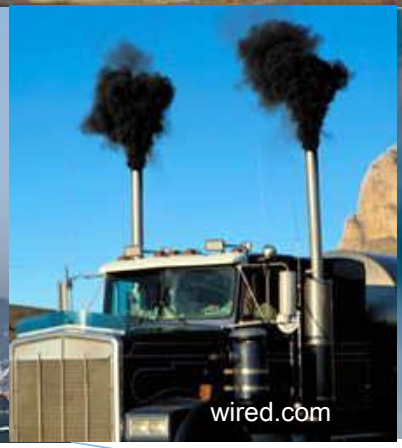
Gazprom – Natural Gas for Cleaner European Transport
Blue Corridor Rally 2012

David Graebe, GAZPROM Germania / Igor Maynitskiy, Gazprom export

So where is the problem?



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… but this is not Europe ?!

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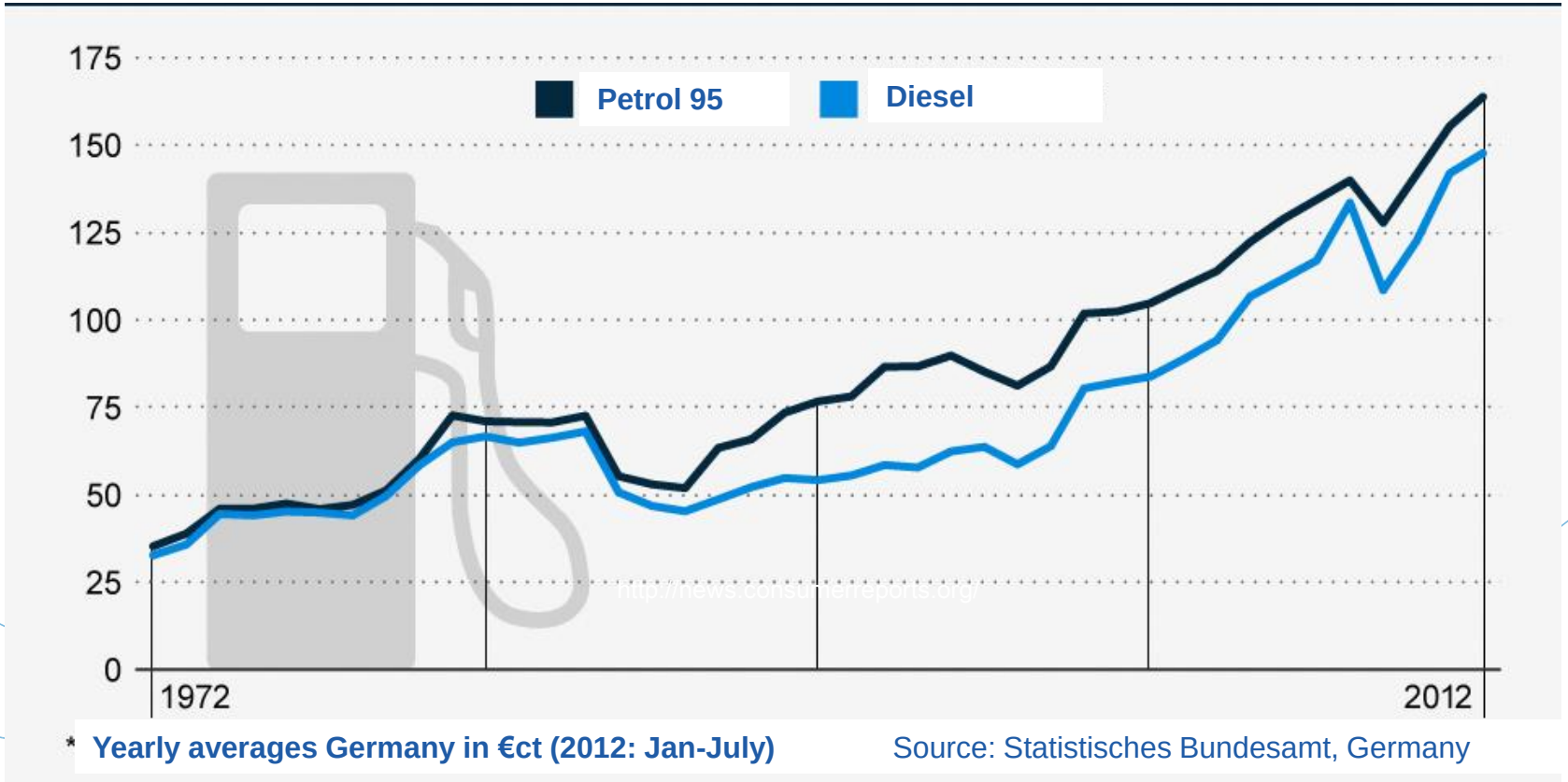
… this is Europe!



