

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

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.

The project sponsors wish to thank the following individuals for their dedicated research and analysis in making this project possible

- 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 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.



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

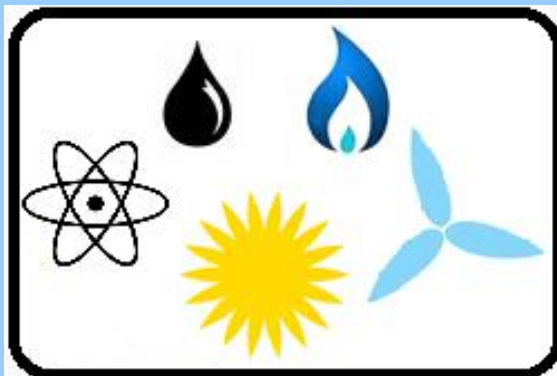
- Number of NGVs: 2,100
 - NGVs are 0.01% of total vehicle population
 - 0.05 NGVs per 1000 population
 - CNG fuelling stations: 33
 - 63.3 vehicles per fuelling station
 - Price differential CNG-Petrol/diesel:
 - CNG equivalent per liter gasoline: €0.47/liter
 - Regular Gasoline: €1.29/liter
- Natural gas costs 64% less than gasoline

Source (January 2012)

www.metanoauto.it

http://www.drive-alive.co.uk/fuel_prices_europe.html

- The sole factor influencing the market development are the economic conditions and the economic benefits of NGVs





- Poland is heavily dependent on oil and gas imports, mostly from Russia, with which Poland has difficult relations
- Coal currently is the dominant fuel in the region, but is declining in market share

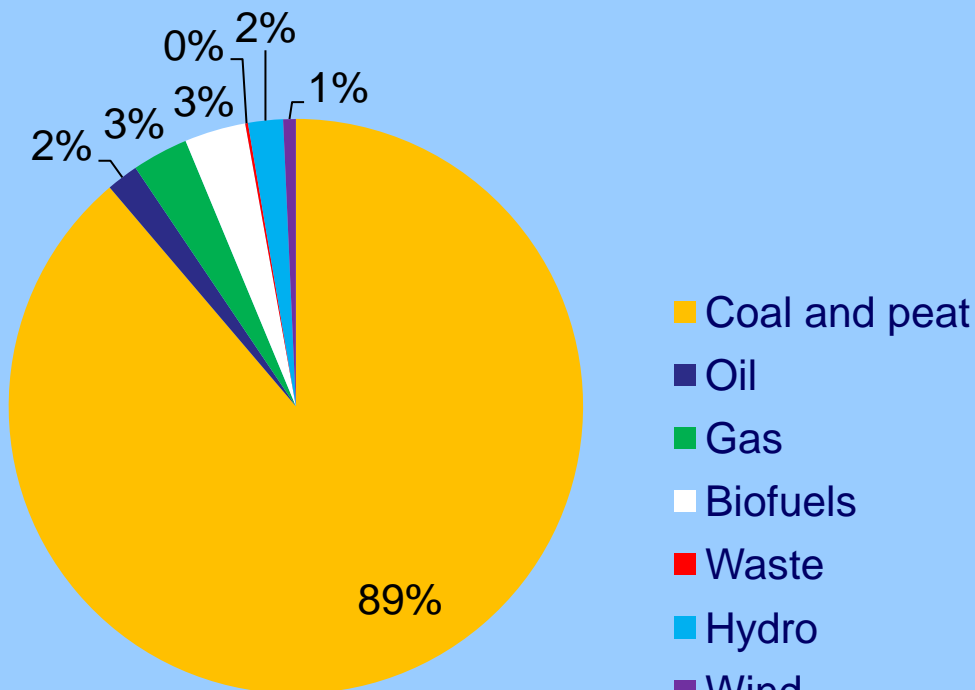


- **Oil**
 - production: 28.230 bbl/day
 - consumption: 564.500 bbl/day
 - imports: 531.300 bbl/day
 - exports: 50.400 bbl/day
 - reserves: 96,38 million bbl
- **Natural gas**
 - production: 6,084 billion m³
 - consumption: 17,2 billion m³
 - imports: 10,89 billion m³
 - exports: 47 million m³
 - reserves: 164,8 billion m³

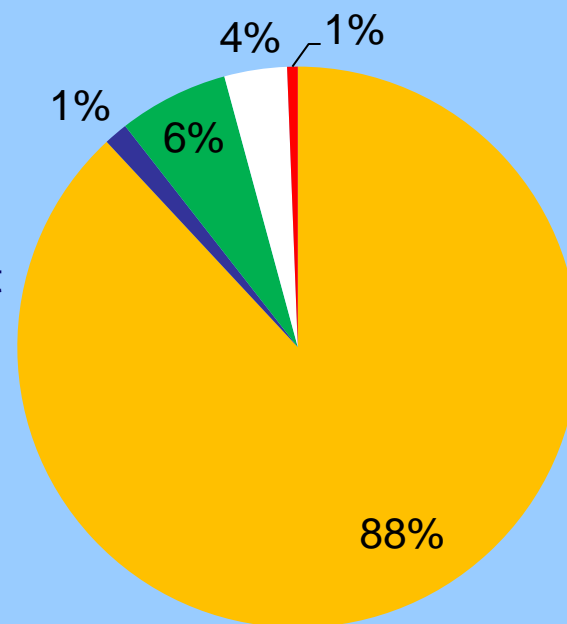
Source: CIA World Factbook 2011

Coal is the dominant source of energy in Poland. Natural gas has a relatively small share of the energy mix

