to be met at a materially lower wholesale energy cost than would have been likely under a gas-based development of Tasmania's electricity sector. The Panel concludes that Basslink has delivered avoided cost benefits to the Tasmanian energy sector of around $200 million over the period 2007 to 2011.

Wind-generation

The Panel's wind-based scenario assumes that the State's emerging electricity needs would have been met solely by the development of large-scale wind farms. It assumes the following developments:

- Woolnorth is developed as it was in reality – therefore the costs are not shown as they occur in both cases;
- a further 150 MW is commissioned in 2003-04 (potentially Mussleroe windfarm);

[51] The Panel's estimates of avoided cost do not include the capital costs associated with the second CCGT unit, given that the TVPS was built in Tasmania and commissioned in 2009 – See Appendix 1.

- a further 150 MW is commissioned in 2005-06 (potentially the proposed Cattle Hill or Robins Island windfarms); and
- a final 100 MW is developed, commencing operation 2009-10.

This would have amounted to an additional 400 MW of wind capacity in the Tasmanian system over this period, resulting in total on-island wind generation capacity of 540 MW, including the Woolnorth wind farm. Given the purpose of this analysis, the technical considerations and constraints relating to connection issues and system stability of such a level of wind development have not been examined. Advice from Hydro Tasmania suggests that it is likely that there would be significant technical limitations on wind development of this scale in Tasmania.

The cost analysis of this scenario is detailed in Appendix 1. A conservative estimate of $90/MWh has been assumed as the cost of wind-based electricity and the transmission costs associated with connecting wind generation into the system have been ignored.[52] As with the gas scenario, there may have been some avoided costs with this scenario relating to the gas-fired capacity that was commissioned over this period. Specifically, it has been assumed that the Pratt and Whitney open-cycle units that were acquired by Hydro Tasmania in 2005 to provide drought support would not have been required, given the assumed development of wind, and the conversion of the Bell Bay Power Station would have occurred to provide thermal support to the combined hydro and wind system.

Table 6 Panel estimates of Tasmanian energy supply costs avoided by Basslink, wind scenario, $nominal

	$ million
Panel estimated cost of wind energy	725
less savings from avoided capital investment	50
plus estimate of industrial load buyback	Nil
Total cost under wind 'no Basslink' scenario *Less*	675
Actual cost of net inflows of energy to Tasmania via Basslink	324
Avoided costs from Basslink	**351**

[52] Given the location of wind developments relative to the transmission network, these costs can be significant.

The estimated net avoided cost to the Tasmanian energy sector from Basslink by comparison with the hypothetical wind scenario is considerably higher than that for the gas scenario, at around $350 million over the period 2006-07 to 2011. This reflects the higher operating costs of wind by comparison with gas. Despite the absence of fuel costs, wind powered generation is relatively more expensive on a per unit of energy basis than natural gas fired generation, largely because of the intermittent availability of wind generation. Some of that additional cost would have been offset by the value of RECs that would have been generated from that wind development. As discussed in Appendix 1, it is not possible to estimate the potential value of RECs for that volume of wind generation over the period.

While noting the widespread support in the community for renewable energy, like Hydro Tasmania, the Panel considers that the use of natural gas fired generation to meet the shortfall in the capacity of hydro-generation would have been the most plausible alternative to Basslink.

In conclusion, analysis of the two potential alternative scenarios for the development of Tasmania's energy sector in the absence of Basslink suggests that the costs associated with meeting Tasmania's observed electricity needs would have been at least $200 million ($nominal) higher than those arising from Basslink over the period 2007 to 2011. These avoided costs of Basslink are in excess of the direct revenue shortfalls arising from Basslink over the same period by at least $70 million, based on the alternative gas scenario considered by the Panel.

5.3 Summary of the financial performance of Basslink

In summary, the analysis undertaken by the Panel of the performance of Basslink to date shows that:

- Hydro Tasmania's trading performance utilising Basslink was substantially diminished by low rainfall in the years immediately prior to and immediately following Basslink becoming operational;
- the direct arbitrage revenue opportunities made available to Hydro Tasmania by Basslink have not, on their own, generated sufficient revenue to cover the overall cost of Basslink to Hydro Tasmania in any year since the link commenced commercial operation, although the business case was not predicated on them doing so;
- if only the range of benefits contemplated in the business case for Basslink approved by the Hydro Tasmania Board in 2002 are taken into account, the financial performance of Basslink over its first five years of operation – as realised by Hydro Tasmania – has fallen short of the net result forecast in the final business case – essentially as a result of the drought which occurred prior to and immediately after the commissioning of Basslink;

- with inflows and storages returning to more sustainable levels in recent years, direct trading benefits have shown a corresponding and marked improvement, and the wider revenue benefits that Basslink has provided to Hydro Tasmania have more than offset its overall Basslink-related costs;
- Basslink has been an effective tool for managing hydrological risk; and
- if not for Basslink, the prolonged dry period experienced by Tasmania in the middle of the previous decade would have had far more severe negative financial consequences for Hydro Tasmania (and possibly customers, were these costs to be passed on to customers).

