



# Prospect and Development Status of European NGV Market

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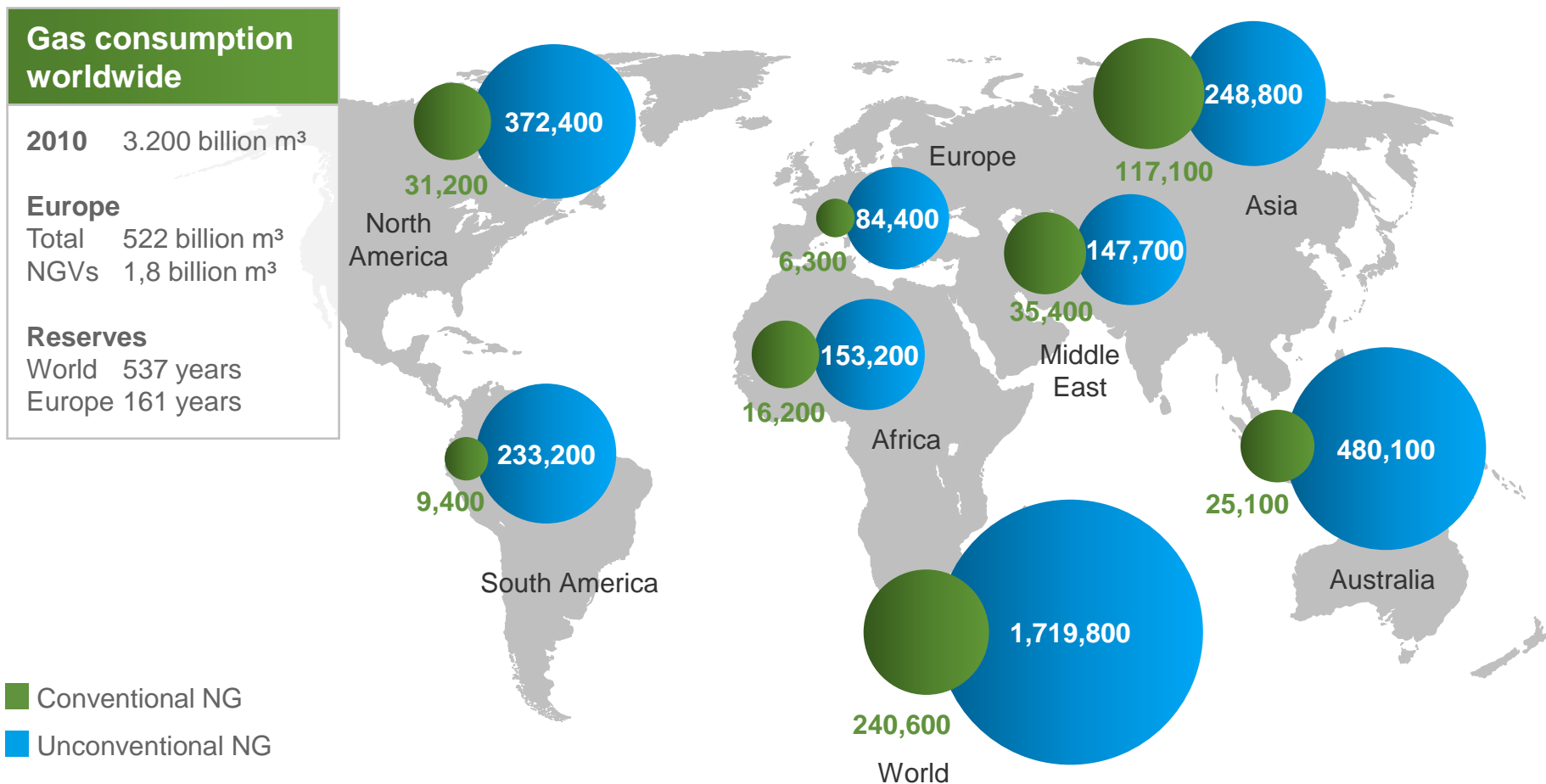
# NGVA Europe – the European Association

## NGVA Europe, the European Natural & bio Gas Vehicle Association:

- Main objective is the promotion of NG and biomethane as fuels for transport
- We represent more than 160 manufacturers and associations (18 Board members)

