Gas Energy Australia

and

Victorian Automobile Chamber of Commerce

SUBMISSION TO THE PRODUCTIVITY COMMISSION INQUIRY INTO AUSTRALIA'S AUTOMOTIVE MANUFACTURING INDUSTRY

2 December 2013

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Review of the Australian Automotive Manufacturing Industry
Productivity Commission
LB2 Collins Street East
Melbourne VIC 8003

Via email: automotive@pc.gov.au

Dear Commissioners

GAS ENERGY AUSTRALIA AND VICTORIAN AUTOMOBILE CHAMBER OF COMMERCE

SUBMISSION TO THE PRODUCTIVITY COMMISSION'S
INQUIRY INTO THE AUSTRALIAN AUTOMOTIVE MANUFACTURING INDUSTRY

Gas Energy Australia and the Victorian Automobile Chamber of Commerce (GEA-VACC) are pleased to present our joint submission to the Productivity Commission's Review into the Automotive Manufacturing Industry.

GEA-VACC welcomes this Productivity Commission review as a key opportunity to examine how the automotive manufacturing and gaseous fuels industries can better collaborate and draw upon the competitive advantages of each activity

The submission provides a common vision for greater alignment between LPG and automotive manufacturing activities to provide a new pathway for overcoming the challenges facing both industries. It makes practical recommendations and outlines a new industry led model, while recognising that government has a critical role in supporting the transition to this new approach.

GEA-VACC would be pleased to address any queries or points of clarification that the Commission may seek.

Regards

Mike Carmody
Director and Chief Executive Officer
Gas Energy Australia

Brian Savage
General Manager, Policy and Government Relations
Victorian Automobile Chamber of Commerce

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EXECUTIVE SUMMARY

The Australian Liquefied Petroleum Gas (LPG) autogas industry and the automotive manufacturing industry are at a cross-road, both faced with the challenge and opportunity of identifying pathways to ensuring their long-term viability. Both industries have and remain active contributors to Australia's transportation sector. However, both are confronted with the challenge of adapting to a globally dynamic and innovative manufacturing sector.

Gas Energy Australia and the Victorian Automobile Chamber of Commerce (GEA-VACC) share a common vision regarding how, through the more effective alignment of the natural competitive advantages of each industry, a viable pathway can be established to create a dynamic automotive manufacturing industry that delivers value-added economic, social and environmental benefits to Australia.

This Submission outlines why the Australian autogas industry is currently at a cross-road, describes the benefits that can be realised from a more integrated LPG automotive manufacturing industry and introduces the concept of a **Centre of Excellence** model – an investment framework to drive greater Australian-based innovation - to help maintain a sustainable domestic automotive manufacturing footprint in this country.

In seeing the industry restructure to this ultimate position, a transition phase is required to assist the sector in achieving these ultimate goals

This Submission outlines the industry's role and responsibilities in progressing this framework forward, proposes a set of broad policy-based recommendations to Government to support the required reforms as well as a specific recommendation to amend the Automotive Transition Scheme (ATS) to broaden the eligibility criteria to enable vehicle conversion activity to be supported under the program.

Australia's gaseous fuels industry at a crossroads

Australia has a fully integrated autogas and automotive industry value chain, capturing the value of abundant indigenous gas reserves through to the manufacturing of LPG powered vehicles. Since autogas industry's early establishment in the 1970s, over $3.5 billion has been invested as a net value of capital expenditure across the value chain.

The early adoption of LPG as a transportation fuel and investment in an LPG vehicle market has been facilitated by Australia's pursuit of technological innovation to provide consumers with high performing and reliable LPG products.

AUSTRALIA'S LPG TECHNOLOGICAL INNOVATION

Local Car Manufacturing: The Holden LPG Commodore uses its gas injection system to directly inject gas into the inlet port, increasing power and torque output, whilst reducing fuel consumption by 13% over its dual-fuel LPG predecessor[1].

Fuel Dispensing: Ebsray Pumps has designed and developed low noise, high performance and high efficiency regenerative turbine LPG pumping technologies and aligned equipment which are exported to Germany.

Despite these Australian-based LPG advantages and the introduction of the Federal Government's *LPG Vehicle Scheme*, the market demand for LPG vehicles in Australia has started to decline. This is due to a combination of changing consumer preferences for efficient smaller vehicles, advancement in hybrid technology and misconceptions around performance of LPG vehicles which continue to undermine their attractiveness.

[1] General Motors Holden (2012) *All-New Dedicated Holden LPG Commodore - Australian Solutions for Australian Conditions*

This situation is in contrast to international activity where there has been significant growth in LPG fuel and vehicle manufacturing over the last decade – in Europe, Asia and the USA – with emerging demand in the Middle East and Vietnam. This growth is primarily being facilitated by a complementary policy setting and set of targeted Government initiatives that incentivise both suppliers and consumers to adopt LPG products.

These global examples of cooperation between industry and Government typify the pathways that Australian industry, through the support of Government, can pursue to realise natural linkages between the LPG and automotive manufacturing to deliver a clearer, low cost transportation option.

Gaseous fuels as an opportunity for Australia's automotive manufacturing industry

In assessing a way forward for the autogas and automotive manufacturing industries, possibilities for alignment should be investigated to optimise a shared capability and capacity that maximises future benefits to the Australian economy.

There is a significant opportunity to reposition the autogas industry to play a more significant role in supporting the Australian automotive manufacturing industry. Both industries need to remain internationally productive and competitive to deliver cost efficient and reliable transportation options to the Australian market. This presents the opportunity to invest, in shared innovations to provide an opportunity to:

- Scale manufacturing capability to increase the productivity and competitiveness of Australia's automotive manufacturing industry.
- Contribute to the creation of a globally competitive automotive industry value chain.
- Deliver sustainable, clean and affordable alternative transport fuel to the Australian consumer.
- Increase energy export capacity and reducing energy security risk.

A whole of sector approach is required to reposition both industries towards a sustainable future, led by industry with the support of the Government and the research community.

Establishing a market driven pathway to growing the LPG automotive manufacturing industry

Having considered the current state of the LPG and automotive manufacturing industry and the opportunities for future growth, GEA-VACC has developed a customer driven **Centre of Excellence** framework in LPG **innovation and** conversion to transform the industry to drive competitiveness, quality and technological advancement in domestic automotive manufacturing.

CENTRE OF EXCELLENCE AS PART OF THE PATHWAY FOR CHANGE

The Centre of Excellence (CoE) will be a world-class facility focusing on delivering Motor Vehicle Producer (MVP) quality conversions at lowest cost by:

- *undertaking innovation*;
- *new product certification and ADR compliance*;
- *emission reduction validation;*
- i*mproved quality and consistency* - drawing upon the world class manufacturing and quality assurance skills that have been developed in the automotive industry and apply them to the conversion process.
- *greater consumer choice and competition*.

which will serve to drive and coordinate collaborative R&D in automotive LPG technologies and conversion processes across the LPG manufacturing value chain.

Industry accepts the need to take the lead in achieving the reforms necessary to realise a **Centre of Excellence** framework to achieve a more integrated LPG automotive manufacturing industry. It is seeking to work with Government to establish a supportive policy and program environment based on the following principles.

1. *An industry with customer focussed innovation* - The pursuit of R&D in LPG technology across the various car categories to meet consumer demand.
2. *A volume driven market that improves industry competitiveness* - Building operational scale to reduce conversion costs to bolster the consumer value proposition.
3. *Providing the Quality Assurance for LPG technology* - Providing certainty to vehicle suppliers that LPG conversion will not compromise vehicle functionality.
4. *Promoting collaboration across the automotive industry* - Aligning the objectives of the LPG manufacturing value chain to strengthen the collaborative R&D capability in this field.
5. *A whole of Government approach* - Supportive government policy settings that facilitate the transition to a new sustainable model for industry growth.

Building a framework for success

It is critical that key industry decision-makers take a leadership role to jointly identify, develop and deploy the **Centre of Excellence** framework to align a future LPG automotive manufacturing supply chain with market demand.

The GEA - VACC recognises that the adoption of a CoE framework will involve a range of challenges, including winning support from local and international MVPs. However, the GEA-VACC are in a unique position to broker the cross industry collaboration needed to develop and deliver industry leadership for effective integration to occur between the LPG and automotive manufacturing industry.

It is envisaged that a Taskforce will be established to engage representatives of industry and relevant industry associations in a structured and transparent conversation around developing this framework.

Whilst industry understands its responsibility in leading the restructuring, the GEA - VACC consider there is a viable business case for the Australian Government provide a supportive policy and program environment (including changes to the Automotive Transformation Scheme) to help implement necessary transformations.

RECOMMENDED AMENDMENT TO ATS TO SUPPORT LPG INDUSTRY INTEGRATE WITH AUTOMOTIVE MANUFACTURING INDUSTRY

That the Australian Transformation Scheme be amended to enable the LPG industry to have greater access to the program for:

- Manufacturers of LPG componentry, including under-bonnet and refuelling equipment
- R&D services providers who are driving the industry effort around innovation.

ATS should include LPG fitment as a dedicated fuel system on the assembly line, conversions applied between the showroom and consumer, and conversions applied to imported new vehicles before sale considered as eligible activity for company participation in the program. The industry is seeking to consult with the Government regarding relevant activity levels to support this participation.

The GEA-VACC strongly endorse the Centre of Excellence framework as a viable pathway for creating the platform to effectively align the natural advantages of the LPG industry with the automotive manufacturing industry to sustain a competitive and productive domestic automotive sector into the future.

1 AUSTRALIA'S GASEOUS FUELS INDUSTRY AT A CROSSROADS

1.1 Performance of the Australian LPG industry

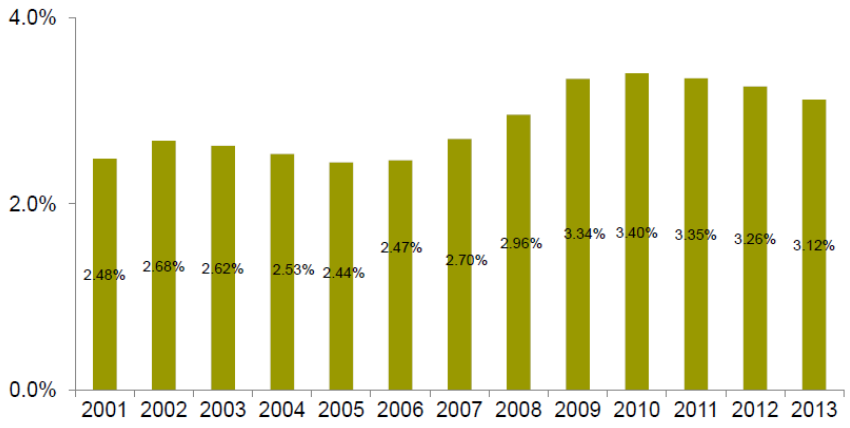
Australia has a long-standing history of powering its vehicles with LPG. The VACC has defined the development of the LPG vehicle market in Australia as comprising of four stages that include[2]:

- The entry of LPG vehicles and conversion technologies between 1975-1979.
- The establishment of refuelling infrastructure within service station networks and the development of standards for LPG conversion and refuelling installations between 1980-1992.
- The introduction of aftermarket LPG conversion systems for new Australian-made passenger sedans and light commercial vehicles, and the refinement of industry standards relating to the design and installation of LPG tanks and the configuration of LPG workplaces between 1993-2000.
- The 'golden age' of the LPG vehicle industry in Australia between 2000-2010, with the introduction of factory-fitted MVP LPG powered vehicles such as the Ford Falcon (2000/2001) and the announcement by the Federal Government's LPG vehicle grants scheme in 2006.

