LPG australia

4th September 2008

Committee Secretary
Senate Select Committee on Fuel and Energy
Department of the Senate
PO Box 6100
Parliament House
Canberra ACT 2600

Dear Committee Secretary

Please find enclosed copies of LPG's Role in Australian Energy Policy.

This document is also available as a web document in the form of a PDF file.

Should you like to receive a web copy, please email me at swoodward@alpga.asn.au

Representatives of LPG Australia would be pleased to appear before the Committee to elaborate on aspects of our policy and to answer any questions the Committee may wish to pose.

Yours sincerely

Stephen Woodward

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Chief Executive Officer

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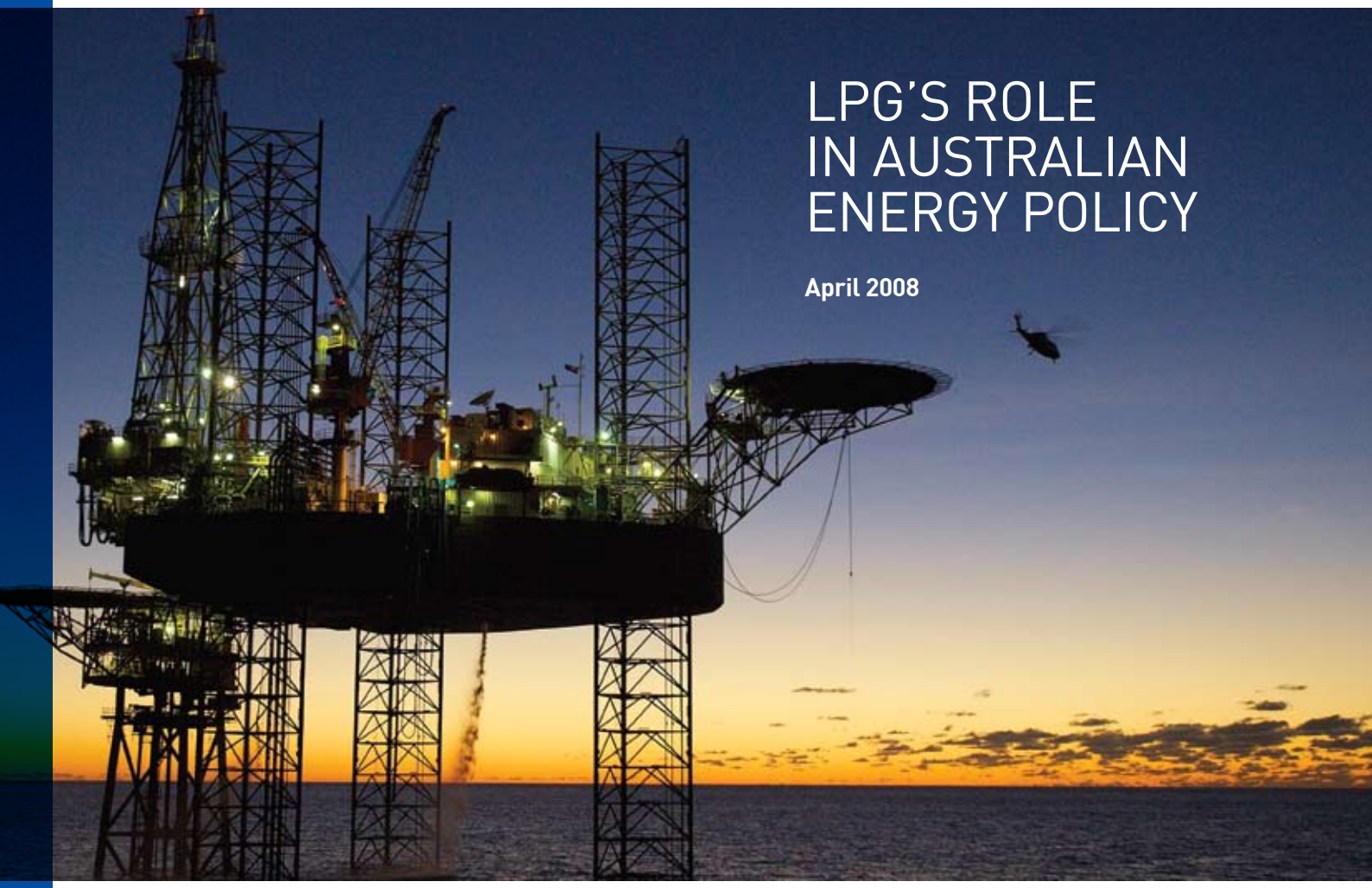

