

The LPG Industry REPORT CARD 2010



1: LPG is an indigenous fuel, delivering Australia's energy security – an exceptional energy

Liquefied Petroleum Gas (LPG) is an indigenous, low carbon, versatile energy source and is easily transported making it available anywhere in Australia. It is cleaner than most conventional fuels, highly energy efficient and is widely available, providing an attractive option for many motorists, making it the fuel of choice for many Australians. LPG has the potential to further reduce Australia's growing reliance on imported crude oil and fuels.

Approximately 80% of LPG produced in Australia comes from natural gas fields, which continues to expand. The remaining 20% comes from refining crude oil¹. In natural gas processing, gas is drawn directly from deep underground reservoirs as a mixture of gases and liquids, including LPG. In crude oil refining, about 3% of a barrel of crude oil is refined into LPG². Both refined and naturally sourced LPG are interchangeable and can be used in transport or as a domestic, commercial or industrial heating fuel.

LPG differs from natural gas and electricity in that it can be easily stored and transported in purpose-built pressurised containers. When lightly compressed it exists as a liquid. One litre of liquid LPG is the equivalent volume of 270 litres of gas³. It has a higher calorific value⁴ which means it burns hotter providing increased energy efficiency in many cooking and heating applications.

The use of LPG in Australia is widespread. It is available in a wide variety of packaging and storage options ranging from cartridges and refillable cylinders of up to 90kg, automotive and forklift cylinders, and bulk tanks placed over, above or under the ground.

Residential and business consumers benefit from the clean burning and easy to control LPG, using it as an alternative transport fuel for their vehicles, cooking in the kitchen or on the barbeque, or to provide hot water and home heating. Modern LPG appliances are highly efficient – solar gas boosted hot water heaters have much lower energy consumption and lower greenhouse gas emissions than most hot water systems⁵. This was confirmed by a study of 11 countries around the world by Energetics.

In the automotive sector, Autogas is continuing to provide economic relief to working families who reside in outer metropolitan areas and who have no access to reliable public transport. Autogas remains an important economic solution to the small and large business sector for their vehicle fleets and at the same time when utilising new generation LPG systems, can assist in meeting their environmental objectives.

1. LPG Australia, April 2008, 'LPG's role in Australian Energy Policy' p9
2. Elgas Website 'What is LPG'
3. Elgas Website 'What is LPG'
4. On a mass basis
5. Energetics, 'LPG An Energy Solution for a low carbon world', p7

LPG boosting the Australian economy – growing supply, demand and infrastructure

- Australia accounts for 95% of the total Oceania supply of LPG with almost 80% of the total LPG production from natural gas processing.

- Over 20,000 Australians are employed in the LPG sector across manufacturing, importation, warehousing, distribution, installation and servicing.

- Over 2,000 registered LPG installation businesses that employ over 7,500 Australians across the nation.

- LPG is used by over one million homes and businesses in regional Australia.

- Total investment in LPG infrastructure is valued at \$3.5 billion.

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

- 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.

In the industrial sector LPG is used for powering forklifts and mechanical handling equipment, providing enough power to do heavy lifting, reducing fumes and pollutants in confined warehouse spaces. LPG is also used for brick making, crop drying, food processing or delivering the energy needs of remote mining operations.

When used as a cleaner, back-up energy booster, LPG accelerates the development of intermittent renewables such as photovoltaic, solar thermal, wind and small hydro sources of energy.⁶

LPG is an important and vital source of energy in regional areas across Australia because it can be economically transported by road tankers. Without LPG, many regional users would be limited to diesel powered generators or electricity if connected to the main grid.

It has been forecast by LPG Australia that LPG supply and demand in Australia will steadily increase in the future with government and industry support. LPG is already playing an important role in shaping Australian energy policy in 2010.

2: LPG Autogas is an environmentally beneficial fuel, delivering significant and immediate CO₂ benefits.

