

VISION *for* AUTOGAS

Liquid Gas
Europe





.....
Even though the market share of alternative-powered vehicles is increasing, **over 90% of all new cars registered in 2018 ran on petrol and diesel.**
.....

Setting the Scene

Despite gains in fuel efficiency, emissions from the transport sector represent about a quarter of total Greenhouse Gas (GHG) emissions in the EU and remain higher than 1990 levels due to an increase in mobility demand.

Within this sector, road transport is by far the biggest emitter accounting for more than 70% of all transport GHG emissions.

- + However, alternative solutions exist today. Autogas has a significant role to play in delivering on the EU's decarbonisation and air quality objectives, particularly from the existing fleet, which can be retrofitted to LPG
- + The internal combustion engine will continue to be the primary powertrain technology for the short to medium-term in a context of climate and air quality challenges
- + All available solutions will be necessary to reach EU targets and therefore a technology-neutral approach is key
- + The market share of EVs is still marginal at less than 1% of the existing fleet and expected to only represent 10-15% in 2030 based on the incentive mechanisms in the post-2020 CO₂ standards
- + Autogas is a clean, efficient, cost-effective and safe solution, which is available now
- + Beyond 2030, BioLPG has the potential to lower its CO₂ emissions by 90%¹. BioLPG is ready for tomorrow and can play a key role in the Commission's long-term decarbonisation strategy

Liquid Gas Europe commissioned a study by the Belgian research centre TM Leuven to assess the societal and environmental impacts of an increase in LPG market share². This Autogas Vision presents the results of a scenario assuming a high Autogas and Electric Vehicle (EV) uptake from 2020-2050.

¹Atlantic Consulting (2018). "BioLPG: A survey of markets, feedstocks, process technologies, projects and environmental impact". Commissioned by Liquid Gas Europe.

²The projections are based on MOVEET, an updated version of the TREMOVE model, which was aligned with the latest PRIMES-TREMOVE scenarios used by the European Commission for impact assessments.

The Mobility Challenge

There are 250 million cars on European roads creating societal and environmental challenges, and demand for mobility keeps growing.



Climate change

Road transport is responsible for almost a quarter of the EU's GHG emissions, and it's the only sector where emissions kept growing in the last decade. The EU has an aim to reduce transport emissions 60% by 2050 in light of Paris Agreement targets and is currently looking at different scenarios on reaching carbon neutrality by mid-century.



Air pollution

NOx and particulate matter (PM) emitted by road vehicles has surged as one of the most critical issues, especially in urban areas. Air pollution is responsible for over 400,000 premature deaths in Europe each year, and yet several Member States are currently in breach of European ambient air quality laws.



Reliance on oil as energy source for transport

Over 95% of existing road vehicles are still conventionally fueled. The number of vehicles running on alternative energies in the EU remains very low, at around 4.1%. Market barriers continue to prevent consumer uptake and mass deployment, impacting energy security and the environment.



Evolving consumer choices

In the wake of the Dieseldate scandal, sales of new diesel cars are decreasing in the EU to the benefit of petrol cars. In the 4th quarter of 2018, diesel market share fell to 34% while petrol new car registrations rose to 57%. All alternatively-powered vehicles combined account for only around 8% of new car sales, mainly due to consumers' lack of awareness, misperceptions, and instability in incentive policies.

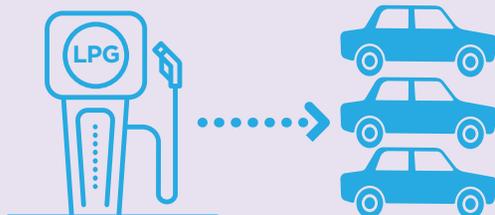
About Autogas

A proven solution available now

Autogas is the **number one alternative fuel** in the EU, currently making up 3% of all alternative fuels and counting 8 million vehicles.

Autogas is...

Used as a **road transport fuel**, also called LPG or propane.



LPG is easily...