LPG'S ROLE IN AUSTRALIAN ENERGY POLICY

April 2008

LPG australia

CONTENTS


NO SMOKING

EXECUTIVE SUMMARY

LPG (Liquefied Petroleum Gas) is a cleaner, low carbon, gaseous fuel, which Australia produces in abundance. Eighty percent of LPG comes from natural gas fields, which continues to grow, and 20% from refining oil.

Increased use of LPG can contribute to critical aspects of Australia's energy policy objectives:

- Climate Change Policy and Greenhouse Gas Emission Reduction – the use of LPG as a transition fuel for automotive and stationary energy delivers an immediate reduction in greenhouse gas (GHG) emissions compared to conventional energy sources;
- Energy Security – Australia is an exporter of LPG but remains a growing net importer of oil and petrol. The Australian Bureau of Agricultural and Resource Economics (ABARE) has forecast production of naturally occurring LPG to double by 2030;
- Cleaner, Transitional, Stationary Energy Fuel for Regional Australia – LPG is the most portable, low GHG fuel available throughout regional Australia, and is an important part of the rural economy. LPG's established infrastructure offers flexibility in meeting energy demand in fast growing areas;
- Economical Transport Fuel Option for Australian Consumers – LPG offers lower fuel costs for Australian motorists;
- National Environment Protection Measure (NEPM) for Air Quality – as an automotive fuel, LPG poses a lower health risk from particulates and air toxics than petrol and diesel.

LPG Australia recommends to Australian governments two key strategies to take advantage of our positive supply outlook and significant established LPG infrastructure:

1. To maintain and promote clear, long-term policies that encourage the use of LPG as a transport fuel option, including ongoing support for the LPG Vehicle Scheme.
2. To recognise and promote the role LPG can play in greenhouse gas reduction by replacing electricity in specific stationary uses, particularly domestic and commercial hot water and space heating.

CLIMATE CHANGE POLICY GREENHOUSE GAS EMISSION REDUCTION

Climate Change policy is challenging.

To achieve a substantial reduction in stationary energy emissions, large investment in renewables and carbon capture will be required, together with large gains in energy efficiency.

Reducing transport emissions is even more challenging. Hydrogen -fuelled vehicles may eventuate, but not soon. The move to biofuels is proving more complex than imagined, and may await the development of the next generation cellulosic biofuels before they can contribute strongly.

LPG, however, can provide immediate gains as both a stationary and transport fuel, using existing technology and established infrastructure.

LPG – Intrinsically Lower GHGs

LPG's intrinsic benefit is similar to natural gas. It has a high hydrogen to carbon ratio. Compared with "heavier fuels" such as petrol, diesel or coal, LPG has lower CO_2 emissions.

The following tables show the benefits of LPG:

Table 1: Full Fuel Cycle CO_2-e Emissions Stationary Fuels

Stationary Fuel	CO_2-e Emissions Kg/GJ	LPG Benefit
LPG	65.3	–
Diesel oil	74.8	13%
Fuel Oil	78.4	17%
NSW Black Coal	98.1	33%
Brown Coal Briquettes	104.3	37%
Purchased Electricity –NSW	295	78%
Purchased Electricity - VIC	364	82%
Purchased Electricity - QLD	289	77%
Purchased Electricity – SA	272	76%
Purchased Electricity – WA	271	76%
Purchased Electricity - NT	221	70%

Source: National Greenhouse Accounts (NGA) Factors. January 2008.

LPG as a Stationary Fuel

For industry, commerce and households, LPG can reduce GHG emissions compared with competing traditional fuels. This is particularly important in the regions of Australia where natural gas is not available.

There is an opportunity to achieve a substantial reduction in GHG emissions from water heating. Half the residential water heaters in Australia are electric – 4 million units, producing around 16 million tonnes of CO_2 each year. Two million units are outside the metropolitan areas. As these units are replaced, a switch from electricity to LPG can reduce GHG emissions by 74%, or by 95% with LPG boosted solar energy.