The Australian new vehicle market is divided into four segments namely Passenger, Sports Utility Vehicle (SUV), Light Commercial and Heavy Commercial vehicles. In providing a contextual backdrop to the 'golden age' of the LPG industry, the overall new vehicle market developed from approximately 770,000 units in 2001 to more than 1.1 million units in 2012.[3]

Australia's light vehicle fleet, comprising passenger and light commercial vehicles, has seen the representation of LPG vehicles increase over the same period. ABS figures show that in 2001, LPG vehicles made up 2.5% of the light vehicle fleet, peaking at 3.4% in 2010, and declining over recent years to 3.1% in 2013. This has resulted from a reduction in sales of domestically produced factory fitted vehicles and a decline of retrofitted LPG conversions that is explored further in Section 1.5 below.

Figure 1 - LPG vehicle penetration of the light vehicle fleet



* comprises passenger and light commercial vehicles

(Source: Australian Bureau of Statistics)[4]

[2] VACC (2013) *Building a viable LPG industry in Australia to 2020: a framework for moving forward,* p.2
[3] Australian Bureau of Statistics (2013) *9314.0 Sales of New Motor Vehicles – Australia.*
[4] Australian Bureau of Statistics (2013), *9309.0 Motor Vehicle Census, p.14.*

1.2 Economic contribution of LPG industry to Australia

The LPG autogas industry is a significant contributor to Australia's economy, generating approximately $350 million in net economic wealth annually and employing over 20,000 people.[5]

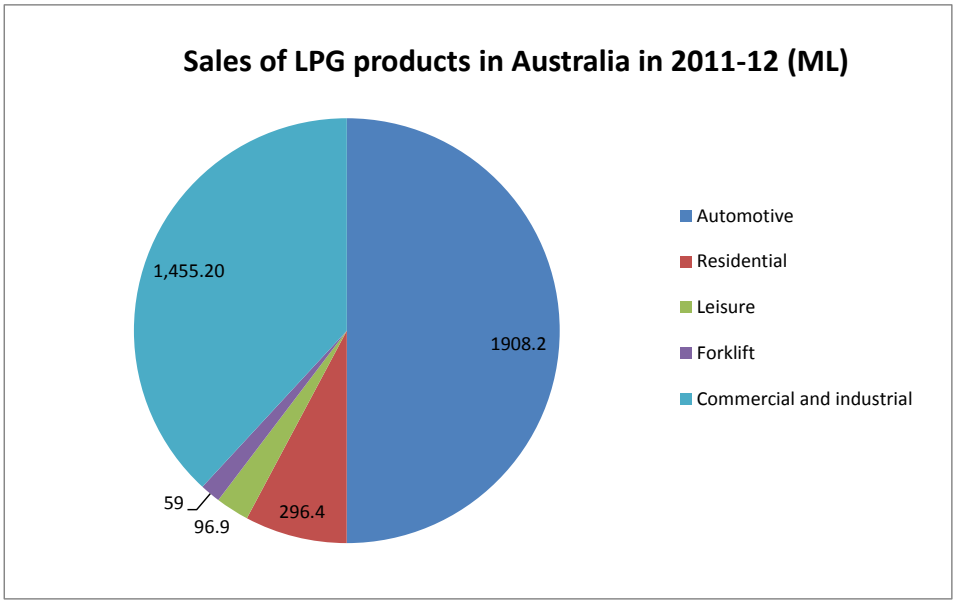
Australia has a fully integrated LPG industry supply chain, from feedstock to vehicle manufacturing. Since the emergence of the industry in the 1970s, over $3.5 billion has been invested as a net value of capital expenditure into the LPG industry across oil and gas producers, refiners, LGP component manufacturers, LPG conversion and support services, importation warehousing and distribution.[6] LPG infrastructure investment has been made in the development of key coastal LPG terminals to strengthen the supply logistics of coastal shipping to support the industry's strong exports, regional depots and service stations.[7] This substantial investment has established the industry with an extensive LPG infrastructure network of 3,800 sites across Australia.[8]

This has facilitated the rapid adoption of LPG vehicles in Australia over the last decade. The country has the fifth largest fleet of LPG vehicles in the world with almost half million vehicles representing 3.1% of the light vehicle fleet.[9] The domestic Motor Vehicle Producers (MVPs) such as Holden and Ford are currently producing factory-fitted LPG vehicles, with the automotive LPG industry supported by the LPG component manufacturing supply chain and developers of LPG technology.

This foundation presents significant opportunities for fuel production, an expansion in manufacturing activities and the provision of strategy support to Australia's broader automotive industry. This would build on the opportunity identified in the AA2020 Roadmap where gaseous fuels is highlighted as one of four pillars of sustainability for the Australian automotive industry.

As an indication of the size of the market, approximately $1.2 billion was generated through autogas sales in 2011-12, equivalent to 1,908ML of LPG produced for automotive applications.[10] This compares to a total volume of 3,816ML of LPG produced for applications across residential, leisure, commercial and industrial sectors.[11] This is illustrated below in Figure 2.

Figure 2 - Petroleum Statistics in Australia, Table 3A



(Source: Department of Industry)[12]

[5] LPG Australia (2009) *Submission to Australia's Future Tax System*
[6] LPG Australia (2010) *The LPG Industry Report Card 2010*
[7] LPG Australia (2008) *LPG's role in Australian Energy Policy*
[8] Victorian Automobile Chamber of Commerce (VACC) (2013) *Building a viable LPG industry in Australia to 2020: A framework for moving forward*
[9] Australian Bureau of Statistics (2013) *9309.0 Motor vehicle consensus, p.14*
[10] VACC (2013) *Building a viable LPG industry in Australia to 2020: A framework for moving forward*
[11] Australian Government Bureau of Resources and Energy Economics (2013) *Australian Petroleum Statistics*
[12] Australian Government Bureau of Resources and Energy Economics (2013) *Australian petroleum statistics*

The Australian Government's *National Energy Security Assessment 2011* (NESA) examines Australia's energy security in terms of the adequate, reliable and competitive supply of the liquid fuels (including LPG), natural gas and electricity sectors. In the 2011 NESA, Australia's liquid fuels security was assessed as high, trending to moderate in the long term. This assessment was based on the country's "continued access to highly adequate and reliable supplies of liquid fuels at price levels that are manageable within the broader economy."[13]

The 2011 NESA, further supported by the *2011 Strategic Framework for Alternative Transport Fuels* and the *2012 Energy White Paper,* acknowledged that it is prudent to maintain a diverse energy supply and encourage the development of commercially viable alternative liquid fuels and technologies.

With Australia's oil fields continuing to deplete, over 70% of liquid fuel currently used in motor vehicles is imported.[14] This represents a significant opportunity for Australia to tap into its LPG resources as a viable alternative fuel solution to domestic fuel needs, and the potential for the expansion and development of the industry's capacity.

This submission acknowledges the findings of the 2011 NESA that self-sufficiency or adequacy alone does not guarantee energy security. Nevertheless, this submission wishes to highlight the fact that Australia's LPG industry has the infrastructure and product affordability to also make a significant contribution to Australia's energy security in term of reliability and competitiveness.

1.3 Industry capacity and capability

1.3.1 Availability of indigenous gas resources

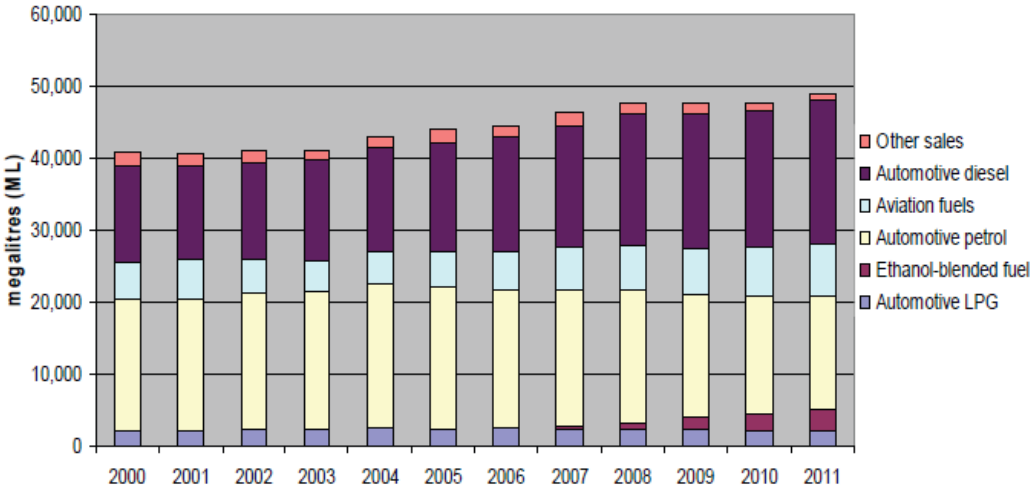
In its *Strategic Framework for Alternative Transport Fuels,* the Australian Government's Department of Resources, Energy and Tourism (RET) expressed the view that by drawing on its competitive advantages (including abundant indigenous energy resources), Australia can enhance its transport energy security.[15]

According to the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) report titled *Energy in Australia 2011,* our indigenous reserves of LPG will last approximately 42 years, however reserves to production ratios have been stable over the past 10 years reflecting the addition of new discoveries that could continue into the future.[16] Australia's LPG consumption of approximately 1.2 million tonnes in transport and 0.7 million tonnes in other uses creates scope for LPG use to expand without the need for imports.[17]

Australia is increasingly importing large amounts of refined oil and products such as diesel for transport use. The figure below illustrates the consumption of transport fuels from 2000 to 2011. Diesel consumption has been higher than petrol since about 2009, with ethanol-blended fuels increasing over the latter years and the consumption of LPG being relatively stable throughout the period.