Electricity production

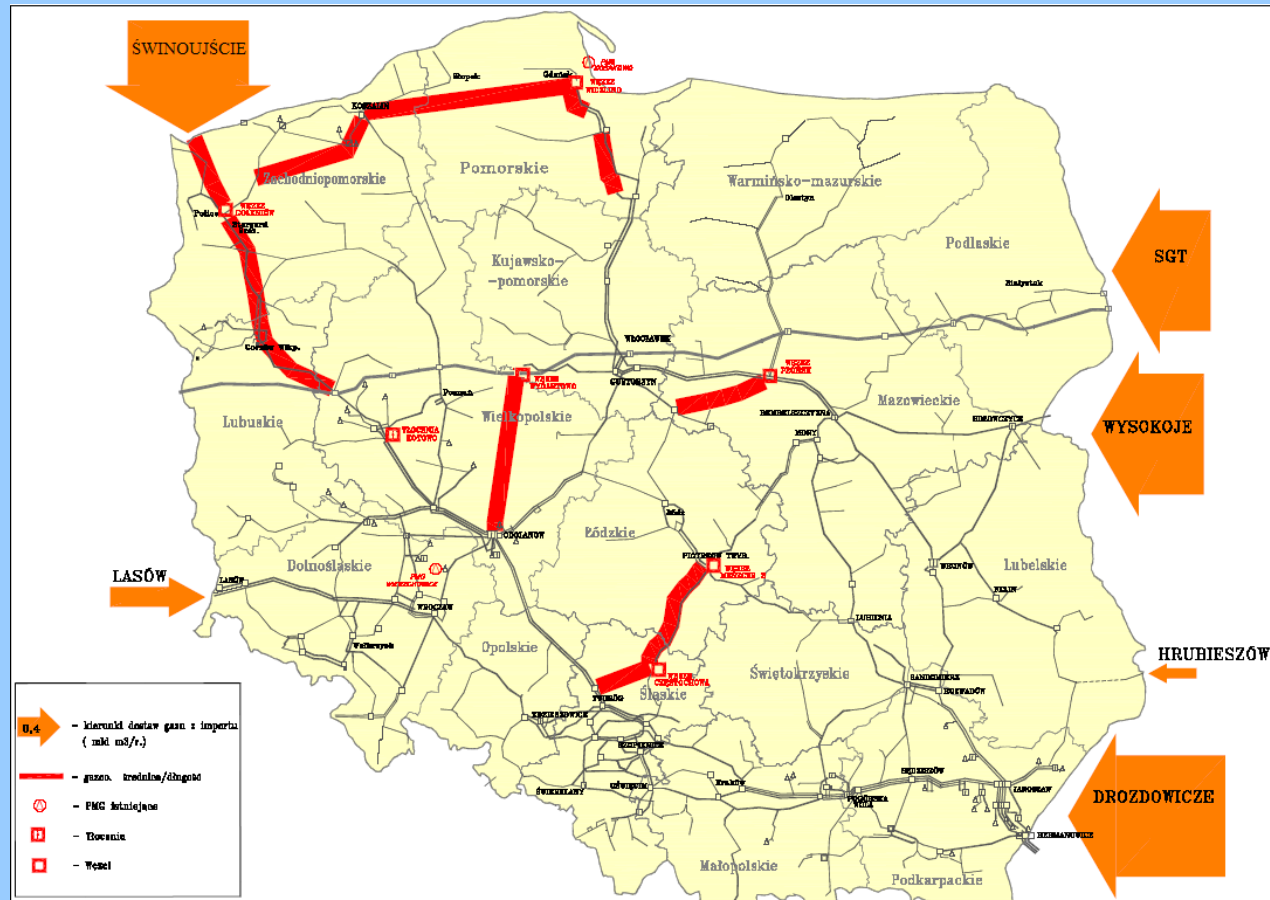


Heating production



Source: IEA statistics, 2011

9.777km of high pressure pipelines, including 14 compressor stations, 56 interconnection points and 974 exit points

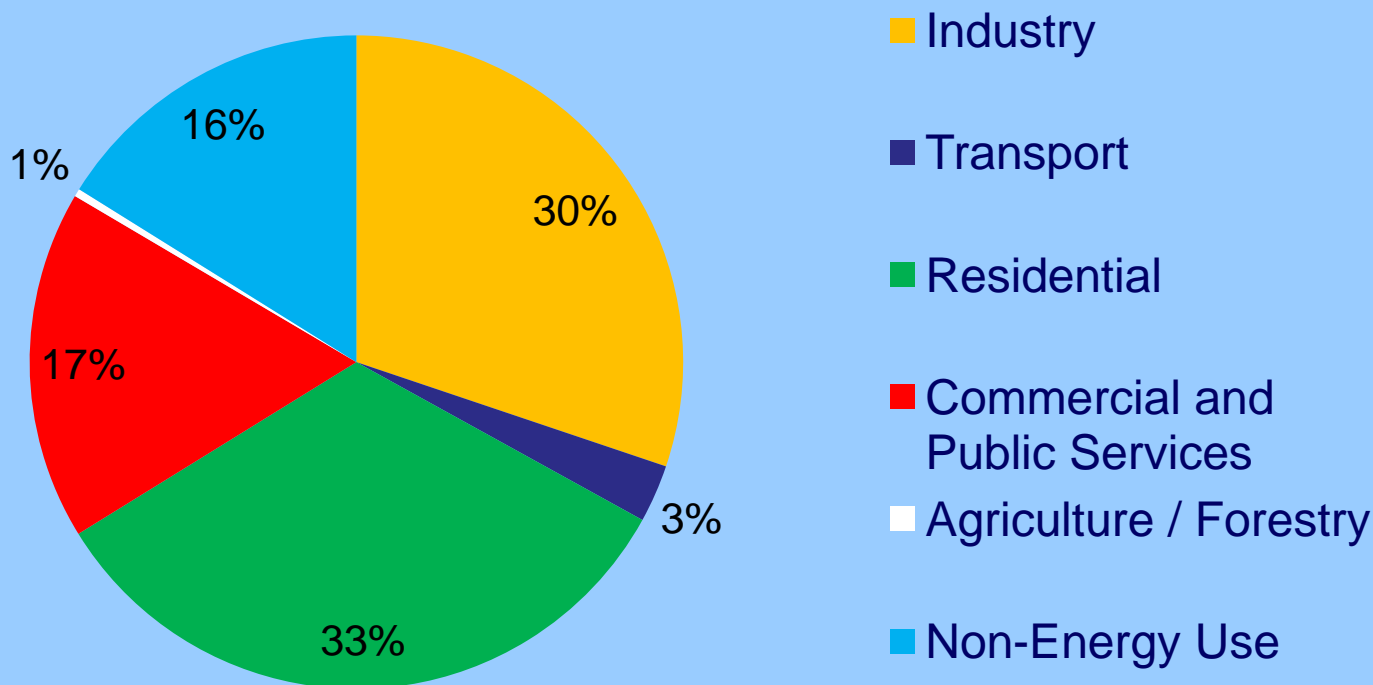


Polish gas system connected to European network but only on an East-West line

- New connections on the North-South line may significantly increase the security of gas supplies to customers



Only 3% of natural gas consumption is used in the transport sector*



*IEA's 3% is not defensible; likely NGV gas consumption is more in line with 0.002%.

