AEGPL **2016**

Measuring emission performance of Autogas cars

IN REAL DRIVING CONDITIONS

LPG
EXCEPTIONAL ENERGY

AEGPL EUROPE
European LPG Association

EUROPEAN LPG ASSOCIATION
RUE BELLIARD 15-17
B - 1040 BRUSSELS
BELGIUM
AEGPL@AEGPL.BE
WWW.AEGPL.EU
@AEGPL

OUR **APPROACH**

AEGPL EUROPE
European LPG Association

CLARIFY AUTOGAS VEHICLES' PERFORMANCE IN TERMS OF CO_2 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: CO_2, 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

FIAT 500L
EURO 6 HOMOLOGATED; ORIGINAL LPG VEHICLE FROM MANUFACTURER (PORT INJECTION); MILEAGE OF 6,300 KM

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

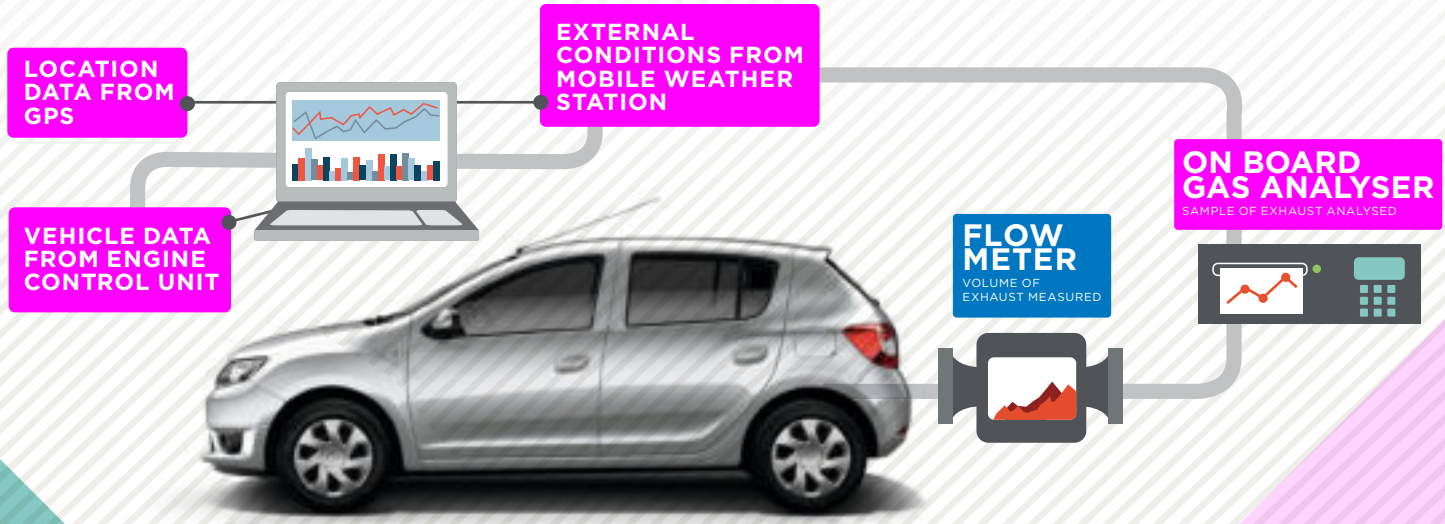
RDE	REAL DRIVING EMISSIONS, RULED BY COMMISSION REGULATION (EU) 2016/646
WLTP/C	WORLDWIDE HARMONIZED LIGHT VEHICLES TEST PROCEDURES/CYCLE