* **Yearly averages Germany in €ct (2012: Jan-July)**

Source: Statistisches Bundesamt, Germany

… and this is Europe (America, Japan, …)!

http://news.consumerreports.org/

http://jalopnik.com

http://crave.cnet.co.uk

"Nissan rescues dead electric cars with gas-guzzling diesel trucks"

(http://jalopnik.com)

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Competition of alternative technologies – not all technologies are equally suited

							
	(✓)	?	?	x	x	x	✓
	(✓)	(✓)	(✓)	?	?	?	?
	?	?	✓	✓	✓	✓	✓
	✓	✓	✓	✓	x	x	?
	(✓)	(✓)	(✓)	?	?	?	?
	✓	✓	(✓)	x	x	x	x

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Our firm believe: natural gas is the best fuel!

Clean

- 25% less CO2- and 75% less CO-Emissions compared to petrol
- Practically no particulate matter and no filters or additives (AdBlue) required
- Use of bio-methane reduces CO2-emissions even further

Safe

- Crash-Tests prove that natural gas vehicles are as safe as conventional vehicles
- Natural gas available 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”
- Storing natural gas as “LNG” provides even wider driving range
- Economically attractive alternative to comply with environmental regulation

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NGV development trends

CNG – Natural gas compressed to 200 bar

LNG – Natural gas liquefied by cooling down to -161 (-137) °C

Established and growing ☑

- Proven technology available here and today
- Cars, busses & trucks available with new models being added by the car industry
- Zero or reduced excise duty

New ★

- Targets heavy duty transport
- Refuelling infrastructure yet to be developed
- More complex supply chain than for CNG
- Zero or reduced excise duty

