

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.

SPAIN

(January 2012)

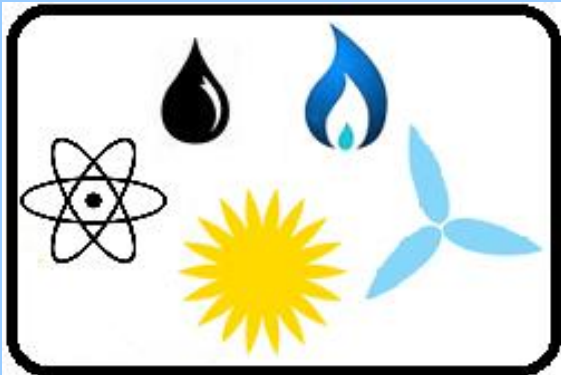


- NGV Profile
- Motivation
- Energy Profile (oil & gas/imports & exports)
- Vehicles
- Fuelling Infrastructure
- Government Support
- Gas Industry Support
- Conclusions

- Number of NGVs: 3,051 (~19% are LDVs)
 - NGVs are 0.01% of total vehicle population
 - 0.06 NGVs per 1000 population
 - CNG fuelling stations: 55
 - 55.5 vehicles per fuelling station
 - Price differential CNG-Petrol/diesel:
 - CNG equivalent per liter gasoline: € .59/liter
 - Regular Gasoline: €1.3/liter
- Natural gas costs 55% less than gasoline

Sources: Gas Vehicle Reports February 2012; www.metanoauto.it (December 2011)
http://www.drive-alive.co.uk/fuel_prices_europe.html

- Economics
- Environment





- Eight nuclear power plants represent almost 8.3% of the installed electricity capacity. Two plants have been shut down in 1990 (Vandellòs) and in 2006 (Josè Cabrera)
- Natural gas is the second most important fuel in Spain, after oil
- Gas supplies are more diversified and secure, thanks to heavy investment in LNG: Spain is the largest LNG importer in Europe

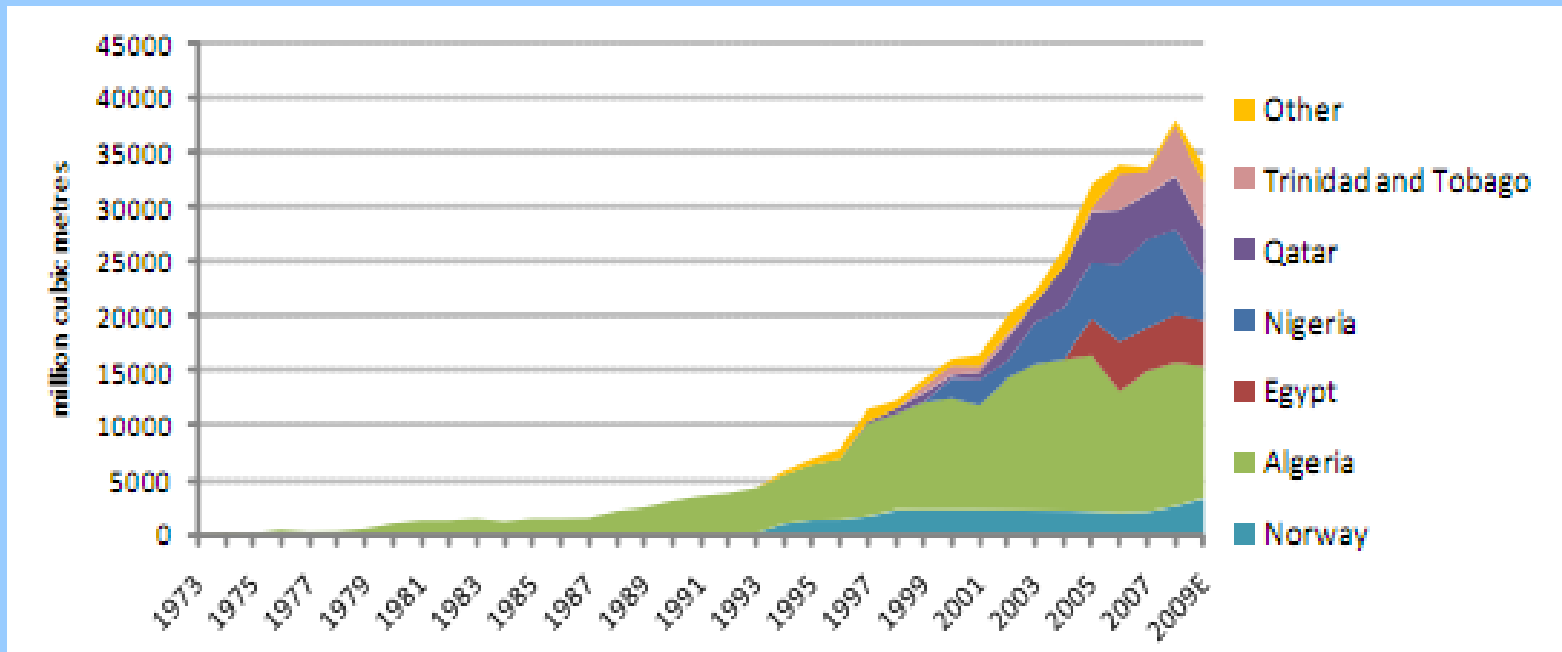
Source: IEA, Energy Policies of IEA Countries: Spain 2009 review

Spain is a major hub importing and exporting natural gas

- **Oil**
 - production: 29.970 bbl/day
 - consumption: 1,441 million bbl/day
 - imports: 1,584 million bbl/day
 - exports: 240.700 bbl/day
 - reserves: 150 million bbl
- **Natural gas**
 - production: 48 million m³
 - consumption: 35,82 billion m³
 - imports: 36,71 billion m³
 - exports: 1,152 billion m³
 - reserves: 2,548 billion m³

Source: CIA World Factbook 2011

Spain is highly reliant on gas imports to fulfill domestic demand

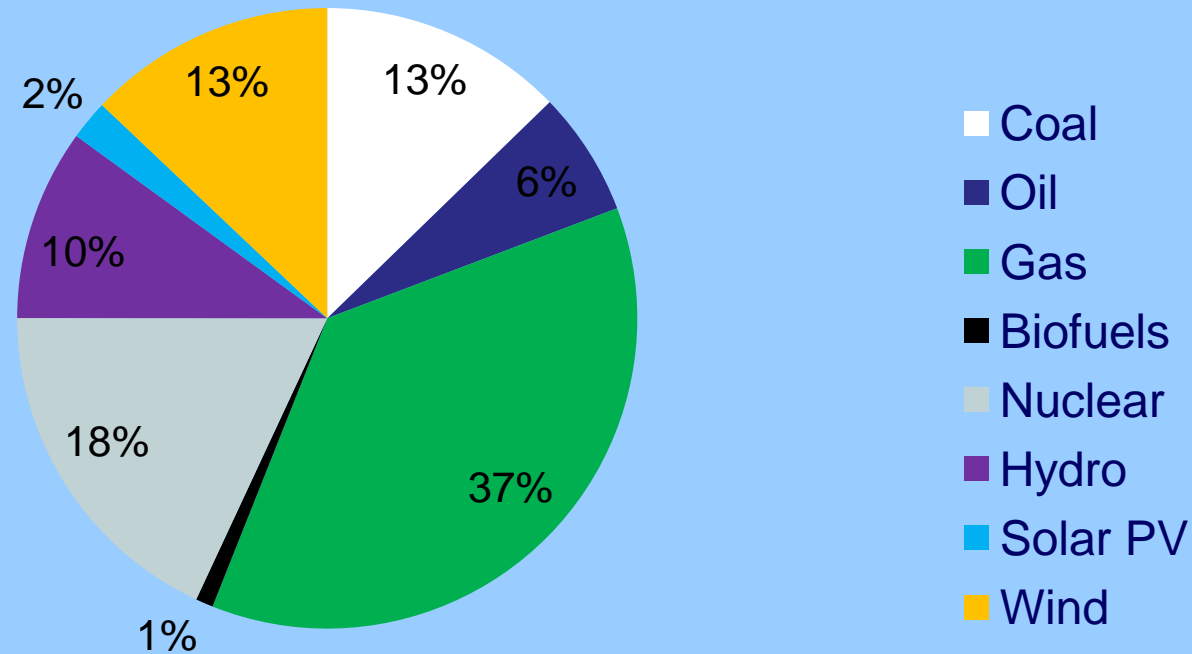


Source: IEA, Oil & Gas Security, 2011

Natural gas is imported from Algeria, France and Portugal, each connected by 2 pipelines

