

NEW INITIATIVES IN NGVs

UNITED NATIONS

Working Party on Gas (WP1)

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Executive Director



Report 2003 of the Alternative Fuels Contact Group

SUMMARY OF CONCLUSIONS



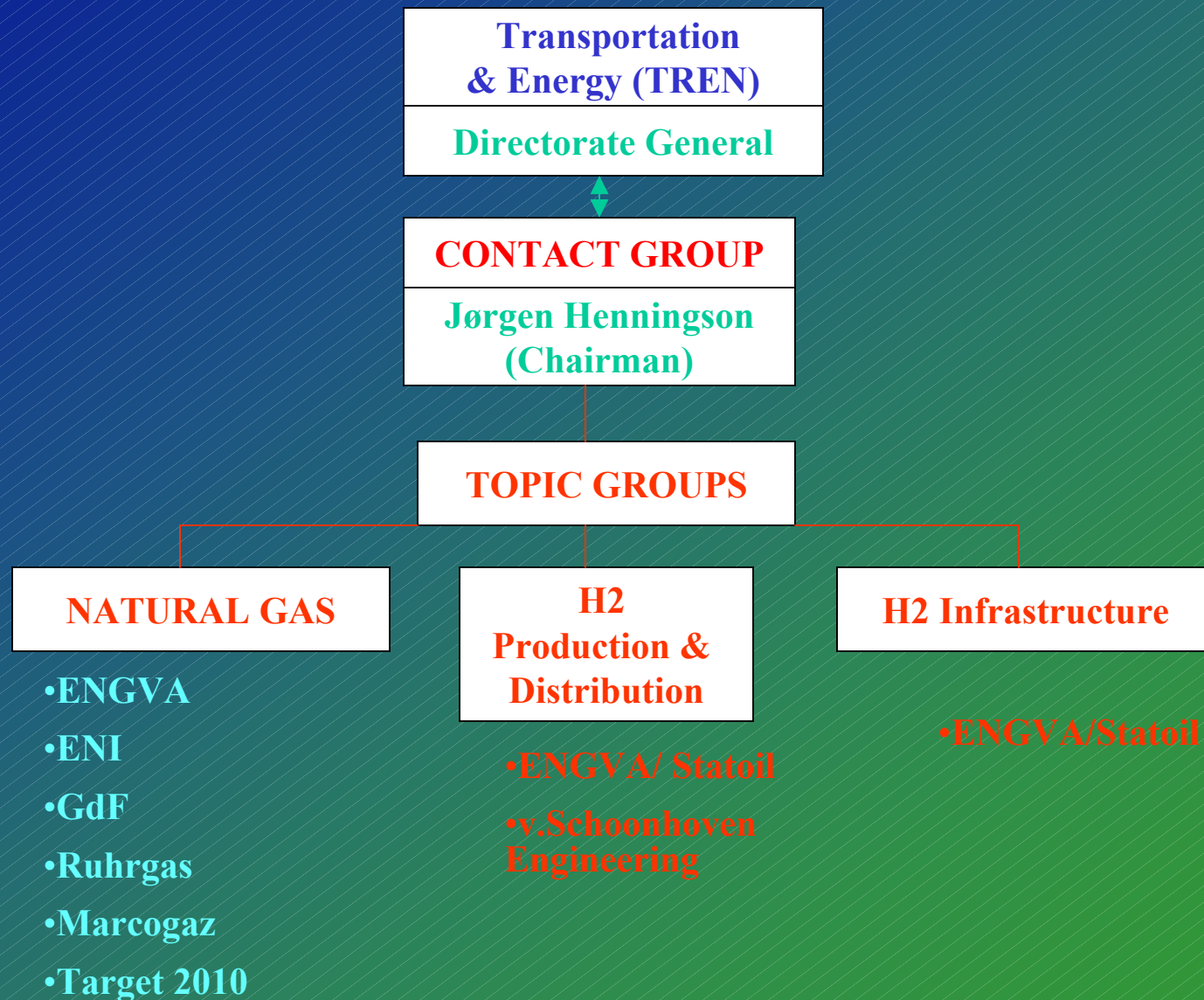
EUROPEAN ALTERNATIVE FUELS POLICY

% Fuel Replacement, Transport Sector, 15 EU Countries
by 2020
[] = Optimistic

Year	Biofuel	CH4	H2	Total %
2005	2			2
2010	6	2		8
2015	[7]	5	2	14
2020	[8]	10	5	[23]

EC Transport Policy Initiative

ENGVA, NGV & Gas Industry Participation



CONTACT GROUP *PARTICIPANTS*

- **European Commission DGs (Tren, Environment, Enterprise, etc.)**
- **Automobile Industry (EUCAR)**
- **Oil Industry (CONCAWE)**
- **Other Stakeholders**
 - **Alternative Fuels**
 - **Customers**