Table 2: Residential Water Heating GHG Emissions

Fuel	Household GHG Emissions (Tonnes CO_2 pa)
Electric Storage	4.2
LPG Instantaneous	1.1 (74% saving compared to electric storage)
Solar – electric boosted	1.5
Solar - LPG boosted	0.2 (95% saving compared to electric storage)

Source: Australian Greenhouse Office Home Technical Manual, Temperate Climate, Medium Household.

The same principles apply to commercial hot water. It is extensively used throughout the hospitality industry, and energy use is much higher than for a household. The percentage GHG reduction on changing from electric hot water is as above, but the reduction in tonnes per establishment can be many times higher than for a household.

Space heating also offers the opportunity for substantial GHG reduction. While correct insulation, ventilation and building construction are particularly important, LPG heating has lower GHG emissions than electric heating.

LPG as a Transport Fuel

LPG technology in light vehicle petrol engines is well established. A typical 6-cylinder petrol vehicle, travelling 15,000 kms a year and averaging 12 litres/100km, generates 4.7 tonnes CO_2-e. If converted to LPG it will consume 15.6 litres/100km, and generate 4.2 tonnes CO_2-e.

Table 3: Full Fuel Cycle CO_2-e Emissions Transport Fuels

Transport Fuel	CO_2-e Emissions Kg/GJ	LPG Benefit %
LPG	65.5	–
Petrol	72.3	9%

Source: National Greenhouse Accounts (NGA) Factors January 2008.

In 2007, more than 100,000 vehicles were converted to LPG. If these vehicles used, on average, the same amount of fuel as the existing LPG fleet, these 100,000 conversions have resulted in 80,000 fewer tonnes of CO_2 being released into the atmosphere. These savings keep occurring year on year until the end of the vehicle's life.

Light diesel vehicles' GHG emissions are similar to those of LPG vehicles. This is one factor driving the recent increased sales of light diesels, but it comes with the disadvantage of diesel's production of more harmful particulate emissions in most cases (see page 24).

Emerging technology, where LPG partially substitutes for the diesel, is showing the potential to deliver 10% GHG savings compared to diesel alone. As it can also apply to heavy vehicles, the potential for GHG savings is large – one long distance articulated diesel truck can produce 300 to 500 tonnes CO_2-e per year.

Emissions Trading

LPG Australia supports the principle of recognising the relative carbon content in the cost of fuels.


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KENWORTH
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ENERGY SECURITY LPG IN AUSTRALIA

Australia increasingly relies on imports for its transport fuels: 70% of crude oil, and 15% of refined petrol demand, are imported.

Crude imports are mainly from Asia where local demand is increasing – the prospect is for increasing reliance on the Middle East.

Conversely, we are an LPG exporter. As LPG is produced with natural gas, the forecast is for increasing LPG production.

Increased use of LPG will thus reduce Australia's reliance on volatile and vulnerable overseas fuel supplies.

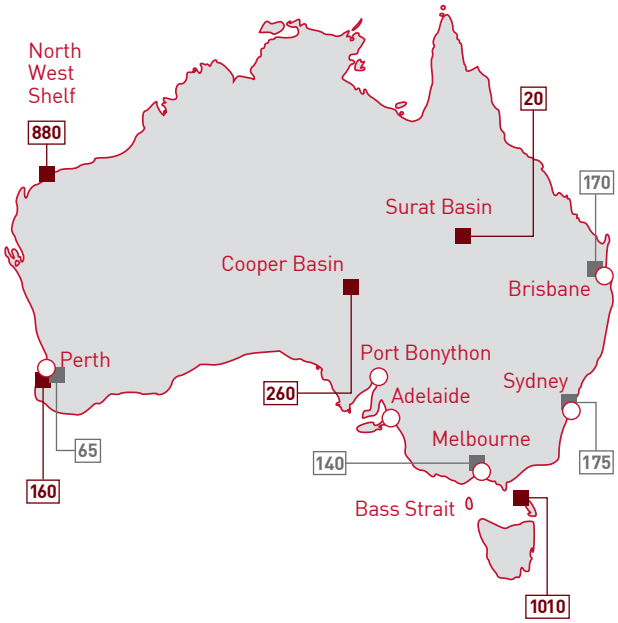
Australian LPG Supply

LPG is produced in Australia in two ways: 80% comes from natural gas (principally) and oil fields, and 20% from crude oil refining.

