Study "Legal and Regulatory Environment for the Construction and Operation of CNG Filling Stations in European Countries"

BACKGROUND TO THIS PROJECT (2011-2012)

- Sponsor: European Business Congress
- Primary Contractor: National Gas Vehicle Association Russia, assisted by Clean Fuels Consulting
- Project Scope
  - 21 European NGV Country Profiles (West & East Europe) – PowerPoint file
  - Legal & regulatory environment to build fuelling station network – Excel File
  - Strategic approaches to create NGV fuel infrastructure – PowerPoint file
  - NGV Infrastructure Calculation Tool (NICA) – Excel File

PURPOSE OF THE PROJECT

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The European market for natural gas vehicles has been expanding steadily since 1994 when there were 524,000 natural gas vehicles (NGVs) and 1,693 CNG fuelling stations. Today the European market has expanded to 1.5 million NGVs and 4,000 fuelling stations; growth of 286% and 236% respectively.

While NGVs and the fuelling infrastructure are a practical potential business opportunity they compete with the 'politically attractive' technologies such as hydrogen fuel cells and electric battery vehicles.

Thus, the time is right for the wider European business community to be made aware of the 'NGV potential.' This is best done by highlighting the excellent opportunities to invest in a sustainable fuel and technology that addresses today's important concerns about energy and the environment through the wider use of NGVs, whether they run on fossil natural gas, liquefied natural gas or renewable biomethane.

The European Business Congress has recognized this need and now is seeking a way to inspire new investments in the CNG fuelling infrastructure across Europe. Once in place, this can lead to a much more widespread development of the European NGV market in individual countries that are linked across Europe along the normal transportation corridors.

ACKNOWLEDGMENTS

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- EBC Project Coordinator: Detlef Wessling, E.On Ruhrgas
- NGVRUS Project Manager: Eugene Pronin, Gazprom
- Clean Fuels Consulting
- Principal Investigator: Dr. Jeffrey M. Seisler
- Research Assistant: Marco Dal Pont
- Project engineer for the Natural Gas Infrastructure Calculation Tool (NICA): Gijs van Schoonhoven (Ingenieurbüro van Schoonhoven)

NGV COUNTRY PROFILES

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NGV Country profiles provide, in a PowerPoint format, a template of information that represents in-depth analyses on a country-by-country basis. The profiles focus on the specific elements that are important to understand the investment environment to develop a CNG fuelling infrastructure. Taken together, these country profiles provide a unique window into individual markets that may be attractive to different commercial interests investing in the NGV infrastructure.

CZECH REPUBLIC
(December 2011)

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COUNTRY PROFILE TEMPLATE

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- NGV Profile
- Motivation
- Energy Profile (oil & gas/imports & exports)
- Vehicles
- Fuelling Infrastructure
- Government Support
- Gas Industry Support
- Conclusions

NGV PROFILE

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- Number of NGVs: 2.700
- NGVs are 0.06% of total vehicle population
- 0.26 NGVs per 1000 population
- CNG fuelling stations: 33
- 81.8 vehicles per fuelling station
- Price differential CNG-Petrol/diesel:
  - CNG equivalent per liter gasoline: 0,99 €/liter
  - Regular Gasoline: 1,32 €/liter

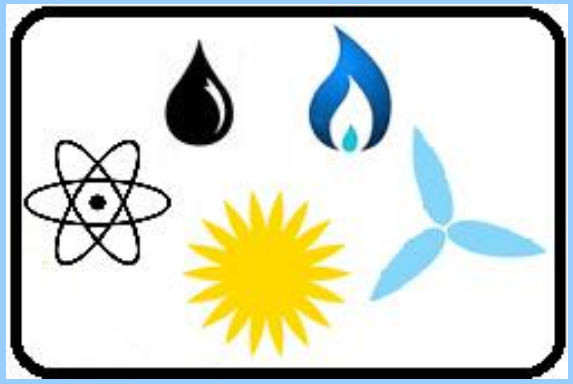
  Natural gas costs 25% less then gasoline

Source (October 2011)
www.metanoauto.it
http://www.drive-alive.co.uk/fuel_prices_europe.html

MOTIVATION

- Environmental protection
- Attempt to reduce high levels of local air pollution

ENERGY PROFILE



ENERGY PROFILE SUMMARY

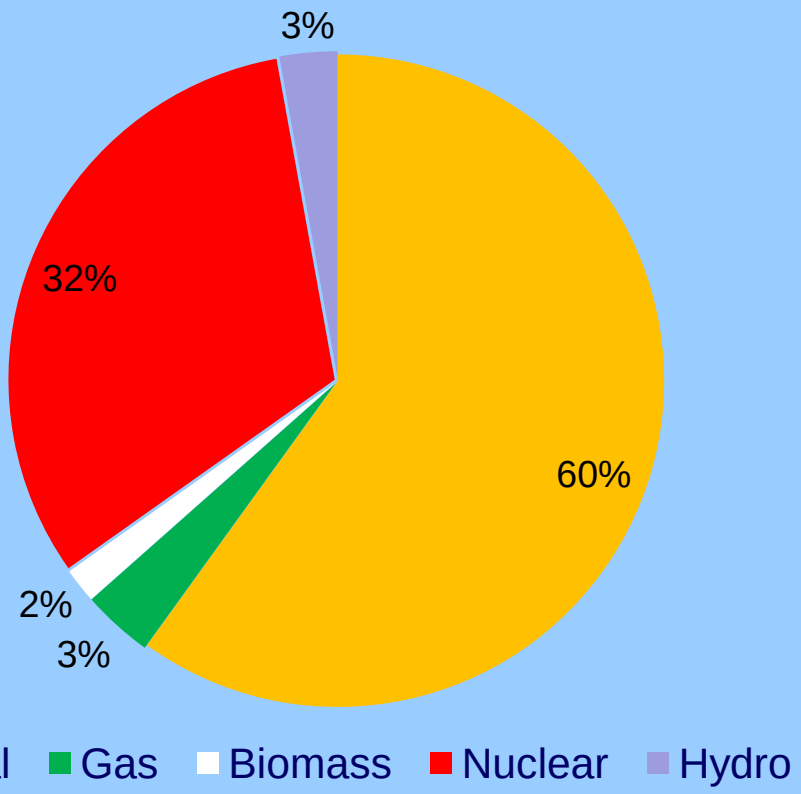
- Czech Republic is the third largest net electricity exporter in the European Union
- Electricity generation is largely composed of domestic coal and nuclear, whereas natural gas is used mainly as complementary fuel in multi-fired units and for peaking purpose
- Czech Republic imports nearly all of its oil and gas

ENERGY PROFILE

- **Oil**
  - production: 10.310 bbl/day
  - consumption: 195.700 bbl/day
  - imports: 208.480 bbl/day
  - exports: 25.480 bbl/day
  - reserves: 15 million bbl
- **Natural gas**
  - production: 203 million m^3
  - consumption: 9,308 billion m^3
  - imports: 8,51 billion m^3
  - exports: 159 million m^3
  - reserves: 3,964 billion m^3

