



Aftermarket conversion for an increased choice of gas vehicles

Claudio A. Córdova Jara
Stockholm, 11th March 2009

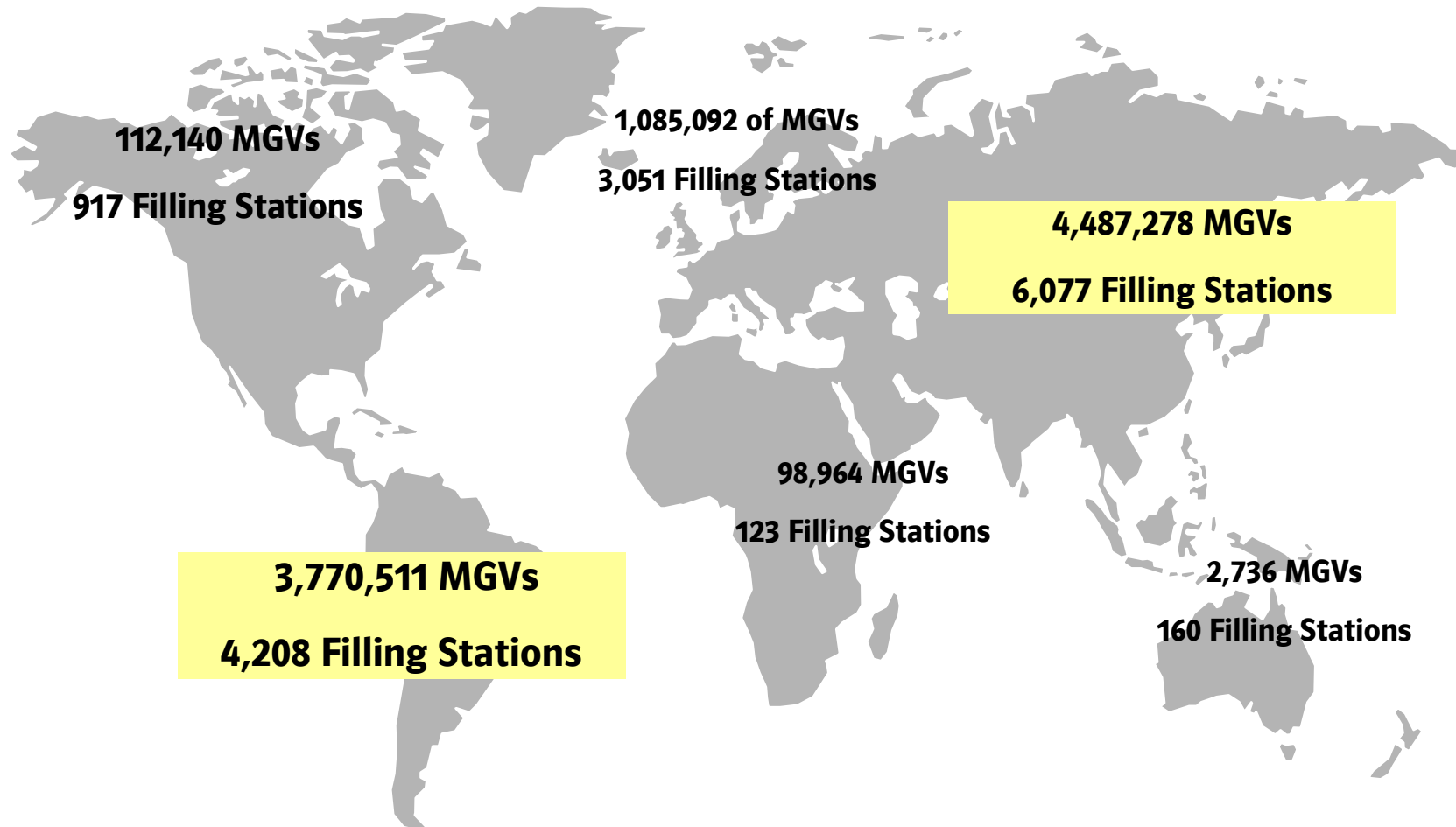
Questions to be answered

1. How World Wide MGVs (Methane Gas Vehicles) Market has been developed so far?
2. What can we expect for Swedish market in the long term?
3. How could be increased the number of MGVs in Sweden?