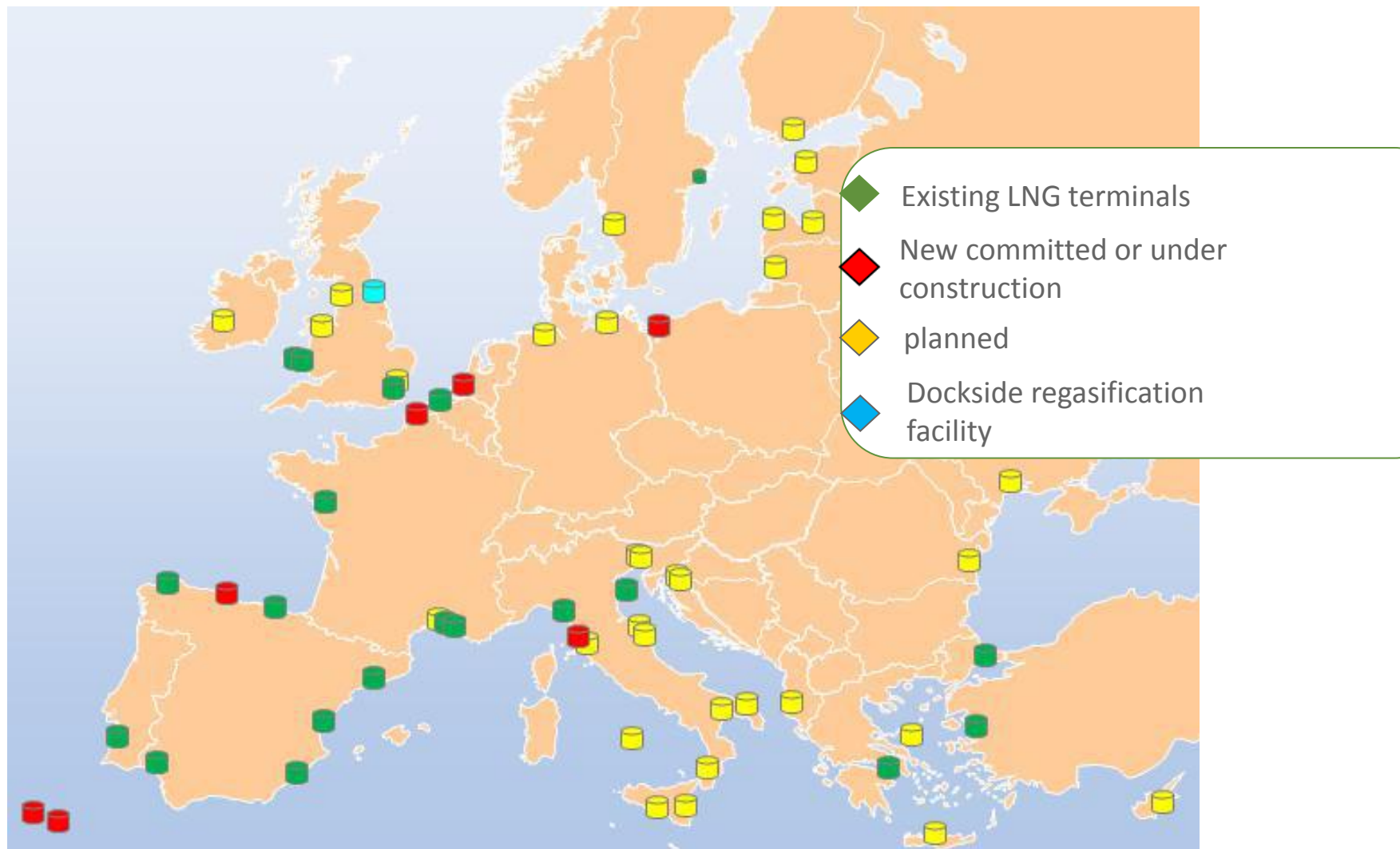


# Worldwide gas reserves (Unit = $10^9$ m<sup>3</sup>)



Source: Data BGR, graph works NGVA Europe

# LNG terminals in Europe



Source: GIE

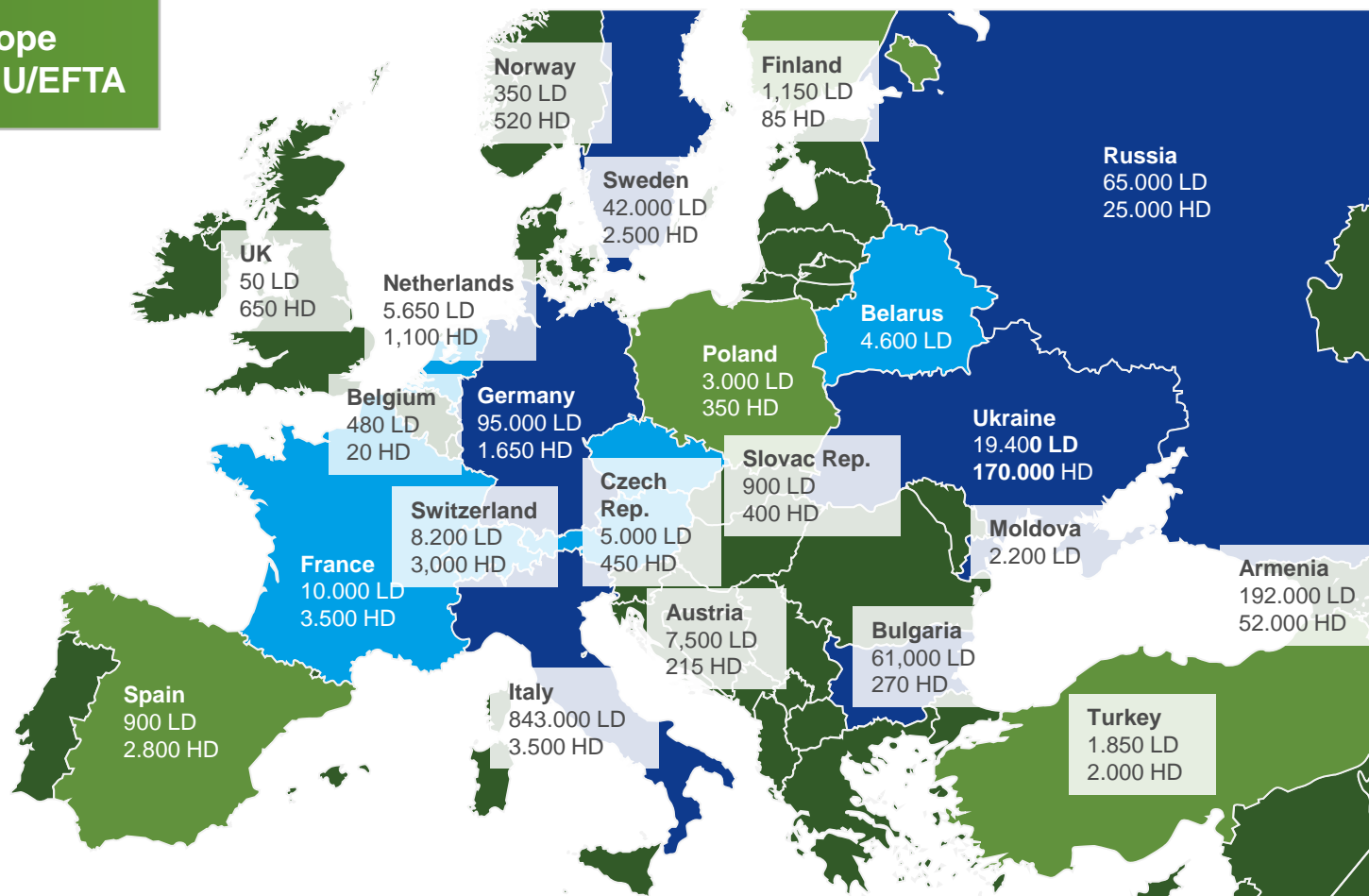
# Methane (CH<sub>4</sub>) = no-regret fuel



