Queensland Government

Petrol Pricing in Queensland

Submission to the Impact of Petrol Pricing Select Committee

November 2005

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Executive Summary

The Queensland Government undertakes a number of activities that contribute to keeping petroleum prices in Queensland lower than in other states. These activities include:

- the retail fuel subsidy scheme (of 8.35 cents per litre) for petrol and on-road diesel;
- monitoring prices in the metropolitan markets of Brisbane, Sydney and Melbourne, as well as the south-east regions of Caboolture, Ipswich, Gold Coast and Sunshine Coast, and a further 22 country cities and towns on an ongoing basis;
- development of integrated public transport initiatives, such as Translink; and
- assisting the development of an alternative fuels industry through the Queensland Ethanol Industry Action Plan 2005-2007.

Furthermore, in the absence of stronger action from the Australian Competition and Consumer Commission (ACCC) on the subject of petrol pricing, the Queensland Government initiated formation of the Parliamentary Impact of Petrol Pricing Select Committee to investigate different aspects of automotive fuel pricing and transport issues in Queensland.[1] The main points of the submission are as follows:

Industry and pricing structure

A combination of international and local factors determine retail petrol prices in Queensland. Broadly speaking, petrol prices are made up of three components, which are, in order of magnitude:

- refined fuel costs that are set in the international market;
- Commonwealth Government excise and taxes; and
- domestic industry costs (including freight costs and retail/wholesale margins).

International influences (such as movements in the prices of crude oil and refined petroleum products, and the $A/$US exchange rate) affect changes in retail prices, and as such, movements in Queensland petrol prices generally follow movements in Singapore refined petroleum product prices (mainly due to benchmark pricing practices). These factors are broadly influenced by supply and demand factors that are exogenous to the local industry. Local factors that influence retail petrol prices vary between locations and over time. These can include, to varying degrees:

- Local demand and supply factors;
- The presence of independent retailers and wholesalers (players other than the four major oil companies);
- The potential availability of imports; and
- The extent of vertical integration in the local industry.

Industry regulation and reform

The Federal Minister for Industry, Tourism and Resources has promised a future review of petrol pricing by the oil majors. Furthermore, a mandatory industry code (the Oilcode) is expected to be introduced to the Australian Parliament in late 2005. This would be introduced together with provisions on predatory pricing, giving the ACCC greater means to monitor both wholesale and retail pricing across Australia. The Queensland Government will monitor the effectiveness of the Oilcode to determine if it enhances the ability of the ACCC to monitor activities in the industry. It is essential that the ACCC continue to monitor petrol prices and respond proactively to any evidence of anti-competitive behaviour.

Queensland fuel subsidy

The Queensland Government's only direct influence on fuel prices is through its Fuel Subsidy Scheme, which provides consumers in Queensland with an 8.35 cent per litre subsidy for leaded and

[1] See Attachment 1 for the Impact of Petrol Pricing Select Committee terms of reference.

unleaded petrol and on-road diesel. The annual cost of the Scheme is estimated at over $500 million. Queensland is the only State to provide such a substantial fuel subsidy.

Over the 12 months to September 2005, the price of unleaded petrol sold in Brisbane averaged around 99.6 cents per litre. This amount was 9.2 and 6.7 cents per litre less than average petrol prices in Sydney and Melbourne respectively. As the level of the Queensland Fuel Subsidy is 8.35 cents per litre, the difference between average prices in Sydney and Brisbane was greater than the amount of the subsidy, while average prices in Melbourne converged more than expected with average Brisbane prices over the period. Overall, there is no evidence to suggest that the Queensland Fuel Subsidy is not being passed on to motorists.

Impacts of petrol price movements

Modelling was undertaken to estimate a 'worst case' scenario of high oil prices and the Queensland economy. The dominant macroeconomic effect of higher petrol prices is a decline in the terms of trade, which tends to reduce the real incomes of Queenslanders. The modelling projects that in the long run (around 10 years), real private and public consumption (a proxy for welfare) might be 4.54% less than it would have been without the increase in petrol prices. Real gross state product (GSP) is projected to be 1.01% lower in the long run. At the industry level, the greatest negative impacts are associated with service industries which sell a large share of their output to households and government.

This modelling doesn't take into account possible flow-on increases in coal demand, which would tend to offset the economic impact of petrol prices on Queensland. It also doesn't assume petrol-saving technology and taste changes (such as consumers switching to vehicles with hybrid technology). Hence, the modelled scenario could be viewed as being somewhat pessimistic.

Practical ways that consumers can reduce their petrol bills

Following a 2001 report on fuel price variability, the ACCC began providing information on its website to enhance consumers' understanding of petrol price cycles and how to take advantage of them. A number of daily newspapers publish average and low prices for different regions, from which, consumers can gauge the best days to buy petrol. Also, The Australian Automobile Association (AAA) publishes petrol prices for Brisbane and 27 regional centres in Queensland on their website. More detailed information on daily capital city petroleum prices can be found at: http://www.motormouth.com.au

The Australian Government is responsible for implementing legislation dealing with the design standards for motor vehicles. Currently, all new vehicles up to 3.5 tonnes must carry a label indicating the fuel efficiency and greenhouse gas emissions of the vehicle. For new vehicles, the existing information on fuel efficiency is adequate and comparable. Information on the fuel efficiency of vehicles manufactured from 1986 onwards is available from the Federal Government's 'Green Vehicle Guide' or on the Australian Greenhouse Office website.

In June 2002, the Queensland Government announced a commitment to introduce an integrated public transit system and to perform this task, created a new entity known as TransLink. TransLink represents a fundamental shift in the way transport services are collectively delivered in South East Queensland.

Alternative fuel sources

Alternative fuels, including ethanol and bio-diesel are currently effectively excise tax free. The Queensland Government has consistently called on the Commonwealth to maintain this arrangement, at least for a considerably longer time, to enable the industry to develop properly. However, the Commonwealth intend to phase in excise taxes from 2011.

A recent Australian Bureau of Agricultural and Resource Economics (ABARE) study raised concerns about the bio-diesel industry's long term profitability when excise taxes are phased in from 2011,

despite an ongoing 50% discount for alternative fuels beyond 2015, concluding that bio-diesel would require an additional 21-32 cent per litre subsidy.

The competitiveness of ethanol production versus petroleum has been the subject of recent debate, particularly given the significant rise in oil prices. The rise in crude oil prices has evidently increased the viability of ethanol production in overseas and local markets in comparison to petroleum. ABARE has calculated that the long-run cost of ethanol production (33 cents per litre) would be less than the threshold level (38 cents per litre) based on oil price, exchange rate and taxation assumptions.[2]

In a highly competitive fuel market the retail fuel price for E-10 is determined by individual fuel companies and their respective pricing policies. For instance, BP has a pricing policy that offers E-10 fuel at the same price as their standard unleaded fuel. However, some independents in Queensland and other states offer E-10 at a discounted price to their unleaded product in an effort to increase market share. Feedback from independent fuel companies suggests a strong increase in sales of E-10 at service stations that offer the product at a discount to other fuel products.

The Queensland Government is developing the ethanol industry through the Queensland Ethanol Industry Action Plan 2005-2007, which allocates $7.3 million for industry development over the next two years, including the Queensland Ethanol Conversion Initiative. This initiative provides financial support for service station operators, fuel distributors and individual organisations. Substantial funding has also been allocated for a communications campaign to boost consumer confidence in ethanol-blended fuels.

The Queensland Government, through the Department of State Development, Trade and Innovation, will continue to assess opportunities in alternative fuels and fuel efficient transport technologies for the wider benefit of the Queensland economy.

Commonwealth fuel excise

While it is generally accepted that tax positions for conventional unleaded and diesel fuels have been guided by the 2002 Fuel Tax Inquiry and the 2004 Securing Australia's Energy Future white paper, the treatment of alternative fuels remains subject to contention. The Queensland Government maintains that the introduction of a net excise on alternative fuels in 2011 will be detrimental to the long term development of a biofuels industry in Australia. Essentially, the 2011 phase-in places additional pressure on the domestic biofuels industry to establish its credentials in the marketplace and become viable before 2011, which is not realistic given the time required to plan, obtain approvals, finance and construct a new facility. Therefore, the preference is that the introduction of a net fuel excise on alternative fuels be placed further out to allow sufficient time for the industry to attract vital capital investment.

Road funding

Currently, Queensland receives an inadequate share of AusLink funding with regard to the needs of the network. Federal road funding allocations are based on historical data that fails to reflect the extraordinary growth being experienced within the Queensland economy. This does not reflect factors such as road length and geography, maintenance needs and economic growth.

[2] The 'threshold level' refers to the level of production costs, given a number of assumptions, at which petroleum production costs are equivalent.

1 Introduction

This submission was compiled by the Queensland Government for the Impact of Petrol Pricing Select Committee in an effort to promote a wider understanding of the factors that influence petrol prices in Queensland. The submission draws particularly on aspects of the terms of reference where significant value could be added, with other items also being addressed.[3] The submission was undertaken based on both the terms of reference and information requests from the Select Committee to Queensland Treasury. Therefore the submission focuses particularly on items a), b), e), g) and to a lesser extent on items c), d), and f). Overall, the submission contains:

- a discussion of the industry structure and pricing of petroleum products, including the role of the Australian Competition and Consumer Commission (ACCC);
- an overview of the Queensland Fuel Subsidy, including the Bulk End User Scheme and administrative issues;
- an analysis of empirical petrol price data for Brisbane, other metropolitan cities and other regional cities and towns in Queensland to determine the extent to which the Queensland Fuel Subsidy is being reflected in retail petrol prices;
- a discussion of the broad impacts of recent price movements;
- a discussion of practical ways that consumers can reduce their fuel bills, including buying at dips in price cycles and being informed of vehicle fuel efficiency;
- an analysis, using computable general equilibrium (CGE) modelling, of the impact of higher oil prices on the Queensland economy;
- a discussion of issues related to the competitiveness of alternative fuels, such as bio-diesel, ethanol and E-10;
- a discussion of the extent of road funding in Queensland; followed by
- concluding remarks.

1.1 Industry structure

1.1.1 Refining

Australia has eight petroleum refineries that produce petrol. Two of these refineries are located in Queensland near the Port of Brisbane, while the remaining facilities are located in New South Wales (2), Victoria (2), Western Australia (1) and South Australia (1).[4] All of these refineries are owned by one of three multinational petroleum companies (BP, Shell and Exxon Mobil) and a fourth company (Caltex), which is jointly owned by a multinational petroleum company and local shareholders. Collectively, these four entities, the four major petroleum refining and marketing companies in Australia, are known as the 'oil majors'.

Australia's refineries are generally old and small by international standards, particularly compared with other facilities in the Asia-Pacific region. Despite this, petrol supplied in the Australian market is dominated by product from Australian refineries, which is produced from local or imported crude oil. In 2003-04, around 37% of refinery input was from domestic oil sources, with Vietnam, Indonesia, Malaysia, Papua New Guinea, Brunei and Saudi Arabia providing 92% of imports in February 2005.[5] Together, the Australian refineries have enough production capacity to supply the entire Australian market for refined automotive fuel.

[3] See Attachment 1 for the Select Committee's terms of reference

[4] Mobil's Port Stanvac refinery in South Australia was 'mothballed' in July 2003 and is currently not operating.

[5] Commonwealth Department of Industry, Tourism and Resources. *Australian Petroleum Statistics* (Issue No. 103, February 2005). Canberra, 2005.

In addition, there is an important role played by the importation of refined fuel as a substitute for locally available petrol. Importing refined fuel is a strategy frequently used by large independent wholesalers and retail chains.

1.1.2 Wholesale

At the wholesale and retail levels of the industry, the major oil companies generally dominate these market segments through very rigid vertically integrated operations. A system of distributors, who can be majority owned by the oil majors, purchase fuel from the oil companies which they on-sell to retailers. In many cases (particularly in country areas), a distributor owns the retail outlets to which they supply.

For some time, the oil majors adhered to transfer arrangements whereby companies could transfer a quantity of refined fuel from one terminal in exchange for an equivalent quantity at another company's terminal. This arrangement allowed each company to access supply from other company's facilities at no excess cost (for certain standard products). Recently these arrangements have broken down to some degree, and the wholesale transfer of product now takes place on a commercial basis.

1.1.3 Retail

The bulk of retail petrol sales are through sites that are owned or headleased by oil majors. The remaining sales are largely through dealer owned sites having long term supply agreements with the oil majors or branded independent wholesalers. In all, the retail sector consists of a number of different commercial operations including:

- Independent chains (such as Matilda and Neumann Petroleum);
- Independent operators using their own site, equipment and brand name;
- Independent operators who use their own site and equipment, but are in a branding agreement with an oil major;
- Single-site franchisees who rent a major-owned site and operate it under a franchise agreement which legally allows them to determine their own prices;
- Multi-site franchisees who rent a number of major-owned sites and operate them under one or many franchise agreements which legally allow them to determine their own prices;
- Commission agents who manage a major-owned site for a commission based on sales and typically cannot set prices themselves;
- Distributor owned sites that are run by a local fuel distributor (which may or may not be owned by an oil major); and
- Sites owned directly by an oil major and operated by company staff.

In Queensland, and more generally Australia, around three-quarters of total service station sites are owned by, or commercially affiliated with, the oil majors. Their share of retail fuel sales is believed to amount to over 85 percent of the total.

1.2 Price structure

1.2.1 Factors influencing retail petrol prices

A combination of international and local factors determine retail petrol prices in Queensland. Broadly speaking, petrol prices are made up of three components, which are, in order of magnitude:

- Refined fuel costs that are set in the international market;
- Commonwealth Government excise and taxes; and
- Domestic industry costs (including freight costs and retail/wholesale margins).

The components other than excise and taxes are quite volatile, for reasons that are neither predictable nor, in many cases, easily explained.

A number of studies and inquiries into various aspects of the downstream petroleum industry in Australia, most notably the Industry Commission's 1994 report, *Petroleum Products*, and various studies by the Australian Competition and Consumer Commission (ACCC), have concluded that petrol prices respond to a complex set of market and industry practice factors. Moreover, it has been observed that, in the short term, there is only a weak correlation between costs and prices for petrol.

International influences (such as movements in the prices of crude oil and refined petroleum products, and the $A/$US exchange rate) affect changes in retail prices, and as such, movements in Queensland petrol prices generally follow movements in Singapore refined petroleum product prices (mainly due to benchmark pricing practices). These factors are broadly influenced by supply and demand factors that are exogenous to the local industry.

Local factors that influence retail petrol prices vary between locations and over time. These can include, to varying degrees:

- Local demand and supply factors;
- The presence of independent retailers and wholesalers (players other than the four major oil companies);
- The potential availability of imports; and
- The extent of vertical integration in the local industry.

Furthermore, the causes of different patterns in local price movements, or 'price cycles', are complex and are influenced by many factors. These can include:

- Competition for market share;
- Oil company price support for their franchisees (discussed further in section 4);
- Differential wholesale petrol pricing;
- Short-term excess output at refineries;
- Changes in demand;
- Possible anti-competitive practices; and
- Movements in refiner margins.

There has been found to be no consensus among industry participants as to the relative significance of these factors. Because a number of influencing factors are interdependent, it is difficult to ascertain the individual impact of any one factor on the behaviour of petrol prices at any given time and in any given locality.

Overall, petrol has certain characteristics that make its price more susceptible to influences from a wide range of factors:

- It is a relatively homogeneous product;
- Its price is very visible;
- It is not easily substitutable, and therefore, demand for petrol is relatively price inelastic in the short term; and
- It constitutes a significant proportion of household spending.

In addition, petrol retailers may also use relatively cheap petrol to attract customers who may then purchase goods and services with a greater profit margin.

1.3 Regulation and reform

In terms of the regulation of industry structure, the Commonwealth *Petroleum Retail Marketing Sites Act 1980* controls the proportion of sites that are allowed to be directly owned and operated by the major oil companies, and the Commonwealth *Petroleum Retail Marketing Franchise Act 1980* controls aspects of the franchise agreements between the majors and their franchisees.

In addition to these Acts, a Petroleum Industry Oil Code was introduced in 1989 under the *Trade Practices Act 1974* to discourage anti-competitive behaviour. Due to its muted influence, the Oil Code is currently under review as part of proposals from a number of Commonwealth inquiries to repeal the 'Sites Act' and the 'Franchise Act'. A revised and strengthened code is part of a reform package designed to protect lessees and franchisees. The intention is that the *Trade Practices (Industry Codes – Oilcode) Regulations 2005* (the Oilcode)[6] would apply to commission agents as well as franchisees. This would also mean that franchisees of the independent chains would be on the same terms as those of the oil majors. The key Oil Code reforms currently being proposed are:

- national Terminal Gate Pricing (TGP) – terminal operators and major wholesalers will be required to post prices charged to retailers in order to make pricing more transparent;
- minimum standards and conditions for petrol re-selling agreements. This refers to all kinds of commercial agreements between retailers and their suppliers, covering traditional franchise agreements as well as agency agreements; and
- a dispute resolution scheme offering small business and other participants in the downstream sector the opportunity for improved business protection and low-cost complaints handling.

Furthermore, the Federal Industry Minister has promised a future review of petrol pricing by the oil majors. The Oilcode is expected to be introduced to the Australian Parliament in late 2005. The Queensland Government intends to await the introduction of the Oilcode to determine if it enhances the ability of the ACCC to monitor activities in the industry.

1.3.1 Price monitoring

The ACCC has assumed a price monitoring role under the *Trade Practices Act 1974* (TPA) which was formerly performed by the Prices Surveillance Authority. The TPA now incorporates the relevant provisions in Part VIIA. The ACCC currently has an informal monitoring role for petrol, diesel and automotive LPG prices. It monitors prices in the major cities and 110 country towns. It also currently monitors international crude oil and refined petrol prices, published wholesale prices of the oil majors and some independents and the city-country retail price differential.

In addition to this, Queensland Treasury monitors petrol prices in the metropolitan markets of Brisbane, Sydney and Melbourne as well as the south-east regions of Caboolture, Ipswich, Gold Coast and Sunshine Coast, and a further 22 country cities and towns on an ongoing basis.

In March 2001, the Commonwealth Government requested the ACCC to examine the feasibility of placing limitations on petrol and diesel price fluctuations throughout Australia. This was due to consumer concerns about petrol price cycles and that prices can suddenly increase by as much as 10 cents per litre in a day. The report found that:

- volatility of retail petrol prices is generally confined to major cities and some rural towns on major highways; and
- the causes of local price cycles are complex and that there is no agreement among industry participants as to the significance of suggested factors.

Following this report, the ACCC began providing information on its website to enhance consumers' understanding of petrol price cycles and how to take advantage of them. The Queensland

[6] Section 51AE of the *Trade Practices Act 1974.*

Government continues to lobby the Federal Government and ACCC to ensure that price monitoring activities continue and, in the event of evidence of predatory pricing practices in the industry, that action is taken to prevent market abuse.

The Queensland Government has ongoing concerns about the effectiveness of the ACCC. In the absence of stronger action from the ACCC, the Queensland Government initiated formation of the Parliamentary Impact of Petrol Pricing Select Committee to investigate different aspects of automotive fuel pricing and transport issues in Queensland. It is essential that the ACCC continue to monitor the petrol prices and respond proactively to any evidence of anti-competitive behaviour.

2 Queensland's Fuel Subsidy

2.1 Background and history

Until 1997, most States[7] imposed business franchise fees (BFFs) on liquor, petroleum and tobacco. Unlike all other States, Queensland did not impose a BFF on petroleum.

On 5 August 1997, the High Court held that the New South Wales' BFF on tobacco was constitutionally invalid as an excise. Under the Constitution, the Commonwealth Government has the exclusive power to impose customs and excise duties. The decision cast doubt upon the validity of all State BFFs.

To protect States' revenues, the Commonwealth introduced safety net arrangements for the States. Under these arrangements, the Commonwealth increased its excise on liquor, petroleum and tobacco and passed on to the States all of the additional revenue raised from this excise surcharge to offset State losses of BFF revenue.

State BFFs were not imposed at a uniform rate. However, for Constitutional reasons, the Commonwealth excise had to be imposed at a uniform rate for all States. In the case of fuel, the Commonwealth excise surcharge was 8.1 cents per litre.

To prevent prices rising and to ensure that States did not make windfall gains from the excise surcharge, States were required to provide subsidies to repay to consumers any difference between the former State BFF rate and the 8.1 cents per litre excise surcharge imposed by the Commonwealth. As The Queensland Government did not have a fuel tax and chose to maintain this, passing the whole of the 8.1 cents per litre excise surcharge to consumers as a subsidy. Queensland's Fuel Subsidy Scheme was developed for this purpose. Over time, the subsidy increased to 8.354 cents per litre in line with increases in Commonwealth excise rate.

2.1.1 The original Scheme

Queensland's original Fuel Subsidy Scheme (the Scheme) was established by the *Fuel Subsidy Act 1997* following extensive consultation with the fuel industry. The Scheme covered three categories of fuel consumption:

- Retail fuel – sales at service stations and other fuel retail outlets;
- Bulk end users – bulk purchases of fuel by consumers such as trucking and bus companies; and
- Off-road diesel – all other purchases of diesel other than for diesel engine road vehicles on a public road (off-road diesel consumers were fully subsidised in nearly all States). This maintained the special treatment of off-road diesel under the BFF regimes under which there was a full rebate of BFF.)

Diesel engine road vehicles are vehicles with a diesel engine and designed solely or principally for transporting persons, goods or animals by road. Vehicles such as mobile cranes, concrete pumping trucks and street sweepers were therefore covered by the off-road diesel subsidy.