LPG Autogas powered vehicles not only reduce running costs but provide the opportunity to deliver significant carbon dioxide (CO₂) benefits. Transport fuel choice has a major impact on the environment and the health of people living in Australia. LPG's inherently clean burning characteristics make it an ideal automotive fuel to combat climate change and improve air quality.

CO₂ reduction

New generation LPG Autogas powered vehicles emit significantly less greenhouse gases and other pollutants than petrol-powered equivalents. The table below shows the results of testing a Toyota Corolla Conquest Hatch 2009 and a Ford Falcon FG XR6 2008 to ADR compliance 79/02 and 79/01 respectively. These tests showed the LPG vehicles had approximately 11% reduction in CO₂ emissions. Over the course of one year where each vehicle travels 20,000 kilometres the LPG powered Corolla would save 384 kg of CO₂ over the ULP option and the LPG Falcon would emit 590 kg less CO₂ than the ULP option (over this test cycle).

MAKE	TOYOTA	FORD FALCON
Vehicle	Corolla	FG
Model and year	Conquest Hatch 2009	XR6 2008
CO ₂ Emissions petrol (91)	179.9	261.2
CO ₂ Emissions LPG	160.7	231.7
CO ₂ Reduction compared to petrol	-10.7	-11.3
Level of ADR compliance	ADR79/02	ADR79/01
Engine size cc	1798	3984
Engine power kW (max)	100	195
Fuel Consumption petrol (91) L/100km	7.69	11.1
Fuel Consumption LPG L/100km	9.94	14.4

Source: Vehicle data from testing conducted by Orbital

The potential to reduce CO₂ emissions by converting vehicles to LPG is well documented. The typical LPG vehicle travels 20,000km per annum. From the above Falcon example, this vehicle would save 590kg CO₂ per year. These savings keep occurring year after year until the end of the vehicle's life. Over its 10-year life span the CO₂ saving is almost 6 tonnes. In 2008, more than 100,000 vehicles were converted to LPG.

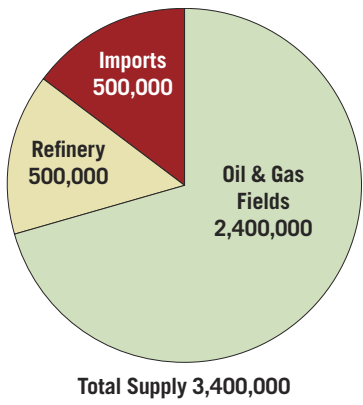
Furthermore, from a greenhouse emissions perspective, when considering the energy expended in producing the fuel as well as the greenhouse gases emitted from vehicle tailpipes, LPG again has very low net emission levels from "well to wheel." A report⁷ on the relative climate change impacts of available fuels concluded that once the energy expended in transporting and processing fuels is accounted for, LPG has lower net greenhouse gas equivalent emissions than petrol.

In addition, LPG Autogas is cleaner during the refuelling process. When refuelling with petrol or diesel, potentially dangerous chemical vapours escape into the atmosphere and could be inhaled. Without vapour capture and recovery at the bowser, the released fuel vapours also contribute to the atmospheric photo-chemistry which causes smog.

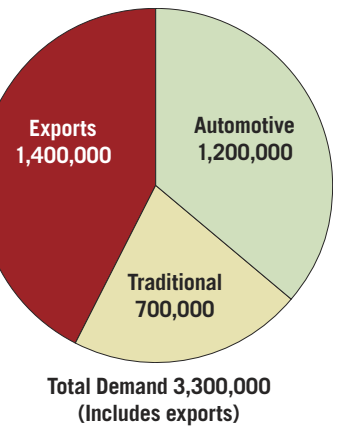
6. LPG Australia, April 2008, 'LPG's role in Australian Energy Policy' p10
7. US Department of Energy, Energy Information Administration, *Alternatives to Traditional Transport Fuels 1994, Volume 2, Greenhouse Gas Emissions*, September 1996