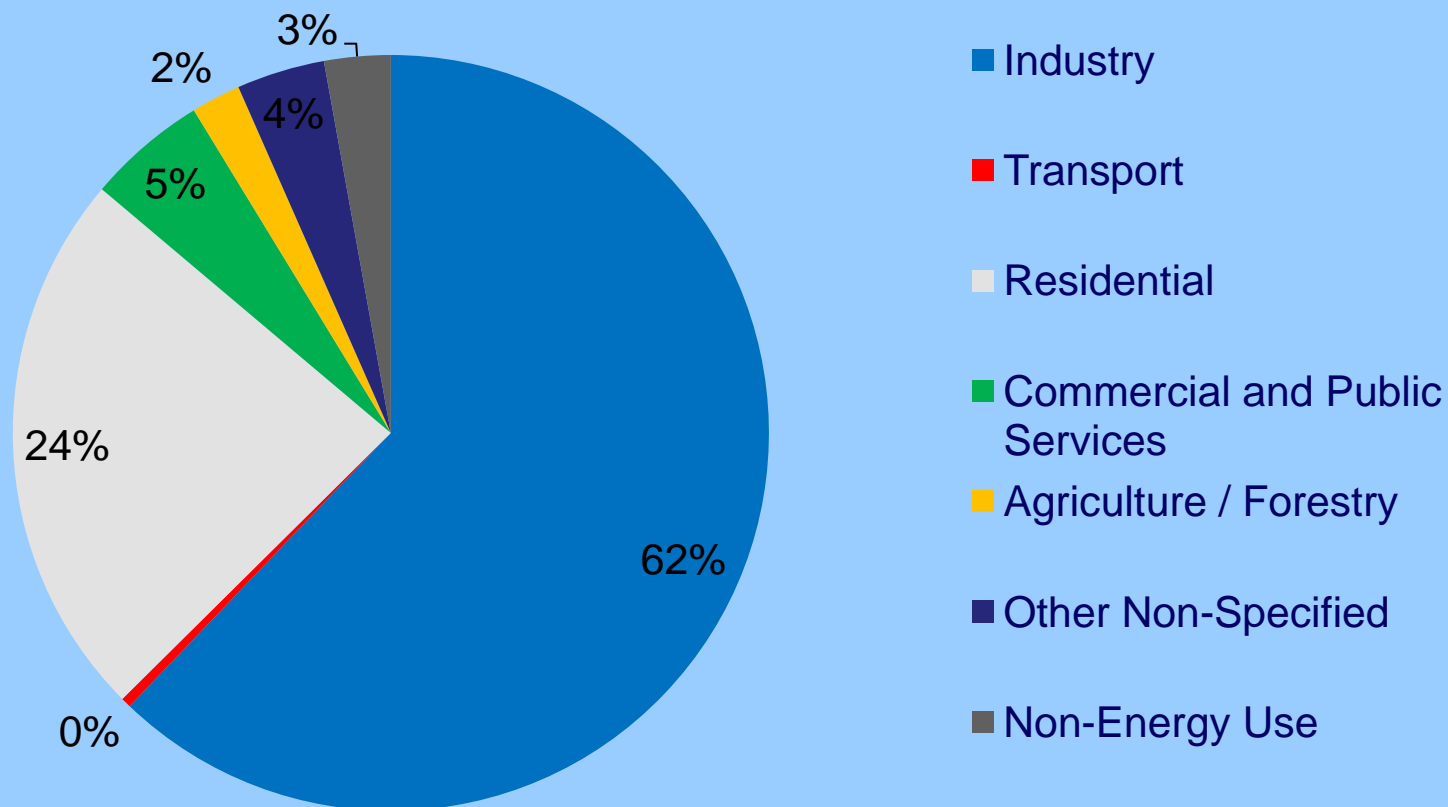


The power generation market is highly dependent on natural gas (37%). But renewable energy sources represent one quarter of Spain's energy resources



Source: IEA statistics 2011

The industrial sector is the main consumer of natural gas; Vehicular use is insignificant



Source: IEA statistics, 2011



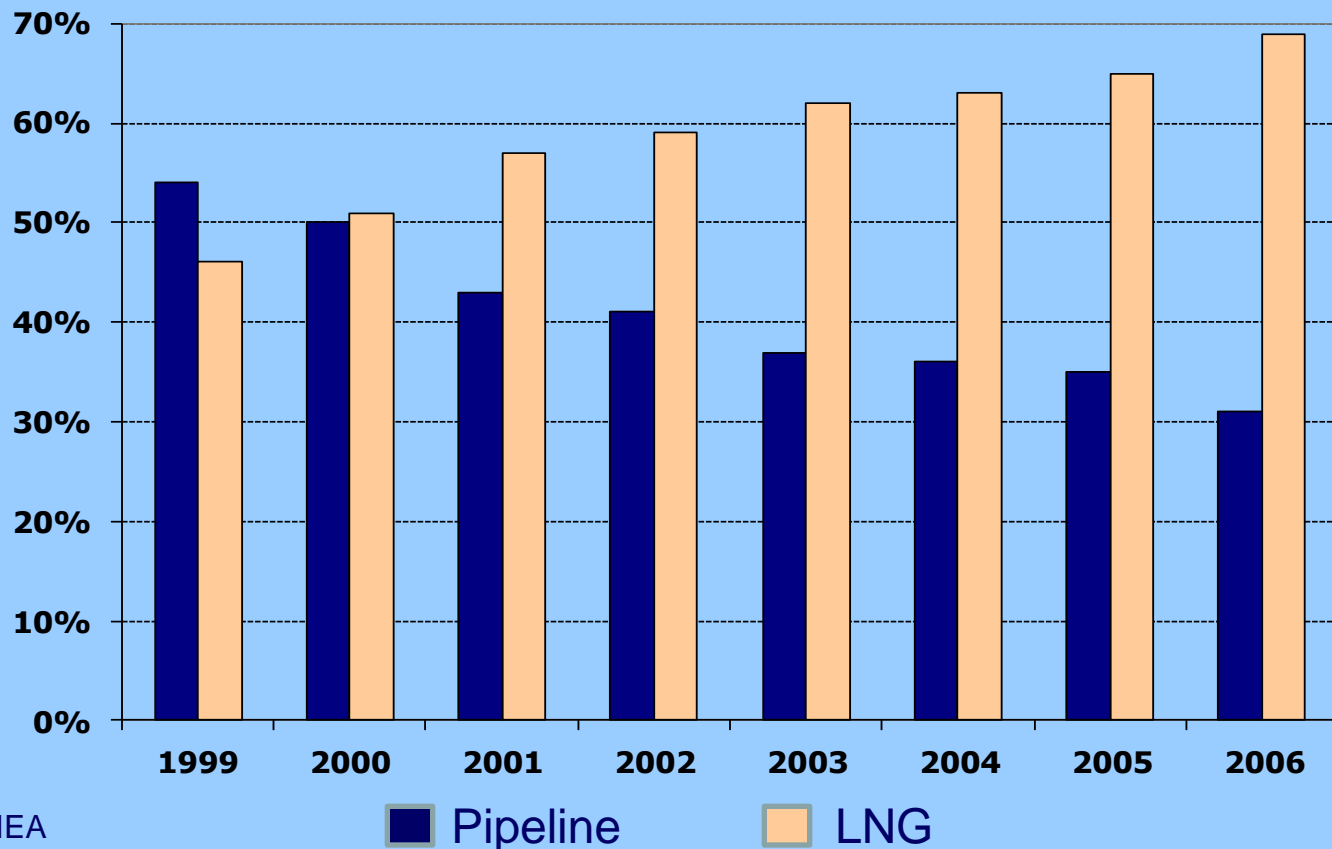
Spain has six operating regasification plants that are the main points of entry for LNG into the natural gas distribution network