6. Are regulated customers paying for Basslink?

Under the BSA, Hydro Tasmania is responsible for meeting the cost of Basslink, which it does through a combination of payments, including the BFF paid to the owner and operator of the link. In return for the facility fee, Basslink presents Hydro Tasmania with a range of revenue generating opportunities which, in turn, provide a source of funding for the cost of the link – as well as a source of profit.

None of those revenue streams draws on customers in the Tasmanian non-contestable electricity market.

The major source of revenue for Hydro Tasmania associated with Basslink is arbitrage, which involves bringing electricity into Tasmania from Victoria at times when Victorian prices are low, and then exporting a matching volume of electricity from Tasmania at times of high Victorian prices. On this basis, the value of arbitrage is derived from interstate customers and not on-island demand.

Similarly, net exports of energy into the NEM involve the earning of income by Hydro Tasmania from interstate customers.

While net imports do not generate additional revenue for Hydro Tasmania, the cost of imported energy since Basslink has been in place has, on the Panel's estimation, been less than alternative on-island supply options.

The electricity prices and fixed charges paid by non-contestable customers through their regulated tariffs have no reference to Basslink in their derivation. The energy cost component built into Aurora Energy's tariffs is based on the cost of a new entrant generator in Tasmania, and transmission and distribution costs are the subject of independent assessment by the Australian Energy Regulator that does not take into account the costs of Basslink.

The ongoing operational costs incurred by Transend in connection with Basslink and the SPS are either recovered directly from Hydro Tasmania, or indirectly from Hydro Tasmania via pass through arrangements with BPL, and the connection assets servicing Basslink are excluded from Transend's regulated asset base, meaning that they are not factored into the transmission charges set by Transend for either direct connect customers, such as Tasmania's major industrial users of electricity, or electricity retailers, including Aurora Energy.

Therefore, given that no upgrades of the transmission network itself were required to cater for the flow of energy over Basslink, Tasmanian customers, whether large or small, do not pay higher transmission costs as a result of Basslink, with the cost being recovered from the parties who are the beneficiaries of the trading opportunities the link provides (Hydro Tasmania and BPL).

For these reasons it is evident that Tasmania's regulated customers are not paying for Basslink, either directly or indirectly. Moreover, as discussed in Chapter 5, interconnection has provided additional electricity supply to Tasmania over the period 2007 to 2011 at a lower cost than would otherwise have been achievable from on-island sources.

To the extent that the cost of Basslink to Hydro Tasmania has, thus far, exceeded the revenue generated directly as a result of interconnection, the shortfall is reflected in Hydro Tasmania's profit and the dividends which have been paid to the Government in the years since the link was commissioned. In that sense, it could be argued that the financial consequences of Basslink for Hydro Tasmania thus far have been borne by the Tasmanian community, as the owners of Hydro Tasmania. However, if the recovery of hydrological inflows into Hydro Tasmania's catchments which began in 2008 continues, the potential exists for the Tasmanian community to share in the benefits that Basslink will realise for Hydro Tasmania's business.

7. Conclusion

The Basslink project had a lengthy gestation period, during which the business case for interconnection was examined and revised repeatedly.

The business case for Basslink was routinely updated for changes in costs and benefits between the in-principle commitment to the project by Hydro Tasmania in February 2000 and final binding commitment in December 2002. The business case continued to show Basslink to be a positive commercial proposition for Hydro Tasmania's business during this evaluation period. Stress testing of the business case also showed it to be sufficiently robust under a range of sensitivity analyses that reflected the key risks to the business case.

The financial performance of Basslink thus far has not fulfilled the expectations contained in the business case on a number of fronts, which is largely a reflection of adverse hydrological factors. Hydrology was consistently recognised as one of the key risks to the Basslink business case.

With a return to more typical hydrological inflows in recent years, the financial performance of Basslink has been consistent with the expectations in the final business case.

Hydro Tasmania has presented the Panel with detailed information to support its conclusion that the net average benefits to its business are in excess of $40 million per annum. The gross benefits are, broadly, evenly split between direct revenue benefits to Hydro Tasmania and its estimates of the avoided costs of the thermal generation which it considers would have been required in the absence of Basslink to meet Tasmania's demand for electricity.

Over the period 2007 to 2011, Basslink has cost Hydro Tasmania around $134 million more than the direct and realised revenue benefits it has achieved from Basslink. This reflects the prolonged period of below-average inflows into the hydro system. Over the period 2010 to 2011, Hydro Tasmania has generated around $30 million more in revenue from Basslink-related sources than Basslink cost it.

Basslink has delivered lower cost energy to Tasmania than otherwise would have been likely. The Panel estimates that the avoided costs savings over the period 2007 to 2011 are at least $200 million. Hydro Tasmania estimates the avoided costs to be more than $300 million.

Put simply, during periods of low inflows when Basslink has been needed to maintain supply reliability, the revenues available to Hydro Tasmania from the link have been less than its costs. During times of more 'normal' inflows, when the link is not needed for supply reliability, Hydro Tasmania has been able to earn revenues from Basslink above its costs. Moreover, the costs of meeting the shortfall in electricity from the hydro system from Basslink have been materially less than the on-island alternatives.

