

NGV Standards & Regulatory Update

January 2013

(Working Party on Gas)

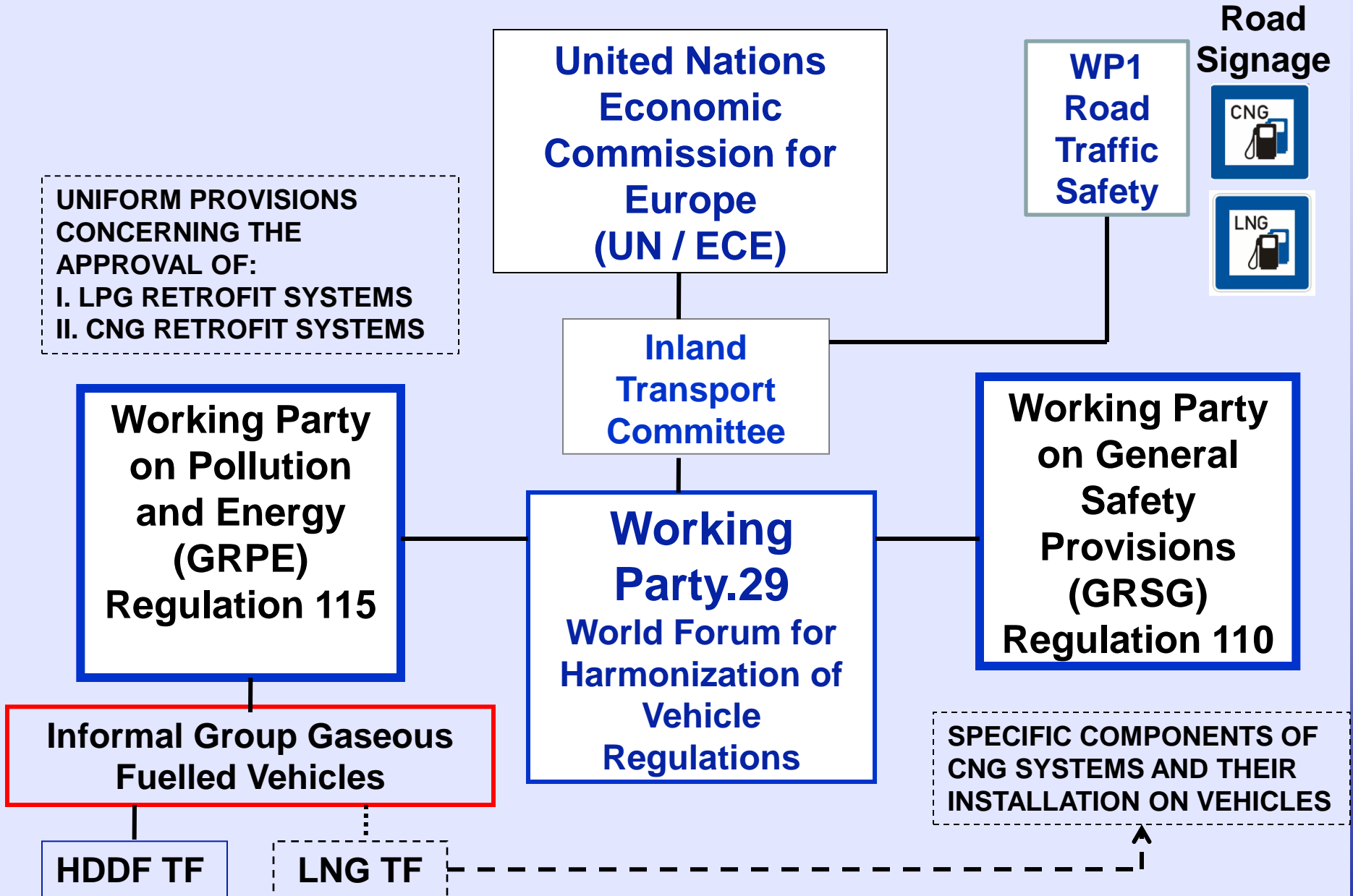
22 January 2013

United Nations, Geneva

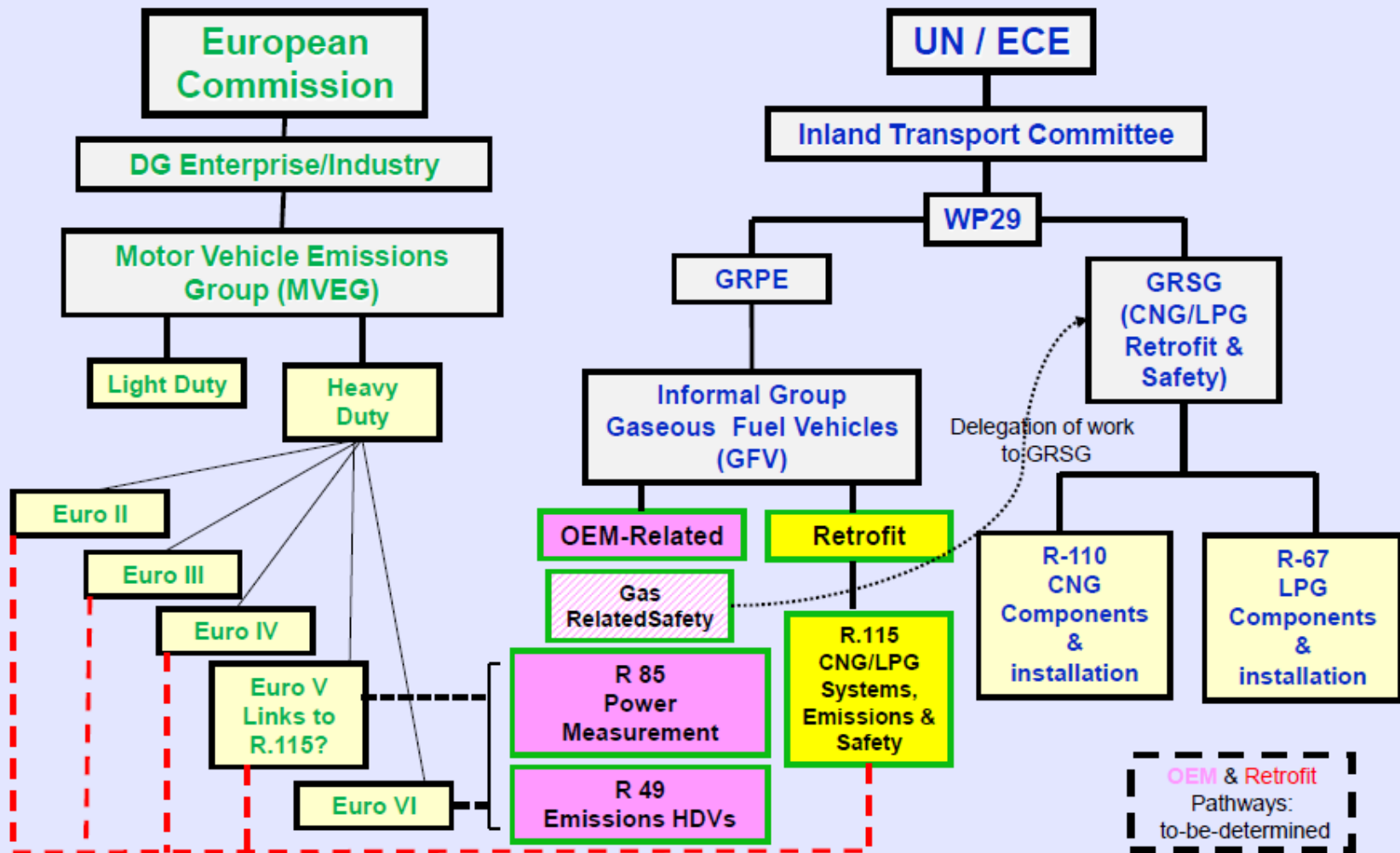
Dr. Jeffrey M. Seisler, CEO



UN Structure for NGV Regulations



Regulatory Landscape to Develop Dual-Fuel Engine Certification Regulations



Heavy Duty Dual-Fuel Task Force: regulatory amendments are making steady progress & will open markets for D-F NGVs