3: Australia abounds in exceptional energy – LPG

Total LPG Supply 2008



Total LPG Demand 2008

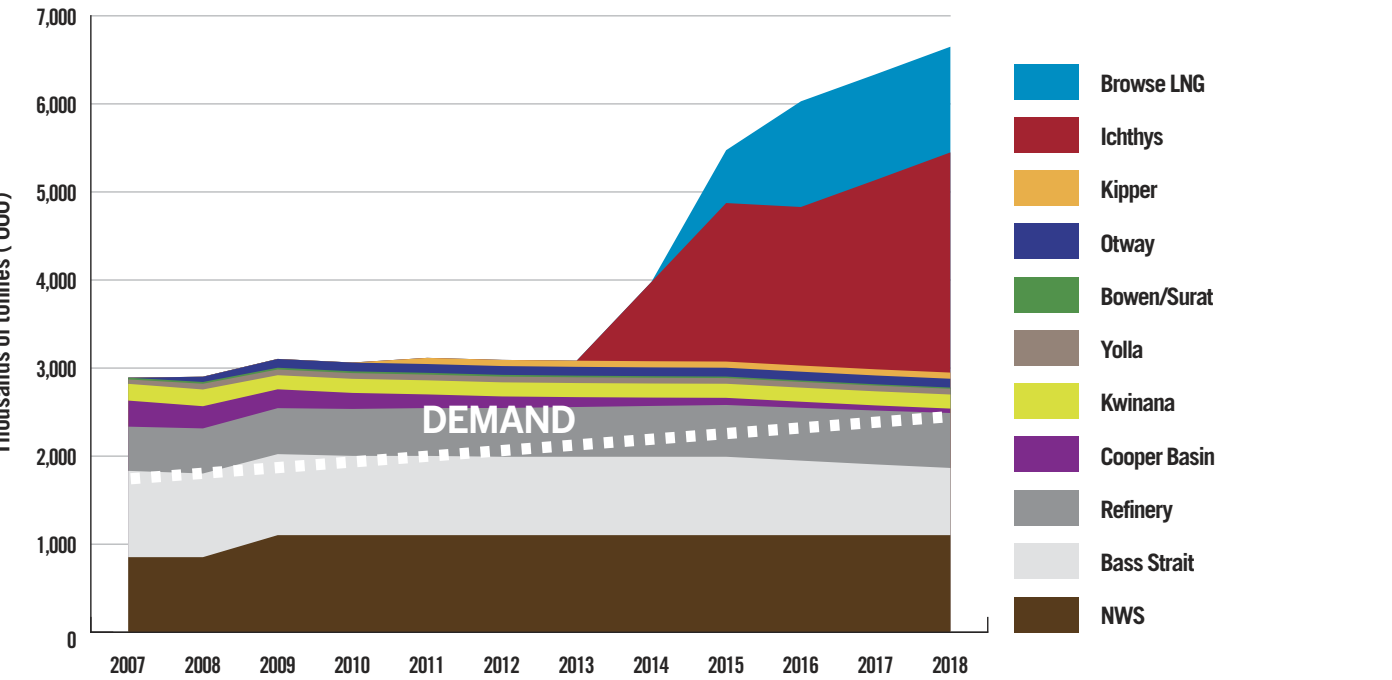


Source: Data from LPG Supply & Demand Study 2008 adjusted by Elgas

countries, including our suppliers, are developing rapidly, experiencing an increase in domestic consumption and decline in production.

