GOVERNMENT
PRICES
OVERSIGHT
COMMISSION

Bass Strait Islands Electricity Price Inquiry 2008

Draft Report

June 2008

Printed June 2008
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ISBN 978-0-7246-5073-6

FOREWORD

This is the first external review of the costs of electricity production and of the level of tariffs on the Bass Strait Islands since 1999. In that time there has been remarkable change in supply on King Island, with Hydro Tasmania's expansion of wind generation now accounting for 35 per cent of the Island's electricity generation, saving some $1 million per annum on the alternative of full generation by diesel fuel. Nevertheless, the cost of generation continues to grow.

In that period, there has been little change in tariffs, despite increases in the cost of diesel (partly offset by Commonwealth initiatives to reduce the excise payable on diesel fuel) and despite recent increases in electricity prices experienced by customers elsewhere in Australia. In 2006-07, Hydro Tasmania received $4.2 million in revenue and Government contributed an additional $6.6 million to meet the $10.8 million per annum cost of generation and supply charged by Hydro Tasmania.

Residents of the BSI have for some time urged the Government to consider parity in electricity pricing with customers on mainland Tasmania. In response, Government officers developed a set of Pricing Principles to guide tariff development for the Islands, and it is within that context that the Commission has been asked to consider the efficient cost of supply on the BSI and to propose a new tariff regime.

There are two important but conflicting objectives for pricing on the BSI. The first is Government's desire to deliver residents of the BSI a supply of electricity at prices consistent with a reasonable household standard of living. The second is that prices should not encourage the use of electricity when alternatives, such as other fuels or energy efficiency, could meet the community's energy needs at less cost. The Commission has attempted to reconcile these objectives in developing a stepped-block tariff proposal.

It is important however to recognise the changing context for electricity supply in Australia and particularly on the BSI with its high reliance on diesel use for electricity generation. Recent increases in fuel prices are likely to be indicative of longer term prices, rather than being short-term aberrations. The Commonwealth's proposed Emissions Trading Scheme will, in the absence of concessions for stationary electricity production, add further pressure to increases in costs.

Hydro Tasmania has diligently explored alternative means of electricity supply as required by the CSO Agreement, mostly with success. However, it appears that the primary focus has been the production and delivery of electricity by Hydro Tasmania. There has been less attention given to reducing electricity demand by fuel substitution (eg the greater use of solar heating or LPG) or by promoting energy efficiency, even though these may be lower cost means of meeting BSI energy needs. Further, the heavily subsidised prices of the existing tariffs do not give residents a strong incentive to pursue alternatives to electricity. If prices were set to reflect full

cost of supply there would be less need for Government intervention to support alternatives: residents and business would make their own decisions as to the lowest cost means of meeting their energy needs. Such a radical increase in price would now be very disruptive, with the current cost of electricity supply and delivery being more than double the current prices.

The tariff package proposed by the Commission has been designed to deliver a reduction in charges for residents in accordance with the Pricing Principle to deliver affordable electricity consistent with a reasonable household standard of living, with increased charges for large residential consumers, larger business and industry on the Islands. In this way, the Commission has attempted to balance the multiple objectives of the Government's Pricing Principles. The proposed tariff structure is a step towards efficient energy production and use.

These proposals are presented to residents, business and other stakeholders for comment. The Commission looks forward to receiving submissions before settling its recommendations to Government.

Andrew Reeves
Commissioner

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GLOSSARY

Term	Meaning within the context of this report
AARR	Aggregate annual revenue requirement
ABS	Australian Bureau of Statistics
AEIFRS	Australian Equivalents to International Financial Reporting Standards
ATSIC	Aboriginal and Torres Strait Islander Commission
Aurora	Aurora Energy Pt Ltd
BSI	Bass Strait Islands
CBD	Carbon Block Developments Energy Limited
Code or TEC	Tasmanian Electricity Code
Commission	Government Prices Oversight Commission
CSO	Community Service Obligation as provided for in Part 9 of the GBE Act
DIER	Department of Infrastructure, Energy and Resources
DORC	Depreciated optimised replacement cost
ESI Act	*Electricity Supply Industry Act 1995*
GBE Act	*Government Business Enterprises Act 1995*
GBE	Government Business Enterprise, required to comply with the GBE Act
GPO Act	*Government Prices Oversight Act 1995*
GPRs	Green Power Rights
GSL Scheme	Guaranteed Service Level Scheme
GST	Goods and Services Tax
GWh	Gigawatt hour
HCCH	Health Care Card Holder
HEC	Hydro Electric Corporation
HV	High Voltage
IEMC	Integrated Energy Management Centre
KIPC	King Island Ports Corporation
KIREX	King Island Renewable Energy Expansion project
kW	Kilowatt
kWh	Kilowatt hour
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MWh	Megawatt hour

Term	Meaning within the context of this report
NEM	National Electricity Market
NPV	Net present value
OTTER	Office of the Tasmanian Energy Regulator
PPA	Power Purchase Agreement
Price Control Regulations	*Electricity Supply Industry (Price Control) Regulations 1998* (now 2003)
RAB	Regulatory Asset Base
RAES	Remote Area Energy Supplies
RECs	Renewable Energy Certificates
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
The Regulator	The Tasmanian Energy Regulator established under the ESI Act
WACC	Weighted Average Cost of Capital

EXECUTIVE SUMMARY

In December 2007 the Treasurer requested the Government Prices Oversight Commission (the Commission) to undertake an electricity price inquiry for the Bass Strait Islands (BSI).

This Inquiry covers the electricity generation, distribution and retail services for BSI customers supplied by Hydro Tasmania. The pricing policies of the BSI were last investigated as part of the Tasmanian Energy Regulator's 1999 Investigation into Electricity Supply Industry Pricing Policies.

This Inquiry is being conducted under the *Government Prices Oversight Act 1995* (GPO Act), in accordance with the Terms of Reference included in the Appendices to this Report. The Terms of Reference were guided by recommendations from a review of electricity arrangements on the BSI, undertaken by a Working Group of Officials established by Government.[1]

Although the Commission has been asked to ascertain the efficient cost of supply and recommend a tariff structure to apply on the BSI, the final price to be charged to BSI customers will be determined by Government.

The Commission has approached the Inquiry in two phases, with the initial phase being to assess the efficient cost of supply, and the second phase to propose a tariff structure to apply on the BSI, taking account of the Pricing Principles set out in the Terms of Reference.

The Commission has assessed the efficient cost of supply on the BSI, taking into account the following:

- cost of the current configuration of generation, distribution and customer services;
- costs of conventional generation (a baseline diesel-only solution); and
- costs of a notional best-fit all-diesel solution.

The Commission has then developed a proposed BSI tariff for residential and business customers to meet the Pricing Principles.

Efficient Cost of Supply

The purpose of assessing the efficient cost of supply is to draw a conclusion as to Hydro Tasmania's annual revenue requirement to meet operating and maintenance

[1] *Review of Electricity Arrangements on the Bass Strait Islands – Final Report,* Working Group of Officials, February 2007.

costs and depreciation (return of capital) and to provide a commercial risk adjusted return on its capital investment (return on capital).

The Commission analysed the costs associated with generation and distribution separately, for each Island, using a 'building block' approach. The cost to provide retail services has been compared to a benchmark cost to serve, that being the cost of providing those services on the mainland of Tasmania.

Hydro Tasmania purchases services from Aurora for operating and maintaining the diesel generation and distribution systems and for retail services. The costs associated with the Aurora contract have been reported separately for each category. Except for retail, Aurora's costs associated with these services also include a mark-up.

Generation

Historically, the BSI relied solely on diesel generation to provide electricity needs. However in the last 10 years Hydro Tasmania has implemented a number of renewable energy solutions on King Island, most notably wind generation via the Huxley Hill Wind Farm and the King Island Renewable Energy Expansion (KIREX) project. Wind generation is expected to provide approximately 35 per cent of King Island's electricity needs for 2007-08, with the remainder provided by diesel generation.

Given the current configuration of electricity supply on the BSI and reliance on diesel generation, the most significant input to the cost of supply is the cost of diesel fuel.

Using Hydro Tasmania's reported costs, the Commission ascertained a total cost to supply of the current configuration for each of the financial years 2005-06 to 2010-11, and after removing the costs of wind generation, the Commission was able to compare the costs of a hypothetical all-diesel solution to the current generation mix.

The Commission estimates that without wind in the system, diesel fuel use would need to be 54 per cent greater to satisfy generation requirements for 2007-08. Diesel fuel costs would also be almost 55 per cent greater – an amount in the order of $1.67 million. Capital charges and depreciation on wind generators offset the savings from the investment in wind to some degree, and as such- costs under an all-diesel solution would be on average $1 million greater per annum compared to the current generation mix, with the increase attributable to increased diesel fuel costs.

To ascertain the efficiency of Hydro Tasmania's investment in diesel generation, and to provide a point of reference for valuation of the diesel generating assets, the Commission engaged a consultant to provide an independent view as to the installed cost of generation plant to meet the long term needs of the BSI.

Utilising the Commission's estimate of efficient operational and maintenance expenditure and the current fuel costs on each Island, the Commission was able to

compare the total cost of Hydro Tasmania's existing generators to the two all-diesel configuration options supplied by the Consultant.

This has shown that Hydro Tasmania's valuation of its generation assets is consistent with the estimated replacement capital cost of diesel generation as quoted by the Consultant. It also confirmed that in the long-term an all-diesel operation is significantly more expensive than the current diesel/wind configuration in place on the BSI.

Thus for the purposes of calculation of efficient costs, the Commission has accepted the current diesel/wind configuration and Hydro Tasmania's generation asset values.

Distribution

As with generation, Aurora is contracted to manage and operate distribution assets and to provide customer services on behalf of Hydro Tasmania. Much of the cost of distribution on the BSI is associated with operations and maintenance of the distribution system.

Due to variability of costs reported between years, changes to Aurora's accounting and reporting systems, and the new contract arrangement between Hydro Tasmania and Aurora, the Commission had difficulty in establishing reliable historical costs and has adopted Hydro Tasmania's estimated costs for 2007-08, less the Aurora mark-up and a portion of Hydro Tasmania's own costs in delivering services on the Islands, as the basis for assessment of efficient costs.

Hydro Tasmania is expecting a significant reduction to distribution related operations and maintenance costs for 2007-08, and has attributed much of the savings to the new contract arrangements with Aurora.

There is a significant increase in distribution costs in 2010-11 with a higher return on assets and depreciation related to planned replacement of significant parts of the distribution system on each Island.

Retail

Retail services are provided by Aurora under the contract for services with Hydro Tasmania.

To ascertain an efficient cost to serve, the Commission has compared the retail cost to serve on the BSI as charged by Aurora against the retail cost to serve as provided by the Regulator to Aurora for its retail operations for tariff customers on mainland Tasmania. The Commission notes that Aurora's reported retail costs are less than the benchmark costs, however it has used the benchmark cost to serve to estimate efficient cost of supply on the BSI.

Hydro Tasmania's Own Costs

Hydro Tasmania incurs costs associated with administering services on the BSI, including labour and management costs, other miscellaneous property/asset maintenance contracts (other than the Aurora contract), and rates and land taxes.

Total Costs versus Efficient Costs

The Commission has examined the total costs of electricity supply on the BSI, as reported by Hydro Tasmania, and established an efficient cost of supply by way of adjustments to Hydro Tasmania's forecast costs:

- The Commission has removed the mark-up attributable to Aurora, as would be the practise in estimating total costs for a regulated monopoly service provided by a single supplier.
- The Commission considers that the portion of Hydro Tasmania's 'own costs' relating to contract administration is not reflective of the lowest cost means of delivering the service, as theoretically the operations on the BSI could be undertaken by one party with minimal contract administration required. For the purposes of assessing an efficient cost to supply on the BSI, the Commission has reduced Hydro Tasmania's 'own costs' by 50 per cent.
- The Commission has substituted the benchmark retail cost to serve for the reported Aurora retail costs.

For each year of analysis the total efficient cost is less than Hydro Tasmania's total forecast costs, by an amount ranging from $0.15 million in 2005-06 to $0.3 million in 2010-11. Whilst the benchmark retail cost to serve used in calculating efficient costs is greater than Aurora's reported cost to serve, this higher cost is offset by the Aurora mark-up on operations and maintenance costs, which has been removed to calculate the total efficient cost. Therefore the small difference between total costs and total efficient costs is mainly due to the exclusion of Hydro Tasmania's own costs for delivery of services on the BSI.

The estimation of costs was based on Hydro Tasmania's estimated diesel costs for 2007-08 to 2010-11. Due to recent increases in diesel fuel prices, the Commission has also modelled the costs of generation on the BSI using recent diesel fuel contract costs. Due to its heavy reliance on diesel generation, increases in the diesel fuel contract price have a significant impact on Hydro Tasmania's total costs for the BSI. The Commission estimates that in 2008-09 Hydro Tasmania is likely to incur an extra $1.1 million in costs if current diesel prices are sustained.

Conclusion on Efficient Costs

The Commission has examined the costs reported by Hydro Tasmania for electricity supply on the BSI.

However, the Commission has had difficulty in ascertaining the efficiency of costs of the services Aurora and Hydro Tasmania provide due to:

- the variability of costs reported between years and across and within categories that Hydro Tasmania could not explain;
- changes in Aurora's accounting and reporting systems, including changes to how Aurora records and allocates costs, together with changes in organisational structures (as explained by Aurora), which has made comparison between years difficult;

- the new contract arrangement between Hydro Tasmania and Aurora, which has made comparison to previous years' operations and costs difficult; and
- inconsistency in reporting work against cost items.

In light of the above and without more detailed information on cost breakdowns, the Commission has adopted Hydro Tasmania's reported costs for the provision of electricity supply on the BSI, notwithstanding that the Commission considers there are areas in which reporting and cost allocation procedures can be improved. Some of these accounting deficiencies are being addressed through the new contract arrangements with Aurora. These include consistent reporting against cost items for work undertaken on each Island, and closer scrutiny by Hydro Tasmania of Aurora's operations on the BSI.

Proposed Tariff Structure

The proposed tariff structure has been determined in accordance with the Terms of Reference for the Inquiry, including:

- the Bass Strait Islands Electricity Pricing Principles, as established by the Government's Working Group of Officials;
- projected annual future Budget contributions; and
- incentives for efficient energy use.

Pricing Principles

The Pricing Principles guiding development of a tariff structure for the BSI stipulate that BSI residents will have access to affordable electricity consistent with a reasonable household standard of living, with continued support from Government.

Until now, BSI electricity customers have faced a uniform tariff regardless of customer type or consumption. The Terms of Reference for the Inquiry and the Government's Working Group of Officials requested a stepped block tariff be investigated for the BSI. The Commission analysed actual customer consumption data provided by Aurora in its role as retail service provider on the BSI, to ascertain consumption profiles of customers to inform the development of its proposed tariff structure.

Customers

In 2006-07, there were 1 127 electricity installations on King Island and 632 on Flinders Island; approximately 25 per cent classified by Hydro Tasmania as business installations and 75 per cent residential. The majority of load (65 per cent) on King Island is business related, with two large customers accounting for half of the business load. In contrast, the majority of load on Flinders Island is residential (58 per cent), with no large business loads.

Tariff Structure - Residential Customers

The Commission proposes a stepped tariff with the following components:

- The energy rate of the first blocks set at a rate commensurate with that on mainland Tasmania, consistent with the Pricing Principles to deliver affordable electricity consistent with a reasonable household standard of living. Tariff 31 (Light and Power) has been used to determine the reference prices for the proposed BSI Residential Tariff for the first 1 500 kWh of consumption per quarter.
- The energy rate for consumption in excess of the threshold consumption be set taking account of the cost of energy substitutes for hot water and space heating.

Average residential consumption on the BSI is less than the average consumption of mainland Tasmania residential customers. This is due in part to the historically high cost of electricity on the BSI, and greater use of competitively priced alternatives to electricity (wood, LPG and solar-thermal for water heating and/or space heating).

The Commission calculates that at January 2008 LPG prices, the cost of alternative energy sources to deliver hot water and space heating to BSI residents is at least 30 cents per kWh.

Based on the above, the proposed residential tariff structure is as follows.[2]

Charge Element	**Rate ¢**
Daily charge (¢ per day)	65.762
First 500 kWh per quarter (¢ per kWh)	19.066
Next 1 000 kWh per quarter (¢ per kWh)	18.144
Remainder (¢ per kWh)	30.000

Under the proposed tariff structure more than 85 per cent of all residential customers would face lower annual electricity charges compared to the current Tariff 51 rates paid by BSI residents, with annual savings of $193 for average consumption customers.

Annual tariff revenue from the residential sector from the proposed tariffs would be similar to current Tariff 51 revenue.

Tariff Structure - Business Customers

The Pricing Principles and advice from Government suggest that the energy rates for business customers should be set equal to the cost of supply with any subsidies for businesses to be delivered through industry assistance measures. The Commission estimates marginal cost of supply, made up of fuel, some operating and maintenance costs and the costs of losses in the distribution system to be between 56 and 57 cents per kWh (based on May 2008 diesel prices). There would be a significant and sudden adverse impact on business customers if prices were increased to this level.

[2] Tariff 31 charges as at January 2008 plus 3 per cent to replicate likely charges to apply on Mainland Tasmania from 1 July 2008.

However, maintaining prices significantly below cost of supply does not encourage users to seek the most efficient means of meeting electricity needs. The Commission proposes that the energy rate for business tariffs be set at 30 cents per kWh – consistent with the Step 3 energy rate for residential customers.

Because there is currently no discrimination between residential and business tariffs, it is likely that some customers are misclassified, and in addition, it is likely that some properties on the BSI are mixed-use (business and residential). To avoid the transition costs associated with installation of separate meters for separate residential and business tariffs, the Commission proposes that business customers face the same rates as residential customers for the first 1 500 kWh of consumption per quarter. The Commission estimates that the revenue loss from allowing the residential rates for the first 1 500 kWh per quarter for business customers would be approximately $149 000 per annum.

Under the tariff proposal, 75 per cent of all business installations would face lower annual electricity charges than under current arrangements. For increasingly larger customers however, the proposed tariff structure has an increasing impact on annual costs, with the largest customers facing increases in annual charges of approximately 35 per cent. The Commission acknowledges the likely significant impact on larger customers, and notes the Working Group of Officials Final Report recommendation that support for existing industry, new industry or substantive expansion of existing industry is better progressed through regional development mechanisms in order to deliver support in the most efficient way.

Annual tariff revenue from the business sector from the proposed tariffs would be approximately $740 000 greater than under current Tariff 51 arrangements.

Impact on CSO Requirement

Based on the Commission's estimate of likely revenues arising from the proposed tariff structure, and the estimated cost of supply based on May 2008 contract diesel prices (approximately $1.70 per litre, escalated in real terms by 2.5 per cent per annum for future years) the proposed tariff structure would require a CSO payment of $6 million for 2008-09, rising over the next few years to almost $6.2 million in 2010-11.

A diesel contract price of $2 per litre would require a further $1.2 million per annum, to maintain tariffs at the proposed levels.

Implementation of an Emissions Trading Scheme foreshadowed by the Commonwealth Government will, unless there is an exemption or free allocation of permits for stationary diesel generation, also increase generation costs.

In order to manage the costs of the CSO, the Commission recommends that the indicative charges listed in the proposed tariff structure be considered as the base for future charges, with escalation according to an index related to diesel fuel costs using 2008-09 as a base, but with no reduction in prices below the recommended levels. This will also provide a stronger price signal to BSI customers as to the true costs of

electricity supply, with incentives for energy conservation and substitution to more efficient means of energy production.

Regulatory and Contractual Arrangements

Due to the significance of the CSO Agreement to electricity supply arrangements on the BSI, the Commission offers a number of observations regarding the structure of current arrangements.

CSO Agreement

The Commission's first observation is that contractual arrangements between the Government and Hydro Tasmania are focussed on arrangements for efficient supply of electricity. However the CSO Agreement does not incorporate financial incentives for Hydro Tasmania to reduce its cost of generation, whether by its own initiative or by purchase of electricity from other lower-cost providers. The Government is dependent on Hydro Tasmania initiatives to recognise and develop lower cost electricity generation.

The introduction of wind generation on King Island has been particularly successful, but other approaches, such as the storage battery initiative, have been less successful, with the Government bearing the risk.

The focus on efficient supply risks over-looking alternative means of meeting the energy needs of residents and businesses on the BSI. There are no incentives under current arrangements to meet BSI energy needs by alternative fuels, such as by substitution of LPG and solar thermal, or to encourage energy efficiency through building design, insulation or energy-efficient products. Higher electricity charges which are closer to the real cost of electricity production would encourage consumers to seek out alternative means of satisfying their needs. However, the tariff rates proposed by the Commission are significantly less than the costs of production and less than the costs of the LPG alternative. Subsidies of other fuels and of energy efficiency initiatives may in the longer term be a better use of CSO funds and to reduce exposure to the cost of diesel fuel.

A broad focus on the BSI energy needs, rather than the primary focus on supply of electricity by Hydro Tasmania, could further reduce the cost to Government, in addition to reducing the environmental impact of energy production on the BSI.

Hydro Tasmania-Aurora contract for services

The Hydro Tasmania-Aurora contract for services has been a fixed price contract which should have given Aurora the opportunity to increase profitability through management of costs. Hydro Tasmania believes that even with the payment of a 15 per cent margin under the proposed new contract, costs can be reduced by close attention to and challenging of reported costs. The Commission considers that a period of such careful cost control could provide a basis for a performance-based contract in the future.

1 CONTEXT OF THE INQUIRY

1.1 Introduction

In December 2007 the Treasurer requested the Government Prices Oversight Commission (the Commission) undertake an electricity price inquiry for the Bass Strait Islands (BSI).

As a vertically integrated operation on the BSI, the Hydro Electric Corporation (trading as Hydro Tasmania) has responsibility for the network and generation operations and retailing on the BSI. Hydro Tasmania also has the responsibility of power system security on the BSI as the BSI System Controller. Aurora Energy Pty Ltd (Aurora) is contracted by Hydro Tasmania to maintain operations and provide distribution and retail services.

A single tariff applies to both business and residential customers. This tariff is less than the actual cost to supply, and the Tasmanian Government provides a subsidy to the BSI customers through a Community Service Obligation (CSO) Agreement with Hydro Tasmania.

Hydro Tasmania and Aurora have assisted the Inquiry by providing information on historical costs and future plans.

This section outlines the context within which the Inquiry of Electricity Pricing on the BSI is being made, taking account of:

- the Terms of Reference and guiding principles for the Inquiry;
- past decisions and reviews concerning electricity arrangement on the BSI; and
- regulatory requirements governing electricity supply on the BSI.

1.2 Guiding Principles

1.2.1 Government Prices Oversight Commission

The Commission is an independent statutory body. It was established in 1996 following the commencement of the *Government Prices Oversight Act 1995* (GPO Act), which was part of Tasmania's commitment to the National Competition Policy Agreement. The GPO Act provides for the Commission to set maximum prices chargeable by Government bodies, and investigate and conduct inquiries into the pricing policies of certain Government State-owned Companies, Government Business Enterprises (GBEs) and Local Government businesses and agencies that are monopoly providers of services and goods in Tasmania.

Under the GPO Act, the Minister may also direct the Commission to inquire into and report to him or her on a matter relating to or affecting the pricing policies of a prescribed body.[3]

1.2.2 1999 Investigation

In 1999 the Regulator made a decision of maximum prices to be charged by the Tasmanian electricity entities for services to be provided for the three years from 1 January 2000, including for the BSI[4].

The Terms of Reference for the 1999 Investigation, issued by the Government, required the Regulator to make a determination for the declared service of 'the retail supply for customers' on the BSI. Due to the integrated nature of electricity supply on the BSI, for the purposes of the Investigation the bundle of 'special services'[5] provided by Hydro Tasmania were taken to be part of the declared retail supply services. Therefore, in accordance with the Terms of Reference the Regulator:

- reviewed the full costs of delivered electricity on the BSI together with the scope for efficiency gains over the Determination period;
- established a set of pricing guidelines for retail tariffs;
- recommended an appropriate structure for the delivery of CSO support; and
- provided information of the impact of various levels of CSO funding on the indicative tariff(s).

Whilst the Regulator determined the aggregate annual revenue requirement (AARR) for the BSI and a reference tariff, being the basis for the maximum allowable tariff for the BSI, the actual tariff paid by BSI customers was established between the Government and Hydro Tasmania. This tariff reflected the Government's decision on the level and structure of assistance to be provided through the BSI Concession.

1.2.3 2002 Declaration of Electrical Services

Prior to the expiry of the 1999 Determination the Regulator was required under the *Electricity Supply Industry (Price Control) Regulations 1998* to consider whether the then current declaration should continue, be revoked or amended. In his decision[6], the Regulator proposed to revoke the declaration in relation to Retail Supply on King

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[3] A prescribed body being any State Government Agency; Government Business Enterprise, statutory authority, State-owned Company, or a Local Government Body.

[4] *Investigation into Electricity Supply Industry Pricing Policies Pricing Determination*, December 1999.

[5] This 'bundle' of 'special services' includes charge variation, additional charge, special meter reading, overdue payment, overdue non-payment, meter testing, connection, and reconnection.

[6] *Declaration of Services – Statement of Reasons and Revocation*, November 2002.

and Flinders Islands as other mechanisms existed to regulate the maximum prices paid by consumers on the BSI for these services.

In making his decision the Regulator recognised that the retail supply of electricity for the BSI was principally governed by the CSO Agreement between Hydro Tasmania and the Tasmanian Government. The CSO Agreement recognised the costs involved in providing electricity to consumers on the BSI and provided Hydro Tasmania with financial assistance to enable it to set lower tariffs than otherwise possible. The Regulator was of the view that, although Hydro Tasmania remained the monopoly supplier, the public interest was protected by this Agreement and that the criterion as stated in Regulation 7(1)(b) of the Price Control Regulations was satisfied in the case of BSI. Under Regulation 7(1)(b) the Regulator can revoke a declaration if 'the declaration is no longer required for the promotion of competition, efficiency or the public interest'.

The Regulator gave notice of the revocation of these services in the Tasmanian Government Gazette on 17 June 2003. In the absence of legislation or other specific regulatory controls to determine the escalation of prices to be applied on the BSI, Hydro Tasmania has continued to price electricity in accordance with the principles established by the Regulator in the 1999 Pricing Determination.

1.2.4 Regulatory Framework - Bass Strait Islands

Prior to 1998 the Hydro-Electric Corporation was the holder of a presumptive licence under the *Electricity Supply Industry Restructuring (Savings and Transitional Provisions) Act 1995* for:

- generation, transmission, distribution and retailing operations on mainland Tasmania; and
- generation, distribution and retailing operations on the Bass Strait Islands.

In 1998 the Hydro-Electric Commission was disaggregated and its generation, transmission, distribution and retail functions for mainland Tasmania were segregated into separate businesses. Hydro Tasmania continued to operate under the *Government Business Enterprises Act 1995* (GBE Act), while Transend Networks Pty Ltd (Transend), responsible for the provision of the transmission network services and Aurora, responsible for the management of the distribution network services and retail services were incorporated under the *Electricity Companies Act 1997*.

Hydro Tasmania retained responsibility for the integrated generation, distribution and retail business on the BSI.

Hydro Tasmania operates under a deemed licence in accordance with the *Electricity Supply Industry (Transitional Provisions) Act 1995*. This allows it to continue to undertake those operations that it was lawfully undertaking prior to the licensing requirement under the *Electricity Supply Industry Act 1995* (ESI Act) until such time as the deemed licence is replaced by a licence issued by the Tasmanian Energy Regulator.

The BSI is designated by regulation under the ESI Act as a separate Supply Area from the mainland of Tasmania. This allows tariffs on the BSI to be set at different levels to those that apply to the remainder of Tasmania. Supply on the BSI is also excluded from the operations of the National Electricity Law.

1.2.4.1 Community Service Obligation

Due to the isolated nature of the BSI electricity systems and reliance on diesel generation, the cost of supplying electricity to the BSI is significantly higher than on mainland Tasmania.

In 1997 the Tasmanian Government entered into a CSO Agreement with Hydro Tasmania for the supply of electricity on the BSI. The BSI CSO was established under the GBE Act (Part 9) to provide for the subsidised supply of electricity to all BSI customers and the provision of concessions to pensioner customers on the BSI. The CSO has been funded by the Government since 1998. Hydro Tasmania is refunded on a quarterly basis the costs of providing the CSO.

A revised CSO Agreement with Hydro Tasmania was renegotiated and finalised during 2002-03 for a period of three years, expiring 30 June 2005. This was subsequently extended through until 30 June 2008 and is currently being renegotiated.

To assist the Commission in preparing this Report, the Tasmanian Government has provided a list of indicative levels of CSO funding for forthcoming years. The Commission is required to consider these proposed budget contributions in making its recommendations. The BSI CSO provides for the BSI Concession (available to all customers) and a further Concession to eligible Pensioner and Health Care Card Holder customers.

The cost to the Government of the CSO was approximately $6.6 million in 2006-07.

Bass Strait Islands Concession

The present structure of the BSI Concession provides for a uniform reduced energy rate for all business and residential customers. Hydro Tasmania is funded for the difference between the revenue received from the subsidised tariff and the cost to Hydro Tasmania of providing electricity to eligible customers.

The maximum energy charge allowable, as established in the 1999 Pricing Determination reflects prescribed adjustments for inflation, the GST and diesel fuel costs. The total calculated average cost of energy for 2008 is 56 cents per kilowatt hour (kWh), much higher than the average rate of 24 cents per kWh (including variable and fixed energy charges) that consumers face under the current tariff.

That is, the subsidy to customers amounts to 32 cents per kWh, meaning that electricity on the BSI is currently being subsidised by about 57 per cent of Hydro Tasmania's reported cost to supply.

Pensioner Concession

The Pensioner Concession is a flat rate deduction from the daily fixed charge, as applicable elsewhere in Tasmania, and at the same rate. Until 31 December 2008 the rebate was 48.4 cents per day.

The total maximum daily fixed charges allowable for 2008 for the BSI are 70.98 cents per day. In line with the increase in the Pensioner Concession for mainland Tasmanian customers, the BSI Pensioner Concession was increased on 1 January 2008 to 82.3 cents per day. At the new rate, the rebate is greater than the daily fixed charges.

Eligible Health Care Card Holders also receive a concession, at the same rate as the Pensioner Concession.

1.2.4.2 Ministerial Charter

Hydro Tasmania's deemed licence for operations on the BSI is supported by a Direction from the Regulator. Under the GBE Act[7] Hydro Tasmania is also required to comply with any Ministerial Charter issued by the Government. The Ministerial Charter provides that Hydro Tasmania has an obligation to:

> …continue to provide an electricity generation, distribution and retail service on King and Flinders Islands. The Government will ensure that arrangements are established to compensate for the additional costs incurred in delivering these services. The Minister expects that Hydro Tasmania will meet its Community Service Obligations (CSOs) as efficient and cost effectively as possible. It will advise the Minister of any implications for the cost delivery of its CSOs.

1.2.4.3 Regulator's 1998 Direction

A Direction issued by the Regulator[8] requires Hydro Tasmania to maintain 'good electricity industry practise'.[9] The intent and effect of the direction was to continue existing operations, procedures and standards having regard to such developments in 'good industry practise' as may be relevant to the BSI. The Direction also requires that Hydro Tasmania comply with Chapter 9 of the Tasmanian Electricity Code (Code) on the BSI, covering retailing and retail metering, including a provision requiring a Customer Charter.

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[7] Section 38

[8] Issued 1 July 1998

[9] Good electricity industry practise means the exercise of that degree of skill, diligence, prudence and foresight that reasonably would be expected from a significant proportion of providers of service operations or equipment equivalent to the services provided under conditions comparable to those applicable to the subject service provider consistent with applicable laws, regulations, authorisations, licences and the Tasmanian Electricity Code.

1.2.5 Review of Electricity Arrangements on the Bass Strait Islands

In 2004 the King Island and Flinders Island Councils called for reductions to the retail electricity tariff on the BSI. In response, the then Treasurer and the Minister for Infrastructure, Energy and Resources wrote to the Department of Infrastructure, Energy and Resources (DIER) requesting the formation of a Working Group to investigate and provide a set of recommendations regarding a number of BSI energy issues.

In February 2007 the Working Group delivered its final recommendations for consideration by the Treasurer and the Minister for Energy. The *Review of Electricity Arrangements on the Bass Strait Islands – Final Report – February 2007* was approved by the Treasurer and the Minister for Energy in October 2007.

One of the recommendations from the report was for the Commission to undertake an electricity price inquiry for the BSI.

The Terms of Reference for the Working Group, and the Working Group's resulting recommendations, were as follows:

Recommending the tariff structure in relation to the BSI, including:

The Principle as to how retail electricity prices are set on the BSI

The level of retail electricity prices on the BSI depends upon the extent of Government subsidy through the CSO.

The Working Group recommended continuation of the Government subsidy though a CSO, with the following guiding principles/ objectives:

> Principle 1: The residents of the BSI will have access to affordable electricity consistent with a reasonable household standard of living.
>
> Principle 2: The Government will continue to support electricity tariffs on the BSI at a level commensurate with the social policy objective of Principle 1.
>
> Principle 3: The BSI electricity tariff will be consistent with other economic and environmental objectives.
>
> Principle 4: The regulatory and/or contractual arrangements for supply of electricity on the BSI will promote ongoing efficiency gains and least-cost supply solutions.
>
> Principle 5: The ongoing support for electricity tariffs on the BSI will be targeted to deliver the objectives in an efficient and sustainable manner, with costs balanced against other calls on public funds.

The type of tariff structure that is implemented

The Working Group recommended that the current flat rate be replaced with a stepped block tariff to better align the cost of basic electrical services on the BSI with

that on mainland Tasmania, but at the same time to create incentives for efficient energy use and to limit the growth of the Government subsidy over time.

Government would decide the rates for each block and the nature of the thresholds that should apply following advice from the Commission.

Who has responsibility for approving annual tariff rates

The Working Group recommended that the Minister for Energy have responsibility for overall energy policy on the BSI, including approval of annual tariff rates.

Estimating the cost to Government of any new tariff structure introduced and recommending as to how this will be funded

The Working Group recommended a continuation of the current arrangement under which the CSO is funded from consolidated revenue to make up the shortfall from the contribution from electricity users on the BSI. The cost to Government of the CSO will be the difference between the efficient cost of supply on the BSI and the revenue likely to be raised by the proposed tariff.

Identifying how increased demand for electricity on the BSI above current generation capacity will be managed

The Working Group recommended that new customers whose loads exceed more than five per cent of installed system firm capacity be required to negotiate individual commercial power purchase arrangements and the supplier will be expected to offer them fair and reasonable terms.

Identifying how cost savings to Government (through the BSI CSO) from a reduction in the Federal Government's diesel fuel excise will be applied; and if it is determined that these savings are to be passed on to the residents of the BSI, recommending an appropriate mechanism to do this

The Working Group found that the savings arising from the reduction in the excise have been offset by increases in the underlying diesel price and, as a result, such savings are unable to be passed directly to the residents of the BSI.

The recommendations of the Working Group have fed into the Terms of Reference for the Commission's Inquiry.