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

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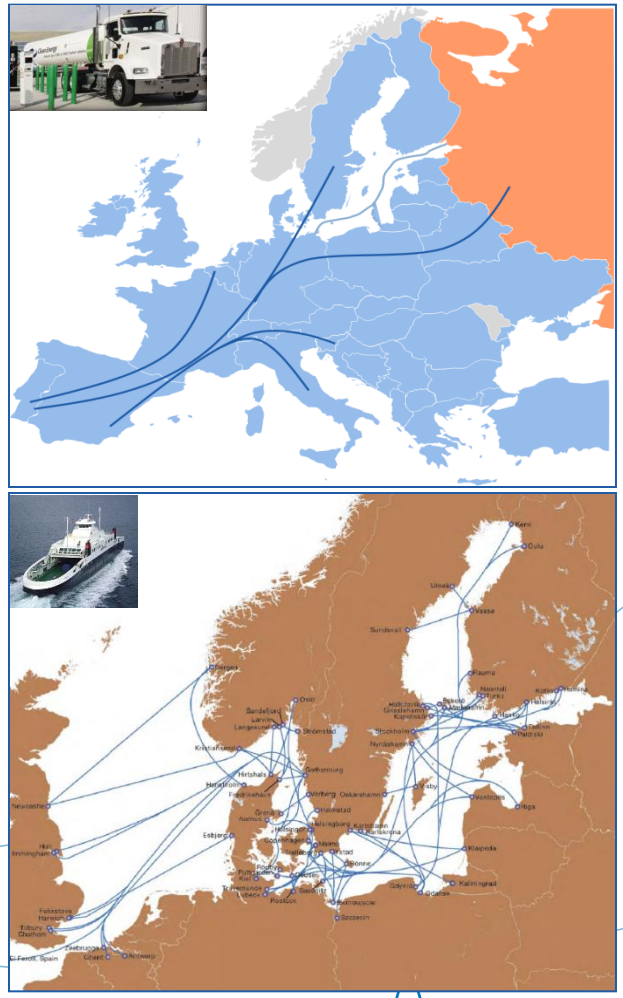
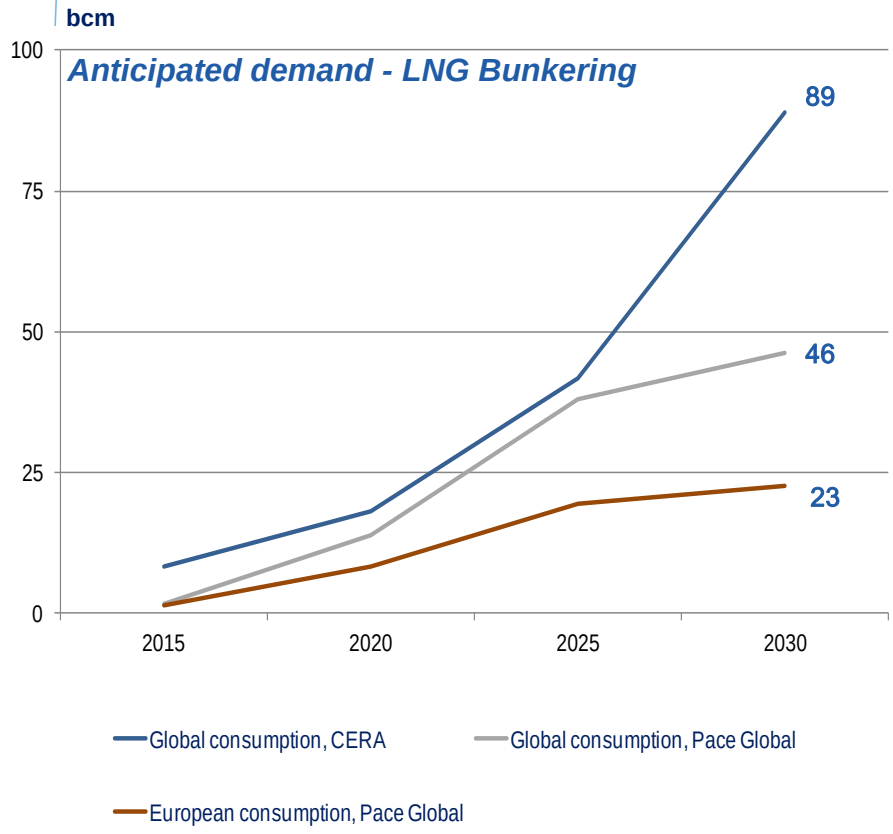
Market drivers influencing Gazprom's European Gas for Transport strategy

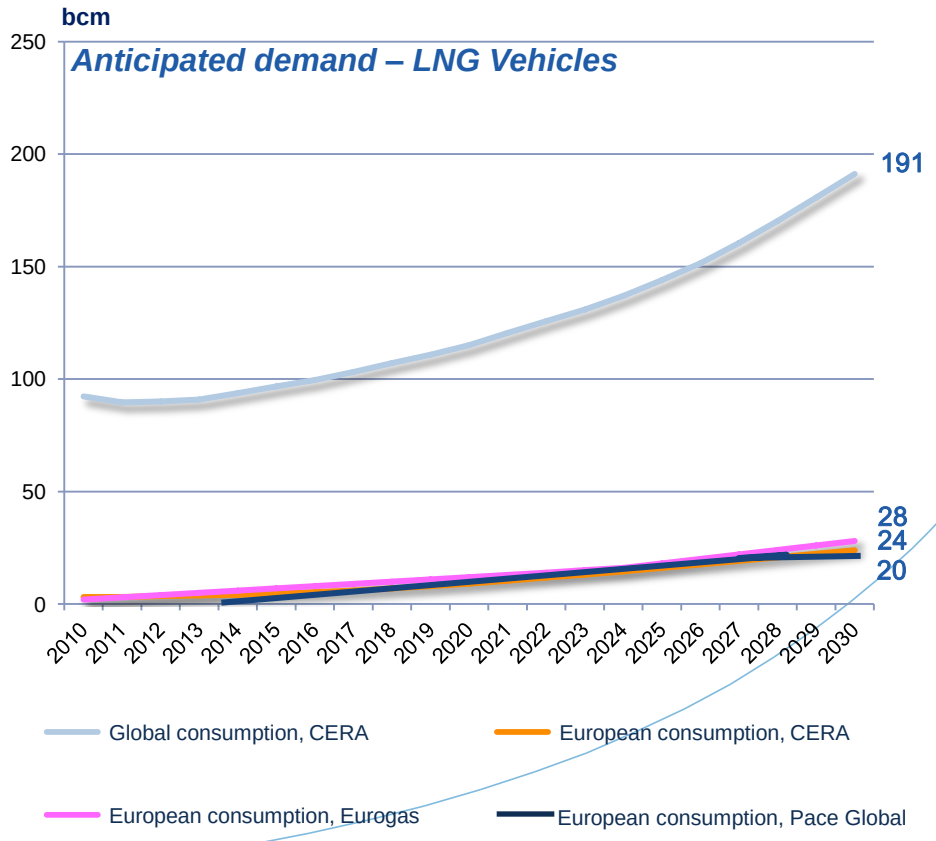
- European emissions reduction agenda drives development of alternative fuels: EU-6 (2013/2014) and associated costs drives development of CNG and LNG as fuel for cleaner road transport (CO_2, NOx, particulate matter)