In contrast, Australia is completely self-sufficient in meeting its natural LPG requirements. About 80% of Australia's LPG is derived from gas fields, both offshore and onshore in West Australia, Victoria, South Australia and Queensland, and about 20% from refining crude oil at Australia's seven refineries. Currently Australia only consumes 58% of the 3,300 kilotonnes (kt) of LPG produced annually. Production is predicted to grow beyond 5,024 kt by 2020⁹. Long-term availability of LPG is assured, with naturally occurring reserves that are capable of satisfying the domestic market for well over 20 years.¹⁰

Australian LPG production to 2018



Source: LPG Australia, 2008, forward estimates

Australian Bureau of Agricultural and Resource Economics (ABARE) have forecast production of naturally occurring LPG to double by 2030. The continued development of large-scale natural gas projects is expected to increase production of LPG above the ABARE forecasts. A demand growth of over 6% a year to 2030 would not result in demand exceeding supply.¹¹

8. Dr. Laurie Sparke OAM, Reducing Transport Emissions March 2008 – p11
9. Australian Liquefied Petroleum Gas Association Limited (ALPGA), Submission to: *Australia's Future Tax System Review*, 17th October 2008, p. 19
10. Peter Anyon, LPG – The Clean Transport Alternative, 'Presenting the Environmental Case', September 2003, p. 3.
11. LPG's Role in Australian Energy Policy – April 2008 – LPG Australia

Policy Outlook

Reliable statistics on LPG supply and demand are crucial to informing the policy formulation process in government as well as describing the role that LPG plays in the Australian energy market. To develop an improved methodology for reporting LPG statistics in Australia LPG Australia has engaged economic consulting firm ACIL Tasman to work with production, suppliers and marketers of LPG, The Department of Resources, Energy and Tourism, ABARE and other industry associations to provide a global consistency in reporting strategic energy statistics. This is in line with the increasing requirement by International Energy Agency on gas reserves and demand. A revised survey methodology was developed and used in the collection of LPG supply and demand data for 2008. The revised methodology will also be used to report data for 2009 and for subsequent years. This effort reflects LPG Australia's ongoing commitment to maintaining reliable statistics on the LPG industry in Australia.

4: LPG – delivering significant savings to Australia's motoring public

LPG's inherently clean burning characteristics make it an ideal automotive fuel.

LPG has approximately 77%¹² of the energy content of Unleaded Petrol (ULP). This means that 1.3 litres of LPG is consumed for every litre of ULP to travel the same distance. Despite this the significant difference in price per litre between the two fuels more than offsets LPG's lower energy content per litre.

Lower running costs

LPG is a cheaper fuel than ULP as the average annual 2009 fuel prices show:

PRODUCT	NATIONAL AVERAGE PRICE 2009
LPG	54.5c
ULP	119.9c
LPG / ULP DIFFERENTIAL	65.3c

Source: Based on Fueltrac data

Using the fuel consumption figures for the Toyota Corolla and the Ford Falcon, and the average price of ULP and LPG in 2009, we have extrapolated the costs of driving 20,000 kilometres. For each vehicle the fuel costs per annum are 41% lower running on LPG rather than on ULP.

MAKE	TOYOTA	FORD FALCON
Vehicle	Corolla	FG
Model and year	Conquest Hatch 2009	XR6 2008
Fuel consumption petrol (91) L/100km	7.69	11.1
Fuel consumption LPG L/100km	9.94	14.4
Cost of 20,000 km using ULP	\$1,844	\$2,662
Cost of 20,000 km using LPG	\$1,084	\$1570
LPG saving	\$760	\$1092

Source: Vehicle data from testing conducted by Orbital

Australia's LPG Fleet

Australia's LPG fleet of 700,000 vehicles is the fifth largest in the world and Australia ranks third highest per capita in the world in Autogas consumption. This represents around five per cent of Australia's light vehicle market. The most recent estimate stated that the Australian Autogas sector consumes 1,200,000 tonnes of LPG annually.

5: National infrastructure is in place to deliver LPG when it's needed, where it's needed

National infrastructure

Most importantly, the distribution and supply chain for LPG is already in place. Australia has an extensive network of LPG refuelling stations, with over 3,200 retail outlets across the nation. It is therefore possible to drive virtually anywhere on Australia's main road system using existing LPG refuelling stations. This has been a key reason why the LPG vehicle scheme has been a success.

This network which the industry has continually invested in over many years, has maintained and supported the needs of the growing LPG vehicle fleet.

