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.

FRANCE
(July 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: 13.000
- NGVs are 0,03% of total vehicle population
- 0,2 NGVs per 1000 population
- CNG fuelling stations: 140
- 93 vehicles per fuelling station
- Price differential CNG-Petrol/diesel:
  - CNG equivalent per liter gasoline: 0,808 €/liter
  - Regular Gasoline: 1,48 €/liter

  Natural gas costs 46% less then gasoline

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

MOTIVATION

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- Environmental considerations
- Economics
- Energy diversification

ENERGY PROFILE

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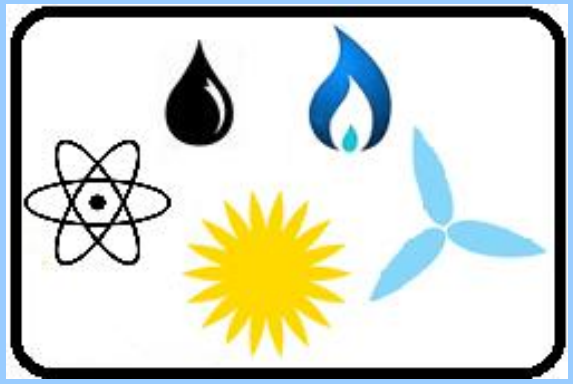


ENERGY PROFILE SUMMARY

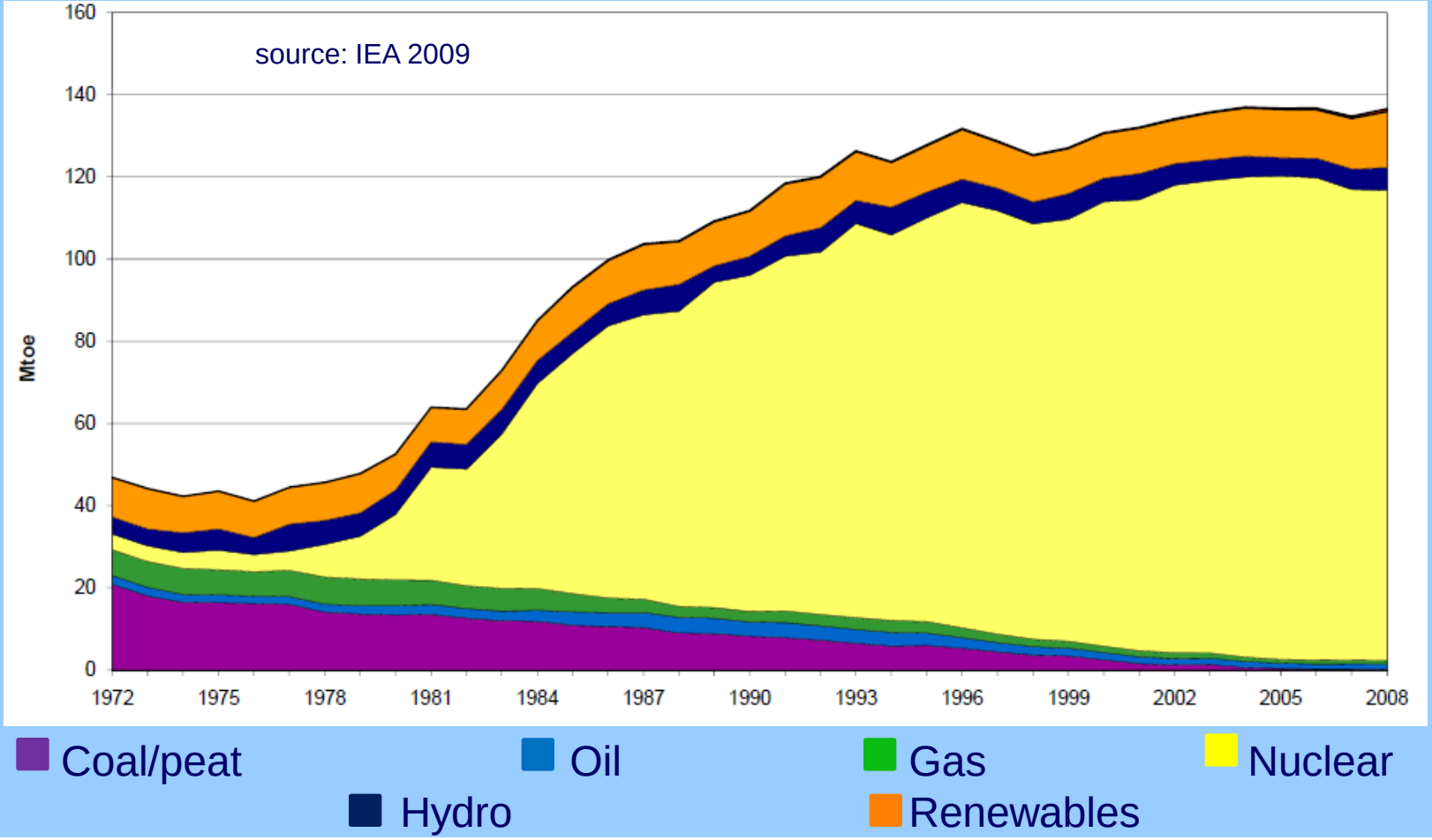
- France derives over 75% of its electricity from nuclear energy (58 nuclear reactors are operating today)
- France is the world's largest net exporter of electricity due to its very low cost of generation
- France is 57th in world ranking for oil production and 64th for natural gas production but imports play an important role in domestic consumption

ENERGY PROFILE

- Oil
  - production: 70.820 bbl/day
  - consumption: 1,8 million bbl/day
  - imports: 2,4 million bbl/day
  - exports: 598.000 bbl/day
  - reserves: 101,2 million bbl
- Natural gas
  - production: 877 million m^3
  - consumption: 44,84 billion m^3
  - imports: 45,85 billion m^3
  - exports: 1,9 billion m^3
  - reserves: 7,1 billion m^3

Source: CIA World Factbook 2011

Natural gas is a diminishing resource while nuclear energy dominates the energy markets