MGVs in the World

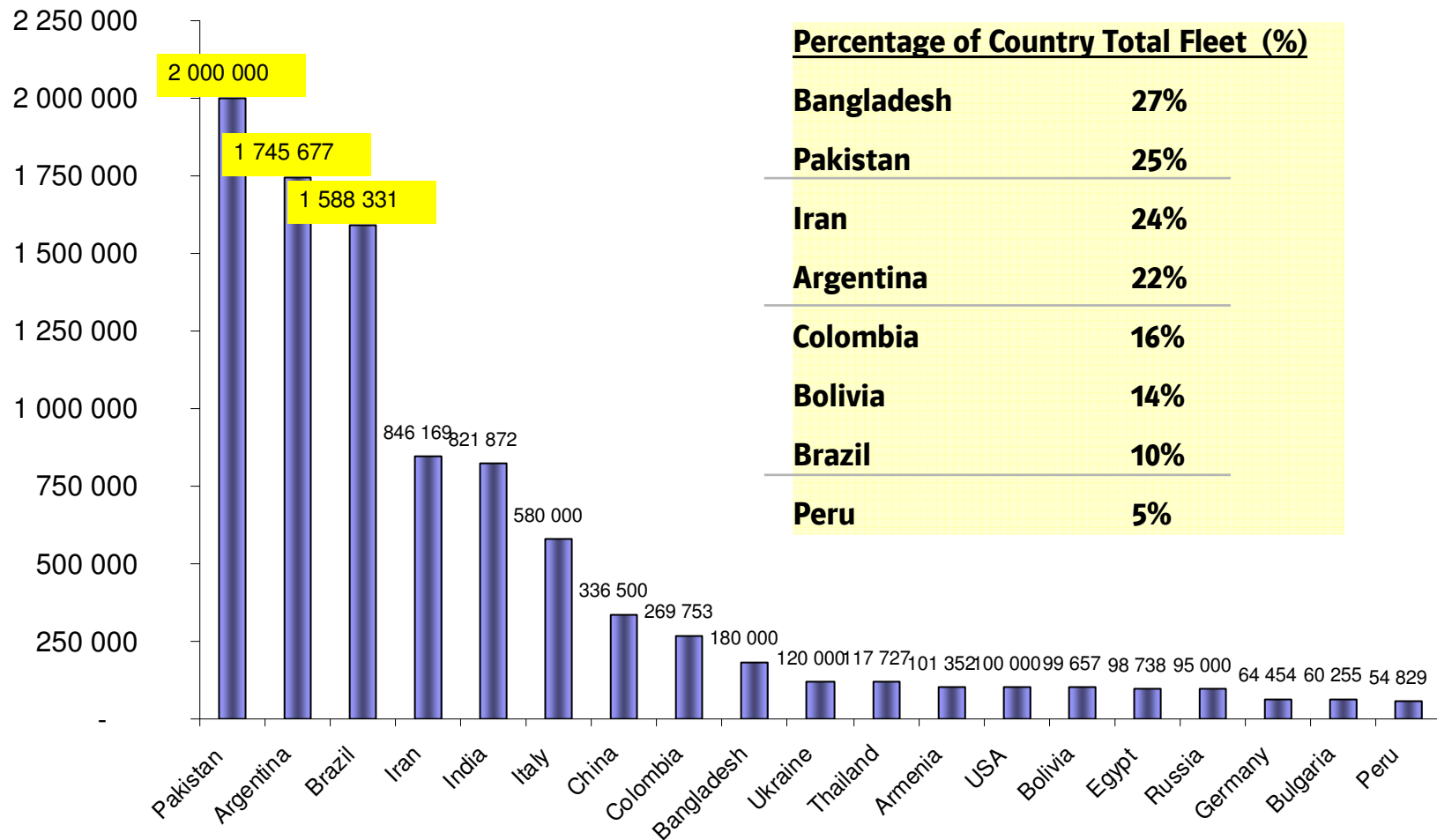
Total 9,563,274 MGVs

Total 14,550 Filling Stations





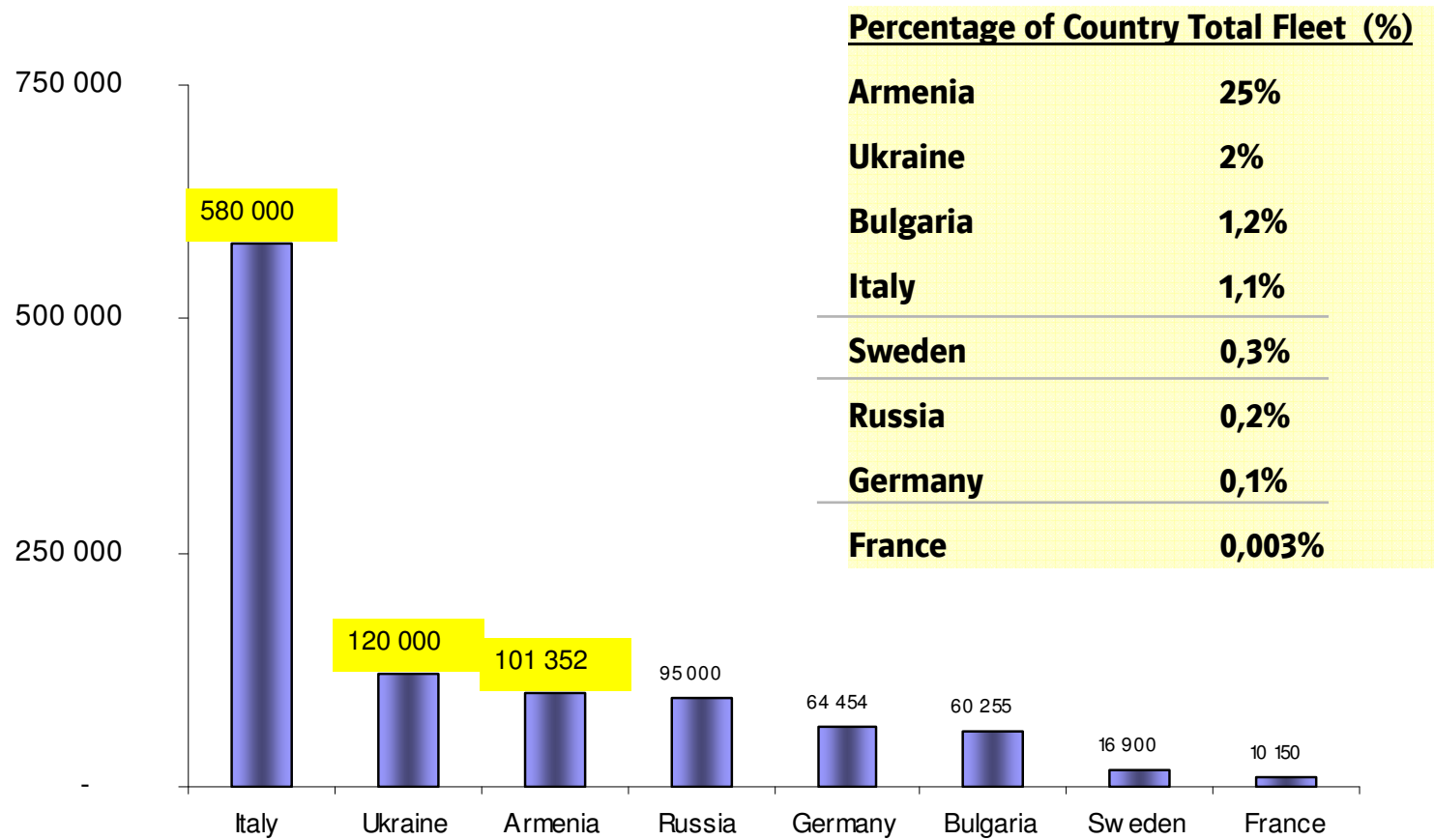
World – Largest MGVs fleets



•Include MGVs fleets > 50.000 vehicles

Source: The Gas Vehicle Report, IANGV

Europe – Largest MGVs fleets

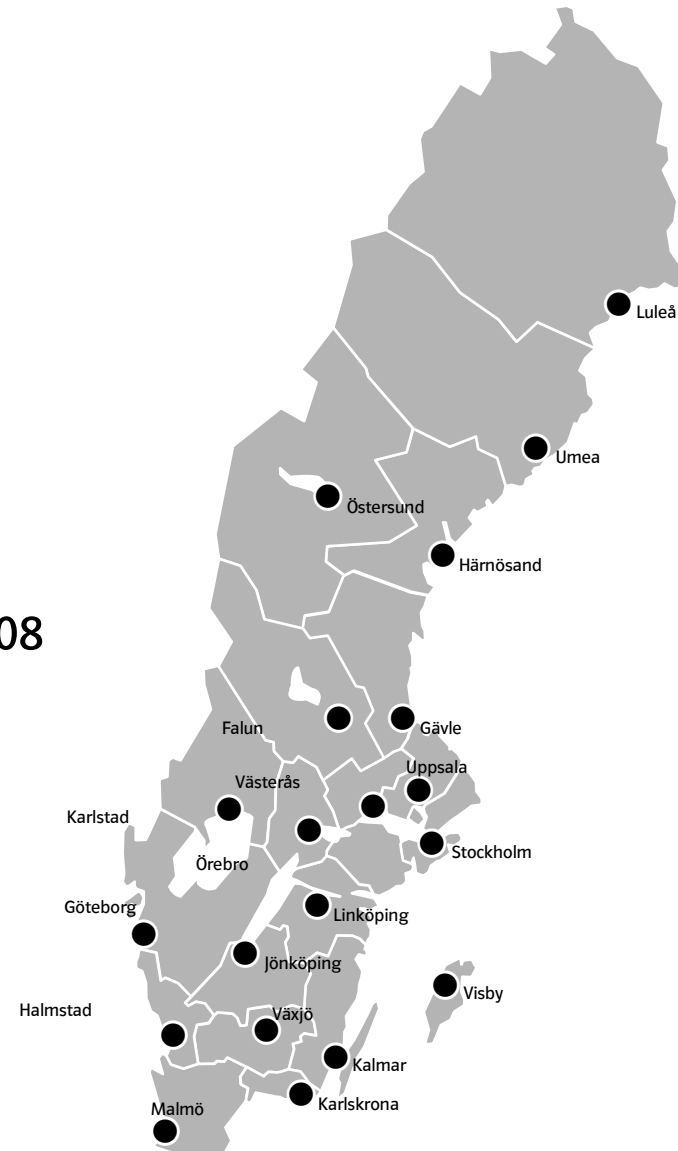


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Swedish Market

