



AGENDA

Critical Issues Workshop

Dual-Fuel (Gaseous/Diesel) Engines: *Opportunities, Challenges & Strategies to Expand the Market*

30 & 31 March 2010

Le Chatelain Hotel, Brussels, Belgium

www.DualFuelStrategies.com

This is the third in the series of Clean Fuels Consulting *Critical Issues Workshops*. This workshop is designed to gather expert speakers to address a knowledgeable audience of specialists involved in alternative fuels, engine development, emissions, regulations and standards who, together, can identify and explore new strategies to open the world-wide markets for dual-fuel gaseous/diesel engine technologies. The workshop provides an excellent opportunity to interact and network with leading figures in the industry and government. The goal is to leave the workshop with a firm idea of the key issues facing the gaseous fuels industries and what strategies and next steps are required to set in motion the process to create certification procedures and related commercialization activities for gaseous/diesel dual-fuel engines and vehicles. A small table top exhibition accompanies the workshop.

DAY ONE: Tuesday, 30th March 2010

12.00-13.00 **COFFEE & REGISTRATION**

13.00-13.15 **WELCOME, INTRODUCTIONS & OBJECTIVES OF THE WORKSHOP**
Jeffrey Seisler, CEO, Clean Fuels Consulting

SESSION I

13.15-15.15 **DUAL-FUEL ENGINE TECHNOLOGIES**

Dual-fuel engine technology since the 1980s has transformed from mechanical-based systems into fully computerized and computer compatible technology that is allowing gas engines to achieve the same performance as diesel technology but using a cheaper, cleaner fuel. The current dual-fuel technology leaders provide their view on today's technologies and what needs to be done to get certified equipment into the market.

- **Westport's High Pressure Direct Injection System: Technology and European Certification,** *John Crawford, Westport Innovations, (Canada)*
- **Dual-Fuel – A Practical, Low Carbon Alternative to Diesel in Heavy Commercial Vehicles,** *Steve Whelan, Clean Air Power (UK)*
- **Volvo Perspective and Activities with Dual-Fuel Engines,** *Rolf Willkrans, AB Volvo (Sweden)*
- **Developments of Bosch Electronic Diesel/Gas System,** *Leonardo Vecchi, Robert Bosch (Brazil)*

15:15-15:45 COFFEE BREAK IN EXHIBITION AREA

SESSION II

15:45-17:45 DUAL-FUEL TECHNOLOGIES II

Without any support from public sector funding, dual-fuel technology specialists work their way through development challenges to get high-efficient, compression ignition engines on the road. Approaches for both natural gas and liquefied petroleum gas will be presented.

Moderator: Alexander Stöhr, German LPG Association

- **Developments and Issues for LPG and Natural Gas Dual-fuel Systems**, *Bas ten Broeke, Prins Autogassystemen (Netherlands)*
- **“SimuFuel”**: **LPG/Diesel Solution for SUVs & Light Duty Vehicles**, *Jürgen Pilsl, Huber Automotive AG (Germany)*
- **Dual-fuel Systems for Off-Road Equipment**, *Gert Jan Rap, CEO, Rap Clean Air Products/International Clean Fuels Training Institute (Netherlands)*.
- **Emissions Challenges for Dual-fuel Engines: Can they improve upon ‘clean diesel’?** *Brian McMurray, Lambda X, (UK)*

18.00-19.30 Cocktails in the Foyer with Table Top Exhibits

DAY TWO: Wednesday, 31st March 2009

8.00-8.30 MORNING COFFEE

SESSION III

08:30-10:00 CUSTOMER EXPERIENCES WITH DUAL-FUEL VEHICLES

New developments in clean engine and vehicle technology are exciting but will they stand up to the daily rigor of in-use service? Can the claims of the technology experts be demonstrated positively once the vehicles are on the road? Does dual-fuel (natural gas and LPG) really work as well as diesel? Are the engines and vehicles reliable? And, most importantly, do they save money? Leading commercial sector innovators talk about their direct experiences – the successes and challenges – of operating dual-fuel natural gas and LPG vehicles.

- **High Pressure Direct Injection Systems for Heavy Vehicles (LNG & CNG) – The Australian Experience**, *Mark McKenzie, Rare Consulting Pty Ltd, Australia*
- **Dual Fuel LPG: Economics & Sustainability in Logistics**, *Tamme Leenstra, H&S Transport (Netherlands)*
- **Diesel-Gas-Solutions: The Economical Way of Driving. German Experience with 300 Dual Fuel Trucks on LPG, CNG and Biomethane**, *Max Luhmann, Luhmann GmbH (Germany)*.

10.00 -10.30 BREAK

SESSION IV

10.30-12.30 DUAL-FUEL ENGINE CERTIFICATION: READY FOR "PRIME TIME" IN THE MARKET PLACE

Dual-fuel engines are allowed under UN ECE safety regulations for NGVs and LPG vehicles but certification to allow them to operate must be done on a country-by-country basis. There currently is a 'reservation' for certification procedures and test methods within UNECE Regulation 115 but much needs to be accomplished before these engines can be certified for operation on a world-wide basis. Until these and other regulations related to vehicle emissions, CO₂, and performance can be amended effectively, the commercial progress of dual-fuel vehicles – both retrofit and factory built -- will be challenged. Regulatory and standards experts from the European Commission and countries with experience or that are considering dual-fuel gas engine technology will discuss what needs to be done to create test procedures, test fuels, and related requirements to bring the technology commercially on par with traditional fuelled and alternatively fuelled engines and technologies. Brief presentations will be followed by in-depth discussion among the panelists and with the audience.

Moderator: Martin Seifert, Swiss Water & Gas Association

- **United Nations Regulations: What's required to develop certification procedures for dual-fuel engines?**, André Rijnders, RDW, Vehicle Technology and Information Centre, Ministry of Transport and Public Works (Netherlands)
- **German Dual-Fuel Engine Certification Experience and Prospects**, Stefan Behrning, TUEV Saarland Automobil GmbH - TUV Rheinland Group (Germany)
- **Swedish Regulatory Perspective on Dual-Fuel Vehicles**, Per Öhlund, (Swedish Transport Agency)
- **Emissions Testing Issues for Dual-Fuel Engines**, Petter Åsman (European Commission, DG Enterprise, Automotive Industry)

SESSION V

12.30-13.15 NEXT STRATEGIC STEPS INTO THE MARKET: THE FUTURE OF DUAL- FUEL

An interactive discussion between panelists selected from the session presenters and the audience will provide the final results of the workshop activities, with an eye toward pursuing activities and strategies to further develop the world-wide markets for dual-fuel gaseous/diesel technology. The discussion will focus on gaps and needs for further research, development and practical applications, including the development of international dual-fuel regulations that will provide for full certification of the engines.

13.15 CLOSING REMARKS & END OF WORKSHOP

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