France has a 193.700 km pipeline network

More than 97% of natural gas used is imported

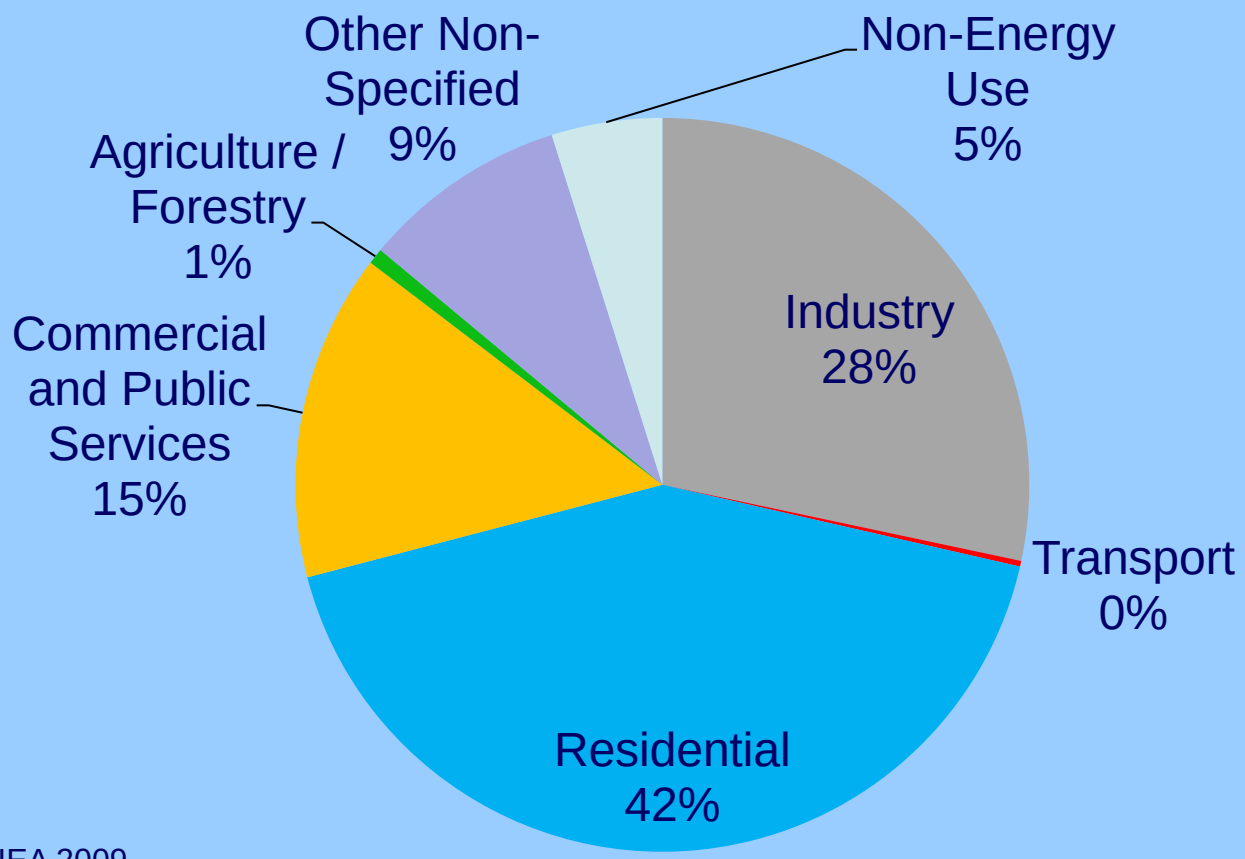
- 81% of natural gas is imported from four countries
  - Norway 32%
  - Netherlands 18%
  - Algeria 16%
  - Russia 15%

Source: IEA statistics

Transmission, Distribution and Storage

- Gas transmission system operated by GRTgaz (100% subsidiary of GDF Seuz) covers 87% of the country. In the south-west there is a separate network operated by Total Infrastructures Gaz France
- France has second longest network after Germany with 193.700 km of pipeline: GDrF (100% subsidiary of GDF Suez) covers 186.000 km, local distribution companies 7.700 km
- Storengy (subsidiary of GDF) operates a fleet of 12 sites (80%), TIGF operates 2 sites (20% of capacity)

Natural Gas used in transport sector is not relevant



source: IEA 2009

3 LNG terminals owned by Elengy (subsidiary of GDF Suez)

- Fos sur Mer: two tanks each with 35.000 with cubic metres capacity and one 80.000 m^3
- Montoir de Bretagne: three tanks with 120.000 m^3 capacity
- Fos-Cavaou: three tanks with110.000 m^3 each

source: Elengy

LNG import capacity will play a growing role in France, iwth more terminals under construction targeted for 2013

- Dunkerque: owned by EDF
- Le Havre-Antifer: owned by Gaz de Normandie
- Fos sur Mer: owned by Shell and Vopack

source: IEA 2009

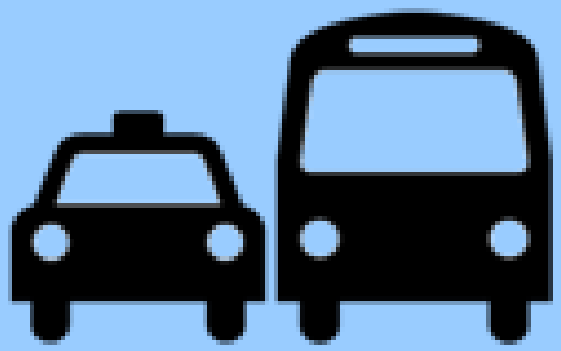
GDF Suez holds a long term LNG supply portfolio based on four different projects and 16 bcm/year

- GDF Suez is the largest LNG importer in Europe
- GDF Suez and Enel implemented a long term swap deal based on a quantity of 3.5 bcm/year linked with Enel's LNG supply from Nigeria

Long term LNG GdF Suez supply			
Origin	**End of supply**	**Nominal quantity bcm/y**	**Delivery**
Algeria	**2013**	**10,3**	**FOB**
Nigeria	**2022**	**0,5**	**ex-ship**
Egypt	**2025**	**4,8**	**FOB**
Norway		**0,7**	**equity gas**

