

“Very fine presentations. CNG has still the need to be presented & customers to be informed...”

Dr. Uwe Thien, Project Manager CNG, Magna Steyr Fahrzeugtechnik AG & Co. KG,
about our NGV-Conference 2007

3rd Annual Congress

NATURAL GAS VEHICLES

Chaired by:

Dr. rer. nat. Bernd Georgi,
Projektmanager,
Volkswagen Motorsport GmbH



The green car effect: NGV meeting European CO₂ emission standards

INTERACTIVE WORKSHOP DAY **24th November 2008** | TWO DAY CONGRESS **25th - 26th November 2008** | relexa hotel Stuttgarter Hof Berlin, Germany

■■■■ Hear international case studies from **18** leading companies and associations:

- **Volkswagen Motorsport GmbH**, Germany
- **Centro Ricerche FIAT S.c.p.A.**, Italy
- **NGVA Europe**
- **Magna Steyr Fahrzeugtechnik AG & Co. KG**, Austria
- **Ullit S.A.**, France
- **Vitkovice Cylinders a.s.**, Czech Republic
- **Erdgas Oberösterreich GmbH & Co. KG**, Austria
- **Metatron s.r.l.**, Italy
- **Semitan**, France
- **WEH Gas Technology GmbH**, Germany
- **GTC Almere Pressurecontrols Europe**, Netherlands
- **Urban Community of Lille**, France
- **Clean Fuels Consulting**, Belgium
- **BDEW e.v.**, Germany
- **TÜV Saarland GmbH**, Germany
- **IAV GmbH**, Germany
- **Gaz de France S.A.**, France
- **Opel Special Vehicles GmbH**, Germany

Gain insight into the latest developments of NGVs:

- Discover how to **increase** the **range of NGVs** with advanced **downsized & turbocharged engine platforms**
- **Obtain efficiency, safety and design flexibility** by adopting the latest technology developments for innovative **lightweight storage concepts**
- **Optimize NGV engine performance** and **exhaust behaviour** to comply with future emissions regulations
- Hear about the latest **political strategies** for NGV world-wide to capitalize on the most **promising future markets**
- Assess the potential of **biomethane** and the use of **natural gas/hydrogen blends** to reduce CO₂ and NO_x emissions

HIGHLIGHTS:

The future of natural gas powertrains: Playing a key role for CO₂ emissions reduction

Centro Ricerche Fiat S.c.p.A., Italy

Master-Slave-ECU for OEM bifuel-sequential concepts

IAV GmbH, Germany

Automotive requirements for CNG storage systems

Magna Steyr Fahrzeugtechnik AG & Co. KG, Austria

Join our interactive workshop day:

- A** Biogas Max: From biowaste to biomethane used as a fuel
- B** Lightweight natural gas storage systems
- C** The NGV market and technology: Point of view of an energy supplier
- D** NGV conversions now & in future: A symbiotic relationship between OEMs and retrofits

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NATURAL GAS VEHICLES

The green car effect: NGV meeting European CO₂ emission standards

Dear Colleague,

The discussion about **limited oil resources** and about the necessity of the worldwide **reduction of CO₂ emissions** is one of the major drivers for the **development of new powertrain concepts**. Therefore OEMs and suppliers are working on innovative solutions for advanced NGVs – especially on **advanced storage** and **CNG powertrain concepts** to **increase the vehicles range**. Although technological progress is made, an increased cooperation of the various lobbies and a deepening of the public awareness of existing solutions are needed in order to continuously push the **growth of the NGV market in Europe**.

To gain an insight into the **latest strategic** and **technical developments** of this complex market you cannot afford to miss this 3rd international conference on

NATURAL GAS VEHICLES

The green car effect: NGV meeting European CO₂ emission standards

24th-26th November 2008

relexa hotel Stuttgarter Hof Berlin, Germany

- Discuss different **marketing strategies** of OEMs and gas suppliers for NGVs to get relevant market insights and **evaluate future trends**
- Learn how to **comply** with the latest **safety requirements** for NGVs and tanks by applying **advanced cylinder design approaches**
- Get an insight into the latest developments of storage systems for **alternative fuels** to assess **system performance, costs** and **characteristics**

High-level speakers from companies and associations such as **Opel Special Vehicles, Centro Ricerche FIAT, Magna Steyr, BDEW, IAV**, and the **NGVA Europe** will report about first-hand experiences and latest developments.