- Integration of Bio Methane into Natural gas, no blending limitations
- Reduced emissions of Nox, Particles and Noise
- **Only real alternative to oil available today!**

# Current European NGV Market (2/2)

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



Source: NGVA Europe, 31.12.2013

# The Clean Power for Transport package

- A **Communication** laying out a comprehensive **European alternative fuels strategy**
- A Directive on the deployment of **alternative fuels infrastructure**
- A **Staff Working Document** on Actions towards a comprehensive EU framework on **LNG for shipping**
- An **Impact Assessment** evaluating cost and benefits of different policy options





# The European alternative fuels strategy

- **Reduce** the EU transport systems **oil dependence** in order to diversify and secure energy supply
- **Reduce** EU **GHG emissions** in line with the 20-20-20 Climate and Energy Package and the 2011 White Paper on Transport
- **Improve** the **air quality** in urban areas in order to meet EU air quality obligations
- **Enhance** the **competitiveness of the European industry**, boost innovation and generate economic growth





# Directive AFI adopted 15 April: CNG & LNG



*Member States have to develop national policy frameworks within 24 months from implementation (autumn 2016).*



400 km



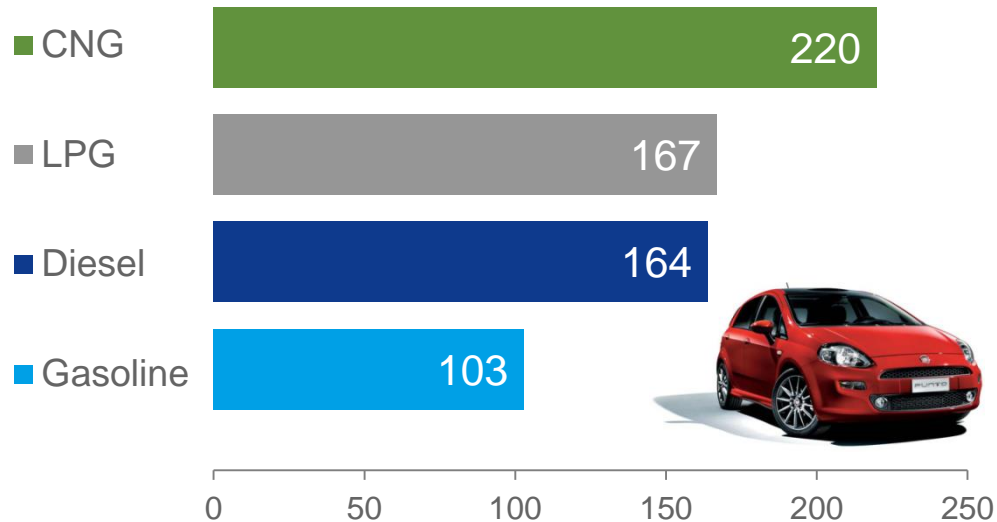
150km

## Detailed provisions:

- CNG in cities/densely populated areas by 2020
- CNG & LNG on TEN-T core network by 2025.  
(150 km and 400 km indicative max .distances)
- LNG in sufficient TEN-T seaports by 2025.
- LNG in sufficient TEN-T inland ports by 2030.
- Common technical standards.
- Unit price per "1 petrol litre equivalent" for better comparability of fuel prices.
- Market assessment/possible revision by 2027.