Transported as liquid



But has **all the benefits of a gas**

LPG is a co-product of...



Natural Gas

or



Oil Production

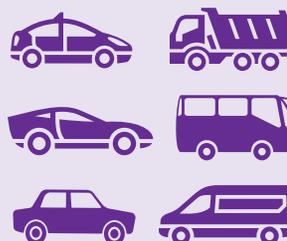
and thus resource efficient by its very nature



60%

of all LPG produced globally derives from natural gas extraction

The cost of purchasing a new LPG car (**out of the 60+ models available in Europe**) or converting an existing petrol car is quickly recovered by the driver



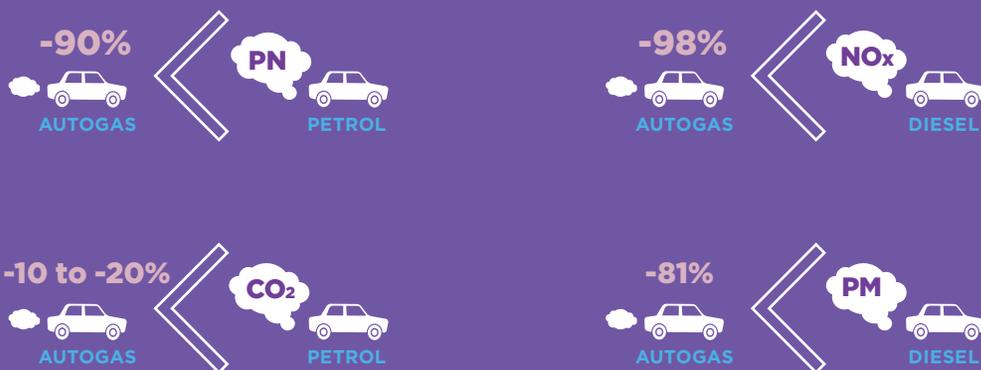
Autogas is suitable for cars, vans, trucks and buses. Individual drivers can choose their new LPG car among 60+ models, produced by the biggest car brands with full manufacturer warranty and other benefits. Alternatively, most petrol vehicles on the road today can be easily and safely converted to LPG.

The Opportunity

Autogas is an affordable and proven solution to address both CO₂ and pollutant emissions

Clean transport, today...

On average, compared to diesel, Autogas emits almost no polluting particles and up to 20% less CO₂ than petrol, measured **under real driving conditions**.



BioLPG...

The industry has recently started distributing BioLPG in small, but growing quantities. This renewable fuel can reduce CO₂ emissions by up to 90% compared to current LPG.

Renewable LPG can be blended with conventional LPG or can fully substitute it with no impact on the engine.



Cost-effective

- + Most petrol vehicles in the market can be easily and safely converted to Autogas
- + The cost of converting a car to Autogas is relatively low: between EUR 500 and 2,000
- + Autogas is a competitive fuel: the price of a litre of Autogas is 57% cheaper than petrol and 53% cheaper than diesel on average in Europe
- + The total cost of ownership of LPG is lower than gasoline and diesel. As such, higher LPG uptake leads to lower costs to the user
- + Cost of building a LPG station: EUR 80,000 to 200,000



Autogas drivers can fill up at one of the 31,000 refuelling stations in the EU

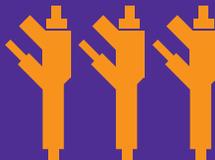


Autogas is increasingly used in combination with an electric motor in hybrids, which offers the best of both worlds...

Autogas is continuously evolving...



...and engines are becoming even more efficient.



Manufacturers are switching to direct injection engine, which produces substantially lower emissions.

The Vision

The Commission's long-term decarbonisation strategy

The Strategy shows that Europe can lead the way by investing into realistic technological solutions that ensure that this transition is socially fair and addresses environmental challenges.

Autogas can contribute to meeting 2030 targets and BioLPG has the potential to meet 100% of European LPG demand by 2050.