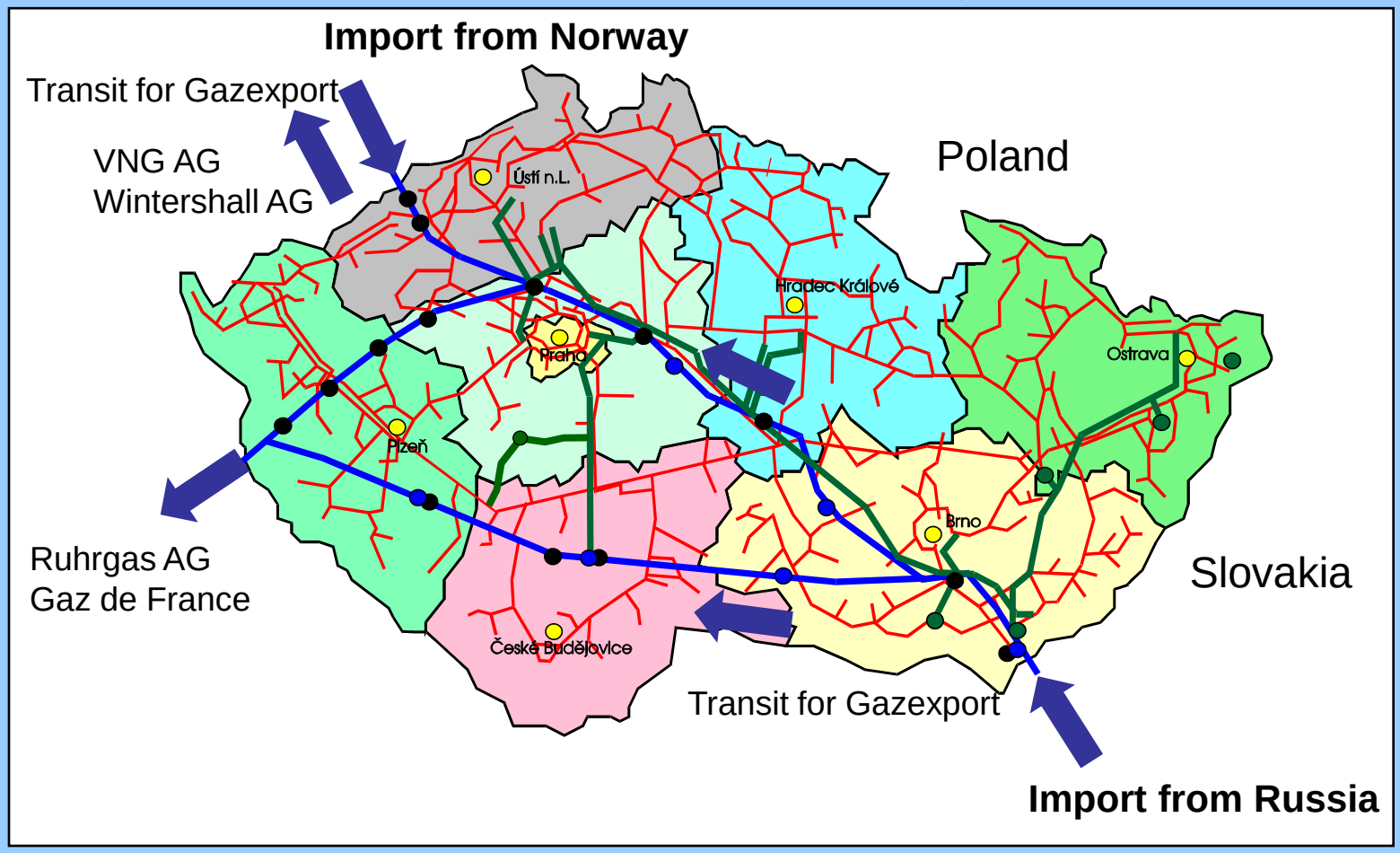
Source: CIA World Factbook 2011

Electricity production is dominated by coal, which is present in large quantities in the Czech Republic