[13] Australian Government, Department of Resources, Energy and Tourism, *Liquid Fuels Vulnerability Assessment*.
[14] LPG Australia (2010) *The LPG Industry Report Card 2010.*
[15] Australian Government Department of Resources, Energy and Tourism (2011), *Strategic Framework for Alternative Transport Fuels*, p.66.
[16] Australian Government Department of Resources, Energy and Tourism, (2011), *Energy in Australia* 2011, p. 4.
[17] Australian Government Department of Resources, Energy and Tourism (2011), *Strategic Framework for Alternative Transport Fuels*, p.55.

Figure 3 - Sales of transport fuels in Australia, volume by financial year



(Source: Department of Resources Energy and Tourism)[18]

1.3.2 Infrastructure

Since the LPG industry emerged in the 1970s, a total of $3.5 billion has been invested in infrastructure to support its maturation in Australia.[19] This infrastructure is extensive and includes seven natural gas processing plants, nine coastal terminals, 170 regional depots, 1,000 local small business distributors and over 3,800 Autogas refuelling stations across Australia.

The establishment of this infrastructure facilitated the need to introduce aftermarket LPG conversion systems and technology for the vehicle fleet. In 2010 (the most current data) there were over 2,000 installation businesses in Australia that employed around 7,500 people. The on-going development of this infrastructure is required to ensure Australia remains ahead of the curve in world-leading equipment and technologies for LPG refuelling facilities enhancing their usability and accessibility.

1.3.3 Industry operators

Approximately 20,000 people are employed across the national LPG supply and LPG vehicle supply chain which is represented by the following segments:

- LPG component manufacturers – include design and manufacture LPG dispensing and distribution equipment for service stations.
- LPG conversion and support services - responsible for the retrofitting and servicing of LPG fuel systems.
- Importation and warehousing - import a range of LPG products for systems assembly and house LPG components and storage systems (tanks) for the market.
- Distribution - this segment is the retail channel for LPG conversions in the domestic market.
- Research & Development - the segment in which intellectual property (IP) for LPG systems resides.[20]

[18] Ibid. p. 17.
[19] VACC (2013) *Building a viable LPG industry in Australia to 2020: a framework for moving forward*
[20] LPG Australia (2010) *The LPG Industry Report Card 2010*

1.3.4 Automotive manufacturing capability

In the same way that MVPs manufacture and factory-fit LPG to a vehicle, the retrofitting of LPG to a petrol vehicle is also a value-added manufacturing process. Australian MVPs and the component supply chain have developed expert capability in designing, engineering and manufacturing the technologies that enable vehicles to be powered by LPG. The broader innovative LPG component segments in which Australian companies operate include:

- Dispensing and distribution - Components that reduce waste at the fuel-pump, improve refilling flow-rates, and equipment for consumer ease-of-use, has given Australia the reputation as a leader in LPG dispensing and distribution technology for refilling and service stations globally.
- On-board LPG tanks - the significant enhancements to installation and ease of set-up, efficient tank shape design, and use of lightweight materials such as aluminium for construction.
- LPG injection system design - components that contribute to the efficiency of the on-board systems by balancing the reduction in fuel consumption whilst achieving increased power output.

In keeping with the ever increasing electronic content of new vehicles, MVP and supply-chain engineering teams around Australia have refined LPG technology in order to improve the performance and reliability of the LPG system.

Both Holden and Ford currently offer factory fitted and advanced LPG systems. Holden's Vapour Gas Injection System directly injects gas into the inlet port, increasing power and torque output, whilst reducing fuel consumption by 13% over its dual-fuel LPG predecessor.[21]

Ford's EcoLPi system (developed by Orbital in Perth) injects liquid directly into the intake port, significantly reducing emissions (approximately 14%) whilst increasing power and torque over previous Ford LPG models.[22]

In line with global MVPs advancing the fuel efficiency of engines, the above examples demonstrate Australia's engineering capability strengthen its reputation and position itself as a significant contributor to the global development of LPG technology. Australia's innovation in the above component areas has advanced conversion technology.

Given Australia's capabilities, it is well placed to capture global market opportunities.

1.3.5 Automotive Australia Technology 2020 Roadmap – identifying LPG technology opportunities

The Automotive Australia 2020 Technology Roadmap (AA2020) was collaboratively developed by Australia's vehicle producers, automotive and non-automotive value chain participants, research institutions, and government.[23] The aim of the AA2020 was to assess global automotive trends and drivers and the domestic supply-chain capabilities to identify opportunities that will sustain a profitable Australian automotive industry into the future.

One of the top four priority areas for technology identified by the AA2020 was 'Gaseous Fuels'. This opportunity builds on Australia's strengths in economics, energy security and the environment.[24] The roadmap specifically outlined gaseous fuels opportunities in:

- A public education campaign designed to change consumer perceptions of gaseous fuels.
- Dedicated LPG systems for Direct Injected (DI) Engines that captures the market for LPG technology fitment to current generation DI engines.
- Expansion of the LPG Retrofit market that is achieved by lifting the standard of LPG fitment to provide MVP style performance and integration.

[21] General Motors Holden (2012) *All-New Dedicated Holden LPG Commodore - Australian Solutions for Australian Conditions*
[22] Orbital Corporation Limited (2011) *Orbital helps propel Ford's LPG Falcon to Award Success*
[23] AutoCRC (2010) *Automotive Australia 2020 Technology Roadmap*
[24] Ibid, p.10.

- Fast Fill solutions for LPG particularly around on-vehicle and infrastructure capacity to consistently fill LPG vehicles in an equivalent time to petrol, thereby improving consumer perceptions.
- High capacity, low cost on vehicle storage tanks for CNG allowing cost effective, lightweight and conformable on-vehicle gas storage.[25]

This opportunity is understandable given Australia's abundance of gas resources and the fact that Australia was one of the first countries in the world to power vehicles using LPG.[26] Australia is in a strong position to further enhance the capability and use of this alternative fuel. As per the AA2020, gaseous fuels is a strong niche market opportunity that can play a critical role in Australia's automotive future by building on the global recognition of this country as a technology leader, our raw material advantages, and leveraging our existing domestic market.[27]

1.3.6 A culture of innovation

The high-end capability residing within the domestic automotive LPG value chain is the key driver for the advancement of LPG technology. Highlighting our inherent culture around innovation, the industry has been addressing many of the opportunities presented by the AA2020, represented by some of the following examples:

Figure 4 - Examples of company innovation

Company	Example of innovation
Ebsray Pumps	Ebsray Pumps is a specialist LPG pump and pumping equipment manufacturer. Key to the company's success is the innovative design of its low noise, high performance and high efficiency regenerative turbine pumping technologies and aligned equipment. This capability has allowed the company to capture approximately 98% share of the domestic retail automotive LPG/autogas pump market and develop export markets, with approximately 70% of its production going to 35 countries. Ebsray Pumps supplies and services more than half of the automotive LPG pumps in Germany equivalent to a value of $6 million, with further export sales to countries that include Spain, Portugal, Thailand, and Hong Kong. Ebsray Pumps noted that having the local industry was a significant advantage for developing their technologies for export markets.
DJ Batchen	DJ Batchen is a manufacturer of LPG products providing contract maintenance services to the LPG and chemical industries in Australia. Specific to the automotive industry, DJ Batchen manufactures automotive LPG dispensing equipment such as bowser nozzles. The company has been successful in winning approximately 95% market share of the domestic market. The company's innovation lies in the development of highly accurate metering mechanisms, submerged LPG storage systems, and dispensing products that are easy to use by the consumer. DJ Batchen's capability has facilitated exports to China, India, South America, Sri Lanka and Indonesia.
Orbital, incorporating Sprint	Orbital is a leading company in advanced technology and product development providing engine and vehicle technologies and

[25] Ibid, p.16.
[26] VACC (2013) *Building a viable LPG industry in Australia to 2020: a framework for moving forward*
[27] Ibid, p.13.

Company	Example of innovation
Gas	alternative fuel solutions. The success of Orbital's automotive LPG capability has already been noted with development of the factory fitted LPG system for Ford. Orbital has a controlling stake in Sprint Gas, which specialises in high performance and highly durable equipment designs for LPG fuel systems. Whilst traditionally LPG conversions are performed on petrol vehicles, Sprint Gas has developed the capability to convert petrol-hybrids into LPG-hybrids. The company had to innovatively design the LPG supply and storage system to seamlessly integrate with the hybrid engine management system to ensure compliance and certification. The LPG integration advances the economic and environmental savings aspect of hybrid vehicles even further. Domestic demand for LPG-hybrid conversions has been largely driven by the taxi industry which is motivated by the push to cut fuel cost. One large Melbourne taxi fleet, Black Cabs Combined, is currently moving to convert 100% of its vehicles to LPG-hybrid drivetrains.

Even though many innovative successes have been achieved to date, there are a number of opportunities for industry and the research community to continue the technological development to improve performance and public perception that include:

- The development of additional LPG systems types including direct injection liquid injection and diesel liquid injection systems, particularly for small vehicles.
- The expanded availability of infrastructure required to support the investment in LPG vehicles.
- The development of supplier capabilities to improve the integration with MVP production processes and overall performance.
- Improved refuelling technology for the end user, such as bowser nozzles and refuelling speed.
- Increased development in accident safety performance for on-board tanks and LPG systems to allay consumer perceptions on LPG technology.

Given the potential for these technologies to develop into commercial opportunities for the industry, it is recommended that GEA-VACC be funded to support the implementation of the AA2020 Roadmap gaseous fuels agenda.

RECOMMENDATION 1: That the Australian Government provides funding to GEA-VACC to support the implementation of the AA2020 Roadmap gaseous fuels agenda.

1.3.7 Workforce and industry skills

Australia has a strong base of skills, technologies and capabilities from which to draw upon to support the LPG industry. However, there are significant opportunities for the industry to develop and upskill its current workforce to build upon existing capabilities. There are targeted training and development programs in place across a number of registered training organisations (RTOs) and TAFE institutions.

All states and territories have their own licencing and accreditation requirements for the installation, repair and servicing for LPG installations to comply with technical requirements of the Australian Standard AS/NZS 1425 ('LP Gas Fuel Systems for Vehicle Engines'), which requires conversion systems to be fitted with an acceptable LPG Compliance Plate if converted to operate on LPG on or after 1 February 1993.