When the non-realised avoided-cost benefits associated with the investment in Basslink are added to the direct benefits from the trading performance of the link, the financial benefits of Basslink in the first five years of its operation have been positive.

Appendix 1: Basslink Counterfactuals

1. Gas counterfactual

As discussed above, it is not possible to be definitive about how the Tasmanian energy sector would have evolved in the absence of Basslink. Therefore, it is also not possible to develop a 'black and white' view about whether Tasmanians are better off than they otherwise would be without Basslink.[53] Nonetheless, the Panel has examined two potential scenarios to develop an informed view of the potential cost implications for Tasmania's electricity sector had Basslink not been progressed and to compare this to present arrangements.

By the late 1990s the total Tasmanian load was approximately the same as the then-assumed sustainable Hydro Tasmania output rating of 10,000 GWh.[54] By 2001, the load had exceeded this rating indicating that additional generation was needed (see Figure 1). At the same time the system storages had reached a low-level plateau based on the commencement of oil-fired Bell Bay generation (Figure 2).[55]

[53] The Panel understands that this is a question that is sometimes posed.

[54] As noted in other Panel papers, it was this situation that provided the impetus for the Tasmanian Government to pursue both Basslink and natural gas.

[55] Bell Bay was used to support storages in low inflow periods by injecting thermal energy into the system to substitute for hydro generation, to reduce the rate at which storages empty. The operation of Bell Bay in this manner was defined as the thermal controls for Bell Bay and reflected storages levels at which more Bell Bay Power Station generation was called on. This operation was based on the cost of running Bell Bay and as storages declined further more Bell Bay generation, at a higher cost, was utilised.

Figure 1 – Actual System Load, Hydro Tasmania system rating (ie inflows) and gas capability from 1996-2010

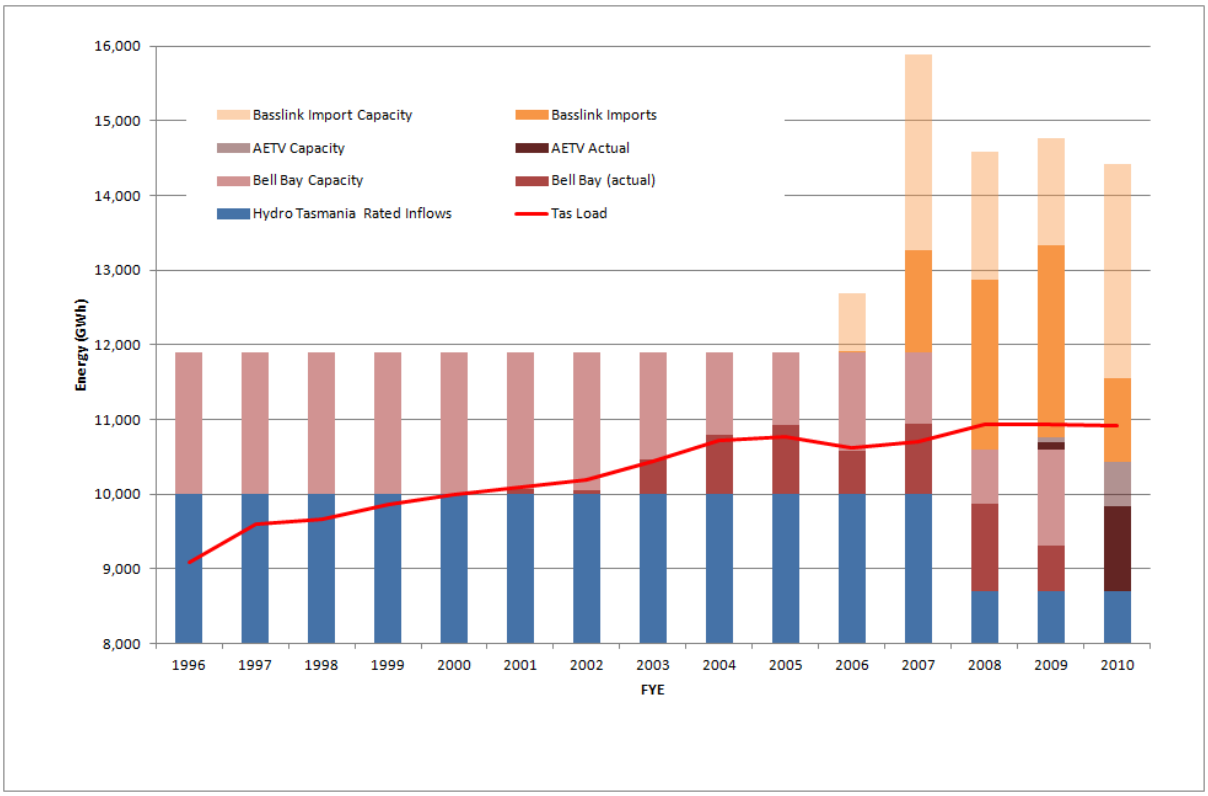
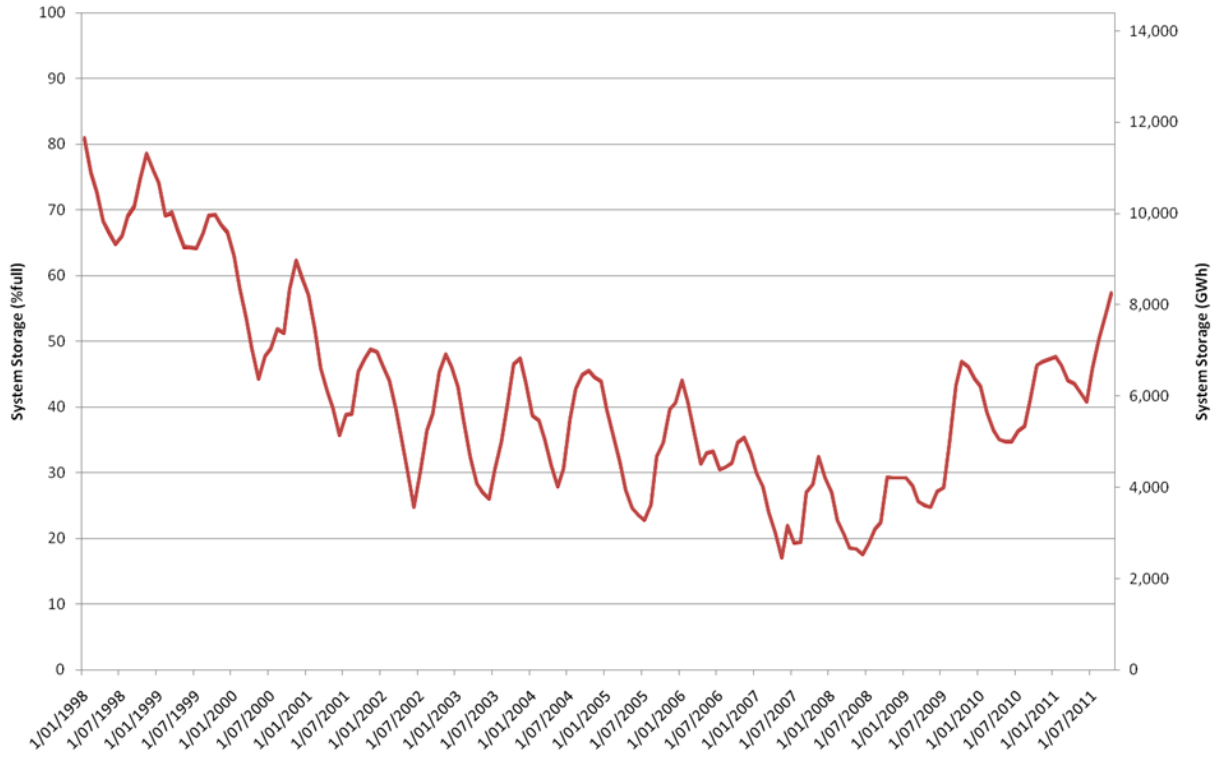