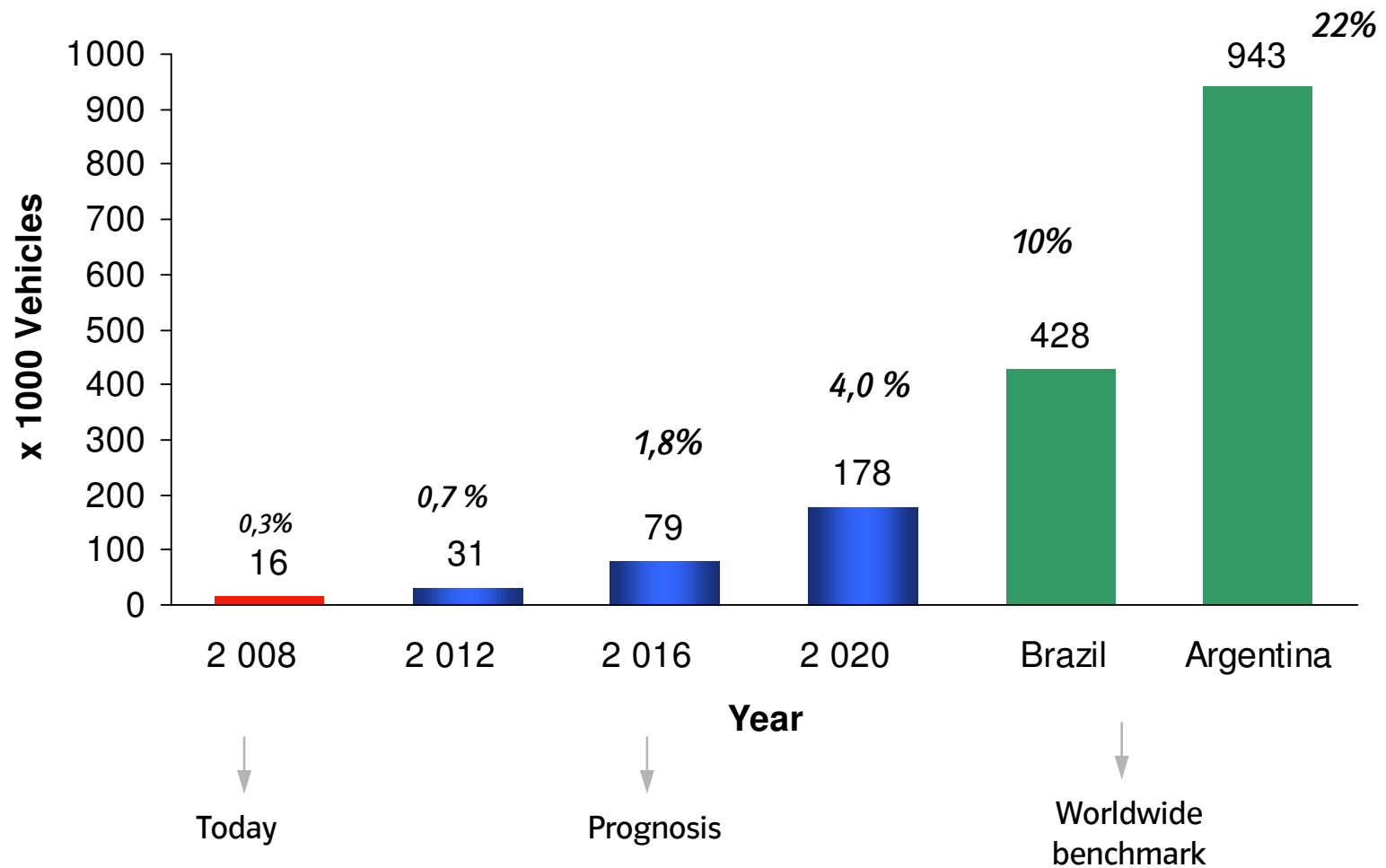
- Facts:
 - 4.284.803 personal cars (Dec-08)
 - 16.000 personal MGVs – (0,3%)
 - 1.316 new personal gas cars were sold in 2008



*OEM = Original Equipment Manufacturer

Scenarios

How can we increase the number of MGVs?



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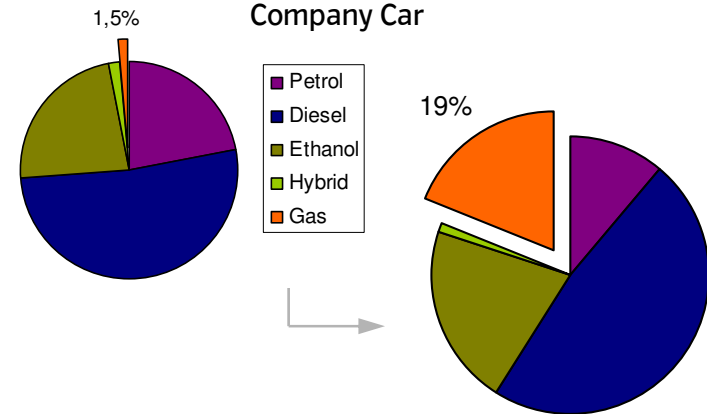
Alternatives to produce MGVs:

- OEM
- A-OEM
- Conversion

OEM = Original Equipment Manufacturer (New 0 Km)



January 08 - 09
Company Car



Source ALD Automotive

A-OEM = Alternative OEM (New 0 Km)

EUROGAS OMEGAS
SYSTEM

The Eurogas Omegas System is a sequential **Common Rail** injection system which injects the gas under pressure into the inlet manifold. The system has been developed specifically for modern Euro 4 engines and is fully EOBD compliant.