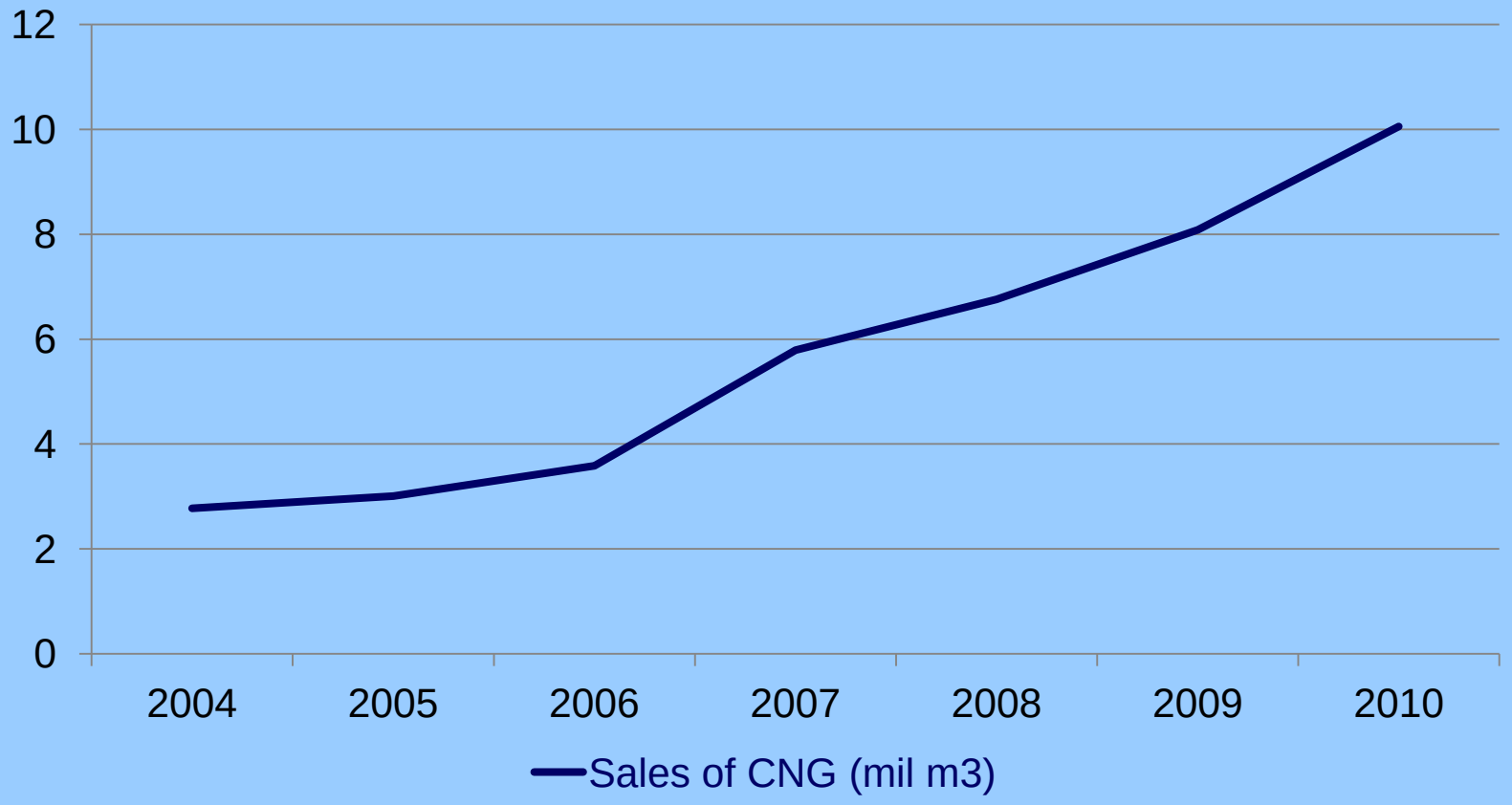


Source: IEA statistics

75% of natural gas is imported from Russia; 25% from Norway

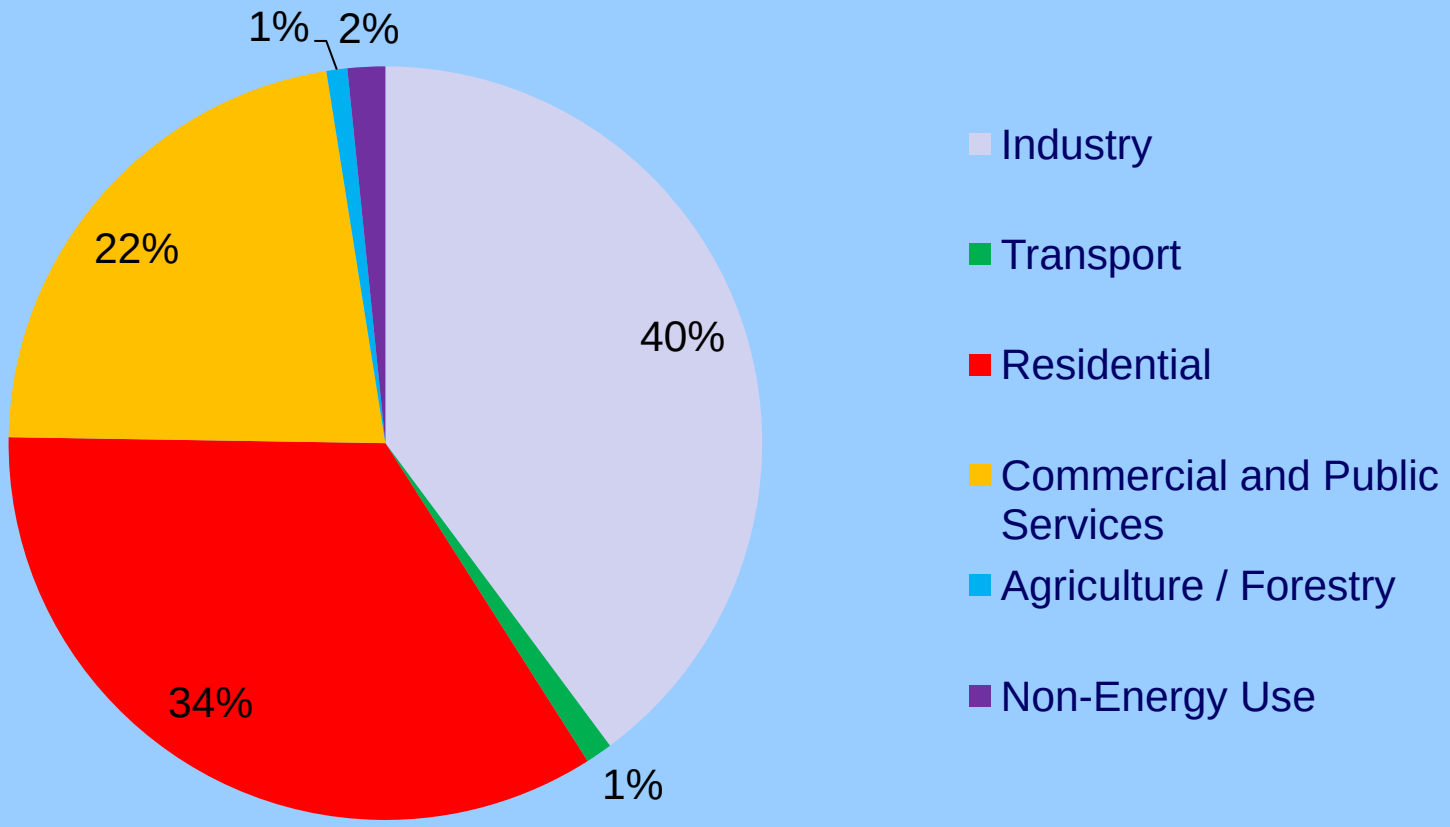


Sales of natural gas are increasing due to the energy policy that aims to reduce the use of coal



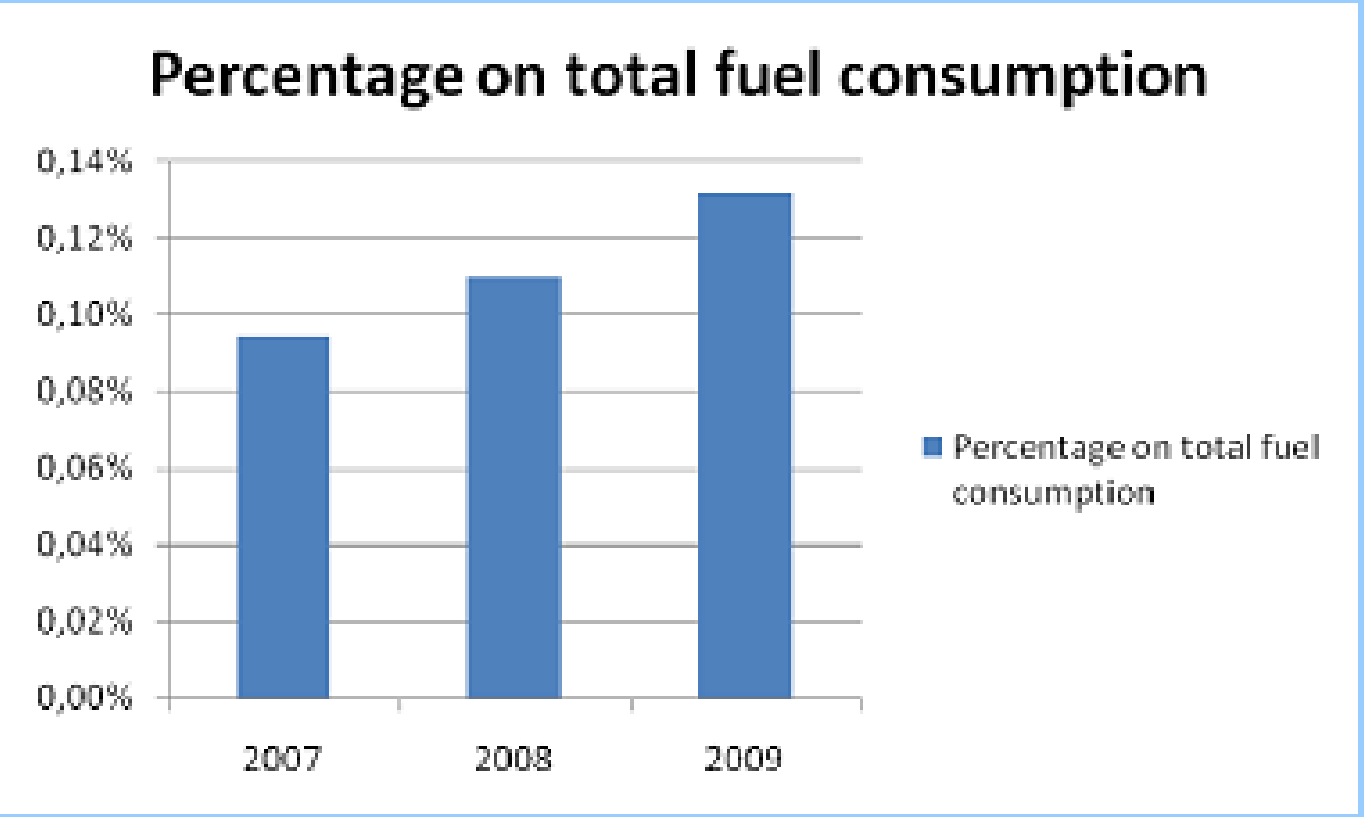
Source: Czech Gas Association, Pavel Novak, 3 March 2011

Natural gas is not yet well developed as an alternative fuel in the transport sector



Source: IEA statistics

The government target to increase the share of alternative fuel by 2020 to 10% of the total fuel consumption is far from being achieved



