Joint World NGV Report by UN ECE / IGU: Strategic trends for Sustainable Development

Methane– Transportation Fuel of the XXI Century

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Contributions to IGU Final Report

61 Expert from
52 Companies
24 Countries
Contributed to IGU
Final Report

Structure of the IGU Final Report

- ACKNOWLEDGEMENTS
- INTRODUCTION
- EXECUTIVE SUMMARY
- MARKET PROFILE: WORLD, CONTINENTS, COUNTRIES
- MINIMUM REFUELLING INFRASTRUCTURE NEEDS FOR EUROPE
- EU EMISSIONS POLICIES AND ITS IMPACT ON THE EUROPEAN NGV MARKET
- FUELLING OF LNG/L-CNG VEHICLES
- SYNERGY OF BIOMETHANE AND NATURAL GAS
- NATURAL GAS BLENDS TECHNOLOGY GAS–HYDRO

Structure of the IGU Final Report

- FROM CONCEPT TO REALITY: SMART TRANSITION TO CLEAN ALTERNATIVE FUELS
- PROMISING NGV RELATED TECHNOLOGIES TO ENHANCE EFFICIENCY AND SAFETY
- RFID SAFETY SYSTEM
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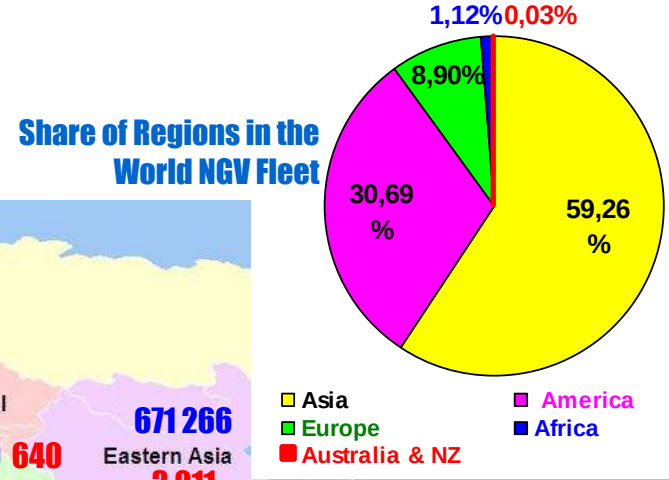
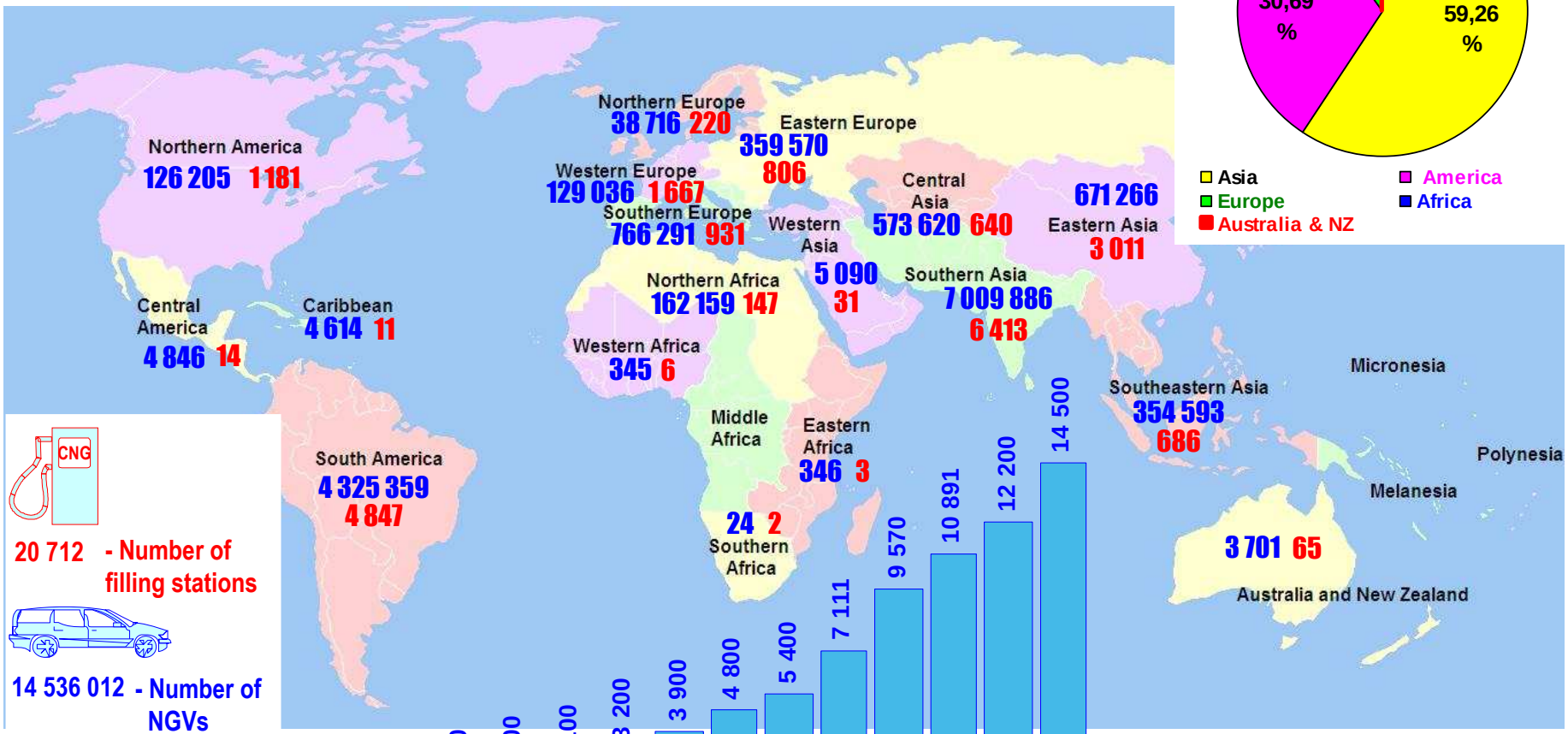
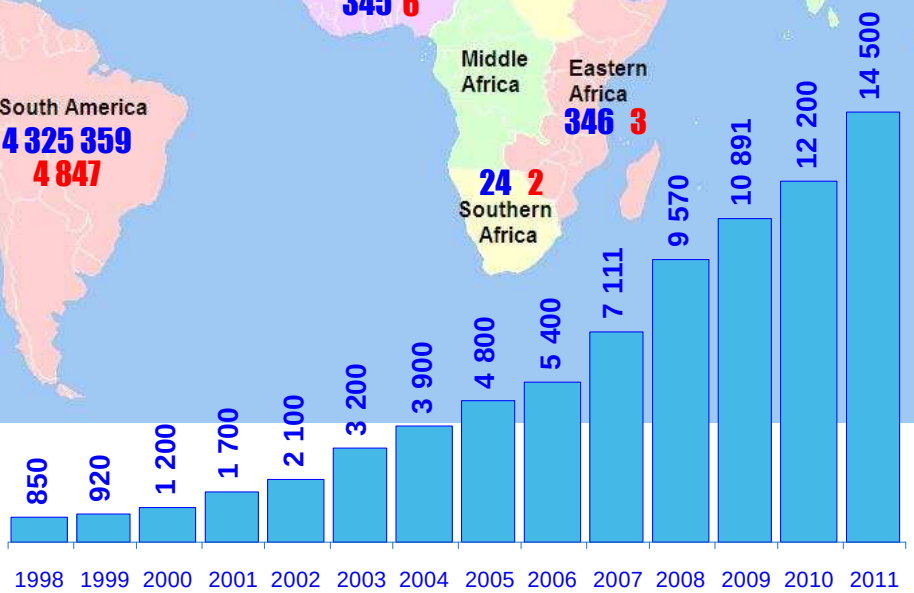
World NGV Market