Source: pictures Gasrec, Bohlen & Doyen, European Commission

# Fuel pricing and range for 10 € fuel costs










Ass: Fiat Punto EVO (comparable motor, 70 to 77 PS),  
average consumption and fuel price

**Cost advantage of natural gas today not transparent**



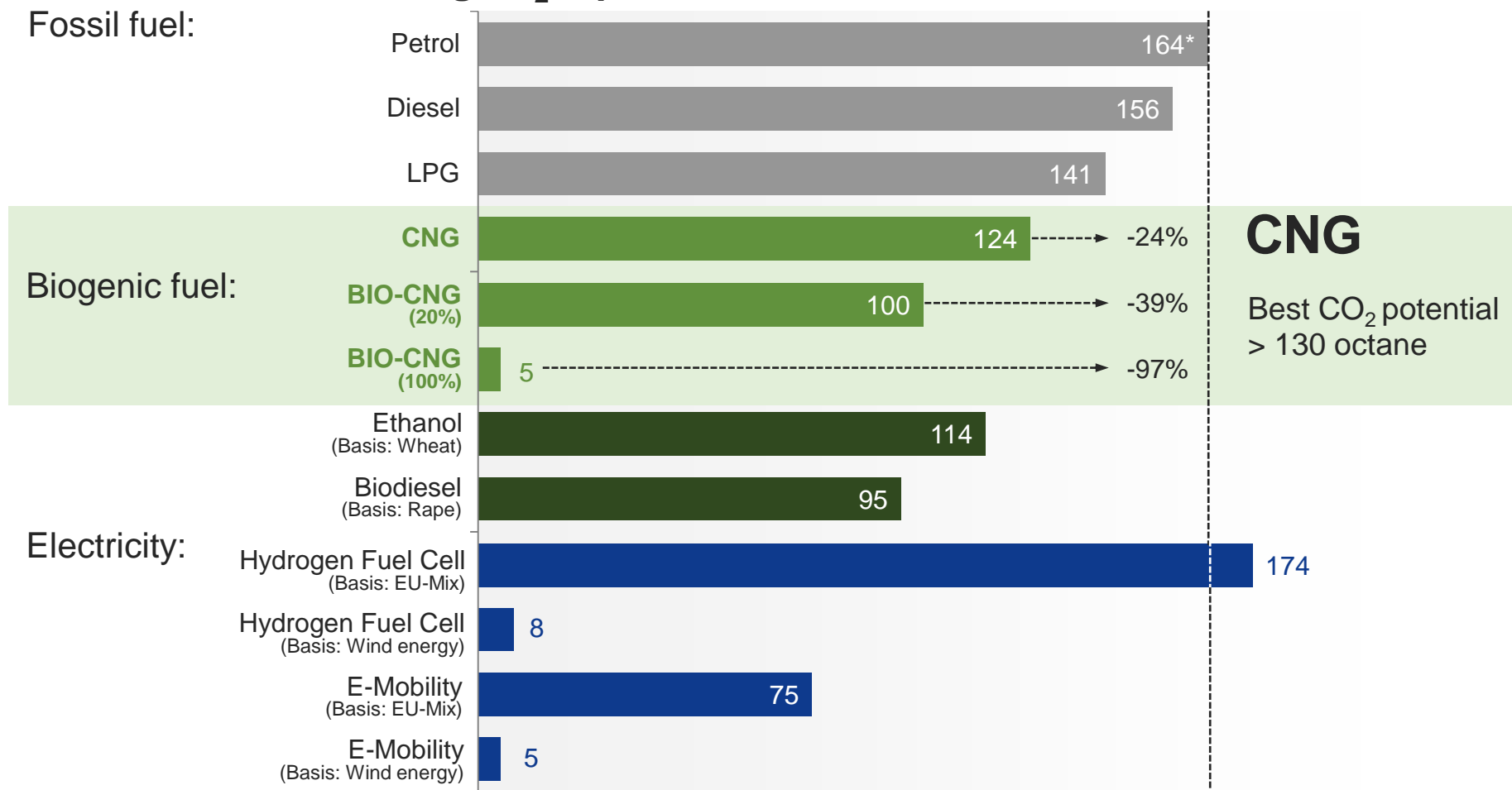
Figure: Fuel prices Germany April 2014. CNG price 0,70 € on litre eq. basis.

# Overview of deadlines

| MODE                                          |             | ROAD                          |                                                                                                                                                                              | WATER                                                                                              |                                                                                               |
|-----------------------------------------------|-------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
|                                               |             | <i>Motor vehicles</i>         |                                                                                                                                                                              | <i>Heavy duty motor vehicles</i>                                                                   | <i>Maritime ports</i> <i>Inland ports</i>                                                     |
|                                               |             | Urban/suburban agglomerations | TEN-T Core Network                                                                                                                                                           |                                                                                                    |                                                                                               |
| F<br>U<br>E<br>L<br><br>T<br>Y<br>P<br>E<br>S | Natural gas | LNG                           |                                                                                                                                                                              |  <b>LNG</b> 2025 | 2025  2030 |
|                                               |             | CNG                           | 2020  2025                                                                                  |                                                                                                    |                                                                                               |
|                                               | Hydrogen    |                               | 2025                                                                                     |                                                                                                    |                                                                                               |
|                                               | Electricity |                               |   2020 |  2025         |                                                                                               |