- Barcelona (1969), Huelva (1988), Cartagena (1989), Bilbao (2003), Sagunto (2006) and Reganosa (2006)
- Enagás has been awarded the administrative license to build a new LNG terminal located in El Musel (Asturias); two other LNG plants are planned in the Canary Islands (Tenerife and Gran Canaria)

Source: IEA



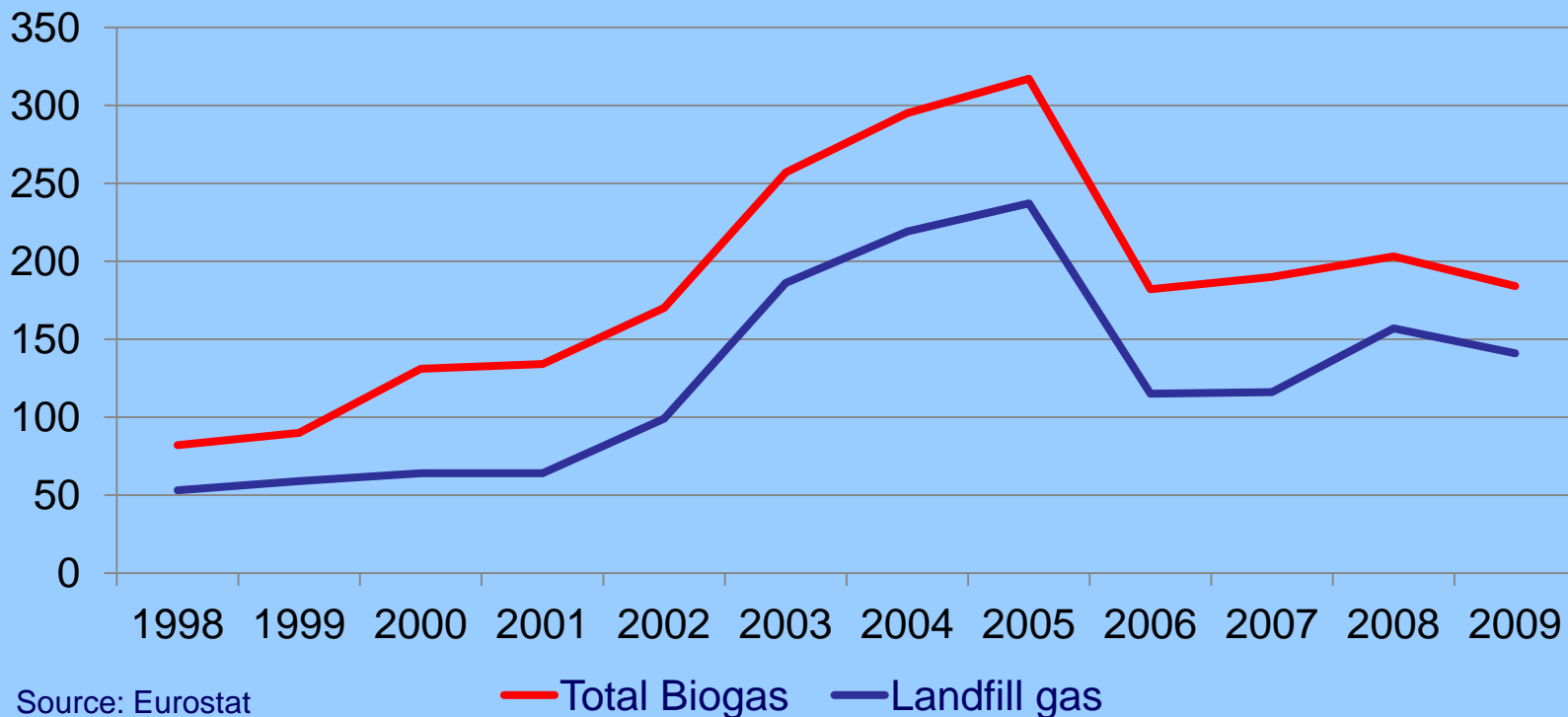
In 2009, 74% of Spain's gas imports were LNG deliveries (from a diversified portfolio of sources), with the remaining 26% being pipeline supplies