Under the original Scheme, licensed retailers, licensed bulk-end users and licensed off-road diesel consumers were able to purchase their fuel at the subsidised price, that is, the selling price less the subsidy. Fuel wholesalers, who were required to reduce their selling price to these licensed consumers and then claimed the subsidy from the Office of State Revenue.

Licensed retailers were then required to pass on the benefit of the subsidy to their customers by reducing the selling price by the amount of the subsidy.

[7] In this section, *States* includes States and Territories.

2.1.2 The 2000 changes

Significant changes were made to the Scheme in 2000.

Abolition of off-road diesel subsidy – 1 July 2000

Under the Commonwealth's National Tax Reform proposals released in August 1998, the Commonwealth assumed responsibility for the payment of excise rebates to persons using diesel for off-road purposes. Specifically, the Commonwealth proposed the following changes:

- Termination of the excise safety net arrangements (States therefore lost this revenue); and
- A new Commonwealth comprehensive diesel fuel credit delivered through the GST system for registered businesses, under which:
  - effective excise payable on diesel fuel used in heavy transport and rail would be reduced from around 43 cents per litre to 18 cents per litre; and
  - all other off-road use of diesel (including marine business use) would qualify for a full credit of all diesel excise.

Like all other States, Queensland discontinued its off-road diesel subsidy from 1 July 2000. This reflected the fact that Queensland's Fuel Subsidy Scheme was originally established to ensure that fuel prices did not rise as a result of the imposition of the excise surcharge imposed for the States and that States did not make windfall gains as a result of the surcharge. With the Commonwealth no longer paying the excise surcharge to the States and proposing to fully rebate excise on off-road diesel, Queensland's off-road diesel subsidy was unnecessary.

On 1 July 2000, the Commonwealth reduced its excise from a total of 44.137 cents per litre (which included the excise surcharge) to 37.481 cents per litre, a reduction of 6.656 cents per litre. This was to offset the effect of GST on fuel prices. The Commonwealth also estimated that tax reform would save refineries 1.5 cents per litre, bringing total fall in prices of around 8.2 cents per litre. Table 1 summarises the excise changes on 1 July 2000 as they applied to off-road diesel used for primary production, for example.

Table 1

Excise, rebates and subsidy for off-road diesel use (primary production)

	30 Jun 00 (cents per litre)	**1 Jul 00** (cents per litre)
Commonwealth excise	35.783	37.481
Commonwealth excise surcharge	8.354	
Total excise	44.137	37.481
Commonwealth excise rebate	35.606	35.694
Qld off-road diesel subsidy	8.354	nil
Total rebates and subsidy	43.960	35.694
Net excise payable	**0.177**	**1.787**

In 2001, the Commonwealth cut the excise rate by a further 1.5 cents per litre and abolished excise indexation for petroleum products.

The Commonwealth's original proposal to extend its excise rebate to include all off-road use of diesel fuel did not proceed following negotiations with the Australian Democrats. Those negotiations resulted in the Commonwealth rebate being extended to rail and marine transport only and activities previously entitled to a partial rebate being given a full rebate (eg. mining and residential activities). Consequently, a number of off-road activities (eg. construction) were not covered by the Commonwealth off-road diesel scheme.

Changes to the retail and bulk end user schemes from October 2000
The original subsidy payment model worked at the wholesale level. This significantly reduced the number of subsidy claimants that the Office of State Revenue would otherwise have dealt with. However, the payment of the subsidy in advance of fuel delivery or usage raised opportunities for abuse of the Scheme. In particular, it was difficult to limit abuse of the subsidy through cross-border trade in subsidised fuel. Also, the lack of ongoing direct interaction between the Office of State Revenue and licensees made monitoring difficult.

The Queensland Government, with a view to ensuring that Queensland motorists received the full subsidy, introduced several changes in 2000, namely:

- The Office of State Revenue now pays the fuel subsidy directly to licensed retailers and bulk end users. Changes in relation to bulk end users commenced on 1 October 2000 while the changes for retailers commenced on 1 December 2000;
- Licensed retailers and bulk end users now purchase their fuel at the unsubsidised price and claim the subsidy in arrears directly from the Office of State Revenue; and
- To assist retailers with their fuel purchases, a provisional subsidy payment is made to them monthly in advance which is reconciled through the claims process.

2.2 Administration issues

The Scheme is administered by the Commissioner of State Revenue. Administration involves licensing, processing and payment of subsidy claims and compliance and recovery activity for overpaid subsidies.

2.2.1 The retail scheme

Overview
Retailers such as service stations and retail shops which sell fuel are entitled to a subsidy for fuel sold by them from their retail site. The fuel must be sold in retail quantities (not more than 2,000 litres per customer per day) and delivered by a metered pump into the running tank of a vehicle or an empty container, such as a fuel drum. (The 2,000 litre limit and the empty container requirement ensure that the subsidy cannot be claimed for fuel pumped into tankers for transport.)

Retail fuel
Retail fuel is motor spirit and diesel of the type ordinarily sold by a retailer in retail quantities but does not include diesel for which the retailer has been notified by the customer that the diesel is for off-road use.

Retail customers who purchase diesel for an off-road purpose must notify the retailer at the time of purchase and are charged the unsubsidised price. Also, retail customers who purchase subsidised diesel from a retailer and subsequently use the diesel for an off-road purpose are required to repay the subsidy to the Office of State Revenue.

Retail diesel sales for private or domestic off-road use are eligible for a subsidy unless the purchaser is eligible for a rebate under the Commonwealth's diesel fuel rebate scheme for the diesel. Similarly marine sales of diesel for private recreational vessels registered in Queensland are subsidised.

The subsidy
The retail subsidy is 8.4 cents per litre. Retailers are required to pass on 8.354 cents per litre to consumers through the reduced fuel selling price but may retain the balance to offset administrative costs incurred.

Passing on the subsidy
While the Scheme is not a price control system, retailers are required by the *Fuel Subsidy Act 1997* to pass on the benefit of the subsidy to their customers through reduced prices. The basis of the Scheme is that market forces determine the selling price for fuel. Passing on of the subsidy by retailers is also monitored as part of the Office of State Revenue's on-going audit program.

Licensing, claiming and record keeping
Retailers are required to be licensed with the Office of State Revenue. In recognition of the substantial cash flow outlays of a retailer in purchasing unsubsidised fuel, retailers are paid a monthly provisional subsidy in advance to assist them with their fuel purchases. (Some retailers prefer not to receive the provisional payment.) Retailers claim the subsidy from the Office of State Revenue monthly in arrears. The actual subsidy entitlement is reconciled against the provisional subsidy paid and any adjustments are then be made against the following month's provisional subsidy payment.

Retailers are required to keep records substantiating their subsidy entitlement.

2.2.2 The Bulk End User Scheme

Overview
Bulk end users buy bulk quantities of fuel for storage at their premises in Queensland and use in their vehicles or equipment. The fuel must be delivered directly into the running tank of a vehicle or equipment used by the person in quantities of not more than 2,000 litres per day.

Mobile fuel distributors may also be bulk end users. Examples include tanker trucks which deliver fuel into vehicles at places other than retail service stations.

Bulk end user fuel
As in the case of retail fuel, bulk end user fuel is motor spirit and diesel of the kind ordinarily sold by a retailer. However, it does not include diesel used for an off-road purpose.

The subsidy
The bulk end user subsidy is 8.4 cents per litre. It was increased from 8.354 cents per litre as part of the 2000 changes to the Scheme in recognition of the cash flow costs which would be borne by bulk end users having to claim the subsidy in arrears as a result of the changes.

Licensing, claiming and record keeping
Bulk end users are required to be licensed with the Office of State Revenue and may claim the subsidy by lodging claims (usually quarterly) in relation to fuel they have actually used during the period. Claims must be made within 2 years of the fuel being used.

Bulk end users are required to keep records that substantiate their entitlement to the amount of subsidy they have claimed. Where the subsidy is claimed in relation to diesel, records must be kept to show the amount that is used for eligible purposes, and the amount that is not eligible (off-road).

The following changes have been made, in consultation with key industry groups, to simplify compliance:

- record keeping requirements were simplified for bulk end users who consume less than 25,000 litres of bulk end user fuel per year; and

- an annual provisional payment of up to $1,000 was introduced to assist smaller bulk end users (i.e. those claiming up to $1,000 per year) by allowing them to access their fuel subsidy in advance by 1 October each year and reducing the paperwork by replacing up to four claims each year with an annual return. To access the provisional subsidy, bulk end users need to establish a claiming pattern for one year to minimise the risk associated with an up front payment.

2.2.3 Compliance activity

Compliance activity is undertaken by the Office of State Revenue in relation to claims by retailers and bulk end users to ensure that the correct amount of fuel subsidy is received.

In relation to audit of claims for off-road diesel after abolition of the off-road diesel scheme on 1 July 2000, the Office of State Revenue implemented a three stage strategy of education and awareness, amnesty and enforcement. During the initial education and awareness phase, an extensive program of advertisements in Brisbane and regional newspapers, articles in industry and association publications, licensee visits and dissemination of information was undertaken. This education was complemented by a three month amnesty period from 1 September 2001 to allow diesel users the opportunity to voluntarily repay any subsidy obtained and subsequently used for off-road purposes.

Since the amnesty, the Office of State Revenue has continued an on-going audit program with the initial focus on the higher risk categories such as earth moving/excavation and construction. This continuing audit program is supported by education through the Office website, newspaper advertisements and public education programs. However, it is difficult to target a specific education program for every off-road diesel user as this type of fuel usage occurs across a number of industries.

2.2.4 Penalties, interest and prosecutions

Provision exists in the *Fuel Subsidy Act 1997* to impose penalties and interest in the following cases.

- A penalty of up to 100% may be imposed where there has been an overpayment of subsidy.
- Interest of 20% per annum may be imposed on amounts owing.

However, the decision to impose a penalty or interest and the amount imposed is made after considering the facts of each case on its merits.

Prosecution for offences against the Act generally carry a penalty of up to 100 penalty units (maximum penalty $7,500). Prosecution action under revenue legislation is undertaken by the Office in the most blatant cases of abuse of revenue legislation.

2.2.5 Cost of the Scheme

Table 2

Queensland Fuel Subsidies 1999-00 to 2004-05

	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05
motor spirit (ML)	4783.0	3358.6	3482.3	3725.5	3791.6	4004.7
diesel (ML)	2250.8	1684.3	1746.3	1885.2	1938.2	2103.6
Total litres (ML)	7033.8	5042.9	5228.6	5610.7	5729.8	6108.3
Subsidy ($m)	583.1	423.6	439.2	471.3	481.3	513.1
Growth (%)		-27.4%	3.7%	7.3%	2.1%	6.6%

Costs of administration of the Scheme include licensing, claims processing, audit and client communication activities. For 2004-05, administration costs of the Scheme were $1.349 million or 0.26 cents for every dollar of subsidy paid that year.

3 Statistical Analysis of Metropolitan and Country Petrol Prices

This section contains a brief consideration of some issues that are relevant to understanding the basic dynamics of differences in the pricing of petrol between densely populated centres and centres that are less densely populated, followed by a basic statistical analysis of prices interstate and across Queensland. The data used for the empirical analysis were sourced from FuelTrac Pty Ltd.

3.1 Structural and costing issues

3.1.1 Metropolitan petrol markets

The inherent nature of the retail petrol markets in Brisbane, Sydney and Melbourne are largely comparable. Each market is characterised by a high degree of competition, high overall product turnover, and a significant number of independents' sites. However, one major difference between the cities' retail petrol markets is the existence of the fuel subsidy scheme which affects retail prices in Queensland.

The major metropolitan retail markets for petrol in Brisbane, Sydney and Melbourne are subject to a number of elements which are unique to high-volume retail petrol markets in Australia. Each city is in close proximity to oil refineries, negating transport scheduling and associated storage costs typically experienced in most regional areas. Furthermore, the higher number of independents operating at the wholesale and retail level, relative to other areas, is believed to have the effect of increasing competition at the pump.

Another characteristic, which has been the subject of recent investigations by the ACCC, is the existence of 'price cycles' in the major metropolitan petrol markets that run over periods of around seven days and cause average prices in each city to vary by up to 12 cents per litre or more over the cycle. This tendency for prices across a major city to move in a similar, consistent pattern is thought to represent fierce competition in these markets.

However, there have been growing concerns in recent years that the oil majors, through their branded distributors and retail franchisees, are using specific practices in metropolitan markets with the long-term objective of eliminating competition from independent retailers. It has been mooted that some of these practices trigger the price cycles or 'price wars' in major cities. These claims are difficult to substantiate given the complex set of contractual arrangements between the oil majors and their downstream operations. The areas of oil majors' involvement that have come under increasing scrutiny in recent times include price discounting and margin support, multi-site franchising and oil company credit cards.

Price discounting and margin support

'Discounting' takes the form of price support by oil companies to selected retail outlets. The level of support provided varies according to factors such as the level of local competition and the potential for high volume turnover. As motorists shift to discounting sites, other branded sites seek the support of their oil company suppliers to match the competition and consequently, discounting becomes more widespread. Prices then tend to fall until one or more of the oil companies decide they can no longer afford to sustain the low prices and withdraw their support rebate. Other companies tend to react in a similar way and prices then move back up to pre-discount levels.

Multi-site franchising

Through multi-site franchising, a franchisee operates a number of sites, usually within the same geographical area. Through this arrangement, oil majors can avoid the operation and intent of the Sites Act and effectively control retail prices in those areas using price support mechanisms. The oil majors have argued that this mode of operation provides efficiency gains through economies of scale.

Oil company credit cards or 'fuel cards'
Using oil company credit cards, the fuel is pre-sold at a contract price. If supplied by a franchisee, that franchisee virtually becomes a commission agent for that sale. It is thought that these cards allow the oil majors to bypass the Sites Act through making direct sales at non-company operated sites. The impact of this arrangement is generally more pronounced in country areas.

3.1.2 Country petrol markets

In analysing trends and differences in retail petrol prices across regional areas of Queensland, it is important to note that there are significant aspects of country petrol markets that operate quite differently to those in metropolitan cities. One of the most obvious factors is the additional cost associated with the transport of fuel. However, this factor alone usually has only a partial impact on the overall retail price of petrol in country markets. More significant contributors to higher prices outside metropolitan areas are:

- The relative volume of fuel and other goods sold at a particular site;
- Local supply characteristics; and
- The degree of competition in regional markets (these items are discussed further in the next section).

The structure of the petroleum industry in country Queensland draws heavily on distributors and the use of terminal facilities located in the coastal seaports of Cairns, Townsville, Mackay and Gladstone. From these centres, fuel is transported via road to retail sites (within close proximity to the terminals), bulk end users (such as large industrial consumers) and distributors' product handling depots (in locations further away from the seaports). Country retail sites can also face significantly higher costs associated with smaller, fragmented delivery and storage capacity at depots and individual sites.

The efficiency of the fuel delivery system is a significant contributor to the costs of retailers in country areas. In particular, country distributors, which supply the majority of retailers, have significant capital investments geared towards double-handling of product and small volume supply.

As part of the introduction of the new tax system in 2000, the Commonwealth introduced the Fuel Sales Grant Scheme to offset the fact that the introduction of the GST would cause a percentage increase in fuel prices that would be greater in higher cost areas. Therefore, this subsidy was made available to retailers in non-metropolitan and remote areas within Australia. The scheme involves a payment to retailers of 1 cent per litre for fuel sales in designated 'non-metropolitan' areas and 2 cents per litre for sales in designated 'remote' areas.

However, this assistance falls significantly short of reducing the actual differential between metropolitan and other areas of the State, which can be 12 cents or more.

3.2 Market issues

As previously mentioned, fuel price differentials between the city and country are often the result of fundamental differences in market characteristics such that country prices may never be as low as those in metropolitan areas, even after allowing for all costs associated with storage and distribution. Retail margins in country markets can be traced to features of country retailing (low volumes and low non-fuel sales) that are largely beyond the control of the retailer, as well as the disproportionately large effect of certain local factors in their pricing strategies.

As the overheads associated with petrol retailing are relatively fixed, the volume sold through a site has a significant impact on the price of each litre of fuel. Retailers in country areas typically sell lower volumes of fuel than their city counterparts, resulting in larger mark-ups on petrol sold through country sites to cover infrastructure and staffing costs. In other words, with less volume over which

to spread these costs, lower volume sites need a higher margin to break even. Also, sales of high profit margin non-fuel items are generally lower at country sites, reducing the opportunity to use margins from these items to cross-subsidise margins on petrol sales.

With smaller populations in country towns, there are limited opportunities to attract regular passing trade or to move large volumes of product quickly, as is done through discounting in metropolitan areas. The absence of retail discounting adds to the perception that country markets subsidise city consumers. However, any attempt by an oil company to earn abnormal returns in order to finance subsidies elsewhere would encourage undercutting by other companies in the area and the entry of new suppliers.

It is also possible that price discrimination in wholesale pricing is more widespread in country areas – that is, the sale of the same products by the same supplier to different resellers at different prices. Differentials in wholesale prices can sometimes be explained in terms of the costs of supplying and the buying power of independents and resellers with large throughput.

However, as many retailers can typically be tied to exclusive supply arrangements with a single distributor (mainly through lack of an alternative), they can become susceptible to the marketing strategies of the companies to which distributors are tied, or those of the distributors themselves. This is indicative of a lack of competition at the wholesale level, and is of greater concern in more remote areas of the State.

Considerable local knowledge is required to put forward an exact explanation of prices in each country town. Each has a different market with a different range of factors contributing in different proportions to local retail prices.

3.3 Interstate metropolitan prices

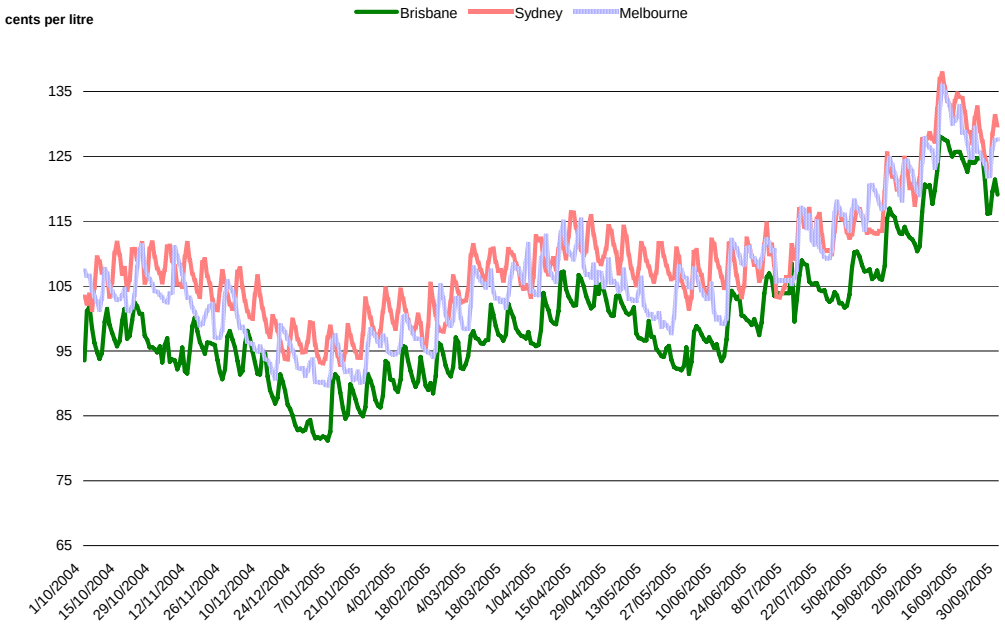
The data for average daily unleaded petrol (ULP) prices in Brisbane, Sydney and Melbourne for the 12 months ending 30 September 2005 are plotted in Figure 1. As can be observed from the chart, average prices in each of these cities displayed a somewhat systematic pattern of weekly peaks and troughs, with some periods of extended discounting.

Overall trends for the period indicate that there was a general increase in average prices in all cities, with a marked increase in the four months to the beginning of September. There was a slight decline in average petrol prices from October until early-December. Within this period, extended discounting in Brisbane can be inferred between the end of October and mid-November. Average petrol prices also fell for an extended period in Brisbane between the mid-December and early-January. There was an increase in average petrol prices from January to April, until prices moved lower over the month of May. Average prices then moved consistently higher from June, until some easing in early-September. The overall increase in petrol prices from October 2004 to September 2005 can primarily be attributed to rising world crude oil prices and a relatively stable $A against the $US.

The general upward trend in world oil prices can be attributed to strong global demand for oil, low OECD oil inventories, continuing uncertainty about future Iraqi oil supplies and global security concerns, which have also influenced increased speculation in oil futures markets. Movements in world oil prices are strongly linked to crude oil production in the OPEC countries due to the importance of this group in supplying world markets.[8] Changes in world crude oil prices then impact on refiners' costs, which filter into the cost of refined petrol. Because world crude oil prices are denominated in $US, movements in exchange rates are reflected in adjustments to refiners' costs (measured in local currency) for a given quantity of crude oil at a given $US price.

[8] OPEC countries produce around 40% of the world's crude oil supply.

Figure 1
Average daily ULP prices for Brisbane, Sydney and Melbourne
(12 months ending September 30, 2005)



Source: FuelTrac

The price of unleaded petrol sold in Brisbane averaged around 99.6 cents per litre over the 12 months to September 2005. This amount was 9.2 and 6.7 cents per litre less than average petrol prices in Sydney and Melbourne respectively (see Table 3 and Figure 2). As the level of the Queensland Fuel Subsidy is 8.35 cents per litre, the difference between average prices in Sydney and Brisbane was greater than the amount of the subsidy, while average prices in Melbourne converged more than expected with average Brisbane prices over the period. Overall though, there is no evidence to suggest that the Queensland Fuel Subsidy is not being passed on to motorists.