Secure your place and book now! We are looking forward to meeting you in Berlin!

Kind regards

Your automotivEQ Team

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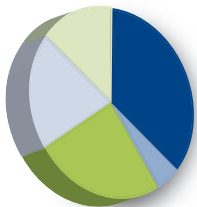


Trägerkreis „Das Erdgasfahrzeug“ – Gemeinsam für den Erfolg
Unternehmen aus der Automobil- und Mineralölindustrie sowie der Gaswirtschaft haben sich zum Trägerkreis Erdgasfahrzeuge zusammengeschlossen, um in einer konzertierten Aktion für eine stärkere Präsenz von Erdgasfahrzeugen in Deutschland zu sorgen. Ideell unterstützt wird der Trägerkreis durch das Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit sowie den ADAC. Der Trägerkreis ist u.a. Initiator der bundesweiten Informationskampagne „Das Erdgasfahrzeug. Sparsam. Sicher. Sauberer.“
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Who will you meet?



- OEMs
- Fleet Management, Municipal Transport
- CNG/NGV Engine/Powertrain Systems Manufacturer
- CNG/NGV Components Manufacturer
- Petrol Industry & Fuelling Stations

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"The congress is helpful to get an insight about the future demand and future development of NGV markets."

Andre Müller, Strategische Entwicklung, Belte AG
about the NGV congress 2007

NATURAL GAS VEHICLES

INTERACTIVE WORKSHOP DAY | Monday, 24th November 2008

Workshop A 10:00-13:00

Pierre Hirtzberger,
Head of R&D
Department,
Urban Waste
Division,
**Urban Community
of Lille, France**
in cooperation with
the Community of
Stockholm

Biogas Max: From biowaste to biomethane used as a fuel

The **European Commission sponsored Biogasmax project** was initiated in order to **promote** the **use** of **alternative fuels** and to **develop alternative** and **cost efficient** means of **urban transportation**. Concerning the Community of Lille the Idea of Biogasmax can be summarized as "**from waste to clean fuel**". There, the project focused on the **production of biomethane** from **raw biogas**, generated by the **digestion of household biowaste**. The production of biomethane in the Organic Recovery Center in Sequedin will be **equivalent to 4 million litres of diesel** per year. This workshop will give an insight into this European project by **assessing its objectives, technologies and outcomes** as well as its **transferability** to other cities and fleets.

- Introducing the Biogasmax project
- Outcomes of the Project in Lille compared to other cities
- Transferability to other cities and fleets

Workshop B 10:00-13:00

Dipl.-Ing. Dr. techn.
Uwe K. F. Thien,
Project Manager
Natural Gas Storage
Systems,
**Magna Steyr
Fahrzeugtechnik
AG & Co. KG, Austria**

Lightweight natural gas storage systems

Vehicles range and **natural gas storage system improvement** is still a challenge with regards to different storage capacity and density. Besides, **increasing prices** for **advanced lightweight materials** are inhibiting their application in existing systems. Nevertheless, individual and **innovative solutions** in **storage improvement** for CNG are expanding. The workshop will grant more **transparency in composite technology** for CNG storage systems **compared to existent in-use systems**.

Topics to be discussed are:

- New weight improvements of systems and elements
- Variable materials and market chances
- Future packaging requirements

Workshop C 14:00-17:00

Guillaume Peureux,
Research Engineer,
Research and
Development
Division,
**Gaz de France S.A.,
France**

The NGV market and technology: Point of view of an energy supplier

As introduction of the workshop, a global presentation of our R&D project will demonstrate the **complete chain** of **Natural Gas** as alternative fuel from the **gas grid** to its distribution to the vehicle via **refuelling stations**, the **security** and **regulation aspects**, the **post-treatment of vehicle emissions**, etc. We will also focus on **burning processes** inside the **combustion chamber** of the **engine** and the **development of dedicated NGV engines**. Finally we might introduce the **benefits** of **using biogas** in addition to NGV.