Source: Natural Gas for Vehicles, UN ECE & IGU Joint report

Today biogas represents 7% of total energy production from renewable sources

Table 1. Biogas plants in the Czech Republic (January 2010).

Biogas production with CHP gas utilisation	No. of plants	Installed power [MW]
Agricultural biogas plants	91	56.64
Sewage gas	57	18.89
Landfill gas	61	23.02
Total	209	96.55

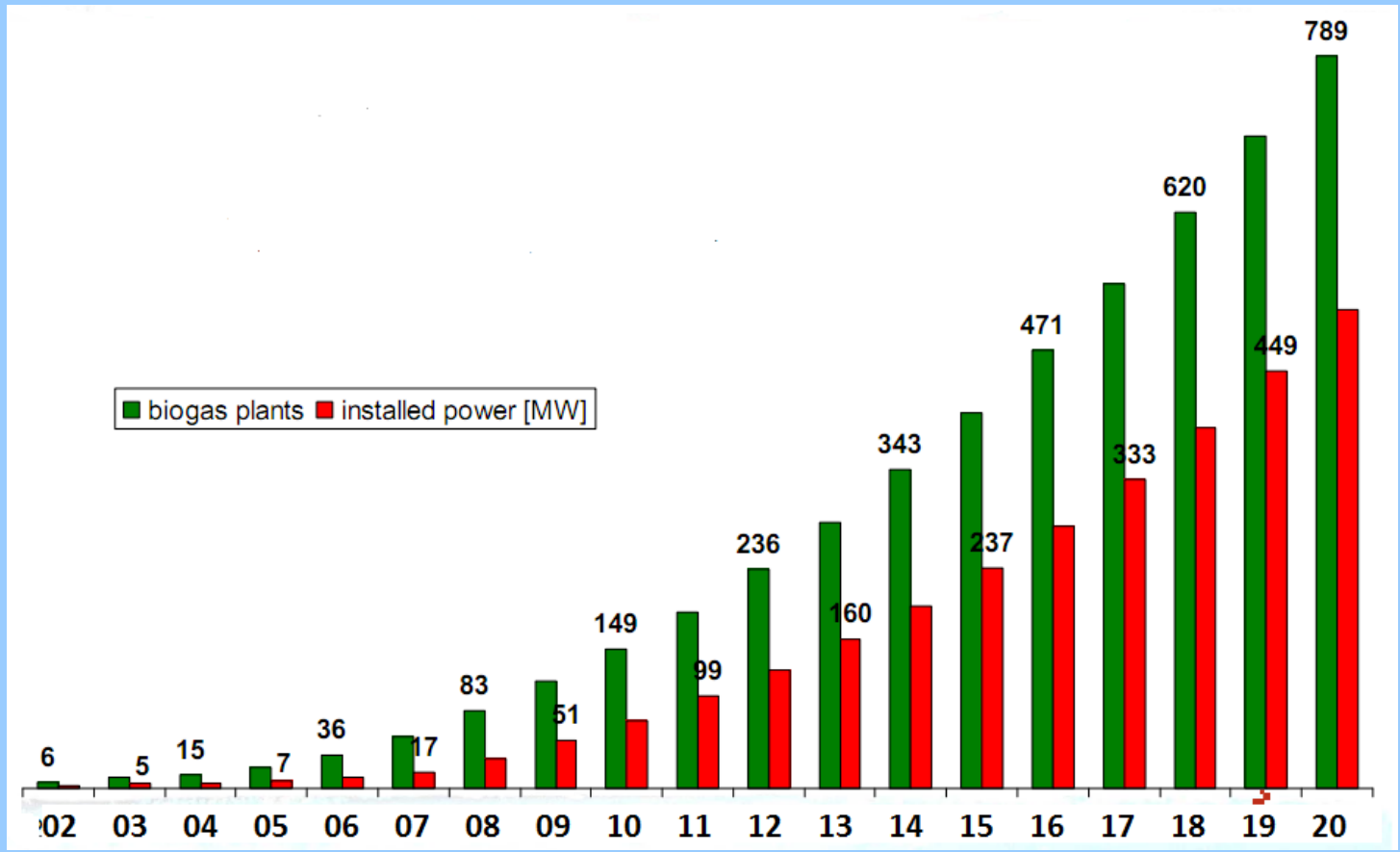
Source: Czech Biogas Association, National Report on current status of biogas production – the Czech Republic