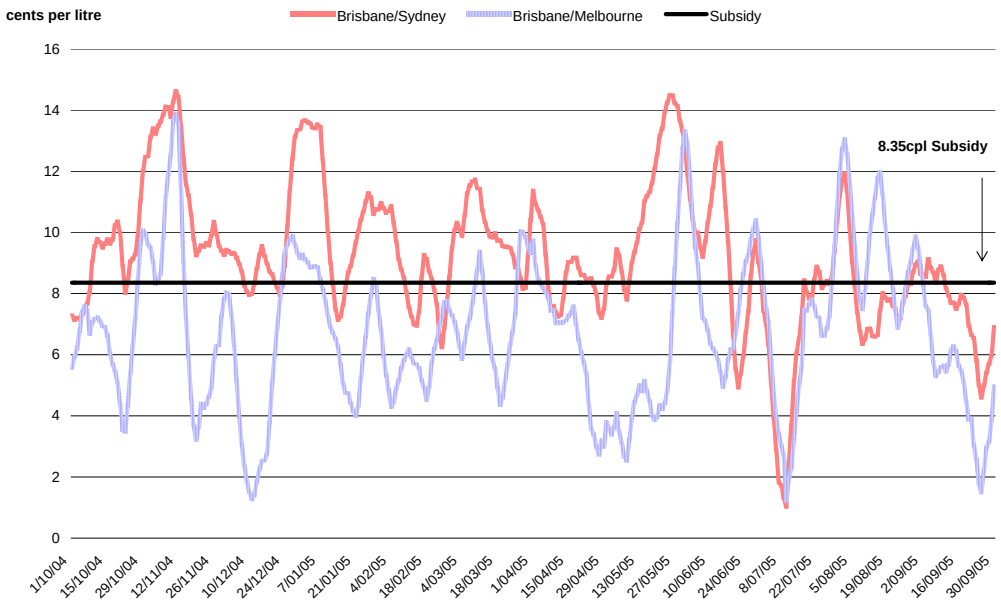
Table 3
Average daily ULP price difference between other cities and Brisbane
(cents per litre, 12 months ending September 30, 2005)

	Sydney – Brisbane	Melbourne – Brisbane
Average	9.2	6.7
Maximum	20.1	17.5
Minimum	-0.6	-3.1
Standard deviation	3.7	3.3

Source: FuelTrac

Within the 12 month period to the end of September 2005, possible episodes of diverging short-term supply/demand dynamics, combined with the marketing strategies of the oil majors, possibly led to movements in average price differentials that varied significantly from expected outcomes. The price differentials between Brisbane and the metropolitan centres of Sydney and Melbourne are shown below. The figure below is based on a 7-day moving average of the daily price difference between Brisbane and the other metropolitan cities of Sydney and Melbourne. This figure illustrates the level of price convergence between daily petrol prices in Melbourne and those in Brisbane, with the difference between Brisbane and Melbourne prices falling below the 8.35 cents per litre fuel subsidy over much of the first eight months of the period.

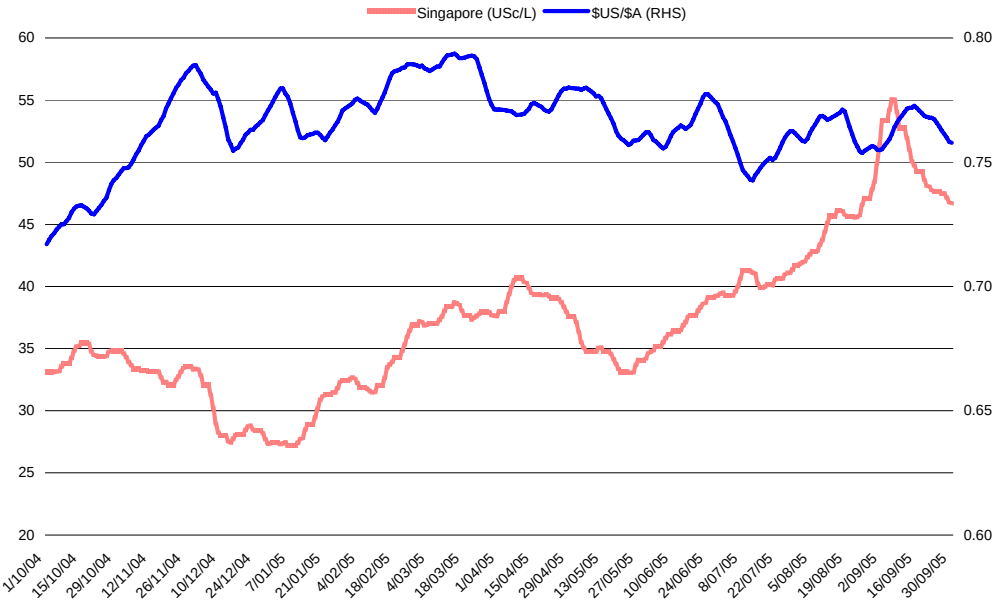
Figure 2
Average daily ULP price difference between other cities and Brisbane
(based on 7-day moving average)



Source: FuelTrac

The overall movements in Australian petrol prices followed a strengthening in regional benchmark prices evidenced by the rise in the Singapore refined petrol price, coinciding with a relatively stable $A in $US terms. Figure 3 shows movements in the $US/$A exchange rate and Singapore MOPS 95 gasoline prices.[9]

Figure 3
Average daily Singapore MOPS 95 price and $US/$A
(MOPS 95 based on 7-day moving average)



Source: Reuters

[9] The Singapore (MOPS 95) refined gasoline price is the benchmark price used in the Asia-Pacific region for determining refiner margins (along with Tapis crude oil prices) and, therefore, the cost of refined petrol.

In Figure 4, a weekly moving average series was constructed consisting of Singapore refined gasoline prices adjusted for exchange rate variations, Australian excise and GST components, estimated amounts for freight, wharfage and insurance, and an adjustment for the Queensland fuel subsidy (as applied to Brisbane prices). This series effectively represents a proxy of the 'landed cost' (including tax), or import parity price of refined petrol. In other words, the series represents the cost of retail petrol less any local industry margins. The differential between the moving average series for average ULP prices in each city and the modelled import parity series gives an approximation of local industry mark-up on ULP sales in each market, given a number of assumptions.

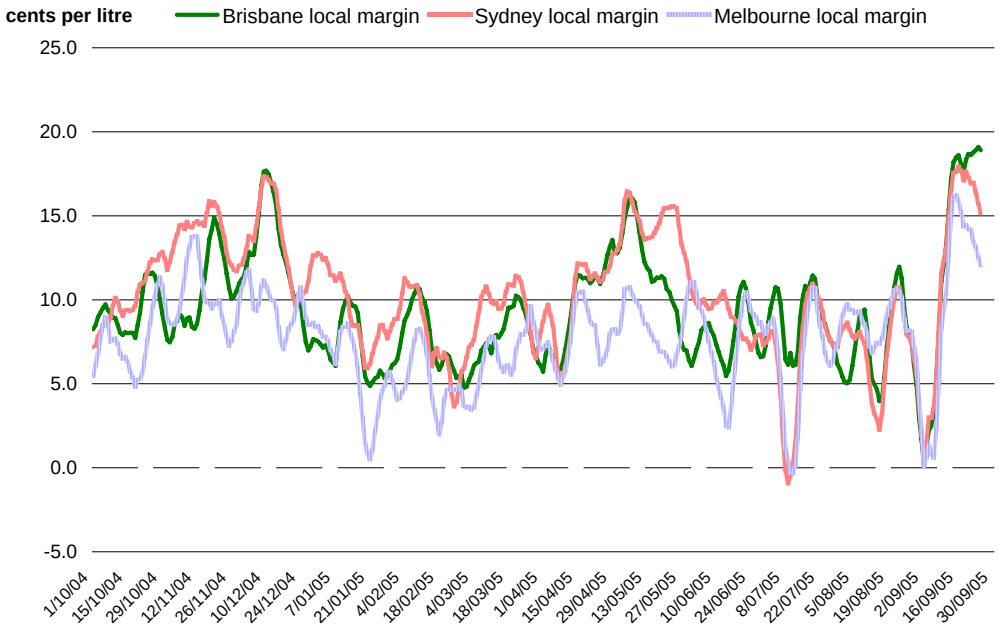
The indicative local industry margin for Brisbane suggested by the difference between average retail prices and indicative import parity prices averaged 9.3 cents per litre over the 12 months to September 2005. The respective indicative industry margin for Sydney averaged 0.9 cents per litre more than that of Brisbane for the same period (after adjusting for the amount of the Queensland fuel subsidy), while the indicative industry margin for Melbourne averaged 1.6 cents per litre less than Brisbane.

Figure 4 illustrates that margins in Melbourne were, on average, lower than those in Brisbane and Sydney over the period. This raises the likelihood that price discounting and subsequent lower retail petrol prices in Melbourne, particularly from mid-November to late-December and mid-January to late-February, may have been affected by the higher retail margins maintained in Brisbane and Sydney over the period. This is also particularly evident from mid-April to late-May. During this period, the difference between indicative local margins in Brisbane and Sydney, and those in Melbourne, was visibly larger. Overall, however, there is no evidence to suggest that the Queensland Fuel Subsidy is not being passed on to motorists.

Figure 4

Indicative local ULP margin based on 'import parity' price measure

(based on 7-day moving average)



Source: FuelTrac, Reuters, Caltex and Queensland Treasury

3.4 Coastal seaport prices

Data for average weekly unleaded petrol prices were collected for 22 'country' towns in Queensland, as well as weekly, seven day moving average prices for the south-east Queensland areas of Brisbane, Caboolture, Ipswich, Gold Coast and Sunshine Coast. For the purposes of comparing prices across Queensland, south-east Queensland ULP prices are taken as being an average of the five south-east Queensland series'. Included in the country data are average unleaded petrol prices for the coastal seaports of Cairns, Townsville, Mackay and Gladstone, which are predominantly supplied by coastal shipping that services bulk storage terminals at the ports of each centre. Table 4 shows the list of country towns included, as well as the average unleaded prices and differences from average south-east Queensland prices for the 12 months ending September 30 2005.

Table 4
Average ULP prices and differences from SE Queensland average prices
(cents per litre, 12 months ending September 30, 2005)

	Average price	Average difference from SE Queensland	Maximum price difference	Minimum price difference	Standard deviation
Coastal seaports					
Cairns	103.4	3.5	5.0	-7.2	2.6
Townsville	101.3	1.4	9.0	-3.8	2.8
Mackay	100.4	0.4	9.4	-6.9	3.4
Gladstone	102.6	2.6	10.0	-5.1	2.7
Other towns					
Atherton	102.3	2.4	8.8	-3.0	3.2
Biloela	104.6	4.6	13.4	-0.9	2.9
Bowen	106.4	6.4	12.8	-2.6	2.6
Bundaberg	101.9	2.0	9.4	-3.2	2.9
Charleville	111.5	11.6	17.1	3.7	3.3
Charters Towers	107.4	7.5	15.2	-0.7	3.3
Emerald	103.7	3.7	10.9	-4.4	3.7
Goondiwindi	103.8	3.8	13.3	-2.0	3.4
Gympie	99.4	-0.6	5.0	-7.2	2.6
Kingaroy	101.9	2.0	8.7	-3.7	2.7
Longreach	109.5	9.5	16.1	1.7	2.9
Maryborough	101.5	1.5	5.5	-3.8	2.1
Moranbah	107.9	8.0	16.8	0.0	3.1
Mt Isa	106.0	6.0	13.8	-3.5	3.6
Rockhampton	103.2	3.3	11.2	-1.5	2.8
Roma	107.6	7.6	13.5	0.8	2.8
Toowoomba	100.9	1.0	6.0	-4.6	2.6
Warwick	99.4	-0.6	6.2	-9.6	3.0

Source: *FuelTrac*

The average differences between average petrol prices at the coastal seaports and those in south-east Queensland (the South-east) over the 12 months to the end of September 2005 were 3.5 cents per litre in Cairns, 1.4 cents per litre in Townsville and 2.6 cents per litre in Gladstone, while average prices in Mackay were only 0.4 cent per litre greater than average south-east Queensland prices. These differentials in average prices may predominantly be attributed to the possibility of more pronounced price discounting and higher turnover of fuel product at retail sites in the South-east, relative to the respective coastal seaports, as well as different supply and demand dynamics, with the possibility of short-term excess product arriving at terminals and depots at the particular seaports.

Overall, differences between the coastal seaports and the South-east, due to variations in the timing of some price movements, caused average prices between the different regions to vary by up to 10.0 cents per litre or more over the period (Figure 5).

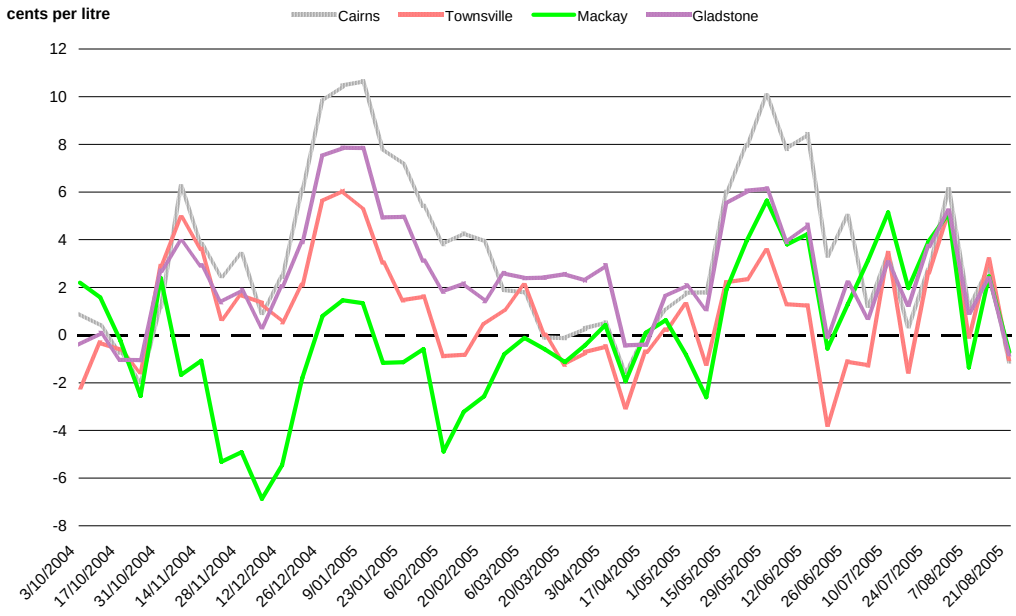
In Figure 5, it can be seen that average petrol prices in Mackay appeared to move ahead of changes in average south-east Queensland prices, causing average Mackay retail petrol prices to be well below those in Brisbane at the end of 2004. Retail petrol prices in Mackay continued to be below south-east Queensland prices and other coastal centres until mid-March, when the differential increased to 6.9 cents per litre in the week ending December 5. Following this, average prices in Mackay fell again in early February, to around 4.9 cents per litre below those in the South-east.

Meanwhile, differentials between petrol prices in south-east Queensland and those at the coastal seaports of Cairns, Townsville, and Gladstone rose steadily until early-January, after which price differentials narrowed when prices in Brisbane increased. During March, average prices in all of the coastal seaports moved to converge with average prices in south-east Queensland. Average prices in the coastal seaports then began to diverge from south-east Queensland prices, as prices fell and indicative industry margins reduced in Brisbane in May.

Figure 5

Average weekly ULP price difference between SE Queensland and coastal seaports

(12 months ending September 30, 2005)



Source: FuelTrac

Average prices in the coastal seaports appeared to lag behind the South-east in terms of the general decrease and then increase in petrol prices experienced in Brisbane over the period. However, petrol prices in Mackay appeared to move more in line with changes in average south-east Queensland prices than expected. At times, this caused differentials between the South-east and Mackay to reduce to well below parity.

3.5 Regional and country prices

Taking into consideration points of distribution and the distances that fuel is transported, there appears to be no strong consistent relationship between levels of unleaded petrol prices in different locations and combinations of these factors. For example, over the 12 months to the end of September 2005, average prices in Atherton were 1.1 cents per litre *less than* those in Cairns, average prices in Bowen were 5.1 cents per litre *greater than* average prices in Townsville, average prices in Moranbah were 7.5 cents per litre *greater than* average Mackay prices and average prices in Biloela were 2.0 cents per litre *greater than* those in Gladstone.

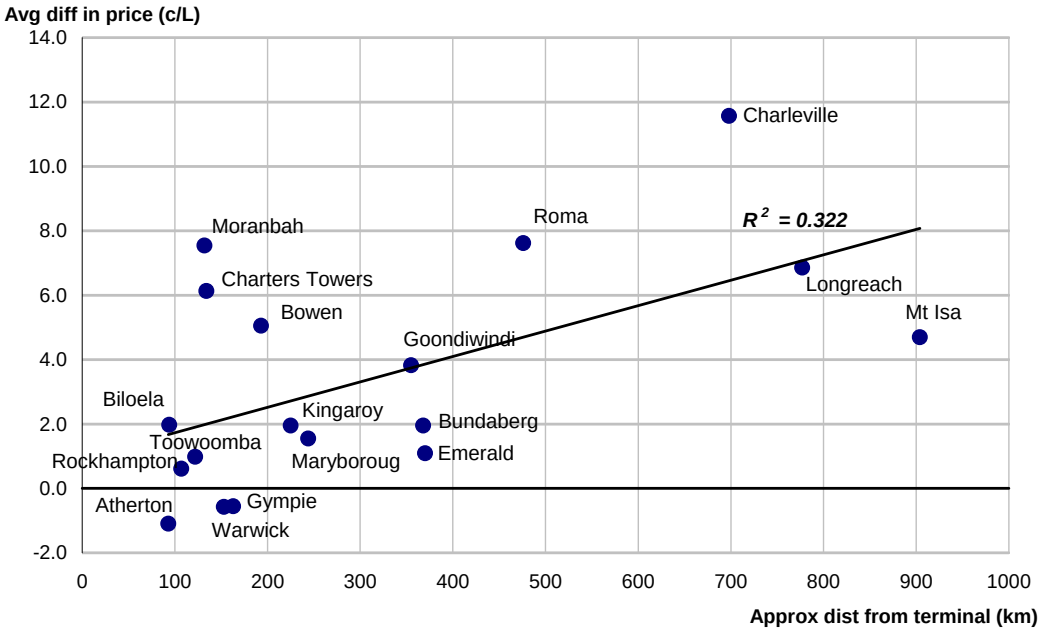
These varying differentials occurred despite the fact that Atherton, Bowen, Moranbah and Biloela are all within 200 km of the coastal seaports of Cairns, Townsville, Mackay and Gladstone respectively, which are the distribution points for fuel in the aforementioned regional centres. This indicates that a number of extraneous factors, such as the size of the region, the number of retail sites and the location of the site in terms of traffic flows can outweigh the effect of transport costs from distribution points.

Figure 6 shows that there was a very weak linear relationship between road distance from coastal seaports to country towns and the average difference in prices between each town and the corresponding supply terminal over the period. This is illustrated by a 'line of best fit' for the data, which suggests that less than one third of the total variation in petrol price differentials can be explained by road distances between the towns and respective supplying terminals.

Figure 6

Average ULP prices and differences from average prices at corresponding seaports

(12 months ending September 30, 2005)



Source: FuelTrac

Table 5 lists the country towns surveyed, the terminals from which they are predominantly supplied, the approximate distances by road from these terminals, and the average differential between average prices observed for each town and prices for the corresponding terminal centre for the 12 months to the end of September 2005.

Table 5

Average ULP prices and differences from average prices at corresponding seaports

(12 months ending September 30, 2005)

	Supplying terminal	Approx dist from terminal (km)	Difference in average price from terminal centre (cents per litre)
< 200km			
Biloela	Gladstone	94	2.0
Atherton	Cairns	94	-1.1
Rockhampton	Gladstone	107	0.6
Toowoomba	Brisbane	122	1.0
Moranbah	Mackay	132	7.5
Charters Towers	Townsville	134	6.1
Warwick	Brisbane	153	-0.6
Gympie	Brisbane	163	-0.6
Bowen	Townsville	193	5.1
200 - 400km			
Kingaroy	Brisbane	225	2.0
Maryborough	Brisbane	244	1.5
Goondiwindi	Brisbane	355	3.8
Bundaberg	Brisbane	368	2.0
Emerald	Gladstone	370	1.1
400 - 600km			
Roma	Brisbane	476	7.6
> 600km			
Charleville	Brisbane	698	11.6
Longreach	Gladstone	777	6.9
Mt Isa	Townsville	904	4.7

Source: FuelTrac, Queensland Treasury

4 Impact of Petrol Prices on the Queensland Economy

4.1 Impacts of recent petrol price movements

Increases in petrol prices have a direct impact on the Consumer Price Index (CPI) and boosted the annual inflation rate significantly in September quarter 2005. However, the recent strength in world oil prices should represent less of a shock to the aggregate price level than earlier global oil price shocks.

Furthermore, variations in the price of crude oil on world markets have a more muted impact on retail petrol prices in Australia than in countries like the United States, where the level of taxation on petroleum products is much less. For this reason, Australian consumers have been relatively shielded from the recent rise in world crude oil prices, to some extent, by the relatively stable $A, and the additional costs borne in the domestic market.

Petrol accounts for a relatively modest share of spending by Queensland households. Automotive fuel has a base-period weight of 3.8% in the latest series of the national CPI. In the broader national accounts measure of household consumption expenditure, automotive fuel accounted for less than 3% of total household spending in 2004-05.[10]

With an average weekly petrol consumption of around 35 litres per household, the increase in petrol prices of almost 20 cents per litre over the 12 months to the end of September 2005 would have added around $7 to the average weekly household fuel bill (taking it to around $42 per week). However, one response of households to higher petrol prices has been to look for ways to reduce their fuel consumption, such as cutting back on discretionary driving or changing to more fuel efficient vehicles.