1.3 Terms of Reference

The Commission's approach to this Inquiry is governed by the Terms of Reference issued by the Treasurer in December 2007. The Terms of Reference require the recommendations to be arrived at and delivered in accordance with the BSI Electricity Pricing Principles.

Essentially, the Commission is required to:

1. Determine efficient cost of supply on the BSI by desk-top review of the cost of conventional generation, the cost of current facilities, and the cost of proven alternatives in remote area power systems; and

2. Recommend tariff structures, including a stepped-block tariff, in accordance with proposed annual future Budget contributions, having

regard to the BSI Electricity Pricing Principles and incentives for efficient energy use.

In undertaking this Inquiry, the Commission is also required to consider the views of key stakeholders and interested parties as necessary.

Under Section 39 of the GPO Act, the Commission must provide a report of its findings to the Minister. The Terms of Reference for the Inquiry requires the delivery of a Final Report to the Treasurer, including tariff recommendations. The Terms of Reference also requires the Commission to deliver a Draft Report for Consultation.

It is expected that the Final Report will be released by end August 2008.

Following advice from the Commission, the Government will decide the rates for each tariff block and the nature of the thresholds that should apply.

The Terms of Reference are reproduced in full at Appendix A.

1.4 Consultation

The GPO Act provides that the Commission may receive submissions, consult with any person, and hold conferences and seminars as it sees fit in the conduct of an inquiry.

The Terms of Reference for the Inquiry note that in undertaking this Inquiry, the Commission is also required to consider the views of key stakeholders and interested parties as necessary.

1.5 Submissions

The Commission is seeking submissions on any matter raised in the Terms of Reference and this Draft Report.

Enquiries concerning this Draft Report should be directed to:

Dana Faletic, Principal Policy Analyst
Government Prices Oversight Commission
Telephone: 03 6233 3935
Facsimile: 03 6233 5666
Email: office@gpoc.tas.gov.au

Submissions should be lodged by 31 July 2008 with the Government Prices Oversight Commission, preferably by email to:

office@gpoc.tas.gov.au

or

by mail to:
GPO Box 770
HOBART, TAS 7001

or

by facsimile to: (03) 6233 5666

2 BACKGROUND

2.1 Power System

Hydro Tasmania owns the electricity system on the BSI, which includes generation and distribution assets. There is no transmission system on either Island. While ownership of assets rests with Hydro Tasmania, Aurora operates the system and provides customer services under contract with Hydro Tasmania.

The electricity supply on the BSI is quite different in nature to the predominantly hydro-based system operating on mainland Tasmania. Generation on each island is provided by diesel generators complemented by wind turbines. In the case of Flinders Island Hydro Tasmania purchases a small amount of wind generated power from a privately owned wind generator.

The Ministerial Charter issued by the Minister for Infrastructure, Energy and Resources to Hydro Tasmania requires the continuing provision of electricity generation, distribution and retail services on King and Flinders Islands. This obligation results in Hydro Tasmania having to make such investments as are necessary to meet base and peak load requirements on the BSI.

Nevertheless, there is the capability for others to invest in generation for example the privately owned wind turbines on Flinders Island.

Table 2.1: BSI electricity system statistics, 2006-07

	King Island	**Flinders Island**
Generation – installed capacity		
Diesel	3 x 1.6 MW 1 x 1.2 MW	2 x 550 kW 1 x 300 kW 1 x 1.2 MW
Wind	3 x 250 kW 2 x 850 kW	1 x 20 kW* 1 x 60 kW*
Total	***8.45 MW***	***2.68 MW***
Distribution		
Number of feeders	4	3
Total route length (km)	404	327
Connected kVA	15 280	5 790
Number of customers	1 127	632
Sales (MWh)	14 517	4 033

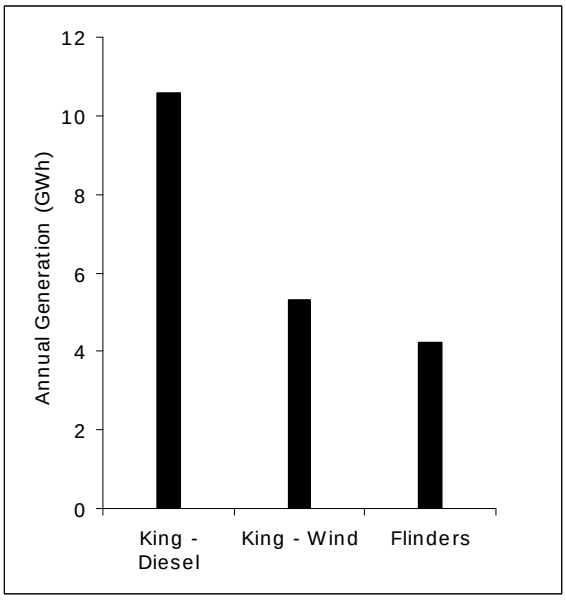
*Privately owned

2.1.1 Generation

Generation on Flinders Island is provided by a bank of four diesel engines and two privately owned wind turbines, providing total generation capacity of 2.68 megawatts (MW). The majority of load is residential (60 per cent), the remainder comprised of business load, and no significant industrial load on the Island.

Generation on King Island is provided by four diesel engines and five wind turbines, giving a total capacity of 8.45 MW. Approximately 35 per cent of the load associated with King Island customers is residential, with the remainder comprised of industrial, commercial and dairy farm load.

Figure 2.1: Generation on King Island and Flinders Island, 2006-07



Hydro Tasmania advises that under industry guidelines, firm supply capacity is equivalent to the installed capacity of the diesel generation minus the loss of the largest machine, for each Island. The current firm capacity for King Island is 4.4 MW. Flinders Island has a firm capacity of 1.4 MW.

System peak for each Island (as at end 2007) was 3.44 MW for King Island (November 2006) and 1.162 MW for Flinders Island (July 2005). In light of historical system peaks, firm supply capacity is adequate.

The wind turbine generators on King Island are restricted to providing a maximum of 70 per cent of the Island's energy needs at any one time, because of the inherent variability in wind and the inability of the wind turbines to independently manage system frequency and voltage.

The installation of a Vanadium Redox Battery Energy Storage System was completed in November 2003. The system was designed to store 800 kWh of energy through integration with the wind turbines and diesel generators to form a three-way hybrid system.

The batteries were intended to smooth the short-term variations in either the output of wind generators or customer loads, and reduce generation costs by allowing a more efficient use of the wind turbines. The batteries are currently non-operational, however a replacement solution is being trialled.

2.1.2 Renewable Energy Solutions

To date, Hydro Tasmania has developed and implemented a number of renewable energy projects on King Island, most notably the Huxley Hill Wind Farm, with a number of projects currently in development stage by their Business Development Group, and privately funded by other parties.

Huxley Hill Wind Farm – King Island

In 1998 Hydro Tasmania commissioned three Nordex Wind Turbine Generators providing a total renewable energy capacity of 750 kW. This resulted in a 16 per cent reduction in annual diesel fuel use.[10]

King Island Renewable Energy Expansion (KIREX)

Under the KIREX project, two additional wind turbine generators supplemented the existing turbines on King Island, increasing the rated capacity of the wind farm to 2.45 MW. In order to increase the level of renewable energy contribution to the load, a Vanadium Redox Battery energy storage system was also installed. The objective of the storage system was to enhance the use of wind power to displace diesel generation. The Battery is currently non-operational.

Resistive Frequency Control – King Island

A new power station control system has been installed on King Island including a large resistive load which is designed to be varied rapidly in order to absorb excess wind generation, rather than spill it. As the resistor can be adjusted rapidly, this will effectively convert spilled wind into spinning reserve that can be used to supplement diesel generation, and ultimately reduce diesel output, therefore reducing fuel use.[11]

Carbon Block Project – King Island

A carbon block/steam turbine energy storage system is proposed by Carbon Block Developments Energy Limited (CBD) subject to successful commissioning of the resistive frequency control and testing of a trial carbon block.

The energy storage system will replace the current resistor bank, retaining the frequency control capability whilst storing the energy in the form of heat for future recovery and conversion to electricity when wind and solar output is low.

The proposed installation will comprise six modules that store energy from wind and solar which will be used to provide power to drive a 250 kW steam turbine generator.

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[10] *King Island "Towards a sustainable renewable energy future"* Hydro Tasmania.

[11] Ibid.

Solar Installation – King Island

Six photovoltaic solar units have recently been installed on King Island by CBD with a generation capability of 94 kW, with power to be purchased by Hydro Tasmania through a Power Purchase Agreement (PPA).

Wind Farm Expansion – King Island

Up to 4 MW of further wind development is planned for King Island (dependent on the successful implementation of the resistive frequency control project). In addition to the resistor/carbon block, the additional wind capacity is expected to raise wind contribution to annual load from the predicted 45 per cent to around 60 per cent of the yearly energy demand.

Wind Farm – Flinders Island

The installation of wind turbine generators on Flinders Island is currently being investigated, as is the upgrading of the existing aged diesel generators. At an approximate capacity of 1 MW, Hydro Tasmania envisages up to 45 per cent penetration from the wind farm, providing that suitable enabling technology is installated.

Ocean Power

Hydro Tasmania notes that they have been approached by a number of proponents for ocean power technologies for development in Bass Strait. Hydro Tasmania recently signed a memorandum of understanding with Sydney-based company BioSystems to undertake trials of its Biowave technology on King Island, and its Biostream tidal-current system on Flinders Island. The aim is to generate 250 kW of electricity for both Islands by 2008.[12]

2.1.2.1 Alternative Fuels

Hydro Tasmania is also investigating the possible replacement of mineral diesel fuel in the diesel generators with alternative fuels such as biodiesel (including tallow from the local abattoir) or Liquefied Natural Gas (LNG). The Commission understands that there is also potential for the use of Liquefied Petroleum Gas (LPG) for generation on the BSI.

2.1.3 Distribution Network

The high voltage (HV) distribution network comprises seven rural overhead feeders: four on King Island and three on Flinders Island. There is limited underground cabling of the distribution system on King Island, and no underground cables within the distribution system on Flinders Island.

[12] *New-wave deal for oceans of energy*, Hobart Mercury, 7 May 2008.

2.1.4 Customer Services

The provision of customer services, including installations and metering, and retail services is provided by Aurora. However as Hydro Tasmania is the holder of the presumptive retail licence it has the contractual relationship with customers.

2.2 Demographic and Economic Information

Table 2.2 provides an overview of some comparative demographics and economic statistics for the BSI and Tasmania as a whole. Information has been obtained from the latest Australian Bureau of Statistics (ABS) Census.

Table 2.2: Demographic and economic statistics for the Bass Strait Islands

	Tasmania (All)	King Island	Flinders Island
Population	476 481	1 639	864
Labour force participation[1]			
▪ Full time	56%	65%	57%
▪ Part time	31%	25%	32%
▪ Unemployed	6.6%	2.1%	3.8%
Income			
▪ Median individual weekly ($/week)	$398	$504	$428
▪ Median household income ($/week)	$801	$902	$737
▪ Median family income ($/week)	$1 032	$1 075	$1 013
Dwellings			
▪ Total private dwellings	216 746	874	617
▪ Unoccupied	27 679 (13%)	189 (22%)	218 (35%)

Source: 2006 ABS Census, and *Australian Bureau of Statistics* 2006 Census QuickStats;

Note 1: Some respondents did not state their hours of work; others indicated their employment was away from work. These accounted for: 6.6% Mainland Tasmania; 8.3% King Island; 7.4% Flinders Island.

Table 2.2 shows that labour force participation and unemployment figures for the BSI compare favourably to those of Tasmania as a whole.

Income levels of all categories listed for King Island, and for individuals on Flinders Island, are commensurate with those of Tasmania as a whole, with only the median household income level and family income level for Flinders Island being lower than that of King Island and of Tasmania as a whole.

A higher proportion of dwellings on Flinders Island are unoccupied (35 per cent), compared to King Island, which at 22 per cent is still higher than the 13 per cent Tasmanian average. The higher proportion of vacant dwellings may be attributable to the larger number of holiday homes or temporary residents on the BSI, in particular Flinders Island.

2.3 Electricity End Use

Using customer records obtained from Aurora, each electricity installation on the BSI can be categorised as either a business or residential installation, although the current tariff does not distinguish between the two categories. The 'business' category includes both commercial and non-commercial institutions such as Government departments and the Councils. This is consistent with the definitions of residential and business applied on mainland Tasmania. For the purposes on this Inquiry, the Commission has classified two large businesses (with a total of 3 installations) on King Island as industrial, due to the size of their load.

Table 2.3 shows the break-down of installations and associated consumption, for each Island across the business and residential categories.

Table 2.3: Bass Strait Islands electricity end use, 2006-07

	King Island		**Flinders Island**	
Industrial		**%**[1]		**%**
▪ Installations	3	0.27	-	-
▪ Consumption (GWh)	4.94	34	-	-
Business				
▪ Installations	284	25	149	24
▪ Consumption (GWh)	4.55	31	1.67	42
Residential				
▪ Installations	840	75	483	76
▪ Consumption (GWh)	5.02	35	2.36	58

Note 1: Percentages are based on total installations and consumption for each Island.

As can be seen from Table 2.3, the share of installation numbers of the business and residential sectors across the two Islands is almost identical, with one quarter of installations on each Island attributable to business customers, and three quarters to residential customers.

In terms of consumption, the three industrial installations on King Island (the King Island Dairy[13] and King Island Abattoir) comprise a significant proportion of the Island's total consumption (34 per cent). Combined with other business customers, non-residential consumption on King Island accounts for two thirds of total consumption on King Island, with residential customers accounting for the remaining third.

In comparison, the residential sector on Flinders Island comprises the majority of consumption on the Island, at 58 per cent. The business sector, with no industrial load, comprises 42 per cent of consumption.

[13] A combination of 2 installations- Factory and Coolstore

2.3.1 Business Installations

Business consumption on the BSI is very heavily influenced by the beef and dairy industries with over 190 beef or dairy farms on the BSI holding roughly 87 000 head of cattle in total.[14]

Table 2.4 depicts the distribution of business customers[15] for corresponding consumption brackets, and the corresponding cumulative consumption for those customers.

Table 2.4: BSI business installations- distribution of installation numbers and consumption 2006-07

Consumption Bracket – kWh per annum	Number of business installations	Cumulative proportion of business installations %	Proportion of total BSI business consumption %	Cumulative proportion of BSI business consumption %
> 300 000[1]	3	100	44	100
200 000-300 000	7	99	14	56
100 000-200 000	5	98	7	41
60 000-100 000	18	97	13	34
40 000-60 000	6	92	3	22
20 000-40 000	35	91	9	19
10 000-20 000	33	83	4	11
0-10 000	329	75	6	6
0- 2 000	204	47	1	1

Note 1: Comprising two installations attributable to the King Island Diary, and one attributable to the Abattoir on King Island.

Table 2.4 shows that a large number of business installations have a very low annual consumption, with nearly half of all business installations recording consumption of 2 000 kWh or less for 2006-07. However, this sector contributed only one per cent to total business consumption on the BSI.

Three quarters of BSI business installations (75 per cent) consumed 10 000 kWh or less in 2006-07, and a further 13 per cent consume between 10 000 and 40 000 kWh. That is, 91 per cent of business installations consume 40 000 kWh per annum or less, however this reflects less than 20 per cent of total consumption recorded by the business sector.

[14] King Island Natural Resource Management Group, *King Island EMS Pilot Project – Final Report*, April 2006, p.3.

[15] Identified by installation.

The next 37 per cent of consumption is recorded by 36 installations consuming between 40 000 kWh and 300 000 kWh.

The remaining 44 per cent of business consumption on the BSI is attributable to three of the 436 business installations- belonging to King Island Dairy and Tasman Group Services Pty Ltd (King Island Abattoir).

Figure 2.2 depicts the total consumption of all businesses within selected consumption brackets.

Figure 2.2: BSI business installations 2006-07 – total consumption for each consumption bracket

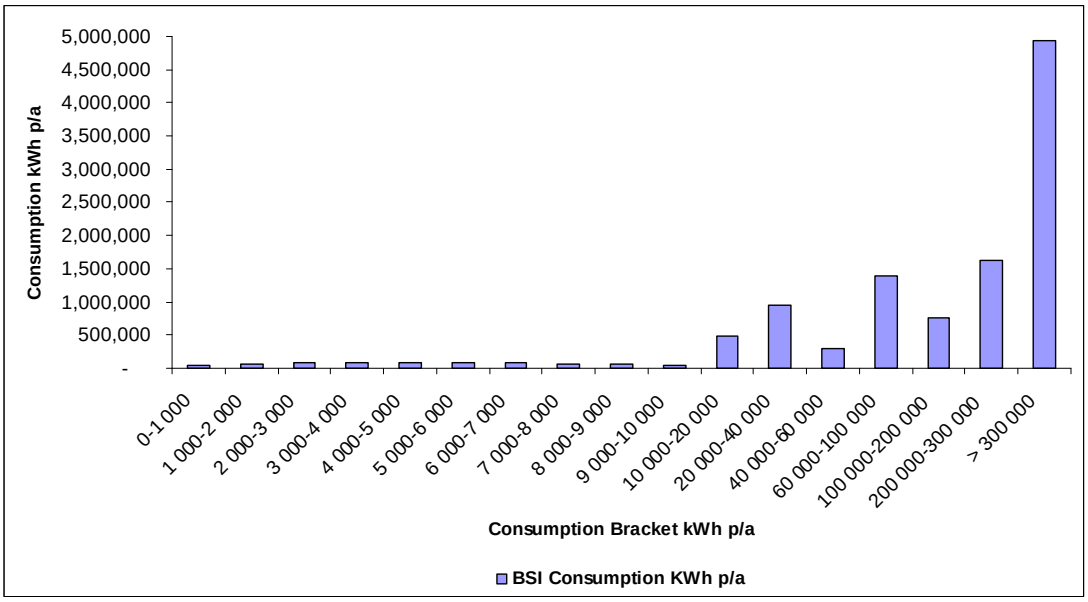

Figure 2.2 shows the sum of consumption by businesses in each of the consumption brackets up to 10 000 kWh per annum is relatively small, in comparison to consumption of businesses in higher consumption brackets. This depicts that most business related consumption is attributable to a few large business consumers on the BSI, rather than a large number of small business consumers.

The average level of business consumption on the BSI is 14 382 kWh per annum, excluding the three largest installations.[16] Due to the range of consumption of business customers, the median of business consumption is perhaps a better indicator of the typical level of consumption, the median being 2 487 kWh per annum, which fits with the large number of business installations reading less than 2 000 kWh per annum.

2.3.2 Residential Installations

Table 2.5 shows the distribution of residential installations in each consumption band, by number of installations and consumption.

[16] The industrial customers have been excluded from the analysis of average and median calculations for business installations.

Table 2.5: BSI residential installations- distribution of installation numbers and consumption 2006-07

Consumption Bracket – kWh per annum	Number of BSI residential installations	Proportion of BSI residential installations %	Cumulative proportion of BSI residential installations	Proportion of total BSI residential consumption %	Cumulative Proportion of BSI residential consumption %
40 000-100 000	10	1	100	6	100
20 000-40 000	13	1	99	5	92
10 000-20 000	106	8	98	18	87
8 000-10 000	116	9	90	14	69
6 000-8 000	189	14	81	18	55
4 000-6 000	303	23	67	21	38
2 000-4 000	337	25	44	14	17
0-2 000	249	19	19	3	3
TOTAL	**1 323**				

Table 2.5 shows that more than 80 per cent of residential installations consume less than 8 000 kWh per annum, accounting for 55 per cent of total residential consumption, and 98 per cent of customers consume 20 000 kWh per annum or less, accounting for 87 per cent of total residential consumption. Figure 2.3 depicts the above information graphically, showing for different consumption brackets the corresponding number of residential installations and aggregated consumption for those customers.

Figure 2.3: BSI residential installations – distribution of installation numbers and consumption 2006-07

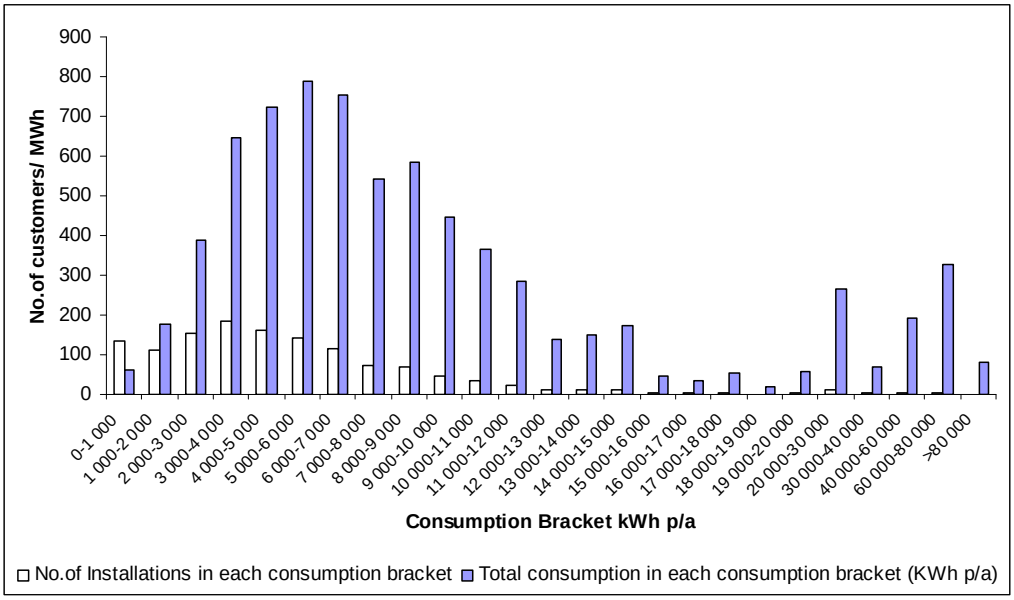

Figure 2.3 depicts the large number of installations with annual consumption falling into consumption brackets up to 10 000 kWh per annum, illustrating that most consumption is attributable to a large number of installations recording low consumption, rather than a few installations that record high consumption, as is the case with the business sector.

Table 2.6 illustrates average and median residential consumption levels for each of King Island and Flinders Island, and for the combined BSI residential sector.

Table 2.6: Annual residential electricity consumption, Bass Strait Islands, 2006-07

	King Island kWh	Flinders Island kWh	Total BSI kWh
Average annual residential electricity consumption	5 971	4 881	5 573
Median annual residential electricity consumption	4 716	4 089	4 516

Source: Hydro Tasmania; Aurora.

Average annual residential consumption for King Island is considerably higher than for Flinders Island (on average, more than 1 000 kWh more), largely due to a handful of residential installations on King Island recording over 30 000 kWh for the year, and none on Flinders Island recording more than 30 000 kWh. It is possible that some of the installations on King Island recording high consumption may actually be business installations, incorrectly classified as residential installations.

The median is often considered a better indicator of a typical figure within a range, as it is much more representative of the central tendency of the sample set. Median consumption for King Island residential installations for 2006-07 was 4 716 kWh, and 4 089 kWh for Flinders Island residential installations.

Average electricity consumption recorded for mainland Tasmania residential installations is in the order of 9 720 kWh[17], significantly higher than the 5 573 kWh average recorded for the BSI. Lower average residential electricity consumption on the BSI comparative to mainland Tasmania can be attributed to a number of factors, including the price of electricity, the use of alternative energy sources, and dwelling occupancy rates for the BSI.

2.3.2.1 Energy Price

BSI residential customers face higher electricity prices compared to mainland Tasmania. This may be both a disincentive for high consumption, and is anecdotally a reason for the greater uptake of alternative energy sources compared to mainland Tasmania.

[17] 2006-07 average residential consumption figures. Source: Aurora Energy.

2.3.2.2 Alternative Energy Sources

A study undertaken by the Integrated Energy Management Centre (IEMC) in 2003[18] found that many BSI customers have sought alternative (cheaper or more reliable) energy sources to electricity for cooking, hot water and heating.

Wood

IEMC reported wood heaters being the dominant space heating option on the BSI, with limited use of plug-in electric heaters.

LPG

According to the IEMC Report, LPG is widely used on King Island for water heating, comprising approximately 40 per cent of residential water heaters. It is less widely used on Flinders Island, with an estimate of 2-3 per cent of households using LPG for space heating and/or water heating. This may be due to the reported higher delivered cost of LPG on Flinders Island compared to King Island.

At the time of the IEMC report, the retail price of a 45 kg cylinder of gas was $116 on Flinders Island; compared to $92 for King Island.[19] Chapter 4 includes a discussion of current LPG costs and converted energy efficiencies.

Solar Hot Water Heaters

IEMC reported in 2003 that Flinders Island was considered to have the highest rate of solar hot water heater installation in Tasmania, at around 50 per cent of total households. At the same time, the use of solar hot water heaters on King Island was relatively small, with household penetration estimated at between 5 and 7 per cent.

The IEMC Report notes that 30 per cent of properties on Flinders Island are rental properties, the majority owned by the Aboriginal and Torres Strait Islander Commission (ATSIC) and rented to the indigenous population. Those dwellings have the highest rate of existing solar hot water heater installations, possibly attributable to an historical rebate for renewable energy solutions for indigenous populations.

2.3.2.3 Unoccupied and Seasonally Occupied Dwellings

As can be seen from Table 2.2 there are a large number of unoccupied and seasonally occupied dwellings on both Islands.

Due to low customer numbers on both Islands, a proportionally high number of low consumption households attributable to seasonally occupied dwellings may be distorting the true average electricity consumption level of permanent resident Islanders.

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[18] *Bass Strait Islands – Feasibility Study of Solar Domestic Hot Water Systems* – IEMC September 2003

[19] Flinders Island price quoted for July 2003; King Island for August 2003.

2.3.2.4 Pensioner Concession Customers

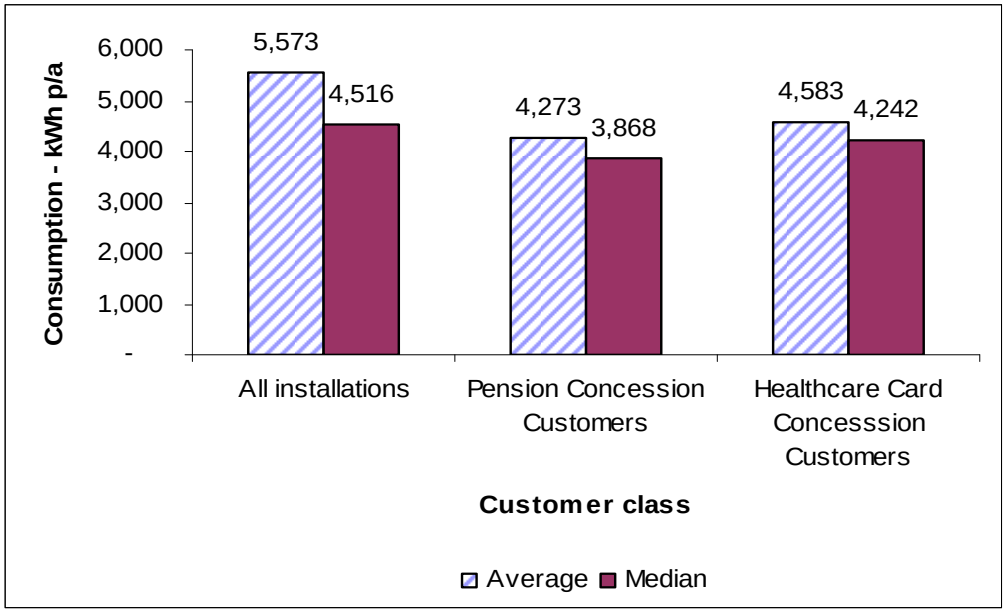
In 2006-07 approximately 22 per cent of BSI residential installations were in receipt of the Pensioner Concession (being either eligible pensioners, or Health Care Card Holders referred to in this report as HCCHs). This is less than the ratio for mainland Tasmania where approximately thirty per cent of residential customers receive equivalent concessions.[20]

HCCHs can be considered a proxy for low income households. ABS data confirms that low income households use less energy than high income household, as is the case on the BSI.

Understanding the typical consumption levels of customer groups that may be more sensitive to price changes is important when developing the tariff structure to apply on the BSI, to ensure that vulnerable customers are not adversely affected by price changes.

Figure 2.4 displays the average and median consumption of all BSI residential installations, and the customers in receipt of a Pensioner Concession.

Figure 2.4: BSI residential and Pensioner concession customer installations- annual average and median consumption



As depicted in Figure 2.4, the average consumption attributable to pensioners in receipt of the Pensioner Concession on the BSI is lower than for HCCHs eligible for the Pensioner Concession, and lower than the average consumption level of all BSI residential installations.

[20] *Comparison of 2008 Australian Standard Offer Prices*, Office of the Tasmanian Energy Regulator, February 2008.

2.3.2.5 Seasonal use

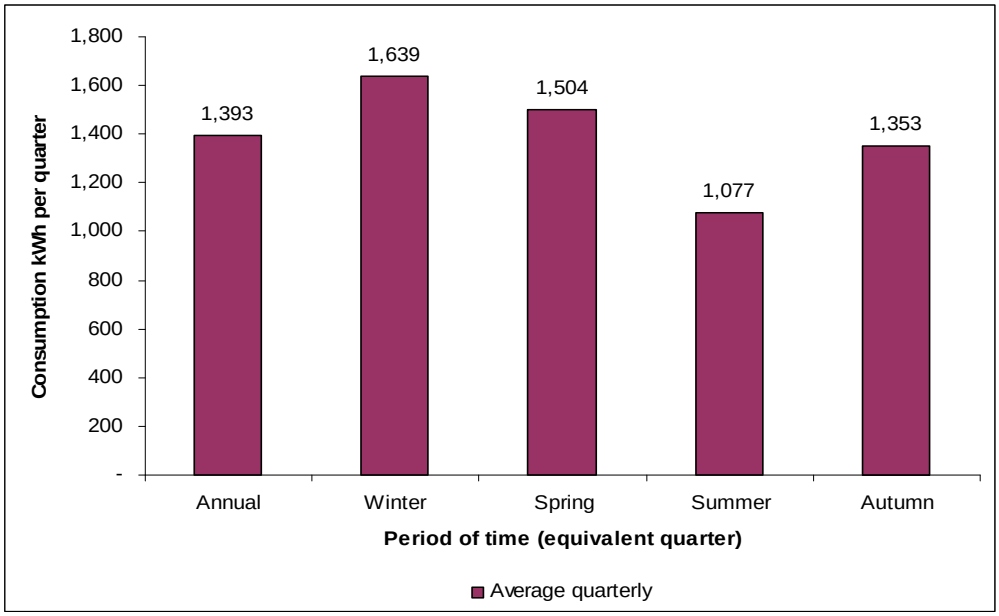
The Commission has attempted to estimate the seasonal variation in BSI residential consumption, using customer data from the Aurora BSI customer database, to determine the impact that the proposed tariff arrangement has on customers in different periods throughout the year. Determining seasonal consumption has proved to be problematic because the billing dates of the two Islands do not align, and furthermore, on each Island there are variations in the length of charge periods, and associated billing dates, making comparisons between charge periods difficult.

After applying a number of methods of analysis to the customer data, the Commission has been able to determine the seasonal variation in BSI residential consumption based on a combination of analysis of actual energy consumption data, and actual billing data. The proportion of total residential consumption applicable to each of the seasonal periods, and the associated consumption for each period, is shown in Table 2.7 and depicted graphically in Figure 2.5.

Table 2.7: Seasonal variation of BSI residential consumption

	Total annual residential consumption	**Winter (29%)**	**Spring (27%)**	**Summer (19%)**	**Autumn (24%)**
Consumption MWh p/a	7 372.764	2 168.33	1 989.91	1 425.155	1 789.370
Average consumption kWh p/a	5 573	1 639	1 504	1 077	1 353

Figure 2.5: Seasonal variation of BSI residential consumption



Residential electricity consumption on mainland Tasmania peaks during winter, mainly attributable to heavier use of electric space heating due to colder temperatures.

Residential electricity consumption on the BSI is also higher during the winter months, with an average consumption of 1 639 kWh over the winter quarter compared to average annual quarterly consumption of just under 1 400 kWh. Consumption is the lowest during summer, with 1 077 kWh for the quarter.

High consumption in winter is indicative of increased heating and lighting requirements typical of the cooler months, although demand for electricity may be tempered by the high use of wood heaters for space heating on both Islands, relative to mainland Tasmania which has a higher reliance on electric space heating.

High consumption during spring may be partly attributable to activities associated with business, even though these installations are currently classed as residential installations.

2.4 Customer Growth and Industry Development

Hydro Tasmania states that annual load growth is approximately three per cent on King Island, and two per cent on Flinders Island and that without major development or investment on either Island, this level of growth would be expected to continue. Appendix C discusses growth assumptions for installation numbers and load in more detail.

According to Hydro Tasmania, future industry and business projects may impact on load into the future, however this is obviously dependent on project go-ahead.

2.4.1.1 King Island Scheelite Mine

Planned re-development of the King Island Scheelite Mine has been announced, however construction has not yet commenced. Hydro Tasmania estimate an increase in residential load as a result of housing of construction workers on the Island in the order of 350 kW, reducing to 200-250 kW for workers employed at the Mine after construction is complete.

Hydro Tasmania states that the Mine itself will not affect load as it will be self-contained, with a privately owned generation and distribution system.

2.4.1.2 Sand Mining Exploration – Flinders Island

Diatreme Resources has begun preliminary explorations for mineral sands on Flinders Island, including titanium, zircon and tin. The company says as many as 70 jobs could be created if a mining project proceeds.

Hydro Tasmania has stated that they are unsure at this stage of the electric impacts of such a venture from either direct or flow-on effects on electricity demand.

2.5 Existing Tariff

The existing tariff for the BSI (Tariff 51) is made up of a daily fixed services charge, a daily fixed meter charge, and an energy rate. The energy rate is currently the same for all customers regardless of customer type. Eligible Pensioners and HCCHs receive a discount on their fixed charges.

In the 1999 Investigation the Regulator was asked to review the full costs of delivered electricity on the BSI, and establish a set of pricing principles for retail tariffs including an appropriate balance between fixed daily charges and energy rates and establish an indicative cost-reflective tariff(s).

In his final Report, the Regulator recommended a maximum allowable tariff for the BSI, taking into account the total cost to supply.[21]

The final energy charge to BSI customers was determined by Government after determining the level of CSO assistance to provide. Appendix B shows the tariffs applying to BSI customers each year since 1997.

In the 1999 Determination, the Regulator specified that adjustments would be made to the BSI maximum energy price according to inflationary factors and the impact of the Commonwealth Government's proposed changes to the taxation system, 'A New Tax System' which removed wholesale sales tax and concurrently imposed a Goods and Services Tax (GST).

Average electricity prices on the BSI have increased by less than one per cent per annum in real terms since 1997. This is despite the introduction of GST in 2000 and the removal of the 5 per cent Government surcharge in 2001. In real terms, prices have been constant since January 2002, as depicted in Figure 2.6.

[21] The recommendation also took into account the five per cent surcharge or levy on electricity supply charges which were imposed by the Government at that time. The Government removed the levy in 2001.