Biomethane is not utilized as a transportation fuel in the Czech Republic

- In the Czech Republic there are no biogas plants with ***upgrading*** systems although there are some projects under construction
- Biogas utilized exclusively in combined heat and power applications

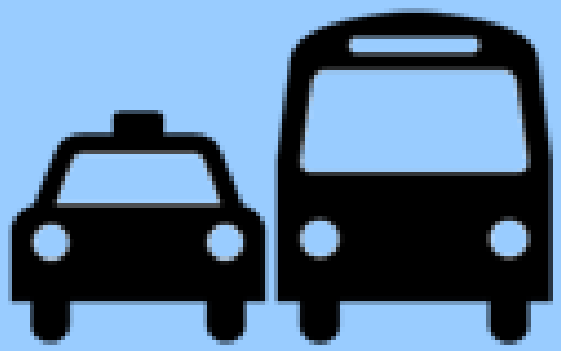
Source: Czech Biogas Association, National Report on current status of biogas production – the Czech Republic

High Feed-in Tariffs scheme will ensure active development of biogas plants by 2020

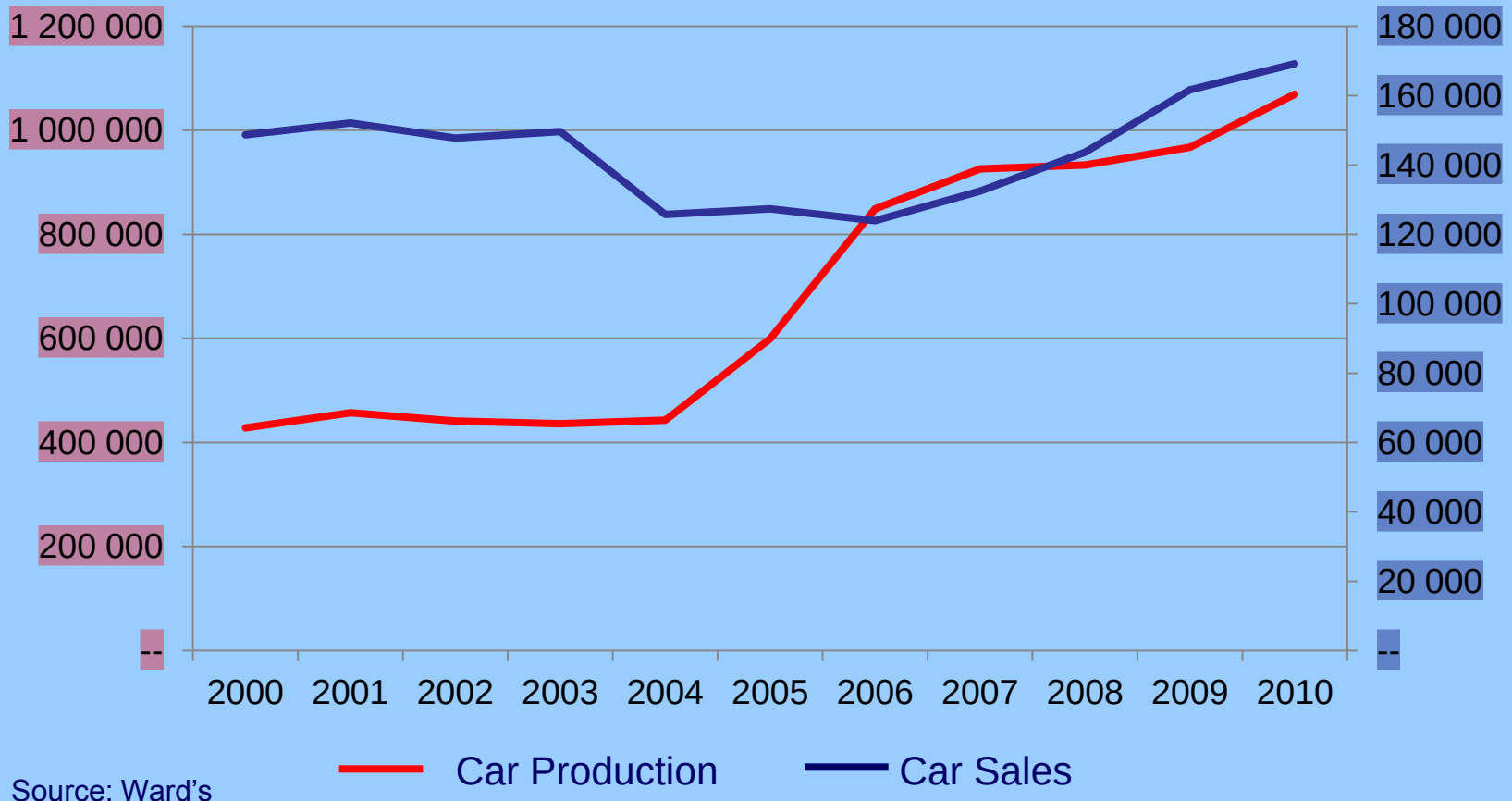


Source: Czech Biogas Association, Biogas in the Czech Republic

VEHICLE PROFILE

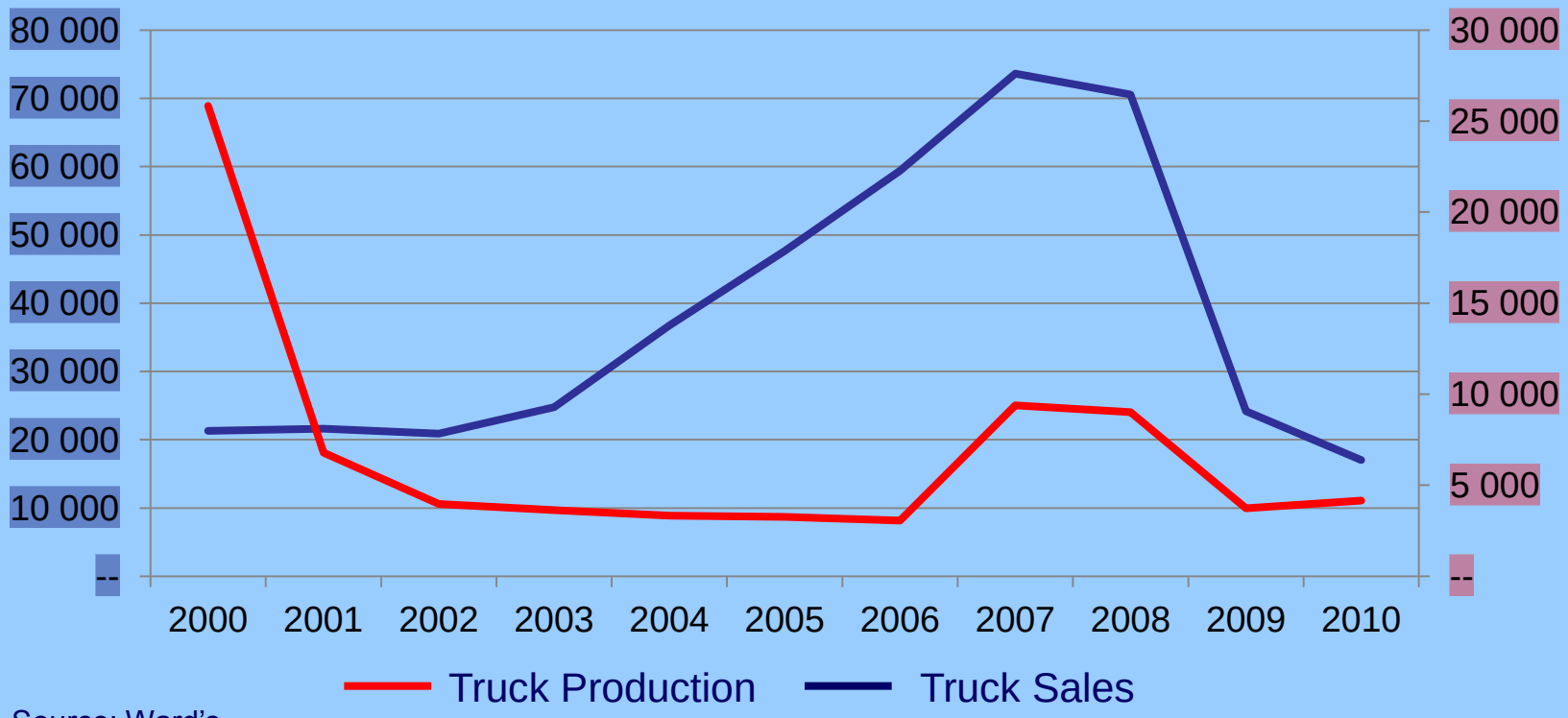


Despite the economic crisis car production and sales continued to increase in the last years



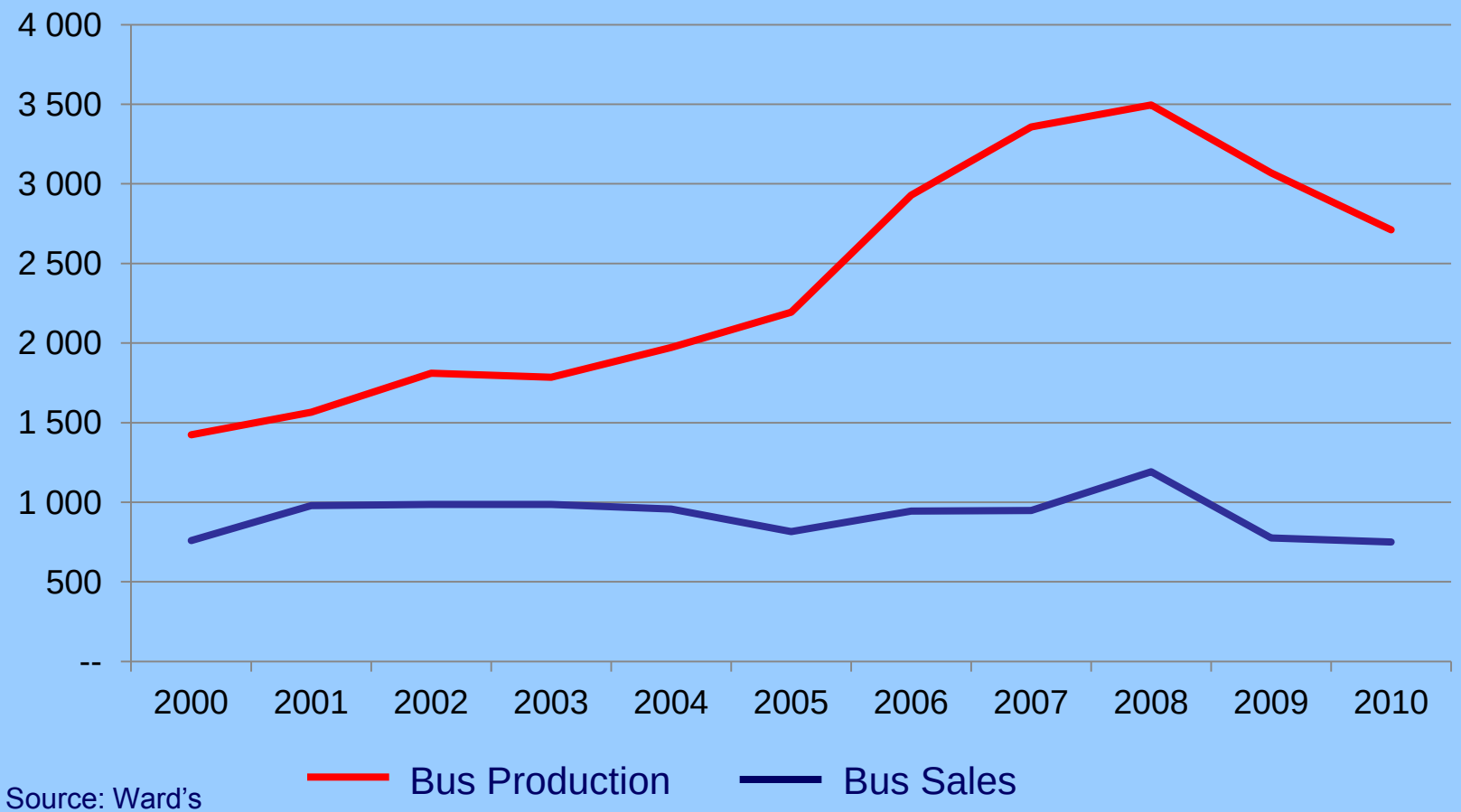
Source: Ward's

Truck sales had a large decline in 2009 and dropped to the same level as in 2002. Production has been more stable since 2002