Despite negative impacts on the economy, increased fuel prices may result in benefits to the environment as a result of more sustainable mode choice or alternately less transport activity. For example, Queensland Transport has seen increased public transport use in south east Queensland. Patronage for the 2004-05 financial year was 136.1 million (across bus, train and ferry modes). This equates to a growth of 9.9% on the 2003-04 year. The Queensland Government continues to invest in public transport to alleviate the impacts of high petrol prices on the community.

4.1.1 Impacts on specific Government agencies

A number of Queensland Government agencies have a significant proportion of their costs attributed to fuel purchases. The following agencies have been particularly affected by the recent rise in fuel prices due to their reliance on petroleum fuel to power vehicles and equipment.

Transport

Queensland Transport has in place a number of contracts for the delivery of public transport services which use fossil fuel. These included contracts for bus and ferry services in south east Queensland and major regional centres. In addition contracts are in place for regional aviation services, long distance bus and passenger and freight rail and taxi services. All of these contracts have been adversely impacted on, by varying degrees, by rising fuel costs. Main Roads' costs may also be increased – for example, through the higher cost of road input products (bitumen, kero cutter, etc).

Public Works

The Department of Public Works is currently managing more than $800 million worth of capital works projects across Queensland for the State Government. These projects range from the $277 million Millennium Arts Project at South Bank through to the refurbishment of the former Health and Welfare Building in George Street, Brisbane.

[10] Reserve Bank of Australia, *Statement on Monetary Policy*, November 2005.

Within the building and capital works divisions of the Department of Public Works, the rising price of fuel has been identified as having no more an impact than the rising cost of other materials used within building and construction. Indeed, it has been identified that other materials required for building and construction have cost movements that are greater and, therefore, noticeably more detrimental to the cost of carrying out works. The limited supply of materials within the building and construction industry has been a major factor of concern throughout the 2004-05 financial year, and is projected to be of concern in the 2005-06 financial year. As fuel is not declining in availability, it is not yet regarded as a primary concern for the building divisions within the Department of Public Works.

SDS

SDS is a commercialised business unit of the Department of Public Works that provides stationery and merchandise supplies across government and commercially. The major impact upon SDS of rising fuel prices has been the fuel levy that is charged on freight accounts. The levy is between 5% and 9%, depending on the carrier and the frequency of use. As SDS is a commercialised business unit, the product pricing is reflected in the actual cost of sales. For general merchandise, all clients are affected equally as freight costs are amortised across the product range. This results in a higher net cost for general merchandise when fuel costs rise. Furniture freight, however, is charged to the customer for deliveries to the outer suburbs of Brisbane and regional Queensland on an individual cost recovery basis. Ultimately, because freight charges are generally higher, the further the product travels, the higher the net dollar effect, particularly for clients in regional Queensland.

QFleet

QFleet manages a fleet of over 13,000 Government vehicles for the State. Rising fuel prices have influenced a consumer trend towards smaller and more fuel-efficient vehicles, which has subsequently impacted upon the saleability of larger and less fuel-efficient vehicles. As a direct cause of the saleability of fleet vehicles, and in order to reflect the market preference for smaller, more fuel-efficient vehicles, QFleet is re-establishing its fleet. Eight cylinder vehicles are being removed from the fleet mix and will only be considered in exceptional circumstances in the future, and four and six cylinder options are being encouraged. Therefore, the rising price of fuel has led to a marked transition in the fleet that is managed by QFleet.

Emergency Services

In the financial year 2004-05, the Department of Emergency Services consumed in excess of 4.2 million litres of diesel and greater than 2.1 million litres of petrol at a total of $5.73 million. During that period diesel prices increased by 23 cents per litre (21.7%), equating to an increase in total outlays of over $829,000, when compared with the cost per litre basis at the beginning of the period. In the same period, the price of unleaded and E10 petrol increased by 13 cents per litre (13.4%), equating to an increase in total outlays of $256,000 when compared with the cost per litre basis at the start of 2004-05.

Similarly, provision of aviation fuel to cater for the increasing use of helicopters in emergency operations has had a significant impact on operational expenditure. In the first quarter of the 2004-05 financial year, $120,000 was outlayed against aircraft fuel, whereas in the same period in 2005-06, this amount was $255,000 (an increase of 53%).

4.2 Practical ways for consumers to reduce their petrol bills

4.2.1 Existing information on the fuel efficiency of different makes of motor vehicles

The Australian Government is responsible for implementing legislation dealing with the design standards for motor vehicles. States and territories have a significant role to play through representation on environment and transport Ministerial Councils and committees. Largely, the

technology available to manufacturers will determine the fuel efficiency of motor vehicles, but Queensland has the opportunity to raise issues through Ministerial Councils.

Under the Australian Government Australian Design Rule 81/01, from 1 January 2004, all new vehicles up to 3.5 tonnes must carry a label indicating the fuel efficiency and greenhouse gas emissions of the vehicle. The objective of fuel efficiency labelling is to encourage the purchase of more fuel-efficient vehicles that also have lower greenhouse impact. It should be noted that in order to provide a fuel consumption figure comparable across vehicle makes, a standardised laboratory test is used. This figure is likely to differ to real world driving. In addition, a different test was used for pre-2004 vehicles therefore comparison of new and second-hand vehicles would be difficult.

For new vehicles, the existing information on fuel efficiency is adequate and comparable. Fuel efficiency information can be found at: http://www.greenhouse.gov.au/fuelguide/search.html

Purchasers of 1986 — 2003 vehicles can access fuel efficiency information from the Green Vehicle Guide at: http://www.greenvehicleguide.gov.au

However, the fuel efficiency of a vehicle is only one factor that people take into consideration in their purchase decision. Other significant drivers are vehicle purchase and operating costs, power output, and number of household members and income. The challenge is to continuously improve the fuel efficiency of all sizes of vehicles. The current voluntary agreement between the Australian Government and vehicle industry for new passenger vehicles has set a National Average Fuel Consumption Target (NAFCT) of 6.8 litres per 100 kilometres by 2010. Targets for larger vehicles and commercial vehicles have yet to be announced.

The agreement can be found at: http://www.autoindustries.com.au/media/2003/04/00000012.html

4.2.2 Price cycles

In March 2001, the Commonwealth Government requested the ACCC to examine the feasibility of placing limitations on petrol and diesel price fluctuations throughout Australia. This was due to consumer concerns about petrol price cycles and that prices can suddenly increase by as much as 10 cents per litre in a day. The report found that:

- volatility of retail petrol prices is generally confined to major cities and some rural towns on major highways; and
- the causes of local price cycles are complex and that there is no agreement among industry participants as to the significance of suggested factors.

Following this report, the ACCC began providing information on its website to enhance consumers' understanding of petrol price cycles and how to take advantage of them. A number of daily newspapers publish average and low prices for different regions, from which, consumers can gauge the best days to buy petrol.

Also, the Australian Automobile Association (AAA) publishes petrol prices for Brisbane and 27 regional centres in Queensland on their website: http://www.aaa.asn.au

More detailed information on daily capital city petroleum prices can be found at:
http://www.motormouth.com.au

4.2.3 Travelsmart

Coordinated in Queensland by Queensland Transport, Travelsmart provides a model for people seeking to reduce car use, fuel bills and traffic congestion, and improve the environment and health. Travelsmart challenges people to make voluntary changes in their travel behaviour and focuses on using public transport, walking, cycling and ride sharing modes. Individuals, schools, community

groups and businesses may participate in coordinated programs or programs they develop on their own. Details of the initiative can be found at: http://www.transport.qld.gov.au/travelsmart

4.2.4 Other impacts and options

Sustained high petrol prices may in the long-term lead to changed travel behaviour, assuming that alternatives are available. Changes might include for instance, better trip planning, change to smaller car, public transport, walking or cycling, or ride sharing. Already there have been significant increases in public transport patronage in south-east Queensland. Patronage for 2004-05 was 136.1 million across bus train and ferry modes (up 9.9% on the previous year). This may have the following social and environmental benefits that would need to be assessed against immediate economic impacts:

- Decrease in noxious and greenhouse gases;
- Improved public health and fitness from fewer pollutants and increased mobility;
- Reduced demand for road infrastructure and maintenance of existing roads;
- Greater patronage and profitability of existing public transport infrastructure; and
- Increased availability of discretionary income to people and families that would otherwise be spent on petrol.

In the short-term, demand for petrol is considered insensitive to short-term price fluctuations as consumers would have little alternative but to pay higher petrol prices where alternative transport options are unsuitable, inconvenient or not available.

However, demand for petrol can be more responsive to price in the longer term – as households and industries consider issues such as location, and travel distances, times and costs, more thoroughly, and make their allied locational and travel mode decisions.

4.2.5 Translink

In June 2002, the Queensland Government announced a commitment to introduce an integrated public transit system and to perform this task, created a new entity known as TransLink. TransLink represents a fundamental shift in the way transport services are collectively delivered in South East Queensland.

TransLink is working towards getting more people out of their cars and on to public transport to ensure that South East Queensland maintains its unique lifestyle and character. To do this TransLink is focused on providing a public transport system that is valued by the community for attractive, efficient, and fast services, as well as being easy to use and understand. The launch of integrated ticketing was the first stage to a better public transport system for the region.

Integrated ticketing now allows people to travel on participating buses, Citytrain and Brisbane City Council ferries using just one ticket across South East Queensland. With a TransLink ticket, passengers can transfer between all TransLink services at no extra cost and explore new travel options.

As the second stage of delivering an integrated public transport system, TransLink has produced the Draft TransLink Network Plan to map out public transport service and infrastructure improvements over the next 10 years and outline a 3 year program of activities. The 3 year program focuses on coordinating services, making services fast, frequent, reliable and safe, and investing in infrastructure to provide quality stations and stops and to cater for growth.

The Queensland Government has approved and committed a total of $335 million over the next decade, with $64 million over the next three years on the Network Plan's 3 year program of service improvements followed by an ongoing investment of $38.8 million per year for seven years to maintain those services.

The Government is making one of the largest investments in Queensland's public transport history in delivering the Draft TransLink Network Plan – a plan which is instrumental in helping to create a new generation of smarter public transport. In the first 12 months of TransLink, there were more than 136 million passenger journeys on public transport in South East Queensland, equating to an extra 12 million journeys compared to 2003-04.

4.3 Modelling analysis of high oil prices

4.3.1 Background

Queensland Treasury's Office of Economic and Statistical Research (OESR) has employed its computable general equilibrium model (QGEMF) to simulate the potential impacts of higher oil and petroleum prices on the Queensland economy. The model's key strength is its industry detail, which facilitates a comprehensive account of the distribution of economic impacts across industries, consumers, and government.

4.3.2 Scope and key assumptions

The scope of the modelling is to estimate the economic impacts on Queensland of a rise in oil prices similar to that experienced over the past two years. During that time, the world price of crude oil has increased from approximately $US30 to $US60 a barrel. Hence, a 100% increase in the world price of oil is assumed in the simulations. Two scenarios are addressed: a 'permanent increase' scenario, in which the oil price is assumed to remain elevated until the end of the projection period; and a 'temporary increase' scenario, in which the oil price remains elevated for two years, before returning to its starting-point level. In both scenarios, the assumed oil price increase is introduced over two years.

From a modelling perspective, a key feature of oil price shocks is that they have world-wide impacts. Hence, as well as affecting the domestic economy, they also change the international environment. OESR has worked with Treasury's Economic Policy Branch to develop an agreed set of assumptions relating to Australia's external environment.

These assumptions are as follows:

- a decline of 1.25% in aggregate export demand, reflecting an assumed negative impact of higher oil prices on world GDP;
- varying increases in the prices of overseas-produced commodities, on the assumption that the effects of higher oil prices on business costs will be similar for overseas and Australian firms.

A key potential impact not modelled here is the effect of higher oil prices on the demand for coal. An increase in the world oil price that was perceived to be permanent would be expected to shift demand towards cheaper sources of energy, like coal and gas. Hence, it is possible that Queensland's coal exports could benefit from an increase in the world oil price, even to the extent that Queensland could experience a net benefit in the long run. However, because of time constraints and technical difficulties, this type of scenario was not modelled. Hence, the scenarios presented here could be viewed as pessimistic, or as 'worst case' scenarios for Queensland.

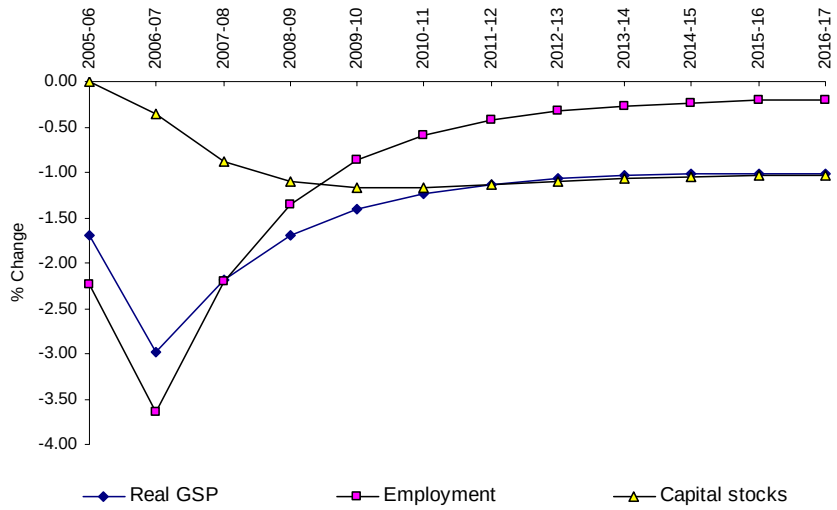
4.3.3 Projections

In the 'temporary increase' scenario, the long term impact on the Queensland economy is projected to be broadly neutral. Hence, for brevity, only the results of the 'permanent increase' scenario are summarised here. More detailed results of the modelling outcomes are contained in Attachment 2.

The dominant macroeconomic feature of the 'permanent increase' scenario is the decline in the terms of trade, driven by the increased prices of imported oil and petroleum. This represents a decline in real income for Queenslanders.

Figure 7 shows the projected changes in Queensland employment, capital stock and real gross state product (GSP). By the second year of the simulation, real GSP is projected to fall 2.98%, relative to the basecase.

Figure 7
Projected changes to employment, capital stock and real GSP, Queensland, 'permanent increase' scenario (cumulative deviation from basecase)



The apparent severity of the short-run impact on real GSP, especially relative to current experience, arises from two main factors:

- A model assumption that workers immediately demand higher wages in order to maintain their spending power. This creates additional 'pain' in the form of employment losses, which in turn drives down real GSP, relative to the basecase. If instead real wages were allowed to decline in the short run (as seems to be happening currently), then the projected employment and GSP decline would be milder.
- As mentioned earlier no flow-on benefits to the coal industry are projected. In the recent past, coal prices have increased roughly in proportion with oil prices, and this has worked against the negative effect of the latter on Queensland's terms of trade.

In the long run, real wages are assumed to be flexible, and so real GSP is projected to recover somewhat, to a level 1.01% lower than it would otherwise have been.

The projections for individual industries show three broad forces in operation:

- the direct impact of higher fuel prices on operating costs and therefore output prices;
- the effect of the projected decline in real income, and therefore real private and public consumption; and
- the effect of a projected depreciation of the exchange rate, which benefits the more trade-exposed industries.

The most adversely affected industry is air transport, for which activity is projected to be some 27% lower by 2016-17 than it would otherwise have been. This is because air transport is the most fuel-intensive industry, and also because most of the exports that are assisted by the projected depreciation of the exchange rate do not use air transport. Conversely, water transport activity is projected to be some 12% higher than the basecase level, because of its strong linkages with commodity exports. The impact on road transport is projected to be approximately neutral, because its core role in the domestic economy makes it relatively price-insensitive.

Table 6 focuses on the industry results that signify the greatest economic impacts on Queensland, positive or negative. The results are ordered by percentage point contribution to the change in real GSP.

Table 6
Projected activity changes for major affected Queensland industries, 'permanent increase' scenario (cumulative percentage deviation from basecase)

Positively affected	2016-17	Negatively affected	2016-17
Coal and gas	11.02	Retail trade	-4.73
Non ferrous ores	11.36	Health	-2.74
Meat	5.69	Education	-3.71
Beef cattle	3.13	Public administration	-3.00
Food products	10.06	Construction	-1.80

It can be seen that the greatest positive impacts are associated with export oriented industries, and industries that are suppliers to export industries (eg. Beef cattle). This is mainly due to the projected depreciation of the exchange rate, which enhances the competitiveness of Australian-produced goods.

The greatest negative impacts are associated with service industries which sell a large share of their output to households and government. As real private consumption and government consumption are projected to decline, the activity of these industries is also projected to decline.

4.4 Outlook for upstream and downstream petroleum industry

Rising world oil and other energy commodity prices are likely to be a feature of global markets over the next decade. This period is likely to see continued rapid economic growth in China, India and a number of other emerging countries, thus ensuring growing pressure on the price and availability of natural resources. In this environment, producers will have a greater incentive to bring on-stream projects that may have previously been un-economic, or further delineate new 'brownfield' and 'greenfield' reserves and resources.

Sustained high world oil prices would gradually affect industrial activity, particularly in the transport sector. However, high oil prices affect all industries world wide and impacts are not isolated to Queensland. Consequently, to the extent that Queensland industry uses oil as an input to production in a similar way to the rest of the world, the relative competitiveness of Queensland firms will not be affected by high oil prices.

In the event of sustained high oil prices, alternative fuel sources will become more viable. For example, hydrocarbon production from unconventional and high cost oil sources would enter the market. Added to this, it is likely that competing fuel sources (ethanol, methanol, LPG, CNG, biodiesel, etc.) would become more economic, with infrastructure for such being established in response to higher oil prices. There would also be more incentive to invest in research and development in alternative technologies. These factors are expected to mitigate the 'hard' supply-side effects of any steady decline in world oil production in the short to medium term, with a long-run step-change into alternative technologies, such as hydrogen technology, beyond this.

Sustained high oil prices are also likely to result in economic adjustment by consumers. This will be most clearly reflected in energy consumption activities, such as the uptake of hybrid motor vehicles. Already, production of hybrid motor vehicles is expected to exceed 500,000 this year, with some estimates predicting this figure to be two million by 2008. High oil prices were also a key driver in the significant switch from oil to gas as a source of domestic heating over recent decades. Changes in consumer preferences will further encourage research, development and investment in alternative technologies.

Overall, there are likely to be both supply and demand responses that would be driven by sustained higher crude oil prices (e.g. recovery of higher cost resources and emerging extraction technologies) and commercialisation and development of alternative fuels and downstream technologies in end-use sectors (in line with consumer preferences).

4.5 Advanced transport technologies

Engine technologies have advanced rapidly over the past few years with the emergence of advanced transport technologies such as Hybrid Electric Vehicles (HEV's), Dual Phase Injection Systems and Fuel Cell Vehicles (FCV's). In addition to these, diesel vehicles are increasing in popularity as diesel engines are becoming more powerful and fuel-efficient than similar-sized petrol engines (about 30-35% more fuel efficient).

Today's diesel vehicles are much improved over those of the past due to improved fuel injection and electronic engine control technologies. New engine designs, along with noise and vibration damping technologies, have made diesel vehicles quieter and smoother. Consequently, it is anticipated that diesel vehicles will increase in popularity in the Australian vehicle market over the coming years.

The Queensland Government recognises the important role that technology will play in reducing fuel consumption within the economy and accordingly, the government is actively;

- encouraging, through QFleet, the uptake of hybrid electric vehicles across the Queensland government fleet;
- supporting trials of Dual Phase Injection Systems by Queensland diesel fleet operators;
- investing in fuel cell technology through the Government-owned corporation ENERGEX; and
- monitoring international developments in Flexible Fuel Vehicles (FFV's) and FCV's.

4.5.1 Hybrid Electric Vehicles (HEVs)

Hybrid Electric Vehicles offer fuel efficiencies of up to twice the fuel efficiency of conventional vehicles[11] and as such can play a practical role in helping to offset overall fuel demand in the Queensland economy. Hybrids are becoming more popular in Australian and overseas markets[12] and importantly, their wide spread deployment requires no investment in new infrastructure.

Almost all major automakers now produce hybrids and several new models are planned for introduction in overseas markets. At present, there are two hybrids available in the Australian market, the Toyota Prius and the Honda Civic.

The Queensland Government has been active in encouraging the uptake of hybrid vehicles across the government fleet through its vehicle leasing and fleet management service provider, QFleet. QFleet encourages client agencies to consider the Toyota Prius as a fuel-efficient alternative to conventional four-cylinder passenger vehicles. The Queensland Government has not set targets or quotas for agencies or for whole-of-government for leasing hybrid vehicles.

According to QFleet, the cost of hybrid technology results in a recommended retail price significantly higher than that of conventional vehicles of comparative size and performance. QFleet subsidises the Prius lease rate in order to make the vehicle a more attractive option for clients, although it remains considerably more expensive than comparable vehicles.

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[11] For instance, the Toyota Prius has fuel economy of around 4.4 litres / 100km

[12] In the United States for instance, uptake of HEV's has grown rapidly in the last few years. New hybrid vehicle registrations reached nearly 84,000 in 2004, while sales of hybrids in the first five months of 2005 reached 73,000. Public and private fleets are contributing to this surge in popularity. More than 90 city, state and county governments, and some private fleets, use light duty hybrids.

QFleet has also evaluated the Honda Insight hybrid vehicle. However, with a maximum seating capacity of only two persons (including driver) and very small luggage space the Insight did not prove to be an appropriate fleet vehicle and only a handful have been leased.