Figure 2.6: Average electricity prices on the Bass Strait Islands since 1997

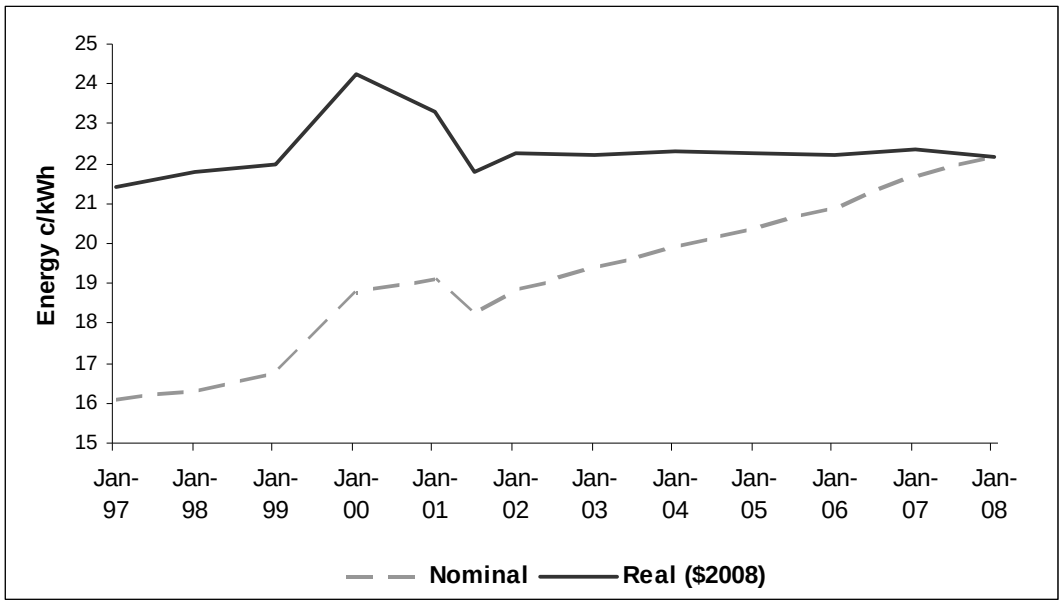


Table 2.8 shows a comparison of Tariff 51 to equivalent Aurora tariffs for Tasmanian mainland residential and business tariff customers for 2008.[22]

Aurora residential mainland customers can choose to take supply under one or under a combination of tariffs. Around 85 per cent of residential customers take supply under a combination of Light and Power, and Hot Water tariffs.

Table 2.8: BSI Tariff 51 and Aurora mainland Tasmania tariffs, from 1 July 2008[23]

	Tariff 51 All BSI	Tariff 31 Residential Light & Power	Tariff 41 Residential Hot Water	Tariff 22 General Business
Fixed Charges c/day	70.98[1]	65.762	12.465	74.647
Energy – first 500 kWh, c/kWh	22.17	19.066	10.941	23.299
Next 1 000 kWh, c/kWh	22.17	18.144	10.941	17.103
Remainder, c/kWh	22.17	15.466	10.941	17.103

Note 1: Comprised of a Services Charge (64.64 c per day) and a Meter Charge (6.34 c per day).

The 1 January 2008 and proposed 1 July 2008 price increases following the 2007 Determination[24] has meant that the price disparity between Tariff 51 and Tariff 31

[22] 20 per cent of Tasmanian mainland residential customers take supply under Aurora Pay As You Go (APAYG), and therefore are not tariff customers in the traditional sense. APAYG is a pre-payment metering option not available on the BSI.

[23] Tariff 31 charges as at January 2008 plus 3 per cent to replicate likely charges to apply from 1 July 2008.

for the energy charge component has narrowed, and from 1 July 2008 it will be approximately 3 cents per kWh for the first 500 kWh consumed per quarter.[25] In 2007, mainland Tasmania customers were paying 15.923 for the first 500 kWh per quarter, compared to the Tariff 51 energy charge of 21.72 cents per kWh – a disparity of 5.8 cents per kWh.

Incorporating fixed charges and analysis across a range of consumption levels provides a more comprehensive view of comparative prices between BSI and mainland Tasmania electricity customers, and is discussed below for each of the residential and business sectors.

Residential customers

Comparison of BSI residential electricity customers to mainland Tasmania customers is problematic, due to a number of reasons. As already noted, Mainland Tasmanian electricity customers are able to access a separate (lower) tariff for hot water supply systems[26], whereas hot water electricity consumption on the BSI is metered with general light and power consumption, therefore there is no separate record of electricity used for water heating. In addition, the use of LPG and solar power for water heating on the BSI also makes usage comparisons with mainland Tasmania customers problematic, as the percentage of mainland customers using alternative hot water heating methods are much lower.

Figure 2.7 shows the range of prices per unit consumption (c/kWh) for BSI residential customers compared to Tasmanian residential customers who take supply under Tariff 31 only (Residential Light and Power), and those that take supply under Tariff 31 and Tariff 41 (hot water).

The costs for those BSI customers using electricity for heating, cooking and hot water may be compared to mainland Tasmania customers who can access both Tariff 31 and Tariff 41.

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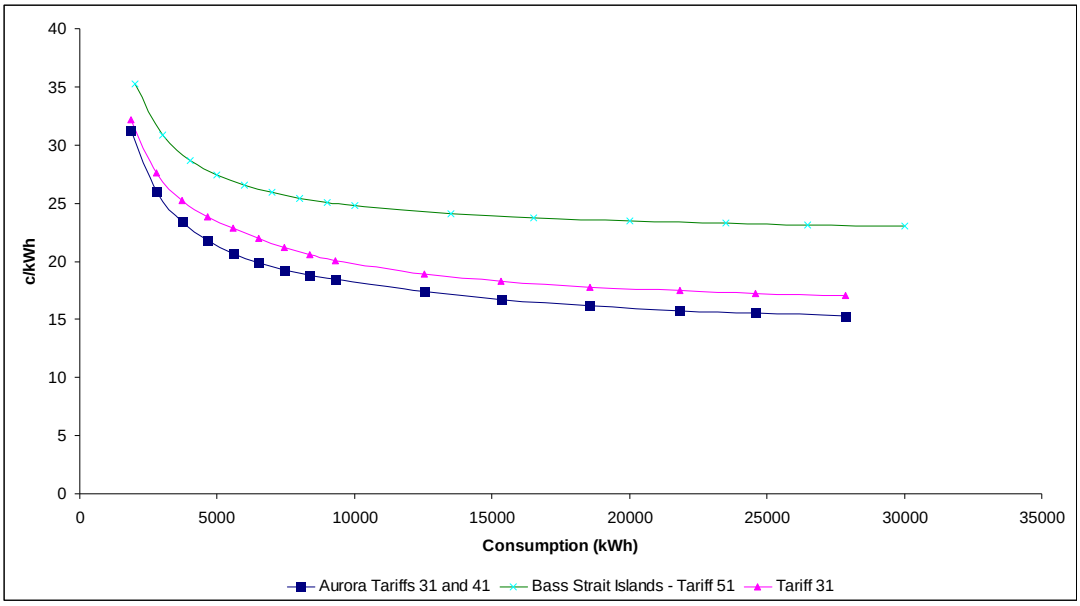
[24] Office of the Tasmanian Energy Regulator, *Investigation into Electricity Supply Industry Pricing Policies Declared Electrical Services Pricing Determination* – 31 October 2007, Reissued December 2007.

[25] Whilst Tariff 51 is a flat energy charge regardless of consumption, the Aurora Mainland Tariffs are declining in nature, with different energy rates for successive blocks of consumption.

[26] Connection is subject to certain (minimum) thermal capacity and volume requirements of the hot water heater. Some small capacity hot water units are not able to access the hot water tariff and are required to be connected to the light and power tariff (Tariff 31).

Figure 2.7: Comparison of BSI Tariff 51 to Mainland Tasmania Tariff 31 and 41

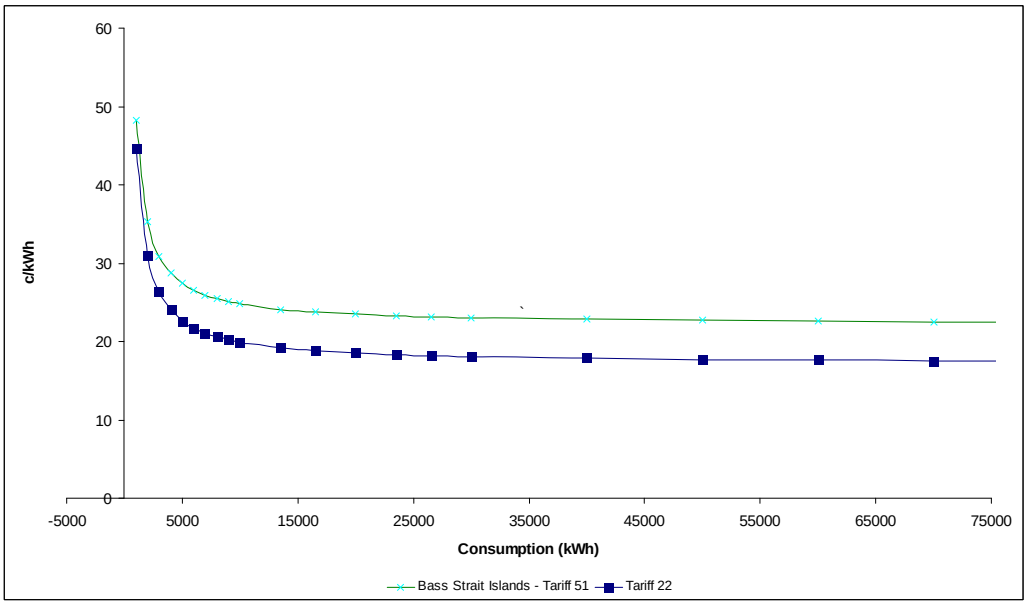


The costs for BSI customers that use electricity for light and power only may be compared to Tariff 31. This shows that as average consumption rises, BSI residential customers face an increasing disparity of prices compared to mainland Tasmania residential customers. This arises because Tariff 51 is a constant rate regardless of usage, whereas Tariff 31 and Tariff 41 have a declining block structure.

Business customers

Business customers pay the same energy rate as residential customers on the BSI. Figure 2.8 shows a comparison of the BSI Tariff 51 to Tariff 22 – Institutional Light and Power applicable to mainland Tasmanian small business customers.

Figure 2.8: Comparison of BSI Tariff 51 to mainland Tasmania Tariff 22



Industrial customers

The load of each of the two largest electricity consumers on the BSI is equivalent to the size of Tranche 3 contestable customers under the Tasmanian mainland retail contestability framework.[27] Contestable mainland Tasmania customers contract for supply with a retailer, and, after the expiry of a specified grace period, are not able to take supply under a tariff. Without knowing the contract arrangements for these customers, it is not possible to compare their prices with the largest BSI business customers.

2.6 History of Costs, Revenue and CSO Payments

Since 1997, Hydro Tasmania has received funding via the BSI CSO to deliver the services associated with electricity supply on the BSI. The CSO payment is the difference between the costs Hydro Tasmania incurs, and the revenues it receives, from supplying electricity to the BSI.

Table 2.9 illustrates the magnitude of the CSO payment that has been required to deliver the tariff for the years 2005-06 and 2006-07.

Table 2.9: History of costs, revenue and CSO payments for electricity supply on the BSI, 2005-06 and 2006-07 (Nominal$)

	Total costs $'000	Tariff revenue $'000	CSO payment $'000
2005-06	10 089	4 215 (42%)	5 874 (58%)
2006-07	10 737	4 116 (38%)	6 621 (62%)

In 2005-06, the CSO made up just less than 60 per cent of receipts to Hydro Tasmania; in 2006-07 this had risen to almost 62 per cent.

This situation arose from an increase in total costs of 6.4 per cent between 2005-06 and 2006-07, with a decline in revenue of 2.4 per cent. The increase in the CSO payment required to compensate Hydro Tasmania for the increased costs and decline in revenue was almost 13 per cent.

The following chapter discusses the efficient costs of supply on the BSI.

[27] The Tranches and dates that customers become contestable are defined in the *Electricity Supply Industry (Contestable Customer) Regulations 2005*. The Government has reserved its decision on Full Retail Contestability, ie contestability for customers, principally small business and residential customers, who consume less than 0.15 GWh per annum.

3 DETERMINING EFFICIENT COST OF SUPPLY

3.1 Terms of Reference

The Terms of Reference for the Inquiry requires the Commission to:

> Determine efficient cost of supply on the BSI by desk-top review of the cost of conventional generation, the cost of current facilities, and the cost of proven alternatives in remote area power systems.

This Chapter is concerned with ascertaining the efficient cost of supply on the BSI, taking account of current and forecast load requirements and likely cost increases.

3.2 Approach

The Commission has analysed the current cost of supply (based on Hydro Tasmania's reported costs); an all-diesel generation mix as a proxy for a conventional generation mix (utilising Hydro Tasmania's costs); and a notional best-fit all diesel solution.

Due to differences in the generation and load mixes of each Island, the costs attributable to each Island have been evaluated separately to determine the efficient cost of supply on each Island.

These costs have then been aggregated to determine the total efficient cost of supply on the BSI.

The purpose of assessing the efficient cost of supply is to draw a conclusion as to Hydro Tasmania's annual revenue requirement to meet operating and maintenance costs and depreciation (return of capital) and provide a commercial risk adjusted return on its capital investment (return on capital).

To aid analysis, the Commission has chosen to consider the costs and associated issues of each segment separately, ie generation, distribution and retail services for each Island. In doing so, the Commission adopted a 'building block' approach for generation and distribution. The approach adopted for retail services is to benchmark the current cost of providing retail services on the BSI with the cost of providing these services to mainland Tasmania customers. Further detail is provided below.

3.2.1 Use of the Building Block for Generation and Distribution

The efficient cost of generation and distribution ascertained using a building block approach is calculated as:

$$AARR = TC = AV*WACC + D + OM$$

Where:

AARR = aggregate annual revenue requirement

TC = total costs

AV = asset value

WACC = the weighted average cost of capital

D = depreciation

OM = efficient operating and maintenance expenditures.

The approach to determining the value of each parameter is as follows.

3.2.1.1 Asset Values

Electricity generation and network businesses are capital intensive. The value of the asset base is used in calculating both the return on capital and the depreciation allowance. Thus it is a significant determinant of the 'Aggregate Annual Revenue Requirement' (AARR) and/or total costs.

Conventionally, jurisdictional regulators across Australia have adopted the depreciated optimised replacement cost (DORC) methodology for setting an initial opening regulatory asset base (RAB) for network businesses. Once this is established they have generally adopted a 'roll-forward' methodology for subsequent years and regulatory periods. That is, the opening asset base is adjusted each year to account for capital expenditure, disposals and depreciation.

However, other methods are permitted under the Australian accounting standards (Australian Equivalents to International Financial Reporting Standards AEIFRS). Under the applicable accounting standards companies are permitted to value their assets at cost (ie historical cost) or fair value. Fair value can be determined by reference to the expected earnings over the life of the asset or by reference to replacement cost. The approaches adopted by Hydro Tasmania for its generation assets and distribution assets are discussed in more detail in Section 3.4 and Section 3.5 respectively.

Capital Expenditure

The amount of capital expenditure allowance rolled into the asset base each year will depend on a number of factors, such as the age and condition of the existing assets and the expected demand for services arising from growth in sales and customer numbers. For sales for 2007-08, the Commission has adopted the average of the sales of the previous two years for each customer category. The Commission has assumed a zero growth in customer installations for 2007-08. Without more detailed customer information the Commission considers it prudent to apply a zero growth assumption for customer installations and load for 2008-09 to 2010-11. The basis of the Commission's growth assumptions for sales and customer numbers for the BSI is discussed in detail in Appendix C.

WACC

Under a building block approach, the return on capital (ie assets) is calculated using a risk adjusted weighted average cost of capital (WACC). The WACC can be set on a real or nominal basis, pre-tax or post tax. As the Commission has modelled Hydro Tasmania's revenue needs on a real pre-tax basis, the application of a pre-tax real WACC is appropriate.

WACC can be set by reference to the business' own WACC, a benchmark WACC, or it can be calculated using benchmark parameters. In determining efficient costs, economic regulators generally adopt either a benchmark WACC or a WACC calculated using benchmark parameters.

The Commission has adopted the WACC used in the 2007 Investigation of Maximum Prices for Distribution Services on mainland Tasmania as the benchmark WACC for calculating the return on capital for both the generation and distribution assets for electricity supply on the BSI. In choosing the benchmark WACC for calculating the return on capital, the Commission notes that Hydro Tasmania is substantially protected from any cost risks, in that the CSO provides for the Government to fund the difference between Hydro Tasmania's total costs and its revenues from operations on the BSI. Given this, the Commission considers that there is no argument to provide for a higher risk adjusted return on capital.

For the purpose of this Draft Report, the risk-free rate and the debt margin have been calculated using the 20 day rolling average of the 10 year bond rate and the average 10 year company bond rate respectively for the period to 14 May 2008.

The parameters adopted by the Commission are provided in Table 3.1.

Table 3.1: Weighted Average Cost of Capital estimate

Parameter	Value
Nominal Risk Free Rate	6.26%
Real Risk Free Rate	2.53%
Inflation Rate	3.64%
Cost of Debt Margin over Risk Free Rate (AAA 10 year Corporate Bonds)	2.92%
Nominal pre-tax cost of debt	9.18%
Real pre-tax cost of debt	5.34%
Market Risk Premium	6.00%
Effective Tax Rate	30.00%
Gamma (franking credits attributed to shareholders)	50.00%
Debt to Equity Ratio	60.00%
Equity beta	0.9
Pre-tax real WACC	7.10%

As discussed in more detail in Section 3.4.1.1, for statutory reporting purposes Hydro Tasmania has grouped all its generation assets (mainland Tasmania and BSI) as one class and each year it values them using the Net Present Value (NPV) of the total expected revenues. The Commission has adopted a roll-forward approach to setting the BSI asset values for the forecast period, consistent with the approach to economic regulation of monopoly service providers. That is, it has ascribed a regulatory value to the existing asset base, brought in new assets at cost, and adjusted for depreciation.

The allowance in the AARR for the return on assets is calculated by applying the benchmark WACC to the rolled-forward asset values.

3.2.1.2 Depreciation

The inclusion of depreciation in the building block model is intended to enable the business to recoup the investment in its assets over the life of those assets. As such, it provides for a return of capital, in addition to a return on capital provided through applying the WACC to the depreciated value of the assets.

The Commission's approach to calculating the allowance for depreciation is consistent with the approach adopted for asset values. A base allowance has been calculated for the opening value of the regulatory asset base, with adjustment for assets brought into the regulatory asset base.

3.2.1.3 Operations and Maintenance Costs

Under the building block approach an allowance is made for the efficient cost of operating and maintaining the systems.

Operations and maintenance services for diesel generation and distribution services on the BSI are provided by Aurora under contract to Hydro Tasmania, with wind turbine maintenance provided by Stirling Wind Pty Ltd and Vestas Wind.

The Aurora services contract provides for Aurora to supply labour and materials (other than diesel) necessary to operate and maintain the systems on the BSI. Under the previous contract which expired 30 June 2007, services were provided on a fixed price (lump-sum) basis, where Hydro Tasmania was billed an agreed fixed amount for each year. Aurora advised the Commission that the previous contract was established with an agreement for a mark-up of 10 per cent on Aurora's costs.

A new contract with Aurora is presently being negotiated with an interim agreement between both parties to work under the principles of the new contract until it can be completed. The new contract will be based on a 'do and charge' no contingency principle, plus a 15 per cent profit mark-up. Whilst the explicit profit margin is greater than the original 10 per cent negotiated under the previous contract, and Hydro Tasmania has advised that this is likely to increase its own costs in assessing

Aurora's reported costs, Hydro Tasmania believes that the new arrangement should result in savings.[28]

The cost of labour, which accounts for more than 40 per cent of direct costs, is a significant component of operations and maintenance costs on the BSI. The Commission recognises that a minimum number of staff is required to maintain services on the BSI, which may place limits on productivity and efficiencies that could otherwise be achieved.

The key issue for the Commission is to look behind the contractual arrangements to determine the efficient costs to supply these services for both generation and distribution. To aid analysis, the mark-up of 10 per cent used previously and the 15 per cent in the proposed Aurora contract has been deducted from the operations and maintenance and overhead costs attributable to Aurora. However, as previously mentioned, Hydro Tasmania expects that the total costs arising under the new contract arrangement to be less than the total costs experienced under the previous contract.

3.2.2 Retail Costs

Conventionally when determining the maximum prices for tariff customers, regulators make an allowance for the cost to provide services for customers (cost to serve), and for a net retail margin. The cost to serve reflects the efficient costs that would be incurred by a retailer in providing services to its customers, including billing, account collection, customer enquiries and advice. The retail margin is intended to compensate the retailer for its investment in the business and the risks it assumes in providing those retail services. The Commission has analysed Hydro Tasmania's retail costs (as incurred by Aurora) and compared these to a benchmark retail cost to serve.

3.3 Overview of Current Cost Structure

The total average cost to supply electricity on the BSI (per MWh) is much higher than for mainland Tasmania, reflecting the isolated nature of the system, and the costly nature of diesel generation.

In its submission to the Inquiry, Hydro Tasmania provided financial information listing the major cost drivers for supply of electricity on the BSI, including costs associated with its contract with Aurora and with other providers.

Figure 3.1 and Figure 3.2 show the breakdown of costs for each Island.

[28] Aurora notes that the costs under the new contract arrangement are preliminary estimates at this stage, and will be finalised at the end of the 2007-08 financial year. The Commission will make adjustments to numbers and report these in its Final Report if Hydro Tasmania advises of differences between the preliminary estimates and finalised figures.

Figure 3.1: Breakdown of costs, King Island 2006-07

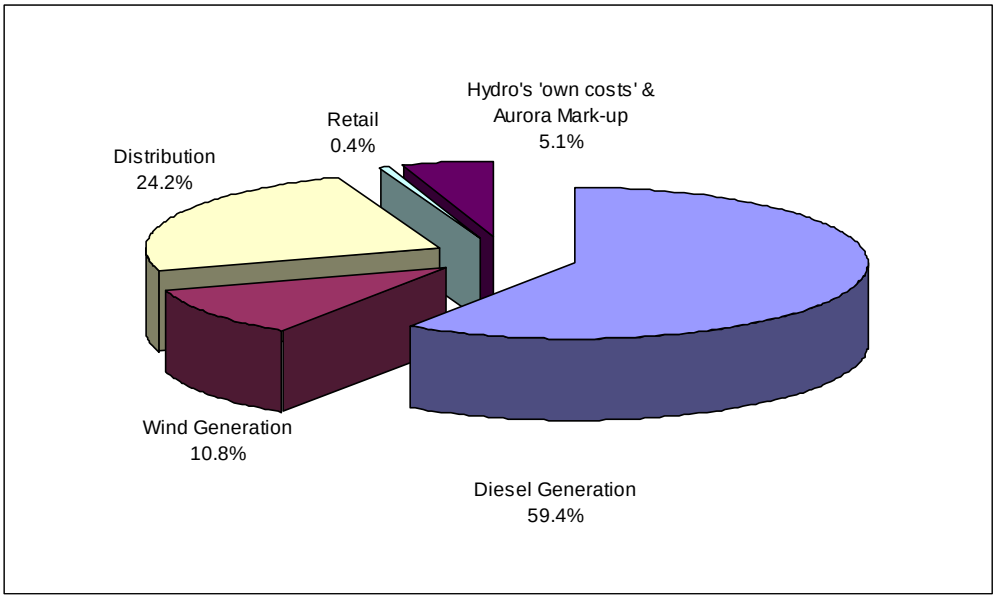
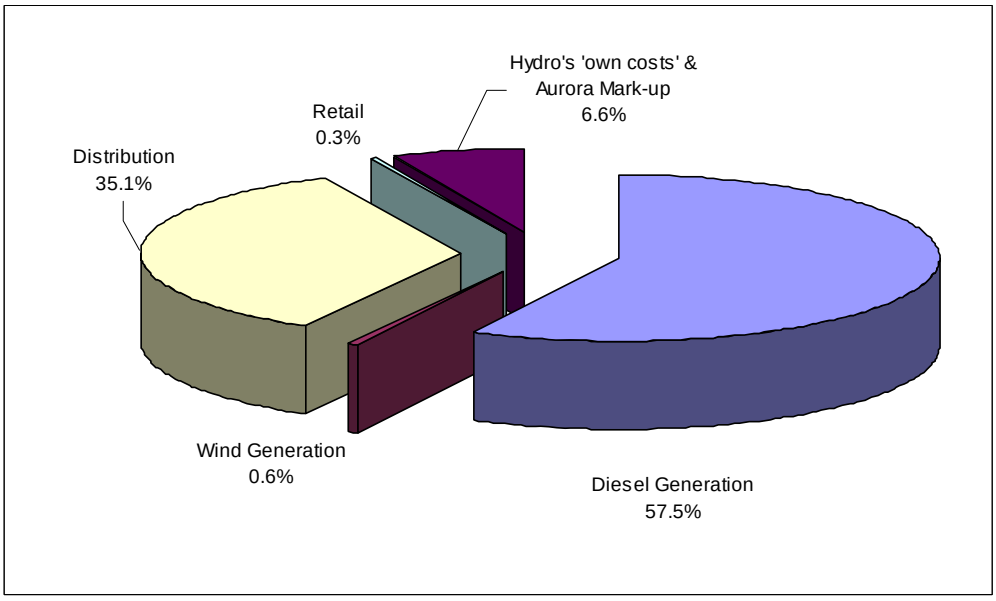


Figure 3.2: Breakdown of costs, Flinders Island 2006-07



As can be seen from Figure 3.1 and Figure 3.2, the costs associated with diesel generation comprise a significant proportion of total costs of electricity supply on the BSI. Table 3.2 shows the breakdown between each cost category.

Table 3.2: Cost structure for electricity supply on the BSI 2006-07

Cost Item	King Island %	Flinders Island %
Diesel Generation		
Return on Assets	5	6
Depreciation	6	3
Fuel for generation[1]	39	33
Operations and maintenance	10	15
Subtotal	60	57
Wind Generation		
Return on Assets	7	0
Depreciation	6	0
Wind purchases & RECs/GPRs[2]	-3	1
Operations and maintenance	1	0
Subtotal	11	1
Distribution		
Return on Assets	5	5
Depreciation	2	3
Operations and maintenance	17	27
Subtotal	24	35
Retail	0.4	0.3
Aurora Mark-up	3	4
Hydro 'own costs'	2.4	2.4
TOTAL	100	100

Notes:

[1] Diesel fuel subsidy included.

[2] Hydro Tasmania receives Renewable Energy Certificates (RECs) and Green Power Rights (GPRs) for wind generation on King Island, and reported these to the Commission as negative cost items (netted from the cost of wind generation).

As shown in Table 3.2, the most significant input to the cost of supply is the cost of diesel, contributing 39 per cent and 33 per cent of total costs for King Island and Flinders Island respectively. Operations and maintenance expenses (combined across the categories), mainly provided through the Aurora contract, make up the next most significant proportion, at 28 per cent for King Island and 42 per cent for Flinders Island.

The Commission has adopted Hydro Tasmania's historical costs for 2005-06 and 2006-07 for the purposes of this Report and used its own estimate of forward energy sales (different to Hydro Tasmania's estimated sales) in conjunction with Hydro Tasmania's estimated costs to determine the likely costs for 2007-08 to 2010-11.

The Commission cannot compare the overall breakdown of the costs of electricity supply on the BSI with other electricity supply systems, as generation is typically an unregulated activity, and therefore benchmark costs associated with typical

generation systems are not publicly reported. The Commission has attempted to compare separate items with available benchmarks, as explained within the discussion on each cost category.

3.4 Generation

In analysing Hydro Tasmania's generation costs for the BSI, the Commission sought to draw comparisons with other remote area power supply systems that also rely on diesel generation for a significant proportion of their base loads. However, as there are no publicly available studies of the costs of supply for these systems, this was not possible.

A further complication in this analysis arose as the Commission was unable to ascertain a depreciated optimised replacement cost valuation for Hydro Tasmania's generation asset values. To assist in its analysis, the Commission sought an independent desk top assessment of the cost of a greenfields all-diesel solution for each Island, this being the installed cost of a notional 'best-fit' diesel generation solution to meet the needs of expected future loads on the BSI.

This has enabled the Commission to test the current costs of supply utilising the current generation mix and an all-diesel generation solution compared to a notional 'best-fit' all-diesel solution.

3.4.1 Current Configuration

According to Hydro Tasmania, the Business Development group of Hydro Tasmania takes the lead in new projects focusing on reducing the consumption of diesel for power generation. Hydro Tasmania states that this is in alignment with their corporate sustainability strategy, and with cost efficiencies as required under the CSO.

In its analysis of efficient costs, the Commission has included projects that contribute to the current mix of generation. However, as Hydro Tasmania has not been able to provide cost estimates or expected efficiency gains relating to future projects, the Commission has not included any expected efficiency gains relating to future projects in its forecast of generation mix and associated costs. The Commission is mindful though of alternatives to the current arrangements for electricity supply on the BSI, including renewable energy solutions in development stage by Hydro Tasmania. Chapter 2 lists current operational and planned renewable energy projects for the BSI.

3.4.1.1 Assets

Table 3.3 and Table 3.4 provide a summary of Hydro Tasmania's actual and forecast generation asset values over the period 2005-06 to 2010-11.

Asset values for 2005-06 have been imputed from the reported return on the cost of capital in the financial information provided to the Commission, adjusted to July 2007 dollars. Asset values as at 30 June 2007 are based on Hydro Tasmania's values

as recorded in its asset schedule. Asset values as at 30 June for the financial year 2007-08 and onwards have been calculated taking into account the book value of assets as at 1 July 2007 and adjusted for forecast real annual capital expenditures, disposals and depreciation. No indexation has been applied.

Generation assets can be sub-categorised as diesel generators, wind generators and other generation assets, Other generation assets include land and buildings housing the generators, diesel fuel tanks and associated control equipment.

Table 3.3: King Island generation asset values (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
Diesel	3 838	1 973	1 893	3 426	3 260	3 093
Wind	4 506	5 509	5 160	4 669	4 178	3 686
Other	(incl above)	1 659	1 610	1 567	1 524	1 482

Note: Asset Values for 2005-06 estimated from information provided by Hydro Tasmania.

Table 3.4: Flinders Island generation asset values (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
Diesel	1 946	1 316	1 221	3 499	3 337	3 174
Wind	-	-	-	-	-	-
Other	(incl above)	1 493	1 459	1 430	1 401	1 371

Note: Asset Values for 2005-06 estimated from information provided by Hydro Tasmania.

As noted in section 3.2.1.1, asset values are the key determinant of the return on assets and depreciation used in the calculation of the AARR.

Hydro Tasmania values its portfolio of generation assets at fair value by reference to the expected earnings over the life of its assets. As discussed earlier, separate fair values have not been established for the BSI. As the majority of Hydro Tasmania revenue derives from sales in the wholesale National Electricity Market (NEM), this introduces an element of volatility into asset values as the expected forward price for energy sales in the NEM is driven by a number of factors which are outside of Hydro Tasmania's control, eg drought and supply and demand factors in other NEM jurisdictions. These factors are unrelated to the expected revenues from generation assets on the BSI. Hence, the Commission considers that the value of BSI generation assets in the statutory accounts is not an appropriate value for determining the efficient cost and AARR for the BSI.

Given Hydro Tasmania was unable to provide a depreciated replacement cost for all its generation assets, the Commission sought advice on the installed cost of recently replaced generation assets on the BSI.

Hydro Tasmania was able to provide the Commission with the installed costs for two recent replacement generation units and the estimated installation costs for a further two generation units to be replaced in the near future. These are:

- two 1.6 MW generators replaced on King Island in the 2007-08 financial year, at a total cost of $1.7 million; and
- $2.4 million budgeted to replace two generators on Flinders Island with a total capacity of 1.4 MW.

These costs have been compared to the values detailed in the BSI accounts as at 1 July 2007 to enable the Commission to assess the materiality of the difference between the fair values for generation assets and the value that would be obtained if they were based on written down replacement costs.

The written down value of the installed diesel generators (excluding peripheral assets such as land and buildings and diesel storage facilities) is $1.9 million on King Island, with an installed capacity of 6 MW. On Flinders Island the written down value based on the Hydro's estimate of fair value of the installed diesel generators with a total capacity of 2.6 MW is $1.3 million. The Commission notes that a significant proportion of the generation assets were installed between 1968 and 1988, giving an average age of over 20 years. The expected average life for some of these assets is in the order of 20 to 35 years.

The comparison of the estimated replacement costs and depreciated fair values suggest that the 2006-07 asset valuation of the current diesel generators is not unreasonable. However, the Commission has concerns that the practice of restating the BSI generation assets at fair values each year is not an appropriate reflection of the value of these assets. The Commission is of the view that Hydro Tasmania should be ringfencing the operations on the BSI from those on mainland Tasmania. That is, a separate set of management, if not statutory, accounts should be maintained by Hydro Tasmania.

Forecast asset values are also impacted by capital expenditures, which are discussed in more detail in the following section. Capital expenditure on generation assets tends to be 'lumpy' which can also result in some 'lumpiness' in the asset values from year to year (as shown in Table 3.3 and Table 3.4).

Capital Expenditure

Table 3.5 and Table 3.6 provide a summary of the historical and forecast capital expenditure from 2005-06 to 2010-11 for King Island and Flinders Island as reported by Hydro Tasmania.

Table 3.5: Capital expenditure – King Island (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	2006-07 $'000	2007-08 $'000	2008-09 $'000	2009-10 $'000	2010-11 $'000
Diesel						
Refurbishments and renewals	166.6		-	-	-	-
Replacements		47.3	1 700.0	-	-	-
Additions	-	-	-	-	-	-
Wind						
Refurbishments and renewals	-	-	-	-	-	-
Replacements	-	-	-	-	-	-
Additions	44.9	13.8	-	-	-	-

The $1.7 million replacement expenditure reflects two generators replaced on King Island during the 2007-08 financial year.

Hydro Tasmania did not advise of any forecast capital expenditure on generation assets for King Island for the years 2008-09 to 2010-11.

Table 3.6: Capital expenditure – Flinders Island (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	2006-07 $'000	2007-08 $'000	2008-09 $'000	2009-10 $'000	2010-11 $'000
Diesel						
Refurbishments and renewals	228.5	410.1	-	-	-	-
Replacements	-	-	-	2 400.0	-	-
Additions	-	-	-	-	-	-

Hydro Tasmania undertook capital works on a generator on Flinders Island during 2006-07 accounting for $0.4 million in renewals capital expenditure. It has also indicated that two generators on Flinders Island are due for replacement, with $2.4 million budgeted for this in 2008-09.

Hydro Tasmania is also planning a wind generation development on Flinders Island, with an indicative cost of $6.5 million and completion expected in 2011. At this stage the project is not fully committed, in that the business case has not been fully developed, nor has it been approved by the Hydro Tasmania Board. Therefore, Hydro Tasmania has requested that the Commission not include this project in its future projections.