- Sulphur Emission Control Areas (SECA from 2015 in Baltic and North Sea) and associated costs drive development of LNG as bunker fuel opposed to MGO or scrubber-technology (SOx)



Expected market potential of Small Scale LNG in Europe





Demand projections derived from Gazprom export: World NOC Congress, June 18, 2012, London

European demand for LNG in NGV and bunkering conservatively expected to reach between 22 and 43 bcm p.a. by 2030

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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 production and retail infrastructure to promote LNG sales as a motor fuel

Europe

- GAZPROM Germania Group extending CNG presence in Germany from 4 to 15 stations until end 2014 and in the Czech Republic (via VEMEX) from 4 to 15 stations by end 2013 → further CNG stations to follow
- Gazprom export & GAZPROM Germania developing LNG for European road transport and bunkering for North- and Baltic Sea

IGU
INTERNATIONAL GAS UNION
UNION INTERNATIONALE DU GAZ

for sustainable mobility
NGVA europe

ERDGAS
Natürlich mobil

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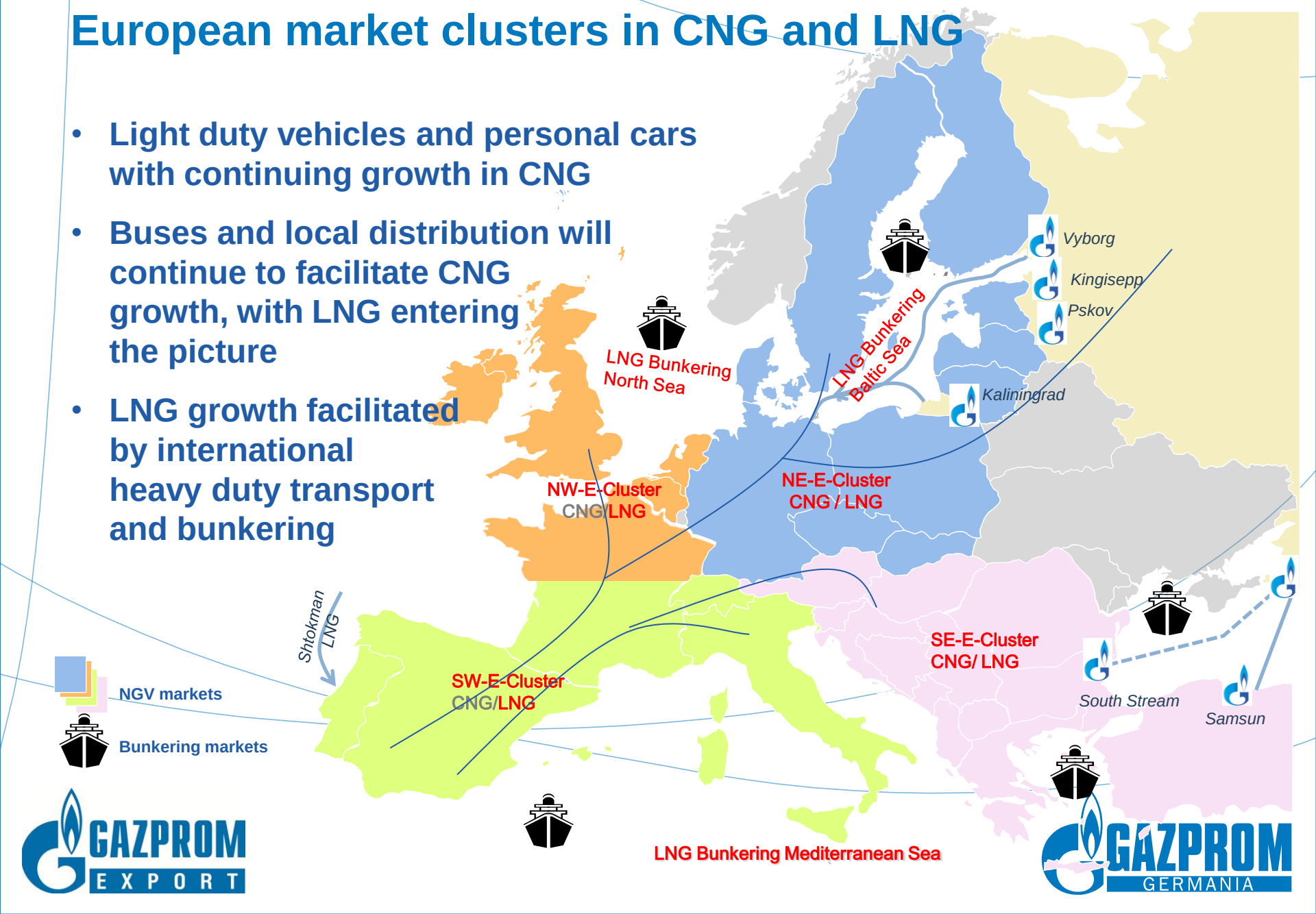
European market clusters in CNG and LNG

- 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



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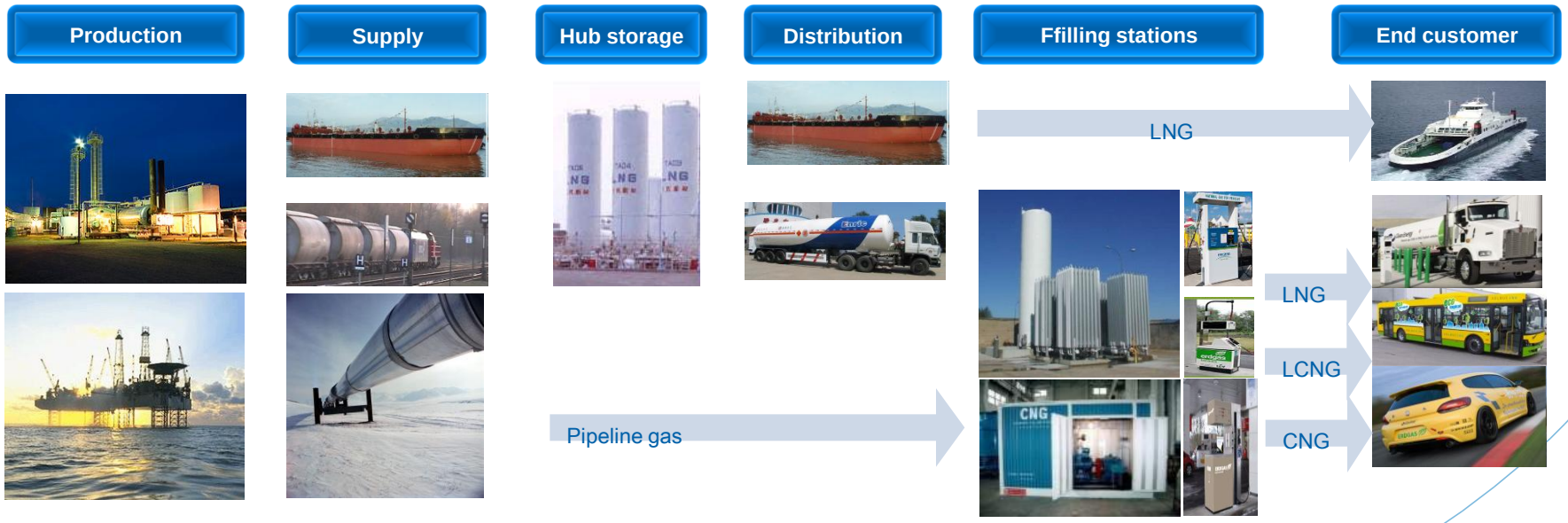
Substantial investments required to complete the value chain – Gazprom will not hold back!