QFleet has purchased a total of 288 Prius since the vehicles became available in the Australian market in 2001. As at 18 November 2005, QFleet has 195 active (currently leased) Toyota Prius petrol/electric hybrid vehicles, operated by 25 different departments and agencies. This is presently the largest individual Prius fleet in Australia. The number is steadily increasing, with 44 more now on order.

Table 7 shows total national sales of Toyota Prius compared with Queensland including purchases by QFleet. The data represents sales for the period since the introduction Toyota Prius in 2001 to November 2005.

Table 7
Sales of Toyota Prius (2001 to present)

	Total sales
Australia	2906
Queensland	547
Purchased by QFleet	288

QFleet purchases account for approximately 52% (288) of Queensland sales (547) of Prius, and 10% of sales nationally.[13]

QFleet is looking at expanding the range of hybrid vehicles as new models become commercially available and has endeavoured to encourage Honda to enter into discussions and negotiations for the supply of the Honda Civic hybrid to the Queensland Government, but these have so far been unsuccessful.

4.5.2 Advanced Heavy Hybrid Propulsion Systems

Hybrid systems have also proved effective in buses and heavy trucks and these technologies are currently in the advanced stage of development in countries such as the United States and Japan. The Queensland Government will continue to monitor technology developments in Advanced Heavy Hybrid Propulsion Systems.

4.5.3 Dual Phase Injection Systems

Dual Phase Injection Systems enable the simultaneous combustion of two fuels, such as:

- Diesel and Compressed Natural Gas (CNG);
- Diesel and Liquefied Petroleum Gas (LPG); and
- Diesel and liquid ethanol.

These systems are currently being trialed in Australia. For instance, one Australian company, Global Fuel Solutions recently received a Commonwealth grant to further develop a system known as an "Ethanol Co-Fuel System" that injects ethanol vapour (via the air stream) into a diesel engine.

Essentially, dual phase injection systems that run on ethanol require a separate storage tank for liquid ethanol, and fueling systems can be retrofitted to diesel powered vehicles for immediate operation. The separate ethanol storage tank is significant as it overcomes the safety and handling issues associated with storing ethanol and diesel blends (known as E-Diesel or diesohol). The introduction of diesohol at the retail level was firmly opposed by a number of key stakeholders to the Commonwealth's Biofuels Taskforce due to safety and handling considerations. In addition,

[13] Please note that the national and state sales data have been sourced from Toyota and should be considered as indicative only.

widespread use of diesohol in general transport would require major investment in fuel handling and storage. [14]

Due to the complications associated with combined storage of liquid ethanol and diesel, the dual phase injection technology is being considered seriously by the Queensland Government as a means to improve fuel efficiency in diesel fleet vehicles. For example, diesel fleet operators such as local councils, mining and road transport companies.

The Queensland Government through the Queensland Ethanol Conversion Initiative is progressing applications by fleet vehicle operators for the trial of Dual Phase Injection Systems. It is anticipated that subject to successful trials, this injection technology will be used increasingly by State fleet vehicle operators and as a consequence, help increase demand for fuel grade ethanol.

4.5.4 Fuel cell vehicles

Fuel cells essentially replace the internal combustion engine as a means of propulsion and fuel cell vehicles are currently being trialled in various countries, including Australia[15], as a future means of transport. Fuel cell vehicles can run on pure hydrogen or hydrogen rich fuels such as ethanol.

Over the past few years, most major auto-manufacturers have collectively invested several $US billion in the development of fuel cell vehicles. Therefore, other than in certain niche application areas, it is highly likely that Australia will become a 'technology adopter' rather than a 'technology developer' of fuel cell transport technologies.

Fuel cell powered vehicles are still being trialled internationally and are not yet commercially available due to the high manufacturing cost of the vehicle and the limited availability of supporting hydrogen fuelling infrastructure. Accordingly, it is generally regarded among industry experts that such vehicles will not enter the mainstream vehicle market until at least next decade.

The Commonwealth Government assessed a broad range of energy-related technologies in developing the national energy policy – Securing Australia's Energy Future[16] which was released in June 2004. In terms of energy innovation, the Commonwealth Government in developing the national energy policy assessed that fuel cell vehicle technologies were a 'reserve category' whereby reserve applies to those technologies that Australia should continue to monitor overseas technology developments.[17] In other words, Australia will most likely be an adopter of technologies in the reserve category.

However, Australia as a nation was viewed by the Commonwealth Government to be 'market leader' in respect of Solid Oxide Fuel Cell technology which is used for stationary power applications. This is due to the fact that significant R&D has been invested in this technology through the CSIRO and subsequently via Ceramic Fuel Cells Ltd, Australia's only fuel cell developer, located in Victoria.

In the longer term, ethanol could be used as a fuel choice to produce hydrogen for use in fuel cell vehicles. The Queensland Government will continue to monitor international developments in fuel cell powered vehicles.

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[14] According to the Biofuels Taskforce, diesohol is likely to remain a niche fuel in Australia and be available only on a small scale due to storage, handling issues and its reduced flashpoint.

[15] Fuel Cell Buses are currently being trialled in Perth.

[16] www.dpmc.gov.au/publications/energy_future/

[17] Criteria used related to technical feasibility, likely development costs, strategic benefits and the role of government.

5 Competitiveness of Alternative Fuels

5.1 Market issues associated with ethanol

5.1.1 Overview

The network of service stations that offer E-10 (a blend of 10% ethanol with 90% petrol) in Queensland has increased eightfold, from 12 in July 2004 to over 100 as at November 2005 (see Attachment 3).[18] It is anticipated that the distribution of E-10 will increase significantly across the State with the implementation of the Queensland Ethanol Conversion Initiative (QECI)[19], a program that provides financial support for the conversion of service stations to sell E-10.

On 22 September 2005, the Australian Government released the Biofuels Taskforce Report and announced a package of policy initiatives to help drive industry development and in particular, boost consumer confidence in ethanol-blended fuels.

Under current policy settings, the Australian Government has committed to achieving a production target of at least 350 megalitres (ML) of biofuels per year by 2010. A key initiative involves major fuel companies implementing Industry Action Plans to ensure that this target is met by 2010. In addition, agreement has been reached with major car manufacturers to guarantee that the use of E-10 will not effect vehicle warranties in all new 'Australian built' vehicles.

Currently, given the success of the Queensland Government's efforts to promote ethanol, the State is experiencing some supply capacity constraints to meet rising demand. For instance, additional capacity is being sourced by some operators from the Manildra ethanol plant in New South Wales. It is anticipated that Queensland may experience supply shortages of fuel ethanol at least in the short term, until additional local capacity comes online from CSR Ethanol Sarina and other ethanol producers.

Under the $7.3 million Queensland Ethanol Industry Action Plan 2005 - 2007, the State Government will lead a communications campaign to boost consumer confidence in and increase the use of ethanol-blended fuels such as E-10. In implementing the communications campaign, the Queensland Government through the Department of State Development, Trade and Innovation, will monitor the supply situation to help ensure that supply capacity is maintained in line with demand.

Alternative fuels, including ethanol and bio-diesel are currently effectively excise tax free. The Queensland Government has consistently called on the Commonwealth to maintain this arrangement, at least for a considerably longer time, to enable the industry to develop properly. However, the Commonwealth intend to phase in excise taxes from 2011.

5.1.2 Ethanol refinery production

Ethanol is currently produced from sugar cane by two companies CSR Ethanol (Sarina) and Rocky Point Mill (Woongoolba). Other sugar mill operators are investigating diversifying into ethanol production. In addition, there are two proposed operations that will use grain as feedstock for ethanol production namely: Dalby Bio-Refinery; and Lemon Tree, Millmerran.

Currently, fuel grade ethanol production in Queensland is estimated by CSR at around 12 million litres per annum. Over 3.6 million litres per annum is being used by CSR to supply the Queensland market with the remainder exported to supply interstate markets. Some ethanol is imported from the Manildra plant in NSW into the Queensland market.

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[18] Of these, around one half are located in the Brisbane/Gold Coast region and the remainder located in major regional areas of Queensland.

[19] QECI also provides assistance to fuel distributors for the installation of fuel blending facilities and or distribution capacity and to individual organisations for the conversion of fleet vehicles for the use of ethanol/diesel blends.

The Queensland Government works closely with the mill proprietors to help identify new productivity opportunities and to encourage new investment. Developing regional industry capacity will remain a key objective of the State Government.

However, over the next 12 to 18 months, an additional 70 million litres of capacity is expected to come online through the Sarina and Dalby plants.

As with other emerging industries, the biofuels industry needs investment certainty and market surety in order to develop into a viable industry. Ethanol producers require substantial 'off take' contracts with major fuel companies to justify investment in new or additional production capacity.

5.1.3 Distribution and consumption of ethanol-blended fuels in Queensland

Ethanol-blended fuels, including E-10, are currently available from over 100 fuel outlets and this number is expected to increase significantly as a result of the ethanol conversion initiatives under the Action Plan. Consumption of E-10 fuel at the pump is increasing and based on current industry estimates, the Queensland market for ethanol-blended fuel is now in excess of 20 million litres per year.[20]

The volume of E-10 fuel purchased by the Queensland Government fleet has risen significantly as E-10 becomes more widely available. Consumption of E-10 fuel by the Queensland Government now averages in excess of 200,000 litres per month.

It is anticipated that the announcement by the Australian automotive industry that it supports the use of ethanol blended fuels in new vehicles will improve prospects in the Queensland market. It is anticipated that it will lead to investment in additional supply capacity and to eventually sell into an expanded Australian market for ethanol are quite positive.

The Queensland Government through the Department of State Development, Trade and Innovation will assess opportunities to collaborate with the Australian Government in the implementation of its biofuels policy measures for the wider benefit of the Queensland biofuels industry.

The Queensland Government's $2.28 million ethanol marketing and communication campaigns to be implemented in 2006 may offer cross benefits to the Australian Government program, particularly in relation to measures that are introduced to improve consumer confidence in ethanol.

5.1.4 Consumer confidence in ethanol-blended fuels

Consumer concern over the use of E-10 has been identified by the Queensland Government and other industry stakeholders as a major impediment to demand growth. As part of the policy initiatives to help remould consumer confidence in fuel ethanol, the Australian Government recently met with major Australian car manufacturers Ford, Mitsubishi, Holden and Toyota to discuss the issue of vehicle warranties.

The abovementioned car manufacturers have now agreed to inform consumers that use of E-10 in all new 'Australian built' vehicles will not affect vehicle warranties. This development could significantly increase consumer confidence in the use of E-10 fuel and thus help to stimulate demand for fuel grade ethanol.

Labels outlining details of this endorsement are expected to be placed on petrol caps of locally manufactured cars from January 2006. With regard to imported vehicles, the Australian Government is lobbying international car makers to attach a label to vehicles that can operate safely on E-10 fuel.

[20] Estimates based on information provided by CSR, 15 November 2005.

5.1.5 Competitiveness of ethanol production

The competitiveness of ethanol production versus petroleum has been the subject of recent debate, particularly given the significant rise in oil prices. The rise in crude oil prices has evidently increased the viability of ethanol production in overseas and local markets in comparison to petroleum.

According to the study undertaken by international energy consultants, LECG (May 2005), the world oil price would have to fall below US$15.40 per barrel before ethanol production became unprofitable in Queensland.[21] Meanwhile, the Australian Bureau of Agricultural and Resource Economics (ABARE) has calculated that the long-run cost of ethanol production (33 cents per litre) would be less than the threshold level (38 cents per litre) based on oil price, exchange rate and taxation assumptions.[22]

In reality, the future profitability of ethanol production is primarily dependent on the world oil price, the exchange rate, fuel ethanol prices and the Commonwealth's taxation regime.

The Queensland Government maintains that the introduction of a net excise on alternative fuels in 2011 will be detrimental to the long term development of a biofuels industry in Australia. Essentially, the 2011 phase-in places additional pressure on the domestic biofuels industry to establish its credentials in the marketplace and become viable before 2011, which is not realistic given the time required to plan, obtain approvals, finance and construct a new facility. Therefore, the preference is that the introduction of a net fuel excise on alternative fuels be placed further out to allow sufficient time for the industry to attract vital capital investment.

5.1.6 Retail fuel prices and E-10

In a highly competitive fuel market the retail fuel price for E-10 is determined by individual fuel companies and their respective pricing policies. For instance, BP has a pricing policy that offers E-10 fuel at the same price as their standard unleaded fuel.

However, some independents in Queensland and other states offer E-10 at a discounted price to their unleaded product in an effort to increase market share. Feedback from independent fuel companies suggests a strong increase in sales of E-10 at service stations that offer the product at a discount to other fuel products.

In the current climate with petrol prices likely to remain high, the greater use of fuel ethanol-blends may be used as a fuel extender (or additive) to help replace petrol. Significantly, the Australian Government proposes to allow ethanol blends of up to 5% to be sold in Australia without a label.[23] Whether or not industry takes up this offer, is yet to be seen. This policy measure may enable fuel companies greater commercial flexibility to use ethanol blended fuels, a result that would help increase demand for fuel grade ethanol. Understandably, ethanol producers such as CSR Ethanol and Manildra have reacted favourably to this development.

The widespread availability of ethanol-blended fuels will give consumers a broader choice of fuel product at the pump and the opportunity to benefit from using a premium performing renewable fuel at a competitive price. Using ethanol blended fuels as a fuel extender across the State's fuel mix could be seen as a practical means to help reduce the fuel bills of Queensland motorists.

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[21] LECG assumed a production cost of ethanol from molasses at 29.5 cents per litre.

[22] The 'threshold level' refers to the level of production costs, given a number of assumptions, at which petroleum production costs are equivalent.

[23] Under current legislation ethanol is sold and blended to a maximum of 10% with petrol and must be labelled accordingly.

Wholesale Price - Domestically Produced Ethanol

Currently, according to industry sources, the wholesale price for domestically produced fuel ethanol ranges from 65 to 90 cents per litre depending on supply contract arrangements.

Securing supply of fuel grade ethanol has been identified as an issue for independent operators seeking to expand the number of sites offering E10. Some fuel companies including Caltex, BP and many of the independents already have long term contracts in place. However, in those cases where contract volumes are exceeded or supply is obtained on the spot market, generally from Manildra, prices have been at the upper end because of tight supply conditions.

Term contracts with ethanol producers are essential for those operators with new projects. Supply contracts underpin the financing of these projects. Previously, fuel companies have been reluctant to enter into off-take contracts with ethanol suppliers but there has been a marked change in attitude in recent times with at least one major oil company seeking expressions of interest to supply fuel grade ethanol until 2011.

Independent operators are unable to obtain premium fuels from the fuel majors but can make a high octane fuel by blending it with ethanol (e.g. 92 octane mixed with ethanol at 10% gives 95 octane fuel). The independents are then able to sell this fuel for more than standard unleaded but less than the major's retail their premium blends.

Given that the cost of the fuel is generally less than ordinary unleaded fuel (this depends in part on logistical costs), the independents obtain a greater margin on the product. This in part explains why the independents have been leading the way in the introduction of E10 fuels.

5.2 Bio-diesel

Alternative fuels, including ethanol and bio-diesel, are currently effectively excise tax free. A recent ABARE study raised concerns about the bio-diesel industry's long term profitability when excise taxes are phased in from 2011, despite an ongoing 50% discount for alternative fuels beyond 2015, concluding that bio-diesel would require an additional 21-32 cent per litre subsidy. Alternative fuels, including ethanol and bio-diesel are currently effectively excise tax free. The Queensland Government has consistently called on the Commonwealth to maintain this arrangement, at least for a considerably longer time, to enable the alternative fuel industry to develop properly. However, the Commonwealth intend to phase in excise taxes from 2011.

Recent media reports have highlighted concerns in the Australian bio-diesel industry about Commonwealth efforts being too 'ethanol-focused' in their support for alternative fuels. Particularly, a 50% higher excise tax will exist on bio-diesel compared with ethanol post 2011 (due to the tax being based on relative energy ratings of the fuels).

Bio-diesel is an effective replacement lubricant for sulphur, which is being phased out of mineral diesel fuel supplies due to air quality impacts. Small ratios of bio-diesel blends can provide significant lubrication and environmental benefits. Bio-diesel produced and sold in Australia is mostly in blends of 20% or less (a 20% blend can reduce tailpipe emissions by up to 47%).

Based on industry sources, bio-diesel can substitute well for mineral diesel (no engine modification and equivalent performance) and can be easily blended in any proportion. However, advice from some Australian engine manufacturers is that the maximum bio-diesel blend for the current fleet should be no greater than 5% (B5). These manufacturers have indicated that higher blends raise significant issues involving engine performance, efficiency, emissions and warranties. There appears to be little or no original engine manufacturer acceptance of blends other than B5 or B20. Warranty acceptance is a key factor in growing the bio-diesel industry domestically, and these two standard blends offer the best prospect for market growth.

5.2.1 Queensland's emerging capacity

Facilitated by the efforts of the Queensland Government, this State is about to see its first commercial scale bio-diesel plant, to be located at a Department of State Development, Trade and Innovation Industrial Estate at Narangba, north of Brisbane. The developer, Eco Tech Holdings, have invested around $12.5 million in this plant, which will produce around 33 million litres per year of bio-diesel from tallow and waste cooking oils/fats. It is currently planned to commence operations by the end of this year.

5.3 Industry regulation and subsidies

5.3.1 Fuel tax changes – alternative fuels

On 16 December 2003, the Australian Government announced new arrangements for applying tax to all fuels used in internal combustion engines. These new arrangements involve the application of fuel tax on an energy-content basis to all fuels used in transport applications

The phase-ins of effective fuel tax and applicable fuel tax rates for alternative fuels are detailed in Table 8 below.

Table 8
Effective fuel tax rates for alternative fuels as 1 July, 2003 to 2015
(cents per litre).

	Ethanol			Biodiesel		
Year	Fuel tax	Production grant	Effective tax	Fuel tax	Production grant	Effective tax
2003	38.143	38.143	0.0	38.143	38.143	0.0
2004	38.143	38.143	0.0	38.143	38.143	0.0
2005	38.143	38.143	0.0	38.143	38.143	0.0
2006	38.143	38.143	0.0	38.143	38.143	0.0
2007	38.143	38.143	0.0	38.143	38.143	0.0
2008	38.143	38.143	0.0	38.143	38.143	0.0
2009	38.143	38.143	0.0	38.143	38.143	0.0
2010	38.143	38.143	0.0	38.143	38.143	0.0
2011	38.143	35.643	2.5	38.143	34.343	3.8
2012	38.143	33.143	5.0	38.143	30.543	7.6
2013	38.143	30.643	7.5	38.143	26.743	11.4
2014	38.143	28.143	10.0	38.143	22.843	15.3
2015	38.143	25.643	12.5	38.143	19.043	19.1

Source: Commonwealth Treasury. Biofuels Taskforce Report p 46.

The above table shows how the effective tax on ethanol will be applied in five equal, annual steps from 1 July 2011 at 2.5 cents per litre, with a final rate of excise of 12.5 cents per litre to apply from 1 July 2015.

From 1 July 2011, imported ethanol and domestically produced ethanol will be treated equally in terms of excise, thereby opening domestically produced ethanol to full international competition. In 2011, the Ethanol Production Grant becomes the Cleaner Fuel Rebate (CFR) and applies to imported as well as the domestically produced ethanol.

5.3.2 Impact of tariff changes on domestic market for ethanol

Table 9 provides a brief analysis of the potential impact of tariff changes on the price of ethanol imported from a major producing country such as Brazil. All prices quoted are in Australian cents and are not adjusted for inflation. All years are financial years.

Table 9
Impact of tariff changes for fuel grade ethanol

	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Brazil Free on Board (fob) Price	60	60	60	60	60	60
Shipping Cost	10	10	10	10	10	10
Fuel Tax	38.143	38.143	38.143	38.143	38.143	38.143
Cleaner Fuels Rebate (CFR)	0	35.643	33.143	30.643	28.143	25.643
Excise Impact	38.143	2.5	5	7.5	10	12.5
Total Cost	108.143	72.5	75	77.5	80	82.5

From the above scenario, the shaded area indicates a 35 cent decrease in the landed price of ethanol upon application of the Cleaner Fuels Rebate (35.643 cents per litre) to imported fuel on 1 July 2011. By 2015, the landed price of ethanol increases by 10 cents due to the incremental impact of the fuel excise from 2.5 to 12.5 cents per litre. The increase in fuel excise also applies to domestically produced fuel ethanol.

Increased competition from imported ethanol would benefit consumers in the short term, as the lower cost of fuel grade ethanol is translated through to the retail end of the fuel market. However, the impending excise changes, and the short time frame before the excise introduction, could deter Australian investment in new plant capacity due to fear of competition from imported product from major ethanol producers such as Brazil.

However, the impact on domestic ethanol producers from import competition may be somewhat offset by the emergence of markets such as Japan which are intent on importing ethanol from major producer nations such as Brazil. That is, there is likely to be such a high level of global demand for fuel ethanol, that Brazil would not be able to supply product into Australia at prices low enough to adversely affect established local producers.

Moreover, Japan has indicated a strong preference to diversify its ethanol supply base and consequently Brazil has been very supportive of the development of a viable ethanol industry in Australia.

The Queensland Government maintains that the introduction of a net excise on alternative fuel in 2011 is not beneficial to the long term development of a biofuels industry in Australia.

Essentially, the 2011 phase-in places additional pressure on the domestic ethanol industry to establish its credentials in the marketplace and become viable before 2011, which is not realistic given the time required to plan, obtain approvals, finance and construct a new facility. Therefore, the preference is that the introduction of a net fuel excise on alternative fuels be placed further out to allow sufficient time for the industry to attract vital capital investment in ethanol production.