The Commission estimates that in early years, the costs of the proposed wind generation would be comparable to diesel generation (at 2007-08 diesel costs), with wind being more economical at higher diesel prices and in the longer term.

Treatment of Redundant Assets

In assessing the value of the asset base, consideration also needs to be given to the treatment of assets that have become, or may become, redundant.

A Vanadium Redox Battery Energy Storage System was installed on King Island in November 2003, however it is not operational. The batteries and inverter remain listed in Hydro Tasmania's asset list. The value listed in the asset register as at 30 June 2007 was $2.4 million, $1.6 million attributable to the battery and inverter plus a further $0.8 million for buildings and control systems.

Given the significant valuation assigned to the system and its non-operational status, the Commission considers that the assets associated with this system should be removed from the asset base, and has done so for the purposes of this Inquiry. The Commission understands that Hydro Tasmania and Treasury have had discussions on the likely future and treatment of these assets, and Hydro Tasmania's current intention is to repair and reinstate the storage system.

3.4.1.2 Depreciation

Hydro Tasmania has provided the Commission with its actual and forecast depreciation on its assets for the period 2005-06 to 2010-11 as detailed in Table 3.7. Its forecast depreciation is based on its current generation assets plus its forecast capital expenditures for the period. Consistent with the treatment of the redundant Vanadium Redox Battery Energy Storage System in the asset base, the depreciation associated with this system has also been removed for the purposes of this Report.

Table 3.7: Depreciation on current mix of generation assets (Real July 2007$)

	Actual		Likely End of Year/Forecasts			
	2005-06 $'000	2006-07 $'000	2007-08 $'000	2008-09 $'000	2009-10 $'000	2010-11 $'000
King Island						
Diesel Generators	218.0	473.1	126.9	166.2	166.2	166.2
Wind Generators	277.0	456.3	362.5	490.9	490.9	490.9
Other Generation	(incl above)	(incl above)	49.4	42.7	42.7	42.7
Flinders Island						
Diesel Generators	73.6	110.9	95.0	122.0	162.0	162.0
Other Generation	(incl above)	(incl above)	33.9	29.3	29.3	29.3

Source: Estimates provided by Hydro Tasmania

3.4.1.3 Diesel Generation Operating and Maintenance Costs

Fuel Costs

As mentioned previously, the major driver of generation costs on the BSI is the cost of diesel fuel, accounting for 37 per cent of total costs to supply the customers on the BSI in 2006-07. Although the capital structure of the BSI has changed since the previous investigation of electricity prices on the BSI in 1999, the proportional costs attributable to diesel generation have remained relatively stable. During the 1999 Investigation, diesel fuel accounted for 40 per cent of total costs.

Hydro Tasmania has a three year contract (expiring on 1 July 2009) with King Island Ports Corporation (KIPC) to procure and deliver diesel fuel to King Island and Flinders Island. The fuel pricing schedule includes the variable costs of purchasing fuel and associated overheads, plus delivery costs and an agreed margin.

Fuel efficiencies for each Island are shown in Table 3.8 and Table 3.9, based on Hydro Tasmania's diesel fuel usage and diesel fuel contract costs as advised to the Commission in February 2008.

Table 3.8: King Island fuel efficiencies - current generation mix (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
Cost of fuel $/litre (KIPC)	$1.35	$1.38	$1.42	$1.45	$1.49	$1.53
Cost of fuel $/litre (after rebate)	$0.96	$0.99	$1.02	$1.04	$1.07	$1.10
Diesel consumption ('000 litres)	3 162	2 887	3 012	2 990	2 942	2 893
Diesel generation MWh	11 604	10 596	11 053	10 975	10 798	10 616
Unit cost $/MWh	$254.83	$270.92	$277.70	$284.64	$291.75	$299.05
Efficiency of generation kWh/litre[1]	3.67	3.67	3.67	3.67	3.67	3.67

Note [1] Hydro Tasmania advises that the efficiency of its new generators on King Island is likely to be closer to 4 kWh per litre, and will provide the Commission with further information for inclusion in the Final Report.

Table 3.9: Flinders Island fuel efficiencies – current generation mix (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
Cost of fuel $/litre (KIPC)	$1.30	$1.37	$1.41	$1.44	$1.48	$1.51
Cost of fuel $/litre (after rebate)	$0.93	$0.98	$1.01	$1.03	$1.06	$1.09
Diesel consumption ('000 litres)	1 169	1 152	1 159	1 185	1 183	1 182
Diesel generation MWh	4 289	4 229	4 253	4 349	4 343	4 338
Unit cost $/MWh	$247.31	$268.21	$274.92	$281.79	$288.83	$296.05
Efficiency of generation kWh/litre	3.67	3.67	3.67	3.67	3.67	3.67

In its submission to the Commission in February, Hydro Tasmania advised that the predicted cost of diesel for 2007-08 (under the contract with KIPC) was $1.42 per litre for King Island, and $1.41 for Flinders Island. Hydro Tasmania receives a subsidy on diesel fuel via the Commonwealth Government's Diesel Fuel Rebate. The Commission has assumed continuation of the rebate for the period to 2010-11.

With the rebate, the effective diesel cost based on the net price is $1.02 per litre on King Island, and $1.01 on Flinders Island for 2007-08. On a per kWh basis, the effective cost, including the diesel fuel rebate, was 27.77 cents per kWh on King Island, and 27.50 cents per kWh on Flinders Island.

Based on the above, the actual and forecast combined effective cost of diesel for the BSI is shown in Table 3.10.

Table 3.10: BSI fuel cost – current generation mix (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $	**2006-07 $**	**2007-08 $**	**2008-09 $**	**2009-10 $**	**2010-11 $**
Unit cost $/MWh	252.8	270.15	276.92	283.83	290.92	298.18

As shown above, in 2007-08 the cost of diesel was expected to be 27.69 cents per kWh for the BSI.

The Commission understands that the price differential of the BSI fuel supply contract is an average 10 per cent greater the Government contract rate. The Commission considers this is a reasonable 'premium' over the Government contract rate given the different ('double') handling required and volumes involved.

Due to recent unforeseen increases in diesel prices, the Commission is mindful that Hydro Tasmania likely underestimated its forecast diesel fuel costs in its submission

to the Commission. The Commission has made an allowance for this in its development of a tariff proposal for the Island (see Chapter 4), given that Hydro Tasmania requires compensation for costs incurred in operating the electricity supply system on the BSI.

Other Diesel Generation Operating Costs

Aurora is contracted to manage and operate the property assets relating to diesel generation on the BSI on behalf of Hydro Tasmania. Table 3.11 lists the costs attributable to Aurora's operations in relation to diesel generation, as reported by Hydro Tasmania.

Table 3.11: BSI diesel generation operation and maintenance costs (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
King Island						
O&M, diesel generation (Aurora)	783.1	678.5	558.1	572.1	586.4	601.0
Manage property assets – diesel generation (Aurora)	32.8	32.7	31.0	31.8	32.6	33.4
Mark-up (Aurora)	81.6	71.1	88.4	90.6	92.9	95.2
TOTAL King Island	897.5	782.3	677.5	694.5	711.8	729.6
Flinders Island						
O&M, diesel generation (Aurora)	577.8	500.8	325.9	334.1	342.4	351.0
Manage property assets-diesel generation (Aurora)	31.3	32.7	40.6	41.6	42.7	43.7
Mark-up (Aurora)	60.9	53.4	55.0	56.4	57.8	59.2
TOTAL Flinders Island	670.0	586.8	421.5	432.1	442.9	453.9

Operation and Maintenance

As shown in Table 3.11, Hydro Tasmania reported significant reductions in diesel generation operating costs from 2005-06 to 2006-07, with expectation of further reductions for 2007-08. Hydro Tasmania advises that the most plausible reason for the reduction in costs would be capital work undertaken in the relevant periods. Hydro Tasmania advises that salaries which would normally be booked against operation and maintenance activities have instead be allocated to capital, causing a reduction in operating and maintenance costs. That is, as there are limited labour resources on the BSI, during periods of significant capital works resources are diverted from operating and maintenance to capital works. As a result a higher proportion of the total cost of labour on the BSI is capitalised into the asset base.

Hydro Tasmania noted that they expect such capital works to taper off in the next few years. Hydro Tasmania is also predicting forward cost increases of 5 per cent (real $) for costs associated with managing and operating diesel generation assets.

Manage Property Assets

The Commission queried the higher costs to manage Flinders Island property assets for 2007-08 and onwards in comparison to estimated costs reported for King Island. Hydro Tasmania report that there had been a 'catch-up' program of maintenance on the houses and buildings owned by Hydro Tasmania on the BSI, with the larger proportion being spent on Flinders Island in recent years.

Further, Hydro Tasmania advises that a large proportion of property maintenance on Flinders Island is performed by Aurora personnel, whereas on King Island it is undertaken by a contractor, on behalf of Aurora. Notwithstanding the above comments, Hydro Tasmania noted that they were not confident that the cost of this contract service has been assigned to the correct cost code by Aurora staff.

3.4.1.4 Wind Generation Operating and Maintenance Costs

Wind Turbine Maintenance Contracts

Hydro Tasmania has a three year contract with each of Sterling Wind and Vestas Wind for the maintenance and servicing of wind turbines on King Island. Table 3.12 lists wind maintenance contract costs for 2005-06 through to 2010-11.

Table 3.12: BSI wind turbine maintenance contract costs 2005-06 to 2010-11 (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
Vestas Wind/ Sterling Wind	57.1	68.7	84.2	86.3	88.5	90.7

Source: Hydro Tasmania

Wind maintenance contract costs have increased significantly over the past two years, with a real increase of 20 per cent between 2005-06 and 2006-07, and Hydro Tasmania forecasting a 23 per cent increase from 2006-07 to 2007-08.

The Commission was not privy to wind maintenance contract details. However, Hydro Tasmania noted in their submission to the Commission that the contract with Sterling Wind for maintenance and servicing of the Nordex machines also covers the emergency breakdown response and parts supply for these machines.

Hydro Tasmania provided some explanation:

> While both contracts for wind turbine maintenance are CPI indexed, this cost centre also picks up repairs and breakdown costs performed by these companies under their schedule of rates. Examples of recent expenditures are replacement of control mechanisms on the Nordex machines and change out of the gearbox oil and main cable supports in the Vestas machines.

Hydro Tasmania has predicted real forward cost increases of 2.5 per cent for costs associated with managing and operating wind generation assets.

Other Wind Generation Operating Costs

Hydro Tasmania purchases a small amount of power from a private owner of two small wind generators on Flinders Island.

Hydro Tasmania receives Renewable Energy Certificates (RECs) and Green Power Rights (GPRs) for its wind generation on King Island. Hydro Tasmania has reported the revenue associated with RECs and GPRs to the Commission as negative cost items, netted from the costs of wind generation. These amounts are included in the table below.

In its role as generation service provider to Hydro Tasmania, Aurora also performs some activities relating to the operation of the wind turbines on King Island, as also included below.

Table 3.13: Other wind generation operating costs (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	2006-07 $'000	2007-08 $'000	2008-09 $'000	2009-10 $'000	2010-11 $'000
King Island						
RECs	(202.8)	(214.0)	(250.2)	(278.9)	(301.2)	(323.6)
GPRs[1]	(16.4)	(22.0)	(26.1)	(5.6)	(5.6)	(5.7)
Manage property assets - wind generation (Aurora)	18.4	15.0	11.1	11.4	11.7	12.0
Mark-up (Aurora)	1.8	1.5	1.7	1.7	1.8	1.8
Flinders Island						
Wind purchase costs	29.5	30.7	32.0	32.6	33.2	33.9

[1] From 2008-09 GPR prices are estimated to be $1.00, which is approximately the current mean price of new GPRs

3.4.1.5 Analysis of Operating and Maintenance Expenditure

Hydro Tasmania's costs as reported to the Commission do not include a break-down between the categories of labour, materials, vehicles and other costs, because under the previous contract arrangement with Aurora this level of detail was not disclosed. There is some disclosure under the new contract arrangement.

In an attempt to understand the components of each of the generation and distribution cost items, the Commission sought information directly from Aurora as to the breakdown of the costs it incurs on the BSI between labour, materials and any other categories.

The Commission would like to note that year on year comparisons for the period 2005-06 to 2007-08 were difficult due to changes in accounting systems and the change to the Aurora services contract arrangement. Further, the Commission was

not able to reconcile the Aurora incurred costs (as submitted by Aurora to the Commission), and the Aurora incurred costs as reported by Hydro Tasmania, for each year.

In addition, the operation and maintenance costs for 2007-08 (both Hydro-reported and Aurora-reported estimated end-of-year costs) are considerably lower than for 2006-07. Hydro Tasmania advised that some of the decrease can be explained by the following:

- A recent high capital work-load relative to operation and maintenance work, where, therefore, capital expenditure is apportioned to Hydro Tasmania's assets instead of to the operational and maintenance category.
- The new contract arrangement which requires Aurora to provide a very detailed breakdown of all costs. Under the previous fixed price contract, Hydro Tasmania was not able to conduct a close evaluation of costs. Hydro Tasmania suggests that Aurora may now be more accurately charging for items than previously due to greater diligence on Hydro Tasmania's part in evaluating Aurora invoices.

As it was not able to reconcile the figures reported by Aurora, the Commission instead reports the breakdown of costs for one year for this Draft Report for illustrative purposes only, and has not made any conclusions as to the veracity of reported costs.

Whilst the discussion above is relevant to generation costs, the comments are also applicable to similar data provided in relation to distribution related operations and maintenance costs under the Aurora contract (see Section 3.5.1.3).

Table 3.14 shows the breakdown of Aurora incurred costs associated with diesel generation for 2007-08.

Table 3.14: Breakdown of Aurora costs associated with diesel generation, BSI, 2007-08

	Labour	Materials	Overheads & Other	Total
	%	%	%	
O&M (Aurora)	24.5	11	64.5	100
Manage property assets (Aurora)	14	4	82	100

The Commission considers the high proportion of 'overheads and other' is remarkable but may be due to the manner in which costs are reported and allocated.

3.4.1.6 Summary and Conclusions - Total Generation Costs

King Island

Table 3.15 and Table 3.16 summarise the Commission's findings in relation to the total cost of supply of generation services on King Island utilising Hydro Tasmania's

reported figures. Table 3.16 displays the information in percentage terms. The return on assets for each period is calculated on the average assets for the relevant period. The average assets are calculated as the simple average of opening assets and closing assets.

Table 3.15: Total generation costs King Island (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
Average Assets	8 343.9	10 438.1	8 901.3	9 161.9	9 312.0	8 612.2
Return on Assets	667.5	835.1	757.5	697.8	628.1	558.4
Depreciation	495.0	929.5	538.7	699.8	699.8	699.8
Fuel	2 957.0	2 870.6	3 069.4	3 123.9	3 150.3	3 174.6
Operations and Maintenance (Aurora)[1]	672.2	558.8	408.2	417.1	412.3	407.9
Mark-up (Aurora)	83.4	72.6	90.0	92.3	94.6	97.0
TOTAL	4 875.2	5 266.6	4 863.8	5 030.9	4 985.2	4 937.7

[1] Net of RECs and GPRs associated with wind generation.

As can be seen from Table 3.15 and Table 3.16, fuel makes up a significant proportion of total costs, with the combined capital costs the next most significant item.

For 2005-06, 2006-07 and 2007-08 the depreciation allowances are those reported by Hydro Tasmania based on the fair values of its assets. The use of fair value results in some volatility in asset values from year to year, and consequently volatility in the return on assets and depreciation expense, as can be seen in Table 3.15 and Table 3.16.

In addition, the asset base for 2005-06 and 2006-07 includes the Vanadium Redox Battery system assets. As these assets were included in the calculation of the CSO, in those years a depreciation allowance and return on capital for these assets were included in the calculation of Hydro Tasmania's revenue requirement. Therefore the Commission has not removed these amounts from the reported figures. However, the Commission has excluded these assets from the asset base going forward, as it is the Commission's view that a return on redundant assets should not be provided.

As a consequence of the variations in the reported fair values of the assets from 2006-07 to 2007-08 and the removal of the Vanadium Redox Battery assets, the forecast return on assets and depreciation for 2007-08 is lower than the actual allowances in 2006-07.

The depreciation allowances for 2008-09 onwards are based on Hydro Tasmania's estimates of depreciation on existing assets plus a depreciation allowance for new assets rolled into the asset base during the period.

The Commission has calculated that without wind in the system, diesel fuel use would be 54 per cent greater to satisfy generation requirements for 2007-08. Diesel fuel costs would also be approximately 55 per cent greater than current costs – an amount in the order of $1.67 million in 2007-08.

However, the consequent savings from investment in wind are offset to some degree by capital charges on wind generators and by increased costs associated with higher diesel prices. In 2007-08 capital charges and depreciation on wind generators will amount to approximately 11 per cent of total costs to supply on King Island, or $741 000. The significance of wind to reducing overall operating costs is apparent when comparison to an all-diesel generation solutions is made, as discussed in Section 3.4.2.

Table 3.16: Total generation costs King Island (Real July 2007$)

	2005-06 %	2006-07 %	2007-08 %	2008-09 %	2009-10 %	2010-11 %
Return on Assets	14	16	16	14	13	11
Depreciation	10	18	11	14	14	14
Fuel	61	55	63	62	63	64
Operations and Maintenance	14	11	8	8	8	8
Mark-up (Aurora)	2	1	2	2	2	2
TOTAL	100	100	100	100	100	100

In Table 3.16, total generation costs for King Island are displayed in percentage terms, showing the marked change in the proportion of costs due to fluctuations in capital costs.

Flinders Island

Table 3.17 summarises the Commission's findings in relation to the total cost of supply of generation services on Flinders Island utilising Hydro Tasmania's reported figures.

The same set of assumptions has been used for calculating total generation costs for Flinders Island as for King Island:

- The return on assets for each period is calculated on the average assets for the relevant period. The average assets are calculated as the simple average of opening assets and closing assets.
- The depreciation allowances for 2005-06, 2006-07 and 2007-08 are those reported by Hydro Tasmania based on the fair values of its assets as at the reporting dates.

- The depreciation allowances for 2008-09 onwards are based on Hydro Tasmania's estimates of depreciation on existing assets plus a depreciation allowance for new assets rolled into the asset base during the period.

Table 3.17: Total generation costs Flinders Island (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
Average Assets	1 946.2	2 484.4	2 744.5	3 804.4	4 833.1	4 641.8
Return on Assets	155.7	198.8	194.9	270.1	343.2	329.6
Depreciation	73.6	110.9	128.9	151.3	191.3	191.3
Fuel	1 060.7	1 134.3	1 169.3	1 225.5	1 254.5	1 284.3
Operations and Maintenance	628.8	553.1	385.6	394.5	403.3	412.2
Mark-up (Aurora)	60.9	53.4	55.0	56.4	57.8	59.2
TOTAL	1 979.8	2 050.4	1 933.6	2 097.8	2 250.0	2 276.6

Table 3.18: Total generation costs Flinders Island (Real July 2007$)

	2005-06 %	**2006-07 %**	**2007-08 %**	**2008-09 %**	**2009-10 %**	**2010-11 %**
Return on Assets	8	10	10	13	15	14
Depreciation	4	5	7	7	9	8
Fuel	54	55	60	58	56	56
Operations and Maintenance	32	27	20	19	18	18
Aurora Contract Mark-up	3	3	3	3	3	3
TOTAL	100	100	100	100	100	100

Historically, the share of total costs attributable to capital charges and depreciation for generation on King Island are quite significant in comparison to Flinders Island. This is due to significant investment in wind turbines and other generation investments undertaken on King Island, and little on Flinders Island to date. However the planned replacement of diesel generators on Flinders Island over the next few years is estimated to increase capital costs, to a similar proportion of total costs as for King Island.

Total Bass Strait Islands

Table 3.19 displays total generation costs for the Islands combined.

Table 3.19: Total generation costs BSI (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
Average Assets	10 290.1	10 438.1	11 645.7	12 966.3	14 145.1	13 254.0
Return on Assets	823.2	1 033.8	952.3	967.9	971.25	888.0
Depreciation	568.7	1 040.4	667.6	851.1	891.1	891.1
Diesel Fuel	4 017.7	4 004.9	4 238.6	4 349.3	4 404.9	4 458.9
Operations and Maintenance[1]	1 301.0	1 111.9	793.9	811.6	815.6	820.1
Aurora Contract Mark-up	144.3	126.0	145.0	148.6	152.4	156.2
Total	6 854.9	7 317.0	6 797.5	7 128.6	7 235.2	7 214.2

[1] Net of RECs and GPRs.

3.4.2 Conventional All-Diesel Generation Solution

To satisfy the Terms of Reference requirement of the Inquiry for a desk-top review of the cost of conventional generation, the Commission requested that Hydro Tasmania provide an estimate of costs to supply electricity on the BSI via an all-diesel solution, in addition to costs of the current generation mix. This was provided. However, to ensure consistency of data, the Commission has used its own model of Hydro Tasmania's reported costs of supply, and similar to Hydro Tasmania's method- it has estimated forward costs of an all-diesel generation solution on the BSI under the current conditions (fuel costs, Aurora contract costs etc), with wind generation and associated wind generation costs removed from its financial model. The Commission has adopted the following further assumptions in developing an understanding of the costs of an all-diesel solution for the BSI:

- As discussed in Chapter 2, firm supply capacity of the current diesel configuration of each Island has been adequate to meet historical system peak load; therefore the Commission considers that the current configuration of diesel generators is adequate to model an all-diesel solution.
- Costs associated with diesel generation operation and maintenance (as provided by Aurora) would be sensitive to the quantum of diesel generation. The Commission has assumed that 20 per cent of operating and maintenance costs vary with output, and has therefore escalated operation and maintenance costs by this magnitude.

The following tables summarise the Commission's findings in relation to the costs of supply of all-diesel generation for each of King Island and Flinders Island.

King Island

Table 3.20 summarises the costs associated with a hypothetical all-diesel solution for King Island. Table 3.21 displays this information in percentage terms.

Table 3.20: Total generation costs King Island, all-diesel solution (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	2006-07 $'000	2007-08 $'000	2008-09 $'000	2009-10 $'000	2010-11 $'000
Average Assets	3 838.1	4 245.1	3 567.1	4 247.7	4 888.8	4 679.9
Return on Assets	307.1	339.6	378.7	348.9	314.1	279.2
Depreciation	218.0	473.1	176.3	208.9	208.9	208.9
Fuel	4 574.6	4 376.4	4 659.1	4 802.2	4 922.2	5 045.3
O&M (Aurora)	894.7	782.4	647.0	665.4	684.9	705.3
Mark-up (Aurora)	89.5	78.2	97.0	99.8	102.7	105.8
TOTAL	6 083.8	6 049.8	5 958.1	6 125.1	6 232.9	6 344.4

Compared to the total costs of supply utilising the current generation mix (as shown in Table 3.15) the total cost to supply the all-diesel generation mix for King Island as depicted in Table 3.20 is higher for each of the years listed above.

The majority of the increase is attributable to diesel fuel costs, with some increase to diesel generation related operations and maintenance costs also. The increases are offset to some degree by the decrease in capital costs.

The Commission estimates that total costs under the all-diesel solution would have been 25 per cent higher in 2005-06 (an amount in the order of $1.2 million); decreasing in 2006-07 to 15 per cent higher ($0.8 million), then increasing over the next few years to 28 per cent higher in 2010-11 ($1.4 million). On average, the difference is just over $1.4 million per annum.

The increase in diesel fuel required to deliver generation requirements in the absence of wind generation would be almost 54 per cent higher with associated diesel fuel costs increasing by almost 55 per cent, or on average $1.67 million per annum, but lower in earlier years (and higher in later years) due to the assumed real increase in diesel fuel prices.

Diesel generation related operations and maintenance costs under the all-diesel solution are also higher due to the assumed sensitivity of operations and maintenance to diesel generation, and the increase in the value of the Aurora margin (due to higher operations and maintenance costs). The increase in operations and maintenance costs is 15 per cent in 2006-07, increasing by each year to 73 per cent in 2010-11. This is greater than the foregone costs of wind related operations and maintenance costs under the current generation mix.

As already noted in Section 3.4.1.6, there is some volatility in capital costs between the years 2005-06 and 2006-07, and the remainder of the period in question, due to inclusion of the Vanadium Redox Battery system assets for the first two years. Without wind generation, capital costs as a proportion of total costs would be approximately 55 per cent lower in 2005-06 and 2006-07, increasing to 60 per cent

lower for each of the later years (due to removal of the Vanadium Redox Battery system assets from the asset base). The lower capital charges of $0.8 million (on average per annum) would offset the increase in diesel fuel and diesel generation related operations and maintenance costs by that amount.

Table 3.21: Total generation costs King Island, all-diesel solution (Real July 2007$)

	2005-06 %	2006-07 %	2007-08 %	2008-09 %	2009-10 %	2010-11 %
Return on Assets	5	6	6	6	5	4
Depreciation	4	8	3	3	3	3
Fuel	75	72	78	78	79	80
O&M (Aurora)	15	13	11	11	11	11
Mark-up (Aurora)	1	1	2	2	2	2
TOTAL	100	100	100	100	100	100

As shown in Table 3.21, fuel contributes between 72 and 80 per cent of total generation costs under an all-diesel solution, with the highest proportion in the later years due to the assumed real increase in diesel prices. Under the current generation mix, diesel fuel accounts for approximately 60 per cent of generation costs.

Flinders Island

Table 3.22 summarises the Commission's findings in relation to the cost of an all-diesel generation solution on Flinders Island.

Table 3.22: Total generation costs Flinders Island, all-diesel solution (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	2006-07 $'000	2007-08 $'000	2008-09 $'000	2009-10 $'000	2010-11 $'000
Average Assets	1 946.2	2 484.4	2 744.5	3 804.4	4 833.1	4 641.8
Return on Assets	155.7	198.8	194.9	270.1	343.2	329.6
Depreciation	73.6	110.9	128.9	151.3	191.3	191.3
Fuel	1 131.4	1 202.6	1 240.7	1 300.2	1 332.7	1 366.0
O&M (Aurora)	616.2	539.7	370.6	379.9	389.5	399.3
Mark-up (Aurora)	61.6	54.0	55.6	57.0	58.4	59.9
TOTAL	2 038.5	2 105.9	1 990.7	2 158.4	2 315.0	2 346.1

Due to proportionally less wind generation utilised on Flinders Island relative to diesel generation in comparison to King Island, removal of wind generation has a lower impact on total generation costs and ratios on Flinders Island.

Under an all-diesel scenario, on average fuel costs are higher by approximately $0.1 million per annum. However, these increased costs are offset by lower operations and maintenance costs under this scenario as Hydro Tasmania does not incur costs associated with purchasing wind generation from the privately owned wind farm on Flinders Island. Hydro Tasmania also has no capital costs associated with wind generation on Flinders Island, therefore unlike the scenario on King Island- there is no change to capital costs under the all-diesel solution.

Table 3.23: Total generation costs Flinders Island, all-diesel solution (Real July 2007$)

	2005-06 %	2006-07 %	2007-08 %	2008-09 %	2009-10 %	2010-11 %
Return on Assets	8	9	10	13	15	14
Depreciation	4	5	6	7	8	8
Fuel	56	57	62	60	58	58
O&M (Aurora)	30	26	19	18	17	17
Mark-up (Aurora)	3	3	3	3	3	3
TOTAL	100	100	100	100	100	100

When compared, Table 3.18 and Table 3.23 show that there is very little difference in the ratios of the cost categories to total generation costs of the current configuration and the all-diesel solution for Flinders Island.

Total Bass Strait Islands

Table 3.24 displays the total generation costs for King Island and Flinders Island combined, under an all-diesel solution.

Compared to the current generation configuration, costs under an all-diesel solution would be almost $1 million greater each year (17 per cent higher) than the current configuration, mostly attributable to the increased diesel fuel requirements on King Island.

Table 3.24:Total generation costs BSI, all-diesel solution (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	2006-07 $'000	2007-08 $'000	2008-09 $'000	2009-10 $'000	2010-11 $'000
Average Assets	5 784.3	4 245.1	6 311.6	8 052.1	9 721.9	9 321.7
Return on Assets	462.7	538.4	573.6	619.0	657.2	608.8
Depreciation	291.6	584.1	305.2	360.2	400.2	400.2
Diesel Fuel	5 706.1	5 579.0	5 899.8	6 102.4	6 254.9	6 411.3
O&M (Aurora)	1 591.3	1 382.3	1 087.8	1 117.5	1 149.0	1 181.5
Mark-up (Aurora)	151.1	132.2	152.6	156.8	161.2	165.7
TOTAL	8 122.3	8 155.7	7 948.8	8 283.6	8 547.9	8 690.5

3.4.3 Greenfields Generation Solution

To assist the Commission in its determination of efficient costs of supply on the BSI, the Commission engaged a Consultant to provide an independent view as to the installed cost of generation plant to meet the long term needs of the BSI and to provide a point of reference for valuation of Hydro Tasmania's diesel generating assets.

The Consultant provided the Commission with an estimate of the capital costs of an all-diesel, notional best-fit solution for each of King and Flinders Islands. The size and configuration of the notional plant was based on electricity demand and energy requirements for each Island and assumes contemporary reliability criteria for determining installed reserve margin and operational spinning reserve.

The Consultant noted that the existing generating plants on the BSI appear to be operated in a manner which provides a reasonable level of supply reliability. However, the Consultant also commented that configuration and operating practises could be optimised to improve flexibility, energy conversion efficiency, and reduce total costs of supply.

In essence, the Consultant's proposed notional best-fit solution consists of more, smaller units than are currently in place at each power station, for the following reasons:

- smaller units would reduce the required reserve margin (currently 72 per cent on King Island, and 100 per cent on Flinders Island);
- smaller units would enable higher unit in-service capacity factors, and improve net energy conversion efficiency (ie a large unit operating below 50 per cent of capacity is relatively inefficient compared to a small unit being operated at above 50 per cent of its capacity); and

- to ensure spinning reserve is maintained, a greater number of smaller units would enable higher per unit loading, rather than two larger units each operating at low load.

The Consultant approached a number of diesel engine manufacturers, receiving responses from two. From the two responses the Consultant was able to prepare two notional cost scenarios for the supply of a best-fit configuration for each of the Islands.

A summary of the capital cost estimates comparing information from both supplies for both King and Flinders Island is tabled below.

Table 3.25: Notional all-diesel best-fit generation solutions, King Island and Flinders Island

		Unit configuration kW	Total installed capacity MW	Fuel consumption at rated load kWh/litre	Estimated total capital cost[1] $'000
King Island	Supplier A	6 x 728	4.368	3.723	2 330
	Supplier B	6 x 768	4.608	4.166	4 060
Flinders Island	Supplier A	5 x 400	2.00	3.827	1 285
	Supplier B	5 x 422	2.11	4.098	1 940

Source: A Beaumont.

Whilst the capital costs based on Supplier B's pricing are significantly higher than those using Supplier A's pricing, Supplier B's units offer superior efficiency, as shown in Table 3.26.

Table 3.26 depicts the converted all-diesel cost efficiency for each of the quoted options and for the current configuration of diesel units based on 2007-08 estimated generation requirements.

Table 3.26: Cost of all-diesel solutions

	Fuel consumption at rated load kWh/litre	Fuel required[1] litres	Total diesel cost $'000	Diesel cost efficiency $/MWh[2]
King Island				
Current configuration[3]	3.67	4 571 662	4 659.181	277.70
Supplier A	3.72	4 506 581	4 592.854	273.74
Supplier B	4.17	4 384 113	4 468.042	266.30

	Fuel consumption at rated load kWh/litre	Fuel required[1] litres	Total diesel cost $'000	Diesel cost efficiency $/MWh[2]
Flinders Island				
Current configuration[3]	3.67	1 231.335	1 242.342	274.92
Supplier A	3.83	1 084.734	1 094.430	242.18
Supplier B	4.10	1 102.733	1 112.591	246.20

Source: A Beaumont.

Notes: 1. Based on 16 778 MWh of diesel generation required for King Island without wind generation, and 4 519 MWh of diesel generation required for Flinders Island without wind generation.

2. Based on 2007-08 cost of diesel at $1.02 per litre (including diesel rebate) for King Island, and $1.01 for Flinders Island.

3. Hydro Tasmania advises that the efficiency of its new generators on King Island and for planned replacement generators for Flinders Island is likely to be closer to 4 kWh per litre, and will provide the Commission with further information for inclusion in the Final Report.

At rated load, the quoted options have better fuel consumption than that achieved under the current configuration of diesel generators, with Supplier B's configuration achieving the best operating cost efficiency for King Island at $266.30 per MWh and Supplier A for Flinders Island at $242.18 per MWh.

To determine the total cost of conventional (all-diesel) generation, the Commission has used its estimate of efficient operation and maintenance expenditure and diesel fuel costs, in addition to the capital costs for each of the options.

Operation and Maintenance Costs

A proportion of maintenance and operating costs are related to the actual running of generators and this output-dependent cost of servicing, filters etc should be included in marginal operating costs. For this analysis, maintenance costs of 1.82 cents per kWh for King Island and 3.21 cents per kWh for Flinders Island have been assumed, with the higher per kWh maintenance costs on Flinders Island attributable to lower economies of scale for operations and maintenance operations.

As noted by the Consultant, the selection of appropriate units and plant configuration should be made with the objective of minimising life cycle costs, including forecasting future energy and demand requirements, necessary capital expenditure, fuel supply costs, and operating and maintenance costs.

Table 3.27: Comparative cost of conventional (diesel) generation

	$ per MW installed capacity $'000	Annual ownership costs $'000[1]	Annual ownership costs c/kWh	Fuel cost c/kWh	Operations & maintenance cost c/kWh	Total cost c/kWh
King Island						
Current configuration[2]	531.250	50.146	1.26	27.77	1.82	30.85
Supplier A	533.425	50.352	1.26	27.37	1.82	30.45
Supplier B	881.076	71.003	1.78	26.63	1.82	30.23
Flinders Island						
Current configuration[3]	1 785.714	168.559	4.06	27.49	3.21	34.76
Supplier A	642.500	60.647	1.52	24.22	3.21	28.95
Supplier B	919.431	74.094	1.86	24.62	3.21	29.69

Notes: 1. Annual ownership costs for supplier A and supplier B options have been calculated using an annuity approach, based on a real interest rate of 7 per cent, and an expected lifetime of generation assets of 20 years. Diesel generators in Australia are typically imported, and therefore asset purchases made at different times are affected by exchange rate movements. The Commission has not taken into account the potential impact of exchange rate fluctuations in its comparison of capital costs.

2. Based on the cost and capacity of two recently replaced diesel generators on King Island (2 x 1.6 MW at $1.7 million)

3. Based on the planned replacement of two generators on Flinders Island (1 x 600 kW and 1x 800 kW at a budgeted figure of $2.4 million).

Table 3.26 shows the diesel cost efficiency of different configurations, where Table 3.27 includes the capital cost of the assets.[29] When factoring in the cost of capital, Supplier A's configuration of generators remains the most efficient configuration for Flinders Island. Including the cost of capital, the current configuration and Supplier A's configuration are equally as efficient for King Island, with Supplier B's configuration slightly less efficient.