Source: GDF Suez Supply, Trading and Marketing

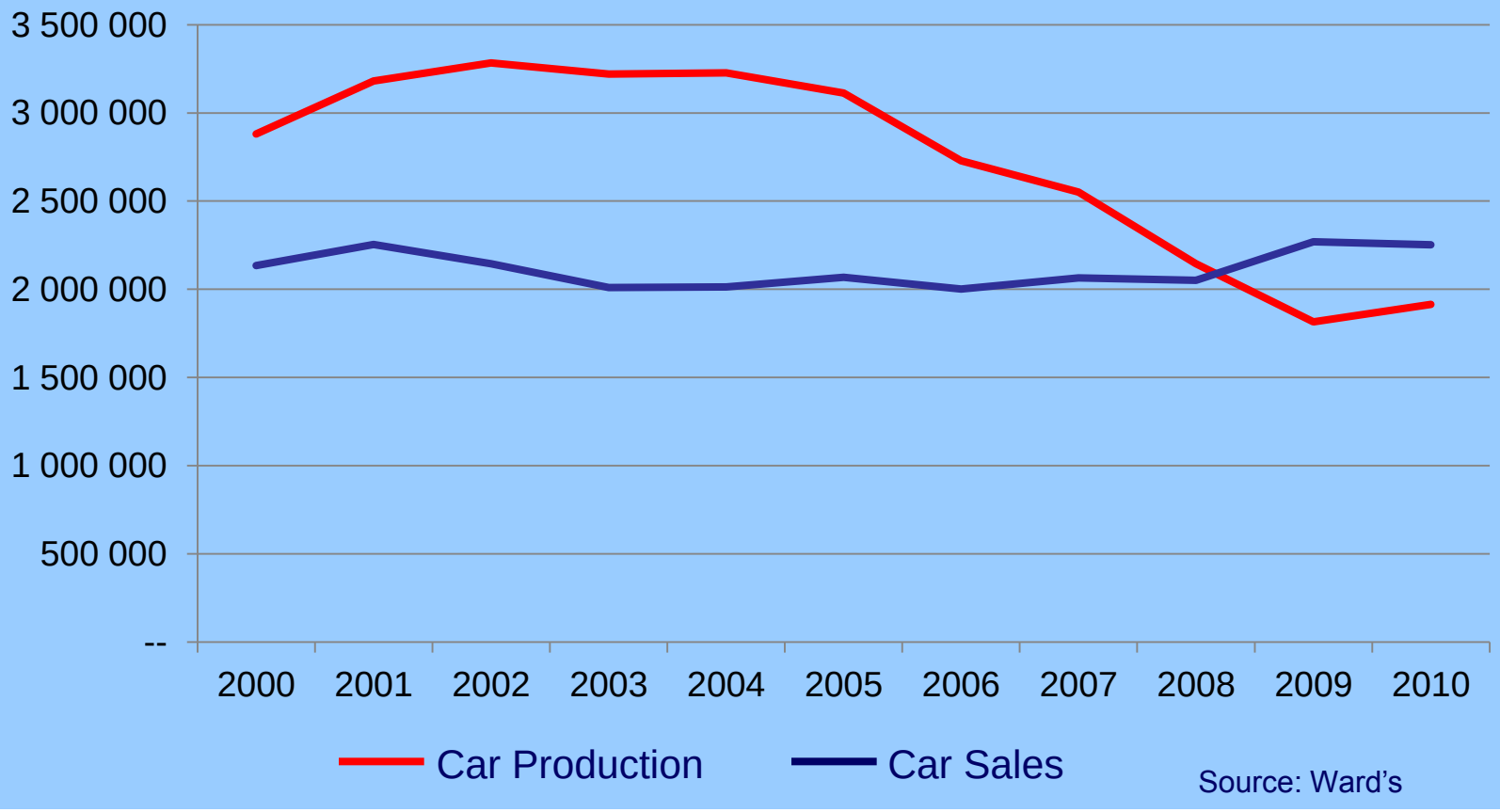
VEHICLE PROFILE



VEHICLES PROFILE

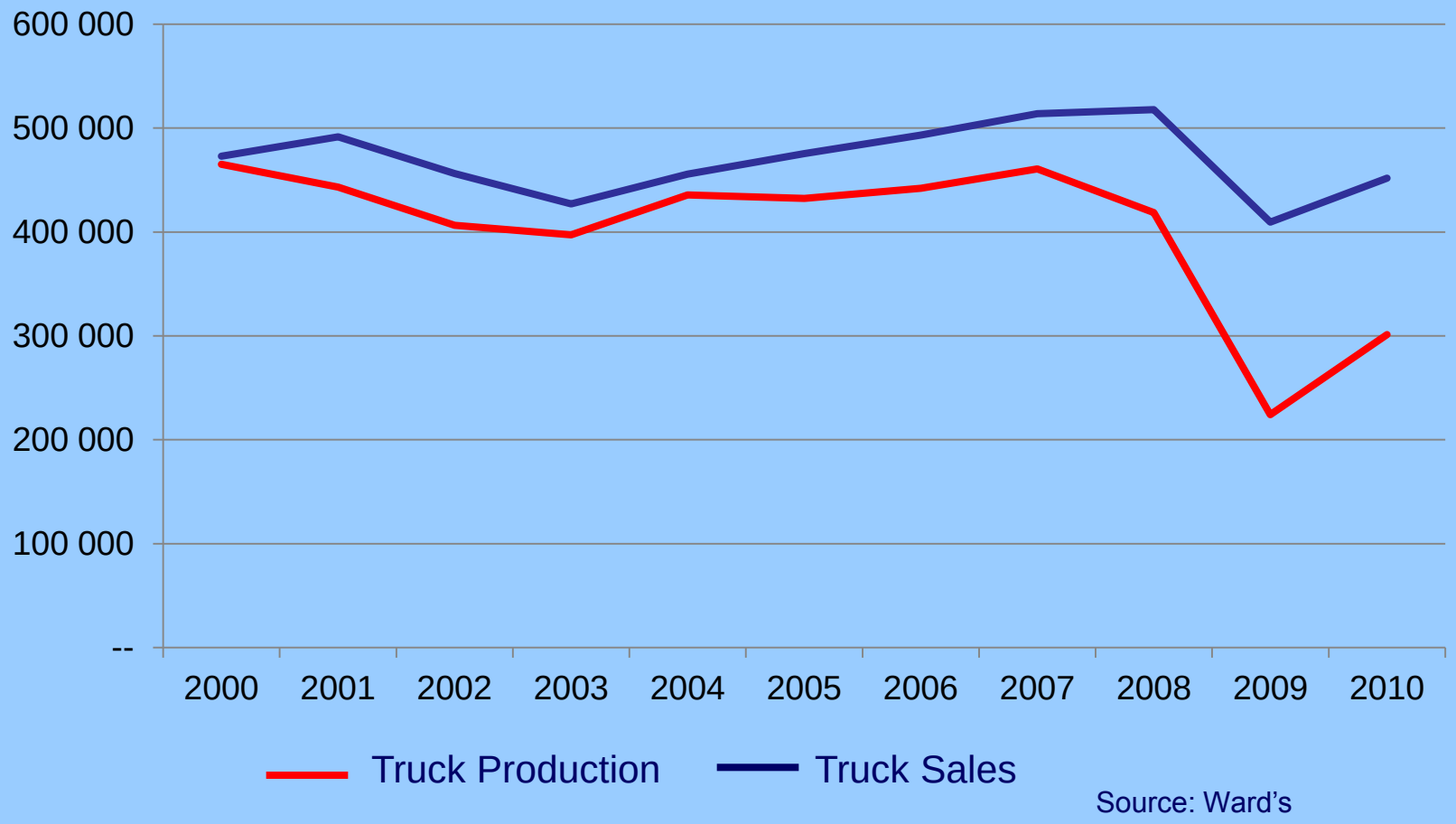
- 2.251.736 new vehicles sold in 2010
- 37.381.126 vehicles on the road in 2010:
  - 84% passenger cars
  - 0,1% buses
  - 15,9% commercial vehicles
- 98% of the market share is represented by diesel (70%) and gasoline(28%)
- NGVs are only 0,02% of the vehicles sold