5.4 Outlook for an Australian fuel ethanol industry

As mentioned previously, given a more certain policy direction for biofuels and support from the Australian automotive industry, the outlook for progressive development of the Australian fuel ethanol industry is positive.

However, this should be considered in the context that the 350 ML per annum target set by the Australian Government represents only a mere fraction (about 1 percent) of the Australian fuel market (27.6 billion litres).[24] This target alone may be insufficient to stimulate the large scale production of ethanol in Australia to supply both rising demand in the domestic market, and in the longer term, emerging export markets such as Japan.

A viable and sustainable ethanol industry in Australia could provide many economic benefits, particularly in rural or regional areas where ethanol production facilities could be located.

The main factors affecting ethanol industry growth were identified by LECG as:

- changes to the world price of oil (and/or exchange rate);
- consumer sentiment towards ethanol-based fuel;
- prices for alternative use of raw materials, both sugar and grain; and
- changes to fuel excise arrangements that affect the relative advantage of ethanol.

5.4.1 Impact of technology

Technology is expected to play a key role in influencing the future demand for fuel ethanol and emerging technologies need to be taken into consideration as the Australian ethanol industry seeks to establish itself. New production techniques using techniques involving the break down of lignin from biomass could revolutionise the production of ethanol by significantly changing the nature of the feed stocks that can used to include any biomass.

Demand for ethanol could continue to grow in the future due to the introduction of new technologies that enable a broader utilisation of fuel ethanol. For instance engine and motor vehicle technologies have advanced rapidly over the past few years with technologies such as Flexible Fuel Vehicles (FFV) and dual phase injection systems. In the longer term, ethanol could be used as a fuel choice to produce hydrogen for use in fuel cell vehicles. These technologies are discussed in more detail in section 4.5.

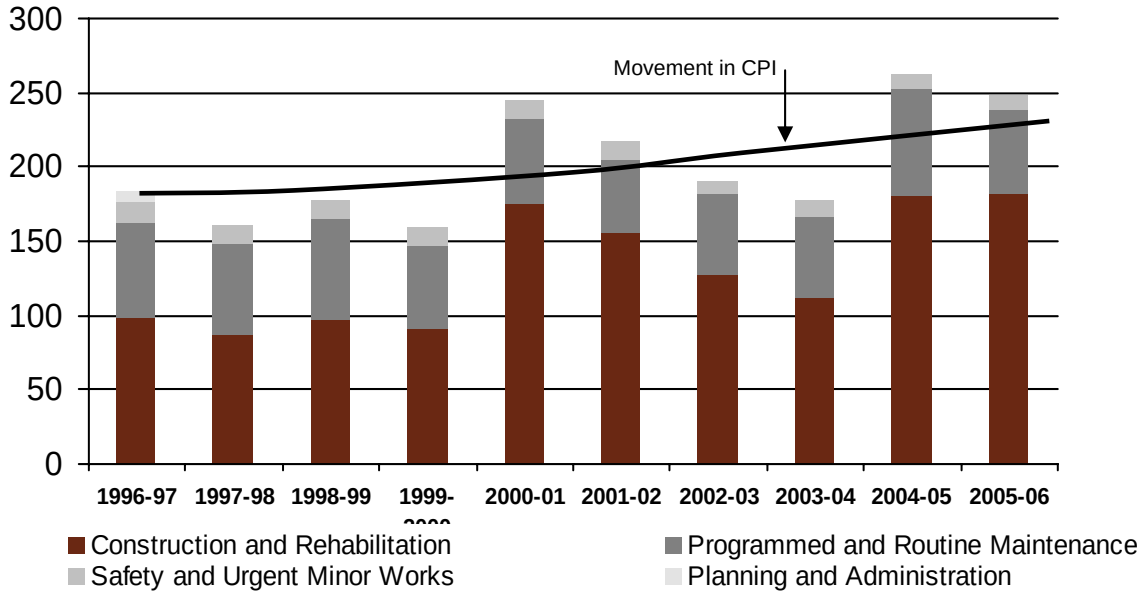
[24] According to the Australian Bureau of Statistics (ABS) 27.6 billion litres of fuel were used in 2003. Petrol accounted for around 65 percent or (17.7 billion litres) of consumption and diesel around 35 per cent (7.9 billion litres). Source: Australian Bureau of Statistics. 9208.0 21-10-04

6 Queensland Road Funding

6.1 Funding mix

Federal transport ministers have regularly acknowledged that Queensland has the worst national highway system in Australia. A recent report from the Australian Automobile Association confirms this.[25] Under the AusLink Bilateral Agreement, the Australian Government has walked away from full responsibility for capital and maintenance and has reduced funding for maintenance of the national network. This falls hardest on Queensland with the worst system in the nation. Additionally, AusLink maintenance funding is capped and therefore decreases in real terms over time. Figure 8 shows the level of AusLink funding to Queensland along with the level at which funding would have increased based on the consumer price index (CPI).

Figure 8
AusLink funding - Queensland
($m)



Another failure in the allocation of funding is that it is measured by road length and traffic and is not being allocated on a needs basis. Capital allocation should be based on capital needs, such as the maintenance state of the system and future growth in demand.

Currently, the federal funding allocations are based on historical data that fails to reflect the extraordinary growth being experienced, and maintained, within the Queensland economy. Queensland has normally received a little more than its population share of total AusLink dollars, which doesn't reflect the State's road length and geography, maintenance needs and growth.

Queensland's extraordinary growth magnifies the transport task and emphasises that a needs based approach is more appropriate. Queensland's share of funding for the former national highway system is a disproportionate percentage of the national total, but our contribution to the network must, by necessity, exceed that of other states. With 35% of all jobs created and population growth consistently greater than the rest of Australia, a much greater share of capital expenditure is essential for Queensland.

[25] *Australian Road Assessment Program 2005* report, available at: http://www.aaa.asn.au

Queensland has significantly increased its expenditure across the transport system during the five year period to 2008-09. The forecasted Queensland Government total commitment for road and transport infrastructure is in excess of $6.16 billion for roads and $2.95 billion for rail and public transport, and in excess of $460 million for local government transport infrastructure (including Roads and Drainage Grants) - a total of $9.57 billion.

The proposed Queensland Government total commitment for road and rail infrastructure on the National Land Transport Network for the period 2004-05 to 2008-09 is $1.11 billion ($654 million for road and $452 million for rail). This does not include $1.6 billion that the state is investing in the national highway system for the gateway duplication. The federal government contribution in Queensland is $1.86 billion for all roads and rail for 5 years.

6.2 Commonwealth fuel excise returns

In the Commonwealth Government's 2005-06 Budget Papers, total estimated revenue from petrol and diesel excise is $13.83 billion.[26] This equates to petrol and diesel excise collections of approximately $674 per capita, Australia wide. An indication of the contribution that Queenslanders make to this Commonwealth tax over five years is approximately 4 million people paying $674 over five years for total of $13.48 billion. The Commonwealth is returning just $1.86 billion dollars to Queensland road and rail over the same five year period.

Total estimated expenditure by the Commonwealth Government on roads in Australia is $2.22 billion for 2005-06. This represents a return to roads of 16.1% of total petrol and diesel fuel excise revenue collected by the Commonwealth. Total payments for 2005-06 by the Commonwealth to Queensland for local and state government controlled roads, are estimated to be $416 million which is approximately 18.7% of Auslink roads funding for the year. In addition, this equates to a per capita investment by the Commonwealth Government on Queensland roads of approximately $104 for 2005-06.

This represents an approximate net overall deficit between excise revenue raised in Queensland and Commonwealth roads grants distributed back to the State and local governments of $570 per capita.[27] In summary, notwithstanding the subsidies provided by the federal government to motorists, the Federal Government returns far less than what it collects for investment in the road network.

[26] 2005-06 Commonwealth Budget Paper No. 1

[27] Using the Australian per capita average for fuel excise revenue collections as an estimate of the Queensland per capita figure, given the unavailability of detailed figures for Queensland

7 Concluding Comments

The Queensland Government is supporting a number of initiatives that will contribute to keeping petroleum prices in Queensland lower than in other states. These activities include the retail fuel subsidy scheme, price monitoring, integrated public transport initiatives and assisting the development of an alternative fuels industry. The wider community can also play its part in addressing the problem, including choices made about vehicle purchases (fuel efficiency information is generally widely available) and mode of transport, including greater use of public transport.

Research undertaken for this submission indicates that the factors affecting petrol price levels across Queensland are many and varied and many of these are impossible or difficult for governments to control, although there are a number of areas in which the Commonwealth is being complacent.

At one level, the major cost components (world crude oil prices, exchange rates, refined fuel costs and taxation) are beyond the control of local industry participants. In addition, the balance of different local influences tends to shift over time, and from location to location. These different local factors can include:

- local supply and demand characteristics;
- barriers to entry in a particular market;
- the presence of independent retailers and wholesalers;
- the potential availability of refined fuel imports;
- the extent of vertical integration in the local industry;
- competition for market share;
- price discounting and margin support from oil majors;
- differential wholesale petrol pricing;
- short-term excess product at refineries and terminals;
- changes in demand (including consumer preferences);
- fuel blending;
- possible anti-competitive practices;
- movements in domestic refiners' margins; and
- the relative volumes of fuel and other goods sold at particular sites.

Due to the different interactions of these factors, it is difficult to determine if there is any excessive market power being exercised in one area that subsidises discounted pricing in other areas. The practices of firms in the wholesale and retail sectors that are contractually tied to the oil majors are often not transparent, making any investigation of the structure of pricing problematic.

Whether the Commonwealth's Oilcode reforms, if implemented, deliver greater powers to the ACCC through enhanced transparency in pricing will be a matter to be determined by ongoing monitoring of the activities of participants at all levels of the industry. While some of the local market characteristics identified as being possibly responsible for causing differences in petrol prices across different regions may prevail (even under more transparent wholesale arrangements), it is essential that the ACCC continue to be vigilant in its monitoring of petrol prices and respond proactively to any evidence of anti-competitive behaviour.

The Queensland Government maintains that the introduction of a net excise on alternative fuels in 2011 will be detrimental to the long term development of a biofuels industry in Australia. Essentially, the 2011 phase-in places additional pressure on the domestic biofuels industry to establish its credentials in the marketplace and become viable before 2011, which is not realistic given the time required to plan, obtain approvals, finance and construct a new facility. Therefore, the preference is that the introduction of a net fuel excise on alternative fuels be placed further out to allow sufficient time for the industry to attract vital capital investment.

A failure in the allocation of funding on the national road network is that it is measured by road length and traffic, and not on a needs basis. Under the AusLink Bilateral Agreement, the Australian Government has effectively walked away from full responsibility for capital and maintenance and has reduced funding for maintenance of the national network. This falls hardest on Queensland, with recent research by the Australian Automobile Association confirming that we have the worst system in the nation.

8 Attachments

Attachment 1. Impact of Petrol Pricing Select Committee Terms of Reference

On 25 August, 2005 the Legislative Assembly, on the motion of the Premier and Minister for Trade, resolved:

1. That a select committee, to be known as the Impact of Petrol Pricing Select Committee be appointed to examine a range of issues regarding petrol pricing in Queensland.

2. That the Committee will consult with the community, investigate report on and make recommendations, in particular, as follows:

(a) Consider the extent to which current petrol price increases the competitiveness of alternative fuel sources such as E-10;
(b) Identify the economic and financial consequences of current fuel prices with a particular emphasis on regional Queensland and outer metropolitan areas;
(c) Identify practical ways that consumers can reduce their petrol bills, including through considering whether existing information on the fuel efficiency of different makes of motor vehicles is sufficient;
(d) Consider the extent to which recent fuel increases could be moderated through enhanced domestic competition, including how the Australian Competition and Consumer Commission powers could be strengthened to deliver enhanced competition;
(e) Examine whether Queensland receives its fair share of road funding;
(f) Identify the capacity and benefits of the Federal Government reducing fuel excise to ameliorate the impact of high fuel prices on families and business; and
(g) Identify whether Queensland motorists are receiving the full benefit of the 8.354 cents per litre subsidy and examine the efficiency of administration for the bulk end users scheme.'

3. That the committee consist of seven members of the Legislative Assembly with four Members to be nominated by the Premier and Treasurer, one member to be nominated by the Leader of the Opposition, one Member to be nominated by the Leader of the Liberal Party and one member nominated to represent the independent members.

4. That the committee have power to call for persons, documents and other items.

5. That the committee report to the House by 31 March 2006.

6. That the foregoing provision of this resolution, so far as they may be inconsistent with the Standing Orders, have effect notwithstanding anything contained in the Standing or Sessional Orders.

Attachment 2. Impacts of Higher Oil Prices on the Queensland Economy

Impacts of Higher Oil Prices on the Queensland Economy

A report prepared for Queensland Treasury

Office of Economic and Statistical Research
Level 8, 33 Charlotte Street, Brisbane, Queensland, Australia
PO Box 15037 City East, Queensland, Australia, 4002
Telephone: (07) 3224 5326 Facsimile: (07) 3227 7437

November 2005

Executive Summary

Background

Queensland Treasury's Office of Economic and Statistical Research (OESR) has employed its computable general equilibrium model (QGEMF) to simulate the potential impacts of higher oil and petroleum prices on the Queensland economy. The model's key strength is its industry detail, which facilitates a comprehensive account of the distribution of economic impacts across industries, consumers, and government.

Scope and key assumptions

The scope of the modelling is to estimate the economic impacts on Queensland of a rise in oil prices similar to that experienced over the past two years. During that time, the world price of crude oil has increased from approximately $US30 to $US60 a barrel. Hence, a 100 per cent increase in the world price of oil is assumed in the simulations. Two scenarios are addressed: a 'permanent increase' scenario, in which the oil price is assumed to remain elevated until the end of the projection period; and a 'temporary increase' scenario, in which the oil price remains elevated for two years, before returning to its starting-point level. In both scenarios, the assumed oil price increase is introduced over two years.

From a modelling perspective, a key feature of oil price shocks is that they have world-wide impacts. Hence, as well as affecting the domestic economy, they also change the international environment. OESR has worked with Treasury's Economic Policy Branch to develop an agreed set of assumptions relating to Australia's external environment.

These assumptions are as follows:

- A decline of 1.25 per cent in aggregate export demand, reflecting an assumed negative impact of higher oil prices on world GDP;

- Varying increases in the prices of overseas-produced commodities, on the assumption that the effects of higher oil prices on business costs will be similar for overseas and Australian firms.

A key potential impact not modelled here is the effect of higher oil prices on the demand for coal. An increase in the world oil price that was perceived to be permanent would be expected to shift demand towards cheaper sources of energy, like coal and gas. Hence, it is possible that Queensland's coal exports could benefit from an increase in the world oil price, even to the extent that Queensland could experience a net benefit in the long run. However, because of time constraints and technical difficulties, this type of scenario was not modelled. Hence, the scenarios presented here could be viewed as pessimistic, or as 'worst case' scenarios for Queensland.

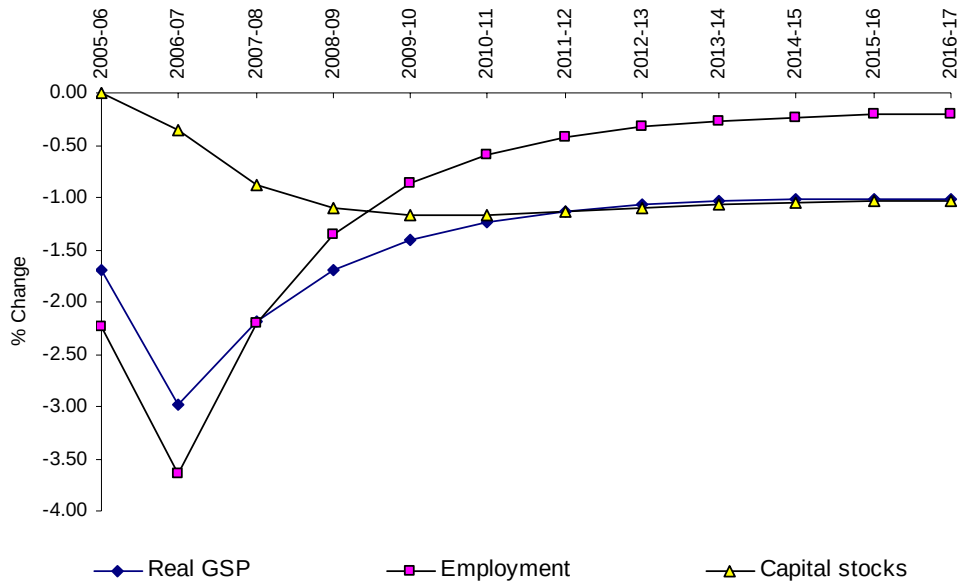
Projections

In the 'temporary increase' scenario, the long term impact on the Queensland economy is projected to be broadly neutral. Hence, for brevity, only the results of the 'permanent increase' scenario are summarised here.

The dominant macroeconomic feature of the 'permanent increase' scenario is the decline in the terms of trade, driven by the increased prices of imported oil and petroleum. This represents a decline in real income for Queenslanders.

Figure 1 shows the projected changes in Queensland employment, capital stock and real gross state product (GSP). By the second year of the simulation, real GSP is projected to fall 2.98 per cent, relative to the basecase.

Figure 1: Projected changes to employment, capital stock and real GSP, Queensland, 'permanent increase' scenario (cumulative deviation from basecase)



The apparent severity of the short-run impact on real GSP, especially relative to current experience, arises from two main factors:

- A model assumption that workers immediately demand higher wages in order to maintain their spending power. This creates additional 'pain' in the form of employment losses, which in turn drives down real GSP, relative to the basecase. If instead real wages were allowed to decline in the short run (as seems to be happening currently), then the projected employment and GSP decline would be milder.
- As mentioned earlier no flow-on benefits to the coal industry are projected. In the recent past, coal prices have increased roughly in proportion with oil prices, and this has worked against the negative effect of the latter on Queensland's terms of trade.

In the long run, real wages are assumed to be flexible, and so real GSP is projected to recover somewhat, to a level 1.01 per cent lower than it would otherwise have been.

The projections for individual industries show three broad forces in operation:

- The direct impact of higher fuel prices on operating costs and therefore output prices;
- The effect of the projected decline in real income, and therefore real private and public consumption; and
- The effect of a projected depreciation of the exchange rate, which benefits the more trade-exposed industries.

The most adversely affected industry is air transport, for which activity is projected to be some 27 per cent lower by 2016-17 than it would otherwise have been. This is because air transport is the most fuel-intensive industry, and also because most of the exports that are assisted by the projected depreciation of the exchange rate do not use air transport. Conversely, water transport activity is projected to be some 12 per cent higher than the basecase level, because of its strong linkages with commodity exports. The impact on road transport is projected to be approximately neutral, because its core role in the domestic economy makes it relatively price-insensitive.

Table 1 focuses on the industry results that signify the greatest economic impacts on Queensland, positive or negative. The results are ordered by percentage point contribution to the change in real GSP.

Table 1: Projected activity changes for major affected Queensland industries, 'permanent increase' scenario (cumulative percentage deviation from basecase)

Positively affected	2016-17	Negatively affected	2016-17
Coal and gas	11.02	Retail trade	-4.73
Non ferrous ores	11.36	Health	-2.74
Meat	5.69	Education	-3.71
Beef cattle	3.13	Public administration	-3.00
Food products	10.06	Construction	-1.80

It can be seen that the greatest positive impacts are associated with export oriented industries, and industries that are suppliers to export industries (eg. Beef cattle). This is mainly due to the projected depreciation of the exchange rate, which enhances the competitiveness of Australian-produced goods.

The greatest negative impacts are associated with service industries which sell a large share of their output to households and government. As real private consumption and government consumption are projected to decline, the activity of these industries is also projected to decline.

Purpose

Queensland Treasury has asked its Office of Economic and Statistical Research (OESR) to simulate the economic impacts of increased oil prices on Queensland. In order to do this, OESR has employed its Computable General Equilibrium (CGE) model of the Queensland and Australian economies (QGEMF). The purpose of this report is to describe the results of OESR's modelling.

Scope and Limitations

The scope of the exercise is to estimate the economic impacts on Queensland of a rise in oil prices similar to that experienced over the past two years. During that time, the world price of crude oil has increased from approximately $US30 to $US60 a barrel. Two scenarios are addressed: a 'permanent increase' scenario, in which the oil price is assumed to remain elevated until the end of the projection period; and a 'temporary increase' scenario, in which the oil price remains elevated for two years, before returning to its starting-point level.

From a modelling perspective, a key feature of oil price shocks is that they have world-wide impacts. Hence, as well as affecting the domestic economy, they also change the international environment. The best way to model the effects on the international environment is by using a multi-region, global CGE model, such as the International Monetary Fund's MULTIMOD model. However, OESR does not have such a model, and has therefore worked with Treasury's Economic Policy Branch to develop an agreed set of assumptions relating to Australia's external environment.

These assumptions address the following issues:

- The impact of higher oil prices on world GDP, and the flow-on effect on demand for Australia's exports;

- Flow-on impacts on the prices of overseas-produced commodities.

While every effort had been made to ensure that the assumptions are realistic, they are critical to the results and therefore represent a significant limitation for the study.

An area of major uncertainty in the Queensland context is the potential impact of higher oil prices on the demand for coal. An increase in the world oil price that was perceived to be permanent would be expected to shift demand towards cheaper sources of energy, like coal and gas. Hence, it is possible that Queensland's coal exports could benefit from an increase in the world oil price, to the extent that Queensland could experience a net benefit in the long run. However, because of time constraints and technical difficulties, this type of scenario is not modelled here. Hence, the scenarios presented here could be viewed as pessimistic, or as 'worst case' scenarios.