Strategic alliances

M&A growth

Organic project based growth

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And what about Poland?

- 47 (33 public) CNG stations / 2,082 NGVs*
- NGV market share: 0.01%
- Natural gas fuel sales: ca. 0.01 bcm in 2008*
- Main player: PGNiG
- Currently focus on LPG; CNG buses in some Polish cities, demand growth can be observed
- Local automotive manufacturer taking initiative in LNG fuelled vehicles (Solbus)
- **“Level playing field” for LNG as fuel for long-distance and urban transport**

CNG stations	47 (33 public)*
NGVs	2,082*
Ø CNG price	3.30 PLN (0.79€)/kg
Energy tax CNG→ 2013 LNG	 0.00 PLN (0.00 €)/kg 0.82 PLN (0.18 €)/kg

* Status 09/2011, source GVR/NGVA Europe

Development of NGV refuelling station network in Europe

Poland is part of the transport corridor from East to West with a high share of HD trucks and buses

Just the start: Joint roadshow of GAZPROM Germania and Solbus presenting LNG-fuelled buses in 6 Polish cities

Pilot-Projects

"First movers" benefit from market chances

Regional transport

Single refuelling stations

Inter-regional transport

First connections between refuelling stations

European transport

Network of refuelling stations to serve long-distance routes **(„Blue Corridors")**

LNG → CNG

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Any questions?

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Source: erdgas mobil

Backup in case needed

Source: auto.de

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Facts & figures
NGV market Germany

- 910 CNG-stations / 95.000 NGVs
- NGV market share: 0.21%
- Natural gas sales: ca. 0.25 bcm in 2011
- Main players: E.ON, EWE, VNG, GASAG, Gazprom
- German government sees possibility to extend share of natural gas as fuel to 2.5 bcm by 2020
- Natural gas and bio-methane is part of the Energy concept of the German government (09/2010)
- Number of CNG stations now again growing
- Target: 1.000 CNG stations until end 2013

CNG-stations	910
NGVs	95,000
Ø CNG price	1.07 €/kg
VAT	19%
Energy tax → 2018 2019 →	 0,2099 €/kg 0,4802 €/kg

Comparison CNG and LNG

Pro's

- **Proven technology** available here and today
- Choice of **vehicles available** with new models being added by the automotive industry
- Generally able to **meet EU 6** standards
- "Zero" or **reduced excise duty** in many European countries, expected to last until 2030

Con's

- Extra weight of gas cylinders decreases fuel efficiency and driving performance
- For buses: sometimes height restrictions for low bridges due to mounting of storage on the roof
- Lower energy density than conventional fuels or LNG
- Excise duty regimes converge towards traditional fuel taxation

Pro's

- **Higher energy density** than CNG resulting in smaller tanks, less weight and higher mileage
- **Lower weight of vehicles** resulting in higher utilization of fuel efficiency
- For buses: **lower centre of gravity** due to lighter fuel tank mounted inside the vehicle results in higher driving comfort
- **Reduced excise duty** with high chances of sustainability until 2030 (as for CNG, but in some countries CNG and LNG are treated differently)

Con's

- New and well tested technology, but refuelling infrastructure yet to be developed
- More complex supply chain than for CNG requires reliable partners for supply + refuelling
- Choice of OEM vehicles still limited