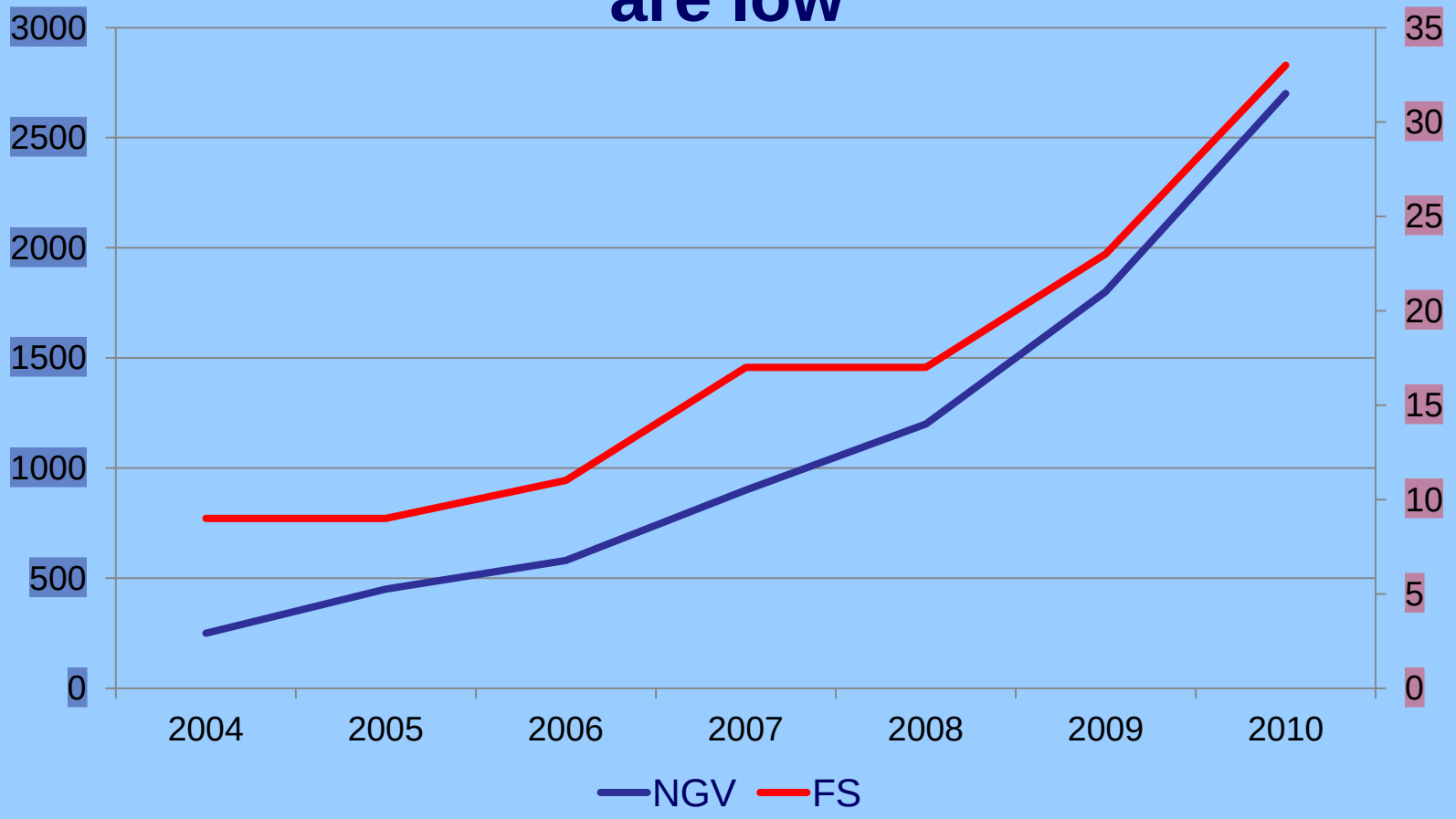
Source: Ward's

Bus production and sales fellowed almost the same trend during these difficult years



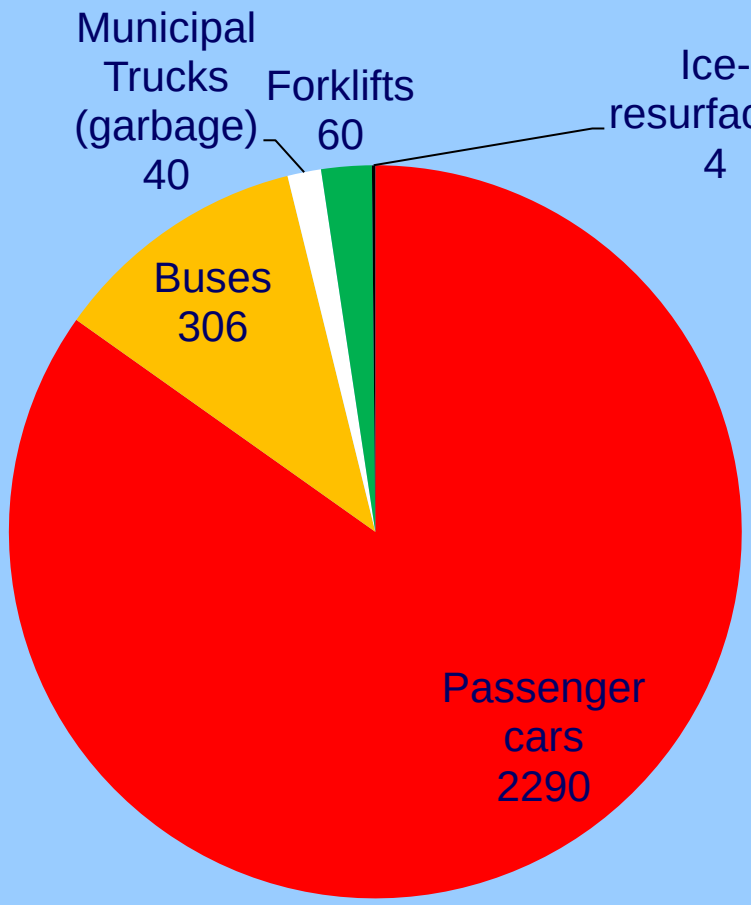
Source: Ward's

NGVs and fuelling stations are growing simultaneously although actual numbers are low



Source: Czech Gas Association, Pavel Novak, 3 March 2011

Passenger cars dominate the NGV market with a share of 85%



Source: Czech Gas Association, Pavel Novak, 3 March 2011

Passengers cars running on CNG are all imported from foreign OEMs

FIAT:
- Qubo
- Punto
- Panda
- Doblò

Mercedes:
- B-Class 180
- E-Class 200

Ford:
- C-Max
- Focus

VolksWagen:
- Caddy Life
- Passat
- Touran

Opel:
- Zafira
- Combo

Source: NGVA.cz

NGV OEM AVAILABILTY

Great variety of Commercial Vehicles, but only one Heavy Duty Vehicle from Mercedes

VolksWagen:

- Caddy

Mercedes:

- Sprinter
- Econic

Opel:

- Combo

IVECO:

- Daily Pritsche
- Daily

Ford:

- Transit

FIAT:

- Ducato
- Fiorino
- Doblò Van
- Doblò Maxi

Source: NGVA.cz

NGV OEM AVAILABILTY

National OEMs are involved only in bus production

NEOMAN:

- Neoplan N4516
- Neoplan N4521

Irisbus:

- Citelis

Evobus:

- Citaro 12m
- Citaro 18m

Source: NGVA.cz

The Czech NGV sector is served by a variety of mostly smlaller equipment providers

- Producers of cylinders
  - Vítkovice Cylinders
- Producers of CNG compressors
  - MOTOR JIKOV Strojirenska a.s. (home filling stations 5 m3/hour)
  - Aquacentrum Praha s.r.o. (filling station up to 25 m3/hour)
- Filling station installers – diverse smaller companies
- CNG conversions – diverse smaller, companies

Source: NGVA, Promoting the Uptake of Gaseous Vehicle Fuels, Biogas and Natural Gas, in Europe GasHighWay

Project supported by NGVA to use NGV for medical transport

Ambulance vehicles running on CNG:

- FIAT Ducato L2H1
- Price of 30.000 €

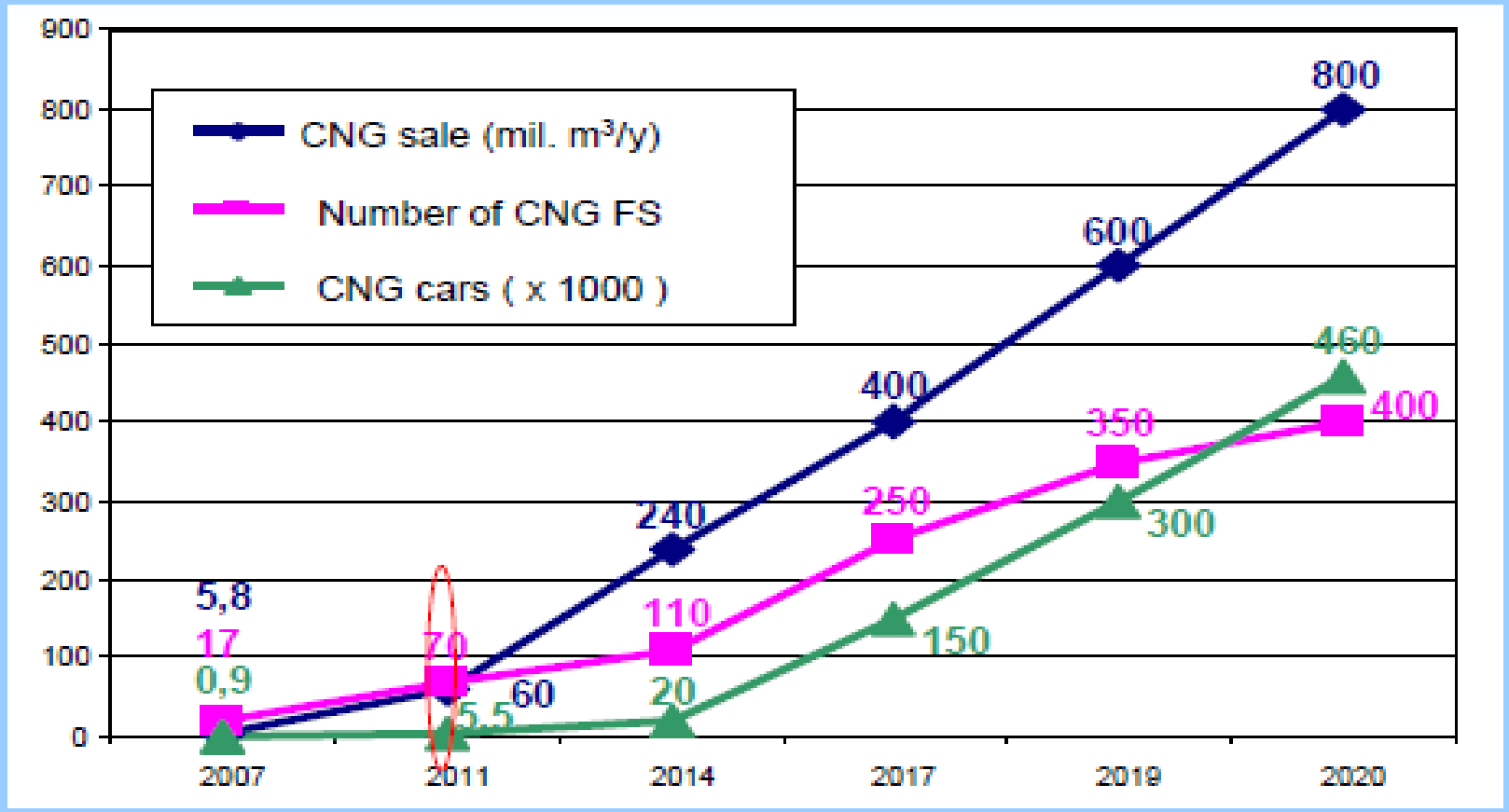
Source: NGVA.cz

NGVs can finally park in underground garages

- Decree signed by the Minister of Interior in September 2011 on the technical conditions of fire protection engineering
- It allows the possiblity to park in all parking, including public underground garages

Source: Czech Gas Union, 20 September 2011

Starting in 2014 an increase of NGVs and fuelling stations is expected



Source: Czech Gas Association, Pavel Novak, 3 March 2011

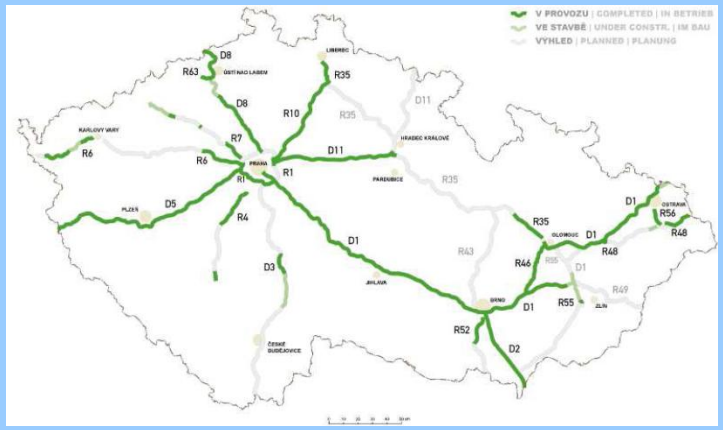
NGV FUELLING INFRASTRUCTURE

About half the CNG stations are created for specific fleet operations (transportation companies) with the possibility to also serve the public

Source: Czech Gas Association, Pavel Novak, 3 March 2011

There are some strategic plans (mainly by private investors) for further development of gas fueling infrastructure

- Most of the CNG stations are located off the main highways and motorways
- It is more costly to build stations on the highways and the motorway infrastructure is not yet well developed



Source: Czech Biogas Association, Optimal location for new gas filling stations by 2020, October 2010

Agreement (2006) between government and gas companies to build 100 CNG filling stations by 2020

- 2005: 14 new stations
- 2013: 31 new stations
- 2020: 100 new stations

(2012 = 33 stations)

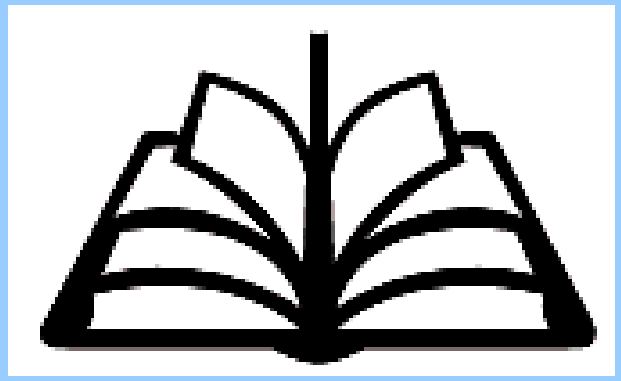
Source: Ministry of Industry and Trade, Gas Industry in the CZ Repubblic, 24 January 2006

Economics – Gas companies say the return on investment in a CNG fuelling station is about 6 years

- Private stations for 5-10 NGVs costs approximately € 9.500-39.000. Total compressor capacity is only ~20 m3/h
- Public CNG stations or stations for buses costs € 313.000+ (140 m3/h + back-up 25 m3/h + storage tank of 4200 L)

Source: Czech Biogas Association, WP3. National Report on state of CNG/bio-methane filling station network – Czech Republic

STANDARDS & REGULATIONS



The CNG stations are designed and built independently from existing petroleum stations and most are unattended

- Multi-fuel stations: allowed
- No limits on opening hours
- Self service: allowed
- Payment practices at the pump: cash, credit card and company fuel cards

CEN prEN 13638 and prEN 13945 are the guiding standards for CNG station construction

- Determines the conditions for the location, performance, testing and operation of quick-fill, self-service CNG stations
- Approval of all gas devices is required by an accredited inspection body in accordance with Czech Occupational Safety Office (COSO) and Czech Mining Authority (CMA) Directive 21/1979 Coll

Source: Czech Biogas Association, WP3. National Report on state of CNG/bio-methane filling station network – Czech Republic

There are existing Czech standards for CNG fuelling systems

- TDG 304 02 CNG refuelling stations for motor vehicles - Currently subject to revision and transformation into a TPG (2011)
  - Sets out the conditions for the siting, execution, testing and operation of fast-fill CNG stations (national regulation related to prEN 13638)
- TDG 982 01 Equipment for parking garages, servicing and repair shops and other facilities for CNG vehicles
- TDG 982 02 Requirements for the operation, repair, maintenance and inspection of CNG vehicles
- TDG 982 03 CNG refuelling appliances

Source: Czech Gas Association

Self Service is allowed but with specific conditions

- CNG pump stations are eligible for self-service filling only if equipped with issue dispensers with NGV-1 fuel connectors, emergency shut-off switch and breakaway filling hoses
- For each CNG filling stations eligible for the self-service filling a professional and obligatory standpoint shall be issued pursuant of the Act No. 174/1968 Coll., of the state personal supervision of the safety of work

Source: Czech Biogas Association, WP3. National Report on state of CNG/bio-methane filling station network – Czech Republic

