Opportunity NGV

- What does it take to make it happen? -

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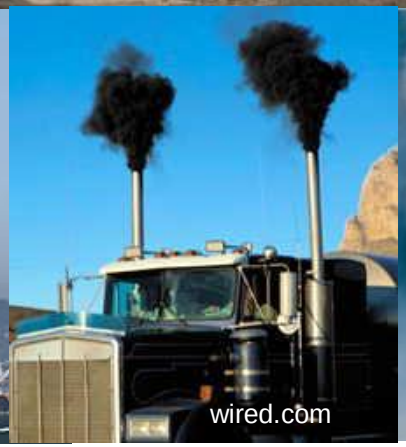
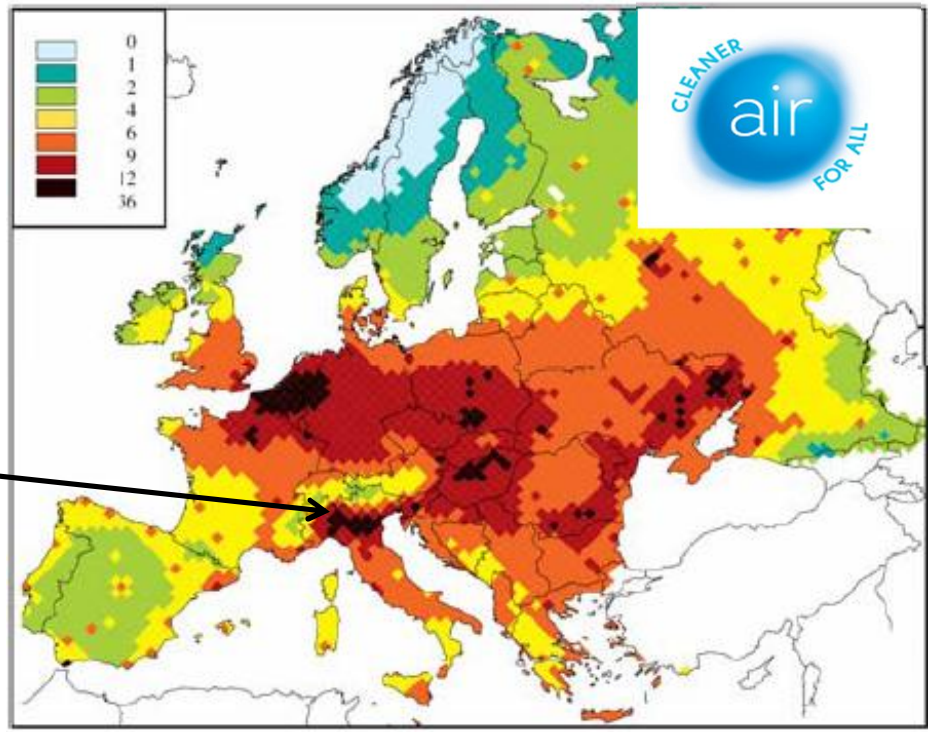
Milan, March 26, 2014

DO WE HAVE AN ENVIRONMENTAL ISSUE?



AIR POLLUTION – THE INVISIBLE THREAT (ESPECIALLY IN HIGH POPULATED AREAS)

NGVs improve the quality of city life!



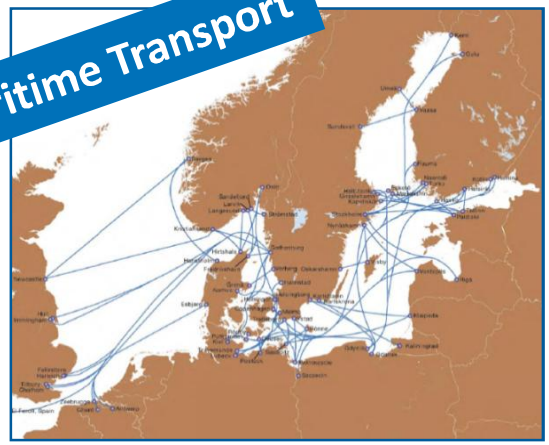
Methane - the recommended fuel:
- reduces public expenses for transport
- avoidance of local pollution
- 50% less noise

