

# LNG as fuel option in heavy duty and municipal transport

06 March 2013

Gas Show Warsaw

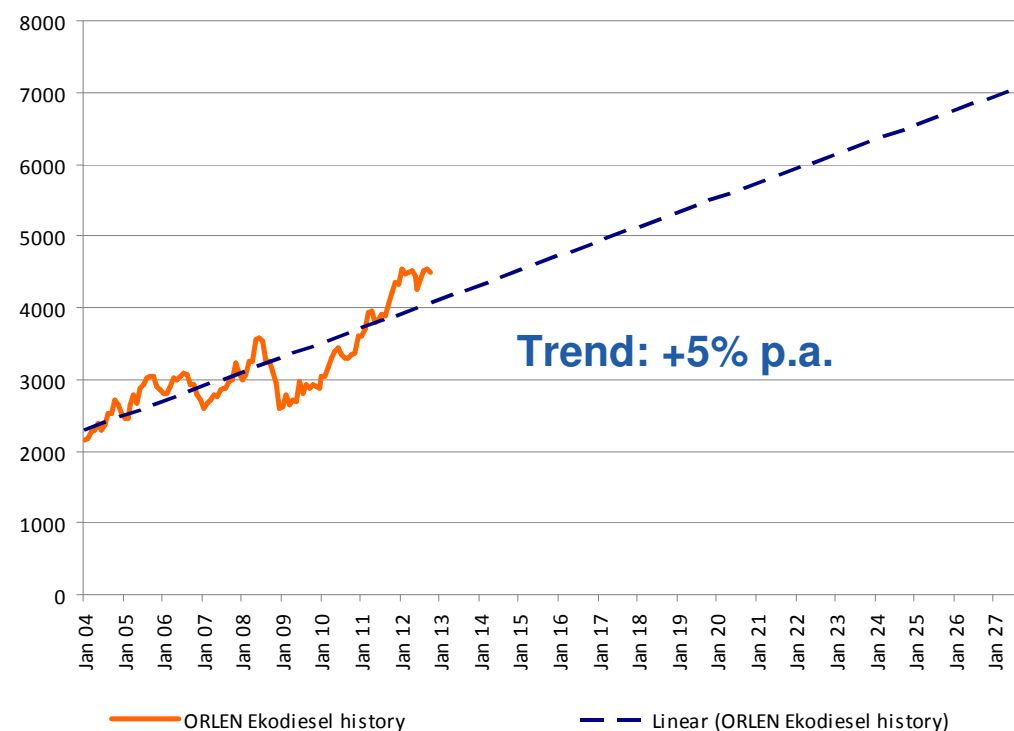


# The challenge for municipal and commercial transport companies



- Increasing fuel prices for petrol and diesel
- Regulations on noise and local pollutants
- Green agenda of customers
- Future-proof, innovative concepts

### Historic ORLEN Wholesale prices



**How to decrease cost for compliance with EU-6 (2013/2014) in CO<sub>2</sub>, NO<sub>x</sub>, particulate matter?**

# Available (or not?) fuel alternatives

	✓	(✓)	(✓)				
	(✓)	(✓)					
			✓	✓	✓	(✓)	(✓)
	✓	✓	✓	✓			
		(✓)	(✓)				
	✓	✓	(✓)	(✓)			

✓ - available

(✓) - subject to technical, commercial or operational challenges

**Natural gas is suitable for all transport sectors**

# We are convinced: Natural gas is the best fuel!

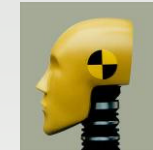


## Clean



- 25% less CO<sub>2</sub>- and 75% less CO-Emissions compared to petrol
- Practically no particulate matter and no filters or additives (AdBlue) required
- Use of bio-methane reduces CO<sub>2</sub>-emissions even further

## Safe and available



- Crash-Tests prove that natural gas vehicles are as safe as conventional vehicles
- Natural gas reserves last longer than oil

## Quiet



- Natural gas engines significantly reduce noise emissions and make 24/7 operations possible

## Proven and economic



- Already today many operators run trucks and buses on "CNG"
- "LNG" provides even wider driving range and commercial benefits
- EU-6 already "built-in" – no extra cost for DPF or other exhaust cleaning systems