Source: IEA statistics, 2011



Small quantities of LNG are domestically produced from the extraction of stranded methane in landfills and coal mines

- LNG production started in 2000
- PGNiG is building an LNG import terminal in Świnoujście that is expected to be operational by the end of 2013 with a capacity of 2.5 billion m³ of LNG per year



**There are 156 working biogas installations.
Most of them produce electricity and heat**

- Agricultural plants: 5
- Landfill gas plants: 78
- Sewage sludge, industrial waste water: 73
- Electricity production from biogas (MWh):
276.500
- Biomethane production (m³): 0

Source: Polish Biogas Association, biogas use in Poland-potential and changes of the market, 2009



Biomethane is not considered viable for the transport section at this moment

- The possible use and popularization of biomethane as a vehicle fuel in the future definitely could boost the general production of biogas
- There are two main aspects connected with lack of biomethane use for transport:
 - The weakness of the biogas market in Poland in general, especially the agricultural sector (market in the start-up phase though there is a potential to develop quickly.)
 - The weakness of NGV market in Poland, especially vehicles running on CNG

Source: GasHighWays



Many barriers slow the development of biogas plants

- **Technical:** Lack of Polish companies producing equipment for biogas plants
- **Legal:** Lack of clear definitions, standards, environmental regulations etc.
- **Administrative:** Long procedures for getting all permissions; Unclear classification of activities (PKD - Polish Classification of Activities) for farmers; Difficulties with getting connections to grid, etc.
- **Economic:** High investment costs; Difficult and unclear procedures for getting financial support; Long term contracts for supply of raw materials not always interesting for farmers

Source: GasHighWay, Promoting the Uptake of Gaseous Vehicle Fuels, Biogas and Natural Gas, in Europe, 2010

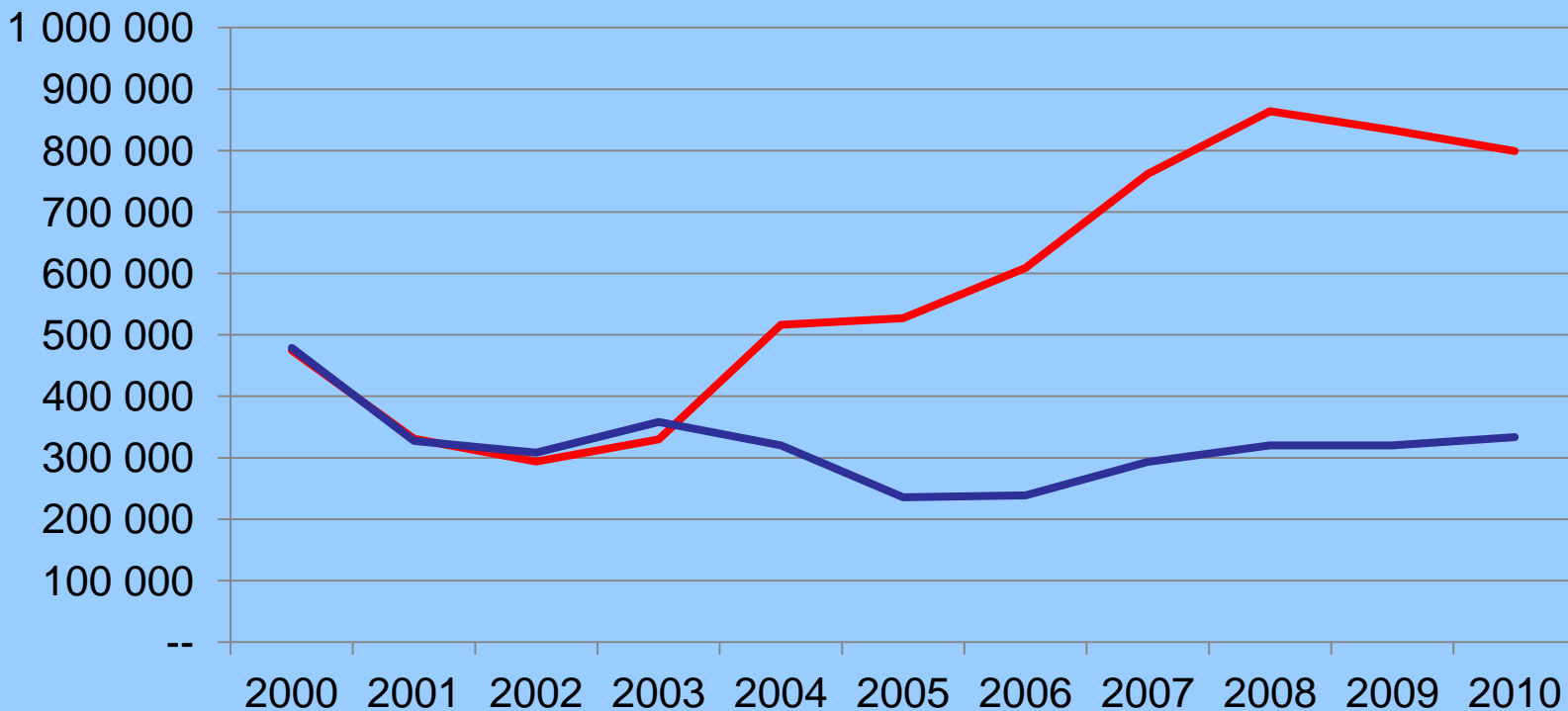




- With its large domestic market Poland is one of the most attractive vehicle markets in Europe in the eyes of the global automotive sector
- The Polish automotive industry consists of approximately 270 registered companies, the majority of which (80%) produce spare parts and accessories



The increase of car production in the last 10 years, compared with a constant market demand, shows how Poland became an exporting country