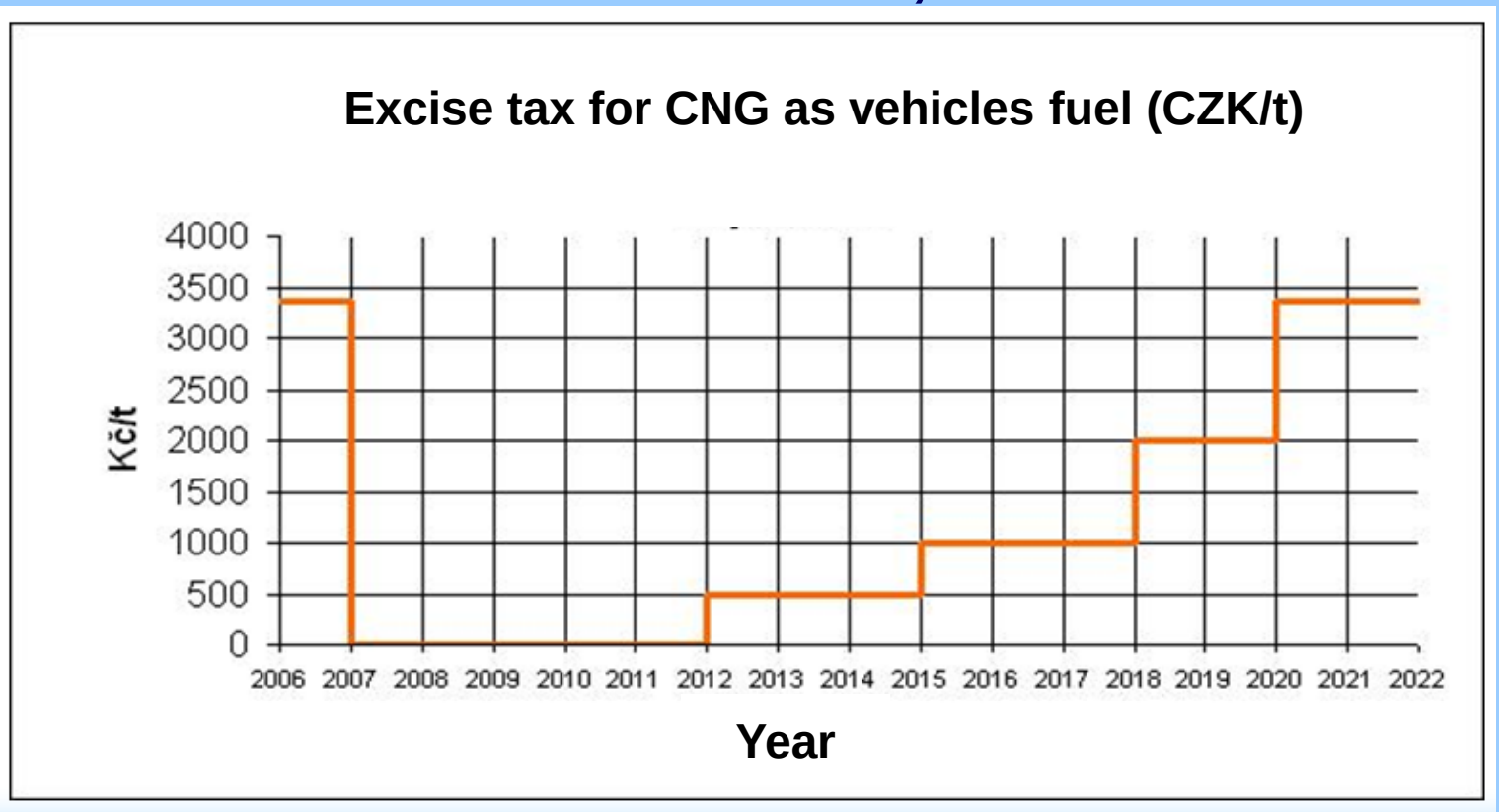
GOVERNMENT SUPPORT

Support of natural gas as alternative fuel approved by government resolution No. 563 on 11th May 2005

- Expansion of CNG bus fleets in cities
- Gradual replacement of government and other public organisations' vehicles with NGVs
- NGVs to be used by businesses and companies
- Use of municipal CNG vehicles as refuse collection trucks, etc.
- Reduce health and environmental risks caused by air pollution

Source: Czech Gas Association

A zero excise duty on CNG went into effect from 1st January 2007 to December 2011. Will reach the maximum level of 133,16 €/t in 2020



Source: Czech Biogas Association, WP3. National Report on state of CNG/bio-methane filling station network – Czech Republic

Vehicle tax system does not include any direct environmental element

- A gradual approach to the CO2 tax on vehicles is expected in the coming years
- An exemption from road tax is only applied to cars used for business purposes if they are electric vehicles, hybrid, LPG/CNG-vehicles as well as vehicles using a blend with high biofuel content:
  - Purchasers of a new vehicle will be eligible for a tax reduction of 48% in the first three years after the purchase and of 40% in the following three years

Source: Clean Vehicle Portal

There are no general public support schemes for biogas *as a vehicle fuel*

- The Czech legislation does not have yet provisions for biomethane
- In accordance with the current legislation, the support scheme includes biogas only for electricity production support

Source: Czech Biogas Association, National Report on current status of biogas production – the Czech Republic

GAS INDUSTRY SUPPORT

GAS INDUSTRY SUPPORT

Agreement on promoting CNG as alternative fuel, signed by and between gas companies and the Czech Government on 16 March 2006

- Gas company must assure construction of a CNG filling station in municipalities that agree to purchasing a minimum of four CNG busses
- Agree to constructing 100 CNG fuelling stations by 2020
- Provide the financial contribution amounting CZK 200.000 (€ 7.800) for new CNG buses; up to a maximum of four buses

Source: Natural Gas for Vehicles, UN ECE & IGU Joint report

NGV Coordinating Task Force Centre set up under an authorization granted by gas distribution companies in 2003

- Created by Transgas and RWE Gas
- Promotes co-operation and advanced relationships between all the stakeholders
- Development and implementation of the Natural Gas in Transport project in the Czech Republic
- Help to roll out an adequate infrastructure of refueling stations, service points and garages
- Create an interesting offering of natural gas vehicles and NGV technologies

Source: Czech Gas Association

NATIONAL LAWS & REGULATIONS

Thanks to several reforms Czech Republic has a modern and flexible economy

- Open to global trade and investment
- The country enjoys high degrees of trade freedom, fiscal freedom, and financial freedom
- Regulatory bottlenecks and lack of transparency remain burdensome

Source: The Heritage Foundation, 2011 Index of economic freedom

Legally, foreign and domestic investors are treated identically

- Slow legislative and judicial reform, uneven contract enforcement, bureaucracy, and corruption are obstacles to foreign investment
- There are no restrictions on payments or current transfers. Residents and non-residents may hold foreign exchange accounts
- Branches or offices of foreign companies may buy local real estate, except for farmland or woodland

Source: The Heritage Foundation, 2011 Index of economic freedom

COMMENTS BY STAKEHOLDERS

On government support for NGVs

- "Lots of interest and good will from the government, but not a lot of action. Not a lot of money being put into the industry overall." (LNG system supplier)
- "Government support is demonstrated at a few levels. Tax incentives have been positive: zero road tax since 2009; no excise tax between 2007 and 2011; minimal excise tax from 1 January 2012 to 31 December 2014. Buses had incentives since 2010 but they are cancelled due to budget problems." (NGV stakeholder, non-profit organization)

Stakeholder commitments in the industry: some mixed signals in challenging economic times

- "Gas companies are very proactive and very keen for CNG (now mostly Prague gas distribution company and E.ON). RWE on the other hand, does not see profitability with CNG and is turning to E-mobility."
- "What is a total disillusion for me and many other Czech NGV stakeholders are the vehicle manufacturers (and car importers to Czech Republic) who do NOTHING to promote CNG sales."
- "The development of the CNG infrastructure is moving at a reasonable rate, however, now only slightly growing as affected by the current economic situation. We expect to gain over 6 – 8 – 10 new fuelling locations every year." (NGV stakeholder, non-profit organization)

The future of the NGV program in Czech Republic?

- "It is not easy to clearly see the future of NGVs in the Czech Republic because of the unpredictable economic situation and budget reductions in all companies and in the government as well. BUT, the Czech market still has some very stabile potential for CNG development." (NGV stakeholder, non-profit organization)

CONCLUSIONS

European Business Congress Study - 2012

- Energy environment
- Gas industry support
- Government support
- NGV market development
- Legal and regulatory framework for CNG station development
- Investment environment

Energy Environment

- Large dependence on coal for electricity generation could drive more interest in natural gas since environmental quality is a concern of government
- The natural gas grid is well developed and accessible for CNG applications.
- LNG may be less competitive due to the established gas grid (competitive issue).
- National rules/regulations against the use of biogas as a vehicle fuel must be amended in accordance with European law on non-discrimination of pipeline access

Gas Industry Support

- Gas industry has, for the most part, indicated its support for NGVs based on the agreement signed with the government in 2006 to support the NGV infrastructure development
- Gas industry at this point are the principal stakeholders to drive NGV market development
- Gas industry must use NGVs, build stations and advocate with government for stronger, sustainable support for NGVs

Government Support

- Government has shown support through fuel tax relief but as those come to an end there does not seem to be any forward-thinking policy
- Biogas only used for electricity generation and could be part of a larger government strategy
- Municipalities are very important to start the CNG infrastructure development if they can convert their fleet vehicles

NGV Market Development

- The lack of support from OEMs is a challenge to get NGVs on the road
- Steady but modest growth in fuel station construction is anticipated (subject to general economic conditions)
- Policy/practice to open dedicated CNG stations and fleet stations to the public will be difficult to mainstream NGV fuelling as it would as part of a petroleum fuel station infrastructure
- Lack of adequate highway infrastructure will affect speed of NGV market development

Legal and regulatory framework for CNG station development

- Clear and transparent regulations exist
- National regulations related to European standards provide guidance for fuelling station construction

Investment Environment

- Czech Republic has incentives foreign investments in a fairly open environment
- Bureaucratic complexity currently is the main barrier

CZECH REPUBLIC
(December 2011)