The Consultant notes:

> There is a significant trend in mainland states for remote area electricity generation to be sourced by competitive tender. This has resulted in a number of specialist companies who own and operate plants on the basis of a long term power purchase agreement. Such agreements generally provide for the plant owner to accept all design, construction, operating and maintenance risks. It is not uncommon for the contract to require that the utilisation of wind turbine

[29] Whilst the ownership costs for the current configuration has been based on the building block approach equal to the return on asset plus an allowance for depreciation, and the ownership costs for the greenfields options have been calculated using an annuity approach, the Commission is of the view that there will be no material impact on the conclusions regarding total generating costs.

plant be optimised, irrespective of ownership. Consideration could be given to introducing such an arrangement for Bass Strait Island electricity supplies.

3.4.4 Discussion and conclusions – efficient cost of generation

Comparison of the all-diesel with the greenfields option shows a comparative diesel cost efficiency (dollar per MWh) for either configuration. Table 3.27 shows that the total costs (c/kWh) from the desk-top greenfields configurations are similar to the costs of the all-diesel generation scenario, utilising Hydro Tasmania's asset valuation and costs. As discussed in section 3.4.2, the cost of the all-diesel operation is significantly higher than the cost of the diesel/wind system. Also, as discussed in section 3.4.1.1, the estimated replacement capital cost is consistent with the Hydro Tasmania valuation of its generation assets. Thus for the purpose of the calculation of efficient costs, the Commission has accepted the current diesel/wind configuration and Hydro Tasmania's asset values, noting that the desk-top assessment suggests slightly lower costs for an alternative configuration on Flinders Island.

3.5 Distribution

Due to the capital intensive nature of the electricity supply industry, the cost of capital is normally the single biggest item for a distribution network service provider, generally making up approximately 50 per cent of costs, with depreciation and operations and maintenance being about 25 per cent each. However, on the BSI, as with generation costs, distribution operating and maintenance costs are proportionally higher than on the mainland of Tasmania. This is possibly due to the small scale of operations on the Islands and the need to maintain a core number of employees with the appropriate skill sets on each Island.

3.5.1.1 Return on Assets

Assets values

The estimated value of distribution assets on the BSI is shown in Table 3.28.

Table 3.28: Value of distribution assets –BSI

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
King Island	4 372.0	4 640.1	5 166.7	5 150.1	5 130.2	5 256.4
Flinders Island	2 259.7	2 347.7	2 648.9	2 605.9	2 757.3	2 543.1

Note: Asset Values for 2005-06 have been calculated form information provided by Hydro Tasmania.

Until the adoption of AEIFRS in 2005-06, Hydro Tasmania valued its distribution assets at fair value. Hydro Tasmania now applies a 'cost valuation' for its distribution assets. This means that at the date of adoption the book values based on fair values became the 'cost' base of its distribution assets. All additions are valued at historical cost. No revaluations are undertaken. Consequently, the 'cost base' in the books is unlikely to be a fair representation of the replacement value or the sale

price of these assets, particularly as many of these assets have relatively long lives, eg 40 years. The Commission also notes that if the benchmark WACC was applied to historical cost (with no revaluations or indexation of these values), the return on assets would be less than the Commission would conventionally allow.

Nevertheless, the Commission has accepted the valuation of Hydro Tasmania's distribution assets as at 1 July 2007 for the purposes of setting the opening regulatory asset values. These have then been 'rolled forward' by adding capital expenditures and deducting depreciation. As the Commission has adopted a real pre-tax WACC, the rolled forward asset values are stated in real terms, ie no adjustment has been made for inflation.

Capital expenditure

Table 3.29 and Table 3.30 summarises the actual and forecast capital expenditure on distribution assets on the BSI from 2005-06 to 2010-11.

Table 3.29: Capital expenditure – distribution assets – King Island

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
Refurbishments and renewals	-	-	-	-	-	1 000.0
Extensions and developments	128.6	177.3	150.0	150.0	150.0	150.0

Table 3.30: Capital expenditure – distribution assets – Flinders Island

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
Refurbishments and renewals	-	-	-	-	-	1 000.0
Extensions and developments	55.1	76.0	65.0	65.0	65.0	65.0

As can be seen from Table 3.29 and Table 3.30, expenditure on extensions and developments is forecast to remain relatively stable into the future. Hydro Tasmania has estimated the need for approximately $1 million for refurbishments/renewals for each Island in 2010-11 reflecting the need to undertake major works to replace the entire distribution system poles and furniture (pole tops etc). The exact timing will be subject to detailed analysis and asset planning. No replacement work is planned in the interim.

3.5.1.2 Depreciation

Table 3.31 summarises the actual and forecast depreciation on the BSI. The approach adopted by the Commission for distribution assets is the same methodology as applied to generation assets, discussed in Section 3.4.1.2.

Table 3.31: Depreciation on distribution assets (Real 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
King Island	179.2	183.6	190.3	170.0	173.7	190.0
Flinders Island	103.3	107.7	107.9	95.6	97.3	111.4

3.5.1.3 Operating and maintenance expenditure

As with generation, Aurora manages and operates distribution assets on behalf of Hydro Tasmania.

Table 3.32 shows the historical levels of operating and maintenance expenditure incurred and Hydro Tasmania's forecast levels for distribution for each Island.

Table 3.32: Distribution operating and maintenance expenditure (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
King Island						
O&M (Aurora)	1 130.5	1 204.1	596.2	611.1	626.4	642.0
Manage property assets (Aurora)	32.8	32.7	31.0	31.8	32.6	33.4
Customer Services (Aurora)	-	-	161.5	165.5	169.7	173.9
Mark-up (Aurora)	116.3	123.7	118.3	121.3	124.3	127.4
TOTAL	1 279.7	1 360.5	907.0	929.7	953.0	976.8
Flinders Island						
O&M (Aurora)	869.8	881.2	439.4	450.4	461.7	473.2
Manage property assets (Aurora)	31.3	32.7	40.6	41.6	42.7	43.7
Customer Services (Aurora)	-	-	265.8	272.5	279.3	286.3
Mark-up (Aurora)	90.1	91.4	111.9	114.7	117.5	120.5
TOTAL	991.2	1 005.3	857.7	879.2	901.2	923.7

Hydro Tasmania is expecting a significant reduction in operating and maintenance distribution costs for 2007-08, and has attributed this expected reduction to the new contract arrangements with Aurora.

Under the previous contract arrangement, Aurora did not distinguish between operational and maintenance costs for distribution assets and distribution related customer services. Costs relating to operating and maintenance of distribution assets also included customer connections and meter reading. From the beginning of 2007-08, these customer service costs have been billed as a separate item (see below for further discussion of customer service costs).

Hydro Tasmania also expects savings as a result of a change to the structure of the contract, previously a lump sum contract. The new contract is basically a do and charge contract with a profit percentage of 15 per cent, to be managed by an open book auditing agreement.

Table 3.33 shows the breakdown of Aurora incurred costs associated with distribution for 2007-08, between the categories of labour, materials and other.

Table 3.33: Breakdown of Aurora costs associated with distribution, BSI, 2007-08

	Labour	Materials	Overheads & Other	Total
	%	%	%	
O&M (Aurora)	24	3	73	100

As noted in Section 3.4.1.5, the Commission is surprised at the high proportion of 'overheads and other' costs, but recognises that this may be due to the manner in which costs are reported and allocated.

Distribution Customer services

Aurora is contracted to provide 'customer service' functions for and on behalf of Hydro Tasmania. In its previous contract with Hydro Tasmania, 'customer service' functions included:

- advice to customers on tariffs, energy consumption, equipment and applications;
- meter readings and billing services;
- revenue collection;
- fault call service and out of-hours services;
- connections/disconnections;
- administration of special contracts for street lighting;
- participation in demand side management investigations; and
- maintenance of records and provision of reports for Hydro Tasmania.

These functions relate to the provision of retail services (eg billing and revenue collection), services provided directly to customers (eg connection and disconnections), contract management (maintenance of records and provisions of reports) and services provided to support Hydro Tasmania functions on the BSI (eg participation in demand side management).

On mainland Tasmania services such as meter reading, fault response, connections and disconnections and street-lighting are defined as distribution services, whereas billing and retail call centre services are defined as the retailer's responsibility.

Hydro Tasmania advises that the new 'customer services' cost item in the revised contractual arrangements directly relates to the provision of specific network customer services such as moving/alterations or additions of services, safety issues etc. The cost of these services on each Island is listed in Table 3.32 under 'customer services'.

From Hydro Tasmania's figures, the likely end-of-year customer services costs are forecast to be higher for Flinders Island than King Island. Hydro Tasmania explains that there have been a number of new distribution network extensions undertaken on Flinders Island in the last year. Also, Hydro Tasmania note that where this type of work (estimation and design) is done on King Island by the Aurora Team Leader, on Flinders Island this expertise is provided out of the Launceston office which requires extra Aurora staff to fly to the Island, thus incurring travel and associated other costs such as car rental.

Table 3.34 shows the breakdown of Aurora incurred costs associated with customer services for 2007-08, between labour, materials and other.

Table 3.34: Breakdown of Aurora costs associated with customer services, BSI, 2007-08

	Labour	Materials	Overheads & Other	Total
	%	%	%	
O&M (Aurora)	24	5	71	100

Similar to operations and maintenance costs for distribution assets, approximately 25 per cent of customer services costs are labour related, with 70 per cent attributed to overheads which Aurora describe as facilities and property costs, depreciation and interest, and logistics and warehousing costs.

3.5.1.4 Discussion and Conclusions - Distribution Costs

King Island

Table 3.35 and Table 3.36 summarise the total cost of supply of distribution services on King Island utilising Hydro Tasmania's reported costs. Table 3.36 displays the information in percentage terms. Operation and maintenance expenditure includes the combined operations and maintenance related to distribution assets and customer services, and management of property assets.

Table 3.35: Total distribution costs King Island (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
Average Assets	4 372	4 640	5 158	5 140	5 193	5 736
Return on Assets	349.8	371.2	366.3	365.0	368.7	407.3
Depreciation	179.2	183.6	190.3	170.0	173.7	190.0
Operations and Maintenance[1]	1 163.3	1 236.8	788.7	808.5	828.7	849.4
Mark-up (Aurora)	116.3	123.7	118.3	121.3	124.3	127.4
TOTAL	1 808.6	1 915.3	1 463.6	1 464.7	1 495.4	1 574.1

[1] Includes operations and maintenance, manage property assets and customer services as provided by Aurora..

Table 3.36: Total distribution costs King Island (Real July 2007$)

	2005-06 %	**2006-07 %**	**2007-08 %**	**2008-09 %**	**2009-10 %**	**2010-11 %**
Return on Assets	19	19	25	25	25	26
Depreciation	10	10	13	12	12	12
Operations and Maintenance	64	65	54	55	55	54
Mark-up (Aurora)	6	6	8	8	8	8
TOTAL	100	100	100	100	100	100

Flinders Island

Table 3.37 summarises the total cost of supply of distribution services on Flinders Island utilising Hydro Tasmania's reported costs.

Table 3.37: Total distribution costs Flinders Island (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
Average Assets	2 260	2 348	2 627	2 590	2 559	3 020
Return on Assets	180.8	187.8	186.6	183.9	181.7	214.4
Depreciation	103.3	107.7	107.9	95.6	97.3	111.4
Operations and Maintenance[1]	901.1	913.9	745.9	764.5	783.6	803.2
Mark-up (Aurora)	90.1	91.4	111.9	114.7	117.5	120.5
TOTAL	1 275.3	1 300.8	1 152.2	1 158.8	1 180.1	1 249.5

[1] Includes operations and maintenance, manage property assets and customer services as provided by Aurora..

Table 3.38: Total distribution costs Flinders Island (Real July 2007$)

	2005-06 %	2006-07 %	2007-08 %	2008-09 %	2009-10 %	2010-11 %
Return on Assets	14	14	16	16	15	17
Depreciation	8	8	9	8	8	9
Operations and Maintenance	71	70	65	66	66	64
Mark-up (Aurora)	7	7	10	10	10	10
TOTAL	100	100	100	100	100	100

Return on assets and depreciation comprise a smaller proportion of total distribution costs for Flinders Island in comparison to King Island, with operational and maintenance expenditure comprising approximately a 10 per cent greater proportion of total distribution costs on Flinders Island than King Island. This is in contrast to the mainland distribution business where the return on assets is the most significant cost segment.

Total Bass Strait Islands

Table 3.39 summarises the total cost of supply of distribution services for the BSI, utilising Hydro Tasmania's reported figures.

Table 3.39: Total distribution costs BSI (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	2006-07 $'000	2007-08 $'000	2008-09 $'000	2009-10 $'000	2010-11 $'000
Average Assets	6 632	6988	7 786	7 731	7 753	8 756
Return on Assets	530.5	559.0	552.8	548.9	550.4	621.7
Depreciation	282.5	291.2	298.3	265.6	271.0	301.4
Operations and Maintenance	2 064.4	2 150.7	1 534.6	1 573.0	1 612.3	1 652.6
Mark-up (Aurora)	206.4	215.1	230.2	235.9	241.8	247.9
TOTAL	3 083.9	3 216.1	2 615.8	2 623.4	2 675.5	2 823.5

The most significant factor of the increase in distribution costs over the forecast period is the planned investment of $1 million to refurbish and replace the distribution system on each Island commencing in 2010-11, as this impacts on both the total return on assets and depreciation.

As previously noted, operations and maintenance costs compared to capital costs on the BSI appear disproportionately high compared to the mainland. Hydro Tasmania notes that the high operation and maintenance costs in proportion to capital costs on

the BSI is due to the larger number of staff per kilometre of assets, due to the remote nature of operations, with no back-up crews available and the need to allow for staffing contingencies.

The proposed significant investment in the network towards the end of the period does have an impact on this, suggesting that the current age and condition of the network and the lack of ongoing investment in replacements may be contributing factors. Nevertheless, the Commission remains concerned that there may be significant inefficiencies or poor reporting of costs of the operations and maintenance functions on the BSI.

3.6 Retail

As noted elsewhere, retail services are provided by Aurora under the contract for services with Hydro Tasmania. Under the new contract arrangements on the BSI, Aurora collects revenues and remits these to Hydro less one per cent for administration, receipting and invoicing, and pass through of actual bad debts. One per cent of revenues equates to a cost to serve of $16 per customer per annum.

Hydro Tasmania has provided the Commission with estimated retail costs for 2007-08, as shown in Table 3.40. No details were provided on the retail costs to serve for the years 2005-06 and 2006-07.

Table 3.40: Retail cost to serve, BSI (Real July 2007$) as provided by Hydro Tasmania

	2007-08 $'000
King Island	31.6
Flinders Island	9.1
TOTAL Bass Strait Islands	40.7

Using its own estimates of sales and applying the Aurora contract margin of one per cent of forecast revenues for 2007-08 (see Appendix C for a derivation of sales figures) the Commission has also estimated retail costs. The cost to serve for 2008-09 and future years has been estimated using the Commission's proposed tariff structure for the BSI (discussed further in Chapter 4).

Table 3.41: Retail cost to serve, BSI (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	2006-07 $'000	2007-08 $'000	2008-09 $'000	2009-10 $'000	2010-11 $'000
King Island	33.7	33.3	33.9	38.7	38.7	38.7
Flinders Island	9.2	9.7	9.9	10.6	10.7	10.7
TOTAL Bass Strait Islands	42.9	42.9	43.8	49.3	49.4	49.5

As noted in Section 3.2.2, conventionally, in determining the maximum prices for tariff customers, regulators make an allowance for the cost to provide services for customers (cost to serve), and for a net retail margin. The cost to serve reflects the efficient costs that would be incurred by a retailer in providing services to its customers, including billing, account collection, customer enquiries and advice. The retail margin is intended to compensate the retailer for its investment in the business and the risks it assumes in providing those retail services.

The Regulator provided Aurora with a cost to serve allowance of $85 (June 2006$) per customer per annum, exclusive of depreciation, and a retail margin of three percent on total sales for mainland Tasmania. Using this as a benchmark, the Commission has calculated a benchmark retail cost to serve and margin for the BSI for 2005-06 to 2010-11. This is shown in Table 3.42.

Table 3.42: Benchmark retail cost to serve, BSI (Real July 2007$)

	2005-06 $'000	2006-07 $'000	2007-08 $'000	2008-09 $'000	2009-10 $'000	2010-11 $'000
King Island	229.4	226.6	227.4	243.9	241.6	239.5
Flinders Island	89.3	92.0	92.0	93.5	92.2	91.0
TOTAL Bass Strait Islands	318.6	318.6	319.4	337.3	333.9	330.5

Comparing the retail cost to serve under the Aurora contract (Table 3.41) with the benchmark cost to serve (Table 3.42) it is obvious that the cost to serve under the Aurora contract is less than the benchmark cost to serve. As retail services on the BSI are provided 'at the margin' by Aurora, Aurora only needs recover the marginal cost to serve each customer.

The Commission has incorporated Hydro Tasmania's reported cost to serve in its analysis of Hydro Tasmania's total costs, but has used the benchmark retail cost to serve in its calculation of an efficient cost to supply the BSI.

3.7 Hydro Tasmania's Own Costs

Hydro Tasmania incurs costs associated with delivering and administering services on the BSI. These include labour and management costs, other miscellaneous property/asset maintenance contracts (other than the Aurora contract), costs associated with technical advice, and rates and land taxes.

Table 3.43 shows how these costs are apportioned to diesel generation, wind generation and distribution operations on the BSI.

Table 3.43: Hydro Tasmania - own incurred costs (Real July 2007$)

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
King Island						
Diesel	30.8	109.0	181.9	181.9	181.9	181.9
Wind	0.2	24.9	36.1	36.1	36.1	36.1
Distribution	43.3	46.7	69.5	69.5	69.5	69.5
TOTAL	74.3	180.6	287.4	287.4	287.4	287.4
Flinders Island						
Diesel	28.8	48.8	82.2	82.2	82.2	82.2
Wind	0	0.6	1.4	1.4	1.4	1.4
Distribution	42.9	31.7	53.8	53.8	53.8	53.8
TOTAL	71.75	81.0	137.4	137.4	137.4	137.4
TOTAL BSI	**146.0**	**261.7**	**424.9**	**424.9**	**424.9**	**424.9**

Source: Hydro Tasmania

The Commission questioned the sharp increase in these costs between 2005-06, 2006-07 and 2007-08. Hydro Tasmania was not able to provide a comprehensive explanation for the increase between 2005-06 and 2006-07 but noted that some of increases relating to 2007-08 and onwards are related to the new contract arrangements with Aurora. For example, Hydro Tasmania now undertakes some of the property management tasks previously managed by Aurora and the additional costs incurred in managing the 'do and charge' arrangements under the new contract with Aurora.

Hydro Tasmania advises that these costs are not expected to increase in real terms from 2007-08 onwards.

3.8 Total Costs

Table 3.44 lists the actual and forecast total costs of electricity supply for the BSI, for 2005-06 to 2010-11.

Table 3.44: Total cost (Real July 2007$) BSI

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
Generation						
Return on Assets	823.21	1 033.8	952.3	967.9	971.25	888.0
Depreciation	568.7	1 040.4	667.6	851.1	891.1	891.1
Diesel Fuel	4 017.7	4 004.9	4 238.6	4 349.3	4 404.9	4 458.9
O&M	1 301.0	1 111.9	793.9	811.6	815.6	820.1
Mark-up (Aurora) [1]	144.3	126.0	145.0	148.6	152.4	156.2
Distribution						
Return on Assets	530.5	559.0	552.8	548.9	550.4	621.7
Depreciation	282.5	291.2	298.3	265.6	271.0	301.4
O&M (Aurora)	2 064.4	2 150.7	1 534.6	1 573.0	1 612.3	1 652.6
Aurora mark-up (10% and 15%)	206.4	215.1	230.2	235.9	241.8	247.9
Aurora Retail Charge	42.9	42.9	43.8	49.3	49.4	49.4
Hydro Tasmania Own Costs	146.0	261.7	424.9	424.9	424.9	424.9
TOTAL COSTS	**10 127.7**	**10 837.6**	**9 881.9**	**10 226.2**	**10 385.1**	**10 512.0**

Note[1] - 10 per cent for 2005-06; 15 per cent for 207-08 to 2010-11.

Recent increases in diesel fuel prices have followed through to Hydro Tasmania's diesel fuel contract with KIPC, with the May 2008 price of diesel at $1.72 for King Island and $1.69 for Flinders Island (delivered).

For completeness, the Commission has considered the likely total costs arising from a diesel price in the order of $1.70 per litre, and escalated this by 2.5 per cent (real) from 1 July 2008. The total costs for the BSI with historical diesel prices for 2005-2008, and likely future diesel prices for 2008-09 onwards is shown in Table 3.45.

Table 3.45: Total cost (Real July 2007$) BSI with diesel fuel costs based on May 2008 prices

	Actual		Likely End of Year/Forecast			
	2005-06 $'000	**2006-07 $'000**	**2007-08 $'000**	**2008-09 $'000**	**2009-10 $'000**	**2010-11 $'000**
TOTAL COSTS	10 127.7	10 837.6	9 881.9	11 310.4	11 482.9	11 623.2

As can be seen from comparison of Table 3.44 and Table 3.45, at the May 2008 diesel price with KIPC and escalated by 2.5 per cent for future years, total costs for the BSI would be $1.1 million greater.

3.9 Efficient Cost of Supply – Findings

To estimate the efficient cost to supply on the BSI, the Commission has evaluated Hydro Tasmania's reported costs.

The Commission has accepted Hydro Tasmania's reported costs as the base for the efficient cost of supply on the BSI, and made some adjustments in line with the Commission's view as to the efficiency of operations.

- The Commission has removed the Aurora mark-up and substituted Aurora's retail costs with a benchmark retail cost to serve (using the mainland Tasmania retail benchmark).

- Hydro Tasmania did not provide a breakdown of the items included in its 'own costs' for delivering and managing services on the BSI, however the Commission understands that a portion of these costs relates to contract administration. The Commission considers that theoretically the operations on the BSI could be undertaken by one party without the need for contract administration services.

  Without a detailed breakdown of these costs, the Commission has made a preliminary estimate that 50 per cent of the costs relate to contract administration, and has removed these for the purposes of establishing an efficient cost to supply. It will conduct a more detailed analysis of these costs prior to the Final Report when it receives more detail from Hydro Tasmania.

- The Commission has also removed the mark-up attributable to Aurora as would be the practise in estimating total costs for a regulated monopoly service provided by a single supplier.

These revised estimates of total costs of supply based on May 2008 diesel fuel prices of $1.72 for King Island and $1.69 for Flinders Island are shown in Table 3.46. The Commission has assumed continuation of the rebate for the period in question (2005-06 to 2010-11).

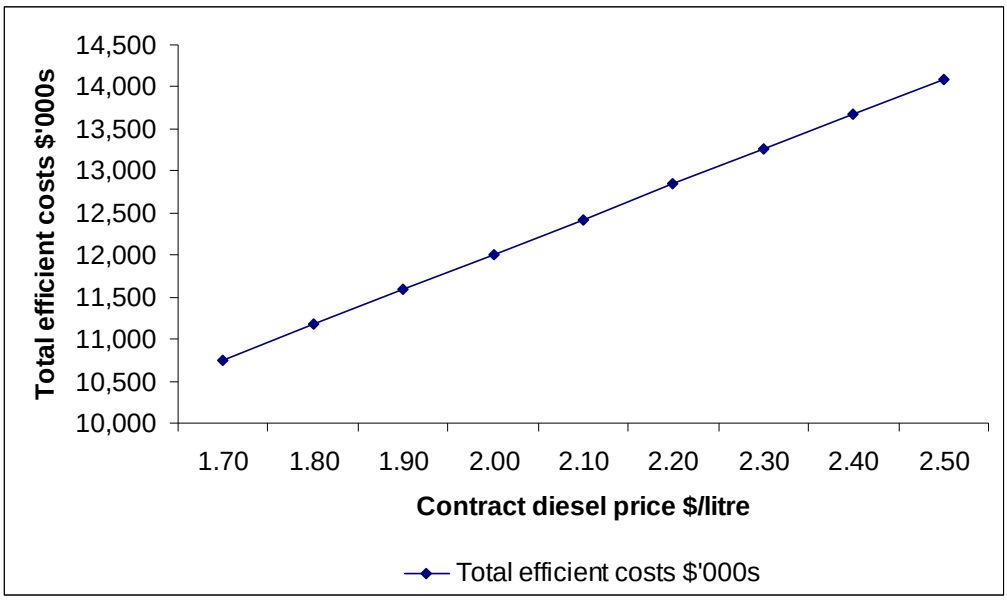
Table 3.46: Total efficient cost BSI (Real July 2007$)

	2005-06 $'000	2006-07 $'000	2007-08 $'000	2008-09 $'000	2009-10 $'000	2010-11 $'000
Total costs	10 127.7	10 837.6	9 881.9	11 310.4	11 482.9	11 623.2
Less Hydro administration	73.0	130.8	212.4	212.4	212.4	212.4
Less mark-ups attributable to Aurora	350.8	341.0	375.2	384.6	394.2	404.1
Less Aurora retail margin	42.9	42.9	43.8	49.3	49.4	49.4
Plus benchmark retail margin	318.6	318.6	319.4	337.3	333.9	330.5
Total efficient Costs	**9 979.7**	**10 641.4**	**9 569.9**	**11 001.4**	**11 160.8**	**11 287.8**

As can be seen from Table 3.46, for each year of analysis the total efficient cost is less than Hydro Tasmania's total costs, by an amount ranging from $0.15 million in 2005-06 to $0.3 million in 2010-11. Whilst the benchmark retail cost to serve used in calculating efficient costs is greater than Aurora's reported cost to serve, this higher cost is offset by the Aurora mark-up on operations and maintenance costs, which is removed in calculating the total efficient cost. Therefore the small difference remaining (between the total costs and total efficient costs) is mainly due to increases in Hydro Tasmania's 'own costs'.

The Commission has also undertaken analysis of the sensitivity of total efficient costs to the price of diesel. The results of the analysis are shown in Figure 3.3.

Figure 3.3: Sensitivity of total efficient costs to diesel fuel prices



The Commission has calculated that a change of $0.10 per litre in diesel fuel prices would add $0.4 million per annum to the costs of supply for the BSI, assuming the current diesel/wind generation mix is maintained.

Conclusion

The Commission has examined the costs reported by Hydro Tasmania for electricity supply on the BSI, as shown in this Chapter. However the Commission has had difficulty in ascertaining the costs of the services Aurora and Hydro Tasmania provide due to:

- the variability of costs reported between years and across and within categories, much of which Hydro Tasmania could not explain;
- changes in Aurora's accounting and reporting systems, including changes to how Aurora records and allocates costs, together with changes in organisational structures (as explained by Aurora), which has made comparison between years' difficult;
- the new contract arrangement between Hydro Tasmania and Aurora, which has made comparison to previous years operations and costs difficult; and
- inconsistency in reporting work against cost items, as admitted by Aurora and as questioned by Hydro Tasmania.

In light of the above and without more detailed information on cost breakdowns, the Commission has accepted Hydro Tasmania's reported costs for the provision of electricity supply on the BSI, notwithstanding that the Commission considers there are areas in which reporting and cost allocation procedures can be improved. Some of these accounting deficiencies are being addressed through the new contract arrangements with Aurora. These include consistent reporting against cost items for work undertaken on each Island, and closer scrutiny by Hydro Tasmania of Aurora's operations on the BSI.

The Commission has some further comments in relation to the efficiency of arrangements and incentives for efficient operations on the BSI in Chapter 5 which also includes a discussion of the regulatory and contractual arrangements on the BSI.

4 TARIFFS

4.1 Terms of Reference

The Terms of Reference for the Inquiry require the Commission to:

> Recommend tariff structures, including a stepped-block tariff, in accordance with proposed annual future Budget contributions, having regard to the BSI Electricity Pricing Principles and incentives for efficient energy use.

The BSI Electricity Pricing Principles (Pricing Principles) were developed to provide guidance to the future regulatory treatment of electricity supply arrangements on the BSI, in particular pricing.

The Pricing Principles form the basis for the development of the proposals contained in this Draft Report, in particular the criteria for determining and evaluating pricing and tariff structures. However, the Pricing Principles are not prescriptive and the Commission has sought clarification from Government to guide the Commission's interpretation of the Principles.

This Chapter outlines the Commission's interpretation and application of the Principles in developing its draft recommendations for tariffs to apply on the BSI.

4.2 Bass Strait Islands Electricity Pricing Principles

As previously noted, the Commission is required to have regard to the Principles in making its recommendations.

The Commission's interpretation and understanding of each of the Pricing Principles are discussed below.

4.2.1 Principles 1 and 2

Principles 1 and 2 state:

> Principle 1: The residents of the BSI will have access to affordable electricity consistent with a reasonable household standard of living.
>
> Principle 2: The Government will continue to support electricity tariffs on the BSI at a level commensurate with the social policy objective of Principle 1.

The Treasurer has advised that:

> The intention of Principle 1 is to ensure that the price of electricity on the BSI allows a customer to have a reasonable household standard of living by having access to basic goods and services.

> Principle 2 outlines that the Government will continue to provide an appropriate subsidy for electricity on the BSI to ensure a reasonable household standard of living.

The reference to 'household' in Principle 1 confirms that Principles 1 and 2 apply to households. Since there is currently a single tariff for the BSI, the subsidy has extended to all customers, business and residential. The Treasurer has confirmed that the subsidised tariff is intended to support domestic customers, but not necessarily business customers, and makes reference to the Working Group Final Report on that matter.

This suggests that the Commission is not constrained to recommending a single tariff, but could recommend a set of tariffs which distinguish between residential and business customers.

Residents and Non-residents

The current CSO Agreement requires Hydro Tasmania to provide a general electricity subsidy to 'residents' of the BSI. This has been interpreted by Hydro Tasmania (and given effect through the uniform tariff) as to apply to all customers regardless of whether they are a business or residential customer, and regardless of whether the customer is a permanent resident or occasional occupant (non-resident) of the connected premises.

The Commission has not considered non-resident customers as a separate class. The administration of tariffs that distinguish residents from non-resident customers would be complex. If Government did wish to confine the subsidy to residents, it could do so by requiring customers to certify the connection as a principal place of residence. This has not been explored and for the purpose of this draft report it has been assumed that all residential connections would be eligible for a subsidised residential tariff.

4.2.2 Principle 3

> Principle 3: The BSI electricity tariff will be consistent with other economic and environmental objectives.

In response to the Commission's request for clarification of Government's 'other economic and environmental objectives', the Treasurer has indicated that:

> It is desirable that any new tariff structure be designed such that it provides incentives to minimise the use of diesel generation and/or encourage more environmentally friendly forms of generation.

The Treasurer has further indicated that the tariff structure may employ price signals or other forms of incentives to encourage more efficient use of energy and limit the growth of the subsidy over time.

The Treasurer noted that large new loads are likely to have a significant impact on both the stability of the electricity system and the cost of supply. This was also dealt

with in the Working Group of Officials *Review of Electricity Arrangements on the Bass Strait Islands*.

In its Terms of Reference, the Government's Working Group of Officials was asked to identify how increased demand for electricity on the BSI above current generation capacity will be managed.

The Working Group of Officials commented that support for existing industry, new industry or substantive expansion of existing industry is better progressed through regional development mechanisms in order to deliver support in the most efficient way.

As detailed in the Working Group of Officials Final Report:[30]

> The principle is that large volumes of electricity should be related to the true costs of efficient supply. If Government assistance is warranted, then it should be targeted, and delivered in an efficient way, and not cause a large distortion towards electricity at the expense of other fuels.

In accordance with the above principle, the interpretation suggests that for consumption in excess of that required for a reasonable household standard of living, the price should be such that it does not encourage further use of diesel generation. Further, subsidies which are provided to support economic development on the BSI should be delivered explicitly and transparently as industry assistance, rather than indirectly through subsidised electricity tariffs.

4.2.3 Principle 4

> Principle 4: The regulatory and/or contractual arrangements for supply of electricity on the BSI will promote ongoing efficiency gains and least-cost supply solutions.

This principle is more relevant to the design of the contractual arrangements between Government and Hydro Tasmania than it is to the design of tariffs. Nevertheless, it reinforces Government's intention to create incentives for efficient energy supply on the BSI. The application of this principle is discussed in Chapter 5.

4.2.4 Principle 5

> Principle 5: The ongoing support for electricity tariffs on the BSI will be targeted to deliver the objectives in an efficient and sustainable manner, with costs balanced against other calls on public funds.

Normally when determining a tariff structure, a regulator will seek to ensure that customers face tariffs that reflect the 'efficient' costs of supply, so that the provider

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[30] Working Group of Officials, *Review of Electricity Arrangements on the Bass Strait Islands- Final Report*, February 2007, p.44.

is able to achieve a commercial rate of return if it is prudent and efficient in its investments and operations.

Due to the relatively high cost to supply electricity on the BSI, the cost reflective tariff (the tariff required to compensate Hydro Tasmania for the total costs incurred in supplying electricity) is high. In this instance, a cost reflective tariff would not achieve the objectives of the Government's Pricing Principles. The existence of the CSO better enables the competing objectives to be delivered.

The Government currently funds the BSI subsidised tariff from the consolidated fund.[31]

4.3 Tariff Design – Principles and Issues

The cost to supply different categories of customers can vary depending on the type of customer, the quantity of their consumption and their associated load profile. In principle, the structure of tariffs should reflect the cost of supplying different categories of customers. Cost reflective pricing satisfies a number of fundamental pricing principles, impacting both the supplier and customers:

- on the supply side, it ensures that supply businesses will cover their efficient costs without earning monopoly profits, and provides an incentive for the business to operate efficiently; and
- on the demand side, cost reflective pricing provides signals to consumers about the costs of electricity usage and promotes the efficient use of energy.

Due to significant investments in infrastructure required for electricity supply, variable charges are 'efficient' if set equal to the marginal cost of production, and a fixed charge is set to recover the shortfall between the revenue raised from the usage charge and the revenue needed to cover total efficient costs.

Setting price equal to marginal cost results in efficient allocation of resources because consumption occurs up to the point where the marginal cost of producing an additional unit is equal to the marginal benefit gained from its consumption.[32] That is, setting the variable component (energy rate) of the tariff equal to the long run marginal cost of supply is consistent with efficient pricing, such that prices signal the costs of providing services, including the costs of future supply augmentation.

In perfect markets, marginal costs would include all costs of production- including environmental costs. Due to the difficulties in estimating environmental costs, these

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[31] The Consolidated Fund receives all State taxation revenue, the majority of Commonwealth payments to Tasmania, territorial revenue and other classes of revenue, such as receipts from GBEs, State authorities and State Owned Companies. Funds may only be expended from the Consolidated Fund under the authority of an Act of Parliament.

32 *Water Tariff Structures Review, Final Report,* Essential Services Commission of Victoria, December 2007 (p.94).

have been ignored for this Draft Report. However, it is important to note that the current direction of the Commonwealth Government response to climate change is to introduce an Emissions Trading Scheme, and there is a real prospect of increases in the cost of fuels and, in turn, the cost of energy generated from fuels.