# Methane & CO<sub>2</sub> WTW emissions - 95 g/km by 2020

## THG-Emission WTW in gCO<sub>2</sub> äq/km



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

# ILUC proposal (6% cap on 1st generation biofuels). Blending of biofuels to meet 10% RES target



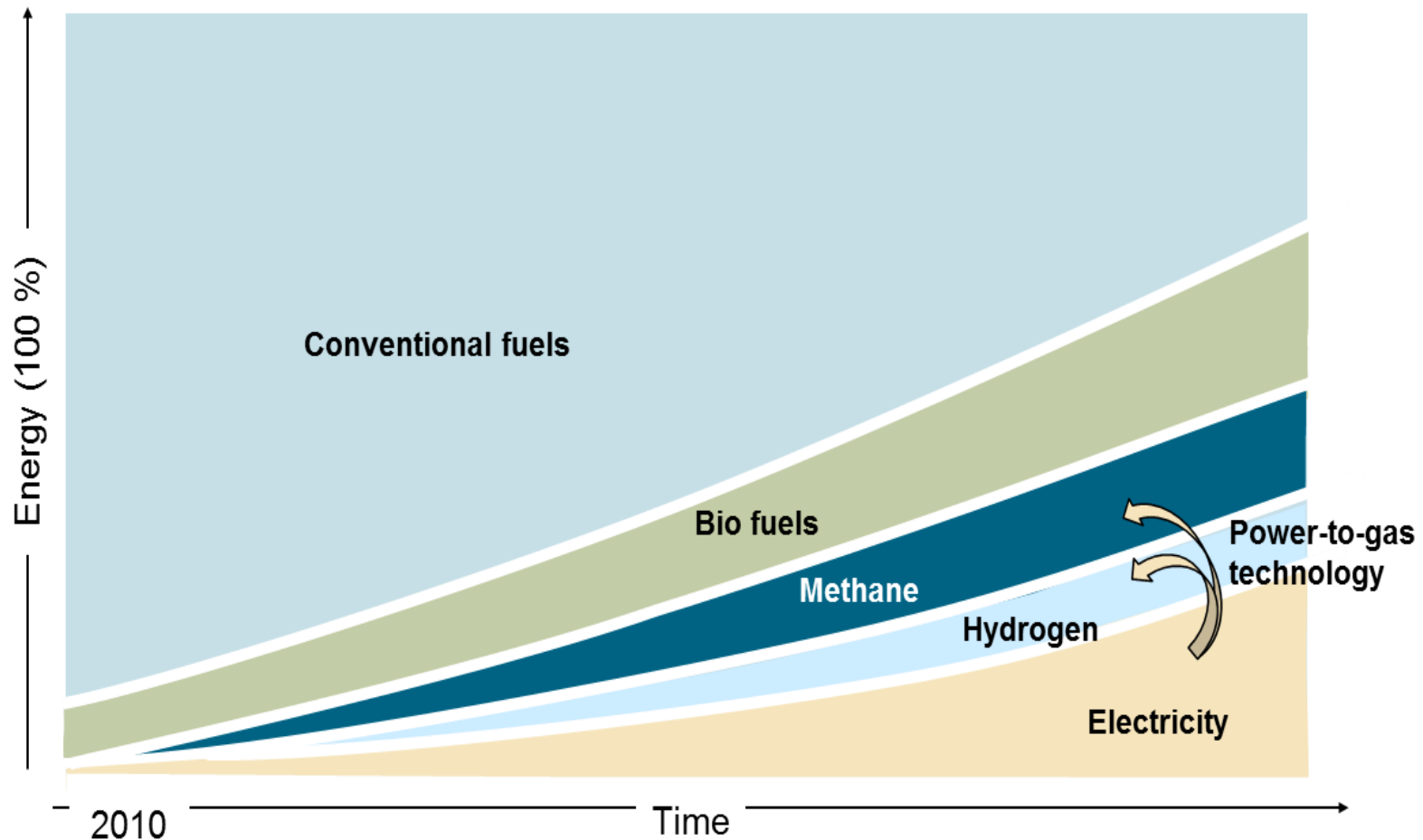
## Principal sources of biomethane



## Power to Gas concept (storage of renewable electricity)



# Renewable CH<sub>4</sub> – NGVs in the focus of research



Scenarios / The indicative evolution of passenger road transport energy source and propulsion technology, towards 2050 [source: ERTRAC]

# Funding for research: Horizon 2020.

## NGVs can close efficiency gap to diesel



Vote on Horizon 2020 in EP Plenary: Oct/Nov 2013

Adoption by the Council: Nov/Dec 2013

Adoption of work programme and publication of first calls for proposals: **11 December 2013**

### *Open calls*

#### CALL 'CLEAN VEHICLES'

- Future natural gas powertrains and components for cars and vans
- Future alternative fuel powertrains and components for heavy duty vehicles

