Minutes of the 8th meeting of the GFV informal group on Gaseous Fuelled Vehicles
Held 14 October 2009, CLEPA Headquarters

The GRPE informal group on Gaseous Fuelled Vehicles (GFV) held its eighth meeting in Brussels at the offices of CLEPA 14 October 2009 under the chairmanship of Mr. André Rijnders (Netherlands). All working papers of the informal group are publicly available at the GRPE website at:
http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/gfv08.html

I. WELCOME

1. The Chairman opened the eighth informal group meeting, welcoming all participants, thanking them for their attendance, and thanking CLEPA for hosting the meeting.

II. REVIEW AND ADOPTION OF THE AGENDA

Documentation: Working paper GFV-08-01 (Agenda).

2. The agenda is approved without changes.

III. ADOPTION OF MEETING MINUTES OF THE SEVENTH GFV MEETING

Documentation: Working paper GFV-07-06 (minutes).

3. The minutes of the last meeting, the document GFV 06-04 were not correctly referenced. The Reference should be GFV 07-06.
4. The minutes of the last meeting were approved.

IV. REPORT ON GRPE & WP29 ACTIONS

5. In June GRPE session, Document GRPE/19 (regarding complete revision of R.115) was adopted and agreed and is now tabled for adoption 10-13 November 2009 at WP29 (Document ECE TransWP29/2009/117) (Proposal for supplement 4 to Regulation 115 (Specific LPG and CNG retrofit system).
6. Regulation 83 is to be aligned with the European Regulations Euro 5 and Euro VI and is under discussion about the format. (The issue for conversion companies is that their procedures are linked to R.83 and not Euro 5 or VI.)
7. Regulation 49 (Emissions of Compression Ignition (CI) and Positive Ignition (PI) LPG and CNG Engines) (GRPE 2009-14, with new reference for WP29) also is on the agenda for the WP29 meeting.
8. Mr. Radzimirski filled in the Template for Ranking Priorities and Develop a Work Program, (Numbered originally as GFV 07-05 from 9 June 2009 meeting in Geneva)

V. NON-METHANE HYDROCARBON (NMHC) REGULATION & RESULTS OF TESTING PROGRAMS

Documentation: Working paper GFV-08-03 (submitted 24.11.2009) JRC report on emissions testing; TNO report on their test results will be made available shortly.

9. Henk Dekker presents preliminary findings from the vehicle emissions testing performed by TNO.

- Henk Dekker presents the report *"Evaluating CH4 Emissions performance of OEM versus retrofitted CNG Vehicles (TNO)"*.(Final working paper yet to be submitted by TNO.)
- Four vehicles tested: one OEM CNG vehicle; two retrofitted CNG vehicles; and one OEM petrol vehicle.
- Results include efficiencies of the CNG and petrol catalysts for CH4, THC, and for hot and cold start as well. (Results were measured pre-catalyst and post-catalyst)
- On the NEDC cycle the efficiencies on the retrofit vehicles dropped.
- Conclusion from TNO: Methane catalyst efficiencies ranged between (KI factor) 0.14 and 0.48. It would be better to measure CH4 output and not the catalyst efficiency.

10. Aldo Bassi presents the results of testing performed by the Italian NGV industry at the European Commission's Joint Research Center (JRC) premises in Italy. Working paper GFV-08-3
    - Total HC efficiencies were measured to calculate the K factor.
      Two vehicles tested (both Fiat Grande Punto Euro 4): OEM vehicle bi-fuel CNG/gasoline in production line equipped with CNG catalyst and retrofitted vehicle bi-fuel CNG/gasoline with retrofit system.
    - Test cycle NEDC (ECE + EUDC), with reference fuel G-20. OEM vehicle tested with original CNG catalyst and a second test with CNG catalyst and gasoline catalyst. Retrofit vehicle tested with original gasoline catalyst and then second test replacing gasoline with CNG catalyst. Every test for each vehicle was repeated twice.
11. Discussion regarding the two sets of tests: Italian measuring THC and TNO measuring CH4 (the THC from NMHC) differs. In the proposed formula in the amendment the conversion efficiency of methane is applied. The fundamental reason to introduce the K factor is because the gasoline catalyst does not effectively catalyze the methane. Because we don't have a dedicated methane catalyst on a (OEM) gasoline vehicle, the measurement must be on efficiency of converting methane, and not necessarily the THC.
12. Another difference in the testing was that the TNO vehicles started on petrol and switched to natural gas after 130 seconds; the JRC tested vehicles switched to natural gas almost immediately. New regulations will stipulate 90 or 60 seconds max switchover time limit from petrol to natural gas.
13. The test results should be merged and compared, showing efficiencies and comparability as a technical document. Then it can be presented before the next GFV meeting in Geneva. There is agreement that a proposal is not submitted too early until a full evaluation is possible.

VI. R115 PROPOSAL FROM AEGPL

Documentation: Working paper GFV-08-2

14. The group went through the Working paper GFV-08-2 Submitted by the AEGPL.
15. Working paper summarizing the agreed points by the group will be made available.

VII. OTHER ITEMS

16. REGULATION (EC) No 595/2009 on type-approval of motor vehicles and engines with respect to emissions from heavy duty vehicles (Euro VI). A proposed Commission Regulation regarding reference fuels, including LPG and natural gas/biomethane, has

been submitted by the EC to the Motor Vehicle Emissions Group (MVEG) meeting on 26th September. For LPG the proposal is to take the reference fuels from the light duty regulation and apply them to HDV LPG vehicles (since they mostly will be light-duty derived vehicles). A footnote was included at request of AEGPL in case an engine manufacturer wants to have vehicles running with higher compression ratios.

17. Requalification of CNG Cylinders. Mr. Rijnders explained that in the Netherlands manufacturers do not provide information about their tank re-qualification requirements, as specified in Regulation 110. So inspectors and consumers do not know when the different types of tanks must be re-qualified and what the testing requirements are (i.e. visual inspection, hydrostatic re-test, etc.). (See cylinder labeling requirements from R.115. 7.1.5.1.11 (d) and in R.115, 7.1.7.2.). The national vehicle inspection authorities do not always know the requalification parameters.
18. Dual Fuel systems. There is more interest among manufacturers to produce dual fuel natural gas systems. The OEMs should be coming with their suggestions as to how to test HD dual fuel engines. (TNO is involved in a project regarding dual fuel systems.) The International Energy Agency also has expressed an interest in dual fuel (Advanced Motor Fuel working group at IEA). Information will be presented at an IEA conference in Bangkok on 17th-20th November.

VIII. NEXT MEETING OF GFV

19. The next meeting of the GFV initially scheduled during the next GRPE (January 2010) needs to be postponed to a yet-to-be-determined date in February 2010 in Brussels due to a conflict that developed during GRPE week with LDHTP meeting scheduled at the same time as the GFV meeting.

IX. CLOSURE

20. Mr. Rijnders thanks the participants for attending and for their input and discussion.

Annex 1

Participants 14 October 2009

- André Rijnders, Chairman (NL. RDW)
- Arnaud Duvielguerbigny, Co-secretariat (AEGPL)
- Jeff Seisler, Co-secretariat (IANGV/Clean Fuels Consulting)
- Henk Dekker, (TNO)
- John May (AECC)
- Salvatore Piccolo (Assogasliquid/Federchimica)
- Petter Asman (European Commission) [to mid-afternoon]
- Aldo Bassi (NGVA Europe/NGV System Italia/IANGV/ISO)