4.3.1 Application of the Pricing Principles- Residential Customers

A portion of a household's electricity use can be considered essential for living purposes, often termed as non-discretionary use, for which there are often few practical alternatives to electricity to supply. This includes lighting, and power for appliances such as refrigerators. It is debatable as to whether space heating and hot water are also non-discretionary, as this depends on the alternatives available for providing such services, and the cost effectiveness of employing such alternatives. Alternative fuels on the BSI for space and water heating, in particular wood, LPG and solar hot water, are already widely used, as discussed in Chapter 2.

Electricity for non-discretionary use warrants a pricing structure that enables customers relying on electricity affordable access (as articulated through the Pricing Principles). This is particularly important for low income households.

Setting the tariff for discretionary use equal to the cost of substitute energy sources is an appropriate means of signalling to residential customers the alternative energy sources available.

In considering how the Pricing Principles may apply to residential customers, the Commission proposes a stepped tariff, with:

- The energy rate for the first block of energy set at a rate commensurate to that on Mainland Tasmania, for a 'reasonable household standard of living'.

  Tariff 31 Light and Power is available to residents of mainland Tasmania with no restrictions on supply. It is primarily used for light and power and for occasional heating. The Commission proposes that Tariff 31 rates for the threshold consumption of a residential tariff satisfy Principles 1 and 2.

- The energy rate for consumption in excess of the threshold consumption be set equivalent to the cost of energy substitutes for hot water and space heating.

  The energy allowances for the threshold consumption and for consumption in excess of the threshold are discussed in the following sections.

4.3.1.1 Residential Tariff Blocks and Charges

Tariff 31 (Light and Power, mainland Tasmania) is the reference for the proposed BSI Residential Tariff charges for consumption up to a level regarded as delivering a 'reasonable standard of living'. Tariff 31 has a declining block tariff structure, as illustrated below:

Table 4.1: Mainland Tasmania Tariff 31 charges[33]

Charge element	Rate ¢
Daily charge (¢ per day)	65.762
First 500 kWh per quarter (¢ per kWh)	19.066
Next 1 000 kWh per quarter (¢ per kWh)	18.144
Remainder (¢ per kWh)	15.466

As discussed below, since it is proposed that the 'reasonable household standard of living' limit be set at 1 500 kWh per quarter, the third block rate of Tariff 31 is not relevant.

Consumption for a 'Reasonable Household Standard of Living'

On mainland Tasmania, some 6 per cent of customers take supply under Tariff 31 (Light and Power) only. These tend to be small customers who do not take supply under Tariffs 41 or 42 (hot water tariffs) since their hot water heaters do not meet the terms and conditions of supply for these heating tariffs.[34] Around 85 per cent of mainland Tasmanian residential customers take supply under a combination of Light and Power (Tariff 31) and Hot Water (Tariff 41) or Hot Water and Space Heating (Tariff 42). The remainder of customers use Off Peak (Tariff 61 or Tariff 62) supply in combination with the above tariffs.

The customer profiles adopted for the Tasmanian Energy Regulator's 2006-07 Energy Supply Industry Performance Report[35] are shown in Table 4.2 below:

Table 4.2: Tariff combinations in use by residential mainland Tasmania customers

Tariff combination	Annual Consumption		
	Low	Medium	High
Tariffs 31 and 41	4 500	7 500	11 500
Tariff 31 component	2 160	3 600	5 520
Tariffs 31 and 42	6 500	10 500	16 500
Tariff 31 component	2 275	3 675	5 775

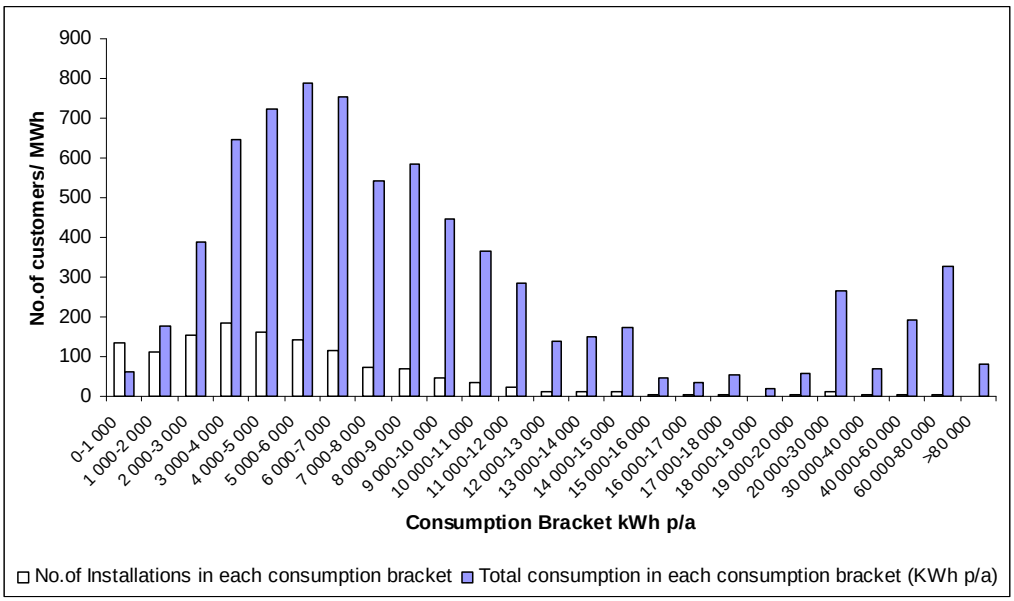
[33] Tariff 31 charges as at January 2008 plus 3 per cent, to replicate likely charges to apply from 1 July 2008.

[34] The Commission understands that Aurora is proposing to amend the terms and conditions of Tariff 41 to enable one small hot water unit per connection to be connected to this Tariff. However, this has yet to be approved by the Energy Regulator.

[35] *Tasmanian Energy Supply Industry Performance Report 2006-07*, Office of the Tasmanian Energy Regulator, December 2007, p.168.

Figure 4.1 shows the distribution of BSI residential customers, by annual consumption.

Figure 4.1: Installations and consumption for each consumption bracket, BSI residential customers

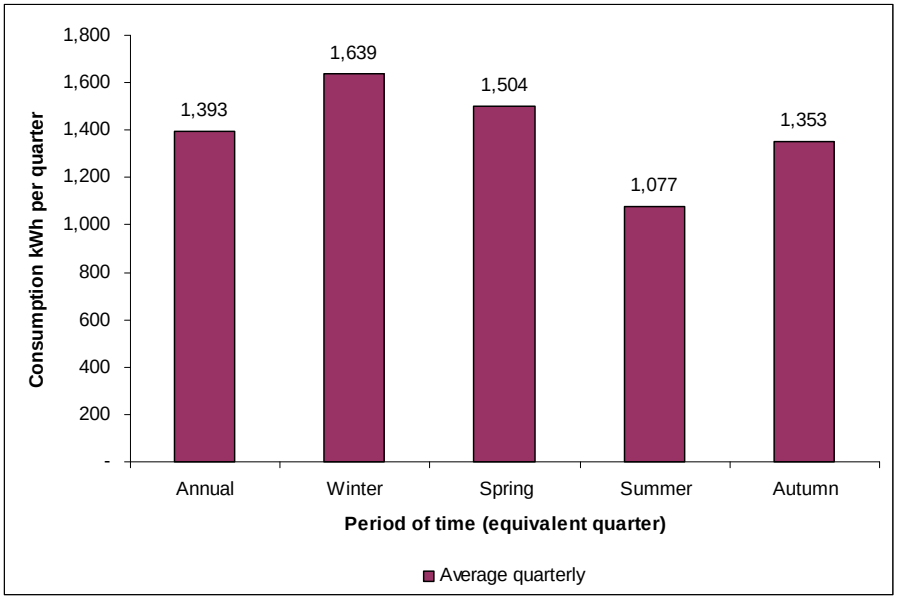


As can be seen from Figure 4.1, the majority of customers have an annual consumption of less than 10 000 kWh. There are a small number of very large consumers (consuming more than 30 000 kWh per annum) classified as residential. It is possible that these customers are misclassified, since there has been no reason, with a single tariff applicable to all customers, for accurate classification.

From examination of the consumption on mainland Tasmania, and considering the distribution of current BSI residential electricity usage, the Commission proposes that the annual consumption to be assumed for a 'reasonable household standard of living' be 6 000 kWh per annum (converted to a quarterly threshold of 1 500 kWh). Although this is less than the 'medium consumption' of mainland Tasmanian residential customers, 67 per cent of BSI residential customers use less than this quantity per annum.

As discussed in Chapter 2, there is considerable seasonal variation in metered electricity consumption. Figure 4.2 shows average residential consumption to be less than 1 100 kWh in the summer quarter, and just over 1 600 kWh during winter, with an average consumption of 1 393 kWh per quarter. If this is taken to be indicative of residential consumption for Light and Power, an allowance of 1 500 kWh per quarter is certainly adequate for a 'reasonable household standard of living' for most household's non-discretionary usage plus an allowance for occasional electrical space heating.

Figure 4.2: Seasonal residential consumption, BSI



Tariff Rates for Consumption in Excess of the Threshold

Two factors are considered in proposing the price for consumption in excess of the threshold residential allowance.

The first proposition is that the price should be such that electricity usage does not displace other fuels which would also meet customers' needs. Substitutes for electricity for hot water include wood, thermal solar and LPG, and for space heating wood and LPG are widely used. Although wood and solar thermal are comparatively low cost heating options, the Commission proposes that the cost of LPG for hot water and space heating be adopted as the 'reference price' (i.e. the price which would deliver energy needs at equivalent cost) for consumption in excess of the threshold consumption.

The second proposition is that the price of electricity in excess of the threshold residential allowance should be subsidy free, i.e. it should not be less than the marginal cost of production and delivery of electricity to the consumer. The Commission's proposal considers both of these propositions.

Estimated Cost of LPG Usage

LPG is available on both Islands. Comparative costs per delivered 45 kg cylinder are listed in Table 4.3.

Table 4.3: Comparative delivered costs of 45 kg LPG cylinders – Bass Strait Islands and Hobart

	Delivered Cost $
King Island	135.60
Flinders Island	191.00
Hobart	122.40

Source: Origin Energy, costs as at January 2008, except for Flinders Island- cost quoted at sale point, February 2008.

The price difference between King Island and Flinders Island arises because LPG is delivered in bulk to King Island, where up until now it has been shipped in cylinders to Flinders Island.

Origin Energy have supplied directly to King Island for a number of years but not Flinders Island, however Origin advises that that they are currently in the process of facilitating its own supply to Flinders Island, including shipping arrangements. Origin hopes to be able to offer a competitively priced product in the near future.

To determine the competitiveness of LPG to electricity on the BSI, the cost (cents per kWh) of electricity is compared to the cost of LPG delivered energy for water heating and space heating for each Island.

For existing LPG customers, the cost of LPG water heating and space heating is the running cost of LPG appliances, given their efficiency and the current price of LPG.

The actual running costs will also depend on many other factors such as the local climate, the size of the space being heated, house design, thermostat settings and operating times. Also, gas heating appliances vary widely in their efficiency, not only between types but also amongst models within each type. A high efficiency and average efficiency model of a gas water heater and gas space heater are given here for comparative purposes, with indicative efficiency of each model as published.

Table 4.4: Comparison of LPG and electricity delivered energy

	Electric water heating and space heating ¢/kWh	LPG water heating Instantaneous 5 Star[36] ¢/kWh	LPG water heating Instantaneous 3 Star ¢/kWh	LPG space heating Flueless (high efficiency) 5.8 Stars[37] ¢/kWh	LPG space heating Flued 2.5 Stars ¢/kWh
King Island	22.17	23	27	24	31
Flinders Island	22.17	33	38	34	43

The nominal efficiency of electric appliances is assumed to be 100 per cent because all available energy is effectively converted to heat. As shown in Table 4.4, given the current tariff, the running cost for electric hot water and space heating systems for BSI residents is 22.17 cents per kWh.

In comparison, at January 2008 LPG cylinders prices and energy capacity of a 45 kg cylinder[38], the running cost of LPG water heating ranges from 23 cents per kWh for

[36] George Wilkenfeld and Associates Pty Ltd, *Estimated Household Water Heater Energy Use, Running Costs and Emissions, Victoria,* May 2005, P.11.

[37] Star ratings of LPG space heaters obtained from AGA Product Directory – February 2008 Edition; efficiency inferred from Energy Efficient Strategies, *Appliance Energy Consumption in Australia: Equations for Appliance Star Ratings,* April 2005, updated 2007, p.11.

[38] A full 45 kg LPG cylinder contains the equivalent of 630 kWh of energy, http://www.sedo.energy.wa.gov.au/pages/emissions.asp.

a 5 Star efficiency rated instantaneous water heater, to 27 cents per kWh for a 3 Star rated instantaneous water heater, on King Island.[39]

For the same water heaters, at the January 2008 higher price of LPG cylinders on Flinders Island, the running costs of LPG water heating is between 33 cents per kWh and 38 cents per kWh.

For LPG space heating, King Island residents face costs ranging between 24 cents per kWh for a flueless 5.8 Star efficiency rated heater, to 31 cents per kWh for a 2.5 Star rated flued space heater. Due to the current higher costs of LPG on Flinders Island, the equivalent units cost between 34 and 43 cents per kWh.

For new customers, the cost of LPG includes the capital cost and installation cost of the unit, and running costs (including fuel), over the lifetime of the unit.

The cost of a standard gas hot water system (capable of delivering 16 litres of hot water per minute) is around $995, and an additional $700 for installation, giving an approximate total of $1 700.[40]

The cost of a standard gas space heating unit is around $1 500 and up to $400 for installation, giving a conservative total of $1 900. Twelve years is the average lifetime of star rated appliances before they need to be replaced.

Table 4.5 displays the capital costs and lifetime costs of gas water heaters and space heaters for each of the Islands given estimated purchase and installation costs, efficiency of the appliances, and current LPG prices on each Island.

If the price of electricity is to be set equivalent to the cost of LPG for similar use, the total cost of electricity supply should be equivalent to the total cost of LPG supply, including the capital cost of the appliance in each case. In principle, the ownership costs of the electrical appliance should be deducted from the lifetime cost shown in Table 4.5 above to derive an equivalent energy price.

Due to the high efficiency of gas instantaneous water heaters, the cost of LPG water heating, including capital costs, is 29 cents per kWh of energy output.

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[39] Most household gas hot water systems in use on King Island are instantaneous gas water heaters (IEMC, Bass Strait Islands – Feasibility Study of Solar Domestic Hot Water Systems, September 2003, p.19).

[40] SFM Environmental Consultants, *Bass Strait Islands Solar Hot Water Trial*, Final Report to the Office of Energy Planning and Conservation, February 2006.

Table 4.5: Lifetime costs for water heating and space heating for BSI residential customers, January 2008 prices

	Electric water heating ¢/kWh[41]	LPG water heating Instantaneous 5 Star[42] ¢/kWh	LPG water heating Instantaneous 3 Star ¢/kWh	LPG space heating Flueless (high efficiency) 5.9 Stars)[43] ¢/kWh	LPG space heating Flued (mid-efficiency) 4.2 Stars ¢/kWh
King Island	26	29	33	39	40
Flinders Island	26	39	44	48	53

For hot water heating, the Commission has estimated ownership cost of an electric hot water installation to be approximately 4 cents per kWh. On this basis**,** the electricity price should not be less than the price equivalent to LPG running costs, of 29 to 39 cents per kWh for high efficiency appliances, and 33 to 44 cents per kWh for low efficiency appliances. On this basis, an equivalent price of 29 cents per kWh would be reasonable for electrical hot water.

For space heating, the capital cost of an electrical appliance is very low, eg for simple plug-in heaters. Thus the relevant LPG benchmark price for space heating would be in excess of 39 cents per kWh, as shown in Table 4.5.

Cost of Production and Delivery of Electricity

The second proposition referred to above is that the price for electricity consumption in excess of the threshold residential allowance should be not less than the cost of production and delivery of electricity to households. This could be either the long run cost of production, which would include an allowance for the capital cost of generating plant, or the short run marginal cost which would include the cost of fuel, some maintenance costs related to generator operations, and an allowance for losses in delivering electricity through the distribution system.

Fuel Costs

In its Submission to the Inquiry, Hydro Tasmania provided the Commission with historical and forecast diesel fuel prices for generation on King Island and Flinders Island, including its assumption of 2.5 per cent per annum increase in diesel prices.

However in May 2008, diesel fuel prices had increased substantially to $1.72 for King Island and $1.69 for Flinders Island (delivered). The cost efficiency for each

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[41] Average unit costs obtained from http://www.warm.com.au/pick_a_topic/hot_water/electric_hot_water.html, installation costs assumed to be similar to gas water heater installation costs.

[42] George Wilkenfeld and Associates Pty Ltd, *Estimated Household Water Heater Energy Use, Running Costs and Emissions, Victoria,* May 2005, P.11.

[43] Star ratings of LPG space heaters obtained from AGA Product Directory – February 2008 Edition; efficiency inferred from Energy Efficient Strategies, *Appliance Energy Consumption in Australia: Equations for Appliance Star Ratings*, April 2005, updated 2007, p.11.

Island under the previously assumed prices and the current fuel prices with a 2.5 per cent increase for future years is listed in Table 4.6.

Table 4.6: Diesel fuel costs on the BSI, (Real July 2007$)

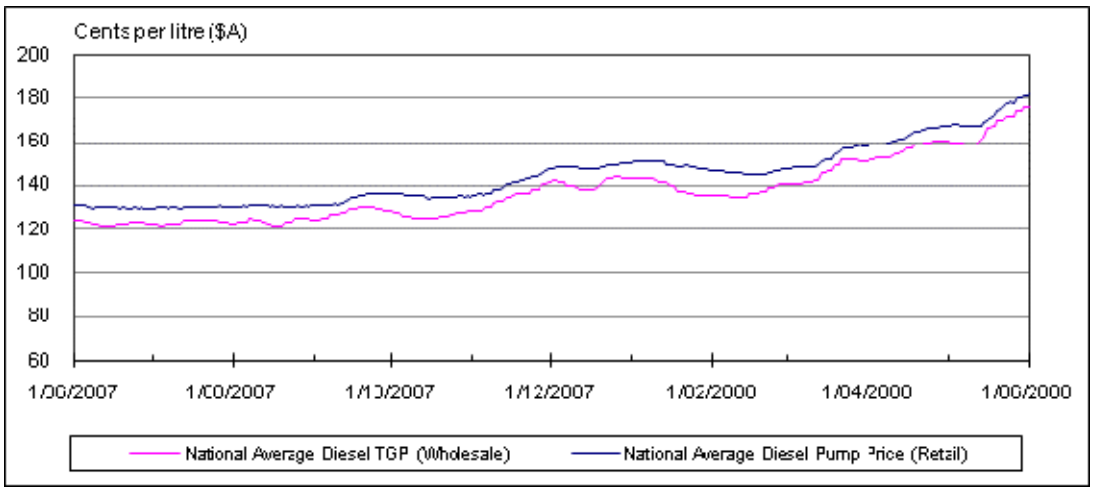
	Actual		Forecasts			
	2005-06	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**
King Island						
Cost of fuel $/litre	1.35	1.38	1.42	1.45	1.49	1.53
Cost of fuel $/litre (after rebate)	0.96	0.99	1.02	1.04	1.07	1.10
Unit cost c/kWh previous diesel price	25.48	27.09	27.77	28.46	29.18	29.91
Unit costs c/kWh **May 2008** diesel price	-	-	35.91	36.81	37.73	38.67
Flinders Island						
Cost of fuel $/litre	1.30	1.37	1.41	1.44	1.48	1.51
Cost of fuel $/litre (after rebate)	0.93	0.98	1.01	1.03	1.06	1.09
Unit cost c/kWh previous diesel price	24.73	26.82	27.49	28.18	28.88	29.61
Unit cost c/kWh **May 2008** diesel price	-	-	35.26	36.14	37.05	37.97

In comparison to the cost of diesel under the previously assumed diesel price, the May 2008 price of diesel increases the cost of diesel generation by more than 8 cents per kWh for each Island, or 30 per cent.

However, the assumption that diesel prices will increase by 2.5 per cent from 2006-07 prices is likely an underestimation, given the recent escalation in diesel prices.

The increase in the wholesale price of diesel (called the Terminal Gate Price or TGP) over the last year is shown in Figure 4.3, including a comparison to the retail pump price. The TGP is probably more relevant to the BSI as diesel is delivered in bulk to the Islands, and not purchased at the retail pump price.

Figure 4.3: Comparison of national average Terminal Gate Price with Pump Price of diesel[44]



As can be seen from Figure 4.3, in the last year the TGP has increased from approximately $1.30 per litre to the current level of almost $1.80 per litre, an increase of almost 40 per cent, with most of the increase occurring in the last three months.

The Commission is mindful of the likelihood of sustained high diesel prices, and the effect that this will have on the cost of generation on the BSI.

Ownership Costs

The marginal cost of additional generation must be added to the estimate of the short run marginal cost (SRMC) of supply to develop an estimate of the long run marginal cost (LRMC) of supply. For this exercise, the ownership component has been estimated from Hydro Tasmania's replacement capital cost for the diesel generation option that best matches the conversion efficiency of the current diesel generation (litres per MWh produced). These costs are shown in Table 4.7.

Table 4.7: Ownership costs, diesel generation assets

	$ per MW installed capacity $'000	Annual Ownership Costs $'000[1]	Ownership costs c/kWh
King Island	531.3	50.4	1.26
Flinders Island	1 714.3	642.5	4.06

Although it is arguable that the marginal cost would be less than this desk-top average cost of new generation, the amounts are not so material that a more refined estimate is justified. It is also arguable that other technology may provide a lower cost solution, but this desk-top study does not allow this additional analysis.

[44] http://www.aip.com.au/pricing/facts/Facts_about_Diesel_Prices.htm

Estimates of Short Run Marginal Cost and Long Run Marginal Cost

Table 4.8 lists the Commission's estimates of SRMC and LRMC for each of the Islands.

Table 4.8: Short run and long run marginal costs on King Island and Flinders Island

	King Island		Flinders Island	
	2007-08 Average	**May 2008**	**2007-08 Average**	**May 2008**
Fuel cost ($/litre)[1]	1.42	1.72	1.41	1.69
Marginal cost of fuel (¢/kWh)	37.40	48.37	37.03	47.50
Operating & Maintenance (¢/kWh)	1.82	1.82	3.21	3.21
SRMC Generated[2] (¢/kWh)	39.23	50.19	40.24	50.70
Distribution losses (%)	12.40	12.40	11.90	11.90
SRMC Delivered (¢/kWh)	44.09	56.41	45.03	56.74
Marginal Generation Ownership Cost (¢/kWh)	1.26	1.26	4.06	4.06
LRMC delivered (¢/kWh)	45.35	57.67	49.08	60.80

Notes: [1] 2007-08 average is based on net fuel cost of $1.02 per litre for King Island and $1.01 for Flinders Island as advised by Hydro Tasmania in their Submission to the Inquiry; May 2008 fuel cost is based on May 2008 net fuel prices as advised by Hydro Tasmania. Fuel efficiency is 3.67 litres per kWh.

[2] Based on 25 per cent of total annual direct diesel generator maintenance costs for each Island, and current diesel generation output.

On the basis of Hydro's estimates of 2007-08 fuel costs, and the Commission's estimates of generation output, operation and maintenance costs and estimated losses, the estimated delivered short run marginal cost for 2007-08 is 44.09 cents per kWh for King Island, and 45.03 cents for Flinders Island, the difference between the Islands attributable to differences in price of delivered fuel.[45]

The cost of fuel however is the most significant input to the calculation of marginal costs.

Net fuel costs have recently increased by 21 per cent over the assumed price for 2007-08 on King Island and by 20 per cent on Flinders Island. At May 2008, diesel prices had escalated substantially above the anticipated 2007-08 average. At May

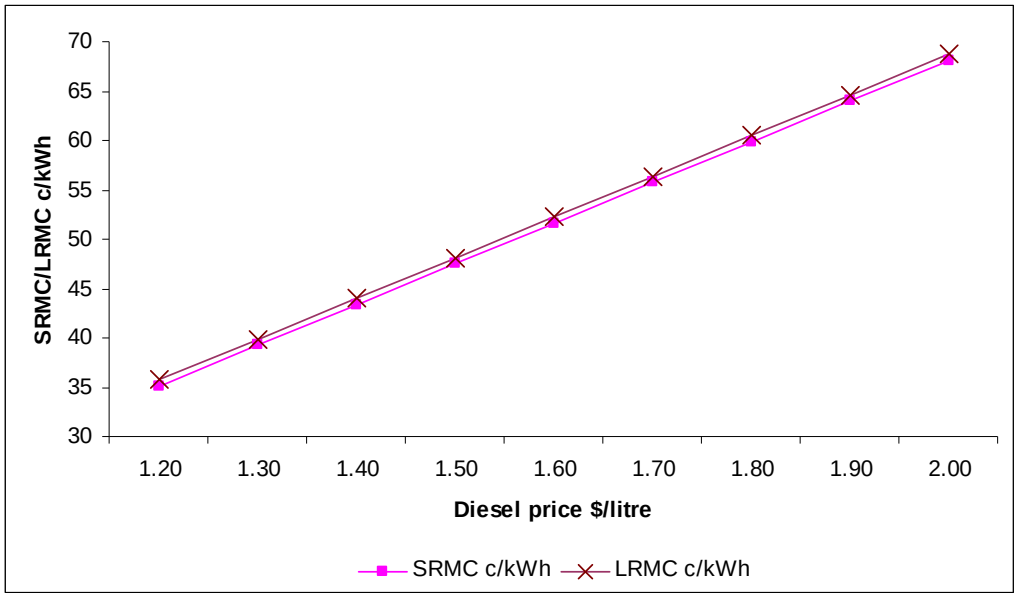
[45] Marginal operating and maintenance costs and capital costs may also differ between the Islands, but since fuel is the dominant cost, it has been assumed that other costs contributing to SRMC and LRMC are similar.

2008 prices, the estimated SRMC is 57.67 cents per kWh for King Island and over 60 cents per kWh for Flinders Island.

Including an allowance for the capital cost of generating plant, the long run marginal cost is 45.35 cents per kWh for King Island and 49.08 cents per kWh for Flinders Island at 2007-08. At recent fuel prices, LRMC is 57.67 for King Island and 60.80 for Flinders Island.

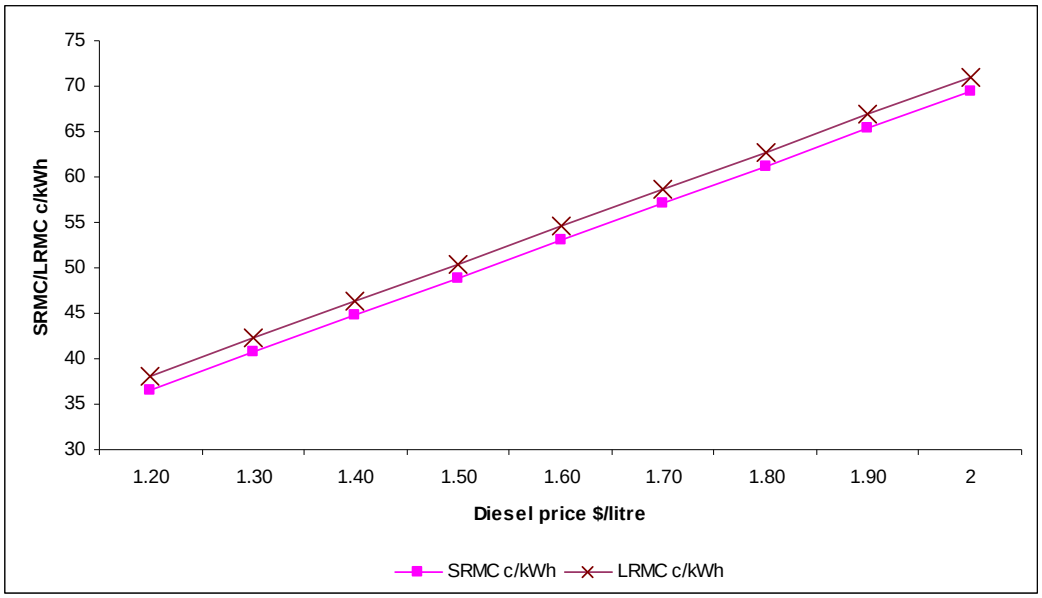
The sensitivity of SRMC and LRMC to the delivered cost of fuel is shown in the following chart.

Figure 4.4: SRMC & LRMC sensitivity to diesel fuel costs, King Island[46]



[46] Price of diesel under contract with KIPC. Price is before rebate.

Figure 4.5: SRMC & LRMC sensitivity to diesel fuel costs, Flinders Island[47]



As can be seen in Figure 4.4 and Figure 4.5, each 10 cent per litre increase in the price of diesel leads to an approximate 4 cent per kWh increase in the SRMC and LRMC of generation for each Island.

4.3.1.2 Residential Tariff- Proposal

The Commission's proposed Residential Tariff is below.

Figure 4.6: BSI Residential Tariff arrangement, proposal

Charge Element	Rate ¢
Daily charge (¢ per day)	65.762
First 500 kWh per quarter (¢ per kWh)	19.066
Next 1 000 kWh per quarter (¢ per kWh)	18.144
Remainder (¢ per kWh)	30.000

The Commission proposes that a BSI Residential Tariff be set to provide a 'reasonable household standard of living' by a stepped tariff, with consumption up to 1 500 kWh per quarter set at Tariff 31 rates, as shown in Figure 4.6.

The price for consumption in excess of this threshold should take account of the cost of substitutes, estimated to be 29 cents per kWh, and the costs of generation and delivery estimated to be more than 44 cents per kWh based on historical fuel prices and trends, and more than 55 cents per kWh at May 2008 fuel prices.

[47] Price of diesel under contract with KIPC. Price is before rebate.

For prices to reflect the cost of production, the energy rate for consumption in excess of the threshold would need to double. Whilst this would have little effect on most households (because most households consume less than 1 500 kWh per quarter) there could be a significant impact on the few large residential users. Further, as discussed later in the Chapter (see Section 4.3.2.1), for practical reasons it is sensible to align the Residential Tariff and Business Tariff as such an increase would have a massive impact on business users.

Whilst a Step 3 energy rate of 44 cents per kWh (double the current rate) would satisfy the principles of marginal cost pricing, its introduction would have a significant and sudden adverse impact on customers and for that reason is not proposed.

LPG prices are also likely to escalate in line with diesel and other fuel prices. Thus it is also likely that the calculated benchmark price of 29 cents per kWh for hot water and 39 cents per kWh for space heating may be less than the long term trend price. Nevertheless, there is a need to balance the impact of prices which accord with the Pricing Principles and the impact of a price shock from moving to long term prices. For this reason, the Commission proposes a Step 3 energy rate of 30 cents per kWh, for consumption in excess of the threshold (1 500 kWh per quarter).

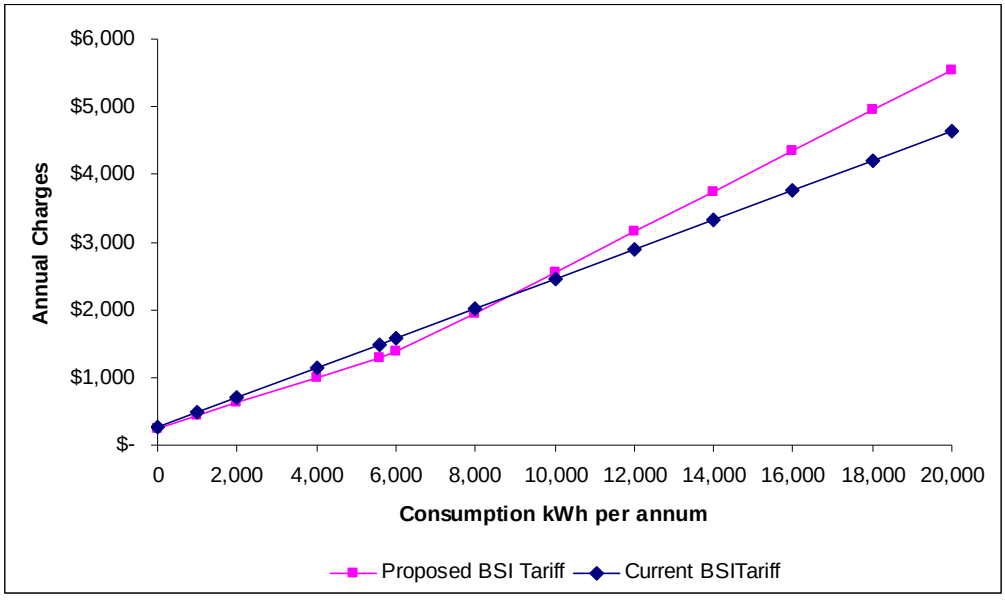
This proposal also recognises Principle 5 and the Government's commitment of CSO funding to deliver a subsidy to BSI residents.

4.3.1.2.1 Customer Impact Analysis – Residential Sector

Compared to the current fixed and variable charges of Tariff 51, the recommended tariff structure delivers significant savings to the majority of residential customers.

Figure 4.7 shows the comparative path of annual charges applicable for the current tariff and proposed tariff for consumption up to 20 000 kWh per annum.

Figure 4.7: Path of annual charges of current and proposed BSI tariff structure

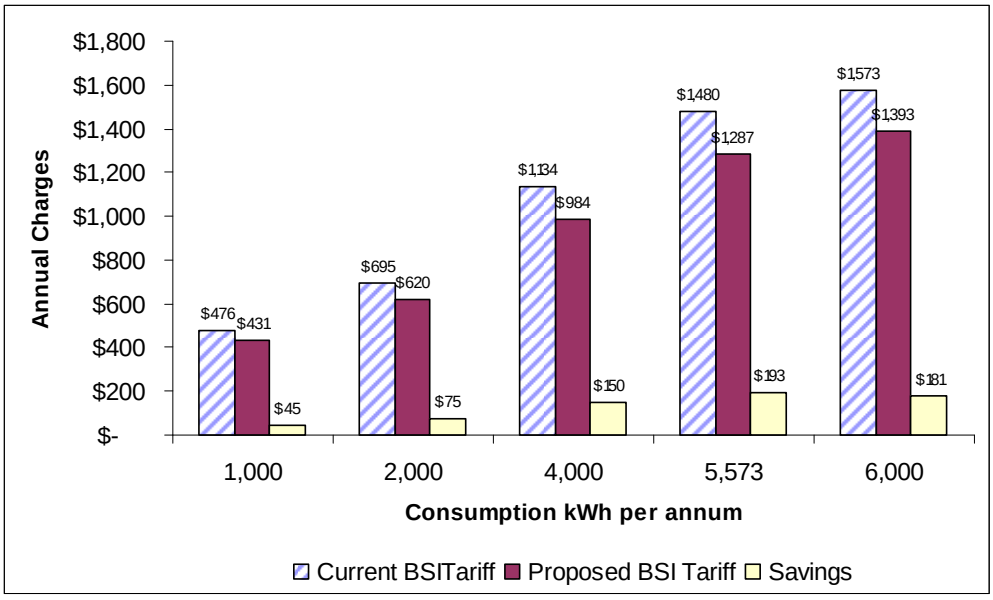


The cross-over point where the proposed tariff arrangement become more expensive for residential customers relative to the current arrangement is for consumption greater than 2 203 kWh per quarter (8 812 kWh per annum). In 2006-07, 1 134 residential installations recorded less than 8 812 kWh per annum, accounting for more than 85 per cent of all residential installations.