SCOPE OF THE REPORT

Alternative Fuels

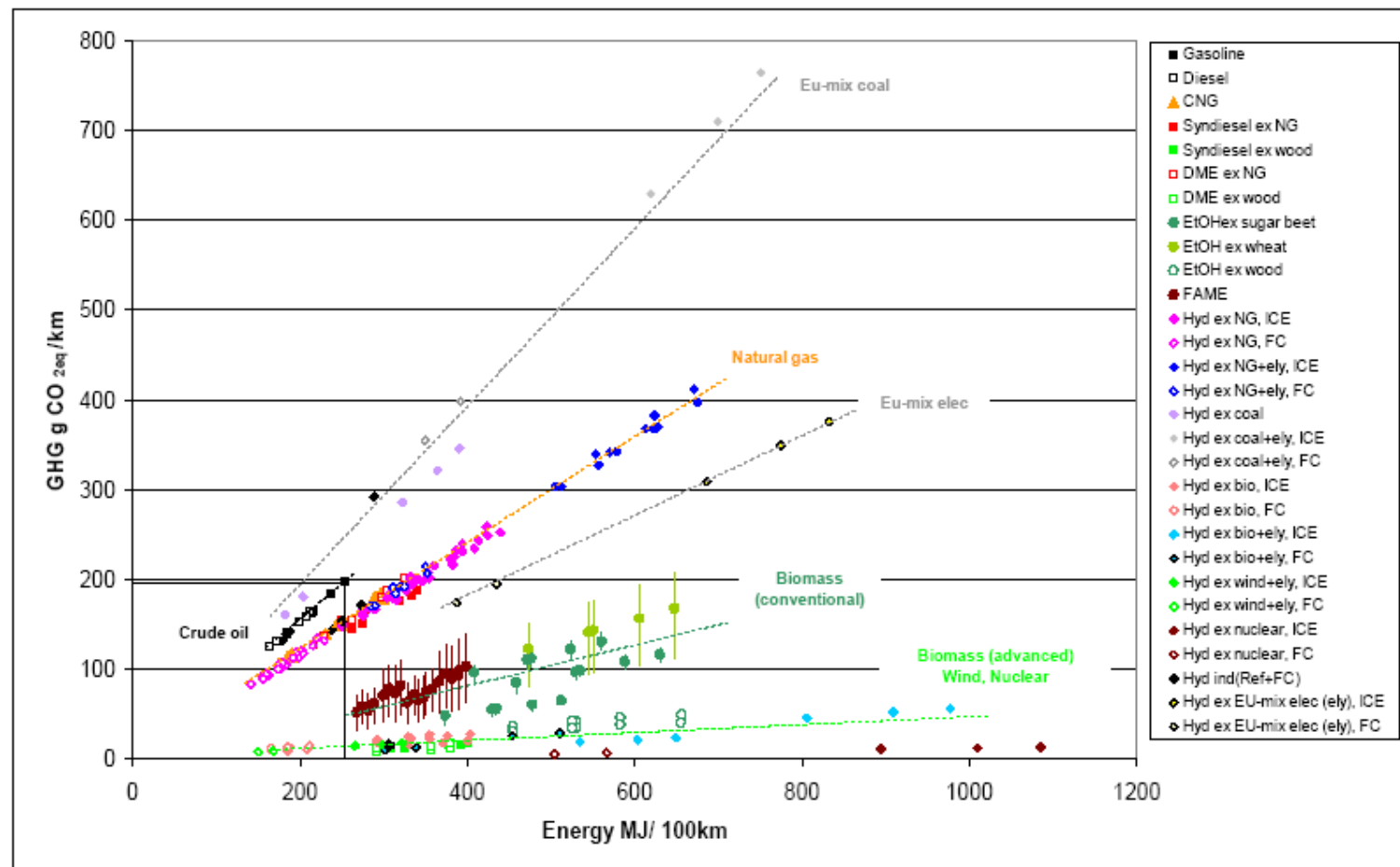
- **Well-to-Wheel Analysis**
- **Natural Gas**
- **Hydrogen**
- **Biomass-to-Liquid (BTL) Fuels**
- **LPG**

WELL-to-WHEEL STUDY

- 75 pathways/options studied
- All fuels theoretically could substitute 5% petroleum by 2010 (up to 35 m/t CO₂ equiv)
- Biomass produce less GHG emissions
- BTL deserves further attention

W-2-W ANALYSIS

Fig. 16: WTW greenhouse gas emissions and energy efficiencies for various primary energy sources with different vehicle technologies



NATURAL GAS

CO₂ Emissions

- **Clear advantage over gasoline today (20-25%) but on par with diesel**
- **Future (2010+ technology) advantages**
 - 16% further advantage over gasoline possible
 - 13% advantage over diesel possible
- **Further advantages possible**
 - Advanced engine technology
 - Biogas offer large potential advantages
- **New concepts for HDVs**

NATURAL GAS

Potential Into the Future

- Only alternative fuel with potential for significant market share above 5% by 2020 in terms of economics and mature market scenario
- Broad market acceptance possible with tax & excise duty incentives
- Mature technology available but product diversity & services need improvement

NATURAL GAS

Potential Into the Future

- Large European scale would ensure mass market benefits (i.e. reduced costs)
- Codes & standards should be harmonised
- Linking H2 and NGV fuelling station infrastructures and technologies may support H2 & H2V introduction

ALTERNATIVE FUELS CONTACT GROUP REPORT

“A main driving force for the large-scale introduction of natural gas as a motor fuel is concern for the security of supply for the transport sector currently solely dependent upon oil products. Natural gas is the only alternative fuel with the potential for significant market share well above 5% by 2020 which could potentially compete with conventional fuels in terms of economics of supply in a mature market scenario.”