Source: IEA

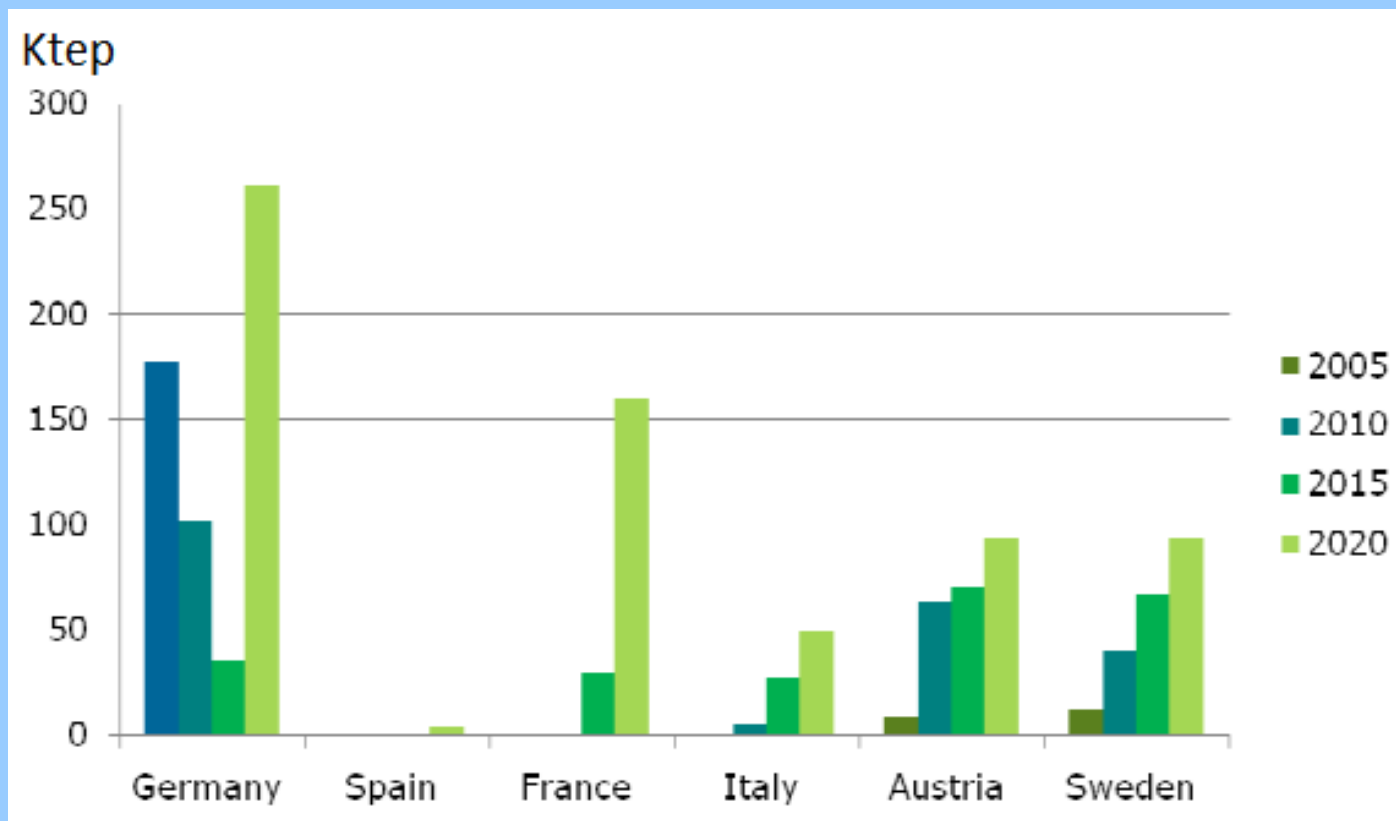


Biogas production, with a high percentage of landfill gas, dropped significantly in 2006. Biogas production remains more or less constant





Compared to other European countries, growth of biogas in the transport sector is expected only from 2020



Source: EBA, National Renewable Energy Action Plans 2010, the European Biogas Market, October 2010



Biogas has many introductory barriers. As such its use as a vehicle fuel will take more time to develop

- Only 6 plants were commissioned in the last 3 years
- Low feed-in tariffs and lack of bonuses to complete the feed-in-tariff scheme
- Rules to allow grid connection are not yet in place: decision depends on each electricity company
- The promotor of the biogas plant has to pay all the costs for the connection
- Complex process to get licencies, permits, etc.

Source: AEBIG, Present and Future of the Biogas in Spain, June 2010



Spain is a European leader in liquid biofuels, thanks to its large production capacity and investments in R&D

- In 2008, the Spanish biodiesel market grew sharply, doubling its size and reaching a production capacity of over 1.5 million tep* per annum from 32 plants
- Twenty more plants are under construction which, on completion, will take total installed capacity to around 7 million tep per annum

* tons equivalent petroleum

Source: IDAE; Renovables made in Spain

Liquid biofuels have increased its share in total transport fuels, reaching 1.15% in 2007, up from 0.32% in 2003

		2003	2004	2005	2006	2007
Bioethanol	Production capacity	220	220	250	420	420
	Production	160	202	240	317	276
	Consumption	152	167	177	179	175
Biodiesel	Production capacity	96	145	186	358	946
	Production	6	13	74	125	168
	Consumption	6	9	27	63	290
<i>Share of total consumption in the transport sector (%)</i>		<i>0.32</i>	<i>0.38</i>	<i>0.44</i>	<i>0.54</i>	<i>1.15</i>

Sources: Country submission, based on Ministry of Industry, Tourism and Trade; APPA; IDEA; F.O. Licht's; EurObserver.

Source: IEA, Energy Policies of IEA Countries: Spain 2009 review

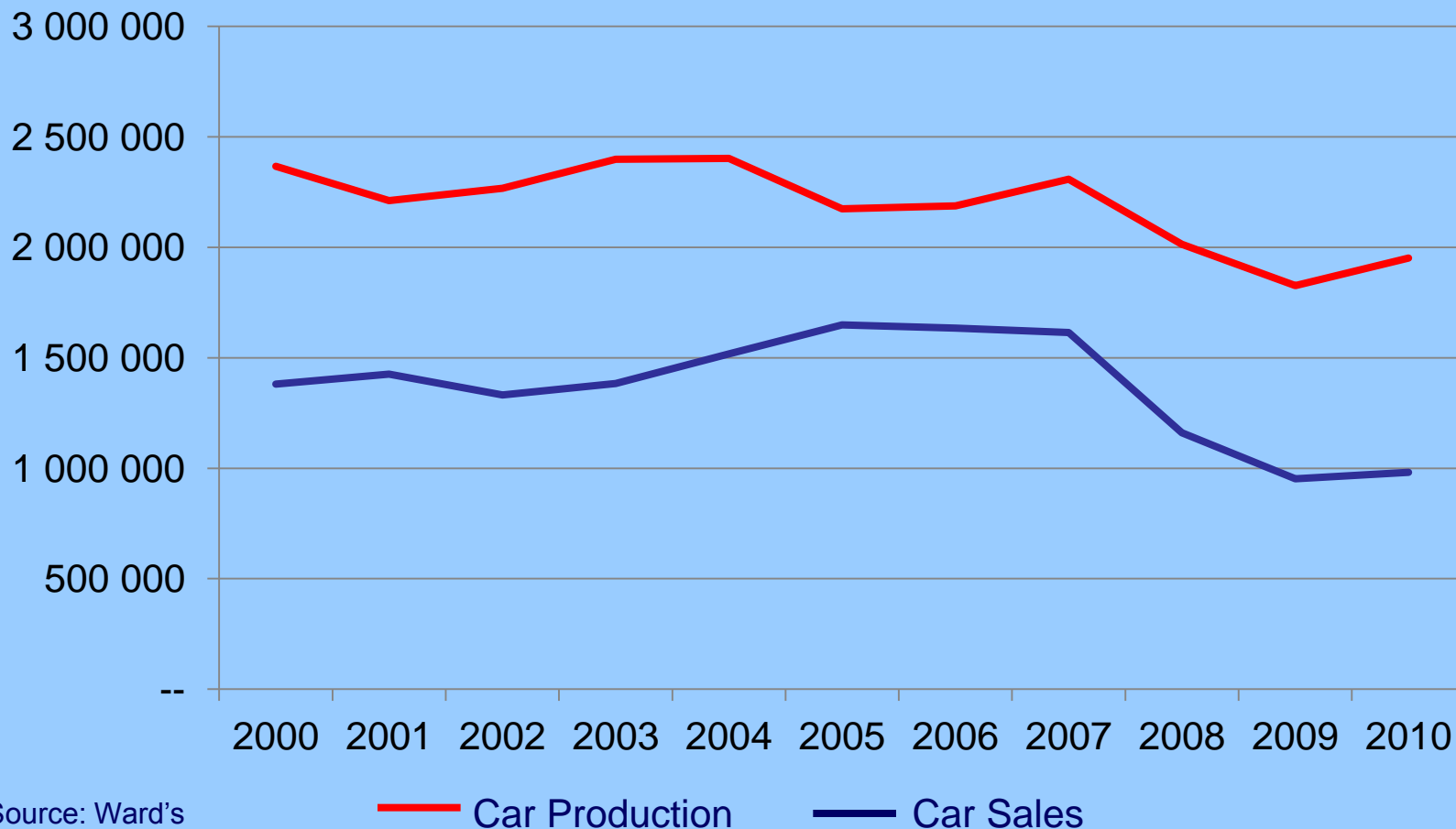




- Passenger car production in Spain ranks number 3 in the European Union: More than 80% of this production is exported to other EU Member States
- R&D activity is not high in the Spanish automotive industry, largely because most manufacturing activity is owned by multinational groups that carry out R&D activities elsewhere
- Transport sector in Spain is responsible for a majority of the CO₂ emissions

