

BIOGENOUS GASOLINE – SUITABILITY AND POTENTIAL OF ALCOHOLS, ETHER AND BTL-GASOLINE FOR ENGINE OPERATION AND PERFORMANCE

¹Dedl, Philipp*, ¹Hofmann, Peter, ¹Geringer, Bernhard, ²Karner, Dieter, ³Lohrmann, Martin
¹Institute for Powertrains and Automotive Technology, Austria, ²OMV Refining and Marketing GmbH, Austria, ³Volkswagen Aktiengesellschaft, Germany

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ABSTRACT – The reduction of carbon dioxide emissions is one of the most important climate targets worldwide. About 10% to 15% of the anthropogenic carbon dioxide emissions are caused by road traffic. The use of alternative fuels on a regenerative basis is one possibility to reduce the carbon dioxide emissions. Currently, for biogenous substitution of gasoline there are only ethanol and ethyl-tertiary-butyl-ether (ETBE) available. Moreover, ETBE, is due to the production process, only 47% by volume biologically chargeable. An enlargement of the range of alternative, biogenous fuels by researching new fuel blends could help to accelerate the distribution of biogenous fuels.

In a research project from the Institute for Powertrains and Automotive Technology (IFA) of the Vienna University of Technology, OMV Refining and Marketing GmbH and Volkswagen Aktiengesellschaft the principal suitability of different liquid energy carriers for the use in spark ignition engines was tested. The investigated substances were several alcohols, ethers, BTL-fuels as well as other potential biologically producible fuel-components. The liquid energy carriers were mixed with conventional premium gasoline RON 95 in concentrations of 10%, 25% and 50% by volume. Some of them were also tested as pure biofuel. The combustion behaviour with regard to energy conversion, efficiency, emissions and full load performance was evaluated. Some of the tested liquid biofuels show a very interesting potential to be used as alternative gasoline fuel regarding energy-efficiency and/or emission behaviour, additionally, the potential of sustainability and greenhouse gas reduction in the life cycle assessment.