Natural gas, in offshore and onshore gas fields, consists mostly of methane, with up to 10% comprising propane, butane, and a small number of other petroleum gases, like ethane. Distillation plants separate the LPG from methane.

LPG is also generated in oil refineries during the processing of crude oil.

Australian Supply 2006 **X 1,000 tonnes**



Field gas
Refineries

Source: DITR, LPG Australia.

Australia is a net exporter of LPG, producing 2.9 million tonnes and using 1.8 million tonnes domestically.

Australia has developed a number of key coastal LPG terminals which provide flexible and economic supply logistics through the use of coastal shipping. The combination of import and export shipping movements has provided the best economic and supply solutions.

ABARE has forecast Australian LPG production to double by 2030. The continued development of large-scale natural gas projects will increase production of LPG above the ABARE forecasts. A demand growth of over 6% a year to 2030 would not result in demand exceeding local supply.

Australian LPG Demand

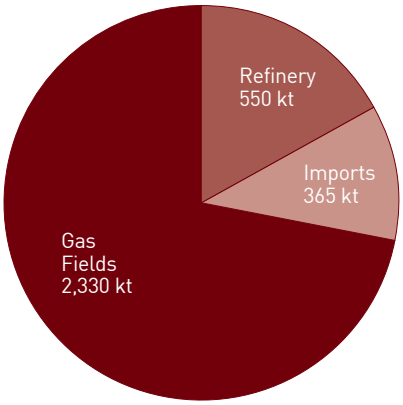
LPG supplies both the transport and stationary energy sectors.

LPG has numerous stationary energy applications: domestic and commercial space heating, water heating, cooking and leisure use (BBQs and caravans), industrial heating, and a variety of agricultural and other industrial uses. Forklift truck use, a growing application, is included as a stationary energy use in Australian energy statistics.

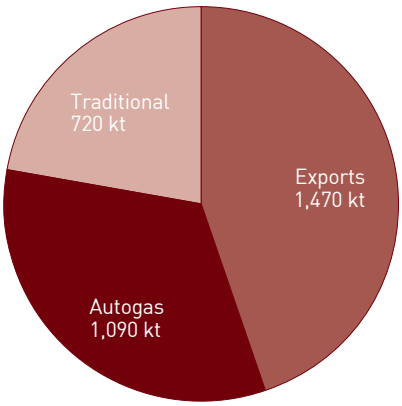
When used as a cleaner, back-up energy, LPG also accelerates the development of intermittent renewables such as photovoltaic, solar-thermal, wind and small hydro sources of energy. Furthermore, LPG is a valuable energy resource in emergency situations (eg: flooding, cyclones, storms, failure of natural gas infrastructure).

LPG as an automotive fuel is well established, and the number of LPG fuelled vehicles has grown significantly over 2006 and 2007. LPG is principally used in passenger and light commercial motor vehicles but also has applications in heavy vehicles and trucks.

LPG Supply and Demand 2006



Total Domestic Supply 2,880 kt



Total Domestic Demand 1,810 kt

Source: DITR, LPG Australia.

CLEANER STATIONARY ENERGY FOR REGIONAL AUSTRALIA

LPG Infrastructure is well established.

One of the challenges for Australia's energy industry is the investment required to provide cleaner forms of energy.

LPG offers many advantages, both to end-users and to society as a whole. It is easily liquefied, at six times atmospheric pressure, facilitating simple transport and storage and making it a highly versatile energy option.

LPG is used by one million homes and businesses, predominantly in regional Australia.

The total investment in LPG infrastructure is valued at $3.2 billion.

LPG - Fifty Years of Investment in Energy Infrastructure

The LPG industry supplies almost one million homes for cooking, heating or hot water; two thirds of all households for BBQs; over 50,000 businesses; and fuels 300,000 forklift trucks and more than 600,000 light vehicles.

LPG is available throughout Australia. The infrastructure can be summarised as follows:

Table 4: LPG Infrastructure

State	Sources	Coastal Terminals	Regional Depots	Service Stations
QLD	4	4	25	443
NSW/ ACT	2	3	65	866
VIC	5	1	44	1003
SA	1	1	14	410
WA	3	1	15	360
TAS	–	2	4	48
NT	–	1	7	59
Australia	15	13	174	3189

In addition, LPG transportation is provided by 300 line-haul (long distance) tankers, and around 300 local tankers.