Figure 2 - Hydro System storage levels from 1998 to 2010



Source: Hydro Tasmania

The key question is, in the absence of Basslink, what would have been the alternative supply options, given that doing nothing to augment Tasmania's capacity to generate electricity would have posed a risk to supply reliability. The Panel has developed two hypothetical energy development scenarios as possible alternatives to interconnection via Basslink, which involved adding to Tasmania's on-island generation capacity through either:

- the development of new gas-fired generation; or
- the development of large-scale wind generation.

In examining both cases, the Panel has assumed that observed electricity demand over the period was the level of demand that would have applied under the alternative scenarios.[56]

Gas-based scenario

Over the period 2001 to 2006, before Basslink commenced commercial operation, Hydro Tasmania's Bell Bay power station was run predominantly on gas[57], based on thermal controls related to the cost of generation. In the absence of Basslink, similar rules would have applied.

In the gas scenario, the thermal controls required would have likely seen more gas-fired electricity injected into the system to maintain storages at a higher level. This higher storage level would assist in maintaining an acceptable level of system reliability for the extreme low inflow case.

To meet the growing gap between supply and demand from 2001 onwards, it is likely a decision to use a thermal source would have been made. In the short term this would have been from Bell Bay (given it was in situ), with the key strategic decision for Hydro Tasmania being whether to:

- continue with oil as the fuel source;
- convert the units to gas-firing[58];
- or build a new larger gas fired unit (i.e. CCGT).

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[56] This is a simplifying assumption. It is arguable that demand may have been at a lower or higher level, but the Panel considers this a reasonable basis for the analysis.

[57] The Bell Bay Power Station (BBPS) was built in the early 1970s and originally fired by heavy fuel oil. Its two 120 MW steam turbine generating units provided thermal generation back-up for Hydro Tasmania's hydropower system, but were used sparingly. The power station was converted to gas firing in 2002 and 2003, after which it was used more frequently, to produce substantially more electricity.