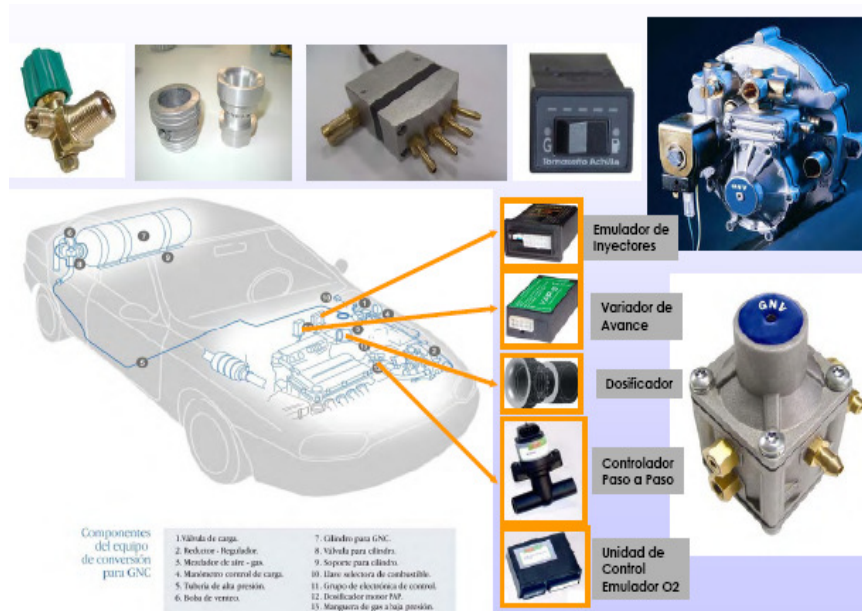
Power, driveability, reliability and emissions are guaranteed by the sophisticated master-slave strategy. Due to these excellence behaviour the system has been homologated by several car importers and is available for a large range of vehicle types.

Besides the fully dedicated kits also universal kits are available in order to develop easily to the local market demands.



- Example: Dutch gas systems manufacturer EUROGAS (Landi Renzo – Italy)
- Gas injection system
- European Type-approval according EN-ECE R115 (-40C for Sweden)
- To achieve EURO standards
- Current operation with Renault The Netherlands

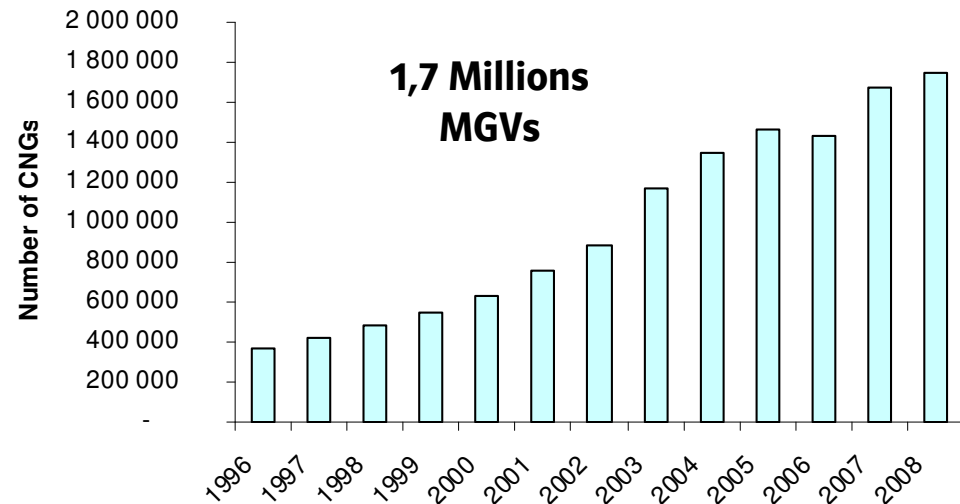
Conversion (under use vehicles)



- Approved conversion systems
- Approved workshops
- Periodical control (Annual/6 months)
- Price/ Environment
- Controlled supply chain
- Massive market – South America

Argentina

- 1,7 Millions MGVs
- 1,800 Gas stations
- 1st CNG Station 1983 YPF – 300 taxis converted
- Main MGVs driver : Price (64% less Petrol, 53% Diesel)
- PECs – local industry of CNG system



Chevrolet Corsa GNC 2003 – Tomasetto Achille (A-OEM)

Argentina export project

Complete CNG Systems



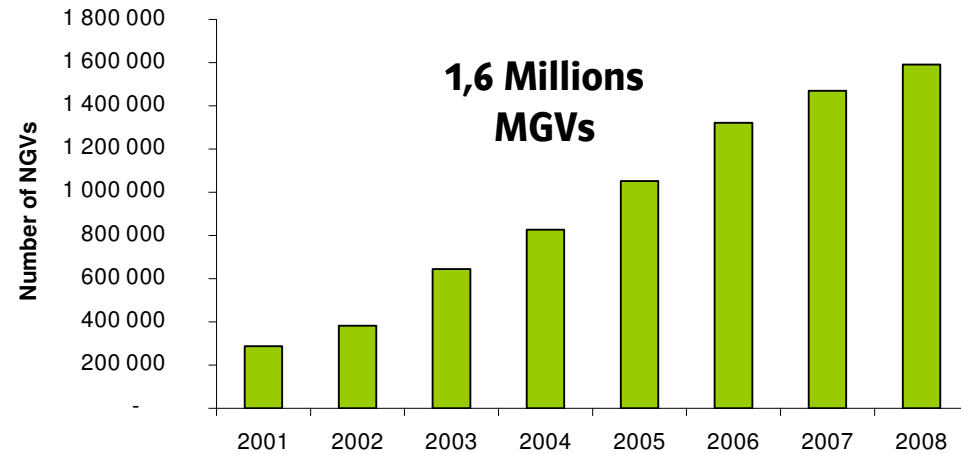
Compressors



- Exporting local CNG technology and know how
- To Southamerica, Europe, Asia
- A massive MGCV market has created a new Industry (Jobs)

