

Measuring emission performance of Autogas cars **IN REAL DRIVING CONDITIONS**



LPG
EXCEPTIONAL ENERGY



European
LPG
Association

EUROPEAN LPG ASSOCIATION

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OUR APPROACH



European
LPG
Association

CLARIFY AUTOGAS VEHICLES' PERFORMANCE IN TERMS OF CO₂ AND POLLUTANT EMISSIONS

- ✓ Proactive testing programme undertaken by the LPG industry, as a commitment to transparency and accuracy
- ✓ Overcome the limits of tests in laboratories by reproducing real driving conditions
- ✓ Based on state-of-the-art test procedures, RDE and WLTP/C, to become mandatory in the EU in September 2017
- ✓ Make it possible to compare the environmental performance of Autogas with traditional fuels (diesel and gasoline)
- ✓ Measure simultaneously a number of GHG and pollutants: CO₂, CO, NOx, HC, particle number
- ✓ For comparison purposes, one vehicle was also tested in its Euro 6 diesel version, with a particulate filter

FIVE VEHICLES TESTED BETWEEN 2015 AND 2016



ALFA ROMEO MITO

EURO 5 HOMOLOGATED; LPG SYSTEM
RETROFITTED (PORT INJECTION);
MILEAGE OF 65,000 KM



SKODA OCTAVIA

EURO 6 HOMOLOGATED; LPG SYSTEM
RETROFITTED (DUAL INJECTION);
MILEAGE OF 74,000 KM



FIAT 500L

EURO 6 HOMOLOGATED; ORIGINAL LPG VEHICLE
FROM MANUFACTURER (PORT INJECTION);
MILEAGE OF 6,300 KM



KIA SPORTAGE

EURO 5 HOMOLOGATED; LPG SYSTEM
RETROFITTED (DIRECT INJECTION);