20 712 - Number of filling stations

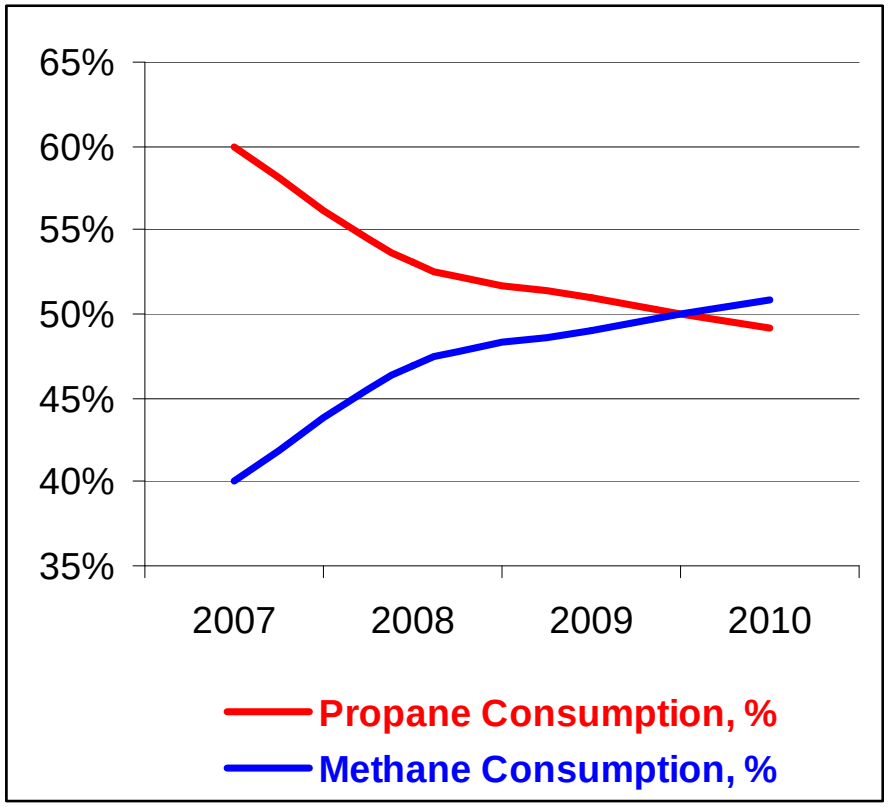
14 536 012 - Number of NGVs



World NGV Fleet, 1 * 1000

Sources: IGU, GVR, NGVRUS

World NGV Market

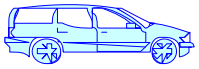


LPG accounted for 60% of the oil fuel alternatives, whereas natural gas (and biomethane) made up 40% in the sector of gaseous alternatives to diesel and gasoline. The share of LPG keeps shrinking while that of Natural gas / Biomethane is growing.

Sources: Petroleum Economist, World LPG Association, IGU, GVR, NGVRUS

Europe

4 000 - Number of filling stations
(5 400 – UNECE Region)



1 559 000 - Number of NGVs
(2 000 000 – UNECE Region)

Factors to Boost NGV Market:

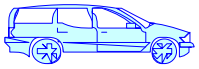
- CO2 emissions reduction strategy.
- Methane is also part of the EU strategy of Future Transport Fuels.
- LNG and CNG Blue Corridors.
- Cooperation between NGV OEMs, fuel suppliers/distributors and fleet operators.
- Development of LNG infrastructure market for medium and long distance MD and HD NGVs.
- Steady growth and expansion of NGV industry.

Northern America

Factors to Boost NGV Market:

- New supplies of shale gas.
- Oil-supply vulnerability.
- Environmental imperatives.
- Major advances in NGV technologies.
- Supportive policy measures.
- Positive response from major private and government fleet operators.
- Expanding trucking corridors and urban fleets.

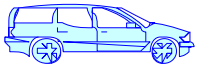
1 181 - Number of filling stations



126 205 - Number of NGVs

Central & Southern America

4 872 - Number of filling stations

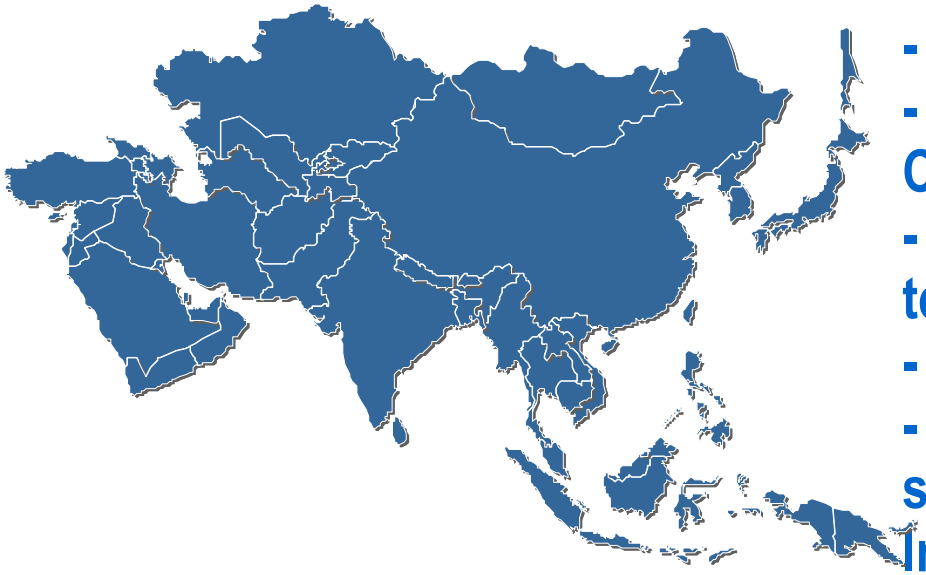


4 334 819 - Number of NGVs

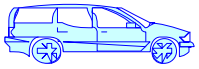
Factors to Boost NGV Market:

- Governmental policies.
- Support of major stakeholders.
- Promotion programs:
  - Financial support for conversions (Bolivia).
  - Required percentage of NGVs (Venezuela).
  - Municipal politics (Argentina, Brazil).
  - Developed conversion industry.