#### CALL 'SMART CITIES AND COMMUNITIES'

- Alternative fuels for Smart Cities

**€70 billion for research and technical development 2014-2020**



# CNG vehicles – low emissions champions

**Eco up! wins Germany's  
"Green car of the Year"**



**Downsized & turbo charged  
engines + CNG is ideal (Fiat Panda)**



**New Audi A3 TCNG. Cleanest  
combustion engine with e-gas**



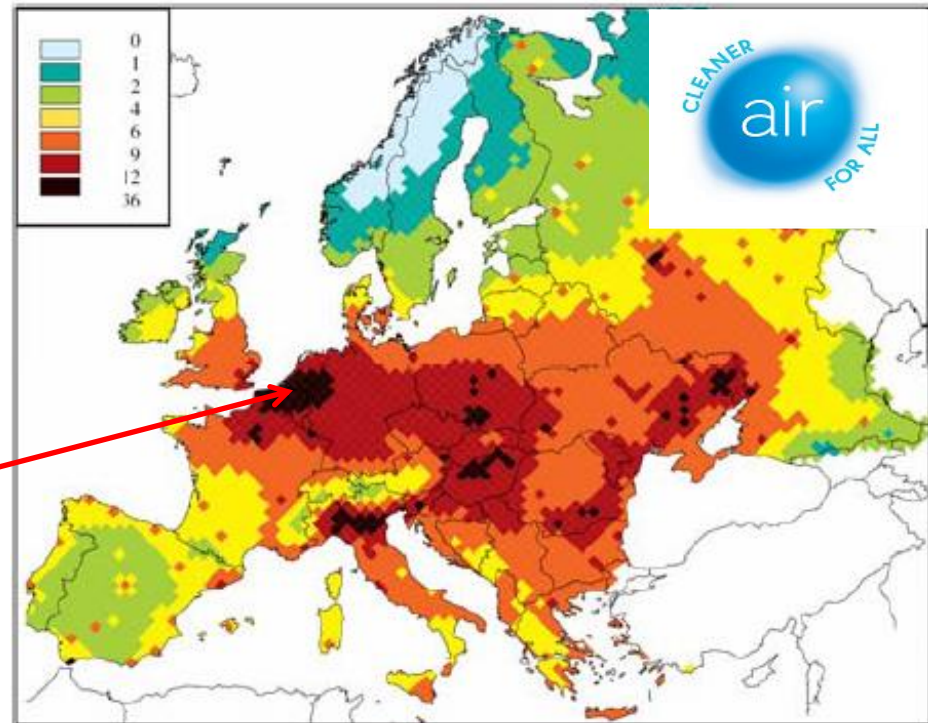
**More attractive OEM models. Range 500 km +  
(Opel Zafira Tourer & Mercedes-BENZ B-Class)**



# Air pollution – the invisible killer: 400.000 pre-mature deaths



NGVs improve the quality of life!



*Opt for CNG in cities!*

- avoidance of local pollution
- 50% less noise

# LNG trucks for long distance transport



## Diesel vs. CNG / LNG

1 Liter



Diesel

CNG  
5 litre



LNG/LBG  
1,8 litre



Two technologies are available for heavy engines:

- Dedicated, using 100% natural gas
- Dual fuel, using diesel injection for ignition and natural gas as the main fuel

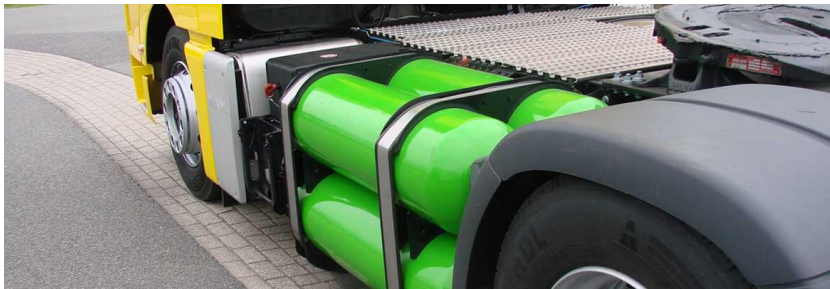
**LNG opened the way for the medium and long distance road transport**



# Weights & Dimensions: CNG & LNG



*18 March, European Parliament TRAN Committee acknowledges extra weight of CNG and LNG fuel tanks.*



Article 1 – paragraph 1 – point 2

**Article 2 – first subparagraph – indents (new)**

'low carbon technology' means technology which does not fully rely on fossil oil sources in the energy supply to transport and which significantly contribute to the decarbonisation of transport. The sources include: electricity, hydrogen, synthetic fuels, advanced Biofuels, **natural gas - including biomethane - in gaseous form (compressed natural gas – CNG) and liquefied form (liquefied natural gas – LNG),** and waste heat.

# LNG trucks for long distance transport



## The LNG Blue Corridors Project

*Large scale project to demonstrate the LNG as a real alternative for medium and long distance transport, as complementary fuel first, and substitute of diesel in the future.*

- 27 partners from 11 countries
- 100 Heavy Duty vehicles running on **LNG**
- 14 new fuel stations
- Total investment: 14.33 M€
- EC funding: 7.96 M€
- 4 years