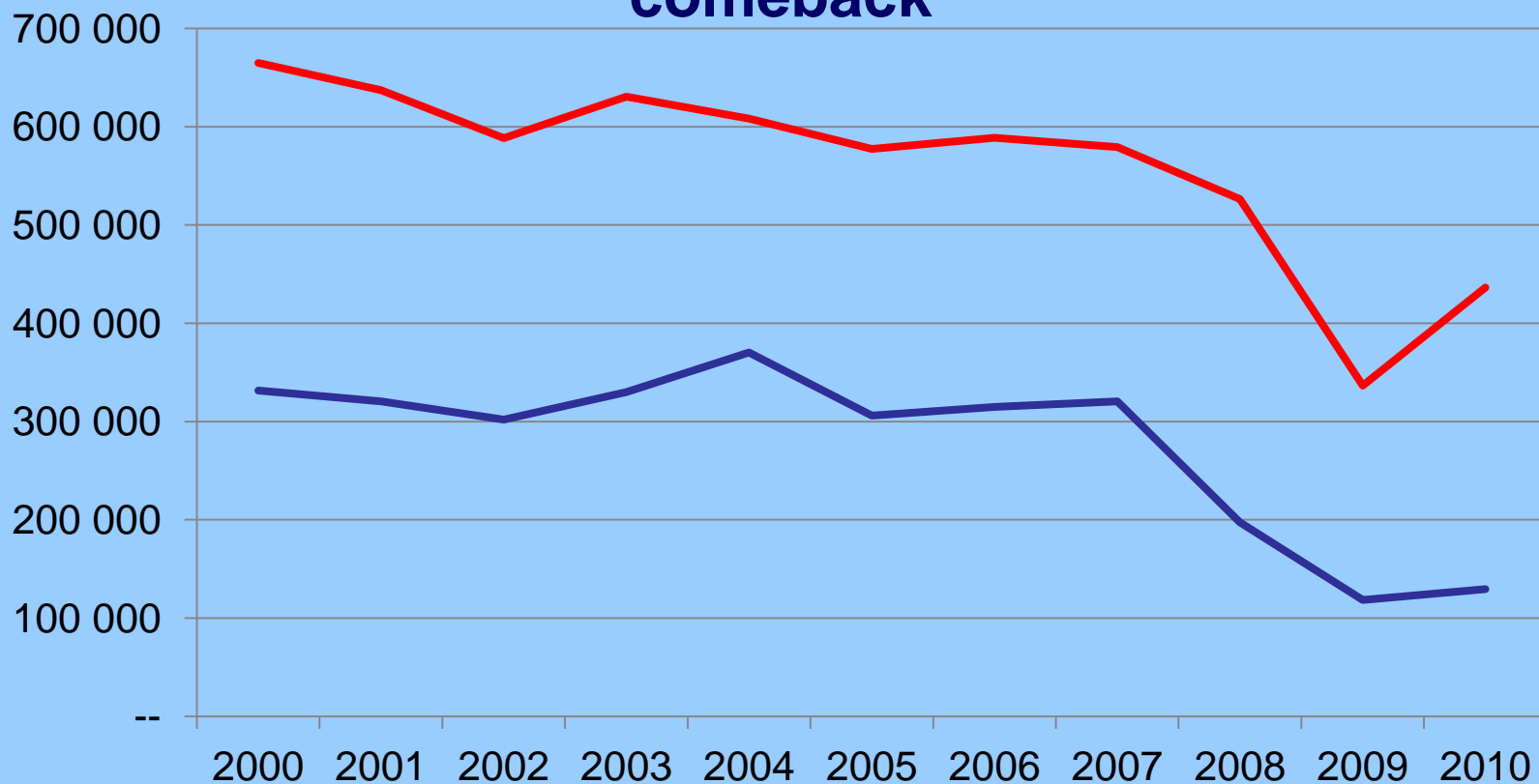


Passengers car production always mirrors the sales volumes





Truck production suffered a downturn in 2009 due to the economic environment but is making a comeback

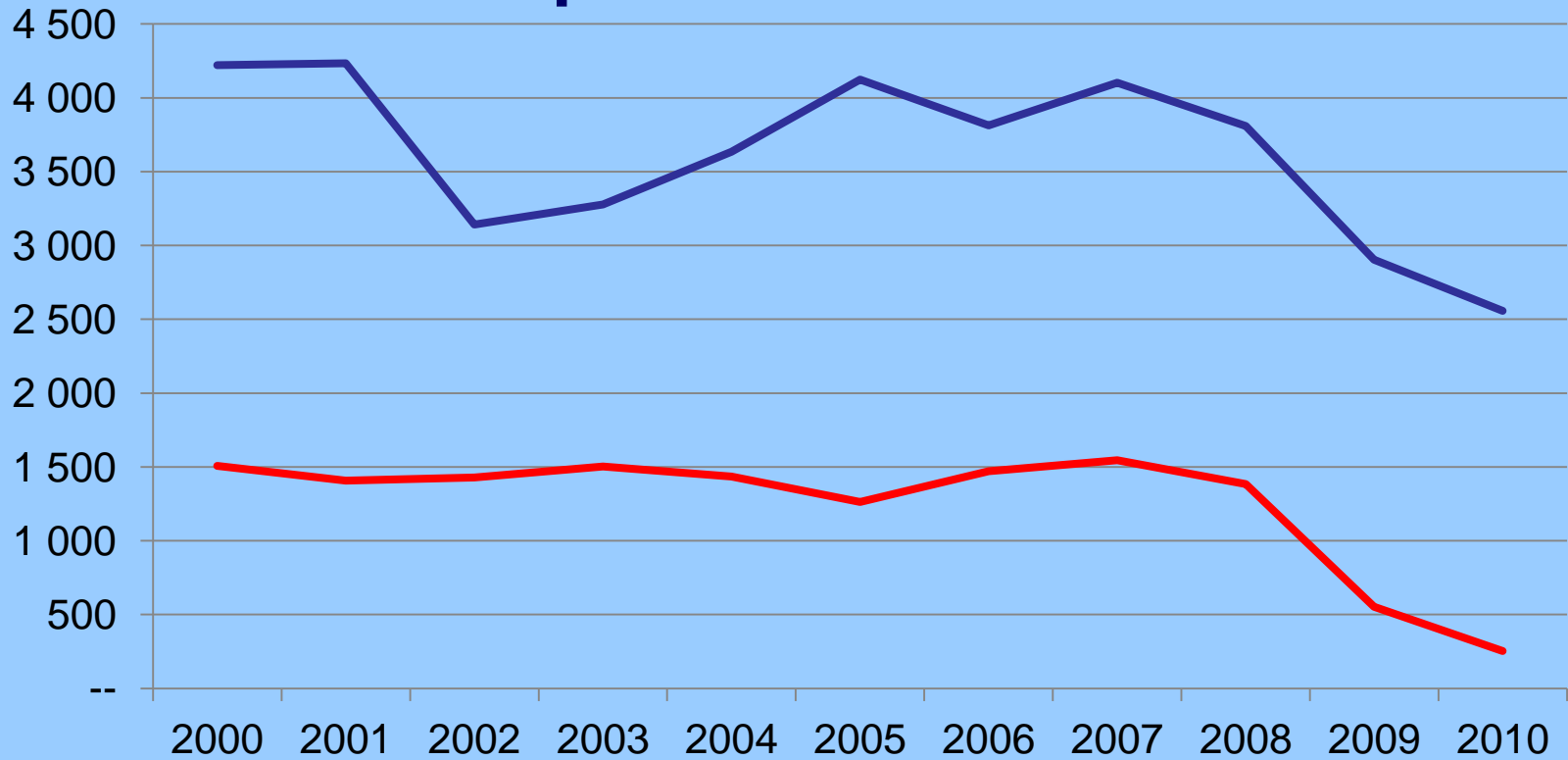


Source: Ward's

— Truck Production — Truck Sales



Due to the absence of a national OEM, bus production can't respond to the market demand and imported vehicles are the norm