Due to a decrese of national production, car sales overtook the car production in 2008



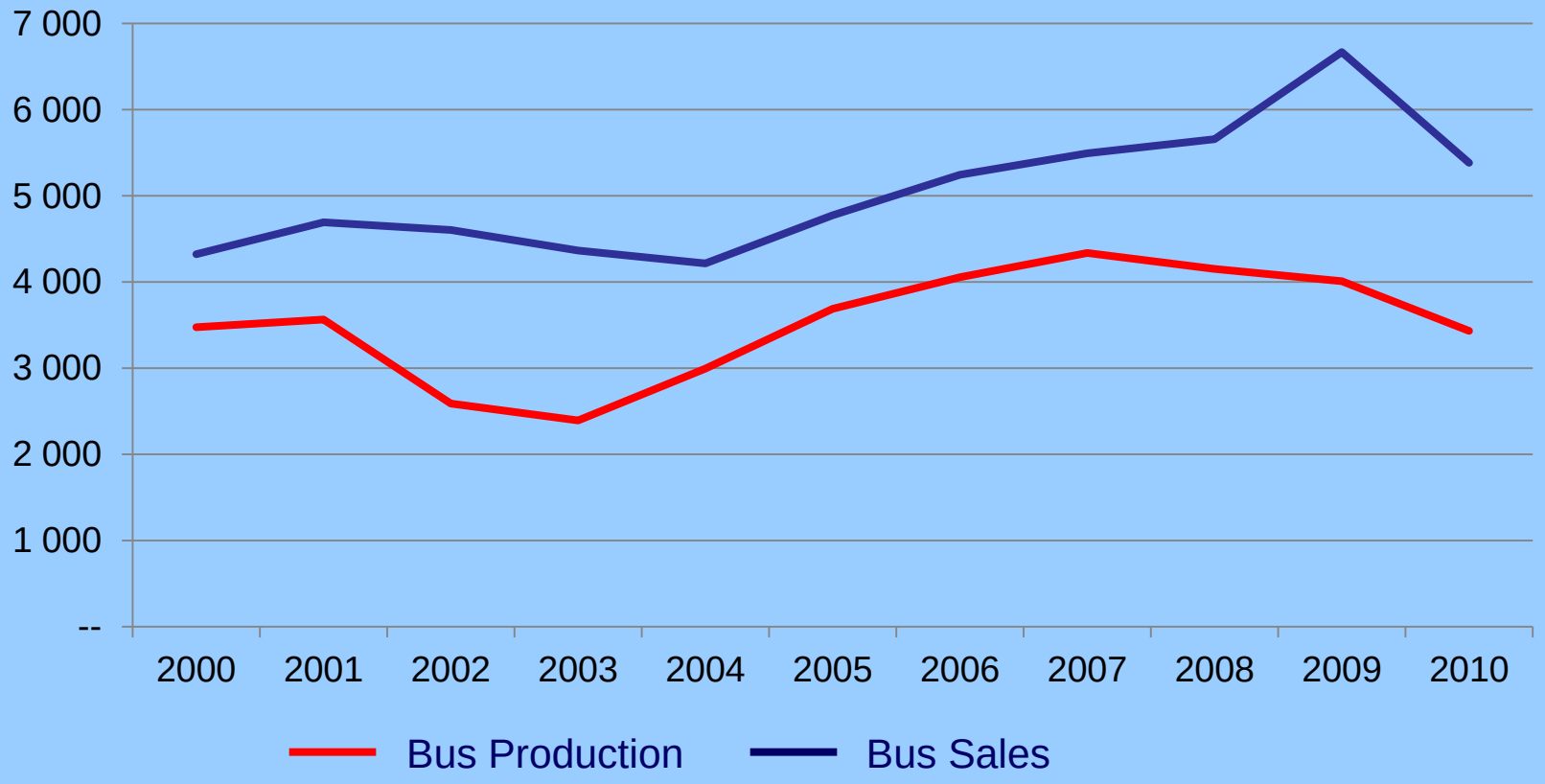
Source: Ward's

Difference between sales and production is increasing since 2000



Source: Ward's

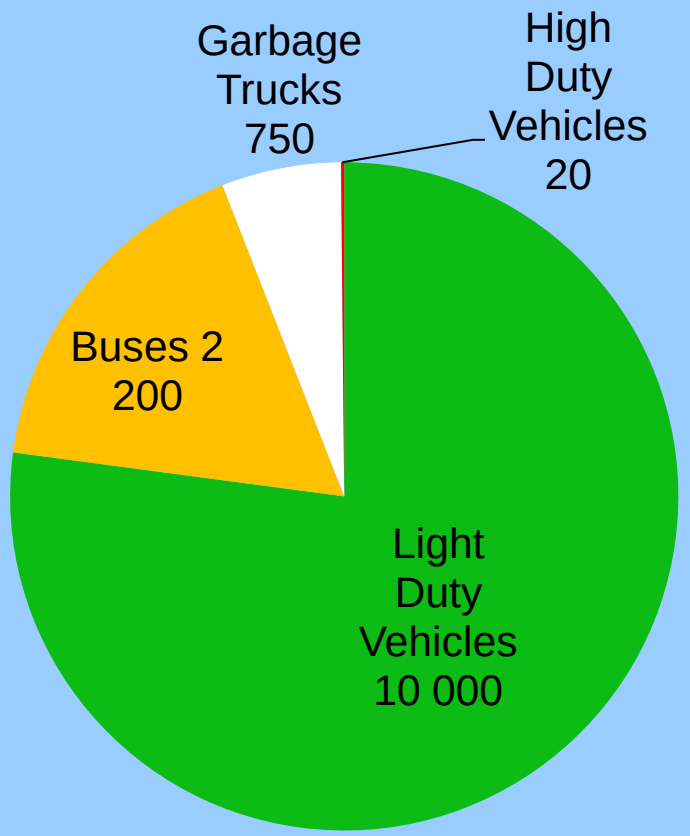
As for cars and trucks, bus production is lower than sales



Source: Ward's

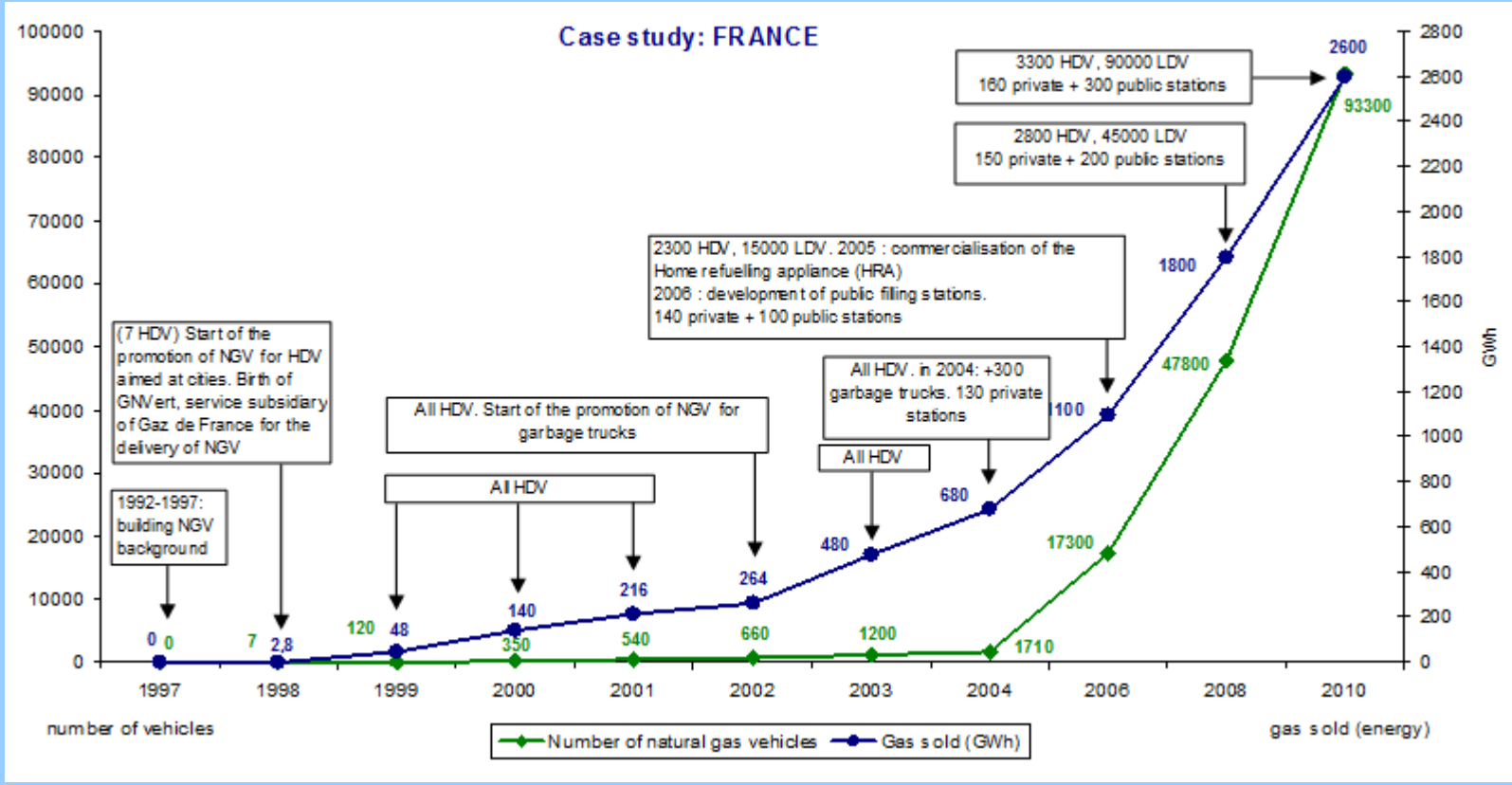
13.000 NGVs are present in France

- 77% are light duty vehicles
- CNG is targeted at the fleet vehicle market



Source: GDF Suez, 4th International NGV Conference - Prague, 9-10 February 2011

NGV market was developed by municipal vehicles, large companies and public transport companies



Source: IGU 5.3 Final Report, 2006 (Updates 2012)

The French OEMs have, for the most part, stopped selling NGVs

- Citroen are producing cars but with old motors that cannot be used on new cars in Europe due to the increasingly stringent Euro emissions regulations. They are producing NGVs for foreign markets and not for domestic sales
- Renault has invested so much in electric vehicles that they have dropped NGVs some years ago
- Peugeot is no longer producing the Boxer and Partner natural gas models
- Only Italian and German NGVs are present in France

Source: NGV industry stakeholder

Citroën
- C3
- Berlingo
- Jumper
- Saxo
- Kangoo
- Xsara

Renault
- Clio
- Kangoo

Opel
- Zafira
- Combo

Mercedes
- B Class 180
- E Class 200
- Sprinter

Scarab
- Merlin

Fiat
- Panda
- Punto
- Doblò
- Qubo
- Fiorino
- Ducato

Volkswagen
- Caddy

Mercedes Benz

- 0405N-G
- 0530N-G3 Citaro

Renault (PVI)