[58] The Bell Bay units were actually converted to gas in 2002 and 2003.

In the absence of Basslink and the need for Hydro Tasmania to maintain the security of the Tasmanian power system, it is likely that the judgement would have been made that it would have been too risky to rely on the old Bell Bay[59] units to meet long term demand growth and provide drought support, whether converted to gas or not.

For the purposes of this analysis, it has been assumed that given the load growth, system capability and planned arrival of natural in the State, a decision in 1999-2000 to develop a new power station to support the future growth could have reasonably been made. A unit of around 200 MW is assumed to be appropriate, particularly given the growth in demand over the 1996-2001 periods. Such a unit would have been of a suitable size to meet the additional demand until 2010.[60]

By 2008 it became apparent that the long term expectation for inflows had significantly changed. Hydrological analysis by Hydro Tasmania had shown that the expected inflows had reduced from 10,000 GWh to 8,700 GWh (Hydro Tasmania officially lowered the inflow expectation in 2008-2009). With the reduction in hydro system expected inflows, there would be a need for further development to meet load around the 2008-2009 period. At the time of the system derating, it is reasonable to assume that a decision to further develop/augment the generation system would have occurred.

For the purpose of this analysis, it has been assumed that a second CCGT unit of around 200 MW would have been constructed and commenced operations in 2009-10 (as the Aurora Energy Tamar Valley plant did). Given this plant was constructed in reality, and it is required under this scenario, its capital cost has not been included in the Panel's estimates of avoided costs.[61]

In modelling the likely output from the CCGT plant, the following considerations were taken into account:

1) The CCGT would have produced the amount of energy actually injected by the Bell Bay Power Station over the period, as well as the additional energy needed to meet the demand observed during the period in excess of that supplied by the hydro system, (for a total of 7 013 GWh over the period); and

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[59] The Bell Bay units were not designed to be a long term energy supply option but more for storage support in low inflow periods. The age of the units, their intermittent operations and their reliability would be a significant risk if relied upon for long term energy supply.

[60] A delayed cost option would have been to convert the units but then install CCGT later.

[61] Moreover, the only variable costs that have been included in the analysis are the estimated costs of producing the 7000GWh of electricity that was supplied by Basslink over the period. In this context, the Panel is seeking to identify only those costs that were actually avoided by having Basslink in place.

2) Target end of year storages in the hydro system in the order of 45-50 per cent of capacity (i.e. reflective of the current year) were considered appropriate (i.e. not too high) and if storages levels fell below 20 per cent it was considered risky unless other generation was assumed.[62]

The Panel has taken the fixed and variable costs estimates for CCGT plant used for regulatory purposes by the TER in setting prices for non-contestable customers in 2010, which were developed by IES.[63]

With these general principles, the counterfactual was modelled and the following tables shows the cost and storage/energy implications of this counterfactual.

Table 1: Outputs and costs under Gas Scenario 64

	Bell Bay Actual (GWh)	Energy Required from CCGT (GWh)	Additional costs of Energy from CCGT ($ million)
2002-03	460	911	54.2
2003-04	796	1 458	62.8
2004-05	934	1 640	64.6
2005-06	585	1 093	56.6
2006-07	936	1 731	68.2
2007-08	1 169	1 731	58.7
2008-09	608	1 731	81.5
2009-10	0	1 275	87.7
2010-11	0	820	69.2
Total	5 488	12 390	604

[62] As an example of the adjustment made for high inflow, the July to December 2005 was the highest 6 months inflow period over the 1996-2010 period. In addition, the December 2005 inflows were nearly 200 per cent above the average inflow for December (for the 1996-2010 period). So for the July to December 2005 period, it is highly unlikely that significant CCGT input would have been achieved. For this reason the modelled generation from the CCGT was reduced to reflect this.

[63] Review of wholesale energy price for period 2010-2013, 7 May 2010, IES.

[64] The difference between the Bell Bay actual and energy required from the CCGT represents the additional energy required in the absence of Basslink to maintain system reliability.