WELL-TO-WHEEL ANALYSIS

Fig. 17: Well-to-wheels energy efficiency emissions

of natural gas vehicles

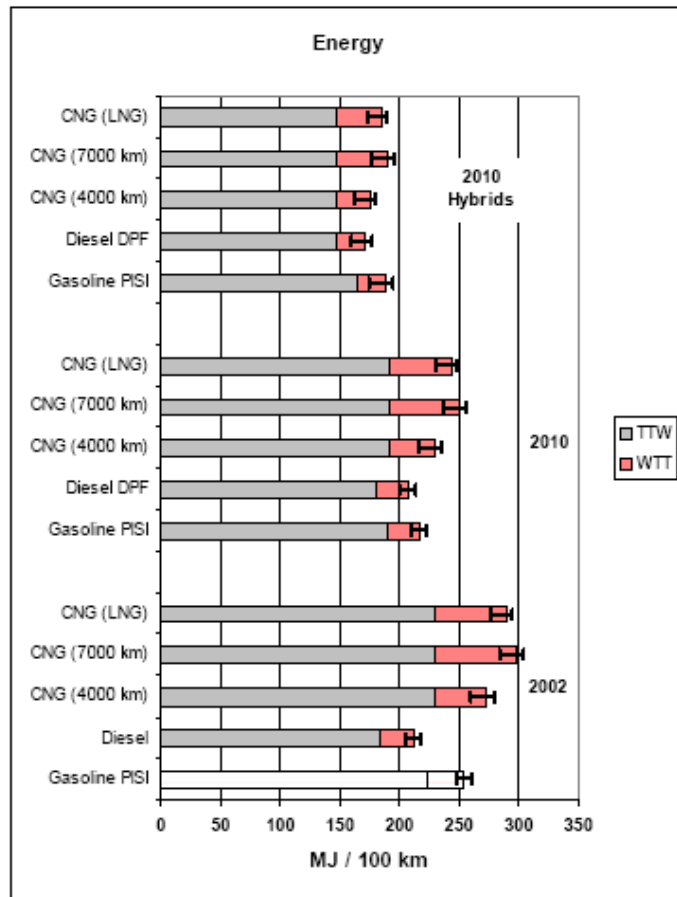
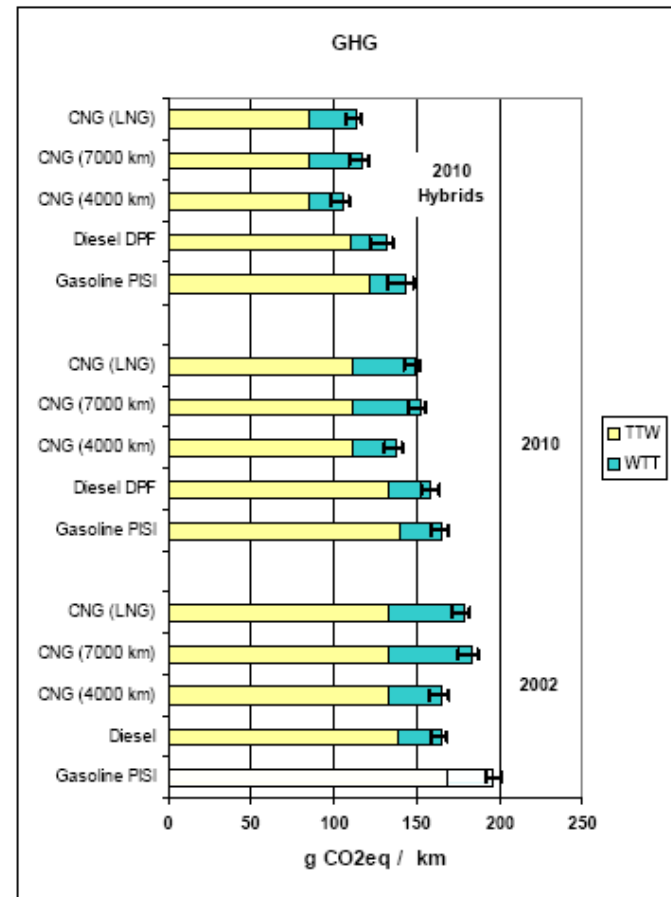


Fig. 18: Well-to-wheels greenhouse gas emissions

of natural gas vehicles



HYDROGEN

- Long term potential for full reliance on renewables
- R&D required to determine best pathways to vehicle and fuel production after 2010
- Steam reforming of natural gas provides best available route to fuel cells
- Further R&D required for biomass-H₂ pathways

BIOMASS-to-LIQUIDS

- **Could enhance EU target of biofuel replacement of 6% by 2010**
- **Maximum replacement potential limited to 15%**

LIQUIFIED PETROLEUM GAS

- **5% market share by 2010 possible, and might compete with NGVs in some market segments**
- **Potential regarding energy security and CO₂ reduction needs to be studied on W-2-W basis**



NEW NGV INITIATIVES AT THE UNITED NATIONS

- **World Harmonisation of Gaseous Fuel Standards**
- **Creation of International Road Signage for CNG Fuelling Stations**