Victoria is the only Australian jurisdiction that has a separate regulatory body, the Automotive Alternative Fuels Registration Board (AAFRB) that is dedicated to the enforcement of compliance and quality assurance for LPG conversion systems being effectively implemented and monitored. The AAFRB ensures that any business in Victoria engaged in the installation or repair of LPG (or CNG) systems to vehicles must be registered with the AAFRB, while individuals undertaking conversions or repairs must be accredited. This framework provides oversight of the skills and capabilities that will meet all standard requirements. The AAFRB is also responsible for accrediting training courses, promoting safe work practices and monitoring the alternative fuels industry in Victoria.

In GEA-VACC's view, having a dedicated national body such as that which exists in Victoria enhances the effectiveness of the enforcement regime and leads to a more cooperative arrangement with the industry. This initiative has the potential to imporve consumer confidence in LPG conversion systems more generally.

Therefore, GEA-VACC considers that developing a regulatory arrangement in regards to the enforcement of LPG installation compliance would significantly improve the quality of these systems and this would be progressed through the COAG process.

RECOMMENDATION 2: Through collaboration with the Australian LPG Centre of Excellence that all State and Territory governments give consideration to the adoption of a nationally consistent LPG conversion regulatory and enforcement regime.

1.4 Understanding the opportunity for LPG in Australia – the international experience

A critical success factor in growing LPG use and vehicles markets across Europe, Asia and the USA has been a focussed policy setting that has established targeted incentives and programmes aimed at reducing the conversion cost for LPG vehicles.

This uptake is further supported by MVPs continuing the development and release of LPG powered vehicles. The 2013 Frankfurt and Tokyo Motors shows were forums premiering the latest LPG vehicles and included:

- Hyundai 'i40' mid-sized wagon and Hyundai 'i10' small car dual-fuel variants.
- Kia 'Picanto' small car with dual-fuel.
- Opel (General Motors) 'Adam' small car with dual fuel.
- Toyota 'JPN taxi concept' with a liquefied LPG-hybrid system.

Europe

The LPG industry in Europe is developing at a fast pace with total consumption of the fuel reaching over 25 million tonnes in 2012[28] and LPG vehicles currently representing 80% of the gaseous fuels market.[29]

- In Germany, the number of Autogas cars increased from 200,000 in 2007 to 455,000 by 2011.
- In Italy, the number of Autogas cars increased from 1 million in 2007 to 1.8 million by 2011.
- In Turkey, the world's leading Autogas market, 40% of private vehicles run on Autogas.[30]

The European Commission is expecting LPG to increase as a proportion of the region's energy mix from 3% to 10% by 2020. This uptake is based on an appropriate regulatory framework that leverages the direction of European policy makers to address both protecting human health and the environment, which can be served by the immediately available benefits of LPG in these fields. The expected growth in LPG fuel and vehicle investment is reinforced by a complementary policy setting that that incentivises alternative fuel uptake.

Selected examples include:

[28] Argus Consulting Services (2013) *Liquefied Petroleum Gas (LPG) Consumption in Europe*
[29] World LP Gas Association (2012), *Global Autogas developments*
[30] Association Europeenne des Gaz de Petrole Liquefies (AEGPL) (2013) *Autogas in Europe, the Sustainable Alternative: An LPG Industry Roadmap*

- Direct subsidies to cover the cost of equipping a vehicle with an Autogas system at the moment of purchase or as a retrofit.
- Exemption from congestion charges for low emission vehicles, free parking for alternative fuel vehicles and access restriction to town centres during peak pollution periods for high polluting vehicles[31]
- New EU regulations to cut CO_2 emissions and pollutant emissions at the time of registration and sale of new cars will create an incentive for car makers to sell more small LPG models.
- Clean Transport Systems Legislative proposal to build-up alternative fuel re-fuelling infrastructure to further spread the uptake of Autogas across Europe.
- Fuel Quality Directive requiring suppliers to reduce carbon intensity of transport fuels sold on EU market by 2020. LPG is already 17% below the decarbonisation target – therefore the more LPG fuel sold, the easier it will be to reach the 2020 target.

Asia

The stock of cars, trucks and buses throughout Asia is growing significantly, in line with economic growth in the region. Governments have become increasingly cognisant of the environmental impact associated with the growth in the vehicle transportation sector - instigating incentives for increased alternative transport fuel uptake – including LPG. As a consequence, LPG vehicle production and uptake in Asia is steadily on the rise with continued growth and investment in more efficient LPG technology – particularly amongst commercial and taxi fleets expected.

Selected polices and incentives include:

- A subsidy program in Hong Kong to be implemented in 2014 to replace catalytic convertors with oxygen on taxis and minibuses already operating on LPG to increase efficiency and LPG fuel consumption.[32]
- A "Universal design taxi" to be established in Japan in March 2012 to promote new type of barrier-free vehicles.[33] Taxi vehicles account for about 80% of LP Gas vehicles in Japan.
- An alternative transport fuel subsidy extending to LPG was established in Indonesia in 2010 to diversify the energy use of vehicles. The stock of cars, trucks and buses in Indonesia is growing at almost 30% per year.[34]

USA

The uptake of alternative transportation fuel in the US is growing rapidly, resulting from both an increase in supply of feedstock – mainly shale gas – as well as significant Government incentive programs to attract investment in LPG vehicle R&D and uptake. Evidence of this is Ford's investment in LPG and CNG vehicles in the US. This has resulted in sales of Ford's commercial vehicles with CNG/LPG engine packages increasing by more than 350 percent from 2009 to early 2013[35].

Selected policies and incentives include:

- Alternative Fuel Infrastructure Tax Credit[36] of 30% for fuelling equipment and an Alternative Fuel Excise Tax Credit to create a tax incentive to use LPG vehicle fuel.
- Vehicle Acquisition and Fuel Use Requirements for Federal Fleets, mandating that 75% of new light-duty vehicles acquired by covered Federal fleets must be alternative fuel vehicles (AFVs), including LPG.
- Improved Energy Technology Loans to support early commercial use of advanced technologies such as LPG fuel vehicles. Eligible projects must reduce air pollution and greenhouse gases.

[31] Ibid
[32] South China Morning Post (2013), *Keeping Hong Kong's taxi and minibus fleet clean for cleaner air*
[33] Japan LP Gas Association (2013), *Autogas in Japan: Where is it going?*
[34] Zuhal R. (2008), *Energy Policy for Indonesia Sustainable Development*
[35] Ford (2013), *CNG/LPG Vehicles*
[36] US Department of Energy (2013), *Alternative Fuels Data Centre: Federal laws and incentives for propane (LPG)*

- Alternative Fuel and Advanced Vehicle Technology Research and Demonstration Bonds issued by qualified state, tribal, and local governments to fund capital expenditures on research and demonstration of alternative transport fuels and advanced battery manufacturing technologies.

In the US market, Alliance AutoGas has a network of certified dedicated LPG conversion centres for fleets that span 34 states across the country. A diagram demonstrating the conversion process at an Alliance conversion centre is at Appendix 1.

Global opportunities for Australian industry

Given the strong growth of LPG in major global markets, there may be opportunities for Australian LPG industries to pursue export opportunities, particularly in innovative technologies and skills. Despite this being an emerging market, these opportunities have not yet been scoped. It is proposed that the Australian Government partner with GEA-VACC to undertake a study that scopes the export market potential for the Australian industry.

RECOMMENDATION 3: To be conducted by the LPG Centre of Excellence that the Australian Government, MVPs and GEA-VACC jointly fund a study to scope the export potential for Australian LPG businesses in emerging global markets.

1.5 An LPG industry at the crossroads

The current decline of LPG and LPG vehicle uptake in Australia is in stark contrast with the growth being experienced in other international jurisdictions.

GEA/VACC believes that given the inherent benefits of the LPG industry, there is a significant opportunity to re-affirm the position of the industry, and re-position it to grow through the domestic value chain.

The desired outcome is for the industry to transition to a business model built for long-term competitiveness and sustainability. There are a range of domestic and export opportunities that can be explored here. There are specific steps that the industry can take to increase its activity levels in Australia, and continue to grow into global value chains, especially in Asia. The industry understands that success in these areas is based on it taking a leadership role. However it is important that the right policy framework be put in place to support the outcome.

1.5.1 Market awareness and the price advantage

Moving the Australian autogas industry back to the peak levels of 2008 involves a range of measures.

Fundamentally, the price differential between LPG and ULP continues to be an important driver, although relative stability in the price of ULP over recent years has moderated this impact.

The industry believes that as the price of ULP continues to increase over the medium to long term this differential will again become a significant catalyst for more LPG sales as consumers seek relief to cost of living pressures.

An additional approach to be implemented by the industry incorporates a co-ordinated information campaign about the cost, preference availability and safety characteristics of LPG as a transport fuel. While innovative and technological advances have continued with the Australian industry at the forefront of global developments, this story needs to be better communicated to consumers. The GEA-VACC appreciates its leadership role in this area, and is implementing a strategy to attract consumer sentiment. This strategy focuses on a public awareness campaign to inform the market of the benefits of LPG technologies, the development of point-of-sale materials for LPG vehicles (including cost calculators) and conducting authoritative research into the environmental and economic performance of different aftermarket LPG vehicle technologies.

1.5.2 The role of fleets

The domestic fleet vehicle leasing industry procures, leases, and manages vehicles for corporations, businesses and government institutions. The overall state of the economy and taxation arrangements, such as the influence of any changes to FBT, impacts on fleet market buying behaviour. Furthermore, demand for fleet car leasing is affected by fuel cost, with higher fuel prices and operating costs impacting on demand for leasing of passenger vehicles.[37]

In responding to these increases, fleet industry firms are competing on the number of green fleet vehicles (including hybrid and electric vehicles) that reside in their fleet inventory.[38] Furthermore, and in line with the broader purchasing choices of private consumers, fleet industry firms are also moving towards small passenger cars that are more fuel efficient and have lower running costs.[39]

There is a strong business case for more LPG vehicles to be incorporated into Australian fleets. For example, with LPG being on average approximately 50 per cent cheaper than petrol, GEA estimates that the Australian Government's fuel bills would drop by $7.3M per year if organisations converted their fleet of petrol powered 6 and 8 cylinder passenger and light commercial vehicles to LPG.

In targeting fleets, the Australian automotive LPG industry has the ability to offer a product that addresses the needs of the fleets includes improving vehicle efficiency.