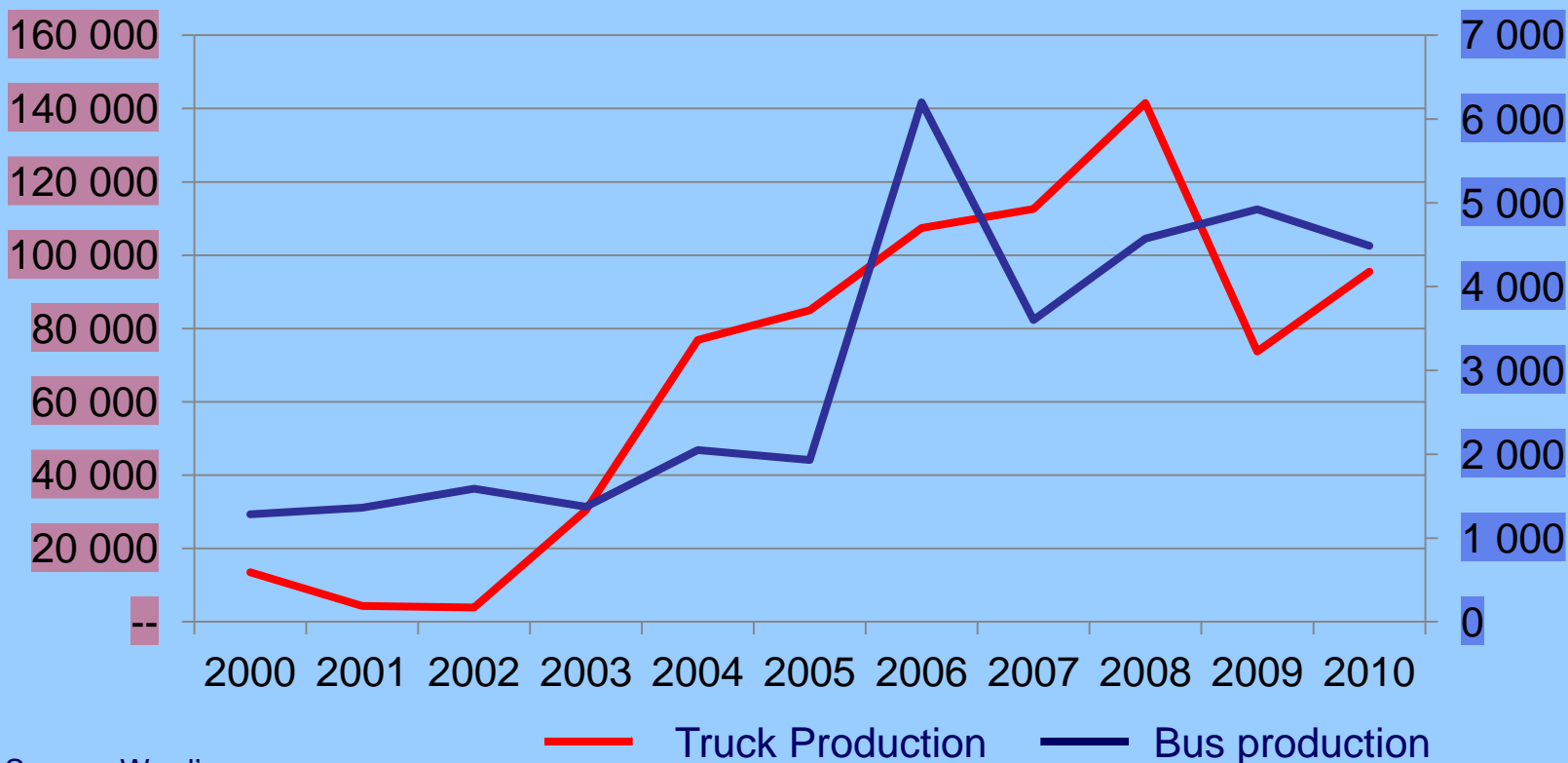


Source: Ward's
OICA <http://oica.net/>

— Car Production — Car Sales



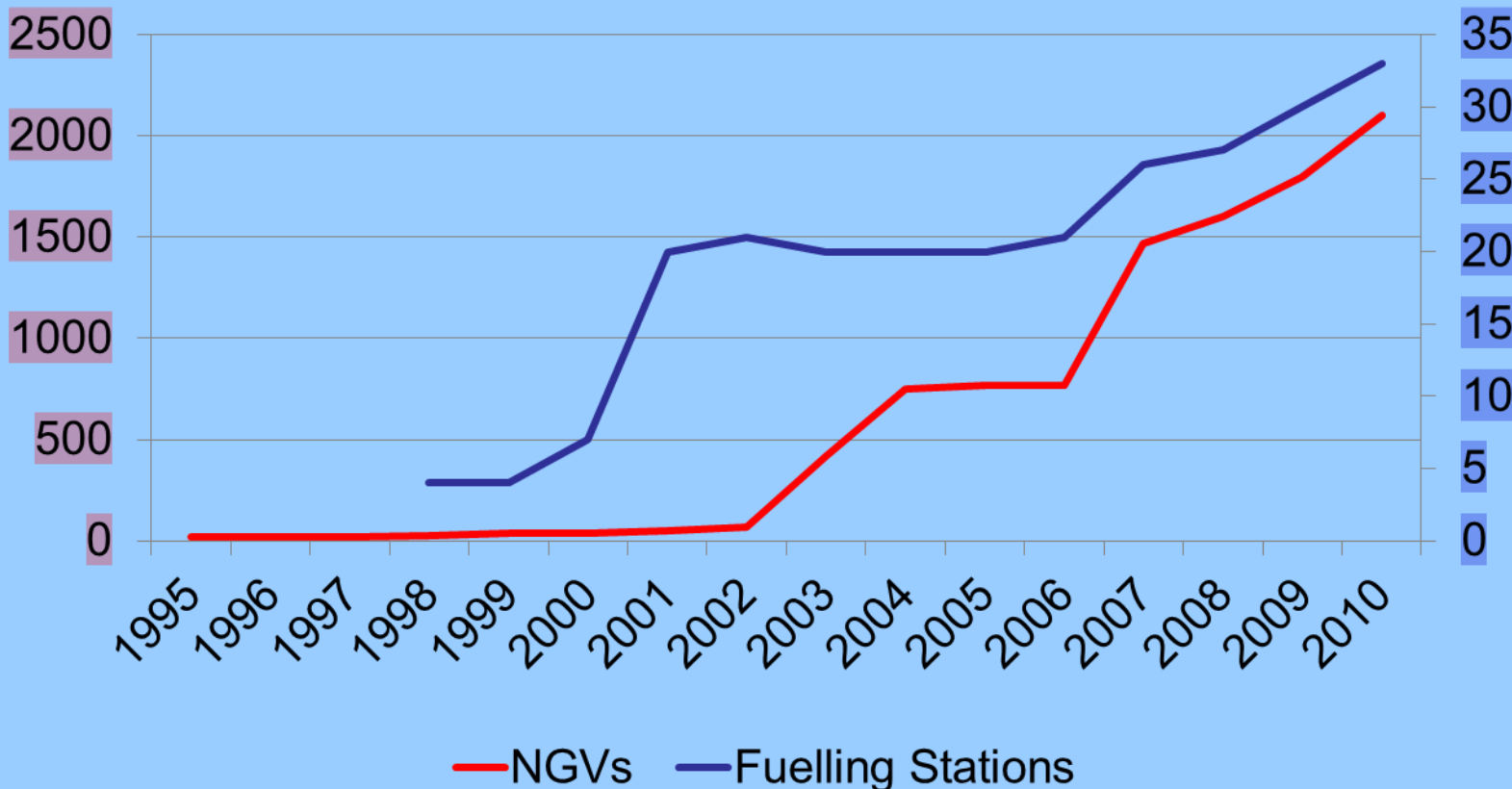
A new truck production industry developed since 2002. Bus industry had a big increase in 2006 and after that remained almost constant



Source: Ward's
OICA <http://oica.net/>

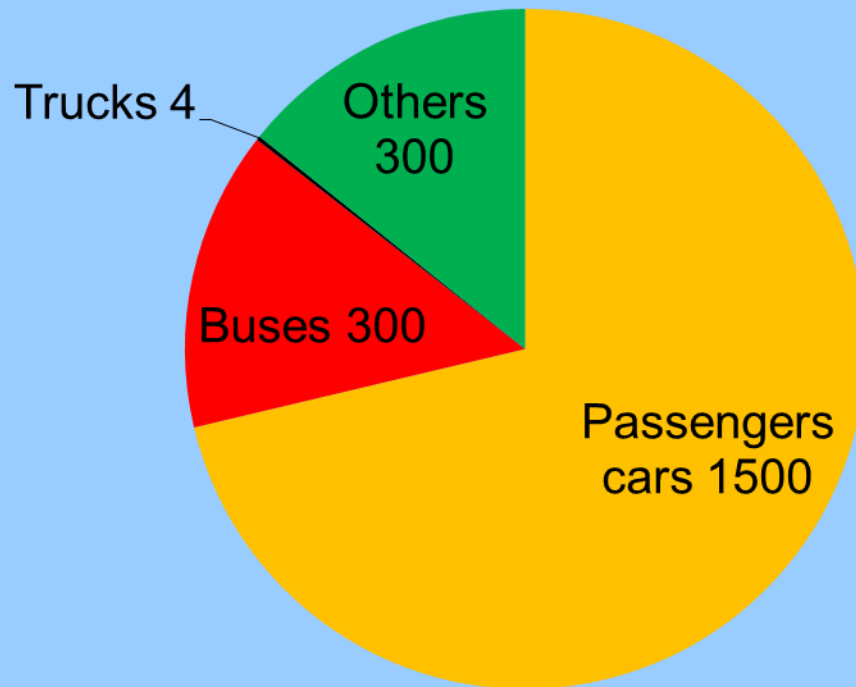


NGVs are a new market in Poland, developed in the last 10 years thanks to municipalities and corporate fleets