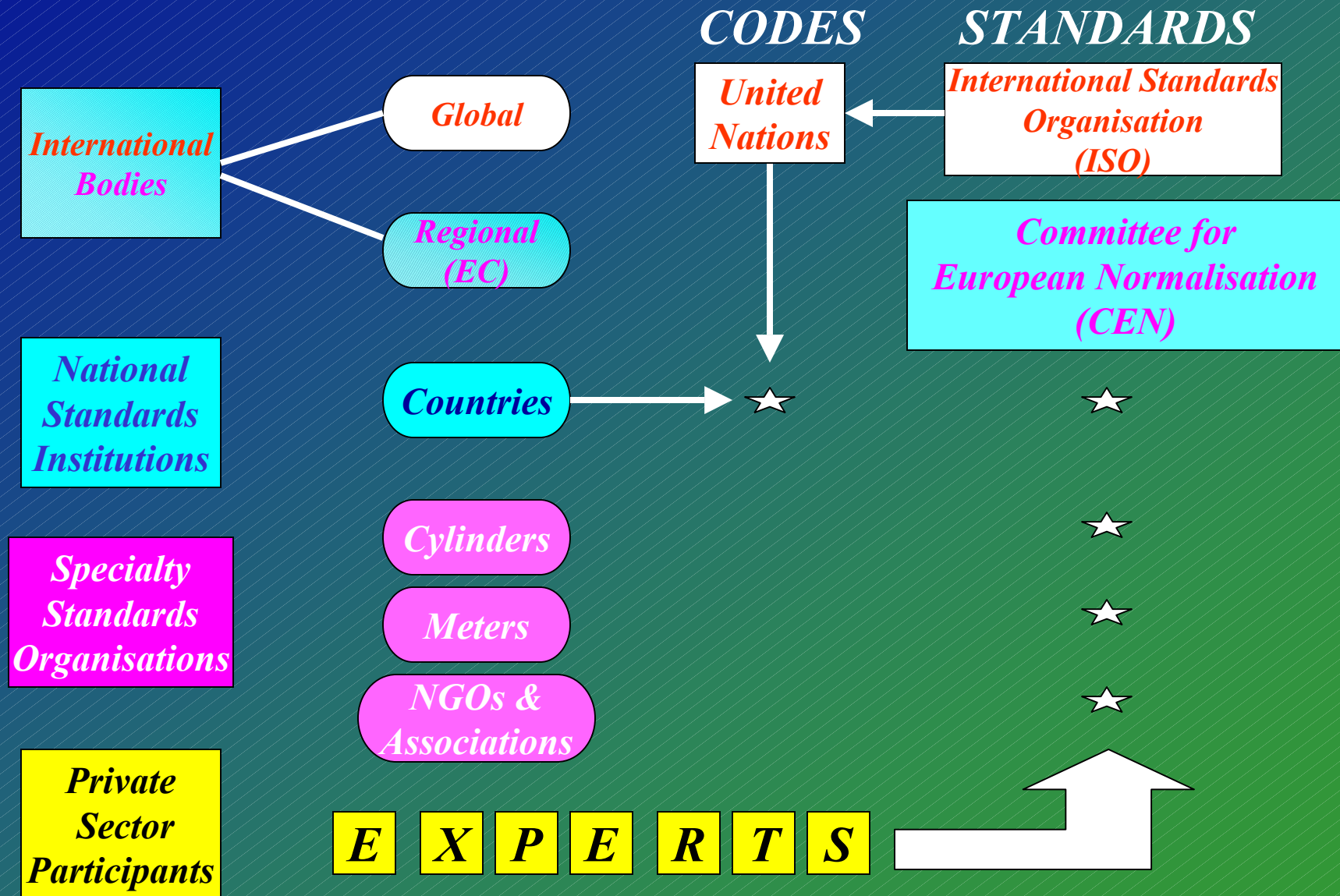
**WORLDWIDE
HARMONISATION OF
GASEOUS FUEL
STANDARDS...**

***PAVING THE WAY TO
COMMERCIALISATION***

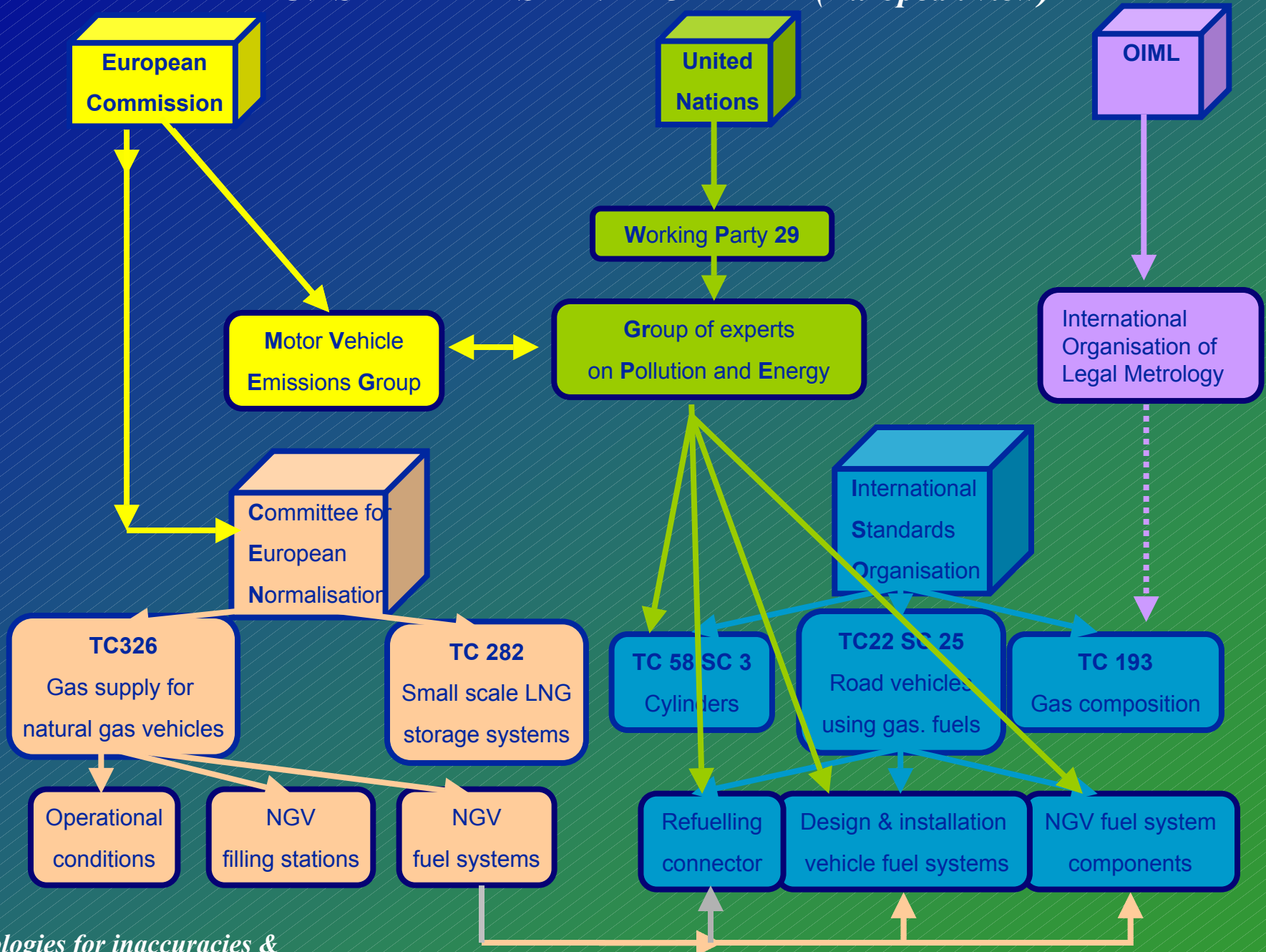
DEFINITIONS

- **STANDARDS**
 - Performance or prescriptive
 - Not ‘legal’ (i.e. not binding) but are intended to be *defacto* models for codes
- **CODES (also know as *regulations*)**
 - *Dejure*/legal, with enforcement implications
 - Can adopt standards by reference or amendment