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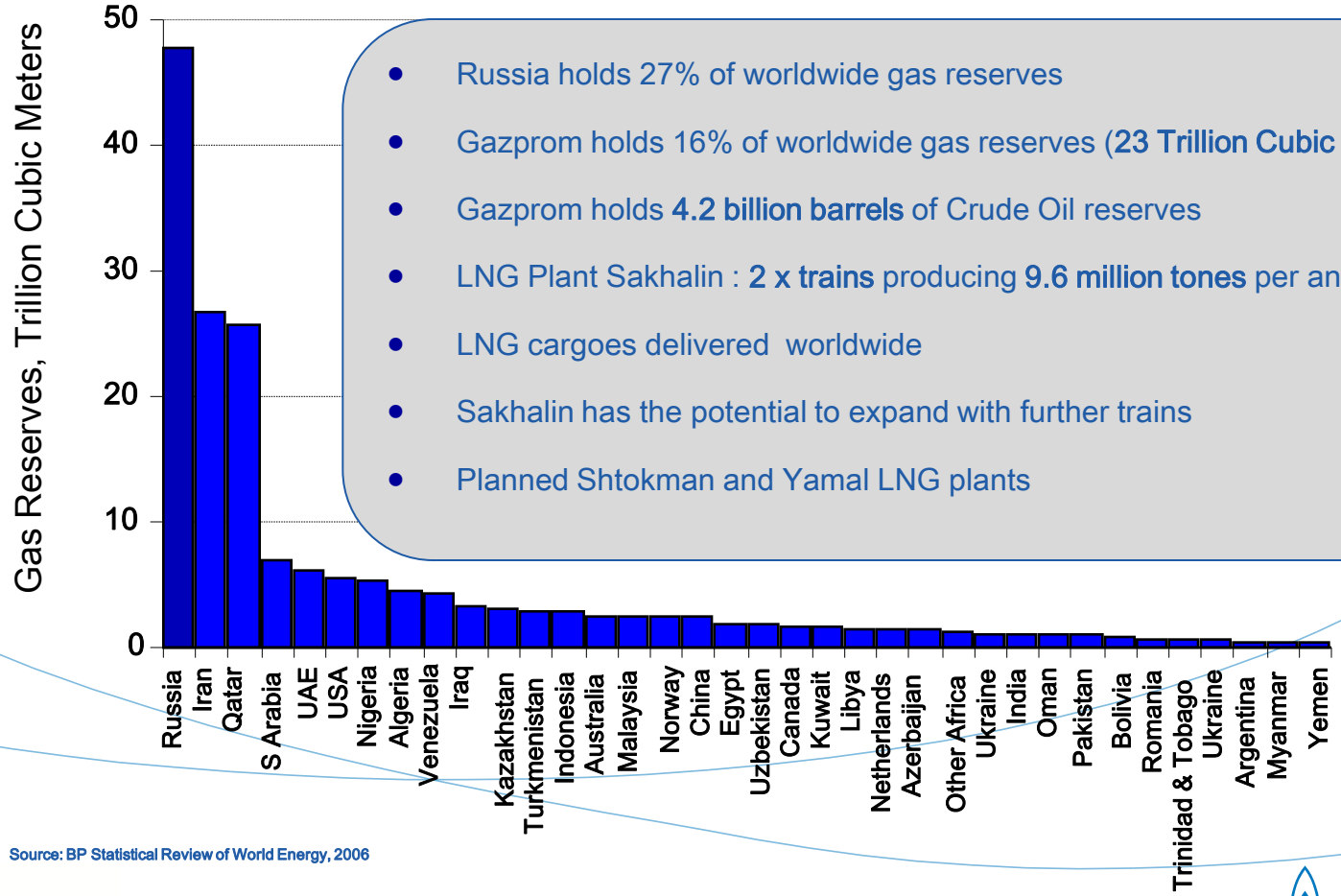
Gazprom - world's largest gas reserve holder



- Russia holds 27% of worldwide gas reserves
- Gazprom holds 16% of worldwide gas reserves (**23 Trillion Cubic Feet**)
- Gazprom holds **4.2 billion barrels** of Crude Oil reserves
- LNG Plant Sakhalin : **2 x trains** producing **9.6 million tones** per annum.
- LNG cargoes delivered worldwide
- Sakhalin has the potential to expand with further trains
- Planned Shtokman and Yamal LNG plants

Source: BP Statistical Review of World Energy, 2006

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