Brazil

- 1,6 Millions MGVs
- 1688 F. Stations
- 643 CNG workshops
- Drivers: Price (46% less Petrol, 25% Diesel)
- Environmental Standards
- 2 OEMs vehicles



Fiat Siena 1.0 CNG



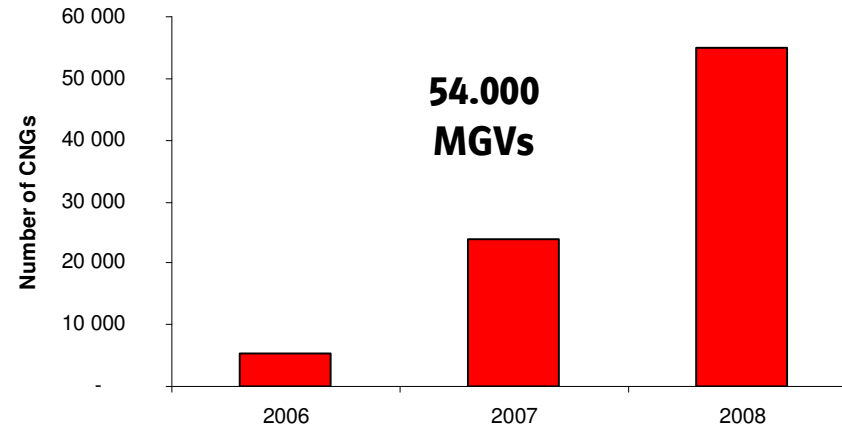
Ford Ranger CNG



LNG Project

Peru

- 54.000 MGVs, 56 F. Stations
- 134 workshops
- Integrated IT system (Control over Supply Chain)
- Recently launched Nissan V16 CNG



Plataforma Financiera Al servicio de talleres

¡USE GAS NATURAL Y AHORRE!

Convierte tu auto a GAS NATURAL VEHICULAR. Financiamiento al 100%

Adquiere un NISSAN - SENTRA cero kms. convertido a GNV con sólo S/. 9,000 de cuota inicial y paga el saldo con el ahorro que obtienes del consumo de gas

(Incluye Seguro de Vida, Fondo de Jubilación SOAT, Seguro Médico, Seguro Vehicular para autos nuevos y Seguro del Equipo para vehículos convertidos)