LEVELS OF CODES & STANDARDS (The Patchwork Quilt)



NGV STANDARDS DEVELOPMENT (European view)



Apologies for inaccuracies & omissions

WORLD-WIDE STANDARDS HARMONISATION: THE OBJECTIVES

- **Help equipment suppliers enter the worldwide market (NGV & H2V are same/similar)**
- **Harmonise existing standards**
- **Produce new and additional standards (NGV & H2) as required (but avoid international overlap/duplication)**
- **Facilitate codification of standards (codes & codes of practices)**
- **Expedite H2 standard development**
- **Link CNG fuelling network to H2 network into the future**

SUGGESTED ACTIONS FOR WORLD-WIDE HARMONISATION

- Bring representatives of all groups together:
World-Wide Harmonisation of Gaseous Fuels Conference
- Identify the *structure* of the standards institutions ...internationally & nationally
- Identify the *substance*: what exists and what is still needed
- Attempt to assign *institutional responsibility* (tough job)
- Identify *the experts* ('warm bodies') to be involved

WHO TAKES RESPONSIBILITY FOR LEADERSHIP?

- United Nations ?
- Support required from regional/national governments & standards institutions
- Funding for private industry participation required
- International/Regional Associations & NGOs

**WE CAN BE HOPEFUL
ABOUT WORLDWIDE
HARMONISATION**

CAN WE BE OPTIMISTIC?

(Good Question!)



ROAD SIGNAGE FOR CNG FUELLING STATIONS

NGV FUELLING STATIONS

A Growing Fuelling Network in Search of an Identity!

- **Many countries have developed their own fuelling station signage (logo)**
- **Many fuel station signs are logos of branded name fuels**
- **Drivers (especially across country boundaries) don't know where to get CNG!**

SEARCHING FOR AN IDENTITY



Switzerland



Pittsburgh, Pennsylvania
USA

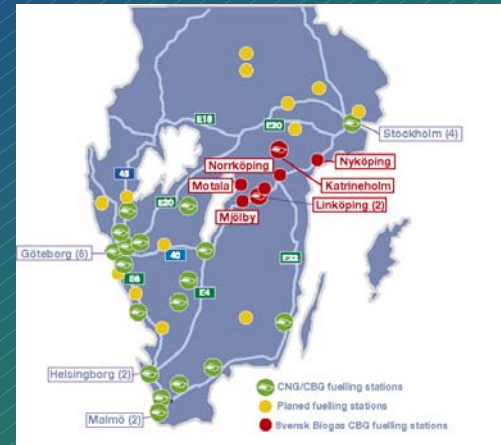
A European Approach?

NATURAL GAS FUELLING STATION SIGNAGE

ITALY



THE SWEDISH APPROACH



SOME 'OTHER' SWEDISH CONCEPTS



An International Logo?



BIOGAS
for
Vehicles

INTERNATIONAL SIGNAGE OUTSIDE EUROPE

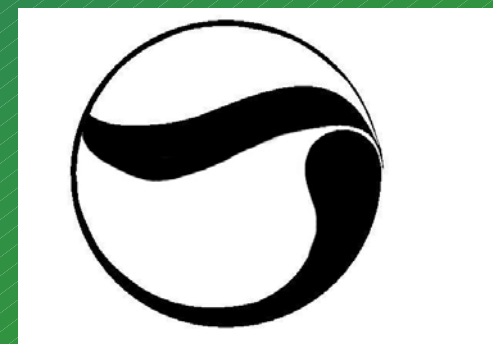
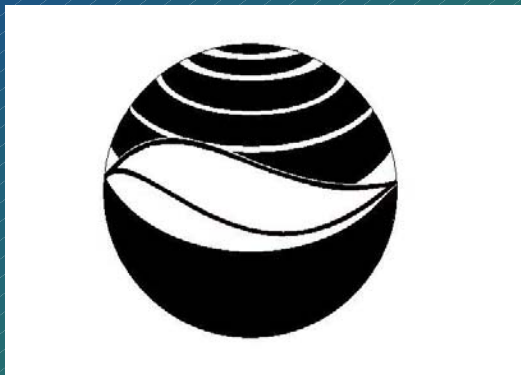
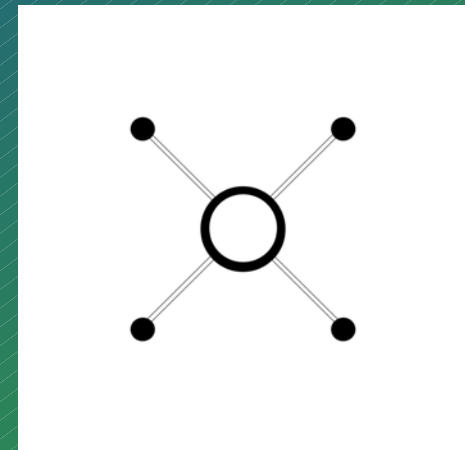
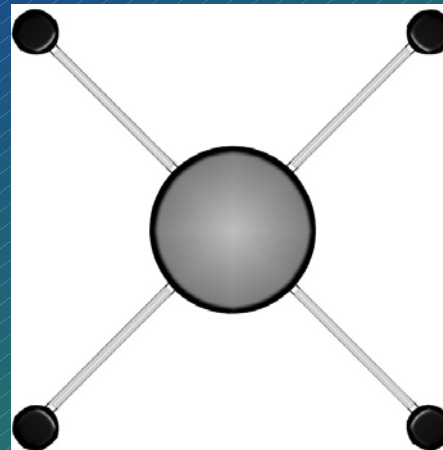
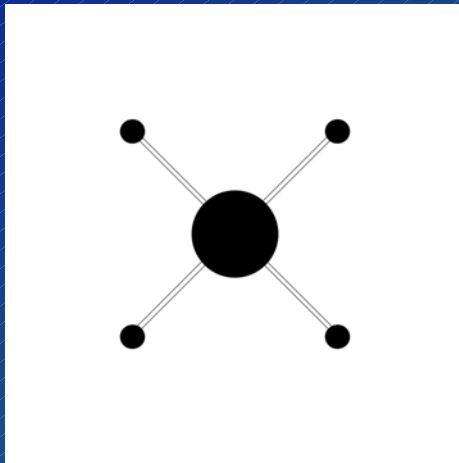


