

**NEW WORK ITEMS**  
**INFORMAL GROUP ON GASEOUS FUEL VEHICLES**  
**Within the UN GRPE (WP29)**

**STANDARD FUEL MEASUREMENT AND DISPLAY UNITS FOR CNG**  
**CLEPA**

**Name of Organisation submitting Amendment/Work Item**  
CLEPA

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**Regulation name and reference number**  
Addendum to the 1958 Agreement (Reg. 83).  
Annex 10a, Table 1.2. TECHNICAL DATA OF THE NG REFERENCE FUELS.  
Any other related UN ECE regulation in which is referred to CNG fuel measurement and display units.

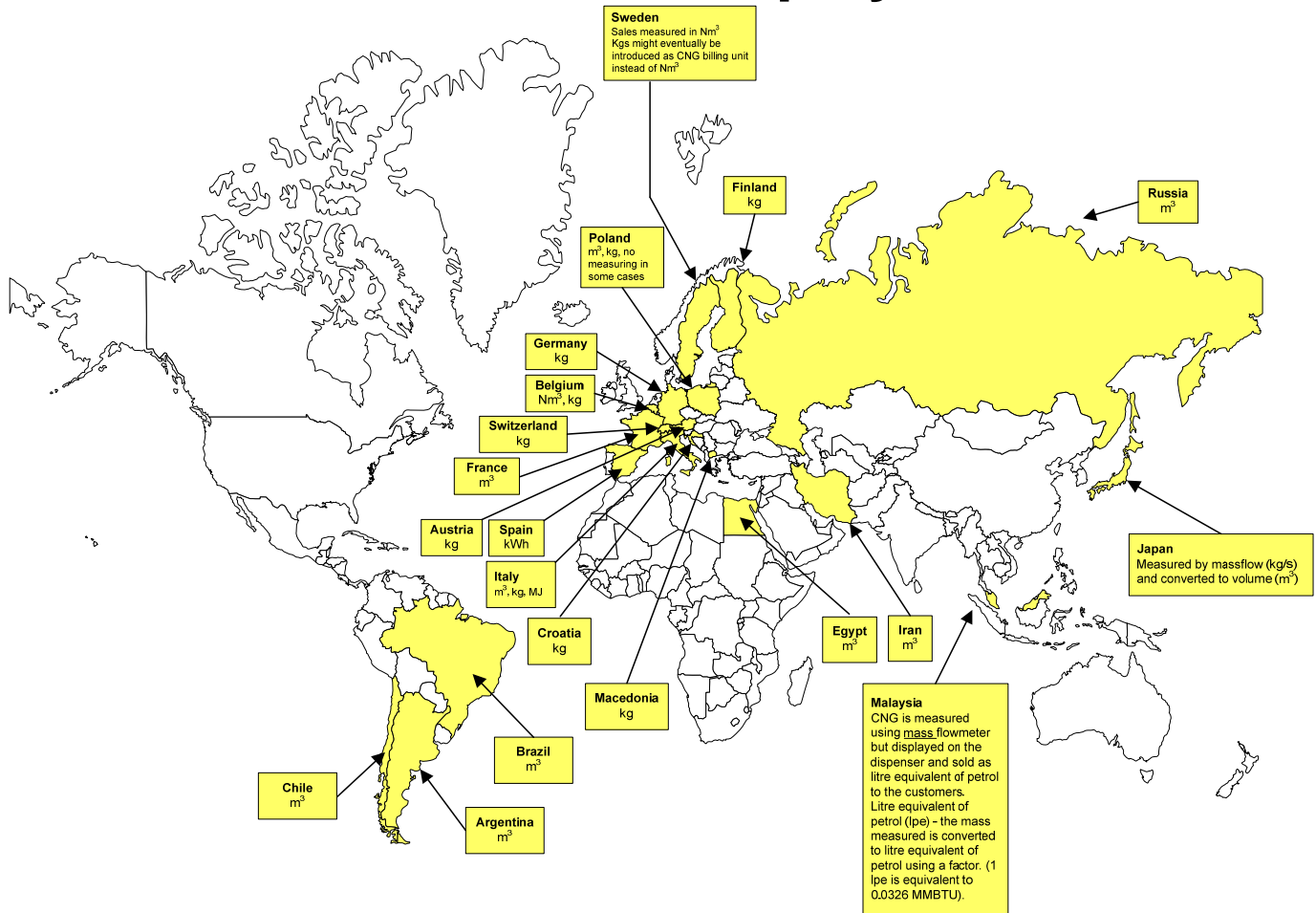
**Name of Amendment/Work Item**  
Proposal to use standard units for Fuel Measurement and Display related to Compressed Natural Gas (CNG).

**Specific language for Amendment/Work Item**  
English

**Rationale: (Why is it important/required?)**

- To use one common global standard of Compressed Natural Gas (CNG) fuel measurement and display unit by using one official SI (Système Internationale) unit.
- To simplify and use one principle unit which can be comprehended by anyone (not only by people with technical background). Many different units for fuel measurements are currently used globally.

# Fuel Measurement & Display



The picture above was copied from INTERNATIONAL COMPARISONS: Units of Fuel Measurement, Report on Study Group 5.3 “Natural Gas for Vehicles (NGV)” Global Opportunities for Natural Gas as a Transportation Fuel for Today and Tomorrow FINAL REPORT 2006.)

- Equivalent unit (kWh) to principle CNG mass unit (kg.) required for e.g. dynamometer operation.
- One single unit used for fuel consumption of CNG vehicle, based on the above principle CNG fuel measurement and display unit (kg./100 km.)

## Amendment

- 1) Replace all CNG tank contents fuel measurement and display units with one standard mass unit for CNG: **kg.**
- 2) Introduce in addition an equivalent unit to this principle unit.: **kWh.**
- 3) Introduce a standard fuel consumption unit CNG: **kg./100 km.**

## Analysis/testing or data requirements to support the Amendment/Work item

(could be anticipated or existing supporting documentation)

Calculation of mean equivalent value for 1 kg of CNG, tolerances (min & max values) for CNG reference gasses G20 & G25:

### G20

Low range: 1 kg= 50.0 +/-2.5 MJ/kg

Conversion: 1 MJ = 0.2777778 kWh

Average: **1kg=13.9 +/- 0.7 kWh.**

**Min value: 13.2 kWh**

**Mean value: 13.9 kWh**

**Max value: 14.6 kWh**

### G25

Low range: 1 kg= 38.9 +/- 2.0 MJ/kg

Conversion: 1 MJ = 0.2777778 kWh

Average: **1kg=10.8 +/- 0.5 kWh**

**Min value: 10.3 kWh**

**Mean value: 10.8 kWh**

**Max value: 11.3 kWh**