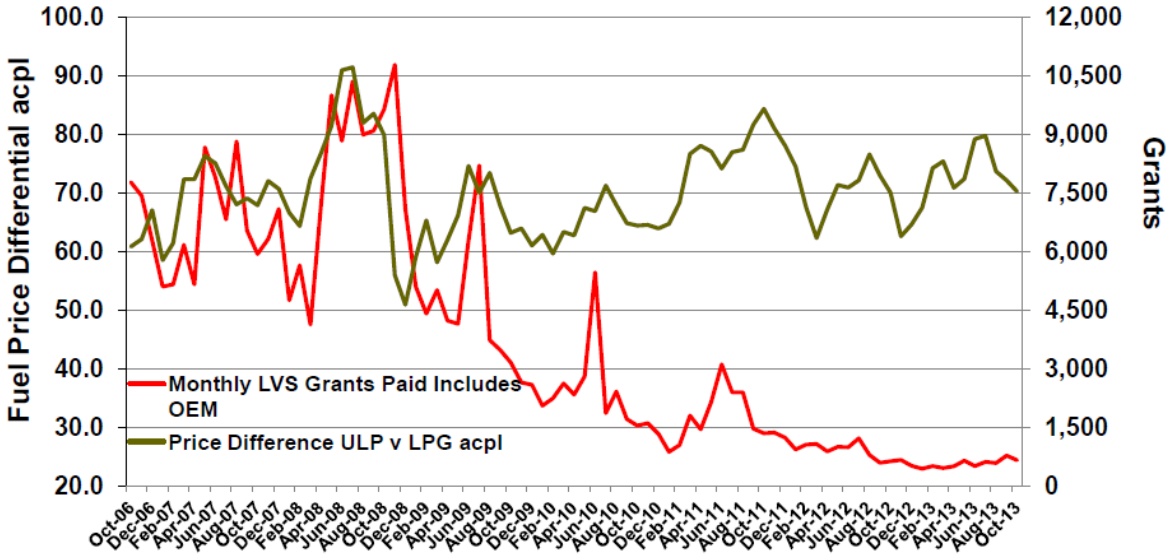
1.5.3 A changing competitive environment

There are some critical factors that have contributed to a reduction in LPG and vehicle uptake which include:

- The consumer economics of moving from petrol to LPG powered vehicles is weakened with improvements in vehicle fuel efficiency and the change in consumer preferences to smaller vehicles. This is seen as a temporary impact however, with long term projects regarding oil and ULP prices highlighting a widening differential over time.
- The emergence of biofuels, hybrids and electric vehicles has increased the competitive landscape around 'green fuels'. In respect to this, LPG needs to continue to position itself around the attributes of availability, low cost of the fuel and its ability to convert a range of vehicles.
- The Federal Government's LPG Vehicle Scheme (LPGVS) (as detailed in section 1.6) is now less effective in encouraging the purchase of new LPG vehicles and LPG aftermarket conversions. Applications received by the Federal Government's LPGVS in FY12 were 68% below the allocated cap of 25,000, with estimates for the current year likely be 95% below the same cap.[40] In response to this, Recommendation 4 addresses the issue to assist it through the medium term transition process.
- Misconceptions associated with the LPG vehicle industry also affect the uptake of the technology in MVP and retrofit applications. This includes issues that relate to perceived power loss, concerns about the safety of LPG, vehicle warranty concerns, compatibility with existing electronics and engine wear. The industry is seeking to be more proactive around this with the consumer information campaign highlighted earlier being a key response.
- The price differential between ULP and LPG more closely correlated with the demand of the LPGVS between 2006 and the early stages of 2009. Despite a relative consistent average price differential over time, there now appears to be consumer disconnect between the price differential and the uptake of the LPGVS, likely based around the relative stability in the ULP price, which is seen as a short term effect.

[37] IBISWorld (2013), *Fleet vehicle leasing in Australia,* p.12.
[38] Ibid. p.19.
[39] Ibid. p.11.
[40] Ibid

Figure 5 - LPGVS grants & fuel prices



***(Source: Gas Energy Australia)*[41]**

1.6 Current policy settings for production, supply and use of gaseous fuels

There are a number of Australian Government policy settings that impact the production, supply and use of gaseous fuels. These include:

- *LPG taxation* – LPG has been subject to fuel excise since 1 December 2011. The increases in annual increments of 2.5 cents per litre will see the full rate of 12.5 cents per litre achieved from 1 July 2015.
- *LPG Vehicle Scheme (LPGVS)* – The LPGVS provides an incentive for private vehicle owners to purchase new LPG vehicles or to convert existing petrol or diesel vehicles to LPG, for the purpose of the increasing the use of LPG. This program is set to end on 30 June 2014. Recommendation 4 addresses the changes that the industry is seeking to this program.
- *Automotive Transformation Scheme (ATS)* - ATS is the key automotive manufacturing assistance program for MVPs and component manufacturers. It aims to encourage investment and innovation in the Australian automotive industry to assist the industry in becoming more globally competitive. Funding of $1.5 billion is available from 2011 to 2015, with $1 billion of funding provided from 2016 to 2020.

LPG parts and systems suppliers are able to access ATS funding on relevant plant and equipment (P&E) and research and development (R&D) expenditure as long as they are able to satisfy the program's broader eligibility requirements. To be eligible, suppliers must be producing one type of automotive component for use as original equipment in at least 30,000 vehicles per annum, or the production value of the automotive component for use as original equipment must be at least $500,000. It should be noted that the emphasis here is focused on suppliers to original equipment production, with suppliers concentrated solely on aftermarket applications would not be eligible for the Scheme.

1.6.1 ATS

While some components of the LPG industry access ATS, the industry believes there is scope to increase the funds availability to the sector. Recommendation 6 addresses this issue.

[41] Gas Energy Australia (2013) *LPG vehicles October 2013 industry statistics*

1.6.2 The policy and program environment into the future

The LPG industry believes the current PC review into the automotive manufacturing industry presents a timely opportunity to consider the way the industry is currently being impacted, and to understand the industry settings required to support future growth.

2 GASEOUS FUELS AS AN OPPORTUNITY FOR AUSTRALIA'S AUTOMOTIVE MANUFACTURING INDUSTRY

The Australian LPG industry believes there is a significant opportunity to lay the foundation for medium to long term growth across the sector. The following key attributes of the sector reinforce the potential of the sector.

2.1 Scale manufacturing capability to increase the productivity and competitiveness of Australia's automotive manufacturing industry

The Australian LPG industry and the automotive manufacturing industry are simultaneously at a cross-roads, both faced with the challenge and opportunity of identifying pathways to ensuring their long-term viability.

The Productivity Commission's Review of the Australian Automotive Manufacturing Industry provides a mechanism to examine how these industries can jointly pursue growth opportunities. The Terms of Reference of the PC's review requires the examination of factors affecting consumer preferences for new products and technologies and also to evaluate public support mechanisms that facilitates R&D in innovative vehicle and component technologies.

In assessing a way forward, it is worth looking at possibilities for alignment, understanding how each industry's natural competitive advantages can be leveraged to produce shared value for the Australian economy.

Both industries are active contributors to Australia's transportation sector, with the gaseous fuels industry providing LPG as a low cost, clean alternative transport fuel that has encouraged the production and conversion of specific LPG and 'dual-fuel' vehicles to market.

There is an opportunity to capitalise and build on this synergy to develop a dynamic automotive manufacturing industry that delivers value-added economic, social and environmental benefits to Australia through the greater adoption of LPG technologies.

2.2 Contribute to the creation of a globally competitive automotive industry value chain

Australia's LPG industry has a fully integrated domestic value chain from extracting and refining the feedstock, producing an alternative transport fuel, through to the design, development and manufacture and conversion of vehicles that use this fuel.

By making strategic investments focussed around increasing the scalability of the conversion of LPG vehicles through funding R&D and developing the requisite skills, competitive efficiencies in the automotive manufacturing industry can be realised.

Targeted funding of R&D will help foster the required innovation to instil local and imported manufacturers' of cars with confidence in the use, application and reliability of advanced LPG vehicle technology. Technological improvements will further strengthen the business case for commercialising the broad scale production and conversion of vehicles to LPG, in turn yielding cost advantages created from economies of scale.

By pursuing a targeted customer-driven model, market demand will see the increased supply of LPG vehicles deliver flow-on supply chain benefits, including a greater need for manufacturing of plant and equipment to support fuel dispensing and vehicle repairs. Manufacturers of a range of components from tanks to under-bonnet components will also benefit.

This expanded LPG and automotive manufacturing capacity will provide the added benefit of sustaining a regional automotive footprint in Australia by multiplying the local, regional and national economic impact of a

fully integrated value chain. This will deliver sustainable income growth and employment dividends to rural areas.

An emerging demand for LPG vehicles will increase the need for manufacturing expertise with specialised technology, conversion processes and servicing requirements – underwriting the long-term value and justification for investing in up-skilling existing automotive manufacturing skills. These changing industry capability requirements will provide the carriage for tertiary, technical and vocational organisations to incorporate skill needs into training and development programs, including on-the-job training opportunities[42].

The increased uptake of LPG vehicles will also require access by consumers to an efficient refuelling, recharging, storage and distribution infrastructure. Currently, LPG has an extensive refuelling network of over 3,700 LPG stations in Australia's capital cities and key regional areas – also providing regional consumers an alternative energy choice to petrol.[43]

While Australia has an extensive LPG refuelling infrastructure that has attracted significant investment over the last four decades, a vibrant LPG industry is required to maintain this network into the future.

The conditions for new and sustained investment in an efficient infrastructure refuelling network[44] can be created by pursuing an industry-led approach to leveraging more cost-effective synergies between Australia's LPG and automotive manufacturing value chains.

2.3 Delivering sustainable, clean and affordable alternative transport fuel to the Australian consumer

LPG is significantly cleaner than most fossil fuels and is highly-energy efficient, making it an ideal alternative transport fuel for the automotive sector. Wide-scale LPG vehicle uptake across Australia has the potential to deliver greenhouse gas emission reduction and air quality benefits as well as substantive vehicle operating cost advantages to the consumer.

In light of increasing global uncertainty around the impact of climate change, the future scarcity of energy resources has been a catalyst for increased R&D and commercialisation of automotive technologies that enables vehicles to use more environmentally cleaner transport fuels.

Significant examination of LPG powered vehicles demonstrates that they produce less greenhouse gases and other pollutants than petrol-powered equivalents. As outlined in Section 1.3.5, Holden and Ford LPG models achieve emissions reductions of around 16% respectively. However, there are opportunities to further improve these environmental advantages through the use of more innovative LPG vehicle technology and processes.

This reinforces how the inter-connectedness of Australia's LPG and automotive manufacturing industry can be leveraged through focussing investment on R&D to adapt, test and advance LPG vehicle technology in Australia. This would enable improved and sustained delivery of environmental benefits and deliver cost-advantages to consumers.

However, regardless of a carbon-constrained economy, using LPG as a transport fuel continues to provide substantial operating cost benefits over traditional fossil fuels. An analysis of recent movements in the price of ULP and LPG suggests that the price differential between these two fuels has remained relatively constant. On average, LPG continues to remain approximately 50% per litre cheaper, when considered on an energy equivalence basis to conventional fuels.[45]

Both the relative price of LPG and environmental footprint of the fuel are significant natural comparative advantages that should be further leveraged as key drivers of demand and a manufacturing capacity in Australia.