The multiplicity of supply sources, backed by an extensive network of regional depots, provides both supply security and the ability to grow LPG use without additional major infrastructure investment. LPG offers a major energy alternative to electricity and natural gas both as an interim and as an emergency energy source.

Regional storage capacity is around 6,000 tonnes, backed by independent seaboard storage of 100,000 tonnes, and a further 200,000 tonnes of storage associated with the production sources.

LPG – The Gas for Regional Australia

LPG is available in a wide variety of packaging and storage options: cartridges, refillable cylinders from 2kg to 90kg, bulk tanks placed over or under ground, etc. Thanks to its transportation in road tankers, LPG is available throughout Australia, especially areas out of reach of natural gas pipelines. LPG is therefore used in remote and regional areas, contributing to regional development. Without LPG, regional users' energy choices would be restricted to oil products and electricity.

Increasingly, export-orientated businesses are required to compete, not only on price but also on GHGs emitted during production (eg. dairy industry). LPG provides an additional marketing edge for specific export industries.

The overall economics of LPG in regional Australia are supported by the combined scale of LPG's use as both a stationary and transport fuel.

By encouraging and maintaining multiple energy supplies to regional areas, the economic benefits of fuel choice are sustained.

Fuel diversity also enhances the ability of any community to respond to an emergency or disaster situation. Cyclone Larry in north Queensland demonstrated how easily some energy supplies can be disrupted for long periods.

After Cyclone Larry, the LPG industry was able to respond quickly to provide urgently needed energy to affected communities, clearly demonstrating the important role the LPG industry can play. The continued and enhanced use of LPG in households throughout regional areas will ensure that capacity is always available thereby enabling a rapid escalation, as and when needed.

LPG – Efficiency, Consumer Choice and Cost

LPG is an optional fuel for residential and business consumers. It is easy to control and clean burning: an advantage for home heating or (say) food processing. Modern LPG appliances are highly efficient – continuous flow water heaters have much lower energy use and lower GHG impact than older style storage units. Modern room heaters give almost 100% heating efficiency.

LPG wholesale prices are linked to oil prices, and LPG prices have increased in recent years as oil prices have risen. Even with higher prices, consumers have continued to choose LPG because of its inherent advantages, despite their option to use electricity in most applications.

The LPG industry would, of course, prefer a lower cost regime for its product. However, LPG's globally based pricing mechanism means that the industry is on a sound long-term basis. Consumers' efficient use of LPG is encouraged by pricing that reflects the value of a cleaner, transportable fuel.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ECONOMICAL TRANSPORT FUEL FOR AUSTRALIAN CONSUMERS

"There are 14.8 million motor vehicles registered in Australia. Passenger vehicles accounted for 77.6%.

In March 2006, 90 per cent of Australian households kept at least one registered motor vehicle in their garage or dwelling. Eighty per cent of those 18 years or over used a private vehicle to travel to work or study.

The car is integral to Australians' work and leisure and to their role as family members. Given this, sensitivity to the cost involved is keen."

("Petrol Prices and Australian Consumers", ACCC, December 2007)

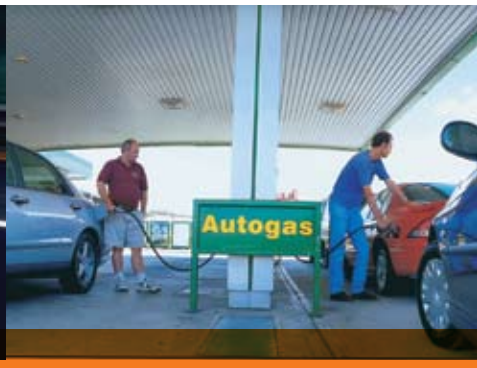
Policy Background

For environmental (both air quality and greenhouse) reasons, and for energy security, the use of LPG as an automotive fuel (LPG Autogas) has received cross-party political support since the early seventies. The principal policy tool has been LPG's excise-free status, still in place today.