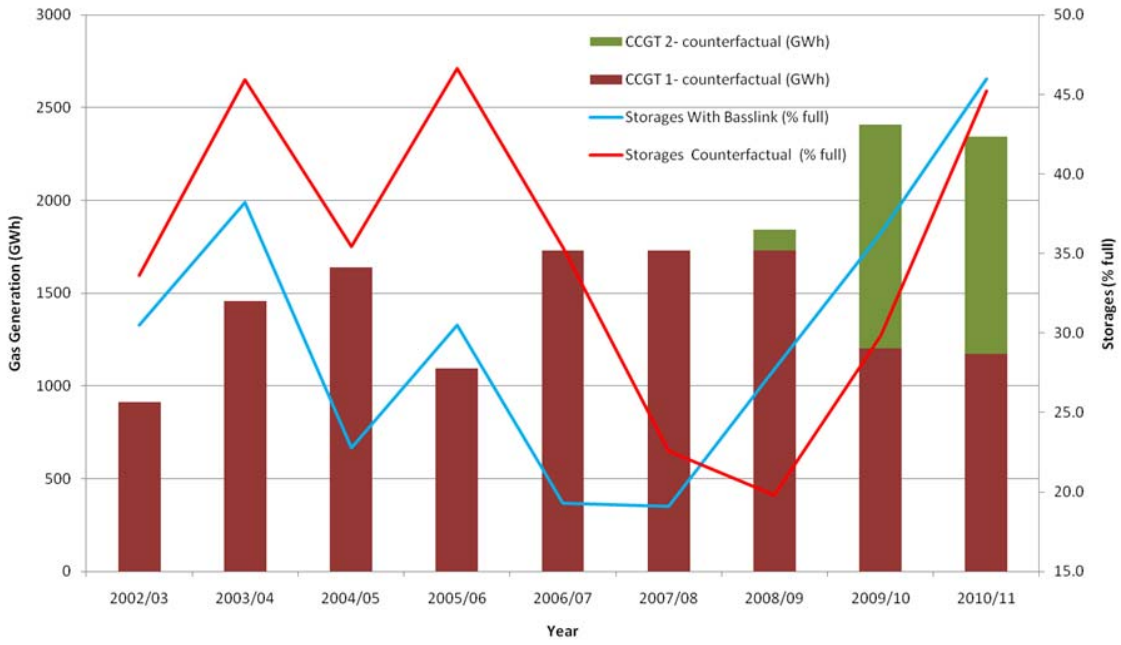
Table 2: Storage levels resulting from Gas counterfactual[65]

FYE	Actual Storage Levels (%)	Predicted Storage Levels (%)
2002-03	30.5	33.6
2003-04	38.2	45.9
2004-05	22.8	35.4
2005-06	30.5	46.7
2006-07	19.3	35.4
2007-08	19.1	22.6
2008-09	27.7	19.8
2009-10	36.3	29.8
2010-11	46.0	45.2

Note: Energy from AETV is included in both the actual and counterfactual cases and hence is in the storage projections but is not shown here (2700GWh).

The net gas input and subsequent change in storage trajectory is shown in the following figure.

Figure 3: Additional Gas Production and Storage variation of counterfactual compared to actual.



[65] This table indicates the additional storage build required in the gas counterfactual to ensure the storage level does not drop too low, significantly less than 20 per cent by the end of each financial year.

The Panel considered the storage profile and concluded that storages falling to below 20 per cent in 2008-09 would be perceived as a risky situation, but having the alternative support from the next CCGT plant starting in 2009-10 allows this to be a realistic scenario. It is also not dissimilar to what was actually observed with Basslink (see Figure 3).

Under the assumption of a CCGT plant being commissioned in 2002, the actual developments in Tasmanian's generation sector over the period, ie Bell Bay conversion to gas and purchase of 120 MW of OCGT plant in 2005, the capital costs of these developments could have been avoided.

Development of more wind could also be an alternative around the 2008-2009 period. Although in the very dry periods, where capacity becomes the problem, it is not likely that wind would be a preferred option and it is unlikely it would have deferred the second CCGT development substantially.

Examination of a scenario that assumes gas-fired electricity was the next generation source to meet Tasmanian growing electricity needs in the absence of Basslink shows that:

- additional costs in the sector would have been in the order of $600 million over the period 2006-11;
- if the capital savings from avoiding BBPS conversion and the acquisition of the open cycle units in 2005-06 are taken into account, the avoided costs fall to around $525 million;
- when the actual costs of meeting the demand through Basslink over the period are considered ($324 million), the net avoided cost from Basslink are around $200 million over the 2006-11 period.

2. A wind-based scenario

Under this scenario, it is assumed that, in the absence of Basslink, the energy deficit would have been made up by large-scale wind developments, rather than gas-fired electricity.

The decision to progress a wind development strategy would have been in response to the need for another energy source. While Bell Bay could still have been converted at a relatively low cost, under this scenario it has been assumed that it would be used as a limited back-up supply and, at most, provide the level of output it has historically. Therefore the decision to build additional wind would have occurred in the 2000 to 2001 period.

As with the gas scenario, the driver for the hydro system would be to build up storage levels and maintain them at higher levels over the period by comparison with that with Basslink, as this would assist in managing dry periods with the lower level of capacity support (i.e. converted Bell Bay) assumed in this scenario.

To balance the energy requirements, and to ensure storages do not drop too low, the analysis assumes that the following is a reasonable scenario for the roll-out of wind developments:

- Woolnorth is developed as it was in reality – therefore the costs are not shown as they occur in both cases;
- Develop 150 MW (i.e. Musselroe) in 2003-04;
- Develop another 150 MW by 2005-06 (potentially Cattle Hill or Robins Island); and
- Develop a final 100 MW commencing 2009-10.

This would amount to an additional 400 MW of wind capacity in the Tasmanian system over this period (including Woolnorth the total would be 540 MW). Given the purpose of this analysis, the technical considerations and constraints, relating to connection issues and system stability, of such a level of wind development, have not been examined.[66]

In relation to costs, an average cost of $2.5 million/MW of installed capacity has been assumed.[67] Under these assumptions, a total investment of approximately $1 billion would have been required to meet the capacity development. On this basis, an annualised cost of wind generation of $90/MWh[68] has been used.