EUROPEAN EMISSIONS REDUCTION AGENDA DRIVES DEVELOPMENT OF ALTERNATIVE FUELS

- EU-6 (2013/2014) drives development of CNG and LNG as fuel for light, medium and heavy-duty road transport (CO2, NOx, particulate matter)
- Automotive industry investing in CNG and LNG models to achieve EU-imposed average CO2-fleet targets (120g CO2/km by 2015 and 95g CO2/km by 2020)
- Furthermore: Sulphur Emission Control Areas (SECA from 2015 in Baltic & North Sea) drive development of LNG as bunker fuel opposed to MGO or scrubber-technology (SOx)

Road Transport

Maritime Transport



PROPOSAL FOR A DIRECTIVE ON DEPLOYMENT OF ALTERNATIVE FUELS INFRASTRUCTURE: CNG & LNG

Intensively debated in European Council and Parliament. Objective to implement in current legislative period

400 km

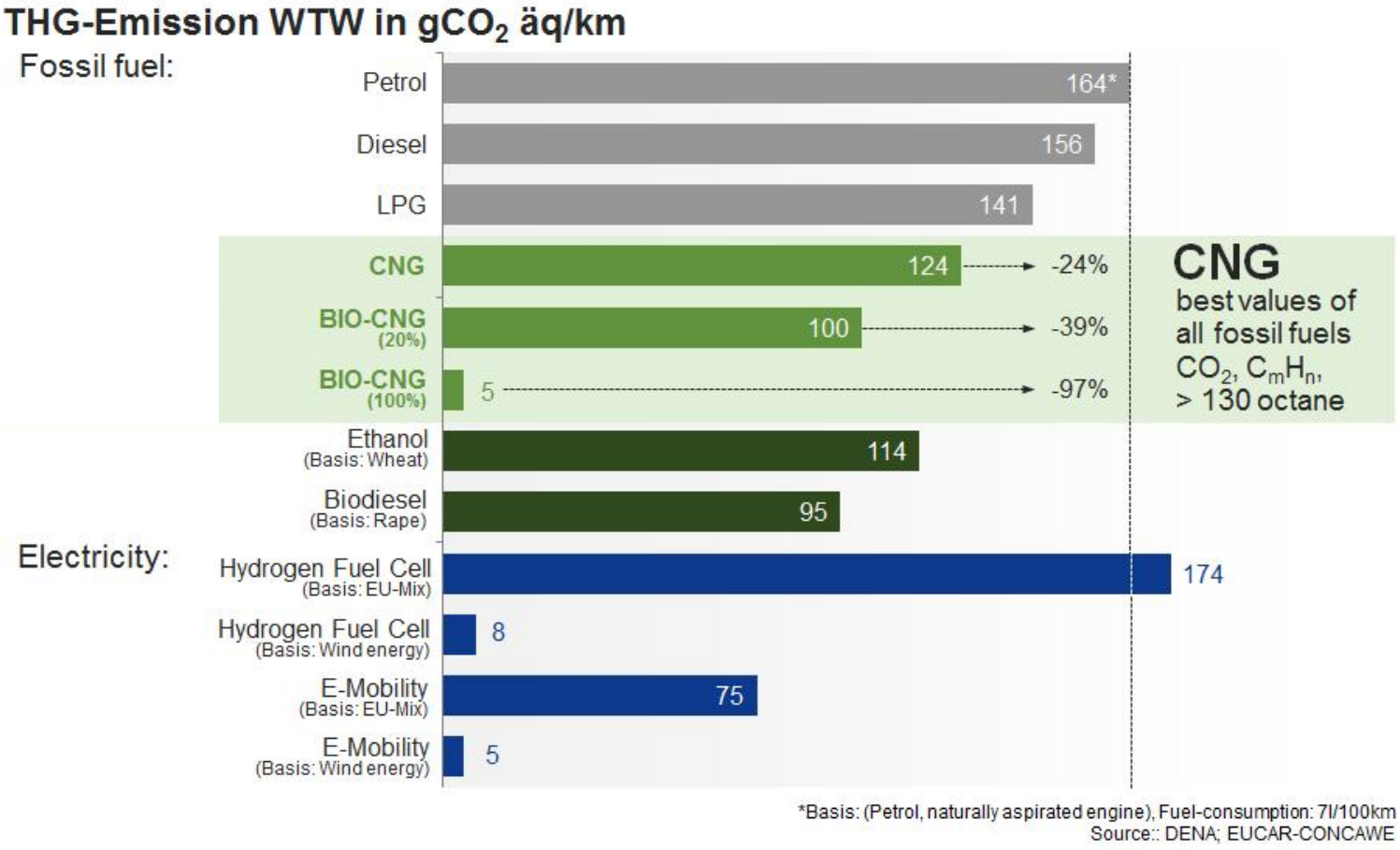
150km

Source: Gasrec, Bohlen & Doyen, European Commission

Main parameters:

- 150 km max. distance between CNG stations
- 400 km max. distance between LNG stations (on TEN-T core network)
- Action plan for the development of LNG in shipping, proposing to install LNG refuelling stations in all 139 maritime and inland ports.
- To be implemented at national level Europe wide by 2020.
- Common standards by 2015

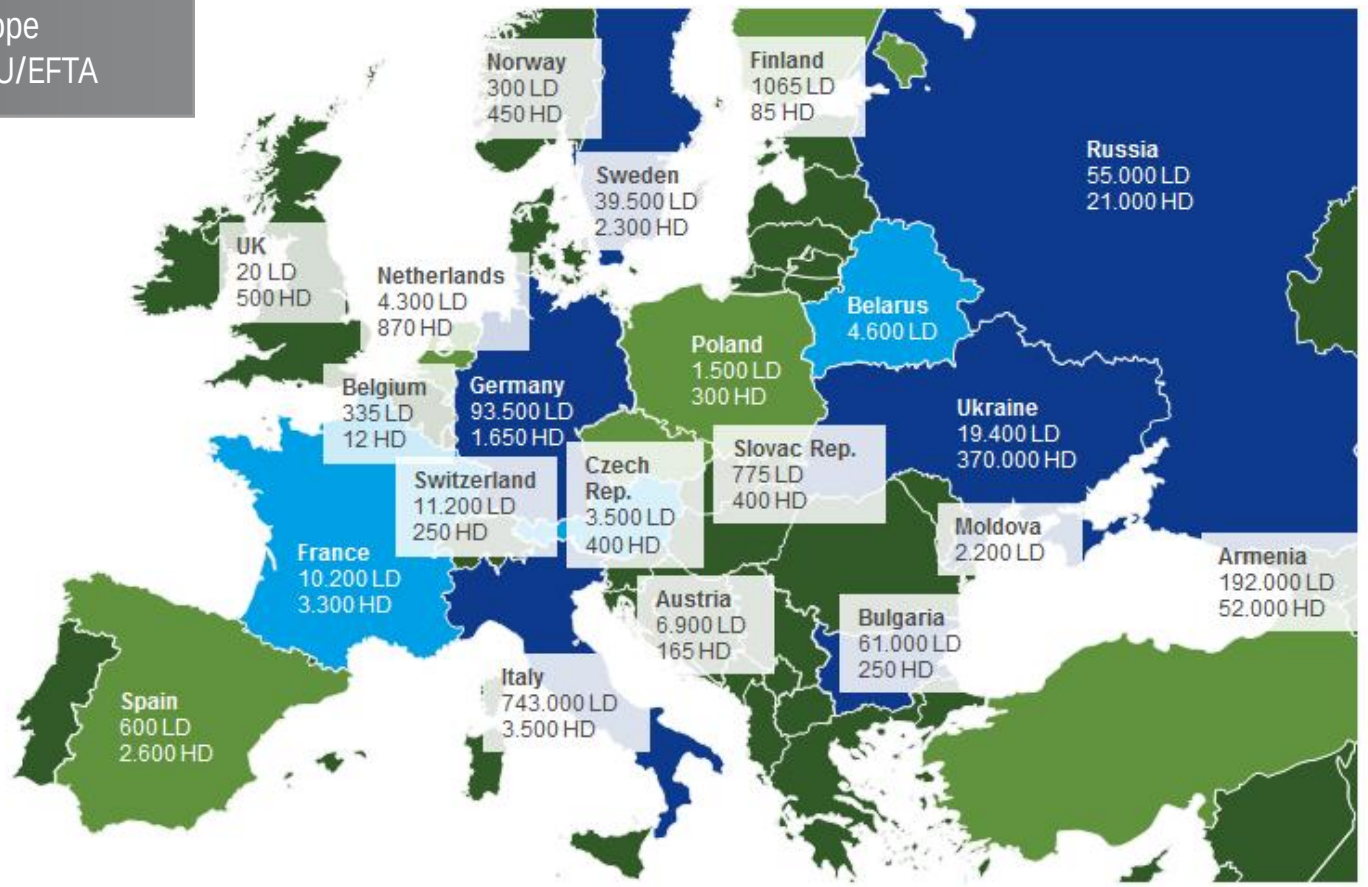
METHANE & CO_2 – THE CLEANEST FUEL ON A WHEEL-TO-WHEEL (WTW) BASIS ALREADY AVAILABEL TODAY



