

AUTOGAS

Clean and Economical Transportation Fuel



Autogas: A Convincing Case

In many parts of the world, vehicle emissions have already reached harmful levels and are contributing to serious urban air quality problems. Moreover, increasing economic activity, population and prosperity will place continued upward pressure on the global demand for mobility, thereby causing an increase in emissions unless alternative solutions are adopted. Draconian measures to curb mobility and emissions are politically unacceptable, and “breakthrough” technologies, such as fuel cell and hydrogen vehicles are years away from commercialisation.

AUTOGAS FACTS

- A proven and reliable transportation fuel that has been used in automobiles, trucks, buses, and a variety of off-road vehicles since the 1960s.
- Autogas is a clean-burning, high octane, abundant, environmentally friendly transportation fuel.
- Due to its low emissions characteristics, autogas is considered a clean, “alternative fuel” – and has been promoted as an effective measure for reducing urban air pollution.
- Autogas holds the largest worldwide market for alternative fuels, where it is efficiently utilised in a wide range of vehicles.



Autogas = Solutions

Autogas stands out as the alternative fuel of choice for governments looking to minimise noxious, toxic pollutants and greenhouse gases.

- Autogas is a practical solution, featuring a unique mix of environmental, operational and economic advantages.
- Autogas demonstrates a proven solution, featuring over 7 million vehicles in operation worldwide.
- Autogas can provide a public policy solution, meeting consumer needs when governments encourage the transition to cleaner fuels.

What is Autogas?



Liquefied Petroleum Gas (LPG or LP Gas) used as an automotive engine fuel.



Clearly recognised as a viable alternative transportation fuel, autogas is the market leader in alternative fuels for the automotive sector. Known around the world as:

Autogas = Automotive LP Gas = LPG = GPL = GLP = Propane

Economic Solutions

Autogas features a variety of inherent practical and cost advantages over gasoline, diesel and other alternative automotive fuels. Today, autogas simply makes economic sense: fuel costs are competitive and the cost of establishing the

distribution network and converting vehicles are low relative to most other alternative fuels. These advantages increase for fleets operating vehicles such as delivery vans, taxis, and buses all of which are highly amenable to autogas conversion.

LP Gas and Transportation Industry Part of the Solution



Naturally, there is an important role for industry including vehicle manufacturers, converters, suppliers, and potential fleet operators to use their experience in expanding autogas into new markets.

Industry stakeholders acting together can eliminate much of the uncertainty surrounding increased autogas use, thereby lowering the risks of investment and improving the potential for market expansion.

Automotive Manufacturers

In recognition of public concern and demand for cleaner vehicles, virtually all of the major automotive manufacturers have introduced vehicles powered by clean, efficient autogas. New engines have been specifically engineered to run on autogas, featuring the same driving performance and acceleration consumers have come to expect with gasoline vehicles.

GAIN Industry Initiative

The Global Autogas Industry Network (GAIN) has been formed to capitalise on the experience of industry leaders and policymakers who have pioneered the expansion of autogas solutions. GAIN is forging and coordinating relationships

Fuel systems and electronic engine management systems have been fully adapted for autogas. Some models also support dual fuel systems that allow the driver to effortlessly switch from autogas to gasoline, thereby eliminating driving range concerns.

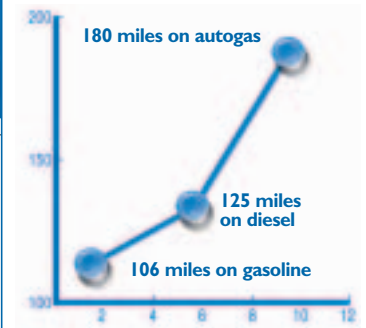
Manufacturers have also upgraded safety features with improved technologies. The gas tanks have been subjected to truly rigorous tests and are much stronger than comparable gasoline tanks. Moreover, an autogas vehicle has a closed and environmentally-sound fuel system which prevents fuel spillage and evaporation.

In terms of convenience, manufacturers are designing cars around the gas tanks, placing them under the floor or luggage compartment to ensure that valuable passenger space is not compromised.

with all industry stakeholders, active in the autogas industry.

For up to the minute information on GAIN initiatives regarding news on the global autogas industry, please check our website at www.worldlpgas.com/gain

• In most countries, autogas features a price advantage over gasoline. For example, on £10 worth of fuel, the average car will travel:



Source: LP Gas Association (UK) 2001

Autogas Suppliers

Autogas is not a new fuel requiring complicated refining processes or engine technologies. Reliable, clean and convenient LP Gas has been used for years. The existing global production and distribution facilities ensure an abundance of easily transportable product necessary for reliable future supply.

Consumption of autogas has steadily increased from 1990 to 2002. With the right mix of investment and government leadership, autogas can continue to contribute to future air quality improvements.