Asia



10 781 - Number of filling stations



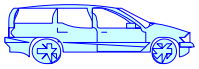
8 614 455 - Number of NGVs

Factors to Boost NGV Market:

- Plentiful investment (China).
- Decarbonisation of economics (Japan, China, South Korea).
- CNG, LNG, Biomethane among chosen technologies.
- Gas network expansion (India).
- Government strategies towards sustainability and self-sufficiency (Iran, India, Kazakhstan, Pakistan, Thailand, Uzbekistan).
- Local production of NGV models and related components.
- World Bank, U.S DOE, EBRD, UNDP support.

Africa

158 - Number of filling stations



162 874 - Number of NGVs

Factors to Boost NGV Market:

Demonstration project were success.

Governmental support and promotion policies (Egypt, Algeria).

Trend to utilize domestic natural gas and reduce oil (products) import (Mozambique, Tanzania, Nigeria).

Availability of national resources of natural gas.

Availability of affordable conversion technologies.

Strategy to reduce emissions and oil dependence.

Synergy of Alternatives

LPG

Fuel Cell

GTL

Hydrogen

Other

E-Gas

Marketing Fuel Alternatives

Alternative natural gases penetrate market: biomethane, shale gas, coal-bed methane, and e-gas.

Methane (natural gas and biomethane) will remain premium commercial fuel alternative.

CH4 synergy with hybrid, hydrogen fuel cell, and micro-turbine technologies.

Heavy Duty NGV Trends

Dedicated and/or dual fuel OEM heavy duty CNG/LNG* urban vehicles acquired by municipalities, federal and private fleets: buses, garbage trucks, street sweepers, special purpose vehicles …

Dedicated and/or dual fuel OEM heavy duty long range (intercity/international) vehicles acquired by private and federal fleets: coaches, trucks.

Conversion is still popular. Although OEM supply becomes principal source for acquisition of new NGVs.

** CNG/LNG = CH_4 based compressed or liquefied gas regardless of origin = natural gas, shale gas, biomethane, e-gas, coal bed methane*

Light Duty NGV Trends








Diversity of CNG light duty vehicles offered by OEM and QVM keeps broadening.

New trends with OEM CNG models are expected to continue in the direction of downsizing and hybridization.

Bi-fuel (NG or gasoline) OEM NGVs will be popular until gas filling network is properly developed.







Off-Road Trends

Coal Mines. Super HD mine hauling trucks (dual fuel or dedicated, CNG or LNG) were successfully tested during past two decades in the USA, Ukraine and Russia.

Airports have high concentration of HD & LD vehicles serving both inside and outside needs. A concentrated, emission and budget concerned, 24/7 guaranteed methane customer of CNG/LNG will tempt investment into both fleets and infrastructure.

Off-Road Trends

Inland waterways. The rivers Amstel, Chao Phraya, Dubai Creek, Mississippi, Moscow and Neva, Seine, Yangzi have seen successful demonstration and commercial operation of different size and purpose river boats that use CNG or LNG (dedicated and dual-fuel) instead of diesel.

Maritime. Emission Control Areas (ECAs) in the Baltic and Northern seas, North America, the Mediterranean and Sea of Japan will require ship owners to use cleaner marine fuels with low sulphur dioxide and particle content. The most attractive option is to use LNG. It might be expected that as many as 10% short-sea ships calling at ECAs will be running on LNG by 2015.

Off-Road Trends


Rail Road. In addition to current utilization of NG to power locomotives (U.S, Brazil) the new projects will show technical, economic and environmental viability of LNG (Russia, Canada) and CNG (India) engine technology for locomotives (offering greenhouse gas reductions of up to 500 tonnes per year for each natural gas locomotive relative to diesel locomotives).



Golden Age of Gas is coming

The global natural gas resource base is quoted to sustain current consumption for over 250 years.

The world population of NGVs by 2020 may reach 50 million units.

In terms of gas consumption HD OEM NGVs may overwhelm that of the LD NGVs. By 2020 HD sector may reach annual CH4 consumption of 200 BCM.

LNG (LBM) may become a primary alternative for heavy duty on- and off-road applications: buses, trucks, rail road, water- and aircraft.

Small scale LNG sector (liquefaction, storage, transportation, dispensing) will grow.

International Blue Corridors, Green Highways, Gas Highways – and not only for on-road vehicles - will connect cities, sea- and airports, railway terminals.

What Has to be Done?

To achieve the modest goal of 50 million NGVs on the roads by 2020 it is necessary to:

- improve and harmonize national legislative/regulatory environment;
- expand incentives for investors;
- build up public awareness;
- secure leadership of gas industry in developing filling infrastructure;
- further develop NGV diversity;
- invite oil-fuel retailers to expand the range of products to sell CNG/LNG.

Thank you for your attention

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