*Basis: (Petrol, naturally aspirated engine), Fuel-consumption: 7l/100km
Source:: DENA; EUCAR-CONCAWE

CURRENT EUROPEAN NGV MARKET

1,85 M NGVs in Europe
1,1 M NGVs in the EU/EFTA



- > 20.000
- 5.000 – 20.000
- 1.000 – 5.000
- < 1.000

Source: NGVA Europe, 01.06.2012

AUTOMOTIVE INDUSTRY INVESTS IN FURTHER DEVELOPMENT OF NGVS

CNG – Natural gas compressed to 200 bar

Established and growing ☑

- Proven technology available here and today with existing or developing infrastructure
- Driving ranges between 300-500km
- Cars, light duty vehicles, busses & trucks available with new models being added

LNG – Natural gas liquefied by cooling down to -161 ° C

New ★

- 2.5 x more energy in the same space → driving ranges up to 1.000km
- Targets heavy duty transport
- Refuelling infrastructure yet to be developed
- More complex supply chain than for CNG

Both "CNG" and "LNG" are natural gas and meet EU6 standards at lower cost than competitive technologies

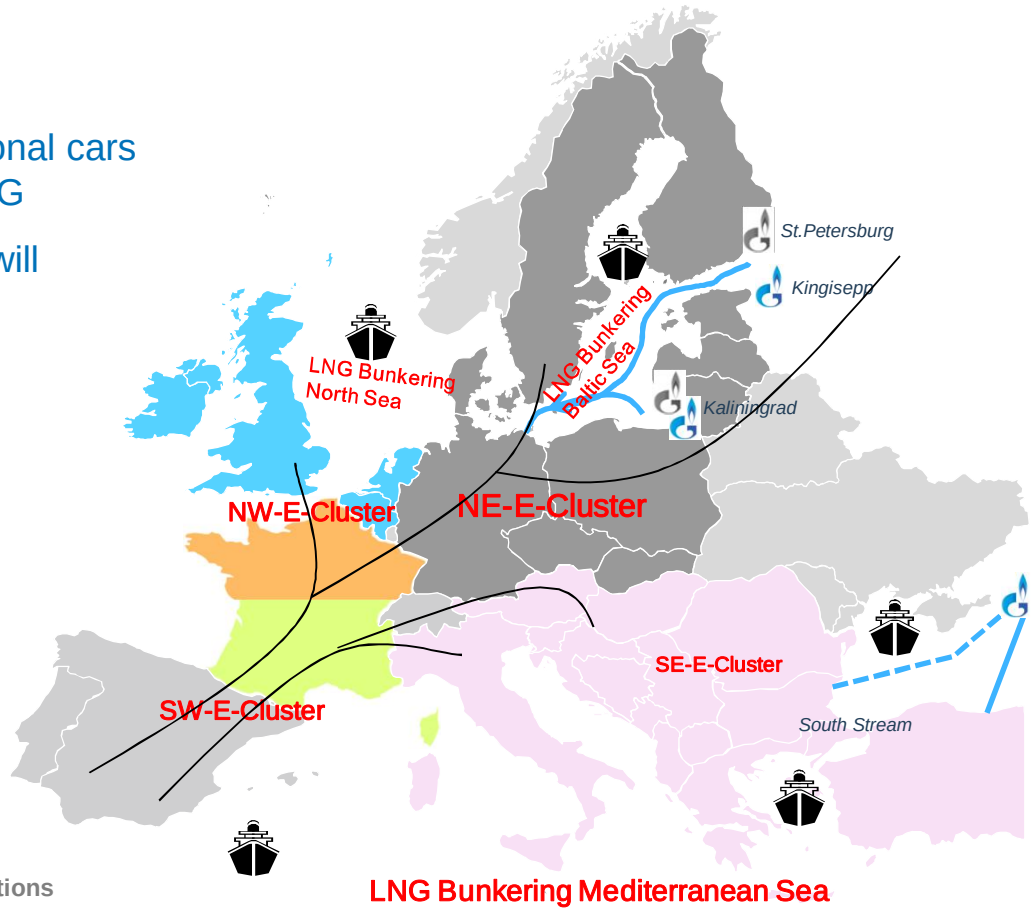
CLOSE THE VALUE CHAIN WHERE REQUIRED

Strategic alliances

Un-/Organic project based growth

CLUSTER APPROACH TO CNG AND LNG MARKET DEVELOPMENT

- Light duty vehicles and personal cars with continuing growth in CNG
- Buses and local distribution will continue to facilitate CNG growth, with LNG entering the picture
- LNG growth facilitated by international heavy duty transport and bunkering