Municipal public transport buses are a small percentage of total NGVs but they account for 70% of CNG consumption



Source: The GVR 2011 data

Source: University of Science and Technology Cracovia, Barriers to the use of Natural Gas Vehicles in Poland, 2006



Various industries are producing cylinders in Poland, but the majority are foreign companies

Cylinders

- Faber
- Ragasco
- Raufoss
- STAKO (Polish but in 2011 was acquired by Worthington Cylinders)
- Ullit
- Vitkovice – Milmet

Gas systems for cars

- Landi Renzo

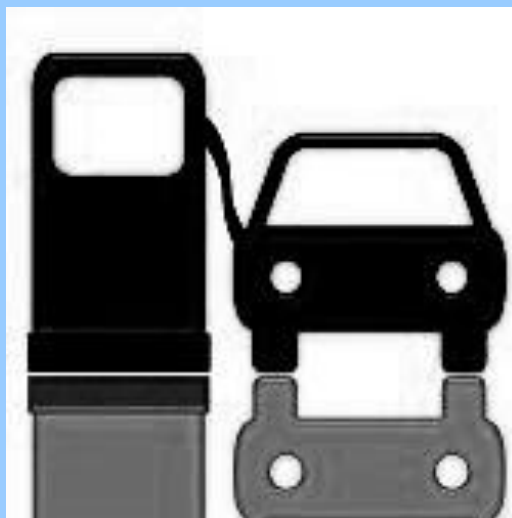
Source: cng.auto.pl

WAWA Taxi corporation is the single CNG taxi fleet in Poland, operating in Warsaw

- “WAWA TAXI” fleet consists of 500 vehicles with about 160 of them fuelled with CNG. The fleet continues to expand
- Close cooperation with SEAT, which provides and services the vehicles

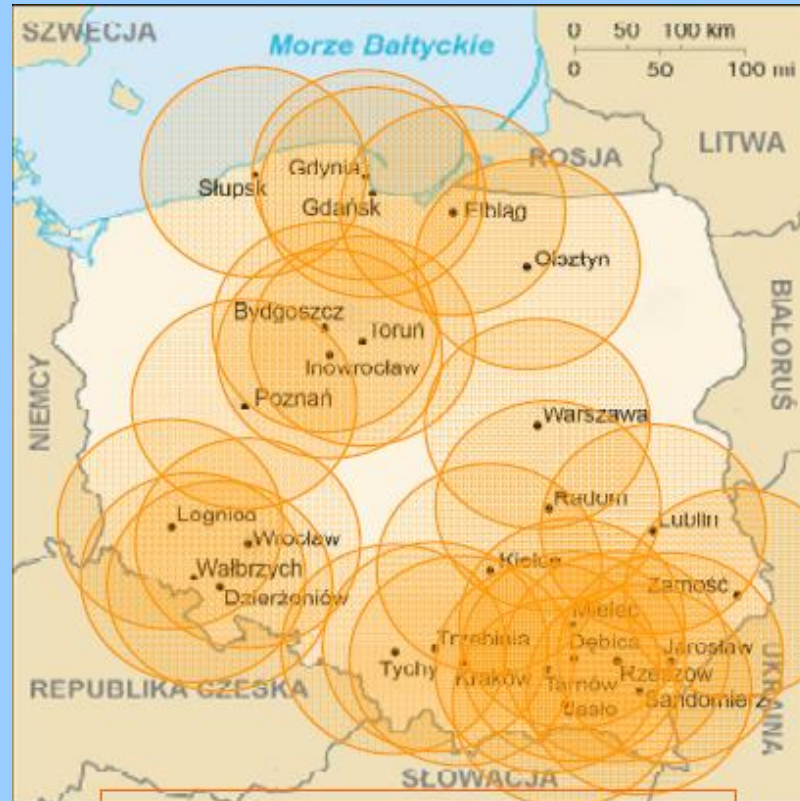


Source: Madegascar.eu





Regional differences in the development of CNG refueling infrastructure are quite large



Circles on the map designate an area of 100 km

Source: PGNiG, Position of NGVs segment in Poland, 2011



The main equipment suppliers for fuelling stations are foreign companies: NGV Autogas is the only national supplier

- NGV Autogas
- Compair
- Greenfield
- Galileo
- IMW

Source: University of Science and Technology Cracovia, Barriers to the use of Natural Gas Vehicles in Poland, 2006