More recently, two important policy positions have been established:

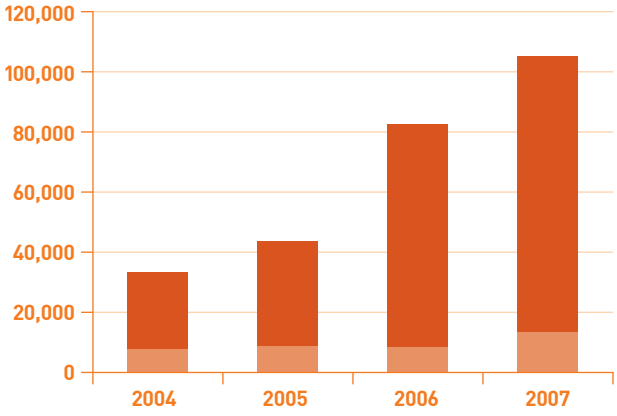
- As part of overall transport fuels excise policy, LPG Autogas was given a clear position, with excise to be applied from 2011 at 2.5c/l, rising to 12.5c/l in 2015 (based on petrol excise at 38c/l). The application of excise is linked to a conversion grants scheme to assist in the industry's transition from its excise-free status;
- In August 2006, the Federal Government announced the implementation of a grants scheme for most private vehicle owners, with grants of $2,000 per vehicle for new and used vehicles converted to LPG and $1,000 for vehicles fitted with LPG at the point of manufacture.

For motorists, conversion to LPG Autogas is an investment. Ongoing growth in LPG Autogas requires certainty of policy. It is thus essential that Government policy that impacts LPG Autogas is clear, and long term in nature.



From 2001 to 2003, there was considerable uncertainty about Government policy that adversely affected public perceptions of the virtue of LPG conversions. Consequently, conversion numbers were very low. Since then, the growing public confidence arising from clear government policy has seen the industry move into a new growth phase, which has been further boosted by the LPG vehicle grants scheme.

Annual LPG Installations 2004-2007



Source: LPG Australia estimates based on cylinder sales data, state compliance data and VFACTS data.

Retrofit LPG
OEM LPG

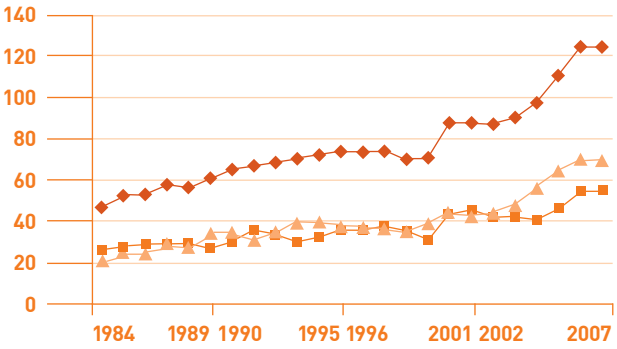
LPG Pricing

LPG, like oil, is a globally traded commodity. Australia exports LPG into the world market, and the price of LPG in Australia is thus based on a global indicator – the Saudi Aramco Contract Price, known as CP.

Broadly, international LPG prices move with oil prices as they share a common use as petrochemical feedstock. However, historically LPG at the retail pump in Australia has been consistently around half the price of petrol.

This relationship has provided ongoing savings for LPG Autogas users, and the motivation for motorists to invest in LPG conversions.

Petrol and LPG Indicative Prices in Australia 1984-2007



ULP
LPG
Differential

Competition in the LPG Autogas Sector is "Fully Effective"

The ACCC December 2007 report (Petrol Prices and Australian Consumers) commented that "competition in the wholesale petrol market is not fully effective".

While not stating any position on the petrol sector, LPG Australia asserts that the LPG Autogas market sector enjoys fully effective competition:

- In addition to the four petrol refiners/ marketers of LPG, three national LPG companies compete in the sector at wholesale and retail levels;
- In addition to the seven Australian refineries, there are seven sources of LPG production (from natural gas) that supply the inland market; and
- There are a number of coastal terminals, independent of the refiner/marketers and the other LPG producers, which can import LPG in substantial quantities (ACCC sees independent petrol imports as increasing competition in the petrol sector).

Motorists' Savings by Using LPG Autogas

The LPG Vehicle Scheme, covering up to 50% and sometimes more of the cost of vehicle conversion, has increased the viability for private motorists. Business users have tax deductibility, and travel longer distances, thus use more fuel, and savings can be much higher.