Source: Ward's

— Bus Production

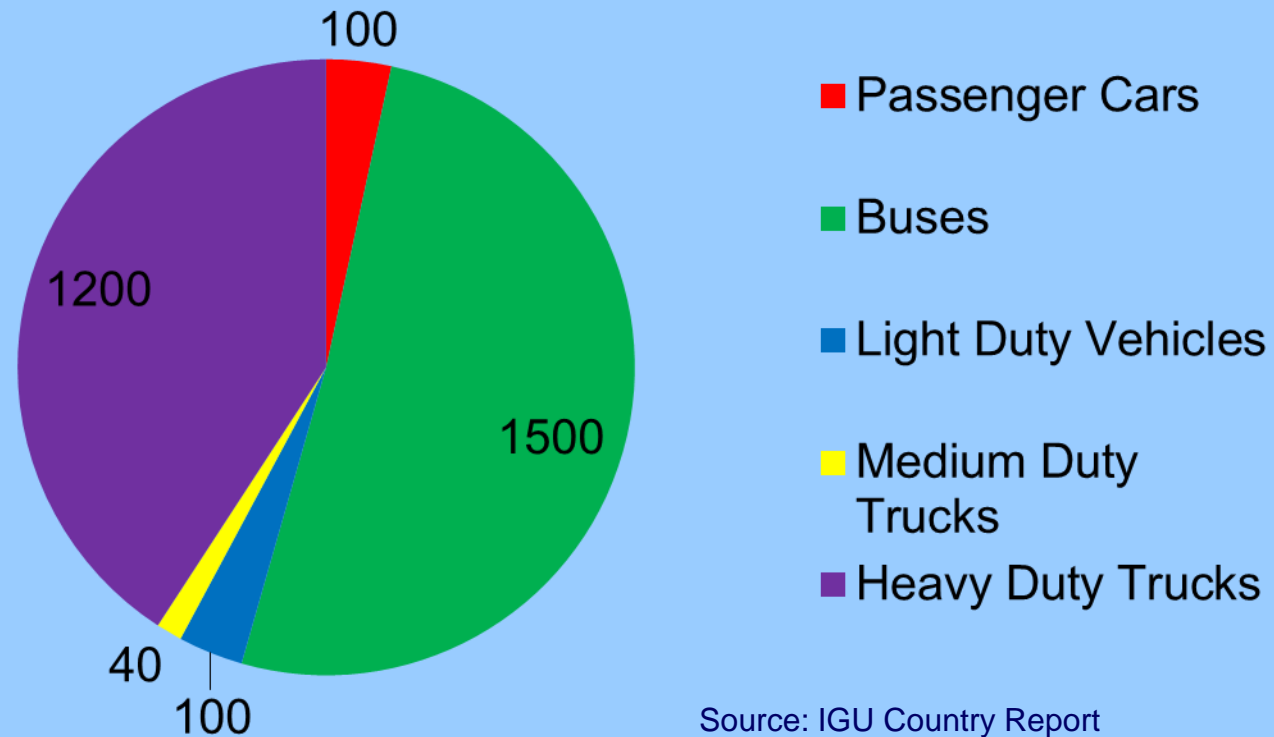
— Bus Sales

- Medium-term NGV developments in Spain are oriented towards potential users, such as big supermarket chains and parcel delivery companies, but also other large city fleets
- Gas Natural offers €1000 of free natural gas for taxi cabs

Source: NGVA Europe



Prior to 2006 only public transport was allowed to use natural gas. Since then, the largest growth has been with centrally fuelled commercial fleets, buses and urban waste trucks. LDV market for NGVs continues to be stifled



Source: IGU Country Report



A wide variety of passenger car NGV models are available but only imported from other countries.

Marca	Tipo
FIAT	Punto Biopower
	Punto Van natural Power
	Multipla Natural
OPEL	Astra Caravan 1.6 CNG
	Combo 1.6 Ecotec CNG TOUR
	Zafira 1.6 CNG
PEUGEOT	Partner bivalent
	PkW Prémium 75
VOLVO	S80
	S60
	S70
VW	Golf Variant
	Touran
FORD	Focus CNG (5-turer)
	Focus Turnier
CITROEN	C3 (2 plazas)
	C3 (5 plazas)
	Berlingo multiespace plus
MERCEDES	E 200 NGT

Source: Gas Natural, Una alternativa real para la mejora de la calidad del aire urbano, 2009



Spanish NGV market offers a good variety of commercial vehicles

Marca	Tipo
CITROËN	Jumper
	Berlingo
FIAT	Doblo Cargo Bipower
	Ducato Bipower / Natural Power
	Doblo Natural Power
FORD	FordTransit
IVECO	35 S11 G
	35 C11 G 3300/3950
	40 C11 G 3300/3950
	35 C11 G 3300/3950
OPEL	Combo 1.6 Ecotec CNG Cargo
PEUGEOT	Boxer LkW 330
	Boxer LkW 350
	LkW 190 C
MERCEDES	SPRINTER NTG KASTENWAGEN

Source: Gas Natural, Una alternativa real para la mejora de la calidad del aire urbano, 2009

CESPA (specialized in waste collection and cleaning) has 21 LNG vehicles working daily in Barcelona

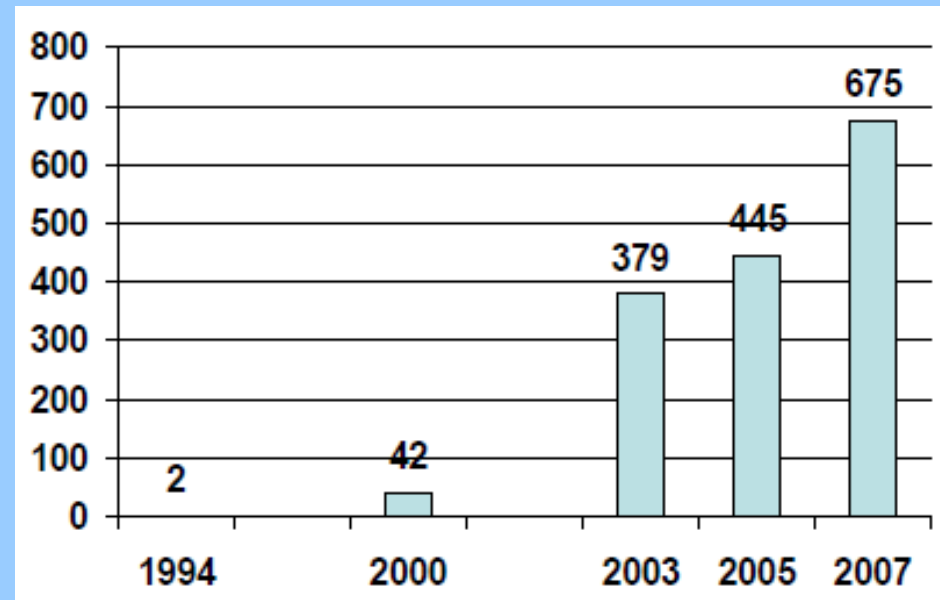
- 11 street cleaning vehicles, 3 roll-on roll-off trucks, 5 RCV's and 2 trucks for container cleaning
- Waste collection trucks begun in 1999 was the first experience in Spain
- A 59 m³ LNG fuelling station serves the vehicles



The City of Madrid is committed to bio-methane garbage trucks.