CNG infrastructure is targeted mostly to fleet customers

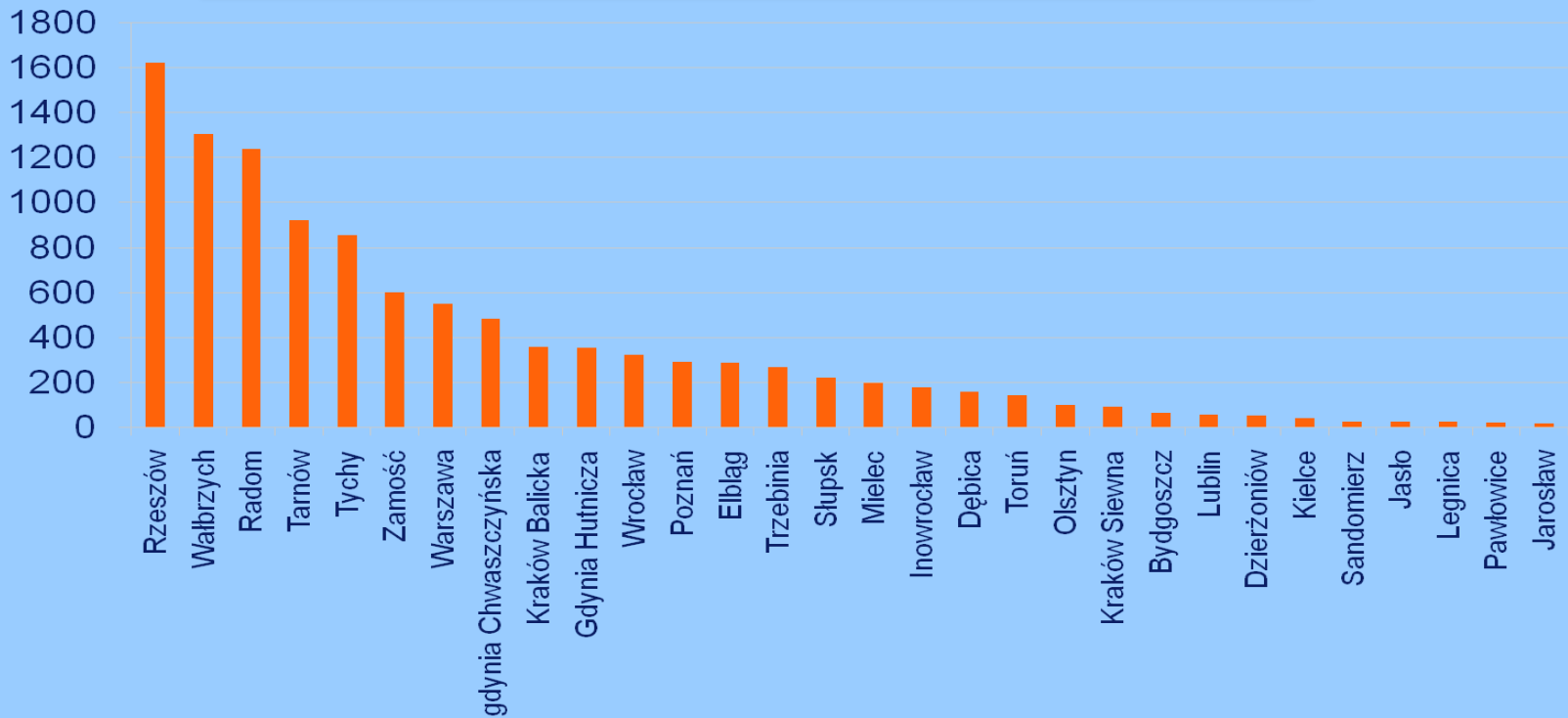
- Existing filling stations are mainly adapted to serve big fleets running on CNG, not individual customers
- Stations mainly located within gated, private property of local gas distributors or bus companies in industrial areas at the outskirts of the cities
- Only two stations are along motorways
- Lack of possibility to pay for gas with credit cards; limited hours of operation; not enough distributors; long and bureaucratic procedures

Source: GasHighWay



Only 3 stations surpass a sales volume of 1000 m3 CNG

Amount of CNG sold (in thousands m3)



Source: CNG.Auto.PI, CNG stations in Poland, February 2012



Fuelling station target for 2012 was not reached by PGNiG

- PGNiG planned to build a minimum of 50 CNG stations by 2010 in order to provide customers with fuel not farther than 50 km
- At the present there are 33 stations in Poland



Source: University of Science and Technology Cracovia, Barriers to the use of Natural Gas Vehicles in Poland, 2006



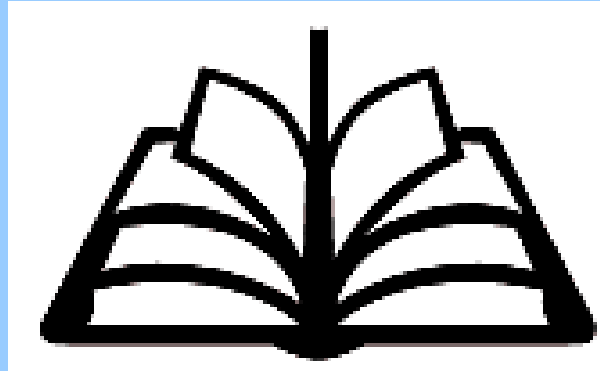
Growth of the current fuelling infrastructure is in doubt due to the closing of some CNG stations in Poland

- PGNiG decided to close two stations (Bydgoszcz and Olsztyn) as of 1st January 2012 due to the high costs compared with the gains
- 6 other stations are at risk of closure due to low gas throughput



Source: cng.auto.pl

cng.auto.pl



- Multi-fuel stations: **allowed**
- No limits on opening hours: only 9 stations opened non-stop
- Self service: **not allowed**
- Payment practices at the pump: only 7 station accept credit cards





All aspects of natural gas transmission and use are specified under regulation KT 277

- Transmission of gas (gas transmission pipelines, compressor stations, pressure reducing and measuring stations, measuring the amount of gas in the transmission network segment) (SECTION 1)
- Distribution of gaseous fuels (natural gas distribution networks and components, installation of compressed natural gas stations, CNG storage and transportation, installation LNG, storage and transportation of LNG) (SECTION 2)
- The use of gas (gas installations in buildings, gas appliances and components are specified (SECTION 3))
- Evaluation of the quality of gaseous fuels (methodology of measuring the parameters characterizing the quality of natural gas, the calculation of its properties, the terminology concerning the quality of natural gas, equipment for measuring the quantity / natural gas energy (SECTION 4))

Source: PKN, Polish Committee for Standardization



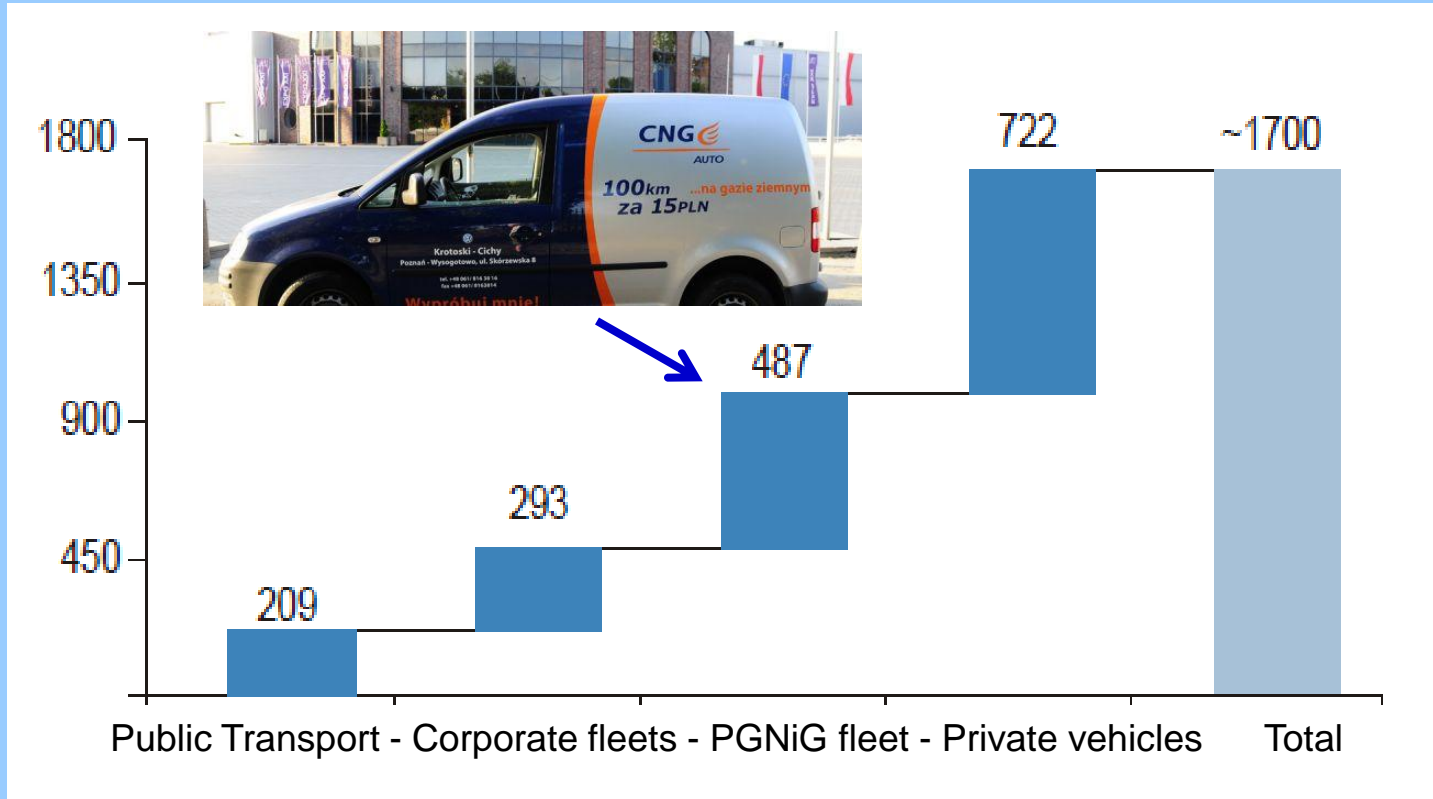
No apparent support (or major interest) for NGVs from the national government perspective