**Natural gas answers key challenges for transport operators**

# Compressed or liquid?



**CNG – Natural gas compressed to 200 bar**



**LNG – Natural gas liquefied by cooling down to -162 °C**

## Established and growing

- Passenger cars, light duty vehicles and medium duty transport (buses, MD-trucks)
- Driving range PC+LDVs: 300-550 km
- Attractive OEM-vehicle choice available
- European infrastructure available/growing
- Zero or reduced excise duty

## New ★

- Heavy duty and municipal transport (buses + trucks)
- Driving range HDVs: 500-1.000 km
- 2.5 x more energy in the same space as CNG
- Lower weight of vehicles, diesel-like refueling times and vehicle performance
- Independence from pipeline network



**“CNG” and “LNG” are both natural gas and meet EU-6 at lower cost than competitive technologies**

# LNG-vehicles and stations in Europe now starting to develop



Volvo FM460 LNG



Solbus Solcity LNG



Mercedes-Benz Econic LNG



IVECO Stralis LNG



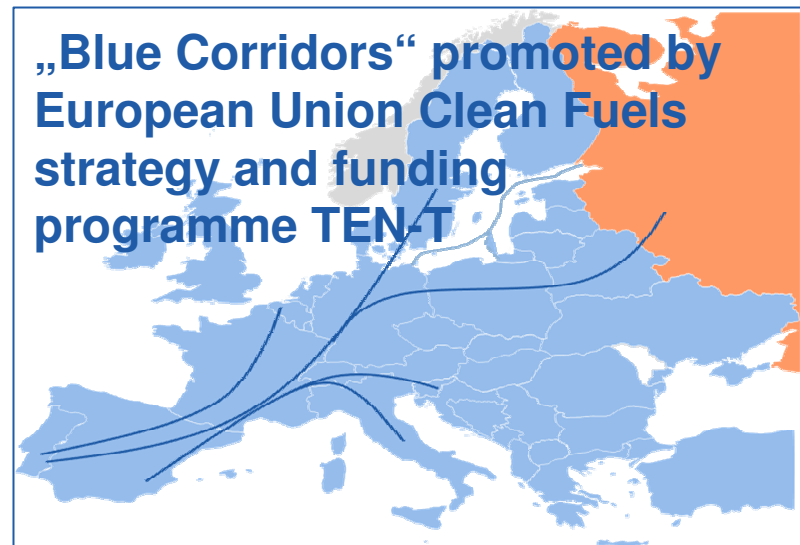
Scania LNG



LNG-filling station in Sweden



GAZPROM Germania's mobile LNG station with IVECO Stralis LNG at the IAA Commercial Vehicles in Hanover (September 2012)



„Blue Corridors“ promoted by European Union Clean Fuels strategy and funding programme TEN-T

# Gazprom provides Russian natural gas to Europe: CNG + LNG as fuel for transport



## Russia

- OAO Gazprom with 200+ CNG stations in Russia
- Extension of CNG refuelling infrastructure now starting also in remote Russian states
- Developing LNG production and retail infrastructure to promote LNG sales as a motor fuel



## Europe

- Natural gas as fuel is priority for Gazprom in Europe
- Extension of CNG network in Germany and the Czech Republic from 12 to 30 stations (2014)
- Development of projects in LNG for European commercial and municipal road transport



**Poland is integral part of East-West transport route and key to creating “Blue Corridors”**

# Experience is key!



## Demonstration of feasibility of LNG buses

- 2 Solbus LNG buses in operation on regular lines of public transport in 6 Polish cities
- GAZPROM Germania provided the mobile LNG refuelling station
- Step from theory to practice: customers see, feel and experience the benefits of LNG-fuelled buses



## 6. Blue Corridor Rally 2012

- 08.-20.09.2012 / 6.700 km
- Dialogue with politicians, administrations, media and end users
- Promotion of **natural gas as environmentally friendly, safe, reliable and cheap fuel**



# Our value proposition



**Bundled offer and guaranteed savings in Total Cost of Ownership compared to Diesel**

Thank you! Any questions?



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