ACN INGENIEROS
GAS NATURAL VEHICULAR

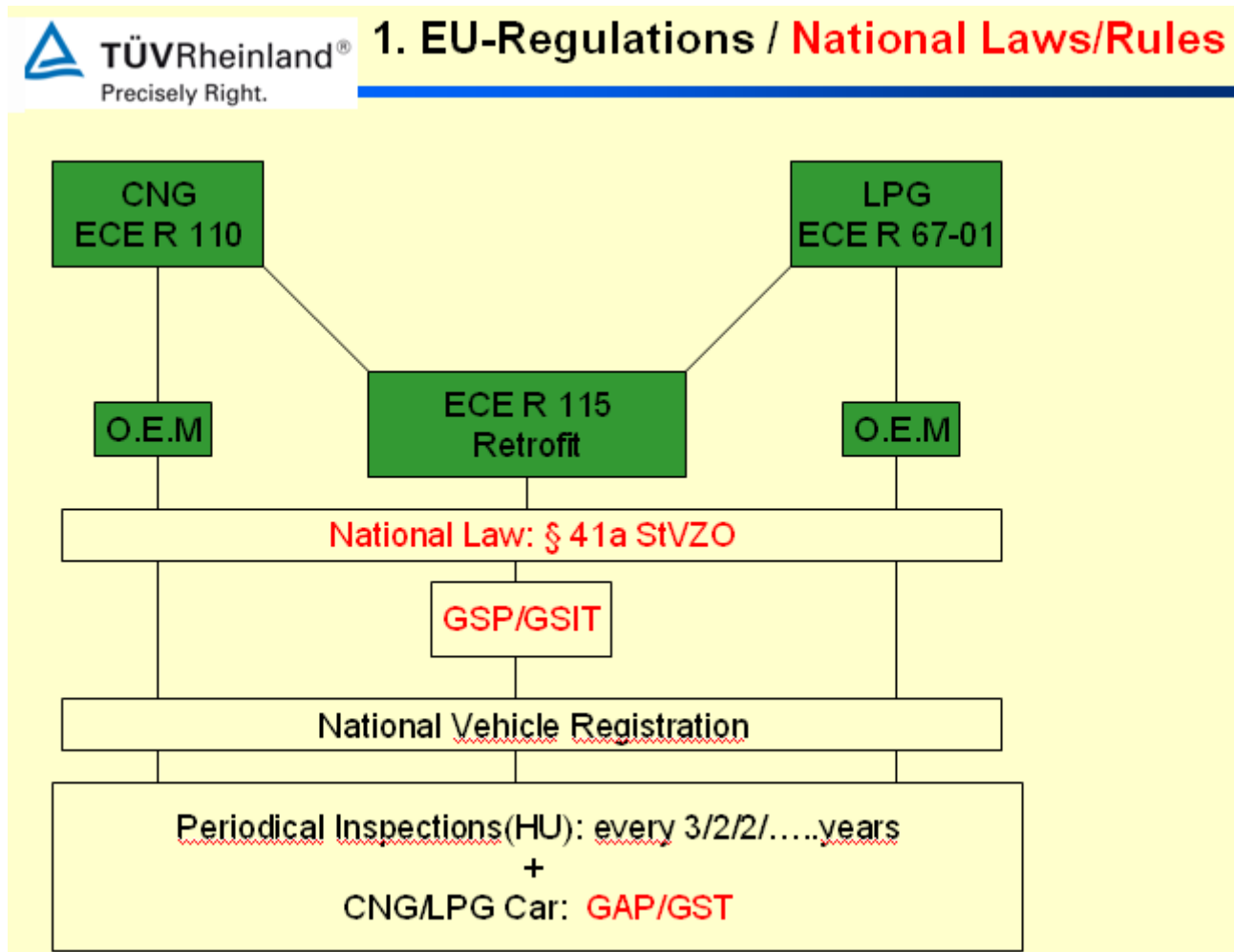
TAXI NUEVO A GAS NATURAL

NISSAN SENTRA "0 km." 2007, 1600 CC, 16 Válvulas
El Saldo se paga con su carga de gas