- Application to the Ministry of Economy on maintaining a zero rate of excise duty on natural gas until 2014
- Lobbying activities undertaken by The Chamber of the Natural Gas Industry in order to maintain a zero rate of excise duty

Source: PGNiG, Position of NGVs segment in Poland, 2011



PGNiG has the largest NGV fleet, accounting for 28% of NGVs in 2009



Source: GasHighWay

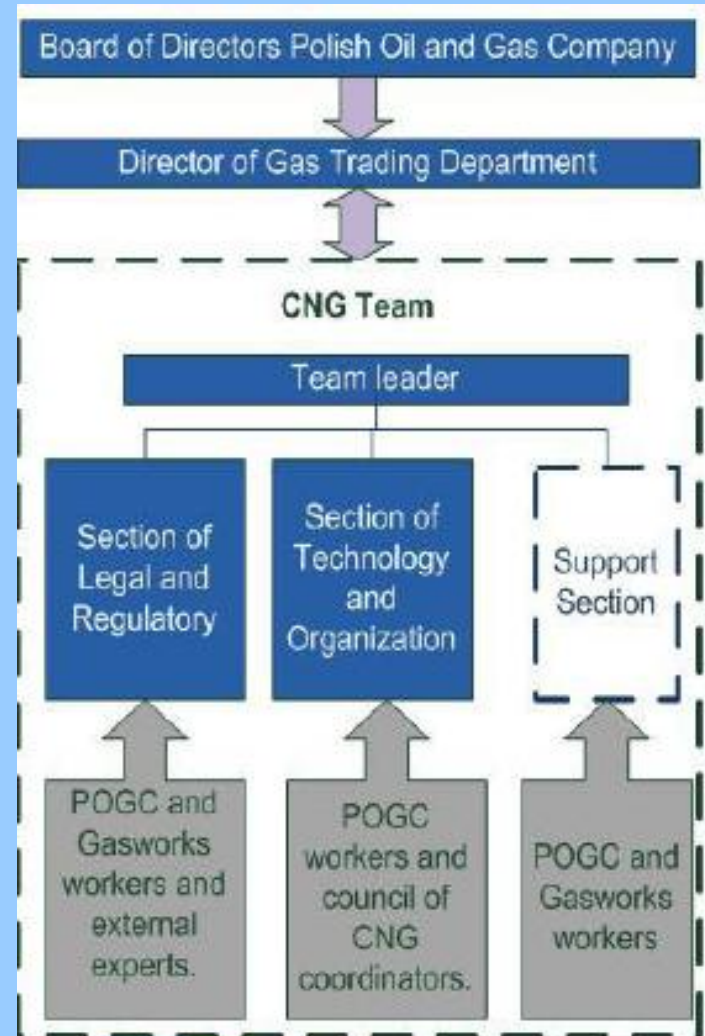


PGNiG is the main investor in CNG infrastructure in Poland

- On 16 February 2010 the Board of Directors Polish Oil and Gas Company (POGC) decided to adopt a strategy to develop the natural gas vehicle market
- A team of three separate divisions of responsibility, the strategy deals with improving CNG regulations, analysis of CNG station profitability and management, and preparation of financial and marketing analyses

Source: PGNiG, Position of NGVs segment in Poland, 2011

A division of labor has been established to deal with different aspects of NGV market development



Position of CNG segment in Poland in light of strategy of development CNG market, Department of Gas Trading Office of Coordination of Gas Trading and Distribution,, Prague, 2010



PGNiG is working on a strategy to change the regulatory environment

Ensuring the competitiveness of CNG compared to fossil fuels	NGV market development	Expansion of CNG infrastructure
<ul style="list-style-type: none"> • Transposition of the 2009/33/WE Directive in a manner favorable to the CNG fuel. • Increase beneficial relationship for CNG in the fiscal and tariff imposed on fuel used in road transport. • Introduction of relief in income tax and tax on goods and services for natural and legal persons using CNG fuel. • The introduction of restrictions on vehicle traffic in urban centers, excluding NGV. 	<ul style="list-style-type: none"> • The introduction of environmental tax, which the mechanism would promote the use of modern vehicles operating on the basis of environmentally friendly fuel. • The introduction of tax credits to lower exploitation costs for NGV. • The introduction of direct surcharge for purchase of the NGV and the reimbursement of the cost of converting vehicles to CNG. • Implementation of pilot programs dedicated for CNG segment. 	<ul style="list-style-type: none"> • Establish a system of subsidies to mitigate against the costs of construction of ecological fuel stations including the introduction of preferential loans. • Introduction of tax relief for natural and legal persons who investing in the development of ecological fuel station network, and periodic tax credits aimed at supporting the business of distribution of clean fuels.