MILEAGE OF 27,000 KM

OPEL ASTRA

EURO 5 HOMOLOGATED; ORIGINAL LPG VEHICLE
FROM MANUFACTURER (PORT INJECTION);
MILEAGE OF 71,000 KM



RDE

REAL DRIVING EMISSIONS, RULED
BY COMMISSION REGULATION (EU) 2016/646

WLTP/C

WORLDWIDE HARMONIZED LIGHT VEHICLES
TEST PROCEDURES/CYCLE

CO₂

CARBON DIOXIDE

CO

CARBON MONOXIDE

NOx

NITROGEN OXIDES

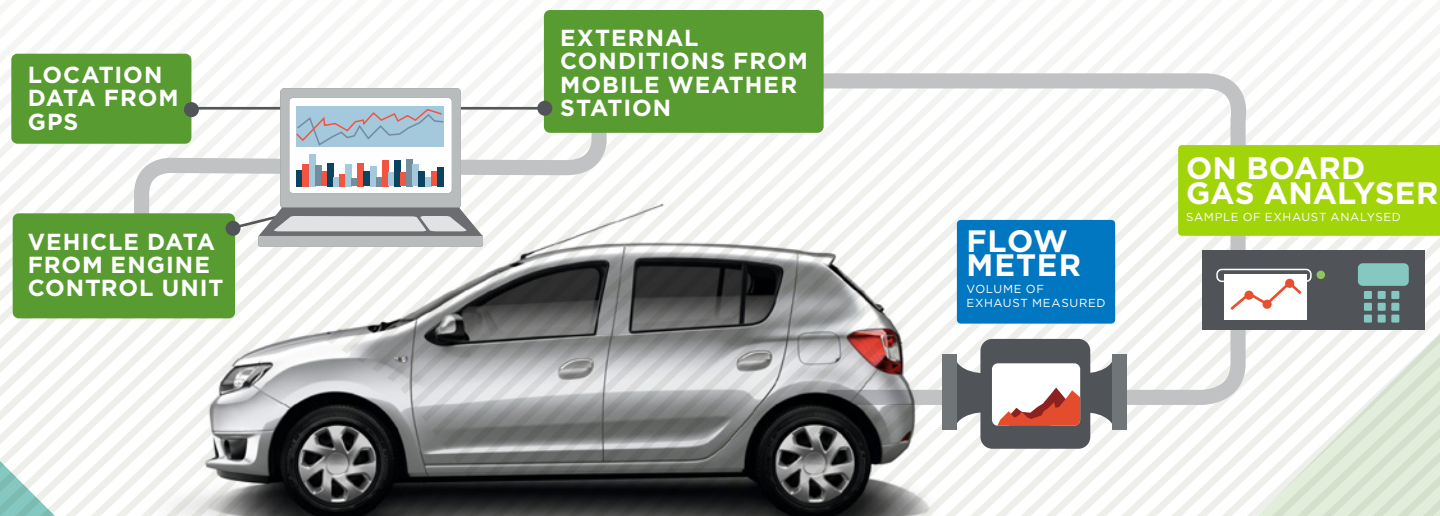
HC

HYDROCARBONS

METHODOLOGY

TESTS UNDERTAKEN BY INDEPENDENT EXPERTS IN TWO DIFFERENT COUNTRIES: THE UNIVERSITY OF APPLIED SCIENCES IN SAARBRÜCKEN, GERMANY, AND THE ENGINEERING CONSULTANCY V-MOTECH IN FRANCE

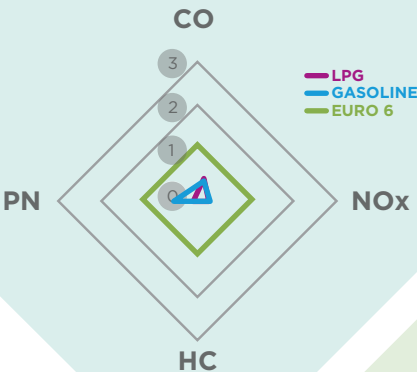
- ✓ Emission data collected by a Portable Emission Measurement System (PEMS) fitted on the cars
- ✓ Series of at least three tests on each model and in each fuel mode (LPG, gasoline and diesel) to guarantee quality, according to the provisions of the RDE Regulation, following a specific route with urban, rural and motorway segments
- ✓ Series of tests on WLTP/C for comparison purposes



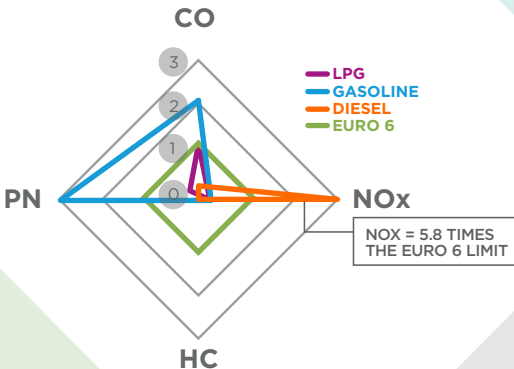
RESULTS OVERVIEW

EMISSION LEVELS IN
COMPARISON WITH
EURO 6 LIMITS

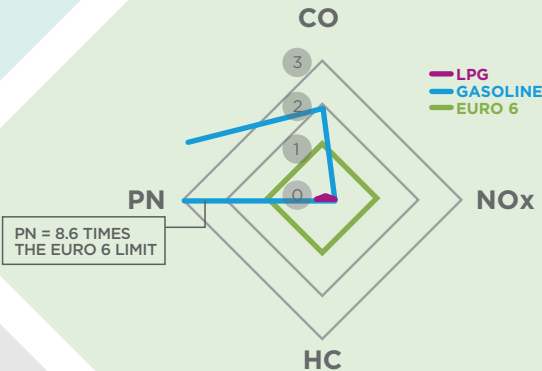
Car #1



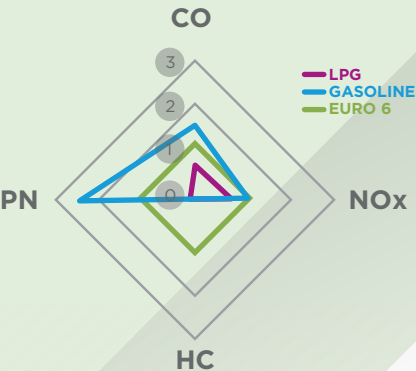
Car #2



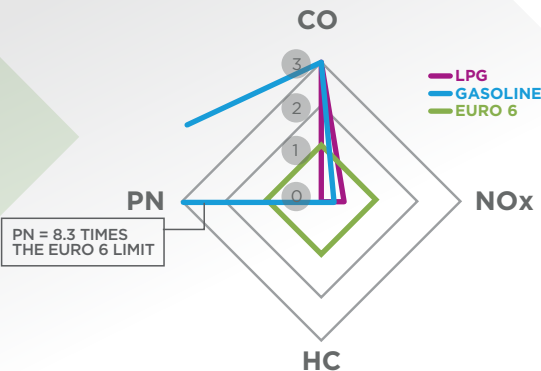
Car #3



Car #4



Car #5



*PN limit applicable to new vehicles with direct injection engines from 1 Sep 2017