- Puncher 250,20 GNV 4x2 20t
- Puncher 250,26 GNV 6x2*4 26t
- Midlum 230,12 GNV 4x2 12t
- Midlum 230,16 GNV 4x2 16t

NGV OEM AVAILABILTY

Lots of NGV buses availables

Irisbus

- Daily minibus CNG 6-7
- Cityclass CNG 10.8-12
- Cityclass CNG 18 m
- Europolis 9.4 meters
- Agora GNV 12m
- Agora GNV 18m

Mercedes-Benz

- 0405N-G
- 0530N-G3 Citaro

Volvo

- B10L-CNG
- B10B LE-CNG
- B10B LE-CNG-6x2
- 7700 GNV

Iveco

- Eurotech MT 190 E 22 CNG
- Eurotech MH 260 E 26 CNG

Vehicle targets have failed to materialize in the quantities projected

A protocol signed in July 2005 defined very ambitious targets, in terms of number of vehicles running on NG/biomethane, to be reached by 2010:

- 3,000 CNG urban buses
- 1,200 CNG urban services trucks
- 100,000 CNG cars and light duty vans
- 300 Fuelling Stations

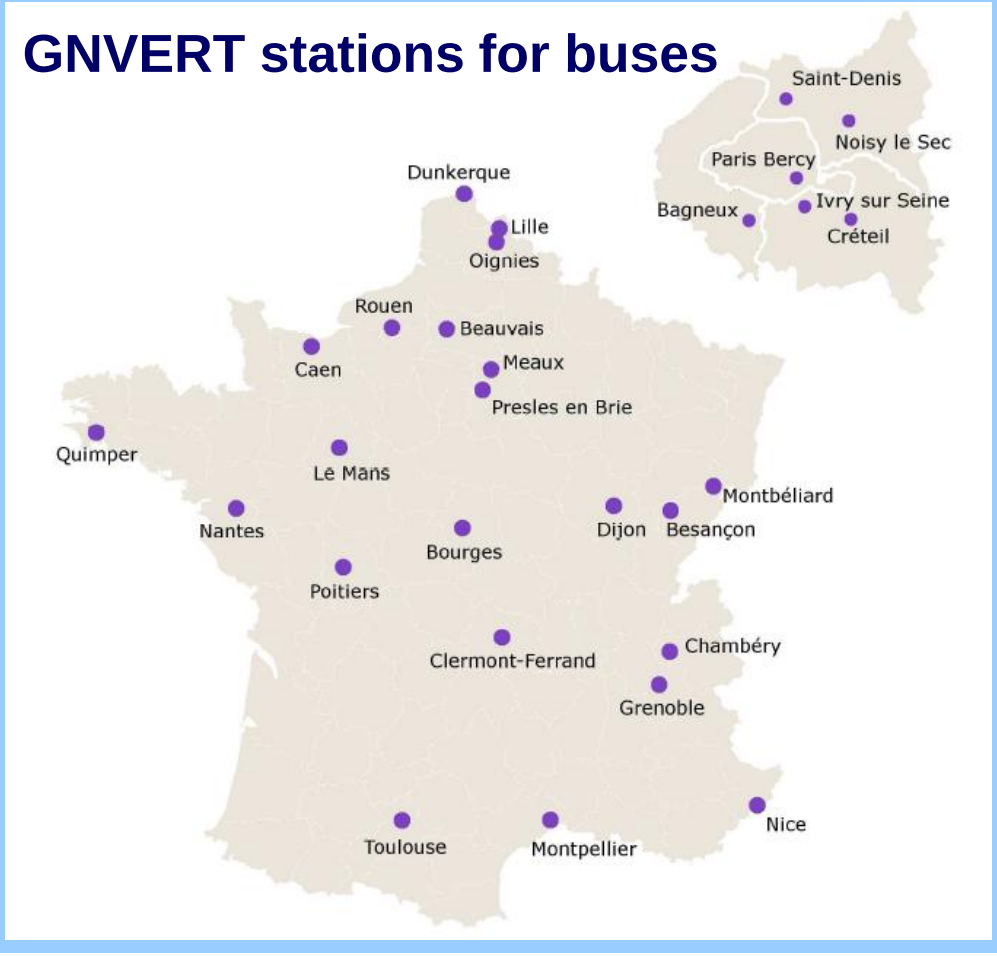
NGV FUELLING INFRASTRUCTURE

GNVert is the main actor in CNG Fuelling Stations

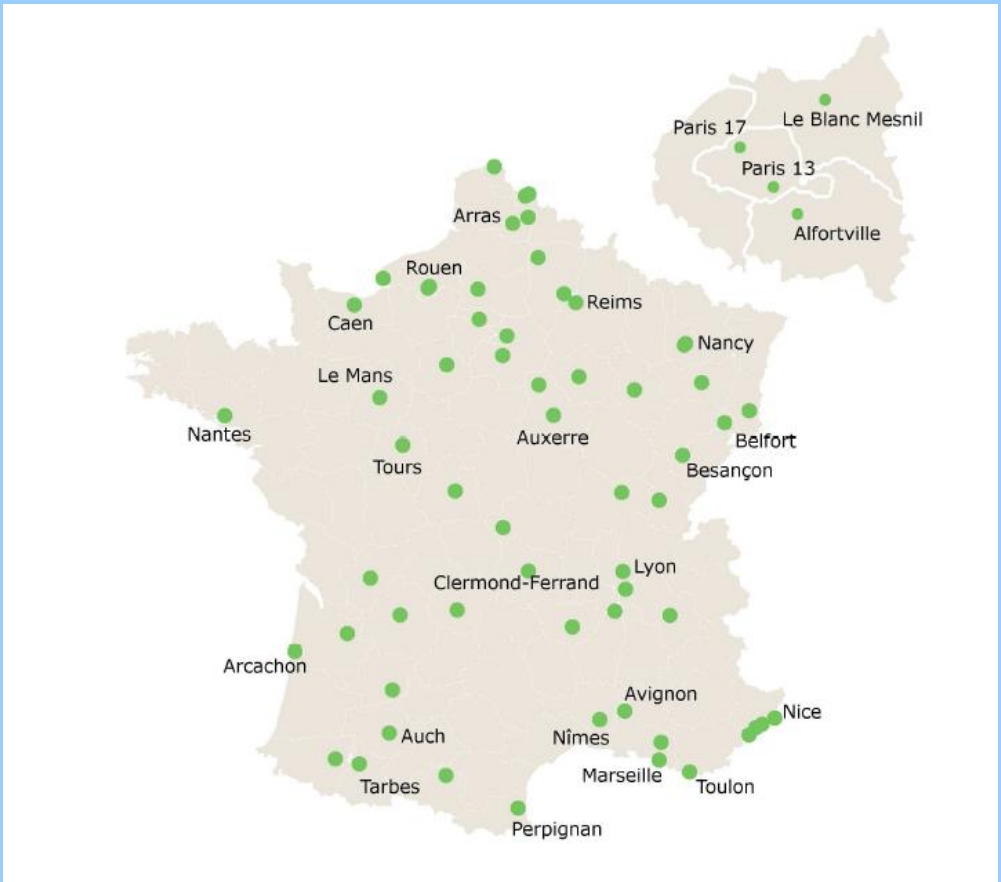
- GNVERT built between 2 and 10 CNG stations a year
- 140 stations GNVERT are spread throughout the country:
  - 32 dedicated stations for buses and/or refuse collection trucks
  - 27 stations open to the public
  - 81 stations dedicated to business fleets