CNG refuse collection trucks in Madrid



Source: NGVA Europe, Bio-natural-gas for cleaner urban transport, March 2009



Many cities in Spain have started using CNG buses, saving about 30 million liters of diesel per year

City	Buses	Target	Fuelling Station ownership
Madrid	350	400	EMT Madrid
Barcelona	251	296	Gas Natural
Sevilla	136	190	Gas Natural
Valencia	70	70	Gas Natural/EMT Valencia
Salamanca	20	40	Gas Natural
Burgos	16	40	Gas Natural
Malaga	4	100	EMT SAM
TOTAL	847		

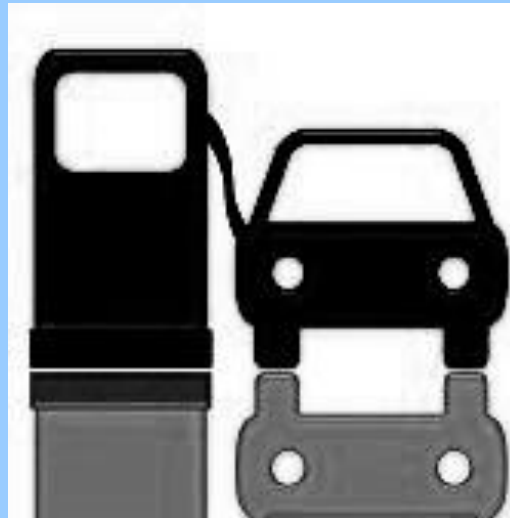
Source: Gas Natural, Una alternativa real para la mejora de la calidad del aire urbano, 2009



EMT, Public Transport in Madrid, aims to have 1.350 CNG buses by 2015

- EMT will invest €51 million to purchase 165 new natural gas buses in 2012
- 23 of these buses, for the first time, will be CNG/electric hybrid models
- EMT also will convert 16 existing diesel buses to hybrid operation under grants awarded by IDEA Electrobuses Project

Source: NGV Global, November 2010
NGVA Europe, February 2011





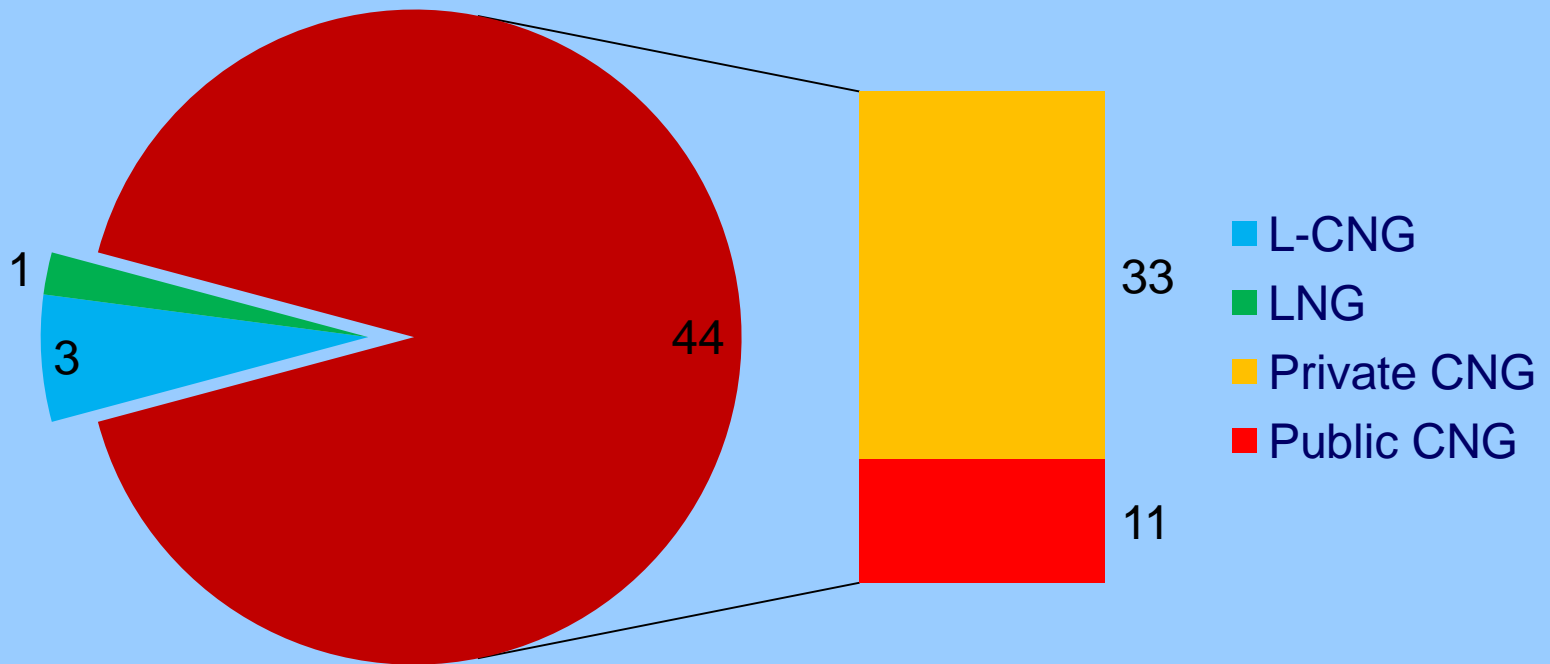
Only a handful cities have public CNG fuelling stations



Source: metanoauto.com



Because of the previous ban on natural gas passenger cars (prior to 2006) the public NGV fuelling station network remains undeveloped



Source: IGU Country Report, Spain 2010

Madrid inaugurated the biggest European NGV fuelling and maintenance station in November 2010

- 9 independent fuelling lines, with compressor capacities of 2.700 Nm³ each that can serve 180 buses per hour
- 9 wash facilities
- Mechaninc workshop
- Electric workshop
- Maintenance workshop



Source: NGVA Europe

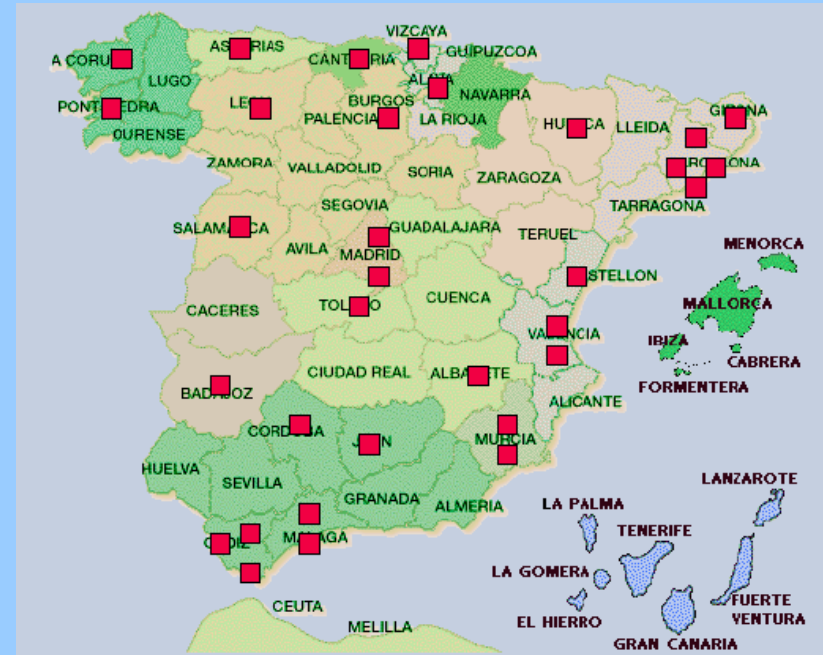


Repsol dominate LPG market with more than 80% of LPG stations in Spain

- Future investments planned by Repsol to enlarge their LPG network



Repsol LPG stations



Repsol next opening LPG stations

Source: Repsol, AutoGas El combustible alternativo limpio y económico de aplicación inmediata, October 2010