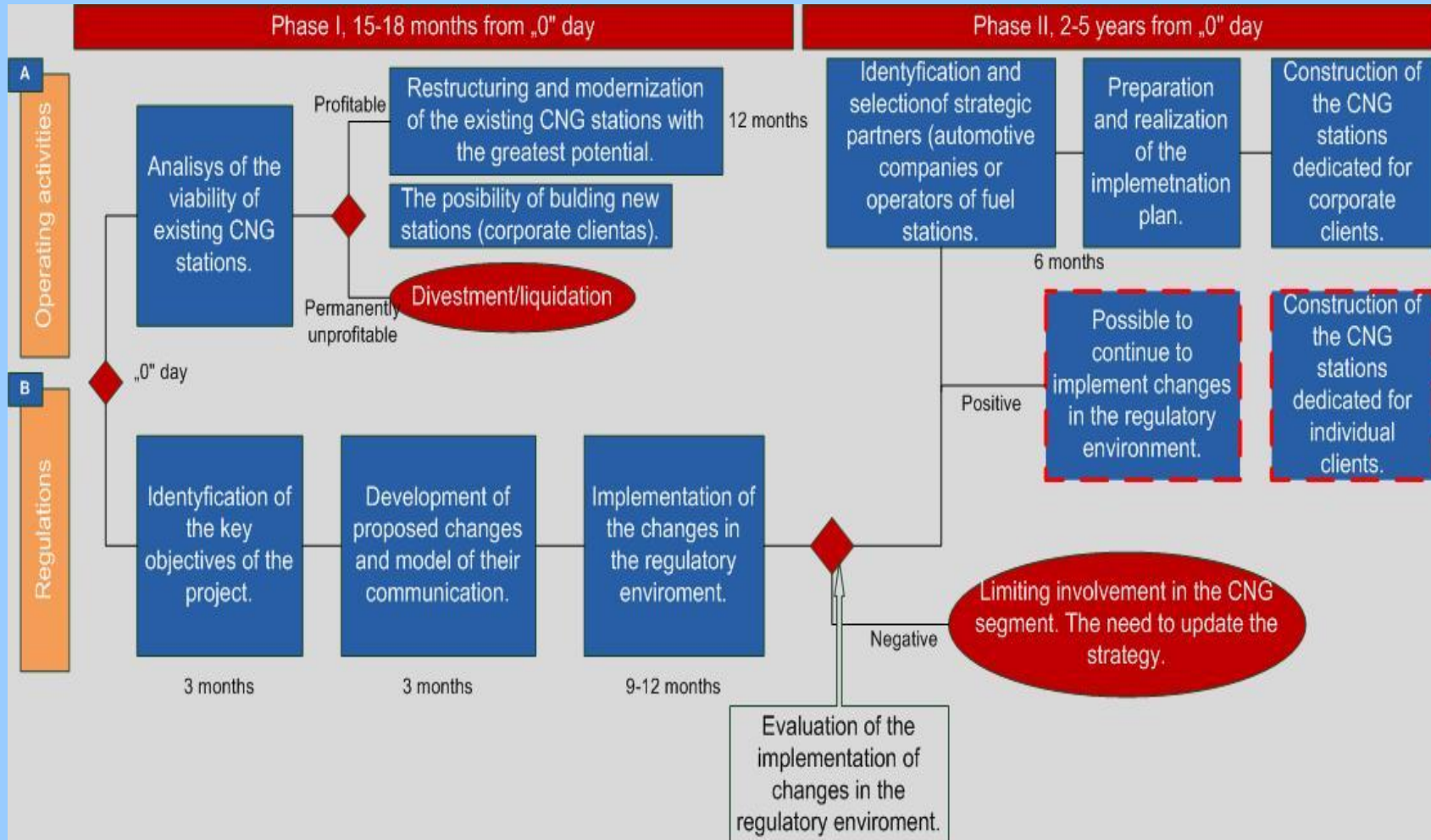


PGNiG actions to support CNG sector in the marketing area

- Active participation in the Congress of the Regions in Swidnica (the Congress included matters related to self-government, investments and economic development of the region)
- Organization of conferences in Ksiaz, whose aim was to create, together with the Czech Republic natural gas "Green Line" along specific routes in Poland and in the Czech Republic where NGVs are planned to be stimulated using new, strategically located CNG fuelling stations
- Active participation in the "VII Supertest Ekonomii", cars competition from Warsaw to Poznam
- Cooperation with importers of cars (Fiat, Iveco, Mercedes, Volkswagen)
- Cooperation with the media in the promotion of CNG as a fuel
- PGVNig has participated actively to promote of CNG at a variety of exhibitions focused on vehicles and fleet operators

Source: PGNiG, Position of NGVs segment in Poland, 2011

Framework timetable for implementing the strategy



Position of CNG segment in Poland in light of strategy of development CNG market, Department of Gas Trading Office of Coordination of Gas Trading and Distribution,, Prague, 2010





Barriers to free trade are quite low, and commercial operations are aided by regulations that support open-market policies

- Measures have been taken to further streamline business start-up procedures and facilitate private-sector development, but the pace of reform has slowed

Source: The Heritage Foundation, 2011 Index of economic freedom



With a transparent and efficient business climate further supported by political stability, Poland has created a dynamic environment for entrepreneurs

- Layers of non-tariff barriers increase the cost of trade
- Certain areas of investment require government approval, and the regulatory system is not particularly efficient
- Foreign and domestic investors generally are treated equally

Source: The Heritage Foundation, 2011 Index of economic freedom





- “Only the expansion of the fuelling network will ensure significant growth. To achieve this PGNiG must work with at least one oil distributor in Poland.”
- “The development of CNG market goes on practically without any financial support by government.”
- “To achieve a sufficient market share for NGVs there needs to be 400 to 800 fuelling stations. The aim of 150 is insufficient.”
- “Mayors and municipal officials are unaware of NGVs and nobody is trying to promote them.”
- “Educating consumers and officials is the most important task.”

Comments from Polish gas industry & equipment suppliers

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

Energy Environment

- The natural gas vehicle market could benefit from further developments of LNG, which also could reduce gas imports from Russia
- Biogas is not presently being advocated and will take some years to become important as fuel unless it is more actively advocated by gas industry and government stakeholders
- European Commission renewable energy targets should help drive biomethane for vehicles

Gas Industry Support

- PGNiG has a very broad scope of business and commercial activity but CNG constitutes a very small percent of company's activity
- Regardless of the small (or even marginal) interest in the CNG market, PGNiG remains the main investor in creating the fuelling infrastructure in Poland, with few other investors or stakeholders showing strong interest in developing the market
- If the Polish Oil and Gas Company NGV strategy can gain support from stakeholders, including the government, it will be a major motivation to build the NGV market

Government Support

- Interest on the part of government in the form of incentives, driving NGVs for their own fleets, etc. will stimulate NGV market development
- Without any government support NGV market growth will continue to be very slow



NGV Market Development

- Buses and trucks are the current focus of the market for CNG but interest of fleet operators needs to be further advocated and promoted if the market is to expand
- Regional disparities in the number of public fuelling stations preclude a significant increase in private commuter NGVs



Legal and regulatory framework for CNG station development

- The national regulation KT 277 specifies the transmission, distribution and use of natural gas in Poland and this is considered sufficient to deal with the CNG market at the current time
- More details related to CNG might be needed if there is dramatic expansion of the NGV market but this is part of the PGNiG NGV strategy

Investment Environment

- Poland seems to be a good country to invest with low barriers and a positive investment environment

POLAND

(February 2012)

European Business Congress Study - 2012