In France 13,5% of total public transport use CNG

GNVERT stations for buses



GNVERT stations dedicated to commercial fleets



From 1st April 2011 GNVert offers credit card payment at all its public CNG station

- Until April 2011 users had to previously sign a contract with GNVert, and received a special fuel card: “badge GNVert”

"We wanted to give a better incentive to buy an NGV and facilitate CNG refuelling for the NGV customer at our stations"

Karine Vernier, president of GNVERT

Source: GNVERT, press release, 23.3.2011

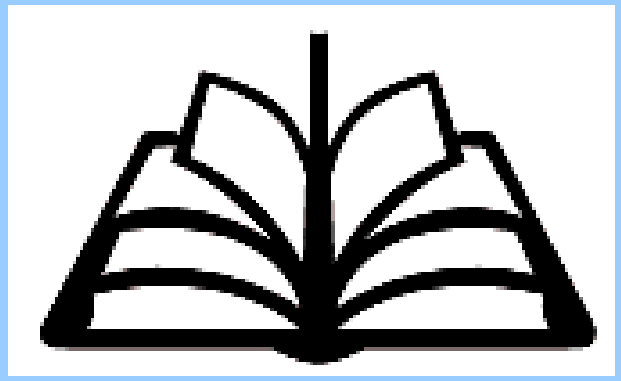
GDF SUEZ offers installation and rental of a micro-filling station at home

- Small device (80 cm, 35 cm wide, 30 cm deep) capable of delivering 1 m^3 of compressed natural gas per hour of operation
- The filling is done automatically
- It takes approximately

3-4 hours to fuel a vehicle

Source: Energie Communes GDF Suez

STANDARDS & REGULATIONS



STANDARDS & REGULATIONS

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

Access tariffs are based on a principle of "Entrance-Exit"

- The territory is divided into zones based on balancing physical congestion on the network in which gas can circulate freely and unconstrained by paying only a one time fee at the entrance and exit
- CRE is the guarantor of access to gas infrastructure:
  - Determination of rules of access
  - Fixation of access tariffs to transmission and distribution of natural gas
  - Participation in European efforts to harmonize the rules of operation of the gas infrastructure

Section 1413 of the ICPE Nomenclature

According to the ICPE Nomenclature, administrative obligations necessary for the running of the station depend on the maximum flow exiting from the compression unit and the total mass of gas in the station:

- Flow rates higher than 2000 m3/h or total mass of gas in the station higher than 10000 kg requires an “Authorization” procedure
- Flow rates between 80 and 2000 m3/h or total mass of gas in the station higher than 1000 kg requires a “Declaration” procedure

Source: Biogasmax project, Synthesis Report on Normative Regulatory Requirements

Safety distances used for fuelling station

Distance between	Dispenser	Compressor	Storage	Dispenser at 5m of a firewall of 2h and 2,5 m high
Opening of a public building	17m	3m	3m	12m
Opening of a station building	5m	3m	3m	-
Emergency Exit of the station buildings	17m	-	-	-
Limit of property	5m	10m	3m with a fire proof cowling	Lenght of the filling hose increased by 2m
Nearest parking place	-	6m	6m, 2m with a fire proof cowling	-
Another fuel storage	-	-	3m	-
Dispenser	-	-	5m	-

GOVERNMENT SUPPORT

GOVERNMENT SUPPORT

Natural gas for transport is exempt from taxation

LOI n 2010-1657 du 29 décembre 2010 de finances pour 2011

TICPE (taxe intérieure de consommation sur les produits énergétiques):

- Gasoline: 60,69 €/hl
- Diesel: 42,84 €/hl
- GNC: 0 €

GOVERNMENT SUPPORT

Bonus/malus tax system
Decree # 2007-1873 (2007). Revised twice in 2009: Decree # 2009-66 (January) and Decree # 2009-1581 (December)

- A new car is taxed (malus) or credited (bonus) if its carbon emissions are above or below certain targets
- Bonus of €5.000 for a car with CO2 emissions less than or equal to 60 g/km
- Bonus of €2.000 for a car whose CO2 emissions are less than or equal to 135 g, as vehicles with LPG or CNG
- Tax exemption on the car registration document also for second-hand cars running with alternative fuels

Bonus/malus tariff for 2011

- < 60 g/km CO_2: Bonus € 5.000
- 61-90 g/km CO_2: Bonus € 800
- 91-110 g/km CO_2: Bonus € 400
- 111-150 g/km CO_2: Neutral
- 151-155 g/km CO_2: Malus € 200
- 156-190 g/km CO_2: Malus € 750
- 191-240 g/km CO_2: Malus € 1.600
- > 240 g/km CO_2: Malus € 2.600