Table 5: Savings by Converting from Petrol to LPG Autogas

Indicative Vehicle	Petrol consumption (L/100km)	Annual savings
Toyota Landcruiser 100 V8	19.3	$1,490
Ford Falcon V8	17.8	$1,369
Holden Commodore V8	17.2	$1,323
Holden Commodore 6 cyl	13.8	$1,064
Ford Falcon 6 cyl	12.6	$971
Toyota Camry 6 cyl	11.9	$916
Toyota Camry 4 cyl Auto	11.9	$916
Toyota Camry 4 cyl Manual	10.7	$823
Toyota Corolla 4 cyl	8.9	$685

(Assumptions: 15,000 kms annually, Petrol $1.45 per litre, LPG $0.72 per litre)

The cost of conversion varies by vehicle but, generally, older vehicles without electronic fuel injection cost around $2,000 to $2,500 to convert, while newer fuel injected vehicles cost around $3,500. With the benefit of a $2,000 grant, conversion of newer vehicles allows a 12-to-18 month cost recovery, while conversion of older vehicles delivers immediate savings.

LPG Vehicle Scheme – Who is Converting?

The scheme objective to assist private motorists most impacted by high petrol prices has been equitable and successful. Based on aggregated data, the regions with the highest number of conversions are located on the periphery of major population centres, from which long commutes are required. Demographically, these areas are often less affluent than inner metropolitan areas.

The majority of LPG Vehicle Scheme grant recipients may be described thus:

- They are families with children;
- They have lower than average disposable incomes;
- They reside in outer metropolitan areas; and
- They have mortgages.

The Broader LPG Autogas Market

Since the introduction of the LPG Vehicle Scheme, the market for LPG Autogas comprises:

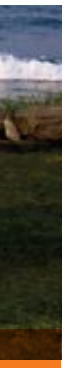
- Many cost-sensitive private motorists
- Other high kilometre travelling private motorists
- Business vehicles – couriers, tradespeople, small business delivery vehicles, sales, security etc.

The business market remains solid, as indicated by the continuing sales each year of around 13,000 new dedicated LPG Falcons – sedans, station wagons and utes.

LPG Autogas provides business with a way to meet sustainability objectives and reduce operating costs.

Table 6: Top Centres for LPG Conversions by State and Territory

NSW/ACT	VIC	QLD	SA	WA	TAS	NT
Nowra	Narre Warren	Toowoomba	Salisbury	Mandurah	Launceston	Casuarina
Liverpool	Cranbourne	Nerang	Morphett Vale	Safety Bay	Devonport	Alice Springs
Wyong	St Albans	Gympie	Smithfield	Midland	Mowbray	Palmerston
Wagga	Werribee	Bundaberg	Aberfoyle Park	Hamilton Hill	Ulverstone	Bagot
Gosford	Hoppers Crossing	Caloundra	Salisbury East	Wanneroo	Bellerive	Buffalo Creek



LPG Autogas Infrastructure

The overall infrastructure that supports both the stationery and transport fuel uses of LPG in Australia is outlined on pages 13 and 14.

Of the 6,500 service stations in Australia, more than 3,100 offer LPG Autogas. These include all the modern, high volume sites. All newly built service stations include LPG Autogas. Travel throughout Australia using LPG Autogas is simple and convenient.

Growth in LPG Autogas use can be managed easily by the addition of LPG Autogas dispensers to existing sites, or investment in LPG Autogas facilities at additional service stations.

Technology

GM Holden and Toyota offer the latest fuel injection LPG systems on their current vehicles. Ford has developed an injection system for their future models. All will deliver overall improved fuel efficiency and performance.

There are over 15 major LPG Autogas equipment suppliers who support both the local vehicle manufacturers and the conversion industry and who provide a range of the latest global technologies. The two local Autogas tank manufacturers have capacity to meet over 150,000 vehicles per year. The conversion industry now has over 2,500 businesses employing 7,500 installers nationally converting vehicles to LPG.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Clifton Hill
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NATIONAL ENVIRONMENT PROTECTION MEASURE (NEPM) FOR AIR QUALITY

"The Air NEPM sets national health-based goals for six pollutants: carbon monoxide, lead, sulfur dioxide, nitrogen dioxide, ozone and fine particles.