This requires pursuing a customer-driven positioning strategy that directly targets users that are highly sensitive to scale and operating costs. A great example of the alignment of consumer preferences with LPG

[42] Australian Government Department of Resources, Energy and Tourism (2011), *Strategic Framework for Alternative Transport Fuels*
[43] VACC (2013), *Building a viable LPG industry in Australia to 2020 – A framework for moving forward*
[44] Ibid
[45] Rare/Pitt&Sherry (2012), *Near term outlook for LPG consumption in Australia*

vehicle operating benefits is Australia's taxi fleet. Taxis continue to be a major user of LPG vehicles and fuels due to significant fuel savings associated with their relatively high annual mileage.[46]

2.4 Increasing energy export capacity and reducing energy security risk

Australia has abundant indigenous LPG resources. Approximately 80% of LPG produced in Australia comes from natural gas fields whilst the remaining 20% is extracted from refining crude oil.[47] LPG is a highly versatile energy source, with uses for transport or as a domestic, commercial or industrial heating fuel.

The stock of natural resources and the country's established energy supply infrastructure provides unique opportunities for a market driven approach to diversify Australia's energy use and reliance.

Today, the global supply of LPG continues to grow – driven by significant increases in US output from shale gas development as well as growth of LPG production in the Middle East and Russia. In 2012, global LPG production was 274mt, 3.1% higher than 2011. Whilst significant transformation in the supply channels has occurred, global consumption has continued to keep pace with increased volume. This is largely a result of new markets such as Vietnam, Bangladesh and Malta importing LPG. Global consumption of LPG in 2012 grew by 1.8% to 264mt.[48]

Despite this global growth, Australia's demand of LPG fuel continues to remain a small proportion of the country's energy/fuel consumption mix, relying on importing an increasingly large amount of oil and refined products for transport fuel use.

The country is currently a net importer of crude oil, other refinery feedstock and most refined petroleum products. However, it is a net exporter of LPG. As a price taker, Australia is intrinsically linked to international rather than domestic energy supply.

This "critical dependence" position was documented in the development of the Australian Government's *Strategic Framework for Alternative Transport Fuels*.[49] This framework emphasises an increase in the number and type of commercially viable fuel sources with robust supply chains in the transport fuel market. It will ultimately strengthen Australia's position to mitigate future energy security risks in the conventional fuel supply market and open up export potential.

Whilst consumption may be presently declining, Australia's LPG capacity presents an opportunity to reduce the country's reliance on crude oil imports to provide a long-term alternative to conventional transport fuels

Both the rising global consumption and abundant LPG resources in Australia provides substantial scope for capitalising on this natural asset to mitigate domestic energy security risk as well as realise export market benefits.

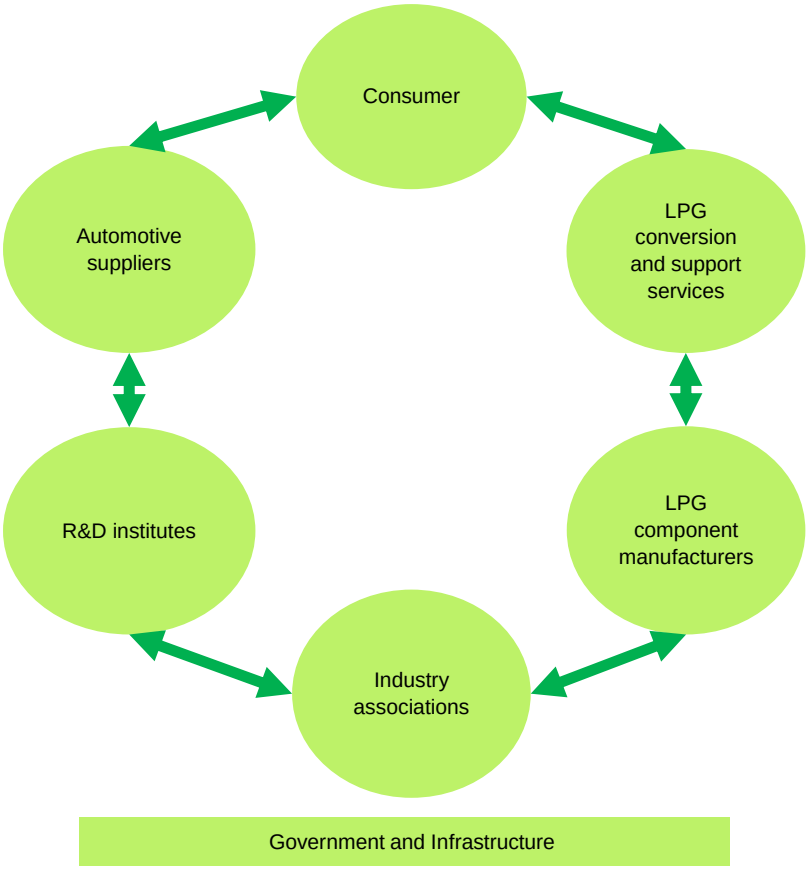
2.5 The automotive LPG manufacturing value chain

With the automotive LPG industry at a cross-road, there is an industry need for a large scale game-changing response to deliver a commercially viable and sustainable industry into the future.

This response will require a whole-of industry approach by the automotive LPG manufacturing value chain that is represented by industry, government, research organisations and industry associations and ultimately the consumer.

[46] LPG Australia (2010),*Future Directions 2030, A roadmap for the Australian LPG vehicle industry*
[47] LPG Australia, April (2008), *LPG's role in Australian Energy Policy*
[48] Argus (2013), *Statistical Review of Global LP Gas 2013*
[49] Australian Government Department of Resources, Energy and Tourism (2011), *Strategic Framework for Alternative Transport Fuels*

Figure 6 - The automotive LPG manufacturing value chain



The role of, and opportunity for each member of the value chain is described in further detail in the table below:

Value chain segment	Role	Opportunity
Consumer	Purchases vehicles	To change consumer perceptions to help them recognise the economic and environmental advantages of LPG fuel systems and technology.
LPG conversion and support services	Converts in-service vehicles to LPG and undertakes repairs	Opportunity to transition from a fragmented group of converters to a highly professional network offering LPG service and support.
LPG component manufacturers	Manufactures local components and technologies	To work co-operatively with local and global MVP technology developers to continually enhance LPG products.
Industry associations	Represents the LPG industry	To assist industry transition to maturity through skills development and training for improved industry relevance and a more sustained segment. To co-ordinate the implementation of a national industry accreditation standard.

Value chain segment	Role	Opportunity
R&D organisations including CRCs, CSIRO and universities	Challenges the current frontier on LPG to develop next generation technologies	To help existing technology further develop in keeping pace with consumer trends and advancing global platforms.
Automotive component suppliers	Supplies LPG-compatible products	To develop and manufacture next generation LPG vehicles in markets.

As outlined in the next section, the success of the response by the value chain is underpinned by addressing the key principles for setting the new pathway that includes:

1. **An industry with customer focussed innovation** - The pursuit of R&D in LPG technology across the various car categories to meet consumer demand.
2. **A volume driven market that improves industry competitiveness** - Building operational scale to reduce conversion costs to bolster the consumer value proposition.
3. **Providing the Quality Assurance for LPG technology** - Providing certainty to vehicle suppliers that LPG conversion will not compromise vehicle functionality.
4. **Promoting collaboration across the automotive industry** - Aligning the objectives of the LPG manufacturing value chain to strengthen the collaborative R&D capability in this field.
5. **A whole of Government approach** - Supportive government policy settings that facilitate the transition to a new sustainable model for industry growth.

The industry accepts the need for it to take the lead on achieving this reform, and is seeking to work with government to establish a supportive policy and program environment.

3 ESTABLISHING A MARKET DRIVEN PATHWAY TO GROWING THE LPG AUTOMOTIVE MANUFACTURING INDUSTRY

The Australian LPG industry has a well-articulated view of the reform that needs to take place to capitalise on the opportunities that the sector presents.

These have been formulated through the development and progressive implementation of a detailed strategy, and the current Productivity Commission process provides a key opportunity to approach government on the way in which these outcomes are achieved in regard to integration with the automotive industry.

The industry also appreciates the need for a transition phase from the current state to the preferred industry scenario. This provides a practical approach to the deployment of the changes required to see the sector achieve its goals, and optimise its contribution to the broader economy.

3.1 Key principles to a new pathway

With consideration to the broader challenges faced by the domestic automotive manufacturing industry and more specifically the automotive LPG manufacturing industry, there is a clear need for restructuring and the need to forge a new direction that will promote long term competitiveness and sustainability of the industry.

The following outlines the key principles and frameworks to be considered as part of the new direction for the automotive LPG manufacturing value-chain.

3.1.1 An industry with customer-focussed innovation

A key response to the current market perceptions and the decline in sales of LPG vehicles involves establishing a new industry structure that harnesses the drivers of demand to deliver a targeted product valued by the market.

The demand determinants of the marketplace are underpinned by further improving the value proposition presented by LPG technology both from an operational cost and environmental emissions standpoint, and educating industry and consumers on the performance, availability and environmental credentials of the fuel.

This is particularly relevant for the new vehicle market and the domestic fleet vehicle leasing industry. With consideration to the annual average distance travelled by the vehicle fleet (15,000km), the consumer economics for switching to LPG appear strongest for ‘Light Commercial Vehicles’ (2.6 years) with payback periods progressively decreasing through categories such as ‘SUV’ down to the least economical ‘Small Car’ category as outlined in the figure below.

Figure 7 - Payback economics (years) for LPG conversion of different vehicle classes

Vehicle type	Average kilometres travelled per year			
	10,000kms	15,000 kms	20,000kms	25,000kms
Small car	11.7 years	7.8 years	5.8 years	4.7 years
Medium car	7.8 years	5.2 years	3.9 years	3.1 years
Large car	5.8 years	3.9 years	2.9 years	2.3 years
SUV	4.7 years	3.1 years	2.3 years	1.9 years
Light commercial	3.9 years	2.6 years	1.9 years	1.6 years

Notes:

1. Assumes price differential of 50 cpl and $3500 conversion cost.
2. Australian private vehicle owner travels an average of 15,000 kms per year (ABS Motor Vehicle Census)
3. Red indicates unacceptable payback, orange indicates marginal payback and green indicates good payback.