CO_2	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

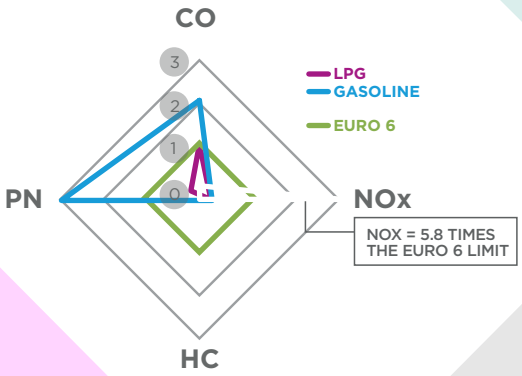


RESULTS
OVERVIEW

EMISSION LEVELS IN COMPARISON WITH EURO 6 LIMITS

Car #1

Car #2



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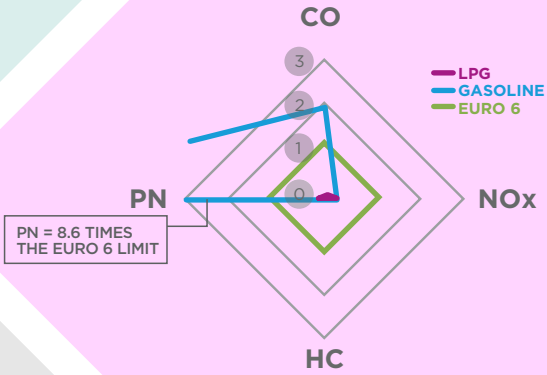

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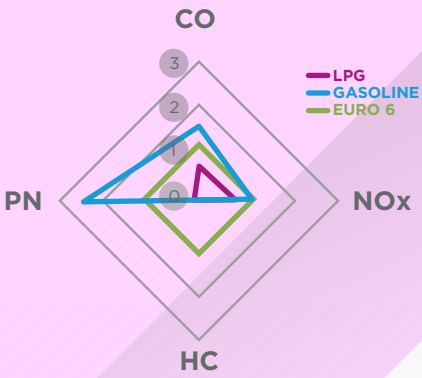

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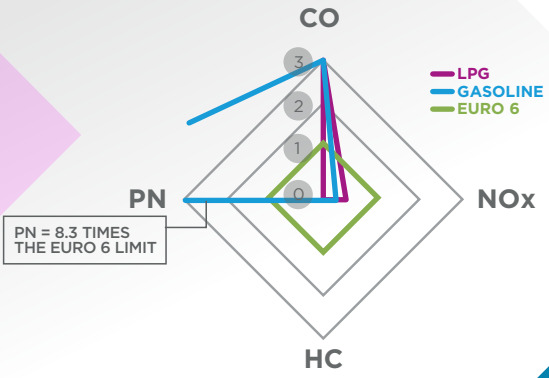


*PN limit applicable to new vehicles with direct injection engines from 1 Sep 2017

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 NOx and particles emissions from transport as causes of negative health effects.

IN ADDITION, AUTOGAS CARS ALSO BRING A 10-20% CO_2 GAIN COMPARED WITH GASOLINE EQUIVALENTS, HELPING EUROPE REACHING ITS CLIMATE CHANGE OBJECTIVES.

AVERAGE RESULTS FOR THE AUTOGAS VEHICLE COMPARED TO GASOLINE

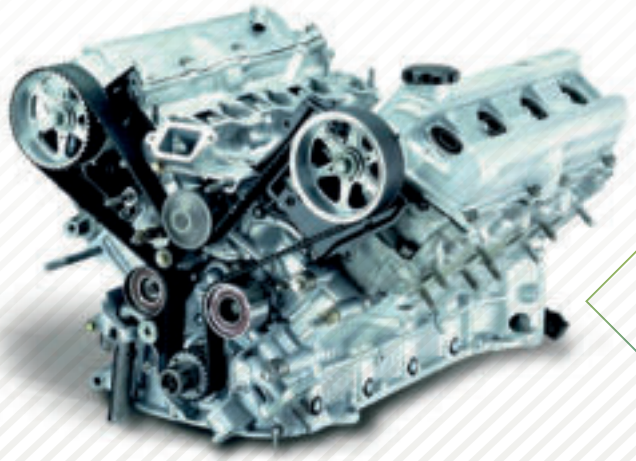
CO_2	CO	NO_x	HC	PN
-13%	-45%	SIMILAR	SIMILAR	-90%

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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