There is increasing medical evidence, both in Australia and from overseas, that both fine particles and ozone contribute to premature mortality through effects on heart and lungs."

(Draft NSW Cleaner Vehicles and Fuels Strategy, November 2007)

Transport fuels, both petrol and diesel, are in most urban areas the main source of these pollutants. They also contribute "air toxics", including carcinogens, to the atmosphere.

LPG – Intrinsically Lower Pollutants

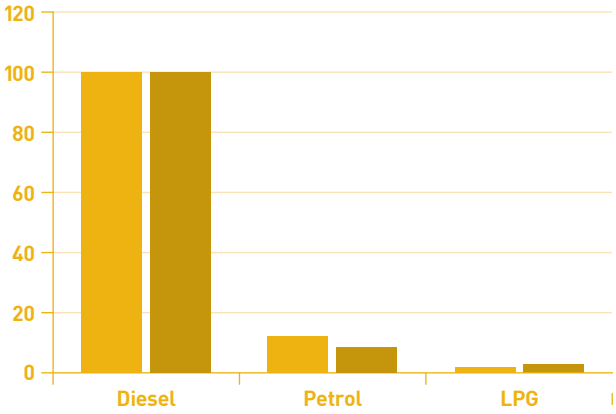
LPG has a simple chemical structure. The more complex composition of petrol and diesel leads to higher levels of both the regulated pollutants and of the, as yet, unregulated air toxics, than LPG.

Australia has pursued various paths to limit vehicle pollutants, including fuel specifications and vehicle emission regulations. LPG meets and exceeds most emission regulations.

The Importance of Fuel Selection in Air Quality Policy

In urban areas around the world particulate matter (PM) and photochemical smog are significant air pollution problems. Of cities that experience periods of severe air pollution, several restrict or discourage petrol and diesel cars from inner urban areas while permitting or encouraging LPG powered cars. For example, LPG powered vehicles are exempt from London'Congestion Charge until 2010, and enjoy reduced road taxes and licence fees.

Average relative PM and NO_X emission rates



Current Model Euro 3 passenger car emission levels of NO_X and PM using Diesel, Petrol and LPG.

Many of the LPG Autogas conversions in Australia are done on cars classified for emissions purposes as Euro 3 or less. For many of these vehicles, converting to LPG improves their emissions profiles. The table above compares average relative particulate matter and NOx emissions for diesel, petrol and LPG variants of the same vehicle.

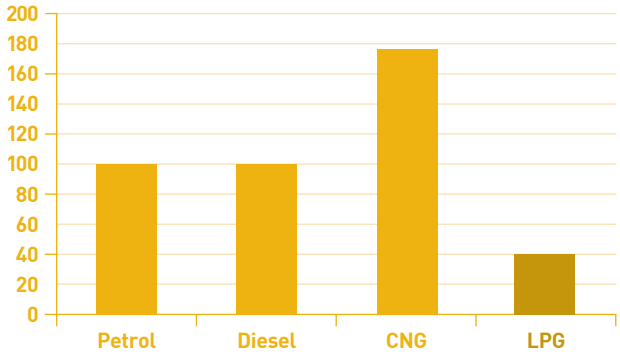
Petrol and diesel emissions for Euro 4 and Euro 5 vehicles are improved compared to Euro 3, but LPG still has a better PM and NOx profile.

Even though it is difficult to isolate the health impact of air toxics, their representation in vehicle exhaust, for different fuels, has been extensively researched. Given their fundamentally toxic, and often carcinogenic nature, it is important that human exposure to these substances is minimised.

The next chart summarises the relative levels of formaldehyde in the exhaust of engines operating on diesel, petrol, CNG and LP Gas.

Comparison of air toxic emissions from commercial fuels (relative to petrol = 100)

Formaldehyde



Relative emissions of key air toxics for engines.

The above charts carry a clear message to policy makers and fleet managers – encouraging the use of LPG will significantly reduce relative emissions of key air toxics.

Both the economy and the community will benefit from governments and industry accelerating the implementation of strategies that encourage the uptake of LPG.

With Australia's advantage of an established infrastructure and ample supply, LPG is a superior light vehicle fuel.

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