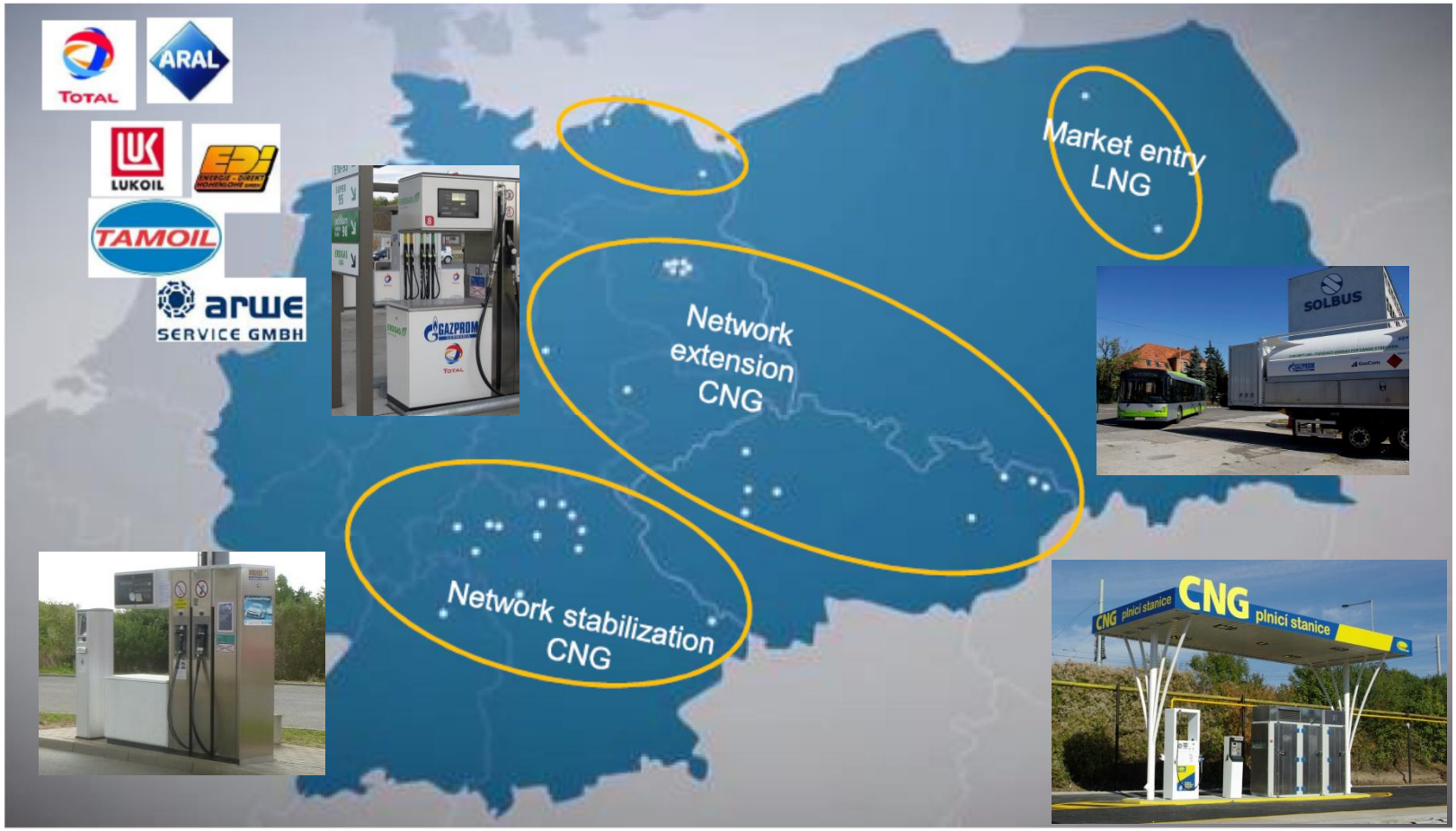


NGV markets

Bunkering markets

Up- / midstream Infrastructure options

GAZPROM IS WELL PRESENTED IN THE MARKET AND THE EXISTING REFILLING INFRASTRUCTURE WILL BE EXPANDED



2013: FIRST 11 LNG BUSES IN EUROPE RUNNING SINCE OCTOBER IN POLAND

- First ever OEM produced LNG buses operational in Europe since 01 October 2013 in the city of Olsztyn (Poland)
- Cooperation of GAZPROM Germania and Solbus
- Buses run 7 days per week from 04.30 a.m. until 23.45 p.m.
- Ca. 65.000 km per bus p.a.
- Solbus Solcity LNG 12m with Cummins ISGL natural gas engine and Chart Ferox LNG onboard-equipment
- Extension to further cities in progress

WE ARE PREPARED TO SUPPORT AN ACCELERATED DEVELOPMENT

Provide sustainable supply of natural gas

- Provide sustainable supply of Russian natural gas to the transportation sector (CNG / LNG)

Establish own presence for CNG/ LNG

- Develop own presence of natural gas filling stations for CNG and LNG in areas of high demand
- Assess opportunities for investments in CNG and/or LNG filling station infrastructure projects in co-operation with automotive manufacturers and clients

Engage in long-term partnerships

- Attract economical and political interest for development of alternative fuel projects in Europe
- Liaise with potential clients interested in lowering operating cost whilst at the same time fulfilling environmental objectives

Thank you for your attention!

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