12. Source: Australian Government, Department of Climate Change, *National Greenhouse and Energy Reporting System Measurement Technical Guidelines*, June 2009

Grants for LPG conversions of registered vehicles

In August 2006 the Australian Government introduced the LPG vehicle subsidy. LPG vehicle conversions for private motorists received \$2,000 to convert their new or used vehicles. In July 2009 the LPG vehicle subsidy began a phased reduction as the table below shows. However, the government at the same time has increased the rebate for new vehicles fitted with LPG at time of manufacture from \$1,000 to \$2,000.

GRANT	CONVERSION COMPLETED
\$1,750	Between 1 July 2009 and 30 June 2010
\$1,500	Between 1 July 2010 and 30 June 2011
\$1,250	Between 1 July 2011 and 30 June 2012
\$1,000	Between 1 July 2012 and 30 June 2013
\$1,000	Between 1 July 2013 and 30 June 2014

Source: AusIndustry data

The figures as at 31 December 2009 show that since the introduction of the grant 250,413 grants have been paid to the value of \$495 million.

AS AT: 31 DECEMBER 2009	NUMBER OF GRANTS PAID	VALUE OF GRANTS PAID
Grants for the LPG Conversion of a Registered Vehicle	248,621	\$493,552,250
Grants for New LPG Vehicles	1,792*	\$2,127,000
TOTAL LPG VEHICLE SCHEME GRANTS PAID	250,413	\$495,679,250

Source: AusIndustry data. * Prior to 1 July 2009, this number referred to vehicles fitted with LPG at the time of manufacture only. From 1 July 2009, this number includes both vehicles fitted with LPG at the time of manufacture and vehicles fitted with LPG after manufacture but prior to first registration.

The number of LPG vehicles is growing

In 2008 there were 96,401 grants paid. Despite this it was estimated there were 120,000 new LPG vehicles on our roads. In 2009 there were 52,955 grants paid and an estimated 71,000 new LPG vehicles on our roads.

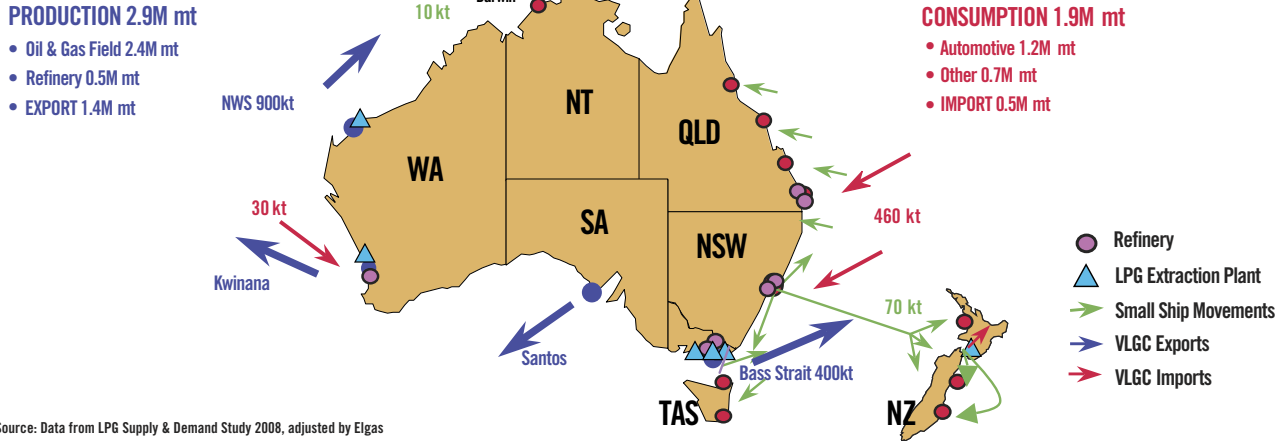
6: LPG – an industry contributing \$3.5b to the Australian economy

The LPG industry has a net capital investment of \$3.5 billion in Australia comprising oil and gas producers, refiners, importers, marketers, distributors, retailers and manufacturers.