A further potential limitation is that the study assumes no increase in the creation and adoption of fuel-saving technology, relative to business-as-usual. It would be expected that an increase in the oil price that is perceived to be permanent would have the effect of diverting more innovative effort towards achieving savings on fuel. However, it was judged that this effect was too speculative to include in the modelling, and that in any case the timeframe for such an effect may be beyond the projection timeframe employed here.

Simulation Design

In model simulations, the modeller imposes a set of assumptions (usually in the form of 'shocks') on the model that are representative of the direct effects of the issue being modelled. Additionally, a number of assumptions relating to economic adjustment processes and the economic environment (ie. the model's 'closure') are necessary. The key assumptions employed in OESR's modelling are set out below.

Assumed duration and size of the oil price shock

There is uncertainty as to whether the rise in the oil price experienced since 2003-04 is temporary, or whether it will persist in the long term. The modelling presented in this paper covers both eventualities, by simulating two scenarios: a 'permanent increase' scenario, in which the price rise persists until the end of the projection period; and a short run scenario, in which the price rise is maintained for two years, and then reversed.

As with the historical price rise from $US30 to $US60 a barrel, the foreign oil price in the simulations is ramped up over two years. In the short run scenario, the assumed price reversal is also over two years.

To reflect the movement in the historical oil price since 2003-04, a 100 per cent increase is assumed in the modelling. This change is imposed on a baseline projection in which it is assumed that the price of oil moves in line with the GDP deflator. All of the results in this report are in the form of percentage deviations from that baseline scenario.

The price change is implemented via a shock to the foreign price of oil. Further, the price of Australian-produced oil is assumed to change in line with the Australian dollar price of imported oil. It is assumed that this price equalisation occurs through mixture of changes in production taxes on domestically produced oil and changes in the profitability of the domestic oil industry.
The price of refined fuel products from the domestic petroleum industry is determined within the model. The Australian dollar price of refined fuel imports is assumed to move broadly in line with the price of domestic refined fuel output.

Assumed impacts on world economic growth

Global economic modelling of oil shocks typically projects a decline in real income for oil-importing countries, which in turn flows through into their demand for other imports. In the case of Australia, it is expected that most of our export destinations would be affected in this way. It is therefore important to try to model the impact of a broad-based decline in demand for Australian exports.

There is no global modelling in the literature that simulates oils shocks of the magnitude assumed here (ie. a 100 per cent increase). Extrapolation of the projections resulting from smaller shocks suggests that the impact of the recent increase in the oil price might result in world GDP being around 1.25 per cent lower than it would otherwise have been. It is further assumed that this translates directly to a 1.25 per cent decline in demand for Australia's exports. This is implemented as an inward shift of the foreign demand curve, with the final result for export volumes being determined by the model.

Again, the magnitude of this effect is extremely uncertain, but its effect on the modelling results is much smaller than for the other components of the simulation.

Assumed impacts on the foreign prices of other goods

Higher oil prices will tend to increase firms' costs both in Australia and overseas. Hence, the prices of foreign goods can also be expected to increase. In reality, it is likely that there would be differential effects across countries, reflecting the fact that different technologies can be used to produce the same good. However, without a detailed global model, these differential effects are very difficult and time-consuming to calculate.

Hence, for this exercise, it is assumed that the prices of overseas-produced goods move broadly in line with the prices of the corresponding Australian-produced goods. In both simulations the increase in the prices of overseas produced goods (Australian imports) is approximated based on the corresponding Australian industry's petroleum cost share. This approach assumes that petroleum usage by overseas industries has the same pattern as Australian petroleum usage, such that the direct impacts on input costs are the same.

The assumed impacts on foreign prices have been implemented in two ways. Firstly, the assumed price change has been imposed as a shock to the foreign price of imports. Secondly, the impact of foreign price changes in foreign markets has been calibrated such that the international competitiveness of Australian exports is maintained, all other things held fixed. Without this effect, the simulations would show the international competitiveness of Australian industries declining across the board, which is unrealistic given the world-wide nature of the oil price increase.

Standard model closure assumptions relevant to all scenarios

The key closure assumptions adopted for the simulations are:

1. The supply of labour in each region (Queensland and Rest of Australia) is maintained at basecase levels, implying that there is no simulation-induced natural increase in population or interstate migration;
2. The level of employment is flexible and real wages are "sticky" in the short run, but over time real wages adjust relative to the basecase such that the level of employment returns to basecase levels in each region;
3. The capital stock in each year is determined by investment activity and depreciation in the previous year. Over time, the capital stock adjusts such that rates of return, which deviate in the short run, return to basecase levels; and
4. Real government consumption varies in line with real household consumption.
5. At the federal level, income taxes adjust in order to maintain the commonwealth government budget position at its basecase level. Commonwealth grants to the regions adjust such that the state government budget positions in each region (Queensland and Rest of Australia) are maintained at their basecase levels.

Simulation Results

As discussed earlier, the scope of the modelling was to examine the effects of both a permanent increase and a temporary increase in the world oil price.

Hence, there are two scenarios:

Scenario 1: The world oil price increases and remains elevated in the long term;

Scenario 2: The world oil price increases and remains elevated for two years only, before returning to its basecase level.

While QGEMF is a two-region (Queensland and the Rest of Australia) model of the Australian economy, for brevity only the Queensland results are shown here. The modelling results for the Rest of Australia are available on request.

The reader should note that all results are expressed as cumulative percentage deviations from basecase levels. For example, a decline relative to the basecase is likely to mean slower growth in absolute terms, rather than a decline in absolute terms. The qualifier 'relative to basecase' is used frequently throughout the commentary, but for readability is not used in every instance.

The results of the two scenarios are presented below.

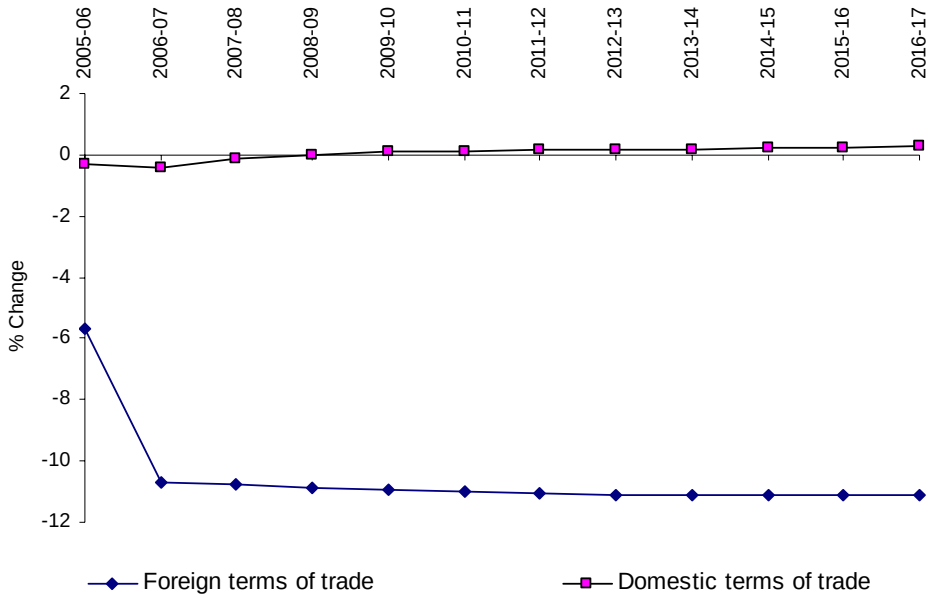
Scenario 1: Long term increase in the world oil price

Macroeconomic results

The dominant macroeconomic feature of Scenario 1 is the decline in the terms of trade driven by the increased prices of imported oil and petroleum. This decline in the terms of trade represents a decline in real income for Queensland, and is mainly responsible for the projected decline in consumption in this scenario.

Figure 1 shows the projected changes in the foreign and domestic terms of trade for Queensland. The foreign terms of trade decline because of the combination of increased foreign prices and downward pressure on export prices arising from reduced foreign demand. The domestic terms of trade decline in the first few years of the simulation because Queensland is an importer of oil from the rest of Australia.

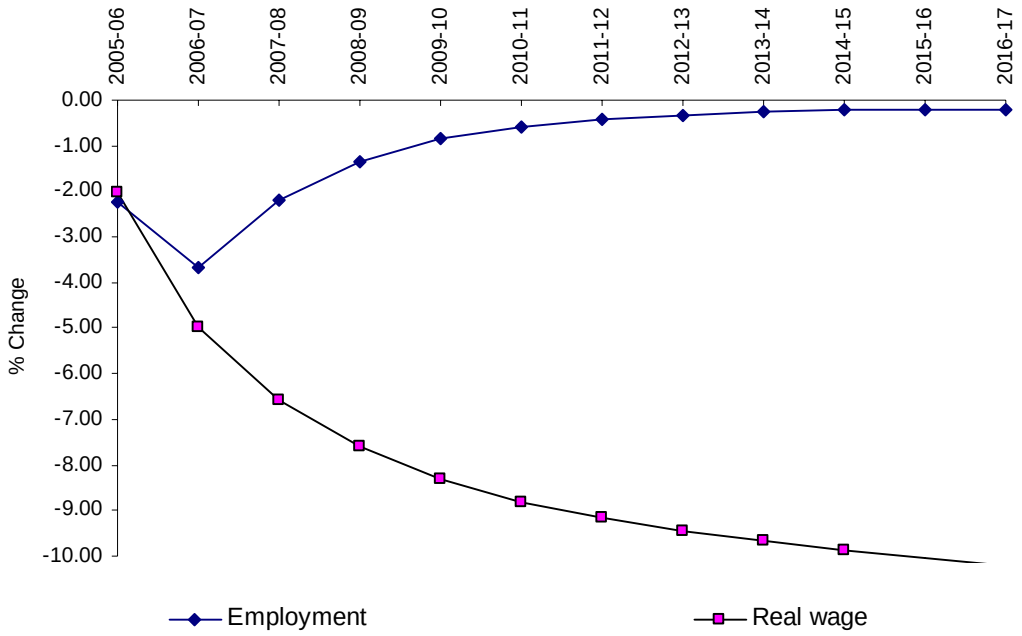
Figure 1: Projected domestic and foreign terms of trade changes, Queensland, Scenario 1 (cumulative percentage deviation from basecase)



Over time, the foreign terms of trade decline further as the Queensland economy adjusts to the higher oil and petroleum prices. The main cause of this is the flow-through to export prices of the reduction in real wages that occurs as the economy adjusts to an initial reduction in labour demand. This is illustrated in Figure 2. In the first year of the simulation, the reduction in real income results in a reduction in domestic demand. This decline in demand reduces the capital and labour requirements of domestic firms. With capital stocks fixed in the short run and real wages assumed to be sticky, firms substitute away from labour, and so employment falls. In the second year, employment falls again as the second installment of the oil and petroleum price shocks adversely impacts on real incomes. As the simulation progresses, however, it is assumed that workers adjust to the poorer employment outcomes by accepting slower growth in real wages, to the extent that employment eventually returns to basecase levels.

The longer-term relative fall in real wages reduces the labour costs of domestic firms and allows domestic prices to fall. The fall in domestic prices leads to a reduction in export prices and hence causes the foreign terms of trade to fall further than would be caused by the changes to oil and petroleum prices alone.

Figure 2: Projected changes to employment and real wages, Queensland, Scenario 1 (cumulative percentage deviation from basecase)

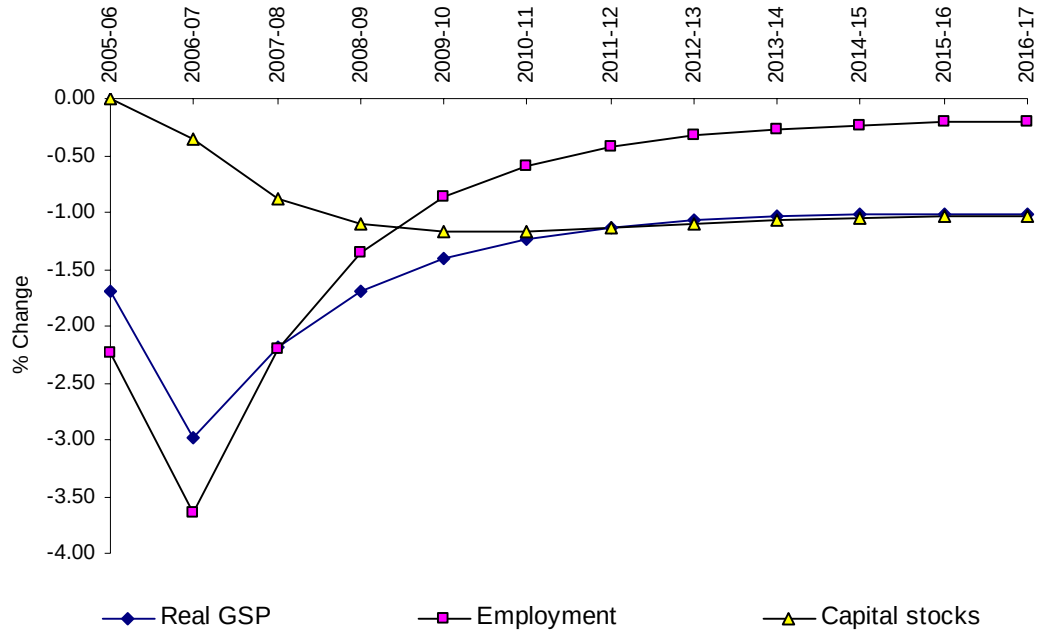


With demand declining, capital stocks are also projected to decline over the simulation period, relative to basecase. In the first year, capital stocks are assumed to be fixed, and the fall in demand results in a decline in the economy wide rate of return. With a reduction in rates of return, the level of aggregate investment declines and capital stocks begin to fall. The adjustment in the labour market accentuates this decline in capital stocks. As the cost of labour to firms reduces, labour becomes more attractive to firms and, where possible, they substitute labour for capital. In the long run, rates of return come back to basecase levels and capital stocks stabilise at a level 1.04 per cent below the basecase.

As shown in Figure 3, the changes in employment and the capital stock result in a fall in real GSP. By the second year of the simulation, real GSP is projected to fall 2.98 per cent relative to the basecase. A critical model assumption that contributes to this short-run response is that workers immediately demand higher wages in order to maintain their spending power. This creates additional 'pain' in the form of employment losses, which in turn drives down real GSP, relative to the basecase. If instead real wages were allowed to decline in the short run, then the projected short-run decline in employment and GSP would be milder.

In the longer term, capital stocks and real wages are assumed to adjust, and real GSP recovers somewhat. In the long run, it is projected to remain 1.01 per cent below basecase levels.

Figure 3: Projected changes to employment, capital stock and real GSP, Queensland, Scenario 1 (cumulative deviation from basecase)



On the expenditure side of GSP, real investment and real private and public consumption are all projected to be below basecase levels in both the short run and the long run (Figure 4). Real investment declines sharply in years 1 and 2, as rates of return fall in response to reduced demand for capital. As capital stocks fall, rates of return come back to basecase levels and investment partially recovers, to a level 2.11 per cent below the basecase.

Real private consumption falls relative to the basecase for two reasons. Firstly, returns to both labour and capital decline over the simulation period, reducing income accruing to households. In the short run, reductions in income occur because of the projected fall in employment and returns to capital. In the long run, incomes fall because of the projected reduction in real wage rates and declines in the physical quantity of capital. The second reason real private consumption falls is the price effects of the decline in the terms of trade. The effect of the increase in oil and petroleum prices is to reduce the purchasing power of household incomes. As the goods purchased by households are relatively petroleum-intensive, real private consumption declines more than real GSP. Real private consumption is projected to decline by 5.49 per cent by the second year of the simulation. In the long run, consumption levels are able to recover somewhat, to a level 4.54 per cent below the basecase.

Public consumption is also projected to decline in relative terms. In QGEMF, nominal public and private consumption are assumed to move together. In real terms, the results diverge slightly, as public consumption is less negatively affected than private consumption, because it is less petroleum-intensive. By year 2, real public consumption is projected to decline by 5.24 per cent. In the long run, real public consumption is projected to be 4.08 per cent below the basecase.

Figure 4: Projected changes to real investment, real public consumption and real private consumption, Queensland, Scenario 1 (cumulative percentage deviation from basecase).

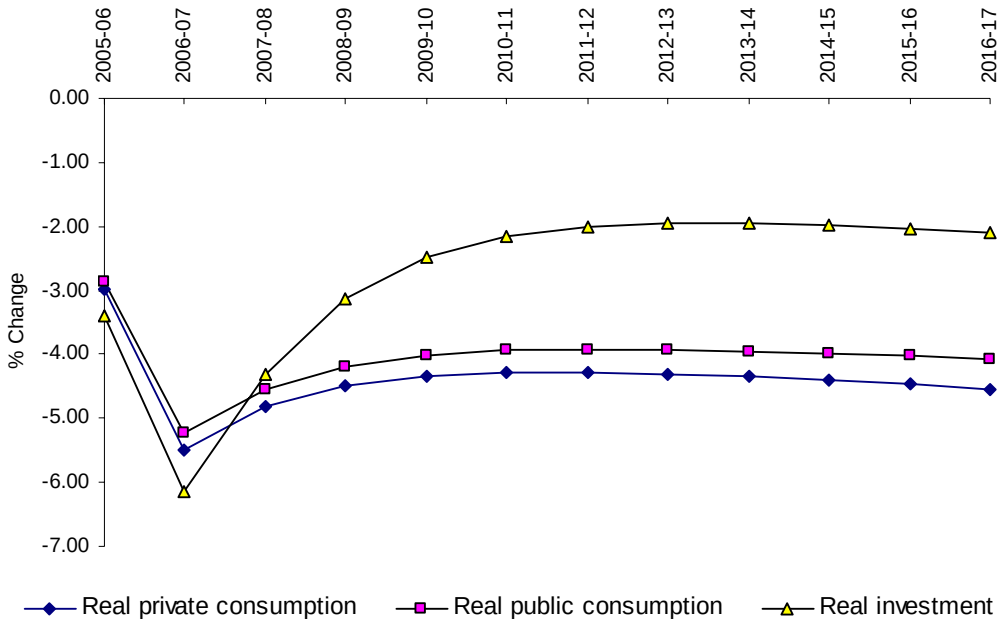
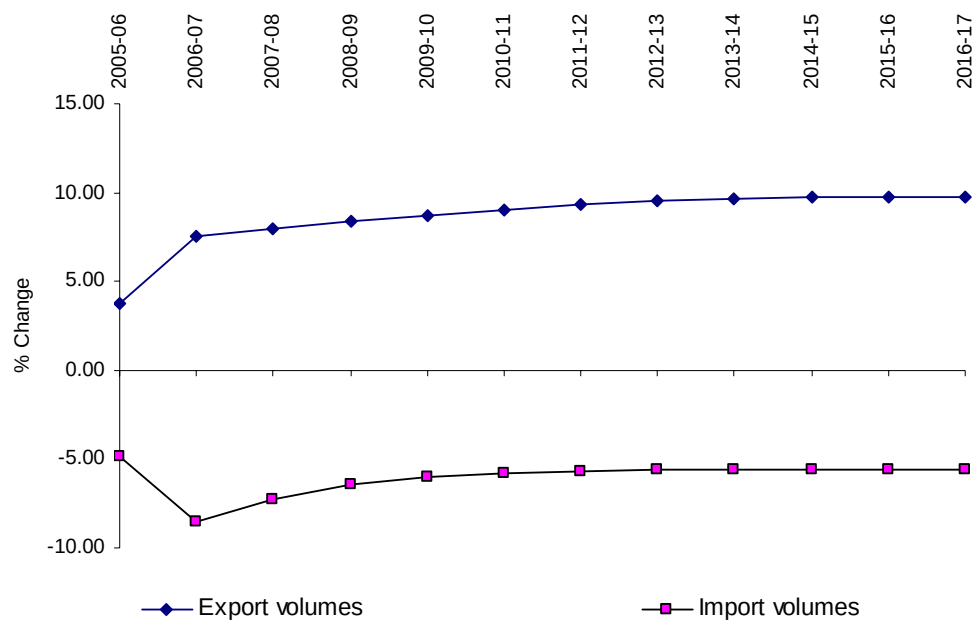


Figure 5 shows the projected changes in foreign export and import volumes for Queensland. A projected exchange rate depreciation makes imports relatively more expensive than domestically produced goods. This, combined with the reduction in incomes, reduces demand for imported commodities and the volume of imports declines over the simulation period. Import volumes are projected to decline by 8.57 per cent in year two, before partially recovering to a level 5.59 per cent below basecase in the long run.

Export volumes are projected to increase over the simulation period. In the short run, domestic firms are left with stranded capital as domestic demand declines. In response, firms reduce prices, and this enhances their competitiveness in foreign markets. In the short run, this price reduction is achieved via a reduction in profitability. In the longer run, reductions in real wages help to make firms more competitive in overseas markets and export volumes are able to increase slightly from their short run position. By year two of the simulation, export volumes are projected to increase by 7.54 per cent. In the long run, export volumes are projected to be 9.80 per cent above the basecase.

Figure 5: Projected changes to export and import volumes, Queensland, Scenario 1. (cumulative percentage deviation from basecase).



Industry results

A key strength of CGE modelling is its industry detail, which allows for a comprehensive account of the distribution of the macroeconomic impacts between industries. As mentioned earlier, no fuel-saving technological change has been allowed for. This means that industries are assumed to continue using the same quantity of fuel per unit of output, with the result that the most fuel-intensive industries are likely to be adversely affected.

Directly affected industries

Not surprisingly, the activity of the *Petroleum* industry, which is the primary user of crude oil both coming from overseas as well as from domestic sources, is projected to decline significantly. The activity level of this industry is projected to be 11.98 per cent below the basecase level in 2017-18.