- The French context and the transportation market (incl. NGV)
- Structuring a research project to meet market needs
- Current actions and prospects

Workshop D 14:00-17:00

Dr. Jeffrey M. Seisler,
CEO,
**Clean Fuels
Consulting, Belgium**

NGV conversions now & in future: A symbiotic relationship between OEMs and retrofits

This workshop deals with the current and **future needs** for **NGV retrofit systems** on a worldwide basis, and the continued relationship between and **impact** on the **retrofit system suppliers** and the **original equipment manufacturers (OEMs)**. **Technical, market-based, and regulatory aspects** of this complex relationship are explored on a global scale. Practical considerations for the worldwide growth of retrofit systems and OEM expansion are elaborated by industry stakeholders.

- Generational technology changes of **light duty vehicle systems** and patterns of retrofit and OEM market development side-by-side in different regions of the globe are presented and explored
- The potential role of **heavy duty dual fuel engines** and **repowering of heavy vehicles** also are discussed and evaluated in light of various markets and **international regulations**

NATURAL GAS VEHICLES

CONGRESS DAY ONE | Tuesday, 25th November 2008

8:15 Registration with coffee break & networking

9:00 Chairman's welcome & opening address
Dr. rer. nat. Bernd Georgi, Projektmanager,
Volkswagen Motorsport GmbH, Germany

Legal and political update from a European perspective

9:10 **Reviewing ongoing political developments**



- Which regulations do already exist?
 - Current developments in Europe
 - Towards a common European strategy?
- Peter Boisen, Chairman,
NGVA Europe, Sweden

NGV market overview – Towards mass-market adoption?

9:50 **How to reach the customer: Marketing strategies**



- How to increase awareness of the customer?
 - Are there any innovative marketing strategies necessary?
 - The role of increasing fuel prices (gasoline/diesel)
 - Salesmen as key players in the decision making process
 - How to increase showroom traffic
- Klaus Hablik, Manager Marketing & Projects,
Opel Special Vehicles GmbH, Germany

10:30 Refreshment break & networking

11:00 **Ten "out-of-the-box" ideas for gas suppliers to push the CNG market**



- CNG movement in Austria: Facts & figures
 - Approaches to "product development" for CNG providers
 - Concepts to deploy existing resources for the CNG market
 - Impulsive and cost-efficient marketing ideas
- Mag. Elmar Krennmayr, Head of Strategy and Legal Affairs,
Erdgas Oberösterreich GmbH & Co KG, Austria

11:40 **Assessment of fuel-price developments and its influence on the NGV market**



- Price developments 2003 - 2008
 - The asset of NGVs in Germany
 - Comprehensive cooperation: Presenting the work of the "Trägerkreis Erdgasfahrzeuge"
- Stefan Thimm, Manager NGV,
BDEW e.v., Germany

12:40 Networking luncheon

14:10 **Introducing CNG technology in public transportation: The VIVALDI-Project in the city of Nantes**



- Towards a cleaner city: Restructuring public transportation
 - How public awareness drives the market position
 - Outcome of and perspectives after the project CNG bus fleet management: Pros and cons
- Philippe Begue, Bus Fleet Manager and
Christine Lasalle, Marketing Department,
SEMITAN, France

Technical developments of engine and powertrain concepts

15:10 **The future of natural gas powertrains: Playing a key role in CO₂ emissions reduction**

HIGHLIGHT

- Natural gas characteristics vs. downsized & turbocharged engine platforms
- Further developments of engine technologies
- The potential of biomethane and the use of natural gas/hydrogen blends

Andrea Gerini, Head of Gas Engine Application for Passenger Cars,
Centro Ricerche Fiat S.c.p.A., Italy

15:50 Refreshment break & networking

16:20 **Core components for natural gas injection systems**



- OEM mass production requirements for natural gas injection systems
- Pressure regulator: Working principle and technical evolution of the piston technology
- Electronic control module: The twin ECU architecture concept and the CNG peculiar functions
- Future evolution of the core components