QUICK FACTS ON LPG

- 7,000,000 cylinders in Australia
- 1,000,000 households use LPG
- 700,000 tonnes of LPG used annually by households and business
- 780,000 tonnes of CO₂ saved through LPG use
- 500,000 tonnes produced at seven refineries
- 2,400,000 tonnes produced in five naturally occurring sites
- 2,900,000 tonnes produced annually
- 2,500 LPG cylinder refueling or exchange centres nationally for residential customers
- 1,400,000 tonnes sold to the export market

Australian LPG Infrastructure 2008



LPG boosting Australian economy – Growing supply, demand and infrastructure

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.

The LPG industry contributes to regional development by servicing remote and rural areas and giving regional consumers an alternative energy choice to oil products and electricity. By encouraging and maintaining multiple energy supplies to regional areas, the economic benefits of fuel choice are sustained.

LPG Autogas accounts for 65% of Australia's LPG consumption across 700,000 cars and light commercial vehicles. For motorists, conversion to LPG Autogas is an investment. Growing public confidence arising from clear government policy has seen the LPG industry move into a heightened growth phase which has been boosted by the LPG Vehicle Grants Scheme.

ABARE has forecast Australian LPG production to double by 2030. LPG production is expected to rise, reaching around 4.5 million tonnes regionally and 270 million tonnes globally per year in 2012.

Industry snapshot

In 2009 the automotive LPG sector was challenged through one of the most turbulent periods in its recent life cycle. The Global Financial Crisis (GFC), LPG conversion rebate reduction, speculation about the introduction of and LPG excise, increasing interest rates and low fuel prices have all had varying degrees of impact on our business. The support from the Federal Government, primarily through the LPG vehicle scheme, has continued to deliver the latest technology and LPG conversions for consumers seeking a more affordable cost option.

Manufacturing sector

DJ Batchen Pty Ltd manufactures LPG Autogas dispensing equipment which is supplied to domestic and overseas markets. The company reports 2009 was a strong year for domestic sales with a 25% increase in sales over 2008. Sales slowed in the last half of 2009 attributable to the investment allowance rebate finishing in June. The company reports a strong link in sales volume and domestic LPG sales. Local business is strongly linked to upgrades of existing LPG service stations.

Exports were slow in the first half of 2009 as the world suffered economic downturn. The second half was better however the high AUD restricted sales. Exports for the calendar year 2009 were AUD \$1.8 million which is the lowest volume in 10 years and a decline of 10% on 2008.

2010 has started brightly for exports with orders over AUD \$800,000 already received from Philippines, Indonesia, Taiwan, Hong Kong, China, India, Mauritius and Fiji. The domestic market is still quiet with the volume

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of conversion activity declining.

Ebsray Pumps is a 100% Australian-owned and managed private company employing some 65 personnel, and is one of the specialist Australian LPG manufacturing companies covering the design and manufacture of LPG pumps and ancillary LPG pumping equipment. The viable local LPG industry, backed by the Federal Government's LPG Vehicle Scheme, has allowed Ebsray to expand its activities, employing four new staff, increasing R&D, increasing investment in more sophisticated capital equipment, new LPG pump products and higher production throughput. This has also allowed Ebsray to compete more actively and competitively in export markets (reaching more than 35 countries worldwide) with the supply of Australian designed pumps. By the end of 2010 Ebsray will have supplied more than 50% of all autogas pumps in Germany.

LGE recently developed the GG1DN series Gasgard nozzles for use on self serve LPG filling stations which represents the latest Acme threaded technology available. This nozzle range has improved safety, ergonomics and performance. They are being used locally and exported to the UK, Germany, Belgium, Canada, USA, Mexico, Chile, China and Hong Kong. These export markets account for 66% of LGE's current production output. The company has utilised the Federal Government's EMDG scheme and currently benefits from the tax breaks offered through product development incentives.