Cairo, Egypt

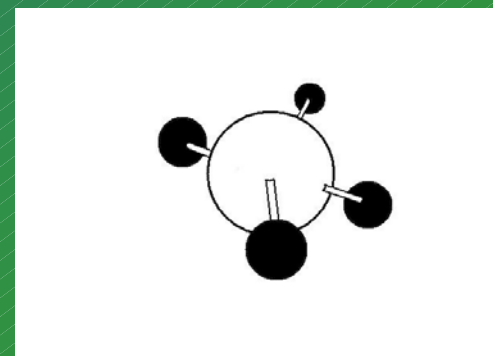
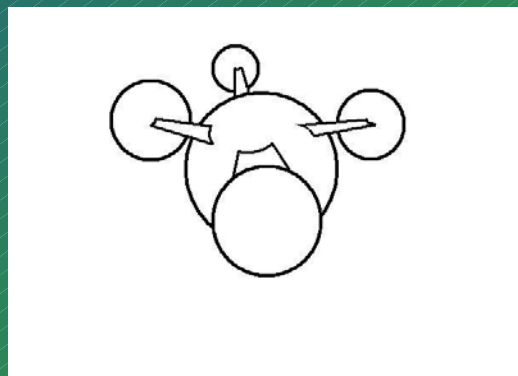
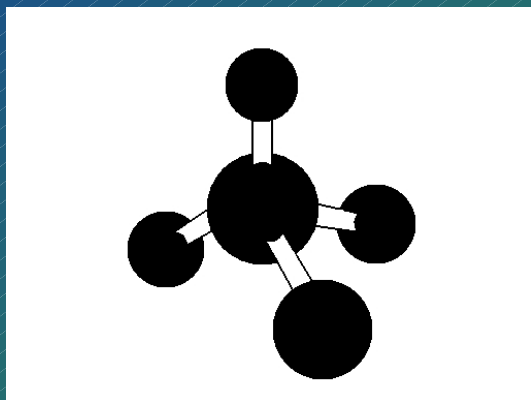
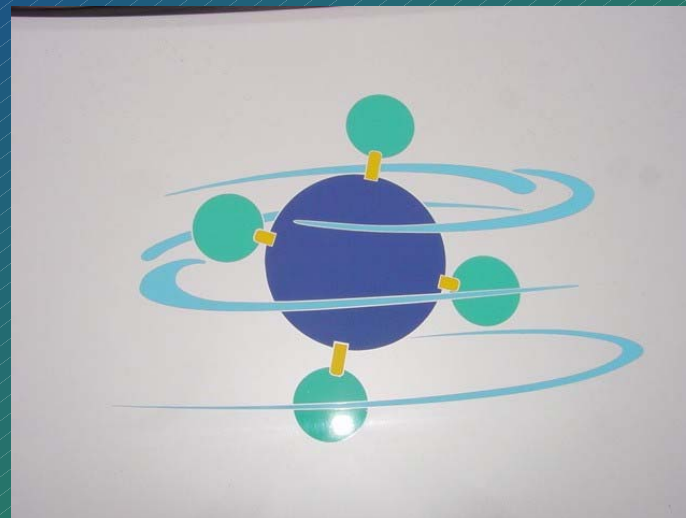
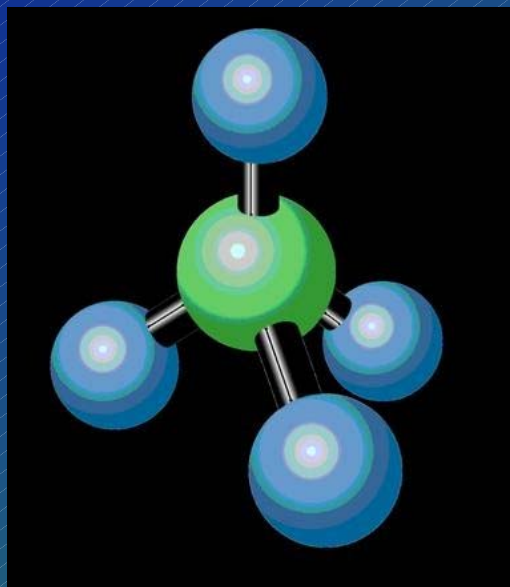