Bonus/Malus system increased in 2012

- < 60 g/km Co2: Bonus 5.000€
- 61-90 g/km Co2: Bonus 800 €
- 91-110 g/km Co2: Bonus 400 €
- 111-140 g/km Co2: Neutral
- 141-150 g/km Co2: Malus 200 €
- 151-155 g/km Co2: Malus 500 €
- 156-180 g/km Co2: Malus 750 €
- 181-190 g/km Co2: Malus 1.100 €
- 191-230 g/km Co2: Malus 1.600 €
- > 231 g/km Co2: Malus 2.600 €

Additional incentive applies for company cars

- Tax exemption on company cars tax (TVS) according to CO2 emission levels
- Modalities and rates changes are set according to the type of clean vehicle (CNG, electric, hybrid, E85, LPG) or the type of activity (taxi, car-sharing, demonstration vehicles, etc)

Source: Clean Vehicle Portal

€ 400 million investment to develop alternative fuels (2009-2012)

R&D plans started in 2008:

- €400 million from public funds dedicated for supporting development for R&D of the low carbon vehicles, including full electric vehicles or hybrid vehicles
- There is nothing special at this time for NGVs in the announcement

Source: GDF Suez, Research and Innovation Department

Public NGV fleets are helping the development of NGV market

- Half of the cities with more than 200,000 inhabitants have already adopted CNG for their public transport fleets
- 1/3 of refuse collection vehicles run on CNG daily
- Paris, Nantes, Toulouse, Montpellier, Lille, Bordeaux, Dijon, etc are using CNG Buses

GAS INDUSTRY SUPPORT

GAS INDUSTRY SUPPORT

GDF Suez is the main national gas company

- GdF-S is lobbying government to ensure NGVs are included in the massive investment into R&D for low carbon vehicles
- Provides R&D support for industry and is participating in European and international NGV associations and programs
- Consistently focused on NGV marketing strategies as part of the corporate focus
- Of approximately 16,000 vehicles in the national fleet, about 3000 are NGVs

GDF Suez is envolved in several NGV projects

- **European project InGas**
  - *Partners:* FIAT, GDF SUEZ, Daimler, General Motors, IFP Energies Nouvelles,etc
  - *Objective:* to develop a CNG dedicated LV for Western Europe
- **1° OEM project: Evaluation of a new optimized direct injection CNG engine for LVs/LDVs**
  - *Partners:* GDF SUEZ & OEM
  - *Objective:* Tests on a 4-cylinder engine with CNG, biomethane, Hythane
- **2° OEM project: Evaluation of a "new combustion" engine for LVs/LDVs**
  - *Partners:* GDF SUEZ & OEM
  - *Objective:* Tests on a 4-cylinder engine with CNG, biomethane, Hythane

Source: GDF Suez, 4th International NGV Conference - Prague, 9-10 February 2011

French NGV program faltered due to economic crisis

- Joint effort from the Ministry, Total, GdF, Carrefour
- It should have started before the crisis in 2009
- Total and Carrefour pulled back on their investment due to other financial priorities and GdF didn't want to go it alone

Source: NGV industry stakeholder

NATIONAL LAWS & REGULATIONS

Business Freedom is very highly prized

- France's efficient and modern regulatory environment makes business formation and operation relatively easy
- The business framework supports dynamism and competitiveness
- Entrepreneurial activity is generally facilitated by institutional strengths such as strong protection of property rights and a relatively efficient regulatory framework

Source: The Heritage Foundation, 2011 Index of economic freedom

Investment Freedom is relatively transparent

- There is no generalized screening of foreign investment, but acquisitions in some sensitive sectors (including air and maritime transport) require approval
- Investments involving large stakes in firms are subject to government review
- Regulations are transparent, but officials have wide discretion to impose “unwritten” performance requirements. Attitudes toward foreign investors can be negative
- Residents and non-residents may hold foreign exchange accounts
- There are no restrictions or controls on payments, transfers, or repatriation of profits, and non-residents may purchase real estate

Source: The Heritage Foundation, 2011 Index of economic freedom

COMMENTS BY STAKEHOLDERS

COMMENTS BY STAKEHOLDERS

"On the attempt in Brussels to equalize the minimum tax on gas and petroleum foreseen to be in place 2023:

- It's a long term goal but the psychological affect is very bad. It means that customers don't consider that the car brings something competitive to petrol cars (i.e. that natural gas is cheaper than gasoline)
- The increased tax affects OEMs' view of the market potential and can reduce their commitment" (France NGV Association)

COMMENTS BY STAKEHOLDERS

- "Government has tried the agrofuels because they have a strong agricultural lobby: a lot of money was invested there" (France NGV Association)
- "If GdF would push for NGVs the government will support them, but they are not likely to advocate for NGVs" (France NGV Association)
- "We need to distinguish between CNG and LPG, which often are confused" (France NGV Association)
- "Better communications are needed to the fleets and municipalities and not necessarily the general public" (France NGV Association)
- "Fleets are the next priority and especially municipalities: selling a new car is a huge investment. So OEM can't produce something without proving the market" (France NGV Association)

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

- Long term petroleum price increases are anticipated but favorable price differential between natural gas and petroleum should be sustainable
- Biogas developments highlight renewable aspects of NGVs to compete with other biofuels

Gas Industry Support

- Lack of lobbying for businesses to use natural gas results in domination of liquid fuels
- The French NGV Association (which comprises government ministries, fuel providers and vehicle manufacturers) is a strong advocate for NGVs and the results are most evident among municipalities and their public vehicles

Government Support

- NGVs are not generally included within the national transport sector energy policies
- National policies are today heavily focused on electric vehicles to the general exclusion of NGVs
- The strongest support is coming mainly from local and regional administrations as seen by NGV use in municipalities (public buses and garbage trucks)

NGV Market Development

- The strong support and focus on municipal fleets, while very positive for the French NGV market, has resulted in a lack of public refuelling station development. This likely has affected the support from OEMs to build and sell light duty NGVs due to an unresolved 'chicken and egg' situation
- The development of alternative gaseous fuels on the mass market (private vehicles) remains "confidential" (i.e. unpublicized)

Legal and regulatory framework for CNG station development

- While there are well-established regulatory protocols for CNG stations, there are no apparent legal obstacles to the development of a CNG infrastructure

Investment Environment

- The long term economics (fuel prices) are favorable (subject to changes in EU minimum fuel taxation)
- The business framework supports dynamism and competitiveness
- Possibilities for foreign companies to enter the NGV and fuelling station market sectors are not limited by any apparent factors

FRANCE
(July 2011)