

# INFORMATION SLIDES OF OEM-DELEGATION

HyCoRA Project Meeting  
H2 Supply to Road Vehicles in relation to  
standardization

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*G.Gissibl(BMW), J.Roussel(Toyota), S.Mock(Daimler)*

# BASIC STATEMENTS ACEA



- OEMs are ready for market roll-out
- Infrastructure is building up in several EU areas
- ISO 17268 (H2 fuelling connector) is standardized
- ISO 14687-2 (H2 Quality) as defined today is addressing only the fuel purity part however does not focus on economical continuous fuel quality assurance. Additional efforts required in order to achieve an optimum between FCV compatibility and fuel cost. (Within the German national initiative H2-Mobility key fuel providers and OEMs have agreed to strive for this optimum.)
- ISO 20100 (HRS): Focus of scope/work is still not agreed. Now ISO 19880-1
- Latest revision of SAE J 2601 (H2 fueling protocol) was published in July 2014, should be referenced in ISO due to global harmonization.

# ISO 14687-2:2012 TO BE ADOPTED AT EUROPEAN LEVEL?

- Yes, fuel specification for fuel cell vehicles is needed as design baseline for vehicle development. Worldwide harmonization and adaption of fuel standard is mandatory.
- ISO 14687-2 also referenced in EU 406/2010, as it is the only existing fuel standard for FCV, but amendments are necessary, addressing the key points:
  1. An overall purity value, without limitation to specific contaminants acting as catalyst poison or leading to degradation, can not be accepted.
  2. Some contaminants can be detrimental to FCV operation and reliability.

# ISO 14687-2:2012 TO BE ADOPTED AT EUROPEAN LEVEL?

- Impurities as particles: A 5-micron filter at the nozzle is needed to stop particles from contaminating FCV's sensitive components (High Pressure)
- Continues fuel quality monitoring: Appropriate monitoring of critical contaminants has to be implemented. Research necessary to develop affordable monitoring and measurement methods.
- Limitation of some impurities in ISO 14687-2 might be over-specified, vehicle OEMs are willing to revise ISO 14687-2 together with gas suppliers in order to achieve feasible fuel cost.

These items will be proposed in TC197/WG24 of ISO (now under ISO19880-1).

(Note: SAE2719 can not be referred to in Commission's directive proposals as it is an industrial standard from US)

# BACK UP: ISO 14687 TABLE

Table 1 — Directory of limiting characteristics

Characteristics (assay)	Type I, Type II
	Grade D
Hydrogen fuel index (minimum mole fraction) <sup>a</sup>	99,97 %
Total non-hydrogen gases	300 µmol/mol
<b>Maximum concentration of individual contaminants</b>	
Water (H <sub>2</sub> O)	5 µmol/mol
Total hydrocarbons <sup>b</sup> (Methane basis)	2 µmol/mol
Oxygen (O <sub>2</sub> )	5 µmol/mol
Helium (He)	300 µmol/mol
Total Nitrogen (N <sub>2</sub> ) and Argon (Ar) <sup>b</sup>	100 µmol/mol
Carbon dioxide (CO <sub>2</sub> )	2 µmol/mol
Carbon monoxide (CO)	0,2 µmol/mol
Total sulfur compounds <sup>c</sup> (H <sub>2</sub> S basis)	0,004 µmol/mol
Formaldehyde (HCHO)	0,01 µmol/mol
Formic acid (HCOOH)	0,2 µmol/mol
Ammonia (NH <sub>3</sub> )	0,1 µmol/mol
Total halogenated compounds <sup>d</sup> (Halogenate ion basis)	0,05 µmol/mol
Maximum particulates concentration	1 mg/kg Particle size?