# The L-CNG filling station concept

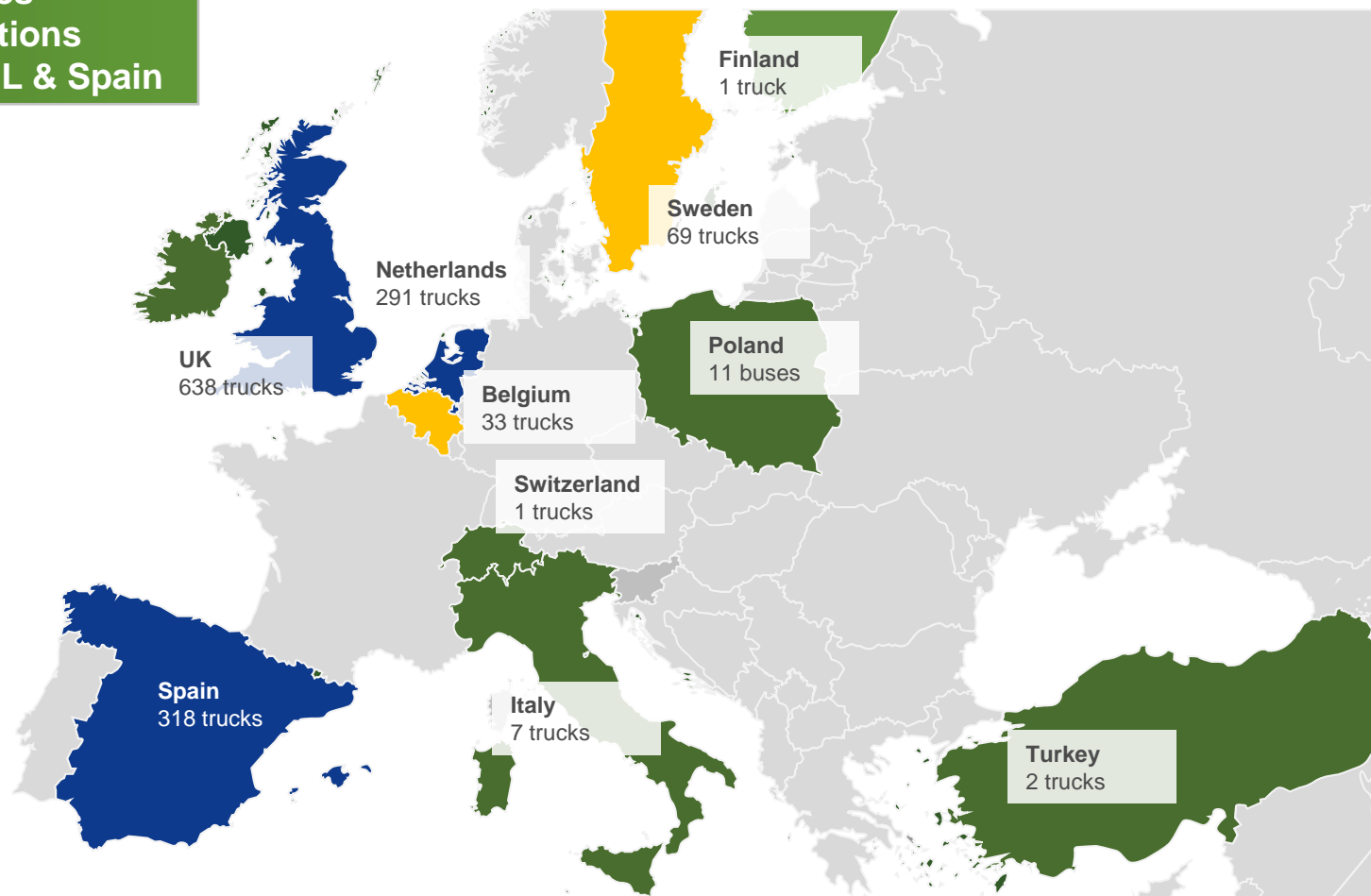
## Inauguration Kallo/Antwerp 14/05





# Current European LNG vehicle fleet

**1.500 LNG Vehicles**  
**35 LNG filling stations**  
**UK leader, then NL & Spain**

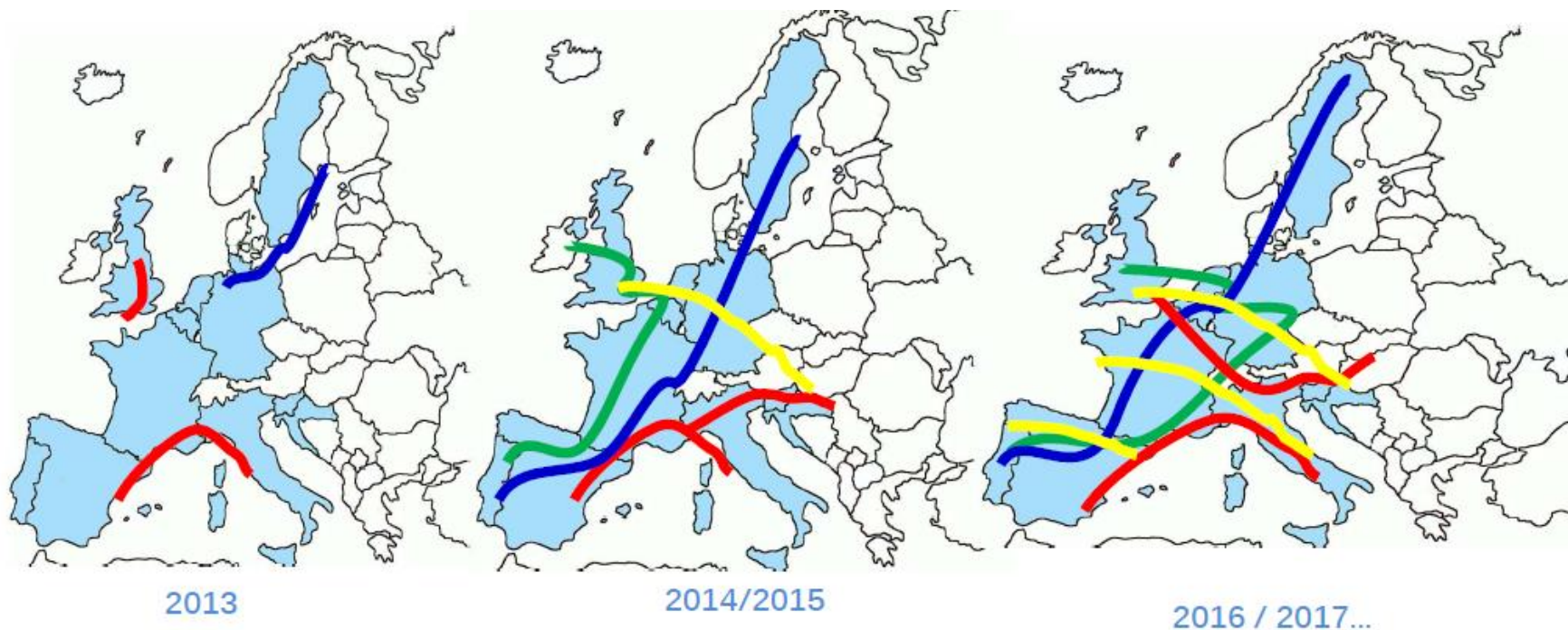


- > 200
- > 25
- < 10
- None

Source: NGVA Europe, 13.03.2014



# Roadmap of the LNG Blue Corridors



# TEN-T funding available for NG road filling stations & LNG bunkering

CNG station. Dats 24,  
Brussels, Belgium



L-CNG station. Indox,  
Lleida, Spain



LNG bunkering. Nynashamn,  
Sweden



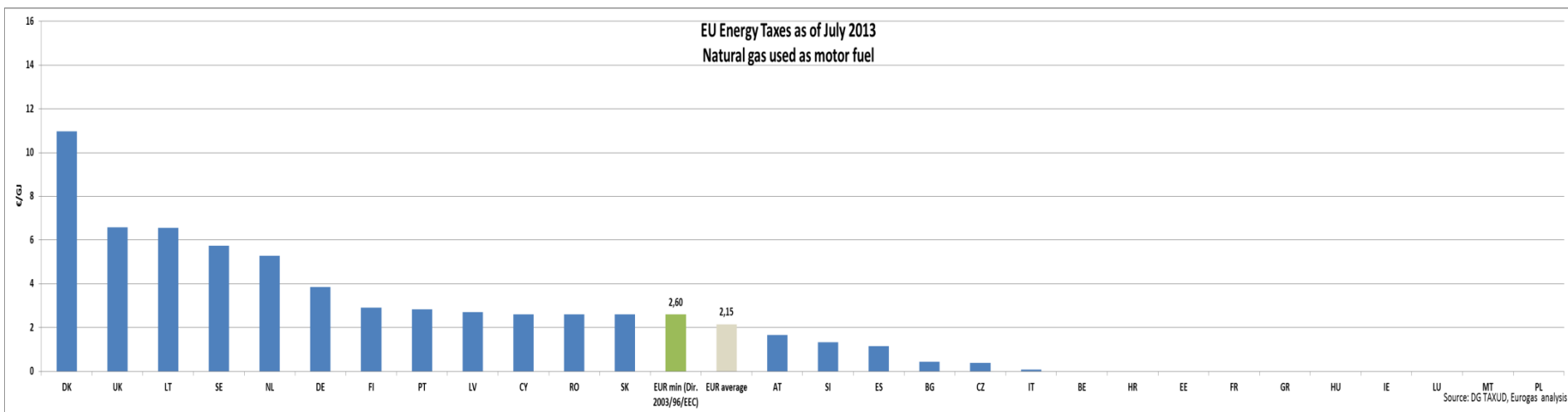
- €23 billion available funding period 2014-2020
- CNG and LNG eligible for funding
- Connecting Europe, cross-border transport, long distances

**More info:** [http://tentea.ec.europa.eu/en/apply\\_for\\_funding/follow\\_the\\_funding\\_process/calls\\_for\\_proposals\\_2012.htm](http://tentea.ec.europa.eu/en/apply_for_funding/follow_the_funding_process/calls_for_proposals_2012.htm)

# Energy taxation on NG in EU 28

## Ongoing discussion – tax harmonisation?

**NGVA Europe position:** “We need adequate transitional periods, derogation possibilities, lower taxes on NG and stronger support for biomethane until a certain market share has been reached.”



*Figure: Current energy taxation levels in the EU*  
Source NGVA.

# Conclusions



- Significant macro-economic savings when using NG as a fuel
- NGVs is the quickest and most cost-effective way to reduce emissions from transport (all types of vehicles and transport modes)
- Harmonisation of standards on its way (ISO Committee 252 on CNG/LNG filling stations, CEN/PC 408 on gas quality, UNECE standardisation of LNG components)
- Infrastructure for CNG and L-CNG filling stations and LNG bunkering is essential
- Tax support for NG main driver during infrastructure build-up phase



5th NGVA Europe International Show & Workshops

**NGV 2014**  
**Brussels**

Natural Gas Vehicles - Biomethane - CNG - LNG - Hydrogen Blends

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