Therefore, at least 85 per cent of residential installations would face lower annual electricity charges under the proposed tariff arrangements than under the current arrangements.

An analysis of the savings of typical customers is shown in Figure 4.8.

Figure 4.8: Comparison of current Tariff 51 and proposed tariff for residential customers



As shown in Figure 4.8, the proposed tariff delivers savings of between $45 per annum for a customer consuming 1 000 kWh per annum (an average of 250 kWh per quarter); to $181 per annum for customers consuming 6 000 kWh per annum (1 500 kWh per quarter).

The charges faced by the average residential installation (recording 5 573 kWh per annum or an average of 1 393 kWh per quarter) would be $193 less per annum than under the proposed arrangements (on average, $48.25 less per quarter).

The Commission has also estimated the seasonal variation in BSI residential consumption, using customer data from the Aurora BSI customer database, to determine the impact that the proposed tariff arrangement would have on customers in different periods throughout the year.[48]

[48] More detail regarding seasonal variation can be found in Chapter 2.

The proportion of total residential consumption applicable to each of the seasonal periods, and the associated average consumption for each period, is shown in Table 4.9.

Table 4.9: Seasonal variation of BSI residential consumption

	Annual residential consumption	Winter (29%)	Spring (27%)	Summer (19%)	Autumn (24%)
Total residential consumption MWh p/a	7 372.764	2 168.33	1 989.91	1 425.155	1 789.370
Average consumption kWh p/q	1 393	1 639	1 504	1 077	1 353

Residential consumption during the winter months is higher due to increased heating and lighting needs, with an average consumption of 1 639 kWh over the winter quarter compared to average annual quarterly consumption of just under 1 400 kWh. Consumption is the lowest during summer, with 1 077 kWh for the quarter.

Under the new tariff arrangements, the winter quarterly bill for the typical residential customer with consumption of 1 639 kWh per quarter would be $19.00 less than under the current tariff structure.

Pensioner Concession Customers

As well as a subsidy on the rate of energy as currently applies to all BSI customers, the BSI CSO provides for concessions to eligible Pensioner and Health Care Card Holders (HCCHs). The concession is the same rate as applies on mainland Tasmania (a discount of 82.3 cents per day off fixed charges). Average consumption recorded for Pensioner Concession customers is lower than the average consumption of all residential installations. This is depicted in Figure 4.9.

Figure 4.9: Consumption of BSI residential and Pensioner Concession Customers

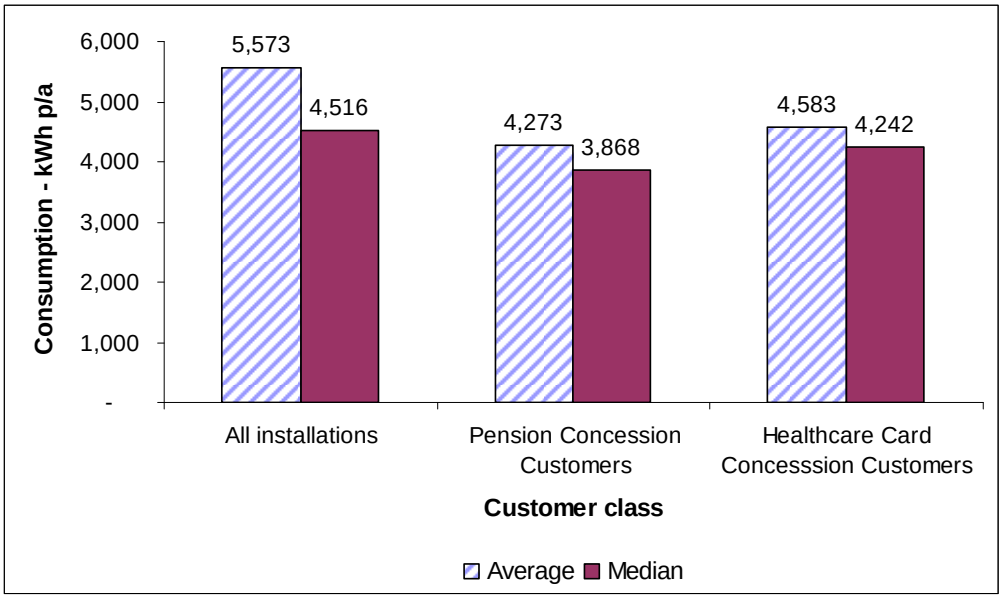
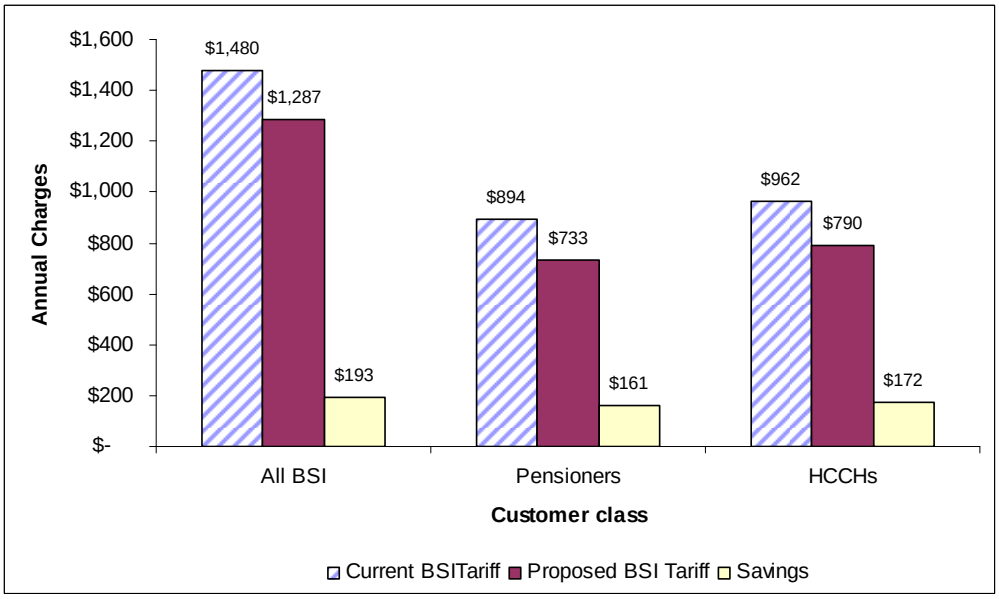


Figure 4.10 depicts the savings that would be realised by BSI Pensioner Concession customers under the proposed BSI Residential Tariff model, relative to current arrangements, in comparison to the average BSI residential customer.

Figure 4.10: Annual charges BSI residential and Pensioner Concession customers



Under the proposed tariff arrangements the average pensioner in receipt of a Pensioner Concession would save an average of $161 per annum (approximately $40 per quarter), and the average HCCH in receipt of a Pensioner Concession would save an average of $172 per annum, relative to the current arrangement. Savings realised by customers in receipt of a Pensioner Concession are lower due to implied lower consumption.

Revenue from Residential Tariff Proposal

Table 4.10 shows the revenue that would be generated from the proposed residential tariff, compared with the current tariff if applied to sales estimated for 2008-09.

Table 4.10: Annual revenue from current and proposed tariffs

	Annual Revenue $'000
Current Tariff 51	1 957.6
Proposed Residential Tariff	1 919.0

4.3.2 Application of the Pricing Principles- Business and Industrial Customers

As discussed in Section 4.2.2, the Pricing Principles and advice from Government suggest that the energy rates charged to business customers should be set at the cost of supply, with any subsidies for business to be delivered through industry assistance measures. Thus it would be open to the Commission to recommend tariffs for business that recover the full costs of supply.

In conjunction with the requirement to consider incentives for efficient energy use, the Commission considers a cost reflective tariff for electricity would be appropriate to encourage efficient use of electricity.

For existing business customers, the relevant marginal cost of supply is the short run marginal cost, since any reduction in demand would reduce fuel and maintenance costs, but there is not likely to be such a significant reduction in load from energy efficiency and fuel substitution that it would avoid the need for replacement of the current generation capacity. The short run marginal cost described earlier is estimated to be between 56 and 57 cents per kWh (based on May 2008 diesel prices).

If the Commission applied the Pricing Principles proposal that prices should represent efficient cost in economic terms, the energy rate for Business Tariffs should be set at a minimum of 56 cents per kWh. Clearly, the impact on larger business customers would be dramatic and, although justified, could lead to substantial costs and potentially serious adverse economic consequences.

Conversely, maintaining prices significantly below the cost of supply does not encourage users to seek the most efficient means of meeting energy needs- whether by electricity, alternative fuels or by cost-effective energy conservation measures.

Noting the Government's commitment to providing subsidies on the BSI and recognising the impact on customers of significant increase in prices, the Commission proposes an energy rate equal to the top residential energy rate of 30 cents per kWh.

However, for significant growth in load for example by the addition of a new industrial load, additional generation capacity and infrastructure would be required and charges should reflect these long run marginal costs.

Thus, the Commission proposes to limit access to the BSI Business Tariff to existing business customers. New large loads or significant increases to existing loads in excess of a nominated business limit should be charged at the long run marginal cost, including an allowance for additional infrastructure in generation and the electricity supply network. Such customers should be supplied under contract, rather than a tariff, and industry assistance also arranged in accordance with Government's industrial development policies and priorities.

4.3.2.1 Tariff Design - Business Customers

In recommending an appropriate tariff for businesses, the Commission has had regard to the requirement to consider proposed annual future budget contributions (delivered through the CSO) and incentives for efficient energy use.

It is proposed that the energy rate for the Business Tariff be set at 30 cents per kWh, consistent with the Step 3 energy rate for residential customers. Since the alignment of the Step 1 and Step 2 residential rates with Tariff 31 is intended to provide BSI households with access to 'affordable electricity consistent with a reasonable household standard of living', the Principles do not require an additional subsidy for the first blocks of a Business Tariff.

However, there is currently no discrimination between residential and business tariffs and it is highly likely that some customers in the customer data base have been misclassified. Many properties on the BSI would be mixed-use. In these circumstances implementation of separate tariffs would require separate meters for business and residential customers and in many cases rewiring of electrical installations may be required to separate residential metered circuits from business metered circuits.

This transition cost could be avoided if a single tariff, reflecting the proposed BSI Residential Tariff, was adopted for all customers. The Commission estimates that the revenue loss from allowing the residential reduced rates for the first 1500 kWh per quarter for business customers (consuming more than 1 500 kWh per quarter) would be approximately $149,000 per annum. The larger business customers would still face the higher rate for their marginal usage, and the loss of efficiency would be small and outweighed by the benefit of simplicity and comparative ease of implementation.

Thus while there are grounds, in accordance with the Pricing Principles, for discriminating between business and residential customers, the same tariff is proposed for both, for the reasons outlined above.

4.3.2.2 Conclusions and Draft Recommendations- Business Tariff

The Commission is proposing that the BSI Business Tariff be aligned with the proposed BSI Residential Tariff, as shown in Table 4.11.

Table 4.11: BSI Business Tariff arrangement, Proposal

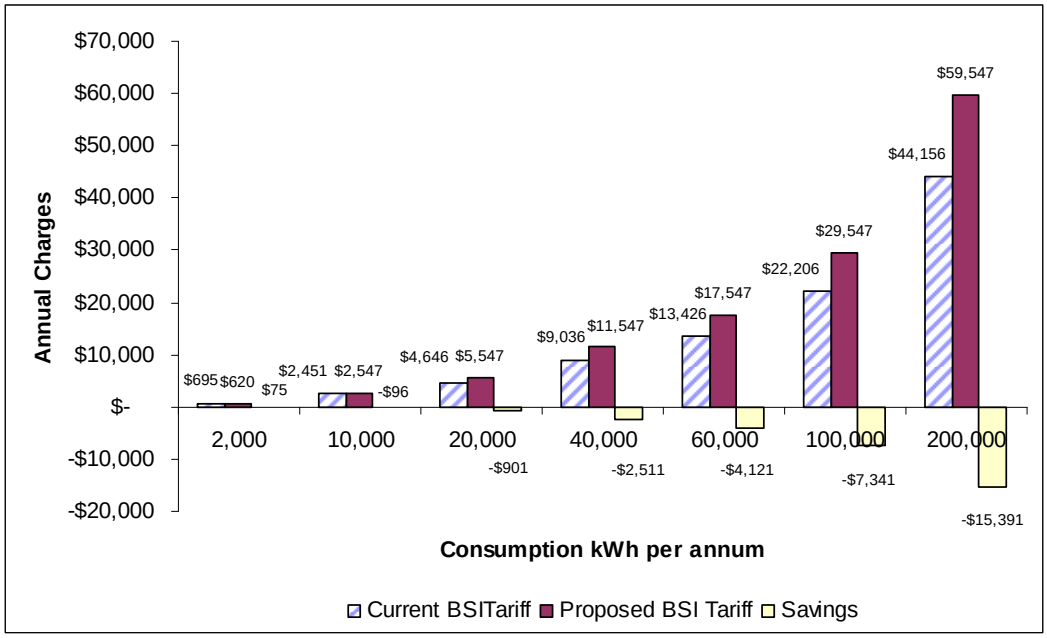
Charge element	Rate ¢
Daily charge (¢ per day)[1]	65.762
First 500 kWh per quarter (¢ per kWh)[1]	19.066
Next 1 000 kWh per quarter (¢ per kWh)[1]	18.144
Remainder (¢ per kWh)	30.00

[1] Based on likely Tariff 31 residential charges for 1 July 2008

Customer Impact Analysis – Business Sector

Figure 4.11 shows the impact of the proposed Tariff Structure on a range of BSI business customers.

Figure 4.11: Impact of proposed BSI tariff structure on business customers



As with residential installations, business customers consuming 8 812 kWh per annum or less will realise savings under the proposed tariff arrangement. In 2006-07, 324 business installations (75 per cent of all business installations) recorded consumption less than this amount, therefore 75 per cent of business installations would see savings from the proposed tariff.

Consumption of the average BSI business installation (excluding the three largest installations) is 14 382 kWh per annum. At the current tariff, annual charges would be in the order $3 413. Under the new tariff proposal, annual charges would be $3 861, an increase of $448 (13 per cent over current annual charges).

For increasingly larger consumers, the proposed tariff has an increasing impact on annual costs. For businesses consuming around 100 000 kWh per annum, costs are likely to increase by around $7 340, an increase of 33 per cent. In 2006-07, six

customers on the BSI had consumption between 100 000 and 200 000 kWh per annum, two of these being classed as residential.

For businesses with consumption of 200 000 kWh, increased annual charges from the proposed tariff arrangements would be approximately $15 390 greater, which is 35 per cent above current tariff arrangements. In 2006-07, seven customers on the BSI had consumption between 200 000 and 300 000 kWh per annum, one of these being classed as residential.

It is also worth keeping in mind that in real terms, electricity prices on the BSI have been constant since January 2002.

Customer Impact Analysis – Industrial Sector

Under the proposed tariff structure, the two largest installations (with consumption of approximately two GWh each per annum) could expect an increase in annual charges of around 36.5 per cent. The Commission acknowledges the potential significant impact of the proposed arrangements on large business and Industrial customers, and it is important to keep in mind that the Commission has been asked to recommend a tariff structure only, with Government to decide the final prices.

In developing its recommended tariff structure the Commission has been constrained by its findings of the efficient cost to supply electricity on the BSI and the constraints of the subsidy as advised by Government.

Business and Industry Assistance

Although the Commission's proposals would result in significant increases in annual cumulative charges for the larger business customers, it is important to note that at a delivered fuel cost of $1.72 and $1.69 for King Island and Flinders Island respectively (May 2008 prices), there would be an annual shortfall of approximately $1.2 million for 2008-09 before fuel and minimal operating costs are covered. The Commission is aware that any significant changes to the tariff structure could have significant customer impacts, especially if businesses have made certain investment choices based on the current tariff structure, and for this reason the Commission has proposed a moderate increase.

The Working Group of Officials Final Report commented that support for existing industry, new industry or substantive expansion of existing industry is better progressed through regional development mechanisms in order to deliver support in the most efficient way.

In his 1999 Investigation, the Regulator suggested that Government assistance in developing a program of energy audits and promoting the use of alternative energy technologies may be more cost effective, both to industry and Government, than continuing to provide the current subsidy on electricity consumption.

The Government may wish to consider requiring existing businesses and/or new businesses setting up on the BSI, above a certain size, to undergo an energy audit in order to be entitled to the subsidy.

The proposed increase in energy rates would add additional incentive for business to explore energy efficiency opportunities and alternatives. There may also be benefits for business and Government to consider sectoral energy efficiency studies (for example targeted to the dairy sector) and programs in addition to individual business assessments.

New Customers

Satisfying supply requirements of large new customers will likely require augmentation to the generation system and may also require augmentation of the distribution system. It is therefore appropriate that any new large customers face an energy price reflective of the long run marginal cost of supply, including the costs of future supply augmentation.

In addressing its Terms of Reference, the Working Group of Officials was asked to identify how increased demand for electricity on the BSI above current generation capacity would be managed. In response, the Working Group recommended that the supplier has an obligation to augment generation capacity efficiently for normal endogenous growth, and that new connections with provision to take capacity over 5 per cent of installed system firm capacity would be expected to negotiate a power purchase agreement with the supplier (Hydro Tasmania).

Further, the supplier would be required to offer a commercial (cost reflective) power purchase contract, ensuring efficient pricing of electricity for new large load, which would likely require supply augmentation. If no agreement can be reached, the customer would be entitled to supply itself, or find another party willing to supply it, subject to satisfactory connection arrangements.[49]

The Commission's proposal to limit access to the Business Tariff to existing customers, and new customers consuming less than 300 MWh per annum is consistent with the principles of the Working Group's proposal, noting that a 300 MWh per annum site would represent approximately 2 per cent of the King Island annual electricity sales.

A 300 MWh per annum site on Flinders Island would represent 7 per cent of annual sales. Thus, consistent with the Working Group of Officials proposal, the Commission proposes that access to the BSI Business Tariff on Flinders Island be limited to existing customers and to new customers consuming less than 100 MWh per annum. The largest installation on Flinders Island in 2006-07 consumed 240 MWh.

4.3.3 Impact of Proposed Tariff Structure on the CSO

Table 4.12 shows the revenue that would be generated from the proposed tariff structure compared with that from 2007-08 tariffs, using the forecast 2008-09 customer base.

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[49] Working Group of Officials, *Review of Electricity Arrangements on the Bass Strait Islands*, February 2007, p.27-28.

Table 4.12: Tariff revenue generated under current and proposed BSI Tariff structures, 2008-09

	Annual revenue		
	Current tariff $'000	**Proposed tariff[1] $'000**	**Difference $'000s**
Residential	1 957.6	1 919.0	-38.6
Business & Industrial	2 563.9	3 307.3	743.4
TOTAL	**4 521.5**	**5 226.0**	**704.7**

[1] Excludes other revenues relating to contract lighting, street lighting, customer contributions and rental income.

The proposed tariff structure has an almost neutral impact on revenue received from the residential sector compared to current Tariff 51 arrangements, whilst the combined tariff revenue arising from the business and Industrial sector would be $0.74 million greater.

Table 4.13 shows the Commission's estimation of the likely total revenues from the proposed tariff structure and its estimated efficient cost of supply for the BSI for 2008-09 to 2010-11. A comparison to 2007-08 is also included. The CSO payment is the difference between total revenues and total costs, therefore as well as tariff revenue 'other revenues[50]' have been included here in the total revenue figure.

Table 4.13 and the discussion following are based on the following assumptions:

- The estimated efficient cost of supply assumes the Government's acceptance of the Commission's assessment of efficient costs noting that the Commission has removed a portion of Hydro Tasmania's 'own costs' and the Aurora mark-up as included in the entities' charges to Government. Inclusion of these charges would add some $0.6 million per annum to the CSO requirement. The Commission has also substituted the benchmark retail cost to serve for Aurora's retail costs.
- The Commission has made conservative estimates of load growth based on historical load growth and information from Hydro Tasmania. Should load growth exceed that estimated, the burden on the CSO will increase.
- Diesel fuel costs for 2008-09 onwards are based on May 2008 diesel fuel prices as advised by Hydro Tasmania.
- The Commission has assumed continuation of the diesel rebate.

The CSO requirement to deliver the proposed tariff structure is also listed.

[50] Includes revenues from contract lighting, street lighting, customer contributions and rental income.

Table 4.13: Total efficient cost of supply, revenues and CSO requirement from proposed BSI Tariff structure (Real July 2007$)

	2007-08 $'000	2008-09 $'000	2009-10 $'000	2010-11 $'000
Total efficient cost of supply	9 569.9	11 001.4	11 160.8	11 287.8
Revenue	4 448.5	5 005.5	5 005.5	5 005.5
CSO requirement	5 121.3	6 000.9	6 160.3	6 287.3

As can be seen in Table 4.13, based on the Commission's assumptions of load growth on the BSI, in real terms tariff revenue will be consistent under the proposed tariff structure, whereas from 2008-09 to 2010-11, the Commission expects the total efficient cost of supply to increase by almost $0.3 million. As a proportion of efficient cost to supply, this represents a 2.7 per cent increase in costs, mostly attributable to the expected increase in diesel costs.

Table 4.13 also shows that at May 2008 diesel prices under contract with KIPC and escalated by 2.5 per cent per annum, the proposed tariff structure would require CSO funding of $6 million for 2008-09, rising to almost $6.3 million for 2010-11.

If there are funds remaining after acceptance of the Commission's tariff proposal, part of the CSO could be targeted to deliver specific industry assistance. However, due to further recent increases in the price of diesel, the diesel price under contract with KIPC may exceed and be sustained above May 2008 prices, requiring an increase in the CSO to maintain tariffs at the nominated level, and eroding the availability of CSO funds for business assistance.

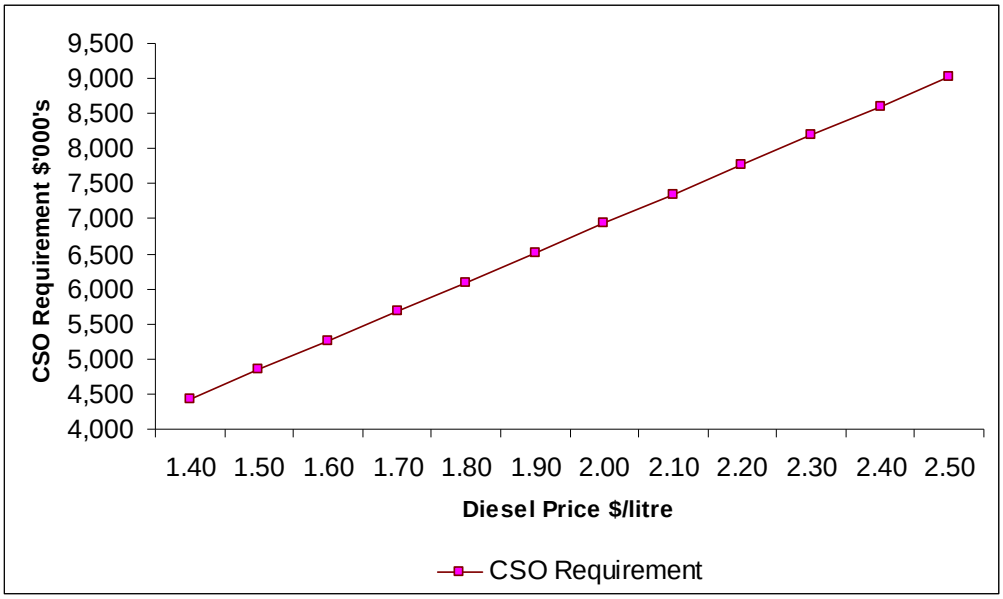
As illustrated in Table 4.14, at a diesel price of $2 per litre from the beginning of 2008-09, with escalation of 2.5 per cent each year, the CSO requirement is significantly increased.

Table 4.14: CSO requirement arising from proposed BSI Tariff structure with diesel prices starting at $2 per litre, 2008-09

	2008-09 $'000	2009-10 $'000	2010-11 $'000
CSO requirement	7 218.4	7 393.7	7 536.3

The sensitivity of the CSO requirement to the price of diesel (under contract) is shown in Figure 4.12.

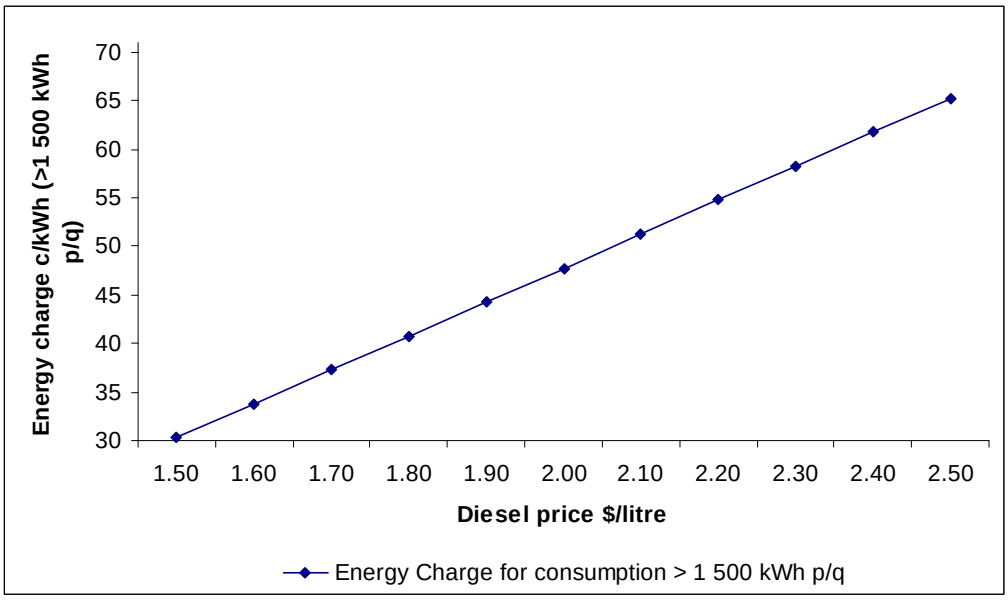
Figure 4.12: Sensitivity of CSO requirement to the price of diesel (delivered)



The Commission's analysis suggests that for every $0.10 per litre increase in diesel prices, the CSO payment would increase by $0.42 million per annum to compensate Hydro Tasmania for the extra diesel costs.

An alternative to an increase in the CSO requirement is for escalation of the tariff to offset the increased cost to supply electricity from higher diesel prices. For every annual increase in the diesel contract prices of $0.10 per litre, the increase in the energy rate under the proposed tariff structure (for consumption over 1 500 kWh per quarter) to maintain the CSO requirement is approximately 3.5 cents per kWh. This is shown below.

Figure 4.13: Sensitivity of energy charges to the price of diesel price (delivered)



Conclusion

The Commission acknowledges the likelihood of continued increases in diesel fuel prices above the forecast level, thus increasing the CSO requirement to maintain the subsidised tariff charges at nominated levels. The implementation of an Emissions Trading Scheme foreshadowed by the Commonwealth Government will, unless there is an exemption or free allocation of permits for stationary diesel generation, also increase generation costs.

In order to manage the costs of the CSO, the Commission recommends that the indicative charges listed in the proposed tariff structure be considered as the base for future charges with escalation according to an index related to diesel fuel costs, using 2008-09 as a base but with no reduction in prices below recommended levels. This will also provide a stronger price signal to BSI customers as to the true costs of electricity supply, with incentives for energy conservation and substitution to more efficient means of energy production.

4.3.4 Other Comments

4.3.4.1 Direct Incentives

Electricity is considered an essential service, and as such, customers are relatively unresponsive to price changes for non-discretionary uses of electricity. For those customers with purely non-discretionary electricity use, introducing a more complex tariff structure may have little effect on limiting electricity use.

Price changes, such as those recommended in this Inquiry, with the aim of encouraging efficient use, may not be as effective in minimising electricity use as alternative measures such as direct incentives to adopt demand side management or energy efficiency measures. The level and focus of demand management measures is dependent on the incentives facing the individuals concerned, including financial and/or regulatory incentives. This is discussed further in Chapter 5.

4.3.4.2 Customer Classifications

Analysis of customer consumption data has highlighted a number of customers on King Island currently classified as residential with very high consumption, more akin to business operations.

The Commission recommends that Hydro Tasmania investigate the current classification of residents. If the Government undertakes to implement separate tariffs for business and residential customers in the future, it will be essential to ensure the charging and billing of customers according to appropriate customer classifications. Thus policies would need to be developed in regard to mixed usage and sharing of meters for residential and business usage.

4.3.4.3 Meter Reading

With the current single rate tariff, the timing of meter readings is not critical and the metering records show that the period between readings may vary, possibly according to staff availability.

However, a quarterly inclining block tariff as proposed would require reading at regular intervals so as not to disadvantage those customers whose consumption is close to the threshold.

4.3.5 Tariff Arrangements - Other Remote Area Power Supply Systems

Appendix C describes the Remote Area Energy Supplies (RAES) subsidy scheme operating in South Australia. This scheme provides a subsidy to contracted service providers for the provision of electricity supply to remote off grid communities in South Australia. In general, the scheme adopts inclining block tariffs, with separate tariffs for domestic and commercial use. The energy rates proposed by the Commission for the BSI are comparable with the RAES rates for domestic and small commercial consumption, and substantially less than the RAES rates for large domestic use (47 cents per kWh for consumption in excess of 3 000 kWh per quarter) and commercial use (62 cents per kWh for consumption in excess of 50 000 kWh per quarter).

5 REGULATORY AND CONTRACTUAL ARRANGEMENTS

There are a number of regulatory and contractual arrangements for supply of electricity on the BSI, the most significant being the CSO Agreement between Hydro Tasmania and the Tasmanian Government, and the contract for supply between Hydro Tasmania and Aurora.

The Terms of Reference require the Commission to recognise the following principle in the development of tariffs.

> Principle 4
>
> The regulatory and/or contractual arrangements for supply of electricity on the BSI will promote ongoing efficiency gains and least-cost supply solutions.

This principle is more relevant to the design of contracts for service delivery than it is to the design of tariffs, and is therefore given consideration separately in this Chapter.

Whilst the CSO Agreement is a matter for Government and Hydro Tasmania, the Commission has commented on the efficiency of contractual arrangements between Hydro Tasmania and its suppliers within its analysis of efficient cost of supply (Chapter 3). A new CSO Agreement between Hydro Tasmania and the Government is currently being negotiated and these observations may be useful in framing the new contract and for future arrangements for delivery of BSI services.

5.1 Incentives for Efficient Service Delivery

5.1.1 The Hydro Tasmania-Government CSO Agreement

Under the current CSO Agreement, Hydro Tasmania is funded to the amount of its 'Net Avoidable Cost' of providing the electricity service on the BSI. 'Net Avoidable Cost' is defined as the difference between actual costs of supply and the revenue Hydro Tasmania receives from customers and other sources.

Thus, because Hydro Tasmania simply receives the difference between their reported costs of supply and revenue, there is no financial incentive to improve efficiency, i.e. to constrain costs, in delivery of the service.

The current CSO Agreement stipulates that:

> HEC [Hydro Tasmania] must provide the CSO in an efficient and cost effective manner, and must use its reasonable endeavours to minimise the Administration Costs.

Hydro Tasmania states that in line with the cost efficiency requirement of the CSO Agreement it has taken the lead in new projects focusing on reducing the consumption of diesel for power generation.[51]

As reported in Chapter 2, the Huxley Hill Wind Farm and King Island Renewable Energy Expansion (KIREX) project were expected to result in 52 per cent savings in both diesel use and diesel fuel costs for 2007-08.

Conversely, one notable investment in renewable energy has not yet yielded savings. On the contrary, Government has incurred significant costs arising from capital charges and depreciation associated with the non-functioning Vanadium Redox Battery. As noted in Chapter 3, the Commission has not included the assets associated with the Vanadium Redox Battery in the calculation of efficient costs.

Thus under the current contractual arrangements, Government is dependent on Hydro Tasmania initiatives to reduce costs, with no financial incentives for it to do so. While Hydro Tasmania has been diligent in promoting the use of renewable energy solutions to substitute for diesel generation, the returns and risks of these ventures are carried by Government.

An incentive-based contract could deliver benefits by providing Hydro Tasmania with financial incentives to reduce cost and improve efficiency of operations and avoid the need for Government micro-management of the contract.

5.1.2 The Hydro Tasmania -Aurora Services Agreement

Up until recently, the Hydro Tasmania-Aurora contract for services has been a fixed price contract with a 10 per cent margin on Aurora's costs which is currently being changed to a cost-plus contract with a 15 per cent margin.

It has been difficult to establish whether Aurora has responded to the financial incentives of the fixed price contract under the recent arrangement, since it appears that there has not been consistent record-keeping or oversight of the costs. However, Hydro Tasmania's belief that its costs will be reduced even after allowing a 15 per cent margin on Aurora's incurred costs suggests that the previous arrangements did not deliver higher efficiency. The change to an auditable cost-plus contract should improve this situation, although it will rely on Hydro Tasmania micro-management and challenging of costs to keep costs under control. The Commission considers that a period under this regime should set up the parties for a change to a contract which includes performance incentives in the future.

5.1.3 Benefit Sharing Mechanisms

A fixed price contract between the purchaser and provider (Government and Hydro Tasmania, and Hydro Tasmania and Aurora) provides an incentive for the provider to increase its profitability during the term of the contract by reducing its costs. An

[51] *Bass Strait Islands Management Plan, Hydro Tasmania,* 2008, P.2

open-book arrangement, or an agreement for sharing of cost data, would allow the purchaser to examine the provider's costs and to use historical cost as a basis for negotiation of a new fixed cost contract. In this way, innovations in service delivery and cost control adopted by the service provider during the term of a contract can be shared with the purchaser as lower costs for the following contract.

As discussed above, the current CSO arrangement relies on Hydro Tasmania initiatives to implement systems for reduction of costs, with the Government enjoying both the benefit and risk of any such initiatives. However Government is likely not well equipped to manage the CSO Agreement by assessing the merits of technical innovation.

An alternative contract design would provide the incentive for Hydro Tasmania to seek out and implement cost-savings, by being allowed to retain the benefits of innovation and at the same time absorb the technical risk of innovation. Such an arrangement could set a return that may, for example, assume a particular technical mix of generation. If Hydro Tasmania can reduce costs by implementing new technology, it could retain the benefits for a number of years. Conversely, if the technology is not a success, Hydro Tasmania would carry the cost for some years. External factors, such as fuel price variance, would be recognised as adjustments to the contracted price for service delivery.

5.1.4 Competitive Tender Process

The Commission understands that Hydro Tasmania does not engage service providers nor purchase assets for the supply of electricity on the BSI through a tender process. There are no incentives built into the current CSO Agreement to explore the most cost effective options, nor any explicit requirement that Hydro Tasmania must tender for services or asset purchases.

Without a competitive tender process, Hydro Tasmania and Government cannot know that the services being provided are necessarily the most cost effective for the BSI. The contracts that could benefit from a tender procurement process include:

- contract for operations and maintenance service provision;
- diesel fuel contract;
- diesel generator purchase and installation contracts;
- wind turbine purchase and installation contracts; and
- private electricity generation.