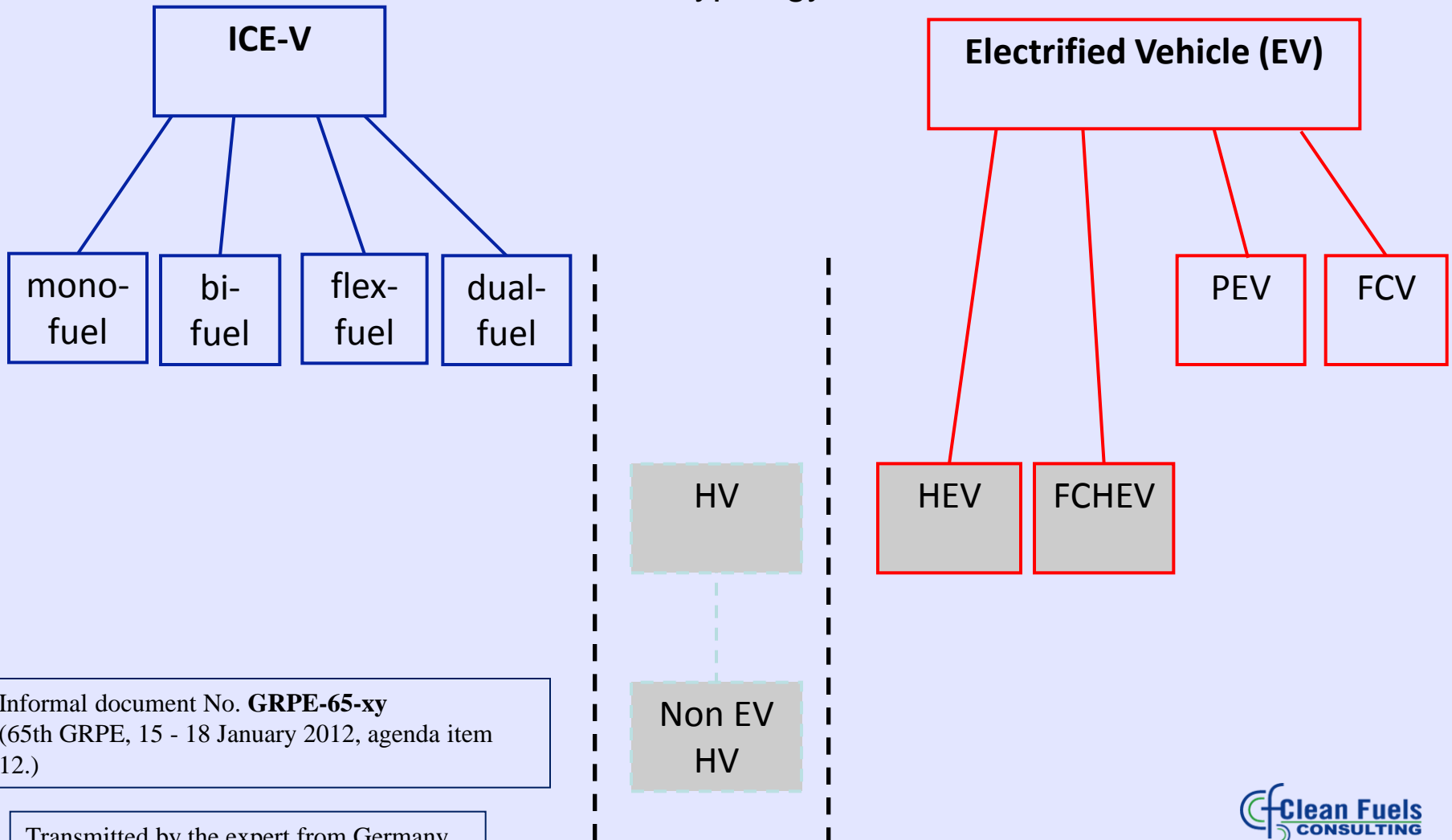
- R.49 rev 6 (Euro VI) (approved 2012)
- R.85 (net power) (approved 2012)
- R.49 rev 5 (Euro V) (formal document for consideration by GRPE: June 2013)
- Retrofits: regulatory pathway under discussion (amend R.115 or create new regulation?)

LNG Task Force: Regulations for Heavy Duty Dual-Fuel engines lead to creation of LNG vehicle regulations

- Amendments to R.110 submitted to GRSG for consideration April 2013
- Without these amendments D-F vehicles running on LNG will have to rely on national approvals.
- Member states looking for regulatory guidance from UNECE.

GFV providing input to GRPE effort to harmonize Vehicle Propulsion System Definitions (VPSD)

Vehicle Typology



Other industry standards being developed will provide important guidance to NGV stakeholders – industry & government

- International Standards Organization (ISO)
 - Fuelling stations: CNG & LNG
 - Vehicular refuelling appliance (CNG) (VRA)
 - LNG fuel connectors
 - LNG fuel tanks
- Committee of European Normalization (CEN)
 - Gas quality
 - Biogas composition: as a vehicle fuel & grid injection

The industry needs to create a strategy to create regulatory structures for new markets

- **Marine applications:** inland shipping & high seas transit: fuel handling & storage; on-board vessel components; rules of transit (i.e. inland operation)
- **Railways:** fuelling; fuel storage in transit; vehicle components; etc.
- **What's needed?** Gap analyses; strategy re: both substance and process; reasonable time-table

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