China

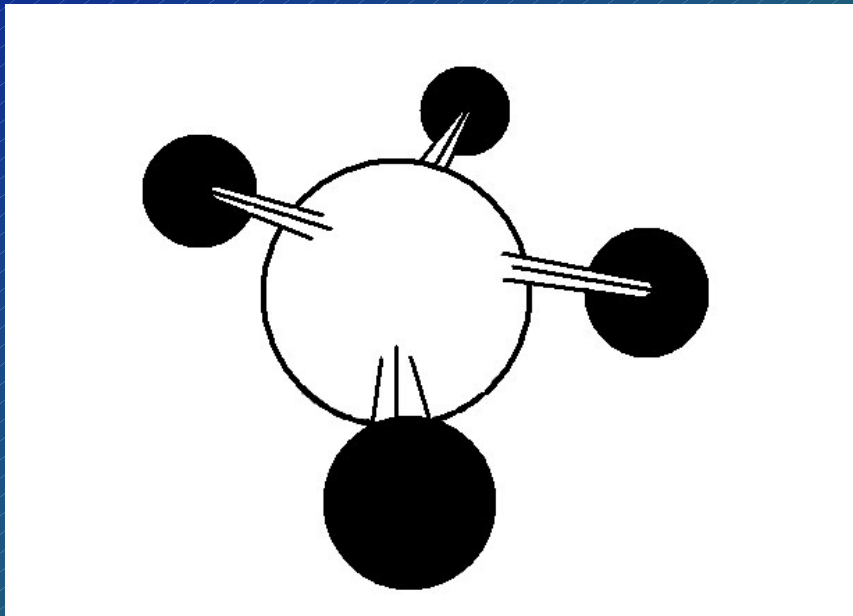
SOME ARTIST CONCEPTS



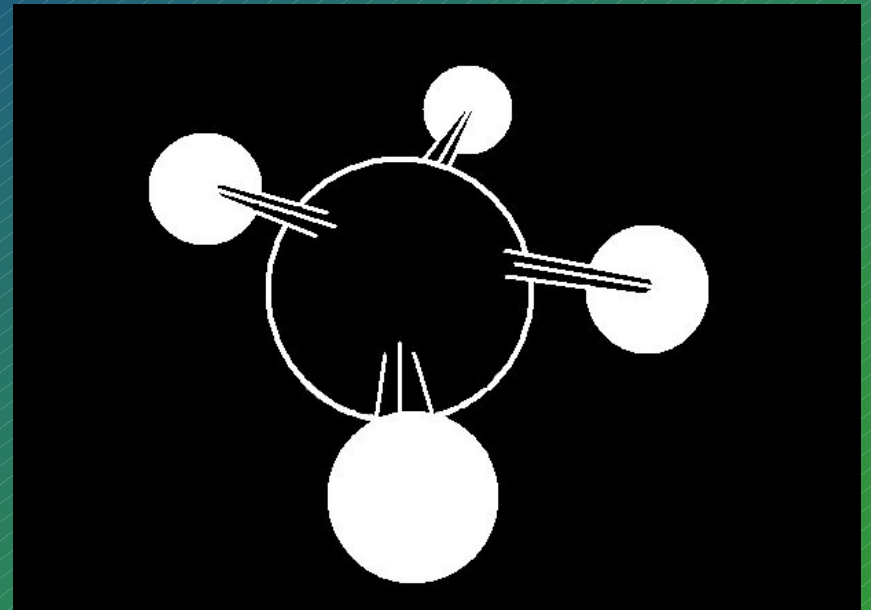
SOME *MORE* CONCEPTS



A CNG FUEL LOGO



Black on White Background



White on Black Background

WHITE ON BLACK OPTION



BLACK ON WHITE OPTION

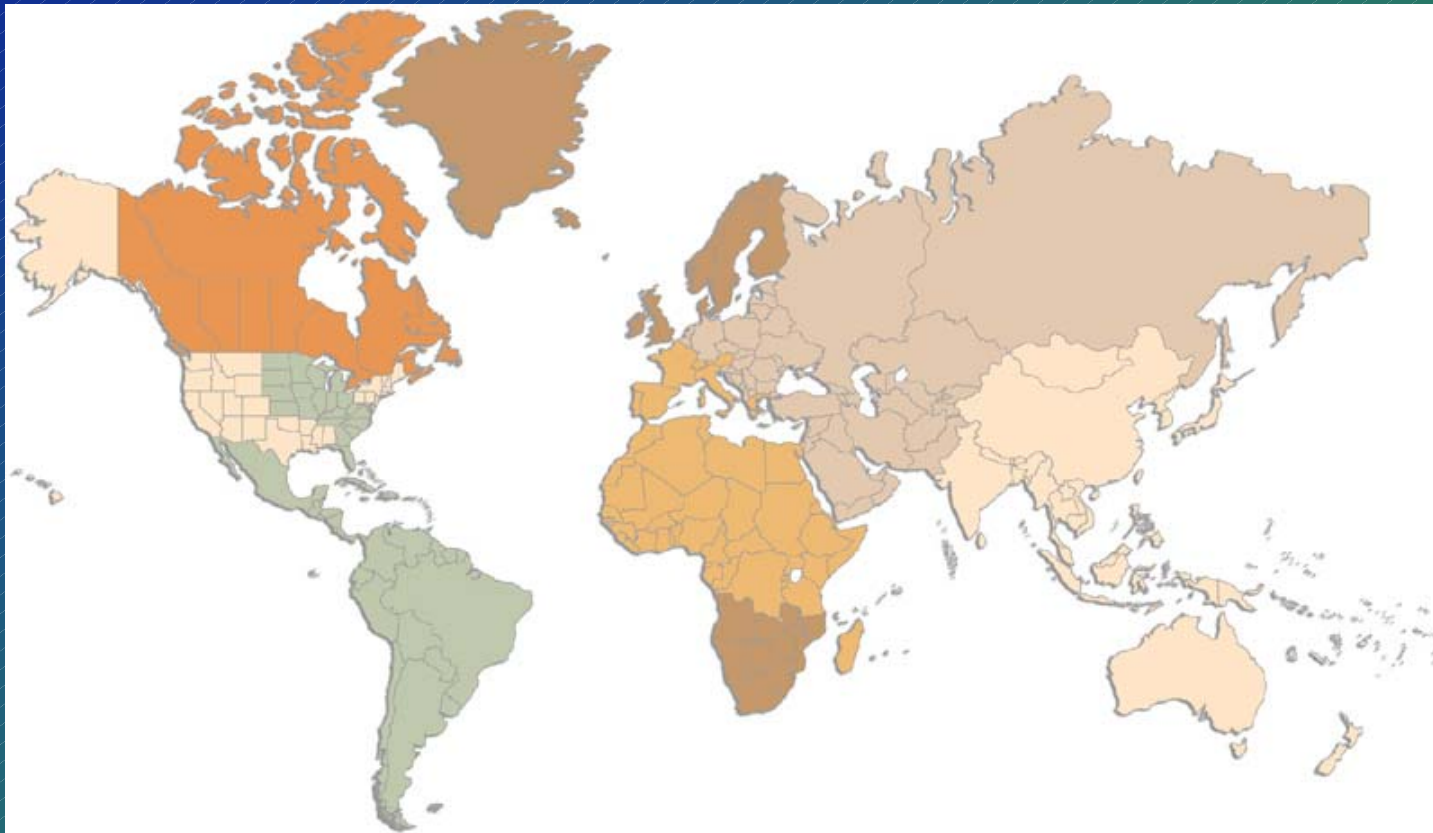


UN WORKING PARTY ON ROAD TRAFFIC SAFETY (WP1)

- A formal proposal will be developed and submitted to WP1 for its next meeting (April 2004)
- We hope to achieve consensus....to achieve a Consolidated Resolution
- And ultimately amend the Vienna Convention



A QUICK VIEW OF NGVS WORLD WIDE



THE TOP TEN COUNTRIES WORLDWIDE

Country	NGVs	Fuel Stations	% Nat.Gas of Petrol
Argentina	1.1 mil	1,127	34%
Brazil	614,840	630	50.7%
Pakistan	410,000	423	56.5%
Italy	400,800	463	57.7%
India	159,159	166	38.6%
USA	130,000	1,300	80.6%
China	69,300	270	64.2%
Egypt	48,360	78	44.7%
Venezuela	44,146	149	*
Ukraine	42,000	130	40.6%

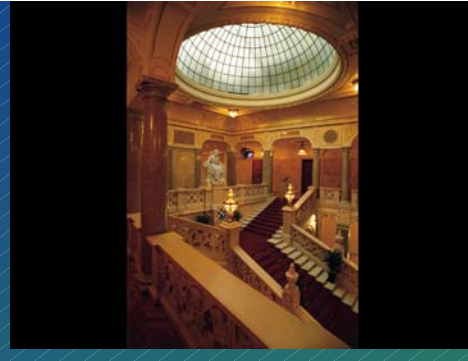
January 2004

EUROPE'S 1000+ CLUB