Other industries with relatively high usage of oil or petroleum in their production processes are also expected to be directly affected as a result of an increase in the foreign prices of crude oil and petroleum. Table 1 presents the percentage change in the activity level of petroleum intensive[28] industries in Queensland.

Table 1: Projected activity changes for major Petroleum-intensive industries in

[28] Ranked according to the input cost of petroleum as a percentage of total cost

Queensland, Scenario 1

Industry	Cost share of Petroleum (%)[29]	Cumulative percentage deviation from basecase		
		2005-06	2006-07	2017-18
Air transport	24.19	-5.10	-12.09	-26.75
Other mining*	5.52	-0.83	-1.48	0.65
Services to mining	5.34	1.36	3.38	10.01
Fishing	4.64	-0.49	-0.44	1.44
Road transport	4.32	-1.06	-1.77	-0.15
Sugar cane	4.21	3.34	7.22	10.06
Non ferrous ores	4.12	1.62	4.13	11.36
Forestry and logging	3.76	0.85	1.64	3.48
Water transport	3.46	5.28	11.67	12.26
Water Supply	3.06	-2.30	-4.49	-4.05

*A miscellaneous category which includes construction materials mining.

The activity of the *Air transport* industry, which has the highest petroleum cost share, is projected to decline significantly over the simulation period. In QGEMF, a large share of the output of the *Air transport* industry is consumed by households. Further, *Air transport* is assumed to be a luxury good. As a result, households choose to consume other goods as the price of *Air transport* rises. *Road transport* is also projected to decline, but by a much smaller proportion. This is because *Road transport* is assumed to be a margin good[30], and demand is therefore relatively price-inelastic. Similarly, other petroleum-intensive industries such as *Other mining* and *Fishing* are projected to contract over the simulation period.

In contrast, export oriented industries or industries that are suppliers to export industries are projected to expand despite the petroleum intensity of their cost structure. The main contributing factor is the weakening of the national terms of trade, resulting in a real currency devaluation, which stimulates exports.

For instance, industries such as *Non ferrous ores*, *Coal and gas*, *Grains* and *Water transport* are export oriented industries and they are projected to increase their output over the projection period. The output of industries such as *Sugar Cane*, *Rail transport*, *Services to mining* and *Chemical products* is also projected to increase, because of strong linkages to the activity of major export industries.

Queensland's *Forestry and logging* industry is also projected to expand, despite its relatively high petroleum cost share. The reason for this expansion is an increase in demand resulting from the projected expansion of the *Sawmill* industry, which benefits from import substitution resulting from a projected increase in the domestic price of imported sawmilling products. Another petroleum intensive industry to benefit from import substitution is the *Basic chemicals* industry.

Negatively affected industries

Most service industries are projected to decline over the simulation period. This is mainly because a large share of their output is consumed by households and government. As real private consumption and government consumption are projected to decline, the activity of these industries is also projected to decline. Similarly, those industries with high petroleum intensity in their cost structure and with low export orientation are projected to contract. Table 2 presents the change in activity for the main negatively affected industries, ranked according to their contribution to the projected change in Queensland's GSP in 2005-06.

Table 2: Projected activity changes for major negatively affected Queensland industries,

[29] Based on the 2004-05 base year model database

[30] In QGEMF, margin goods are those that are used to facilitate the sales of other goods. *Road Transport* is a margin good in that it is used to transport goods from the producer to the final user.

Scenario 1 (cumulative percentage deviation from basecase)

Industry	2005-06	2006-07	2016-17
Retail trade	-3.58	-6.37	-4.73
Health	-2.46	-4.43	-2.74
Education	-2.54	-4.74	-3.71
Public administration	-2.52	-4.55	-3.00
Construction	-3.09	-5.34	-1.80
Wholesale trade	-2.53	-4.37	-1.74
Residential building	-2.60	-5.03	-2.49
Property	-1.97	-3.61	-2.08
Business services	-2.17	-3.95	-2.41
Other services	-2.69	-4.85	-3.10

Positively affected industries

Table 3 presents the main positively affected industries in Queensland, ranked according to their relative contribution to the projected change in Queensland's GSP in 2005-06. It can be observed that export oriented industries and industries that are suppliers to export industries (eg. *Beef cattle* mainly sells its output to the *Meat* industry) are projected to expand over the simulation period. This is mainly due to the weakening of the national terms of trade which leads to a real currency devaluation.

Table 3: Projected activity changes for major positively affected Queensland industries, Scenario 1 (cumulative percentage deviation from basecase)

Industry	2005-06	2006-07	2017-18
Coal and gas	1.87	4.54	11.02
Non ferrous ores	1.62	4.13	11.36
Meat	2.84	5.75	5.69
Beef cattle	1.78	3.47	3.13
Food products	3.34	7.22	10.06
Non ferrous metals	1.98	4.64	8.62
Water transport	5.28	11.67	12.26

Scenario 2: Short term increase in the world oil price

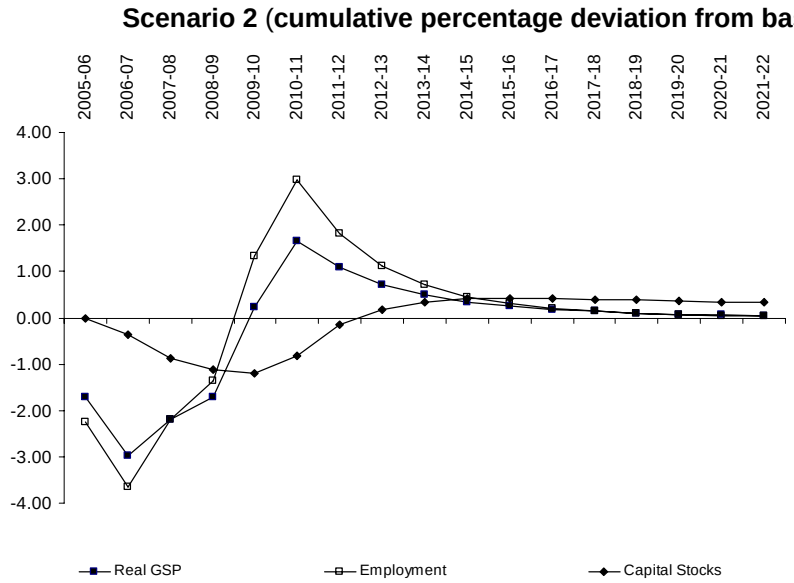
In Scenario 2, as in Scenario 1, the initial ramp-up in the world oil price occurs over two years. It is then assumed to hold at the same elevated level for two years, following which the oil price (along with the other imposed effects) is assumed to decline to its original level over a further two years. From that point on, no further change is imposed, relative to the baseline projection.

The first four years of the projections are exactly the same as for Scenario 1, reflecting an assumption that economic agents don't perceive that the oil price increase is only a short term phenomenon. In the fifth and sixth years, the shocks introduced in the first and second years are reversed. Because of these later shocks, the projection time frame is extended to 2021-22 to ensure sufficient time for the long run outcomes to become apparent.

The adjustment path of the economy following the reversal of the shocks (Figure 6) reflects a critical model assumption about the adjustment of real wages. Over the first four years of the simulation, employment is projected to be below basecase levels, and so by the fourth year, real wages have started to adjust downward. The reversal of the shocks therefore provides a relative stimulus to an economy with lower wages than originally, and this results in employment and real GSP temporarily rising above their basecase levels[31].

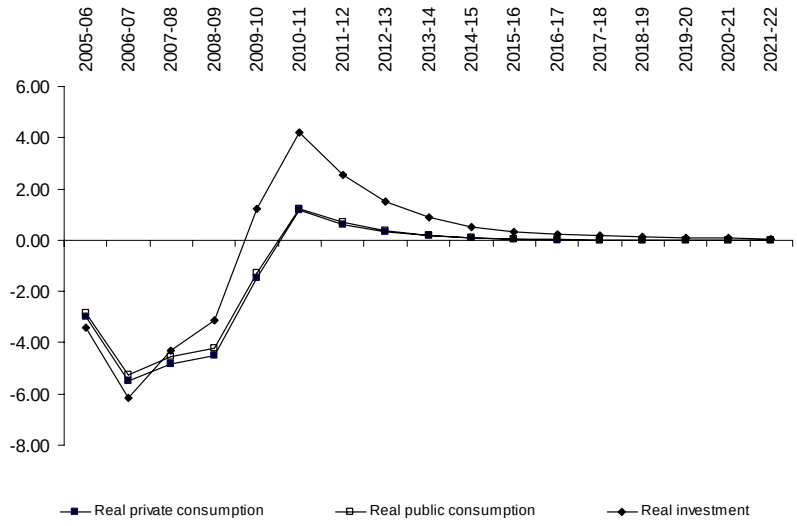
Figure 6: Projected changes in Queensland real GSP, employment and capital stocks,

[31] If, on the other hand, it was assumed that wages didn't decline over the first four years, GSP would remain in negative territory, converging towards basecase levels from below.



By the end of the simulation period, employment and real GSP return to their basecase levels as the real wage increases again. This is arguably an optimistic projection, particularly if the results for real public and private consumption are taken into account (Figure 7). With a short-term adverse terms of trade shock, it might be expected that the income lost to the economy during the period of lower terms of trade would not be recovered, such that the main economic aggregates would be below basecase levels in the long run. However, due to the model assumptions regarding economic adjustment, no long term detriment to the economy is projected to remain after the world oil price returns to its original level.

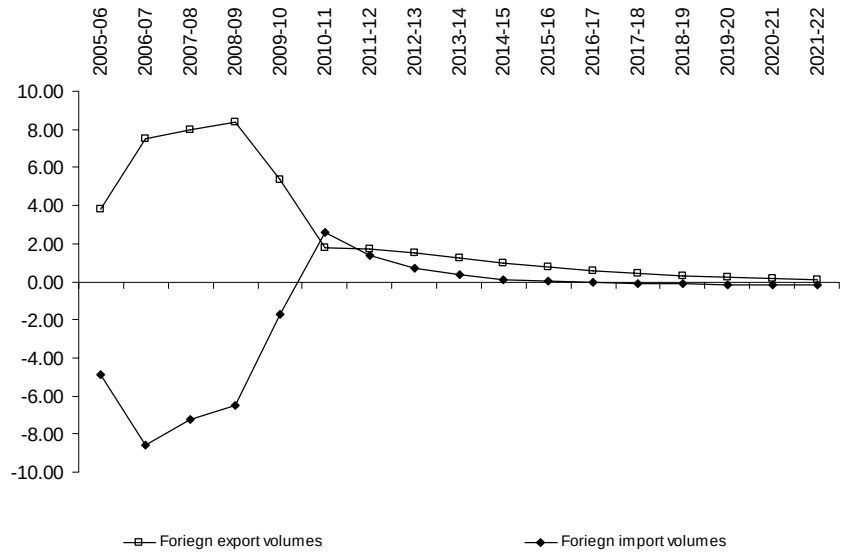
Figure 7: Projected changes in real private consumption, real public consumption and real investment, Scenario 2 (cumulative percentage deviation from basecase)



The projected path of capital stock remains marginally above its basecase level at the end of the simulation. As the shocks are initially ramped up during the first two years of the simulation, export industries (which are relatively capital-intensive) benefit through the weakening in the foreign terms of trade, and their activity expands. This results in higher investment by export industries and partially explains the capital stock remaining slightly above its basecase level at the end of the projection period.

On the expenditure side of GSP, the projected paths of real private consumption, real public consumption, real investment, and export and import volumes converge to their basecase levels in the long run, as illustrated in Figures 7 and 8.

Figure 8: Projected changes in Queensland foreign export volumes and foreign import Volumes, Scenario 2 (cumulative percentage deviation from basecase)



Conclusions

Other things remaining the same, the effect of an increase in the world oil price on the Queensland economy is a decline in the terms of trade, and a consequent loss of real income. Scenario 1 suggests that GSP might be around 1 per cent lower in the long run, with real consumption (a rough proxy for welfare) around 4 per cent lower in the long run. If the oil shock is only temporary, the residual effect in the long run might be relatively small, depending on the flexibility of real wages (Scenario 2).

It should be reiterated that the modelling results presented here are subject to a number of limitations (see Section 2), and should therefore be viewed as indicative, rather than a considered, comprehensive treatment of the topic. In particular, Queensland's position as a net exporter of energy (with coal exports exceeding oil imports) suggests that the impact of the oil shock on the terms of trade could be negated, and even reversed in the long term, depending on the response of the world energy market to higher oil prices. Hence, it might be argued that the scenarios modelled here are somewhat pessimistic. Given more time to do the necessary background research and model development, it would be possible to produce a more comprehensive analysis.

Attachment 3. E10 Outlets in Queensland

Note: Shell (i.e. Coles Express) fuel outlets offer "Optimax Extreme" which is a premium fuel blend containing 5 percent ethanol www.shell.com.au/extreme All other fuel outlets listed here offer premium fuel blends containing 10 percent ethanol.

Shell Optimax Extreme will be available at these sites by the end of 2005.

Brisbane Area:

QFleet Depot, Colchester Street	**South Brisbane**
BP Capalaba, Qld Cleveland and Dollery Roads	**Capalaba**
BP Express, 237 Brisbane Road	**Goodna**
BP Express Plaza, Cnr Moggill and Cedarleigh Roads	**Kenmore**
BP Express Virginia, 1830 Sandgate Road	**Virginia**
BP Cannon Hill, Cnr Creek and Wynnum Roads	**Cannon Hill**
BP Wishart, 528 Newnham Road	**Wishart**
BP Eastern Heights, Cnr Robertson and Grange Roads	**Eastern Heights**
BP Gliderway, 62 Brisbane Road	**Ebbw Vale**
BP Thornlands, Cnr Bloomfield and South Streets	**Thornlands**
BP Stanley Street, 979 Stanley Street	**East Brisbane**
BP Tingalpa, Cnr Manly and Wynnum Roads	**Tingalpa**
#Coles Express Albany Creek, 171 Old Northern Road	**Albany Creek**
#Coles Express Balmoral, Cnr Oxford St and Hawthorne Road	**Balmoral**
#Coles Express Kallangur, Cnr Anzac Ave and Duffield Road	**Kallangur**
Coles Express Kessels Road, 651 Kessels Road	**Mount Gravatt**
Coles Express Milton, 319 Coronation Drive	**Milton**
#Coles Express Runcorn, 501 Compton Road	**Runcorn**
#Coles Express Sherwood, Cnr Sherwood & Oxley Roads	**Sherwood**
Coles Express Virginia, Cnr Sandgate and Robinson Roads	**Virginia**
Neumann Albion, Cnr Albion and Mclennan Streets	**Albion**
Neumann Lindum, Cnr Sibley and Kianawah Roads	**Wynnum West**
Neumann Eagle Farm Depot, 23 Theodore Street	**Eagle Farm**
Neumann Eagleby, River Hills Road	**Eagleby**
Neumann Greenbank, Lot 2/8 Sheppards Drive	**Greenbank**
Neumann Kooralbyn, Store 9 Salisbury Avenue	**Kooralbyn**
Neumann Rocklea, Cnr Ipswich and Elmes Roads	**Rocklea**
Neumann Underwood, 3077 Logan Road	**Underwood**
Neumann Morningside, Cnr Wynumm and Junction Roads	**Morningside**
Neumann Beenleigh, 21 City Road	**Beenleigh**
Evolve Mt Warren Park, 40 Rochester Drive	**Mt Warren Park**
South East Queensland Fuels, 61 Ashover Road	**Rocklea**
Independent Fuel Supplies, 3198 Moggill Road	**Bellbowrie**
Freedom Fuels Mt Gravatt, 154 Creek Road	**Mt Gravatt**
Freedom Fuels Wakerley, Cnr Green Camp and Molle Roads	**Wakerley**
Freedom Fuels Seven Hills, Cnr Oateson Skyline and the Corso	**Seven Hills**
Freedom Fuels Acacia Ridge, 281 Leoroyd Road	**Acacia Ridge**
Freedom Fuels Willawong, 233 Sherbrooke Road	**Willawong**
Freedom Fuels Eight Mile Plains, 2494 Logan Road	**Eight Mile Plains**
Freedom Fuels Rocklea, 46 Sherwood Road	**Rocklea**
Freedom Fuels Fernvale, Brisbane Valley Highway	**Fernvale**
Freedom Fuels Redbank Plains, Cnr Kruger St and Henty Drive	**Redbank Plains**
Freedom Fuels Inala, Cnr Rudd and Freeman Streets	**Inala**
Freedom Fuels Thornside, Cnr Rickertt and Thornside Roads	**Thornside**
Freedom Fuels Beenleigh, 52 Logan River Road	**Beenleigh**
Freedom Fuels Marsden, 502 Browns Plains Road	**Marsden**

Freedom Fuels Goodna, 114 Brisbane Terrace	**Goodna**
Freedom Fuels Grange, Cnr Days Road and Colston Street	**Grange**
Freedom Fuels Nudgee, Cnr Nudgee and Tufnell Roads	**Nudgee**
Freedom Fuels Kuraby, 1319 Beenleigh Road	**Kuraby**
Freedom Fuels Wooloowin, Cnr Shaw Road and Emma Street	**Wooloowin**
Freedom Fuels Brendale, Cnr Southpine and Kremzow Roads	**Brendale**
Freedom Fuels Kedron, 277 Gympie Road	**Kedron**
Freedom Fuels Brisbane Market, Sherwood Road	**Rocklea**
Freedom Fuels West Ipswich, Cnr Brisbane Road and Tiger Streets	**West Ipswich**
Freedom Fuels Ningi, 1473 Bribie Island Road	**Bribie Island**
United Petroleum Booval, 203 -209 Brisbane Road	**Booval**
United Petroleum Park Ridge, 445 - 459 Chambers Flat Road	**Park Ridge**
United Petroleum Springfield , 2 Woodcrest Way	**Springfield**

Sunshine Coast Area:

BP Nambour Depot, Bli Bli Road	**Nambour**
Coles Express Caloundra, 69 Beerburrum Street	**Caloundra**
Caltex Gold Nugget Gympie Service Station, 5 Bruce Highway	**Gympie**

Gold Coast Area:

Coles Express Surfers Paradise, 2824 Gold Coast Highway	**Surfers Paradise**
Neumann Nerang, Cnr Spencer Road and Grenfell Street	**Nerang**
Independent Fuel Supplies, 85 Spencer Road	**Nerang**
Independent Fuel Supplies, Markeri Street and Robina Parkway	**Robina**
Independent Fuel Supplies, 9 Tallebudgera Creek Road	**West Burleigh**
Independent Fuel Supplies, Cnr Nerang Southport Road and Olsen Avenue	**Ashmore**

Toowoomba Area:

BP Toowoomba City, Ruthven and James Streets	**Toowoomba**
BP East, Cnr Bridge and Mary Streets	**Toowoomba**
BP Herries Street, Cnr Herries and Neil Streets	**Toowoomba**
BP Truckstop, Anzac Street	**Toowoomba**
BP Dalby Depot, 1 Wyley Street	**Dalby**
Caltex Garden City, 877 Ruthven Street	**Toowoomba**
Caltex Superstore, Cnr James and Ruthven Streets	**Toowoomba**
Caltex Taylor Street 383 Taylor Street	**Toowoomba**
Caltex Jondaryan, Warrego Highway	**Jondaryan**

Warwick Area:

BP Koremans, 180 Wood Sreet,	**Warwick**
Caltex Truck n Travel, New England Highway	**Warwick**
Caltex Stanthorpe, New England Highway	**Stanthorpe**
Caltex Goondiwindi Truckstop, Boundary Road	**Goondiwindi**
Caltex St George, 102 Victoria Street	**St George**
Freedom Fuels Allora, 1 New England Highway	**Allora**

Bundaberg Area:

BP Logging Creek, Isis Highway,	**Cordalba**
BP Bundaberg Depot, 33 Princess Street	**Bundaberg**

Maryborough Area:

BP Maryborough, Ferry Street	**Maryborough**

Rockhampton Area:	
BP on Albert, Albert Street	**South Rockhampton**
Mackay Area:	
BP Whitsunday, 112 Shute Harbour Road	**Cannonvale**
BP Shakespeare, 114 Shakespeare Street	**Mackay**
BP City Gates, 324 Nebo Road	**Mackay**
BP Oak Street, Oak St and Tropical Avenue	**Andergrove**
BP Proserpine, Bruce Highway	**Proserpine**
BP Sarina, Broad Street	**Sarina**
Townsville Area:	
BP Ingham, 66 Townsville Road	**Ingham**
BP Garbutt, 2 Bombala Street	**Garbutt**
BP Ayr Depot, 48 Lynch Street	**Ayr**
Caltex Sunland, Edward and Burke Street	**Ayr**
Caltex Garbutt, 26-28 Pilkington Street	**Garbutt**
Caltex Ingham, 25 Herbert Street	**Ingham**
Ampol, 103 Thuringowa Drive	**Kirwan**
Far North Queensland:	
Caltex Woolworths, 131 Sheridan Street	**Cairns**
Caltex Manunda, 1 Hoare Street	**Cairns**
Ampol, 230-238 Sheridan Street	**Cairns**
Ampol Reservoir Road 31 Reservoir Road	**Cairns**
Caltex Portstar, 30-36 Kenny Street	**Cairns**
Caltex Mareeba, 70 Byrne Street	**Mareeba**
Caltex, Bruce Highway	**Tully**
Caltex, Bruce Highway	**Mourilyan**
Caltex (Tom Dooley Smithfield P/L), Captain Cook Highway	**Cairns**
Caltex Petroleum Distributor P/L, Draper Street	**Cairns**
Caltex Petroleum Distributor P/L, Cnr Bunda and Kenny Streets	**Cairns**