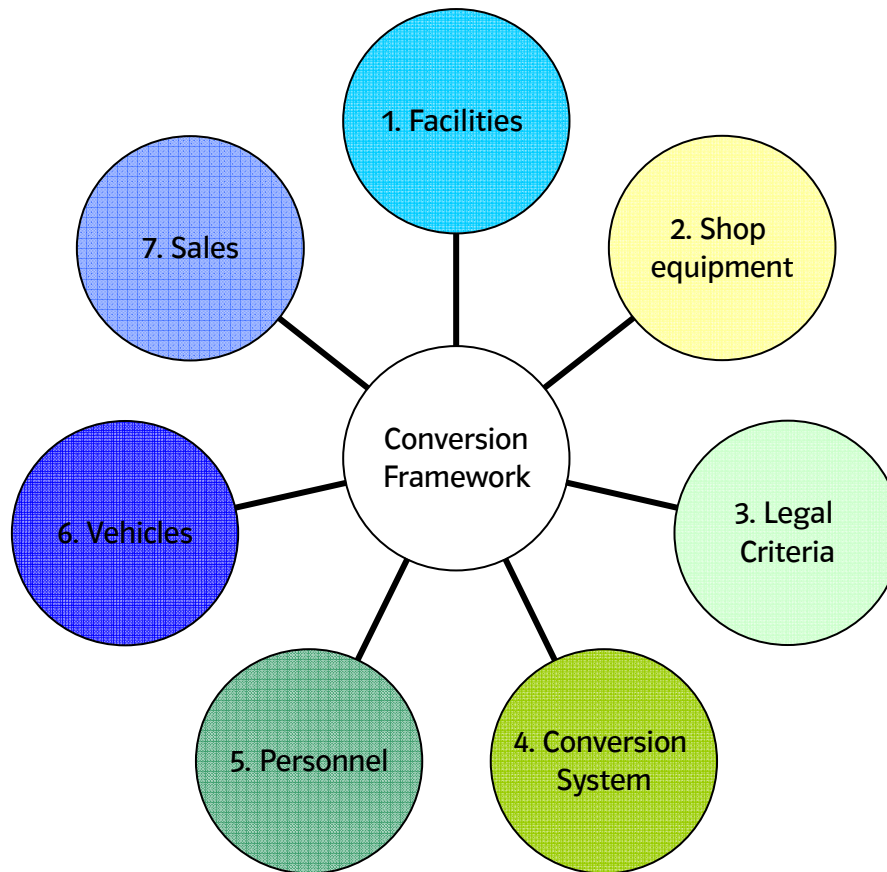
Inicial S/. 9,000

Nissan Sentra V16

German CNG/LPG Framework

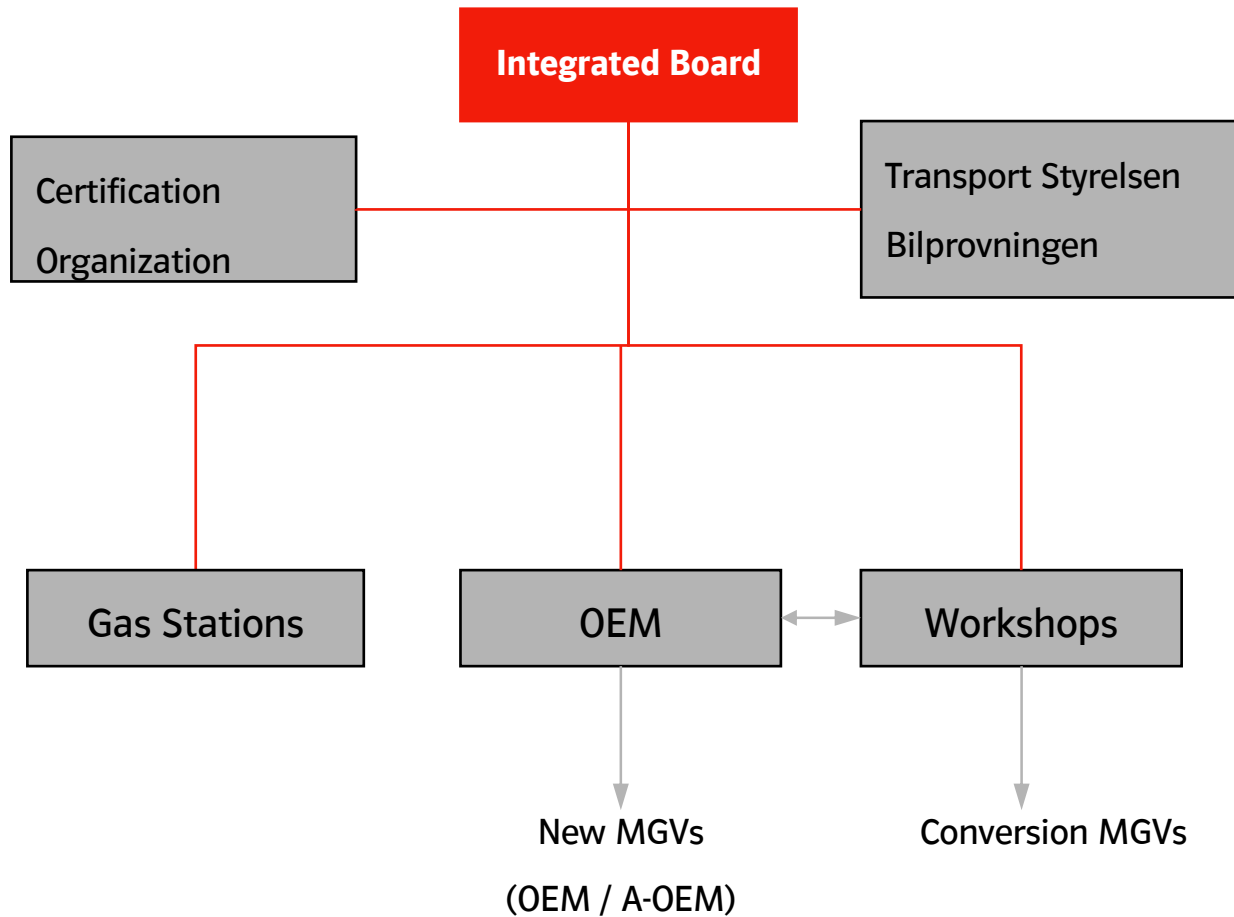


7 Elements of Framework



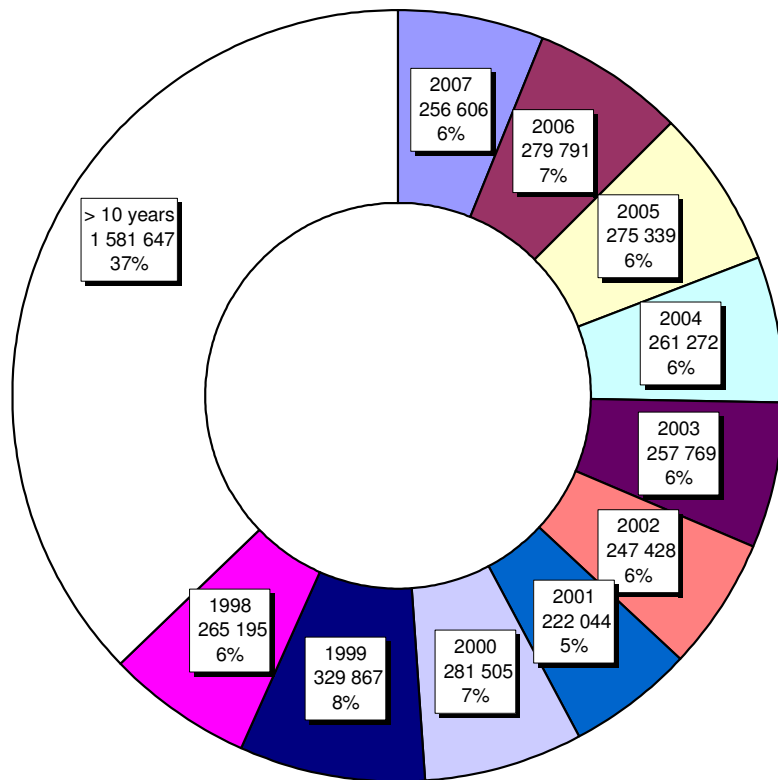
- Centralized administration
- Quality of conversions
- Consumer Protection
- Enforcement of Environmental Criteria
- Organization of Converters

Stakeholders that can collaborate within Framework



How many vehicles can be converted?

Swedish Personal Car Distribution 2007



- 37% are over 10 years old
- 31% are under 5 years old
- 36% (1,5 Millions) were built between 2000-2005:
- Conversion prognosis:
 - 1% (15.000); -67 KTonCO₂^{*}/year
 - 5% (77.000); -335 KTon CO₂^{*}/year
 - 10% (155.000); -669 KTon CO₂^{*}/year

Graph information's source: European Motor Vehicle Parc 2007 - ACEA

*CO₂ factors according LCA, Biogas-Petrol - Grönabilister



Proposal:

- To **integrate** gas vehicles sources within a **Framework**
 - OEM, A-OEM, Conversion
- Focus on : **safety/environment**
- To get involve MGVs users (To match **offer & demand**)
- Take **Good Practices** from worldwide MGVs industry

e-on

Tack så mycket!

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