While it is acknowledged that contract negotiation may produce a better outcome than procurement by tender where there is a small field of potential suppliers, the contract design is such that there is no incentive for Hydro Tasmania to seek out the lowest cost means of service delivery.

5.2 Demand Management

Demand management refers to activities undertaken to meet consumer's requirements for energy services in more efficient ways. This encompasses energy efficiency, network load management and generation load management, and distributed generation.

The focus of the CSO Agreement (and the focus of the Terms of Reference for this Inquiry) is on the efficient provision of electricity to meet the electricity demands of BSI consumers. Even though the cost of the CSO grows as electricity consumption increases (since the marginal cost per unit delivered is greater than the price per unit delivered), the CSO Agreement is not designed to reduce the demand for electricity by meeting the needs of BSI consumers in other ways. Given the high cost of electricity production on the BSI, there should be significant opportunities to reduce costs by fuel substitution and by the implementation of energy efficiency measures. The following sections consider some of these opportunities.

Energy Efficiency

For residential consumers, energy efficiency refers to a reduction in energy use without loss of utility, such as the use of compact fluorescent globes whilst maintaining suitable levels of lighting. For businesses, energy efficiency refers to an overall reduction in energy consumption while maintaining or increasing output.

The costs of electricity supply are made up of fixed costs necessary to finance the capital investment in the network and in generating plant, and variable costs associated with the moment-to-moment generation and delivery of electricity. For energy efficiency to contribute to reducing infrastructure investment in the network or in generating plant, it must reduce demand in peak or high demand periods of electricity use. However, any energy efficiency measures which reduce total use, at any time, will lead to lesser fuel use and lower generation costs.

The Tasmanian Government through the Department of Environment, Parks, Heritage and the Arts 'CleanBiz' Program is currently working with a number of King Island businesses to help them identify and improve their environmental impact, focusing on the areas of waste, water, chemical use, transport and energy.

Load Management[52]

Load management involves activities designed to reduce peak load on the electricity system as a whole or in particular parts of the system. There are two benefits from management of peak demands. Load management can reduce the peak demand on the network, thereby deferring or avoiding the need to augment the network, whilst also reducing the peak generation demand, thereby avoiding the need for greater installed capacity.

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[52] Definitions taken from Independent Pricing and Regulatory Tribunal (2001). *Inquiry into the Role of Demand Management and Other Options in the Provision of Energy Services: Issues Paper*. Sydney, IPART.

Both network and generation load management activities achieve a benefit by reducing loads on the system directly or by shifting peak loads into off-peak periods. These initiatives reduce capital costs. As shown in previous chapters, capital charges are relatively small, with the cost of fuel dominating controllable costs. Thus the load management initiatives with greatest benefits on the BSI are those which reduce total load.

Demand Management Options - BSI

In 2003 Hydro Tasmania investigated demand management options for the BSI. The *King Island Demand Side Management Options Report*[53] canvassed the means and potential for reducing demand during the peak hours of 6 am-9 am and 5 pm-8 pm, and the potential for utilising current wind spill, particularly in off-peak hours. According to the Report:

> This study has confirmed that there are three potentially viable ways to reduce the costs of supplying electricity on King Island including:
>
> - Wide-scale replacement of electric hot water systems;
> - Use of an emergency diesel generator at King Island Dairy; and
> - Generation of electricity using tallow from the King Island Abattoir[54]

The Report also states:

> Discussions with the six largest end-use customers also confirmed that demand side management of electricity is a valuable and worthwhile exercise for the customer, but of marginal value to Hydro Tasmania.[55]

None of the identified opportunities appear to have been followed up, due to the lack of financial incentive for Hydro Tasmania to do so under the current CSO Agreement. Chapter 4 discusses how pricing signals can affect consumer's energy use and thus encourage consumers to seek their own opportunities to manage their energy needs. Government could also assist through consumer education of the opportunities, but there are mixed incentives and capabilities- while the Department of Treasury and Finance has the incentive to reduce the CSO, it would be reliant on other Agencies for the technical advice and implementation of such a program.

Distributed Generation

Distributed generation refers to generation systems (also known as embedded generation) that are installed, generally at customers' premises, within the electricity network.

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[53] Hydro Tasmania, November 2003.

[54] Ibid, p.1

[55] Ibid, p.1

Hydro Tasmania already allows customer grid interactive solar/wind connections. As well as wind purchased from a private operator on Flinders Island, Hydro Tasmania purchases electricity from one very small solar grid interactive installation. Hydro Tasmania nets off any exports against the customer's retail bill, consistent with arrangements in place on mainland Tasmania.

Hydro Tasmania has also agreed to purchase power from a new 100 kW private solar farm via a Power Purchase Agreement.

At current tariffs, the return to the customer of self-generation is much less than the cost to the Hydro Tasmania of producing the electricity for the customer's use. By under valuing self-generation, opportunities for economic local generation, whether by solar-voltaic or small scale wind, are being rendered un-economic. To avoid this, it would be desirable if Hydro Tasmania purchased output from distributed generation at prices up to Hydro Tasmania's avoided costs (which for much of the time would be the fuel costs of diesel generation), and sell electricity to consumers at the subsidised rate. Separate meters would be required.

In addition to substantially higher remuneration for electricity produced, private producers may also be eligible for other grants and subsidies. Such opportunities may be at lower cost than Hydro Tasmania's own generation, even from its own renewable initiatives. Sensibly, Hydro Tasmania should set the purchasing rate for private generation at the level of Hydro Tasmania's own marginal cost for alternative generation- whether by diesel, wind or its own new projects. The 2003 Hydro Tasmania study referred to above also identified opportunities for the production of bio-diesel and generation from King Island resources. It does not appear that either of these has been pursued. A tender for supply could encourage interest in alternative technologies.

5.3 Commission's Observations on Contractual Arrangements

The Commission's first observation is that contractual arrangements between the Government and Hydro Tasmania are focussed on arrangements for efficient supply of electricity. This focus risks over-looking alternative and lower-cost means of meeting the energy needs of residents and businesses on the BSI.

There are no incentives under current arrangements to meet BSI energy needs by alternative fuels, such as by substitution of electricity with LPG and solar thermal, or to encourage energy efficiency through building design, insulation or energy-efficient products. Higher electricity charges which are closer to the real cost of electricity production would encourage consumers to seek out alternative means of satisfying their needs. However, the tariff rates proposed by the Commission are significantly less than costs of production and less than the cost of the LPG alternatives. Subsidies of other fuels and of energy efficiency initiatives may in the longer term be a better use of CSO funds and reduce exposure to the cost of diesel fuel.

The CSO Agreement does not incorporate financial incentives for Hydro Tasmania to reduce its cost of generation, whether by its own initiative or by purchase of

electricity from other lower-cost providers. The Government is dependent on Hydro Tasmania initiatives to recognise and develop lower cost electricity generation. Hydro's introduction of wind generation on King Island has been particularly successful, but other novel approaches, such as the storage battery initiative, have been less successful, with Government bearing the risk.

A broad focus on BSI energy needs rather than the primary focus on supply of electricity by Hydro Tasmania could further reduce cost to Government, in addition to reducing the environmental impact of energy production on the BSI.

The Hydro Tasmania-Aurora contract for services does not appear to have been diligently managed. It has been a fixed price contract but Aurora has not responded to the opportunity to increase profitability through management of costs. Hydro Tasmania believes that even with the payment of a 15 per cent margin, costs can be reduced by close attention to and challenging of reported costs. A period of such careful cost control could provide a basis for a performance-based contract in the future.

5.4 Performance and Information Reporting

The Regulator explained in his 2007 Investigation:

> In setting price controls for a monopoly provider of essential services, there is a concern that the entity may reduce costs (and thus increase profits) at the expense of service quality. To prevent this behaviour, regulators may link price with service quality by, amongst other approaches, requiring an entity to meet average and minimum standards of service.[56]

The price/service package is an agreement between the service provider and the Regulator (or in this case Government as the purchaser of services) as to the provision of services to a specified standard or service quality in exchange for a regulated or agreed price. There are a number of mechanisms available to the Regulator and Government to enforce such agreements, including comparative performance reporting and financial penalties and rewards related to performance.

The *Electricity Supply Industry Performance and Information Reporting Guidelines*, issued by the Regulator, lists the quarterly and annual reporting requirements for operations on the BSI to be submitted by Hydro Tasmania. The information is required to assist with comparative analysis, although it is not necessarily a measure of the Licensee's performance.

As already mentioned, the Ministerial Charter and the Regulator's Direction issued 1 July 1998 respectively require Hydro Tasmania to continue to provide an electricity generation, distribution and retail service on the BSI, and to maintain 'good electricity practise'.

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[56] OTTER, *Investigation of Prices for Electricity Distribution Services and Retail Tariffs on Mainland Tasmania – Final Report and Proposed Maximum Prices*, September 2007, P.285.

Aurora, as contracted by Hydro Tasmania to maintain operations and provide distribution and retail services, is required to adhere to key performance indicators as agreed with Hydro Tasmania. Performance indicators include measurements on safety, environment, customer satisfaction, performance of assets and reporting. Targets have been established to measure performance however Aurora as operator does not incur financial penalties for poor performance on the BSI.

5.4.1 Service Standards and Performance

Performance on the Bass Strait Islands has traditionally been poor compared to performance levels on mainland Tasmania. This is mostly attributable to the fact that maintaining an optimum staff structure on the BSI is difficult. By necessity the workload of the limited staff is multifaceted, in that they have to repair line faults as well as attend to inherent problems with running diesel generation supplying such small and variable loads. When a momentary short circuit occurs on the BSI, especially at times of low load, the diesel generators can trip causing a total system black. On the mainland of Tasmania, due to the size (or inertia) of the system, such an event would very rarely cause an outage.

Distribution Service Standards and Performance

Given the very different nature of the systems on the BSI compared to the mainland of Tasmania, only the retailing provisions of the Tasmanian Electricity Code (TEC) are applicable. Nevertheless, the performance of the distribution network on each Island has been reported in a manner consistent with the performance standards for rural feeders stipulated in the TEC.

New TEC standards have been developed for reporting for future years for mainland Tasmania[57], however the BSI were not included in the classification, therefore performance here is reported against the old TEC Feeder Reliability Standards.

The main measures used to compare performance of electricity networks are the system average interruption duration index (SAIDI), which is known as the 'customer average minutes off supply', and the system average interruption frequency index (SAIFI) which is a measure of how often a customer, on average, loses supply during one year.

The key performance indicators for the operation of the system as previously stipulated in the TEC and as agreed between Hydro Tasmania and Aurora include:

- Aurora should aim for SAIDI not to exceed lower band set by the TEC in relation to reliability and availability for supply area category applicable to the BSI's; and
- Aurora should aim for SAIFI not to exceed lower band set by the TEC in relation to reliability and availability for supply area category applicable to the BSI's.[58]

[57] See *Joint working Group Final Report – Distribution Network Reliability Standards*, February 2007

The standards for the average reliability and the lower bound of reliability for the BSI are listed in Table 5.1, with performance for 2006-07 and 2007-08 (year to date) listed in the tables following. For a feeder to be classified as poor performing, it must fall below the lower bound limit for either SAIDI or SAIFI, or both.

Table 5.1: Distribution standards for BSI

	Average reliability		Lower bound of reliability	
	Annual no. of supply interruptions	**Annual total interruption time**	**Annual no. of supply interruptions**	**Annual total interruption time**
BSI	6	480 mins	9	720 mins

Table 5.2: BSI distribution system performance, SAIFI 2006-07

	Lower bound of reliability Annual number of supply interruptions					
	Standards		**Flinders Island**		**King Island**	
	Average	**Lower Bound**	**Actual Performance**	**No. of feeders below lower bound**	**Actual performance**	**No. of feeders below lower bound**
Quarter 1	6	9	3.686	0	1.53	0
Quarter 2	6	9	2.07	0	1.43	0
Quarter 3	6	9	6.77	1	2.17	0
Quarter 4	6	9	9.34	1	3.44	0

One feeder on Flinders Island was performing below the lower bound of performance for SAIFI values for each of the third and fourth quarters in 2006-07. This is in marked contrast to performance for 2007-08 (to date), where all three feeders have performed below average for the first two quarters, and two performed below average for the third quarter.

[58] *Tender submission to Hydro Tasmania: Provision of generation, distribution & retailing services on the Bass Strait Islands*, Aurora Energy.

Table 5.3: BSI distribution system performance, SAIFI 2007-08

	Lower bound of reliability Annual number of supply interruptions					
	Standards		Flinders Island		King Island	
	Average	Lower Bound	Actual Performance	No. of feeders below lower bound	Actual performance	No. of feeders below lower bound
Quarter 1	6	9	10.83	3	4.33	1
Quarter 2	6	9	13.16	3	4.79	1
Quarter 3	6	9	11.80	2	4.89	0
Quarter 4	6	9	-	-	-	-

King Island had no feeders performing below the lower bound of performance for SAIFI values for 2006-07, with one feeder performing below the lower bound for each of quarter one and quarter two of the current financial year.

Table 5.4: BSI distribution system performance, SAIDI 2006-07

	Lower bound of reliability Annual number of supply interruptions					
	Standards		Flinders Island		King Island	
	Average	Lower Bound	Actual Performance	No. of feeders below lower bound	Actual performance	No. of feeders below lower bound
Quarter 1	480	720	271 mins	0	169 mins	0
Quarter 2	480	720	146 mins	0	112 min	0
Quarter 3	480	720	180 mins	0	175 mins	0
Quarter 4	480	720	246 mins	1	282 mins	1

Table 5.5: BSI distribution system performance, SAIDI 2007-08

	Lower bound of reliability Annual number of supply interruptions					
	Standards		Flinders Island		King Island	
	Average	Lower Bound	Actual Performance	No. of feeders below lower bound	Actual performance	No. of feeders below lower bound
Quarter 1	480	720	308 mins	0	348 mins	1
Quarter 2	480	720	346 mins	0	331 min	0
Quarter 3	480	720	389 mins	0	281 mins	0
Quarter 4	480	720	-	-	-	-

For 2006-07, only one feeder on King Island and one feeder on Flinders Island delivered below average performance for one quarter, whereas for year-to-date 2007-08, two of the three distribution feeders on Flinders Island were classified as poor performing over the first three quarters, whilst all of the distribution feeders on King Island were within the performance bounds.

The performance of the distribution network on the BSI for 2006-07 is compared to that of mainland Tasmania in Table 5.6.

Table 5.6: Performance comparison of distribution network of BSI to mainland Tasmania, 2006-07

	SAIDI	SAIFI
Average for Rural – Mainland Tasmania	305	2.93
King Island	363	4.27
Flinders Island	314	9.95

In 2006-07 distribution network performance of the BSI was of a level such that the experience of customers on the BSI was comparable if not better than many people in rural areas of mainland Tasmania, although performance appears to have deteriorated over 2007-08.

The new distribution reliability standards, whilst not applicable to the BSI as it a separate supply area to the mainland Tasmania, have also been considered here to enable a discussion of BSI performance against the new standards.

In accordance with the terms of reference, the Joint Working Group on Distribution Network Reliability Standards recommended the establishment of four area categories, the boundaries of which are defined on the basis of annual electricity consumption density:

- High Density Commercial – areas of high annual consumption commensurate with the CBDs of the State's cities;
- Urban and Regional Centres – a city, town or other urban centre with annual electricity consumption at or higher than the electricity consumption density within the existing urban areas under the GSL scheme;
- Higher Density Rural – higher consumption rural areas and low-density periurban areas; and
- Lower Density Rural – the remaining regions of the State.

Whilst not classified under the new standards, given the size of their load and previous classification as 'rural' under the old TEC standards each of the Islands could be considered as High Density Rural.

Under the new system, two standards are established for each area classification, being a maximum annual outage count for the classification, and a maximum annual outage count for each area within the classification. The performance of the Islands' distribution systems for 2006-07 is compared against the new standards, for illustrative purposes only, in Table 5.7.

Table 5.7: Distribution network annual outage standards, High Density Rural, and comparative BSI performance 2006-07

	Standard	King Island	Flinders Island
Classification standards (no. of interruptions)	4	4.27	9.95
Area standard (no. of interruptions)	6		
Outage duration classification standard (mins)	480	363	314
Outage duration area standards (mins)	600		

As can be seen from the above, based on performance for 2006-07, the King Island distribution system would have met the standard for number of interruptions, with Flinders Island exceeding the area standard.

For outage duration, performance of each Island would have met the area standards.

Whilst the distribution system of the BSI appears to be comparable to that of some rural areas on mainland Tasmania, the BSI continue to experience a high number of generator trips and outages, as discussed in the following section.

Generation Standards

The key performance indicators for the operation of the generation system are agreed between Hydro Tasmania and Aurora, and include:

- generator availability at all times sufficient to meet firm capacity;
- reduction in the number of System Black Outs from prior financial year;

- start/stop reliability to exceed 98 per cent. [59]

Performance of the generation system for 2006-07 is listed in Table 5.8.

Table 5.8: Generation performance – BSI 2006-07

System category	System Blacks		Average interruption - minutes		Average Minutes Off Supply per kVa	
	Limit	Actual	Target	CAIDI	SAIDI target	SAIDI actual
King Island						
Generation fault		1		3		3.00
Distribution initiated fault		0		0		0
Total blackouts	8	1	13.75	3	110	3.00
Flinders Island						
Generation fault		7		7.00		56
Distribution initiated fault		11		11.60		116
Total blackouts	20	18	12.50	9.56	250	172

As can be seen from Table 5.8, the performance of the generation system for each of King Island and Flinders Island for 2006-07 met the target set for total number of blackouts and time off supply.

Flinders Island had 18 system blacks (where power supply to the entire Island was interrupted), which was below the maximum of 20 set by Hydro Tasmania.

More than half of these faults were caused by faults on the distribution network causing protection equipment to trip the generators. This is primarily a consequence of the small size of the load on the Island, especially at night, when the generators are unable to 'ride' through a sudden step change in load caused by a distribution outage.

There was one system black on King Island in 2006-07, giving rise to only three minutes of outages. This represents a significant decline in the number of system blacks compared to 2005-06 (when there were 13) and a significant decrease in system black minutes (113 minutes in 2005-06).

However, the performance of 2006-07 contrasts to performance for 2007-08 to date, where the performance of the generation system for both Islands has exceeded the limit set for number of total blackouts, with the Flinders Island generation system also exceeding the target for average minutes off supply.

[59] Attachment 7 of Aurora Tender document.

Guaranteed Service Level Scheme

A Guaranteed Service Level (GSL) scheme operates on mainland Tasmania, whereby customers receive payment if they experience an undue number of interruptions or an extended duration of interruptions. Although the triggers, thresholds and penalty rates would be different for the BSI to the parameters that apply on mainland Tasmania, such a scheme would reduce the gap between services to BSI customers and services to electricity customers on mainland Tasmania.

A GSL scheme would benefit customers, and it may improve performance by focusing attention on under-performance. However, it would also increase costs to Government.

APPENDIX A: BASS STRAIT ISLANDS ELECTRICITY PRICE INQUIRY TERMS OF REFERENCE

Background

In July 2005 the Treasurer and Minister for Infrastructure Energy and Resources requested the Department of Infrastructure, Energy and Resources (DIER) to convene a working group to investigate and provide a set of recommendations regarding a range of Bass Strait Island (BSI) energy issues including tariff structure, managing demand above current generation capacity and identifying how cost savings to Government (through the CSO) from a reduction in the Federal Government's diesel fuel excise will be applied.

The Minister for Energy released a draft discussion paper for public consultation in September 2006. A number of submissions were received in response to the consultation and incorporated into a final discussion paper and accompanying recommendations.

As part of these recommendations, it was recommended that the current flat rate tariff be replaced with a stepped-block tariff. Government would decide the rates for each block and the nature of the thresholds that should apply following advice from the Government Prices Oversight Commission (GPOC).

It was further recommended that the Minister for Energy request the Treasurer to issue Terms of Reference to GPOC under the *Government Prices Oversight Act 1995 (GPOC Act).*

The Terms of Reference would include details of the Government's social objectives, as articulated in the policy principles, together with a range of potential funding levels for the CSO. GPOC would then recommend to Government a tariff that takes into consideration the Terms of Reference and the current cost structures.

It was further recommended that the current arrangement, under which the CSO is funded from the Budget to make up the shortfall from the contribution from electricity users on the BSI, should continue. The cost to Government of the CSO will be the difference between the efficient cost of supply on the BSI and the revenue likely to be raised by the proposed tariff.

Overall Objective

GPOC is to ascertain the efficient cost of supply on the BSI and to recommend to the Treasurer (and Government) a tariff or tariffs.

It is proposed that the tariff structure on the BSI should be changed in order to create appropriate incentives for efficient energy use and to limit the growth of the government subsidy over time.

The recommendations are to be arrived at and delivered in accordance with the BSI Electricity Pricing Principles/Objectives below.

Bass Strait Islands Electricity Pricing Principles/Objectives

Principle 1: The residents of the BSI will have access to affordable electricity consistent with a reasonable household standard of living.

Principle 2: The Government will continue to support electricity tariffs on the BSI at a level commensurate with the social policy objective of Principle 1.

Principle 3: The BSI electricity tariff will be consistent with other economic and environmental objectives.

Principle 4: The regulatory and/or contractual arrangements for supply of electricity on the BSI will promote ongoing efficiency gains and least-cost supply solutions.

Principle 5: The ongoing support for electricity tariffs on the BSI will be targeted to deliver the objectives in an efficient and sustainable manner, with costs balanced against other calls on public funds.

Terms of Reference

1. Determine efficient cost of supply on the BSI by desk-top review of the cost of conventional generation, the cost of current facilities, and the cost of proven alternatives in remote area power systems; and

2. Recommend tariff structures, including a stepped-block tariff, in accordance with proposed annual future Budget contributions, having regard to the BSI Electricity Pricing Principles and incentives for efficient energy use.

Current funding arrangements will continue to apply, under which the CSO is funded from the Budget to make up the shortfall from the contribution from electricity users on the BSI.

The cost to Government of the CSO will be the difference between the efficient cost of supply on the BSI (as determined by GPOC) and the revenue likely to be raised by the proposed tariff(s).

In undertaking this review, the Commission is to consider the views of key stakeholders and interested parties as necessary. However, any consultation should have regard to the considerable level of consultation that has already occurred with stakeholders as part of the BSI electricity arrangements review process.

Deliverables and Timetable Key

Date	Details
March 2008	Draft Report for Consultation
June 2008	Delivery of Final Report including Tariff recommendations to Treasurer

Method of funding inquiry

In accordance with section 39A of the *Government Prices Oversight Act 1995*, it has been determined that the Department of Treasury and Finance will fund the costs of the inquiry.

Attachments

Review of Electricity Arrangements on the Bass Strait Islands – Final Report February 2007

APPENDIX B: BASS STRAIT ISLANDS TARIFF HISTORY

	January 1997	January 1998	January 1999	January 2000	January 2001	July 2001	January 2002	January 2003	January 2004	January 2005	January 2006	January 2007	January 2008
Service Charges (¢/day)	39.1	43	48.1	53.98	54.9	52.29	54.95	56.49	58	59.44	60.92	63.34	64.64
Meter Charges (¢/day)	4.6	4.6	4.7	5.28	5.37	5.11	5.38	5.53	5.68	5.82	5.97	6.21	6.34
Standing Charge (¢/day)	41.6	17.6	0	0	0	0	0	0	0	0	0	0	0
Energy (¢/kWh)	16.1	16.33	16.73	18.79	19.11	18.2	18.84	19.37	19.89	20.38	20.89	21.72	22.17
Energy (real 08) (¢/kWh)	21.42	21.78	21.97	24.24	23.30	21.78	22.28	22.23	22.30	22.27	22.21	22.36	22.17

APPENDIX C: FORECAST ENERGY SALES

Hydro Tasmania is compensated for the costs it incurs in providing electricity supply on the BSI in accordance with the CSO Agreement. The size of the CSO payment is the value of the difference between the revenue Hydro Tasmania receives (from fixed services charges, energy sales and other revenue sources) and the costs associated with electricity supply on the BSI. Therefore it is necessary to know likely future energy sales to estimate future generation requirements, and therefore total costs.

Hydro Tasmania has provided the Commission with energy sales data and related revenue for the BSI for the years 2005-06 and 2006-07, calculated from a billings customer database provided by Aurora.[60] Hydro Tasmania has forecast energy sales for 2007-08 based on energy sales from the first half of the 2007-08 financial year, and forecast energy sales for the next three years based on its 2007-08 estimate and its own load growth and cost growth assumptions.

Hydro Tasmania's historical and forecast figures for energy sales for each of King Island and Flinders Island are shown in Table 0.1.

Table 0.1: Hydro Tasmania reported and forecast Energy sales (MWh) 2005-06 to 2010-11

	2005-06 MWh p/a	2006-07 MWh p/a	2007-08 MWh p/a	2008-09 MWh p/a	2009-10 MWh p/a	2010-11 MWh p/a
King Island						
Business	10 156	9 428	9 354	9 486	9 622	9 762
Domestic	5 060	5 018	5 693	5 548	5 715	5 886
Private Lighting	0.16	0.17	0.16	0.16	0.16	.016
Street Lighting	71	71	72	72	72	72
Total Sales	15 287	14 517	14 812	15 106	15 409	15 720

[60] Aurora maintains customer records in their role as retail service provider for the BSI.

	2005-06 MWh p/a	2006-07 MWh p/a	2007-08 MWh p/a	2008-09 MWh p/a	2009-10 MWh p/a	2010-11 MWh p/a
Flinders Island						
Business	1 632	1 665	1 740	1 755	1 810	1 847
Domestic	2 272	2 358	2 408	2 456	2 505	2 555
Private Lighting	0.21	0.23	0.24	0.24	0.24	0.24
Street Lighting	11	11	11	11	11	11
Total Sales	3 915	4 034	4 159	4 242	4 327	4 413
BSI Total Sales	19 202	18 551	18 971	19 348	19 735	20 133

Figures in **bold** are actuals.

The Commission has also examined the Aurora database, and calculated actual energy sales and charges for each category and charge item, for 2005-06 and 2006-07.

Table 0.2: Commission calculated energy sales (MWh) 2005-06 to 2010-11

	2005-06 MWh p/a	2006-07 MWh p/a	2007-08 MWh p/a	2008-09 MWh p/a	2009-10 MWh p/a	2010-11 MWh p/a
King Island						
Industry[61]	4 879	4 944	4 911	4 911	4 911	4 911
Other business	4 823	4 553	4 688	4 767	4 767	4 767
Total Business	9 702	9 496	9 599	9 678	9 678	9 678
Domestic	5 063	5 015	5 039	5 042	5 042	5 042
Private Lighting	0.20	0.21	0.21	0.21	0.21	0.21
Street Lighting	71	53	62	62	62	62
Total Sales	14 836	14 565	14 701	14 783	14 783	14 783

[61] Combined energy sales attributable to the three largest installations.

	2005-06 MWh p/a	2006-07 MWh p/a	2007-08 MWh p/a	2008-09 MWh p/a	2009-10 MWh p/a	2010-11 MWh p/a
Flinders Island						
Business	1 637	1 675	1 656	1 709	1 709	1 709
Domestic	2 277	2 357	2 354	2 354	2 354	2 354
Private Lighting	0.26	0.28	0.27	0.27	0.27	0.27
Street Lighting	11	8	9	9	9	9
Total Sales	3 925	4 040	3 983	4 072	4 072	4 072
Total BSI Sales	18 761	18 606	18 683	18 855	18 855	18 855

Figures in **bold** are actuals calculated from the Aurora Database; forecasts calculated applying Commission assumptions.

It should be noted that Hydro Tasmania's and the Commission's calculation of energy sales are from a common data source, however the respective energy sales figures differ. This is likely due to differences in the interpretation of the information within the database, estimates of unbilled energy, and the information being sought.

The Commission is interested in the actual energy sales which takes into account unbilled energy, rather than billed sales. Reviewing historical actual energy sales is considered a better estimate of likely future energy sales, and consequently, energy sales revenue is less likely to be distorted by irregularities in meter reading dates.

Therefore, the Commission has chosen to use its own assessment of historical energy sales (2005-06 and 2006-07) rather than Hydro Tasmania's calculations, in determining future energy sales and associated revenue streams. This is explained further in the discussion below.

Effective Energy Rate

The effective energy rate is the ratio of revenue for each category (industrial, business or residential) and the reported kWh sales figures for the corresponding category, over a defined reporting period. Whilst sales from the first to the second half of the financial year differ, regardless, the effective energy rate should still approximate some value between the earlier calendar year tariff, and the later calendar year tariff[62] for the relevant period. Unbilled energy and variations to meter reading dates and billing periods will impact on the effective energy rate and may account for some differences between the effective energy rate and the applicable tariffs for the period.

[62] The relevant tariffs for the 2006-07 financial year are the 2006 calendar year tariff (20.89 c/kWh) and the 2007 calendar year tariff (21.72 c/kWh).

Using Hydro Tasmania's reported energy sales and associated revenue delivers an effective energy rate which is on average two cents per kWh lower than the average of the actual tariffs, for each customer category for both 2005-06 and 2006-07. If the Commission was to forecast energy sales using Hydro Tasmania's forecast energy sales data this would underestimate the likely future revenue Hydro Tasmania would receive, and also impact on the size of the CSO payment.

The Commission's energy sales and associated revenue calculations deliver an effective energy rate comparable to the actual tariffs applicable to each period.

Installation Numbers

Customer installation numbers are required to determine historical average growth per installation for each customer class (industrial, business or residential), and to estimate future growth per installation and customer class.

Hydro Tasmania was not able to provide the Commission with historical, current or forecast installation numbers. The Commission has determined historical installation numbers for each category on each Island from the Aurora database, and determined likely future installation numbers based on historical growth, and in consideration of other factors, as discussed below.

Growth

Hydro Tasmania has advised that, for planning purposes, it forecasts annual load increases of three per cent on King Island and 2 per cent load on Flinders Island.

Based on its calculation of energy sales and customer installations, the Commission has determined growth between the financial years 2005-06 and 2006-07 for each customer category for each Island. This is shown in Table 0.3 and Table 0.4 including estimated future load growth.

Table 0.3: King Island actual and forecast growth rates 2005-06 to 2010-11

	2005-06 (actual)	**2006-07 (actual)**	**2007-08 to 2010-2011 (forecast)**
Number of industrial installations	3	3	3
Average sales per industrial installation (MWh)	1 626	1 648	1 637
Increase in sales per industrial installations (%)	-	+1.3	0.0
Number of business installations	275	284	284
Increase in business installations(%)	-	+3.3	0.0
Average sales per business installation (MWh)	17.54	16.03	17.00
Increase in sales per business installation (%)	-	-8.6%	0%

	2005-06 (actual)	2006-07 (actual)	2007-08 to 2010-2011 (forecast)
Number of residential installations	839	840	840
Increase in residential installations(%)	-	+0.1%	0%
Average sales per residential installation (MWh)	6.03	5.97	6.00
Increase in sales per business installation (%)	-	-1.1	0.0

As shown in Table 0.3, between 2005-06 and 2006-07 there was little growth in sales to Industrial customers, and negative growth in sales to other business customers and residential customers, contradicting Hydro Tasmania's forecast of 3 per cent load growth for the Island.

Table 0.4: Flinders Island actual and forecast growth rates 2005-06 to 2010-11

	2005-06 (actual)	2006-07 (actual)	2007-08 to 2010-2011 (forecast)
Number of business installations	140	149	149
Increase in business installations (%)	-	+6.4	0.0
Average sales per business installation (MWh)	11.69	11.24	11.47
Increase in sales per business installation (%)	-	-3.9	0.0
Number of residential installations	468	483	483
Increase in residential installations (%)	-	+3.2%	0.0
Average sales per residential installation (MWh)	4.87	4.88	4.87
Increase in sales per business installation (%)	-	+0.03	0.0

Table 0.4 shows that between 2005-06 and 2006-07 sales to business customers declined by almost 4 per cent, with relatively no change to sales to residential customers; falling short of Hydro Tasmania's forecast of 2 per cent growth for Flinders Island.

The Commission has decided to take a conservative approach to estimating future growth in installation numbers and load for each customer category on the BSI. Attempting to predict future growth in installation numbers and load on the BSI based on recent growth rates is problematic due to:

- lack of historical data available on which to properly assess recent growth rates;
- variable economic conditions and the impact of the drought which may have an impact on customer load and also customer installations in the short term and/or longer term;

- differences in meter reading and billing periods for the BSI and between years[63], creating fluctuations in energy sales over billing periods; and
- the potential impact that a new tariff schedule may have on customer load.

Rather than try to predict sales for 2007-08 based on growth between 2005-06 and 2006-07, the Commission has determined 2007-08 sales per customer category as the average of the previous two years.

The Commission has applied a zero growth assumption for customer installations for 2007-08.

Without more detailed information on economic conditions and historical customer information, the Commission considers it prudent to apply a zero growth assumption for customer installations and load for 2008-09 to 2010-11.

[63] Meter reading dates on the BSI can be variable, and billing periods differ between the two Islands (confirmed by Aurora staff).

APPENDIX D: TARIFF ARRANGEMENTS - OTHER REMOTE AREA POWER SUPPLY SYSTEMS

South Australia – Remote Area Energy Supply

In South Australia, the Remote Area Energy Supplies (RAES) subsidy scheme provides a subsidy to contracted service providers for the provision of electricity supply to remote off grid communities in South Australia.

The RAES subsidy is shared among various remote area communities in SA, excepting Coober Pedy which is a single large region that enjoys some economies of scale, and therefore is priced more conservatively.

For all other regions, the base tariff for domestic customers is equal to the grid price of the connected SA network, plus 10 per cent. Domestic customers face heavily subsidised rates for the first 8 000 kWh consumed per annum, a conservative estimate of the average household use, where the average household consumption of grid connected SA domestic customers is between 5 000 and 6 000 kWh per annum.

An increasing tariff reflects the real cost of production for commercial customers and those domestic customers who consume above the base allowance. A cost reflective tariff (reflecting full cost recovery) is applied to all State Government and Commonwealth Government Agencies, and to domestic customers consuming above 16 000 kWh per annum.

The tariff steps between the most heavily subsidised and the cost reflective tariff were chosen arbitrarily.

The RAES Tariff is as follows.

Table 0.5 SA Remote Area Energy Supply tariff arrangement

Domestic	**Cents/kWh**	**Per cent increase per kWh (over previous quarter step) %**
Supply charge of $34.158 per quarter		
First 300 kWh	19.088	
Next 1 700 kWh per quarter	20.961	9.8
Next 1 000 kWh per quarter	33.241	58.6
Next 1 000 kWh per quarter	47.444	42.7
All additional kWh	70.67	49.0

Commercial		
Supply Charge of $34.158 per quarter		
First 3 000 kWh per quarter	23.487	
Next 4 500 kWh per quarter	26.944	14.7
Next 7 500	26.894	-0.2
Next 35 000 kWh per quarter	35.474	31.9
All additional kWh	62.165	75.2
State Government Agencies		
All kWh	70.67	
Commonwealth Government Agencies		
All kWh	70.67	