The existing fleet 250 million vehicles

LPG can not only help address the EU's long-term strategy, but also can have a direct impact on emissions from the existing car fleet. There are currently 250 million passenger cars on the road today with an average life span of 11 years, and up to 17 years in Eastern Europe.

EU legislation only addresses emissions from new cars, with delayed effects. Converting existing vehicles to Autogas now is cost-effective and can accelerate road transport emissions reduction efforts.

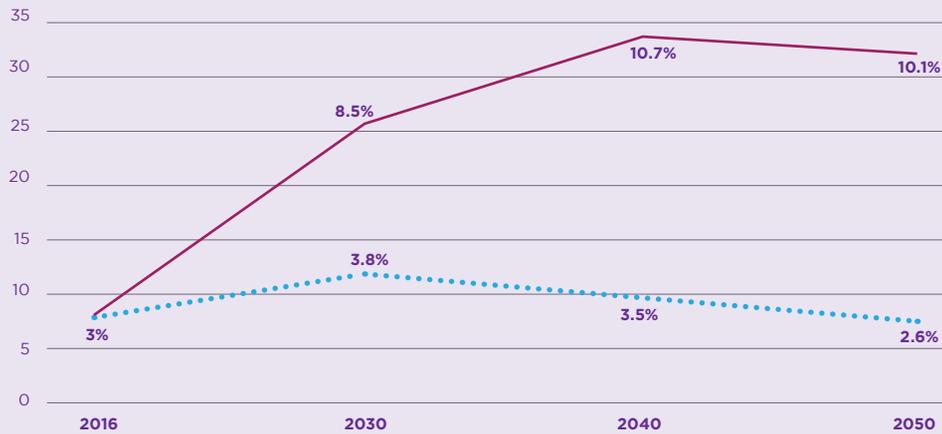
Our scenario **EVs and Autogas together**

Autogas is increasingly used in combination with an electric motor in hybrids, which offers the best of both worlds. In our scenario, a comparison of low and high EV uptake shows that LPG savings do not come at the expense of electromobility but actually complement it.

LPG can support air quality and mitigation strategies in the short to medium-term when EV market share will be low. Regardless of the uncertain EV-uptake scenario, the LPG potential is evident and is a no regrets solution, covering the period until zero-emission vehicle sales ramp up.

Study Results

Number of LPG vehicles under a baseline vs a projected growth scenario (in millions of vehicles)



With the right policies in place, the total fleet of Autogas vehicles could reach a peak market share of 10.7% in 2040.

Cumulative emissions reduction in the EU under the projected growth scenario to 2050

Higher LPG uptake leads to significant emissions reductions of harmful pollutants.



The environmental and societal benefits equal **18.7 billion euros in 2050.**

Call to Action for Policymakers

- 1 Speed up the implementation** of the Directive on Alternative Fuels Infrastructure deployment
- 2 Raise consumers' awareness** on the availability and the benefits of alternative fuels through effective communications
- 3 Ensure technology neutrality** allowing all sustainable alternatives to compete fairly
- 4 Take a holistic approach** considering well-to-wheel or life-cycle analysis when establishing emissions standards. LPG is among the cleanest fuels on a well-to-wheel basis
- 5 Ensure consistency** across policy areas to effectively promote alternative fuels in a coherent manner
- 6 Develop a strategy** to address emissions from the existing fleet, the 'old cars', by promoting their replacement or retrofit to LPG
- 7 Continue the application** of low excise duty on Autogas reflecting its lower environmental impact. As evidenced, any limited reduction in excise revenue is compensated in the form of a reduction of external costs stemming from the benefits of Autogas on the environment and public health compared to conventional fuels
- 8 Adopt measures,** such as exemptions from congestion charges, free parking, access to 'high occupancy lanes' and to restricted city centres during peak pollution periods to vehicles powered by alternative fuels, such as Autogas
- 9 Ensure the preference** for cleaner alternatives, including Autogas, in public procurement tenders



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**Liquid Gas
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LPG – The Smart
Alternative,
Everywhere
You Need It