Environmental Solutions



Autogas is an outstanding fuel for vehicles that must comply with increasingly stringent emission requirements. Low emissions of particulates (PM), carbon monoxide (CO), nitrogen oxide (NOx), and non-burned hydrocarbons (HC) enable autogas to outscore conventional fuels and most alternatives for environmental benefits. It also plays an important role in mitigating climate change, because it has among the lowest life-cycle greenhouse gas emissions of all commercially available fuels. Moreover, auto-

gas is a non-toxic and non-poisonous fuel that will not contaminate aquifers or soil if spilled. Additionally, investments in the autogas refuelling infrastructure could later supply clean fuel necessary for advanced future technologies, such as fuel cells or hydrogen.

Autogas is simply a clean transportation fuel. Its impressive environmental benefits are influencing fuel choice decisions, and are rapidly driving increased use in many countries.

Autogas does not contain heavy metals and its sulphur content compares favourably to ultra low sulphur petrol (ULSP) and ultra low sulphur diesel (ULSD); in tests on the latest Euro III vehicles, autogas demonstrated clear environmental advantages over ULSP and ULSD.

Compared to gasoline, autogas yields:

- 50% less carbon monoxide
- 40% less hydrocarbons
- 12% less carbon dioxide
- 35% less oxides of nitrogen
- 50% less ozone forming potential

Source:TNO

Autogas Environmental Performance

Tailpipe emissions [g/km]	Autogas	Diesel	Gasoline
Particulates (PM)	< 0.001	0.040	0.001
Nitrogen Oxides (NOx)	0.04	0.40	0.06
Hydro Carbons (HC)	0.05	0.06	0.08
Greenhouse Gas (CO ₂)	170	170	190
Carbon Monoxide (CO)	0.3	0.5	0.6

Source:TNO

The chart shows that emissions of autogas are considerably lower than diesel emissions. For diesel engines it will be more and more

difficult to meet future standards, especially as it is expected that they will become technology neutral.

Governments Can Make a Difference

Market barriers can be solved with incentives from policymakers.

Despite the environmental and economic advantages that favour the promotion of autogas, it still faces critical barriers to market entry. The costs of purchasing and/or converting vehicle engines or modifying refuelling

infrastructure can initially be higher than continuing dependence on conventional fuels. However, these are initial obstacles and do not extend over the lifetime of the vehicle. Investments in autogas can actually generate savings in the longer term.

INCENTIVE PROGRAMS CUT COSTS AND HASTEN SAVINGS

Government-sponsored conversion grants significantly reduce the initial cost of switching to autogas. Combined with the lower fuel costs, autogas users are limiting the payback period on autogas vehicles enhancing the attractiveness to switch.

Policymakers have the opportunity to help consumers understand the longer-term benefits of their vehicle purchase decisions.

Education and energy policy leadership, along with the rationalisation of regulatory programmes, technology development, and vehicle availability, are the pathway to a cleaner future - fuelled by autogas.

Clear and concise long-term government policies are required to expand the use of autogas, enable industry to invest in clean vehicle production, and provide consumers with choices and confidence in purchasing a clean autogas vehicle.

These actions make sense because environmental protection is essential to good governance, especially as policymakers increasingly recognise public concerns for action on limiting urban air pollution and global warming.



Implementing appropriate government policies for expanding autogas use is possible in the near-term.

Policymakers have a wide range of tools at their disposal, including:

- Fiscal and financial measures such as excise duty exemptions or rebates, grants or tax credits for vehicle purchases or infrastructure investment

and accelerated depreciation for vehicle conversions and purchases.

- Regulatory measures such as alternative fuel vehicle purchase requirements for fleets, appropriate health and safety standards and exemptions from city-driving restrictions.
- Technology development, including direct funding for research, development and demonstration.



- Other measures such as voluntary agreements with city authorities and fleet operators on introducing alternative fuel vehicles and information dissemination programmes.



Safety First

While there is considerable awareness of the environmental and economic benefits of autogas, it is also important to note that autogas is an especially safe fuel for vehicle applications.

- New autogas vehicle tanks are manufactured to meet or exceed the most stringent standards. They are constructed from carbon steel or composites and are more puncture resistant than typical gasoline, methanol or ethanol tanks.
- Modern autogas fuel systems are protected by advanced pressure regulators and excess flow valves, adding to the overall safety of an autogas vehicle.
- Autogas has the lowest flammability range of any alternative fuel. If it leaks, autogas liquid quickly evaporates. Moreover, autogas will not ignite unless the source of ignition reaches at least 504 degrees Celsius-compared to only 221 to 260 degrees Celsius for gasoline.

Additional Information

The World LP Gas Association has recently published two new documents exploring the wide scope of autogas solutions.

- “Developing a Sustainable Autogas Market - A Guide for Policymakers” explores the potential role autogas can play in improving air quality, and offers a roadmap through the challenging process of formulating and implementing sound public policies and environmental programmes.
- “Clearing the Air - A Technical Guide on Autogas - Emissions, Test Methods, Standards and Technology” delineates the range of environmental standards that are rapidly being established for new vehicles. The study examines emissions data, and clearly highlights where autogas outscores other transportation fuels in terms of reduced pollutant and greenhouse gas emissions.



WORLD LP GAS ASSOCIATION

**9, rue Anatole de la Forge
75017 PARIS - France
Phone : (33) | 5805 2800
Fax : (33) | 5805 2801
www.worldlpgas.com**