(Source: VACC)[50]

In keeping pace with changing consumer and fleet preferences, the domestic automotive industry needs to strategically position the advancement of LPG technology in the 'battle of the balance sheet'. This can be achieved by advancing LPG technology to further reduce vehicle operating cost across all vehicles segments, making the conversion process more cost-effective and improving the availability of LPG-powered vehicles. Additionally, the industry believes there will be a natural improvement in the cost equation around LPG as the price differential with ULP continues to expand.

In further stimulating demand and advancing LPG technology leadership, the domestic automotive industry could further pursue the following additional R&D activities for the aftermarket sector:

- New aftermarket technologies for smaller petrol and diesel powered passenger cars
- New aftermarket technologies for diesel powered SUV's and light commercial vehicles.

This process would create a virtuous circle where consumers response to certain innovations driving greater industry R&D activity and so on.

3.1.2 A volume driven market that improves industry competitiveness

The impetus for advancing automotive R&D investment is facilitated by a framework that drives volume and economies of scale in the market. Both domestically produced and imported vehicles provide pathways that enable the efficient and scalable supply of LPG which will serve to reduce operational costs.

Given that imported vehicles represent approximately 82% of Australia's new vehicle market, one way for the automotive LPG industry to boost production volume is to pursue the conversion of imported vehicles. There is significant precedent in the Australian automotive industry for this approach, with a number of newly imported vehicles having componentry fitted to them in Australia before being passed to the consumer. The ATS program even provides some support for local component manufacturers supplying product into this process.

Another avenue for increasing both the volume of domestically produced vehicles and LPG volume in the market lies within the sourcing strategies of the Government vehicle fleet. Local, State and Federal Government agencies account for more than 54,000 vehicles annually (2012-2013) of which approximately 25% are Australian-made vehicles.[51]

As an example, increasing the domestic vehicle quota for Government and facilitating the conversion of all domestically produced Government vehicles (approximately 13,300) along with a targeted proportion of

[50] VACC (2013) *Building a viable LPG industry for Australia to 2020: a framework for moving forward*
[51] Federal Chamber of Automotive Industries (2013) *Vehicle Sales 2012*

imported Government vehicles would provide obvious volume advantages and act as a market driver for the industry to develop LPG technologies suitable for a range of vehicle categories.

An initiative that would build scale for LPG conversion in the industry, such as a dedicated conversion facility, would improve operational efficiencies that could decrease conversion costs. This would have a positive impact on the consumer economics with regards to switching to LPG by reducing the payback period, and potentially result in further uptake of the technology.

3.1.3 Providing the Quality Assurance for LPG technology

Whilst Australian standards on aftermarket LPG conversions exist to ensure compliance in the industry, the potential variability between conversion operators could affect the vehicle's drive and performance characteristics, impacting vehicle reputation and branding in the market.

With this perceived risk to reputation, vehicle suppliers (manufacturers and importers) are therefore not inclined to endorse the fitment of non-MVP manufactured LPG systems to their vehicles. Aftermarket LPG conversions can therefore have a limiting effect on the validity of a new car's warranty and in turn be a consumer deterrent.

This obstacle must be overcome by the vehicle suppliers and the automotive LPG industry to potentially unlock LPG volume in the imported automotive market. A key principle for the automotive LPG industry is to provide certainty to the vehicle suppliers that the reliability of their vehicles will not be compromised when converting them to LPG.

The endorsement by vehicle suppliers could potentially be achieved with an automotive industry framework that promotes collaborative R&D projects for developing LPG technologies.

3.1.4 Promoting collaboration across the automotive industry

A key to strengthening Australia's R&D capability in this alternative fuel sector will be the need for vehicle suppliers (manufacturers and importers) and the automotive LPG industry (manufacturers and service providers) to more closely engage in collaborative activity.

Whilst industry examples have been cited demonstrating the successful collaboration between LPG technology providers and domestic vehicle producers, the development of LPG technology for a range of imported vehicle categories will require enhanced cooperation with vehicle importers and their global parent companies. Aligning the objectives of R&D, LPG technology manufacturers, vehicle suppliers and aftermarket operators will serve to enhance the collaboration throughout the LPG automotive manufacturing value chain.

This alignment can be achieved through funding effective R&D activities that provide the industry with confidence to convert vehicles to LPG using accredited installation and through-life service providers. The greater integration of the Australian LPG industry in the global value chain will also ensure the local sector remains at the forefront of international innovation.

3.1.5 A whole of government approach

Certainty and consistency in government policy is paramount for supporting the key principles of a new pathway for the LPG industry.

Given the nature of the LPG industry, it will inevitably span Federal, State, and local Departments across areas such as taxation, industry, resources, infrastructure and procurement policies.

Creating a policy setting that recognises the contribution and strategic value of the gaseous fuels industry to the domestic automotive and the broader Australian economy can provide certainty and set a new industrial agenda.

Integrating government strategic frameworks such as the *Strategic Framework for Alternative Transport Fuels* with industry mechanisms such as the ATS will leverage our national resource advantages and foster automotive industry innovation. This could provide a strategic focus through which the Australian automotive industry can strengthen a niche position within the global automotive context.

3.2 The need for a transition phase

Achieving industry reform successfully can be a complex process. Inevitably, the vision for a sustainable industry into the future results in difficult changes from the current state scenario.

The Australian LPG sector is no different. The bold vision being proposed by the industry will require significant change over the medium term period, and the GEA-VACC understands the need to ensure an effective transition phase.

To be successfully implemented, this transition needs to have the following characteristics:

- The ability to provide time for key industry stakeholders to adjust their business operations to succeed in the new paradigm. This will include a range of issues associated with a greater focus on innovation, through to enhanced skills and training activities.
- Undertaking the consumer information and marketing campaign aspects of the plan. This will focus on highlighting the performance, cost and safety advantages of LPG as a transport fuel.
- The need to properly design, plan and develop the Centre of Excellence concept. A collaborative approach to this will ensure that the optimal number of industry stakeholders identify a role in the reformed sector.
- The ability for organisations which may not be viable in the long term to seek merger opportunities with other stakeholders, or identify adjacent industry opportunities that will provide sustainability in their particular circumstances.

There are a number of aspects to the Government policy and program settings required to oversee this transition period.

Federal Government policy decisions have contributed to the recent sharp decline in the growth of autogas vehicles. This has included increasing amounts of fuel excise on autogas from 2011, while at the same time granting an excise exemption for biofuels until 2021. Cuts to the value of LPGVS grants, the capping of the uptake and the decision to terminate the program on 30 June 2014 has compounded this impact. It has also reinforced public perceptions that the Federal Government no longer supports LPG and that the rate of excise on autogas would be soon increased to that applying to petrol and diesel.

From now until the CoE model becomes operational, this Submission recommends the adoption of transitional measures to prevent further rundown of the LPG industry's physical and human capital. These might include an extension of the current LPGVS (or equivalent grant support) and/or a pause in the current scheduled increases in the amounts of fuel excise on autogas.

RECOMMENDATION 4: That the Federal Government supports the LPG industry's shift to the new Centre of Excellence model and the retention of existing industry capability by providing transitional assistance until the new approach is fully operational, which may involve:

- Pausing the current scheduled increases in the amounts of fuel excise on autogas
- Temporarily extending the LPGVS program
- Providing a competitive grants program.

3.3 Centre of Excellence for LPG automotive manufacturing

Having considered the current state of the industry and the opportunities for future growth, GEA-VACC has developed a new framework that would transform the LPG industry to drive competitiveness, quality and innovation. The core of the new framework is the establishment of an LPG automotive Centre of Excellence (COE) and manufacturing scale LPG conversion centres.

3.3.1 Centre of Excellence as part of the pathway for change

The GEA-VACC's proposed new pathway involves the establishment of an LPG Centre of Excellence. The Centre of Excellence would be a hub for R&D and quality assurance activity for the LPG conversion industry.

It would undertake a range of activities including new product certification, emission reduction validation, and the development of production processes.

It would serve to drive and coordinate collaborative R&D in automotive LPG technologies and conversion processes across the LPG manufacturing value chain.

Further, as envisaged by this Submission, it would play a critical industry development role in technical areas including regulatory reform and identifying opportunities to export Australian developed technologies to emerging LPG markets.

Dedicated conversion centres would be world-class facilities focusing on achieving economies of scale in LPG conversions. These centres could potentially utilise infrastructure and skills released from the automotive manufacturing industry. Given the scale economies of this model, it is expected that there would be a shift in the conversion market over time from its current fragmented structure towards a small number of conversion centres.

Case study - Manufacturing-scale conversion centres in Australia

While not yet as large scale as those in Europe or the United States, manufacturing scale conversion centres are also becoming a feature of the Australian automotive market. IMPCO Technologies-BRC is the world's largest gaseous fuels automotive systems businesses and is listed on the NASDAQ stock exchange. Since commencing operations in Australia in 1996 in Cheltenham (Victoria), IMPCO Technologies has developed an installation and service network comprising over 200 SMEs nationally. It has established a major complex in Dandenong South that includes 'Delayed-OEM' facilities that enables large scale installations of LPG systems prior to vehicle registration within 24 hours through a high quality automated process. It offers conversions on a range of locally made and imported vehicles.

3.3.2 Benefits of a Centre of Excellence approach

The Centre of Excellence and manufacturing-scale conversion centres approach is consistent with the key principles that were outlined in Section 3.1 and generates a range of benefits compared to the current fragmented state of the industry. These include:

- *Reduced conversion costs* - By utilising a dedicated manufacturing facility that has been set up for high volume conversions, the cost to the consumer falls significantly. While conversions currently cost approximately $3,500, industry consultations by GEA-VACC and international experiences suggest that this cost could be substantially reduced.
- *Improved quality and consistency* – A dedicated facility will draw upon the world class manufacturing and quality assurance skills that have been developed in the automotive industry and apply them to the conversion process. This will ensure that converted vehicles will have the same degree of reliability as a factory fitted LPG, which should satisfy both MVPs and consumers.
- *Greater consumer choice and competition* – By aggregating demand by Australian consumers for a certain locally made or imported model to be converted to LPG, it becomes more economical to undertake the R&D, testing, certification and industry development activities that is required to offer that vehicle to the market as an in-line LPG product. This gives consumers a greater range of LPG vehicles in the market to choose from.

GEA-VACC also acknowledges that the move to a model encompassing a CoE and manufacturing scale conversion centres will involve significant change for the LPG industry. It is prepared to work with all segments of the industry to facilitate this change. It recognises that under the model LPG installers and converters, many of which are SMEs, would transition their businesses to undertaking LPG service and repair activities. GEA-VACC is committed to working with these businesses through the transition and would provide the necessary training and development.