As the amount of wind in the system increases, its effective capacity will decrease. This is due to the coincidence of wind availability, high storages and inflows and subsequently resulting in more spill from the combined system. In high inflow periods - winter and spring - a greater proportion of the hydro system becomes 'must run' due to the likelihood of spilling, and without interconnection to provide access to a larger market, opportunities are limited to Tasmanian demand. This is accounted for in the analysis by reducing the capacity factor assumed for wind as more wind is added to the system.

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[66] Note there is also no strong correlation between when the wind blows and the demand for energy in Tasmania. This is why the synergy between wind and hydro generation/storage is so beneficial, ie using the wind generation when it blows and reducing the hydro generation and store more water versus when there is no wind that the stored energy in the hydro storages is used to meet demand.

[67] The Panel is aware of a wide range of estimates of the cost of wind, particularly within the range of $2.2-$2.8 million/MW.

[68] This is considered a low assumption. For example, based on the AEMO 2010 National Transmission Network Development Plan costs estimates for wind developments, 200 MW of wind from a medium scale wind development would be around $100/MWh on an annualised basis, and from a large scale wind development (500 MW) around $95/MWh. These estimates assume a capacity factor of 40 per cent.

For modelling purposes, it is assumed that:

- for the first additional 150MW of additional wind capacity, the capacity factor of the wind generation was assumed to be 38 per cent;
- with additional wind capacity increasing to 300 MW, the overall capacity factor for wind was assumed to be 36 per cent;
- with additional wind capacity increasing to 400 MW, the overall capacity factor was assumed to be 32 per cent.[69]

On this basis the modelling generated the following outcomes:

Table 3: Wind Scenario, estimated output and costs

FYE	Wind Capacity (MW)	Additional Wind Energy (GWh)[1]	Additional costs ($m)[2]	Actual Storages (%)	Predicted Storages (%)
2002-03	150	499	47.3	30.5	33.9
2003-04	150	499	47.3	38.2	45.1
2004-05	150	499	47.3	22.8	33.2
2005-06	150	499	47.3	30.5	44.4
2006-07	300	946	94.6	19.3	34.1
2007-08	300	946	94.6	19.1	24.0
2008-09	300	946	94.6	27.7	20.0
2009-10	400	1 121	126.1	36.3	29.0
2010-11	400	1 121	126.1	46.0	46.5
Total		7 078	725.2		

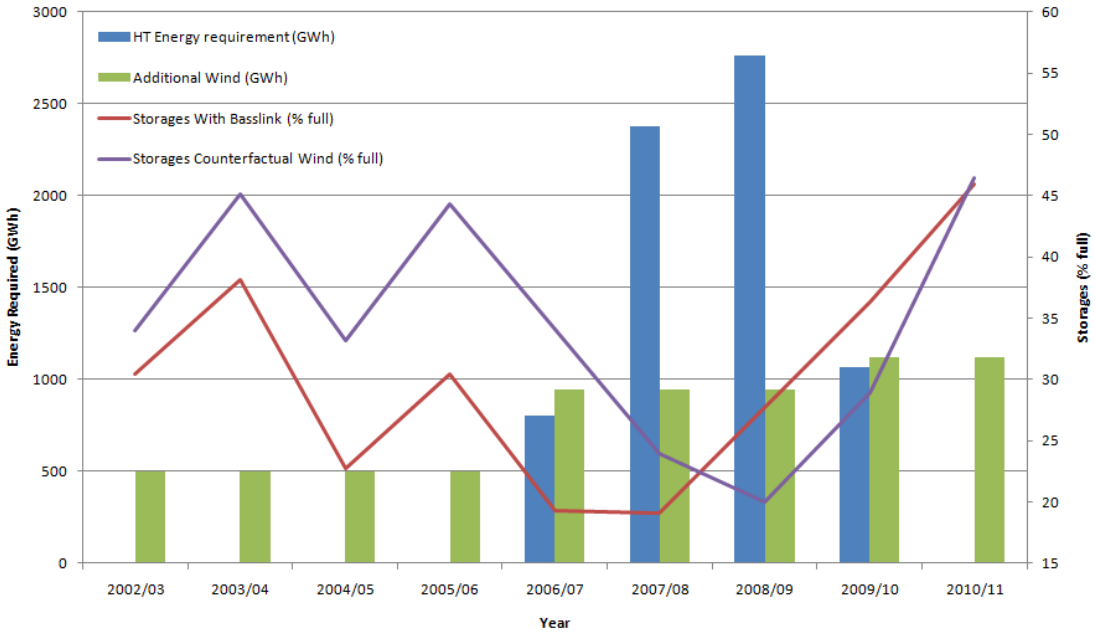
[1] Assumes Woolnorth is operating in both cases and is the effective wind input,
[2] [2] Is the total cost of wind at $90/MWh (ie gross cost, not including REC revenue).

As can be seen the total cost is in the order of $725 million.