Manchester Tank is an Australian manufacturer of LPG cylinders for a wide range of applications. Following substantial growth in the Autogas sector, Manchester Tank invested heavily into equipment & personnel in an effort to supply the existing Australian Autogas distribution network.

The company's automotive division grew 50% in 2006-07, and a further 27% in 2007-08 and 26% growth in 2008-09. The economic crisis of the past year has seen a decline of over 75% in this product group. This caused the company to reduce its staff. Investment over recent

years means the company has capacity to take advantage of future growth.

Major fuel system suppliers

Alternative Fuel Innovations has remained positive and maintained a significant focus on Sales, New Product Development, Market Education and Research & Development programs during the GFC. Over the past twelve months the company has increased its Market Development Team by a further 20%, the Research & Development team has relocated to a purpose built Centre of Excellence including training facilities, CAD design and full fabrication capabilities. Research & Development expenditure has increased by 16% with additional 6% growth in employment. A further 10% growth in commercialisation of new products and an 11% growth in export opportunities has been achieved. AFI is in the final stages of pre-production of an Australian designed, developed and manufactured Premium LPG Liquid Injection System that offers higher quality, significant improved features, simpler and quicker installation as well as delivering superior performance, greater dependability and best practice CO₂ emissions reductions of 10% to 14% when operating on LPG.

IMPCO has established its Delayed Original Equipment Manufacturer (DOEM) installation plant investing \$5.5 million over five years. This 6,676m² facility will see first vehicles come off the production line in March 2010. Employing 44 people this plant will produce in excess of 300 dual fuel vehicles per month. In response to the GFC IMPCO invested heavily in R&D to develop leading technologies for new vehicles and systems to position them strongly for an improving market.

Orbital has achieved major milestones in 2009 including: appointment by Ford Australia as the OEM supplier of their new-generation liquid LPG system for Ford Falcon E-Gas and selection to supply liquid LPG injection systems to Holden Special Vehicles (HSV) for their greenhouse friendly LPG high performance vehicles for release in 2010. During the year Orbital also released its first range of greenhouse friendly after market LPG kits for the after OE and retrofit market which are ADR emissions compliant and achieve CO₂ reductions of 10% – 13% when operating on LPG. The company increased its workforce by 40% and moved to new larger premises in Arndell Park investing over \$4m to expand its LPG business operations in Sydney and Perth. Orbital also commissioned its heavy duty engine test facility in Western Australia (with the assistance of Commonwealth funding). This facility is capable of testing and certifying engines that operate on a range of fuels including LPG, CNG, LNG, Hydrogen, Gasoline, Diesel & Ethanol.

Sprint Gas have continued their strategy in spending between 3% and 5% of their revenue for promoting LPG conversions to their integrated dealer network. With over \$10 million invested, they are confident that 2010 will show a marked increase in conversions over the latter part of 2009.

INDUSTRY HIGHLIGHTS

Manufacturing sector:

- DJ Batchen Pty Ltd reported 2009 saw a 25% increase in sales over 2008.

- Ebsray Pumps expects to have supplied more than 50% of all Autogas pumps in Germany by the end of 2010.

- LGE stated 66% of their production is going to export markets.

- Manchester Tank declared due to past investment they have excess capacity to take advantage of growth in 2010.

Major fuel system suppliers:

- Alternative Fuel Innovations is in the final stages of pre-production of an LPG Liquid Injection System which offers 10% to 14% CO₂ emissions reduction.

- IMPCO has established its Delayed Original Equipment Manufacturer (DOEM) installation plant investing \$5.5 million over five years. Employing 44 people this plant will produce in excess of 300 dual fuel vehicles per month.

- Orbital has increased its workforce by 40% and has been selected as the OEM supplier of the the liquid LPG injection system for the Ford Falcon E-Gas and to Holden Special Vehicles (HSV).

- Sprint Gas have continued their strategy of spending 3% to 5% of their revenue for promoting LPG conversions to their integrated dealer network.



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