3.3.3 Developing the Centre of Excellence proposal

While it generates significant benefits, GEA-VACC recognises that the adoption of a CoE model will involve a range of challenges, including winning support from local and international MVPs and government

It is envisaged that an industry taskforce comprising of stakeholders from the automotive LPG industry, vehicle suppliers, automotive research bodies, government and representatives from the motoring community being involved in the assessment of the CoE model.

RECOMMENDATION 5: That an industry taskforce comprising stakeholders from the automotive LPG industry, vehicle suppliers, automotive research bodies, government and representatives from the motoring community be established to develop the Centre of Excellence model.

4 BUILDING A FRAMEWORK FOR SUCCESS

Understanding how to align the natural advantages of the LPG industry with the Australian automotive manufacturing industry to produce a competitive and productive value chain will rely on effective co-operation and collaboration amongst key stakeholders.

Industry understands its responsibility in leading the restructuring, and is looking to the Australian Government to provide the policy framework and funding support to help implement necessary transformations.

4.1 Promulgating industry leadership and investor confidence

The market is best-placed to make decisions on the most suitable pathway forward for establishing a dynamic Australian automotive manufacturing industry, including exploring options for effective alignment with the LPG industry. Through enabling industry to be the “catalyst for change”, commercial investment will be directed towards implementing a strategic option that will yield the most competitive returns.

It is critical that key industry decision-makers take a leadership role to jointly identify, develop and deploy a consumer-driven response to align supply chain activities with market demand. These are:

This framework will be shaped around four key strategic pillars and the set of guiding principles (outlined in section 3) to facilitate efficient supply chain co-ordination and unlock emerging drivers of demand.

- **Accelerate investment:** Facilitate capital investment in a customer-focussed LPG and automotive manufacturing integration strategy that engages directly with current market needs and excites future demand.
- **Innovate through research and development (R&D):** Gain the confidence of local automotive manufacturers and car importers by demonstrating the quality, reliability and value in supporting scalable LPG conversions in Australia.
- **Transition manufacturing and service capacity and capability:** Access and re-purpose the physical and human assets to support the entire LPG and automotive manufacturing supply chain (R&D, manufacturing and servicing).
- **Stimulate market uptake**: Instigate demand for LPG vehicles in Australia by engaging in a targeted engagement campaign that directly aligns vehicle benefits with user objectives, particularly through negotiations with commercial fleets.

A taskforce will be established to engage representatives of industry and relevant industry associations in a structured and transparent conversation around developing a framework for aligning the LPG industry with a future automotive manufacturing industry.

Table 1 identifies the key LPG and automotive supply chain participants in the Taskforce and why, in the view of GEA-VACC, each stakeholder should be involved in a constructive dialogue to establish a pathway forward.

Table 1 Taskforce industry participants

Representative Group	Reason of involvement	Representatives
Leaders of the LPG vehicle industry	Articulate objectives of current LPG supply chain participants to co-design a future pathway that supports greater alignment with Australian Automotive industry	Gas energy Australia VACC LPG system manufacturers LPG providers (e.g. Elgas)
Leaders of the Australian automotive industry	Engage the leaders of the Australian Automotive industry in a discussion about how the LPG industry can support a future for automobile manufacturing in the country.	FCAI CEOs of Australian Manufacturers
Australian vehicle manufacturers and suppliers (importers)	Secure support of local and overseas car manufacturers in the reliability and cost-competitiveness of LPG vehicles.	Toyota Australia Holden Australia Mitsubishi Motors Hyundai
Automotive research bodies	Provide real time intelligence on innovations to realise LPG vehicle product improvements.	Melbourne University (School of Mechanical Engineering) Auto CRC
Representatives of the Australian private equity and venture capital industry	Create interest from niche venture capitalists in the delivery of innovative technologies in the Australian Automotive sector	Alex Capital Partners Claymore Capital
Representatives of the Australian motoring community	Excite uptake and reposition LPG vehicles as a viable and efficient future car for buyers	NRMA RACV RACQ AAA

To reinforce the theme of this submission, we are seeking a supportive policy framework from government to provide the backdrop for industry to deliver on this opportunity.

4.2 Utilise GEA-VACC as key advocates to co-ordinate LPG industry and automotive manufacturing industry dialogue

The GEA and the VACC are in a unique position to broker the cross industry collaboration needed to develop and deliver industry leadership for effective integration to occur between the LPG and automotive manufacturing industry.

Through leveraging the collective membership base of these organisations, which includes representatives all current supply chain participants, both the GEA and VACC have commenced the process of securing the involvement of critical industry stakeholder in the formation of the Taskforce.

Both organisations have the capability to articulate the benefits and outcomes of participating in a joint industry dialogue and are well placed to shoulder a key role in co-ordinating the development future options for the alignment of the LPG and automotive manufacturing industry.

These organisations would also provide availability to government on behalf of the industry for the achievement of the goals we set around the industry's contribution to the Australian economy.

4.3 Support for gaseous fuels as part of a new automotive policy and funding framework

The Australian Government currently supports the automotive industry through the Automotive Transformation Scheme (ATS) which *aims to encourage competitive investment and innovation in the Australian automotive industry and place it on an economically sustainable footing*[52].

This policy and funding framework was established with recognition of the strategic importance of the automotive industry to Australia, being a traditional source of investment, jobs and innovation with flow-on benefits to other industries.

The scheme has a legislated 10 year implementation timeline with delivery over two stages:

- Capped assistance of $1.5 billion from 2011 to 2015 (Stage 1).
- Capped assistance of $1 billion from 2016 to 2020 (Stage 2).

Participants of the ATS are entitled to receive assistance in the form of quarterly cash payments for

- 50 per cent of the value of eligible investment in R&D.
- 15 per cent of the value of eligible investment in P&E.

Given the opportunities available for the gaseous fuels industry to help re-position the future competitiveness and productivity of Australia's automotive manufacturing industry, there is a viable business case for extending eligibility under the Automotive Transformation Scheme to help transform the LPG industry through the establishment of scalable LPG manufacturing and conversion centres.

By the Australian Government supporting a market-led pathway to better integrating the gaseous and automotive manufacturing supply chain, industry will be provided with a platform to:

- Develop and commercialise innovative gas technologies for new Australian manufactured vehicles and for LPG conversion of imported petrol and diesel powered vehicles;
- Maintain and expand the capacity and capability of Australia's automotive manufacturing industry through a transitionary period; and
- Support the adaption of existing and emerging small and medium operators within the LPG and automotive manufacturing industry to changing operating conditions.

4.3.1 Recommended amendments to ATS to support gaseous fuels industry integration with automotive manufacturing industry

Registration for the Automotive Transformation Scheme (ATS) is based on the applicant satisfying prescribed eligibility requirements, which vary from category to category. The existing ATS categories are:

- Motor vehicle producers – MVPs.
- Automotive component producers – ACPs .
- Automotive machine tools or automotive tooling producer – AMTPs.
- Automotive Service Providers – ASPs.

All categories involve the manufacture or provision of a certain level of original equipment related activity. Original equipment is currently defined in Regulation 1.5 of the *Automotive Transformation Scheme Regulations* 2010.

ATS is currently only available to entities who undertake certain levels of original equipment related activity which is ultimately provided to a motor vehicle producer.

The industry believes there is substantial scope to utilise the ATS program to drive a number of the industry and economic outcomes we have highlighted.

[52] AusIndustry, Automotive Transformation Scheme, accessed at http://www.ausindustry.gov.au/programs/manufacturing/ats/Pages/Fact-Sheet.aspx

RECOMMENDATION 6: That the Australian Transformation Scheme be amended to enable the LPG industry to have greater access to the program for:

- Manufacturers of LPG componentry, including under-bonnet and refuelling equipment
- R&D services providers who are driving the industry effort around innovation.

ATS should include LPG fitment as a dedicated fuel system on the assembly line, conversions applied between the showroom and consumer, and conversions applied to imported new vehicles before sale considered as eligible activity for company participation in the program.

The industry is seeking to consult with the Government regarding relevant activity levels to support this participation.

5 CONCLUSION

The GEA-VACC share a common vision for greater alignment between the LPG and Australian automotive industries to provide a viable pathway for overcoming the challenges facing this country's declining domestic automotive manufacturing footprint.

There are inherent economic and environmental advantages of LPG, and the international experience in countries that have embraced technological innovation provides a powerful demonstration of the opportunities that it can generate. Through an industry led approach supported by an appropriate Government policy setting, Australia can exploit the natural comparative advantage it has in LPG, to the benefit of the local automotive industry and broader economy. Importantly this extends to the ability to ease cost of living pressures for the consumer.

The establishment of an industry-led **Centre of Excellence** (CoE) framework will provide a world-class facility which focusses on achieving economies of scale in LPG conversions as well as undertaking new product certification, emission reduction validation, and the development of production processes. The CoE framework will serve to drive and coordinate collaborative R&D in automotive LPG technologies and conversion processes across the LPG manufacturing value chain.

The GEA-VACC puts forward six recommendations to industry, researchers and government to support the CoE framework.

Recommendation 1: That the Australian Government provides funding to GEA-VACC to support the implementation of the AA2020 Roadmap gaseous fuels agenda.

Recommendation 2: Through collaboration with the Australian Centre of Excellence that all State and Territory governments give consideration to the adoption of a nationally consistent LPG conversion regulatory and enforcement regime.

Recommendation 3: To be conducted by the LPG Centre of Excellence that the Australian Government, MVPs and GEA-VACC jointly fund a study to scope the export potential for Australian LPG businesses in emerging global markets.

Recommendation 4: That the Federal Government supports the LPG industry's shift to the new Centre of Excellence model and the retention of existing industry capability by providing transitional assistance until the new approach is fully operational, which may involve:

- Pausing the current scheduled increases in the amounts of fuel excise on autogas
- Temporarily extending the LPGVS program
- Providing a competitive grants program.

Recommendation 5: That an industry taskforce comprising stakeholders from the automotive LPG industry, vehicle suppliers, automotive research bodies, government and representatives from the motoring community be established to develop the Centre of Excellence model.

Recommendation 6: That the Australian Transformation Scheme be amended to enable the LPG industry to have greater access to the program for:

- Manufacturers of LPG componentry, including under-bonnet and refuelling equipment
- R&D services providers who are driving the industry effort around innovation.

ATS should include LPG fitment as a dedicated fuel system on the assembly line, conversions applied between the showroom and consumer, and conversions applied to imported new vehicles before sale considered as eligible activity for company participation in the program. The industry is seeking to consult with the Government regarding relevant activity levels to support this participation.

GEA-VACC has a vision for the future of the LPG sector in Australia, and for the contribution it can make to the nation's automotive sector.

The LPG industry is ready to drive this transformation, and is seeking a supportive policy and program framework from the Australian Government.

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APPENDIX 1- ALLIANCE AUTOGAS CONVERSION CENTRE