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



Existing ISO Standards are the models used in the Spanish NGV market

- Compressed Natural Gas Vehicles Operations (UNE-EN* 13423:2001)
- Natural gas - Natural gas for use as a compressed fuel for vehicles (UNE-EN ISO 15403:2008)
- Gas cylinders. High pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles (UNE-EN 11439:2001)
- Compressed natural gas filling stations (UNE 60631)

*UNE = "Una Norma Espanola"

Source: AENOR, Spanish Standards Institute



NTGS Code (Natural Gas Transmission System) requires odorization of natural gas

- Odorization is required for all forms of gas consumption, including for transport
- Level of concentration is required, while an environmental permit is not mandatory
- During the transport of natural gas continuous and periodic inspection is done

Source: Marcogaz

Spanish gas market is a highly transparent system that complies with the EU legislation

- Second Gas Directive (1003/55/EC) was transposed into Law 12/2007
- The Ministry of Industry, Tourism and Trade holds regulatory powers such as price-setting and carries out the infrastructure investment planning

Source: IEA, Energy Policies of IEA Countries: Spain 2009 review

Spain is not yet in compliance with European biogas requirements

- Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas requires non-discriminatory access and non-discriminatory tariffs for biogas injection into the natural gas grid



IDEA, Ministry of Energy is working with Gaz Natural and regions. In every region/state, each has their own policy

Main incentives used in Valencia, Cataluña, Madrid:

- LDVs : Acquisition of NGVs with CO₂ emissions lower than 140 gCO₂/Km: public support of up to 15% of market price with a maximum of €1,200
- HDVs: Acquisition of NGVs, with no limit of CO₂ emissions: public support of up to 15% of market prize with a maximum of €12,000
- Natural gas as vehicle fuel has lower tax: 0.4140 eurocents / kWh (6.5 times lower than diesel)

Source: Gas Natural, Una alternativa real para la mejora de la calidad del aire urbano, 2009

E4 Strategy (Development and Efficiency) of 28/2/06 allows a contribution for the construction of filling stations

- Support up to 30% of investment with a maximum of €60,000 for public-use fuel stations
- Support up to 30% of investment with a maximum of €30,000 for individual stations (private/restricted use)

Source: Gas Natural, Una alternativa real para la mejora de la calidad del aire urbano, 2009

No excise tax on CNG and reduction on registration tax are the two measures coming from the national government

- There is an excise tax of €0.36/litre on gasoline and €0.33/litre for diesel. Natural gas is exempt from excise tax
- The registration tax on the net car price is based on CO₂ emission. Rates are:
 - 0% up to 120 g/km CO₂ emission
 - 4.75% between 121 g/km and 160 g/km CO₂ emission
 - 9.75% between 161 g/km and 199 g/km CO₂ emission
 - 14.75% equal and higher 200 g/km CO₂ emission

Source: Cleanvehicles.eu

Strong support for NGVs is coming from municipalities

- Main municipalities require vehicles purchased for urban freight to be powered by CNG
- NGVs allowed to enter and park in areas that are usually designated as car-free
- Permission for all NGVs to park in zones reserved for loading
- CNG fuelled taxis to get priority at strategic locations such as train stations and airports
- NGVs may use bus lanes
- Barcelona gives a 25% reduction on the road tax for NGVs, hybrids and hydrogen fuelled vehicles

Starting from 2011 commercial vehicles running on CNG can park in Madrid with a discount

- They pay only €272/year for the “orange card” to park in certain authorized areas of Madrid, compared to normal vehicles that must pay €362/year
- The measure, approved unanimously by the three municipal groups at the City Council, is part of an amendment to the Regulating Ordinance of the parking rate

Source: NGV Journal, Natural gas vehicles will park with discount, December 2010

Spain supports the use of renewable energy in transport by a “carrot and stick” approach: fiscal incentives and supply obligations

- Since 2002 liquid biofuels have benefited from a specific zero tax rate introduced by the Fiscal, Administrative and Social Measures Act 53/2002
- Fuel suppliers had to ensure that 5.83% of their fuel sales to the transport sector come from renewable energy source in 2010

Source: IEA, Energy Policies of IEA Countries: Spain 2009 review

Due to high CO2 emissions the Government has recently set a target of one million hybrid and electric cars by 2014

- With the integrated strategy promoting electric mobility ("Estrategia Integral para el Impulso del Vehículo Eléctrico") from April 2010 and the related action plan ("Plan de Acción") from November 2010 the Spanish government has defined its priority for the electric mobility in the near future

Source: Cleanvehicles.eu





Gas Natural Fenosa is leader supporting NGV market

- GNF working with Carrefour supermarkets to install CNG dispensers
- General Motors and GNF work together to promote NGVs to car rental companies, private business and public transport fleets
- GNF is providing €1000 of free natural gas for taxi cabs to spur their use of NGVs
- Also GNF is considering subsidizing some of the cost of new vehicles for certain customers





**Main barrier is the chicken eggs problem:
without a critical mass of NGV the gas
companies are not investing in CNG, LNG or
L-CNG infrastructures**

- Market is so small that neither Repsol nor *Gas Natural* are willing to commit to a large investment in building the public fuelling infrastructure
- The high cost of CNG station installation is a disadvantage for the NGV gas industry business case until more vehicles are on the roads





Procedures for setting up a business have been streamlined, with the number of licensing requirements reduced

- A myriad of non-tariff barriers increase the cost of trade
- Nearly all sectors are open to foreign investment and approval procedures have been streamlined

Source: The Heritage Foundation, 2011 Index of economic freedom





- “Gas companies are having trouble locating good places to install stations. The downtown petrol stations also don’t have enough space”
- “They are trying to look at very small stations with just a dispenser located on the street (like a bus stop concept), but they are fighting with City Hall over these types of solutions”

Stakeholder at Gas Natural



“The national government support is not very clear. But the government generally is supporting alternative fuels but not any one specifically”

Gas Natural

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

Energy Environment

- As an important energy source in Spain, natural gas could have a good opportunity for growth in the transport sector
- Spain is the largest European importer of LNG and with investments in infrastructures Spain could introduce LNG and also use L-CNG to develop an NGV market
- At this time the biogas market and infrastructure mechanisms (also for feed-in) are insignificant but could be a factor in the longer term energy mix

Gas Industry Support

- At this moment the market is too small to stimulate investments, but the gas companies are going to try and open the market through various cooperative mechanisms with different commercial stakeholders
- Natural Gas Fenosa is supporting NGVs with financial support to help certain customers such as taxi drivers purchase new NGVs

Government Support

- Municipalities will play a distinct role in NGV market development and could help motivate the national government to support the NGV market
- Fiscal incentives, parking incentives and low CO2 incentives provide encouraging motives for NGV use **BUT...**
- Government is more focused on electric mobility but new developments by government for alternative fuels generally are positive and long term NGV market growth could benefit



NGV Market Development

- With only 55 vehicles per fueling station the critical mass is lacking to make the fueling infrastructure economical in the short term
- Public and private fleets are fundamental to developing the fuel infrastructure network
- Developing L-CNG fuelling stations in cities where a critical mass of heavy and light duty vehicles (including taxis) can be created would help motivate and build the national NGV market
- LPG is well established in Spain and is aggressively promoted by the oil companies and a well organized lobby



Legal and regulatory framework for CNG station development

- Spain has clear and transparent regulation in line with ISO standards both for fuelling stations and NGVs

Investment Environment

- Open economy that allows foreign investment in all sectors without any restriction or substantial barriers

SPAIN

(January 2012)