The energy production and storage estimates are shown in Figure 4.

[69] Note with Woolnorth already assumed in the system, this scenario would see approximately 500MW of wind operating, potentially at times of system loads of less than 1 000 MW (and non-discretionary hydro generation of over 1 000 MW).

Figure 4: Wind Scenario Wind Energy Input and Storage Comparison



The above analysis assumes that all of the costs from wind generation are required to be funded from the Tasmanian market. However, under the Australian Government's Renewable Energy Target scheme, the RECs generated by wind are nationally traded. A case can be made that a material proportion of the RECs generated by wind under this scenario would be acquired from markets outside Tasmania, reducing the overall cost burden that would be required to be met from Tasmania.

It is not possible to robustly estimate the revenue that may have been generated by the sale of RECs under this scenario. Given the volume of additional RECs assumed to be produced - close to 20 per cent of the original REC target of 9500 GWh – it is highly unlikely that the prices that did prevail for RECs would have been realised, given REC prices are responsive to supply and demand (and this scenario represents a large change in supply, with no change in demand).[70]

Similarly to the gas scenario, there may have been some avoided costs with this scenario relating to gas-fired capacity that was commissioned over this period. Specifically, the Panel's analysis assumes that the Pratt and Whitney open-cycle units that were acquired by Hydro Tasmania in 2005 to provide drought support would not be required, given the assumed development of wind, and the conversion of the Bell Bay Power Station would have occurred to provide thermal support to the combined hydro and wind system.

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[70] At the extreme, assuming there was no price response and that that all of the RECs generated from the assumed wind put were sold at the then-prevailing market prices in the year in which they were produced, the Panel estimates that this would have generated around $260m over the analysis period. This is likely to materially overstate the REC revenues that could have been achieved.

This examination of a scenario that assumes wind-based electricity as the next generation source to meet Tasmanian growing electricity needs in the absence of Basslink shows that:

- additional costs in the sector would have been in the order of $725 million over the period 2007 to 2011;
- avoiding the capital costs of the Pratt and Whitney generators would save around $50 million;
- when the actual costs of meeting the demand through Basslink over the period are considered ($324 million), the net avoided cost from Basslink is around $350 million over the 2007 to 2011 period;
- the sale of RECs from wind would provide an 'external' source of revenue to meet some of these costs; and
- the practical feasibility of this hypothetical wind scenario has not been tested, although Hydro Tasmania's view is that such a development would not have been technically feasible from a transmission and system security perspective.

Conclusions

- It is not possible to be definitive about how the Tasmanian energy sector would have evolved in the absence of Basslink.
- The Panel has examined two potential scenarios to develop a view as to the potential cost implications for Tasmania's electricity sector had Basslink not have been progressed and to compare this present arrangements.
- The analysis shows that Basslink has enabled Tasmanian demand to be met at a materially lower cost than under two alternative scenarios: gas-fired electricity or a hypothetical wind-based scenario, the technical feasibility of which has not been tested.
- The net avoided cost to the Tasmanian energy sector from Basslink by comparison with the gas scenario is estimated to be around $200 million over the period 2006-11.
- The net avoided cost to the Tasmanian energy sector from Basslink by comparison with the hypothetical wind scenario is considerably higher, at around $350 million over the period 2006-11, potentially offset by the value of RECs that would could have been generated from that wind development.
- On the basis of this analysis, it is reasonable to conclude that Basslink has provided additional electricity supply to Tasmania over the period 2007 to 2011 at a lower cost than would otherwise be achievable from alternative on-island sources.

Appendix 2: Sources of value from Basslink

Source of value	Description
Arbitrage	The price differential associated with the simple matching of the highest priced 'exports' with equal volumes of the lowest priced 'imports' of energy – ie balanced flows across Basslink.
Lost Tasmanian sales	The decrease in sales attributable to Basslink as a result of existing hydro generation being displaced by new entrant wind and gas competitors.
Net exports	The balance of north and south bound energy flows across Basslink during any particular year, over and above the energy flows in each direction involved in arbitrage (which cancel each other out). Net exports reflect the energy able to be exported into Victoria during shoulder periods.
System yield	The increased system yield realised through better water management made possible as a consequence of Basslink. Additional energy is produced for the same level of hydrological inflows through better balancing of those inflows with export and import volumes across Basslink, reducing spill in times of high inflows as well as the level of water storages that need to be maintained as a buffer against hydrological risk.
Renewable Energy Certificates (RECs)	RECs are accumulated by Hydro Tasmania when generation at individual power stations exceeds their MRET baselines in an individual year. Increased system yield sees the creation of additional RECs, which are then sold to wholesale purchasers of electricity, such as such as electricity retailers, who then surrender the certificates to the Office of the Renewable Energy Regulator in order to discharge their liabilities to purchase a given percentage of their electricity needs from renewable energy power stations.
VIC contracts	Increased revenue associated with the sale of insurance products (i.e. price caps) in the Victorian region of the NEM.
Tas pricing effects	The additional revenue associated with an uplift in electricity prices for some customers with market based contracts as a result of periods of dry hydrological inflows.