Country	NGVs	Fuel Stations	% of Petrol
Italy	400,800	463	57.7%
Ukraine	42,000	130	40.6%
Russia	36,000	218	40.7%
Germany	14,420	322	55.6%
Belorussia	5,500	24	*
France	6,500	105	65.9%
Sweden	4,260	44	81.5%

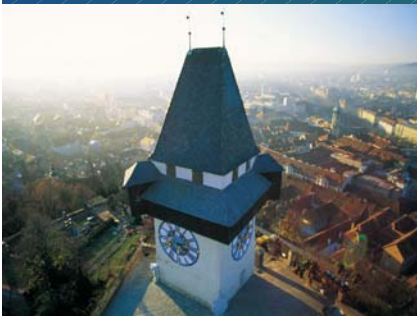
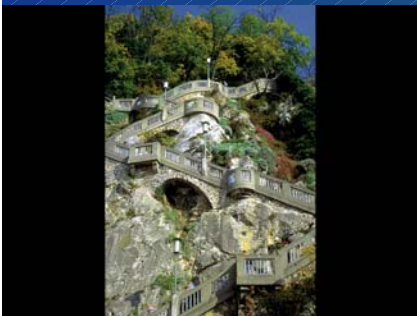
**This Year's ENGVA
Conference**

**Back to the Future:
NGVs Expanding
with Europe!**



Graz, Austria

25-27 May 2004

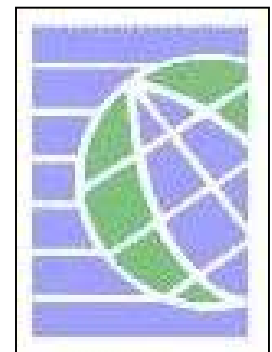


Hosted by OMV





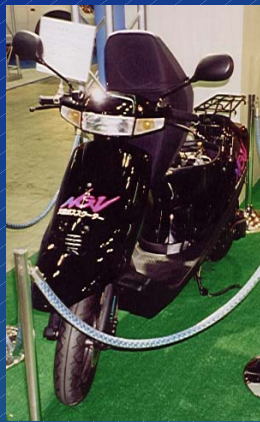
26-26 OCTOBER 2004
papers@ngv2004.com



NGV Diversity: the Possibilities are Endless!



Clean sweeper



Motorcycle



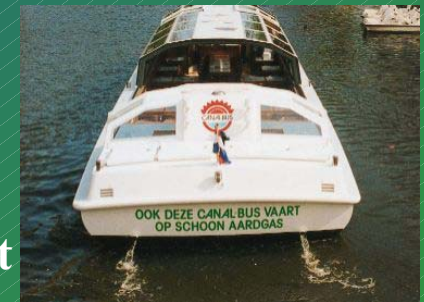
Rickshaw



Russian Locomotive



Go-kart



Canal boat



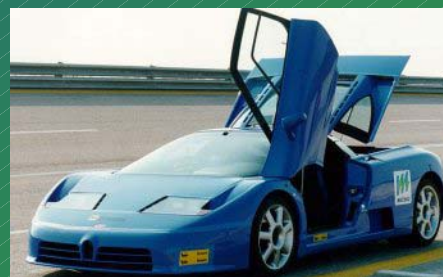
Union Pacific - USA



Russian Tupolev



NGV Icecleaner



NGVs

A GLOBAL OPPORTUNITY

Argentina



China



Japan



Indonesia



Brazil

VISIT THE ASSOCIATION WEBSITES!!!



- www.iangv.org.nz



- www.engva.org