CONCLUSION

AUTOGAS VEHICLES, EVEN OLDER CONVERTED CARS, BRING SIGNIFICANT REDUCTIONS IN NO_x AND PARTICLES EMISSIONS WHEN COMPARED TO EQUIVALENT DIESEL AND GASOLINE MODELS RESPECTIVELY.

✓ The WHO's air quality guidelines clearly identify NO_x and particles emissions from transport as causes of negative health effects.

IN ADDITION, AUTOGAS CARS ALSO BRING A 10-20% CO₂ GAIN COMPARED WITH GASOLINE EQUIVALENTS, HELPING EUROPE REACHING ITS CLIMATE CHANGE OBJECTIVES.

AVERAGE RESULTS FOR THE AUTOGAS VEHICLE COMPARED TO GASOLINE

CO ₂	CO	NO _x	HC	PN
-13%	-45%	SIMILAR	SIMILAR	-90%

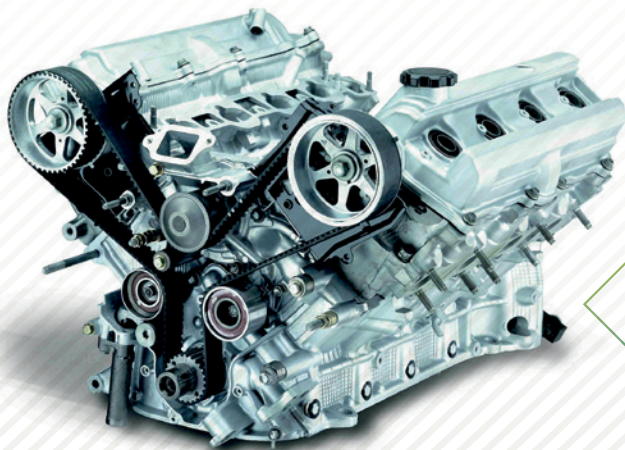
WHILE THIS RESULT CANNOT BE GENERALISED, THE SINGLE SERIES OF TESTS COMPARING AUTOGAS AND DIESEL (SAME CAR MODEL, SIMILAR ENGINE) SHOWS THAT LPG BRINGS A 98% REDUCTION IN NO_x EMISSIONS IN REAL DRIVING CONDITIONS.

AUTOGAS IS A PROVEN SOLUTION TO REDUCE TRANSPORT EMISSIONS, FOR REAL.



ABOUT **AUTOGAS**

- ✓ LPG used as on-road engine fuel
- ✓ Propane, butane or a propane/butane mix
- ✓ The most commonly used alternative fuel in the Europe:
14,7 million vehicles, served by over 46,000 filling stations
(EU28 + 7 neighbouring countries, 2015)
- ✓ More than 80 LPG models available from a dozen
car brands in Europe
- ✓ An environmentally friendly option for road transport



ABOUT AEGPL

AEGPL IS THE SOLE REPRESENTATIVE OF THE LPG INDUSTRY AT EUROPEAN LEVEL, REPRESENTING NATIONAL LPG ASSOCIATIONS AS WELL AS DISTRIBUTORS AND EQUIPMENT MANUFACTURERS FROM ACROSS EUROPE.

OUR MISSION IS TO ENGAGE WITH EU DECISION-MAKERS AND THE WIDER POLICY COMMUNITY IN ORDER TO OPTIMISE THE CONTRIBUTION THAT LPG - AS A CLEAN AND IMMEDIATELY AVAILABLE ENERGY SOURCE - CAN MAKE TO MEETING EUROPE'S ENERGY AND ENVIRONMENTAL CHALLENGES.



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