Miletto Giuseppe, Sales Engineer,
Metatron s.r.l., Italy

17:00 **Master-Slave-ECU for OEM bifuel-sequential concepts**

HIGHLIGHT

- Optimized engine performance and exhaust behaviour
 - Cost fitting through fully scalable and flexible solutions
 - Short project time schedule through fully automated development environment
 - Implications for the European and emerging markets
- Iraklis Avramopoulos, Head of Department Gas Propulsions, Business Area Powertrain Development and
Ralph Meyer, Team Manager Mechatronics Gasoline Systems Algorithm Development,
IAV GmbH, Germany

18:00 Closing remarks of the chairman

18:05 End of congress day one

NATURAL GAS VEHICLES

CONGRESS DAY TWO | Wednesday, 26th November 2008

8:30 Registration, coffee & networking

9:00 Chairman's welcome
Dipl.-Ing. Dr. techn. Uwe K. F. Thien, Project Manager
Natural Gas Storage Systems,
Magna Steyr Fahrzeugtechnik AG & Co. KG, Austria

Innovative refuelling technologies & standard prospects

9:15 **The CNG refuelling interface – improving the way of the gas from the dispenser into the vehicle**



- Overview about the different solutions around the globe
 - Technologies and standards – NGV1 and others
 - Prospects of a common standard – NGV1 for all?
- Roman Nagy, Key Account Manager Alternative Fuels,
WEH Gas Technology GmbH, Germany

10:00 Refreshment break & networking

10:30 **GTC Europe, one-stop-shop to NGV Technology**



- CNG at home
 - CNG dynamic
 - CNG refuelling station
- Peter van der Lichte, Director,
GTC Almere Pressurecontrols Europe, The Netherlands

Advanced tank & storage systems

11:15 **Automotive requirements for CNG storage systems**

HIGHLIGHT

- Requirements for cost, quality and weight – Future targets
- Reliable lightweight design with composite technology
- Need and potential for weight and cost reduction
- Impact to complete vehicle concepts with sufficient driving range up to 600 km

Dr. Pavel Novak, Group Leader High Pressure Storage Systems
and
Dipl.-Ing. Alexander Schärfl, Development Natural Gas Storage Systems,
Magna Steyr Fahrzeugtechnik AG & Co. KG, Austria

12:15 Networking luncheon

13:45 **Advanced lightweight cylinder systems:
Natural gas and H2 storage**



- Alternative storage concepts – Innovative shapes and materials
 - Advanced lightweight cylinder systems
 - Assessing current developments
- Claude Hembert, President and CEO,
Ullit S.A., France

14:30 Refreshment break & networking

15:15 **Pressure vessels in CNG systems**



- Current technology in the production of steel cylinders
 - Comparison with ALU and composite cylinders
 - Application of steel cylinders in vehicles, filling stations and trailers
 - Presumption of the development and requirements for pressure vessels in the following 5 to 10 years
 - Practical experience from the pressure vessels for CNG
- Ivo Brabec, Head of Steel Cylinders Department,
Vitkovice Cylinders a.s., Czech Republic

16:00 **Safety of CNG storage onboard a vehicle:**



Tanks and their installation

- Applicable regulations worldwide in comparison with each other
 - Testing of cylinders: State of the art
 - New cylinder design approaches and possible impact on regulations
 - Safety of CNG vehicles compared to others
- Dr. Stefan Behring, Competence Center for Alternative Fuels,
TÜV Saarland GmbH, Germany

16:45 **Lessons learned? What are the most promising technical developments and which are the latest requirements for NGV systems of tomorrow? What do we still need to achieve and where do we go?**



Conference wrap-up

Chairman:
Dipl.-Ing. Dr. techn. Uwe K. F. Thien, Project Manager
Natural Gas Storage Systems,
Magna Steyr Fahrzeugtechnik AG & Co. KG, Austria
Panel:
Speakers of the day

17:00 Closing remarks of the chairman & end of the congress