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United Nations Economic Commission for Europe

‘Workshop’ on Heavy Duty Dual-Fuel Retrofits

Informal Group on Gaseous Fuelled Vehicles (GFV)

13 December 2012

Brussels

André Rijnders

Chair of GFV



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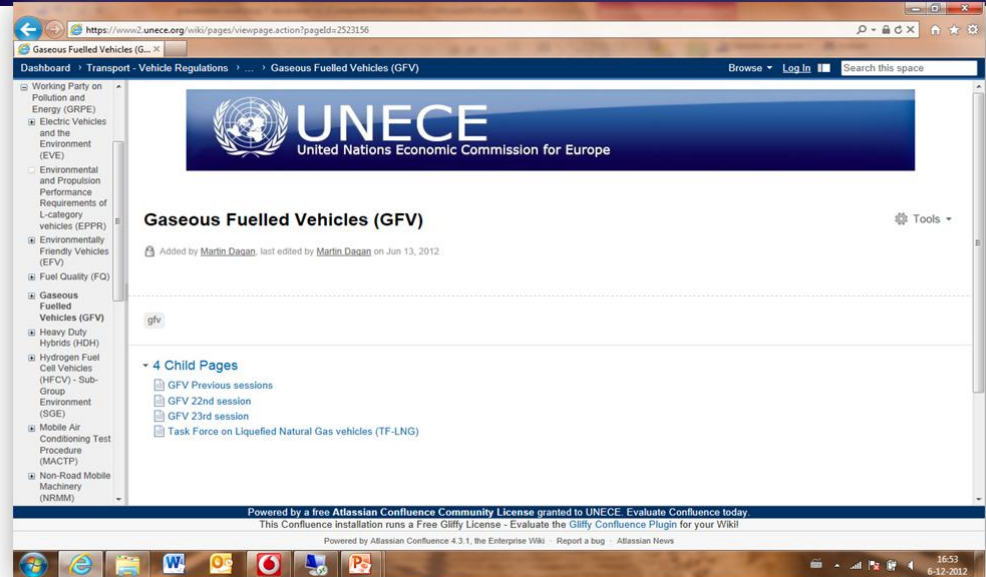
Purpose of the Retrofit Dual-Fuel Workshop

Explore the perspectives on Heavy Duty Dual-Fuel (HDDF) retrofit systems by Retrofit System Manufacturers and Vehicle Manufacturers.

View of authorities in respect with Heavy Duty Dual-Fuel retrofits.

Consider the work being done by the Heavy Duty Dual-Fuel Task Force (HDDF TF) within the GFV.

The results of this workshop will provide input to the HDDF TF, GFV, and the UNECE Group of Experts on Pollution and Energy (GRPE) as to next steps for retrofit HDDF regulations.



- **GRPE Informal group on Gaseous Fuelled Vehicles (GFV)**
 - All gas related emission items
- **2 task forces**
 - Heavy Duty Dual Fuel (HDDF-TF)
 - LNG



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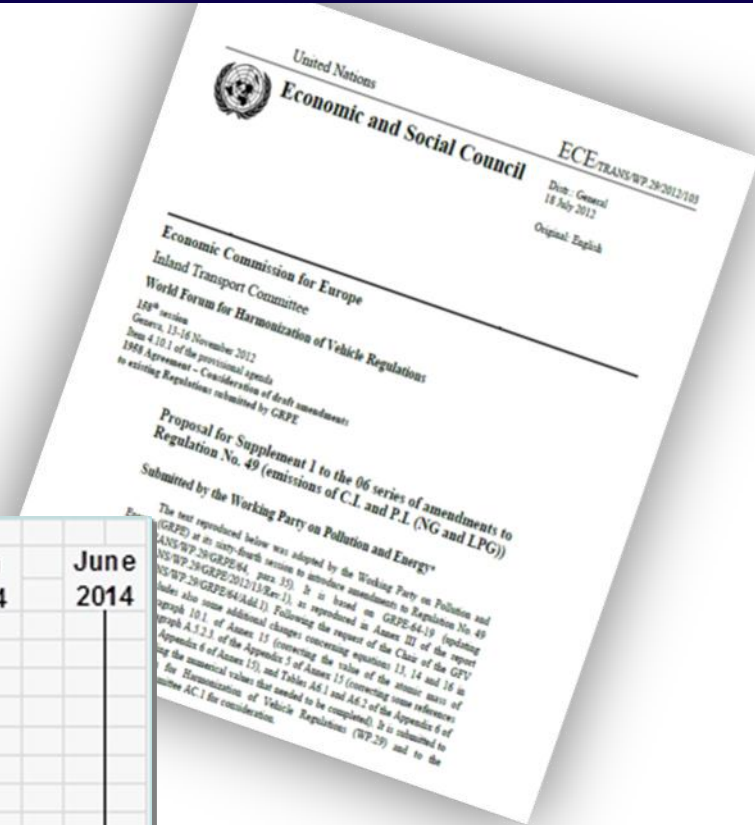
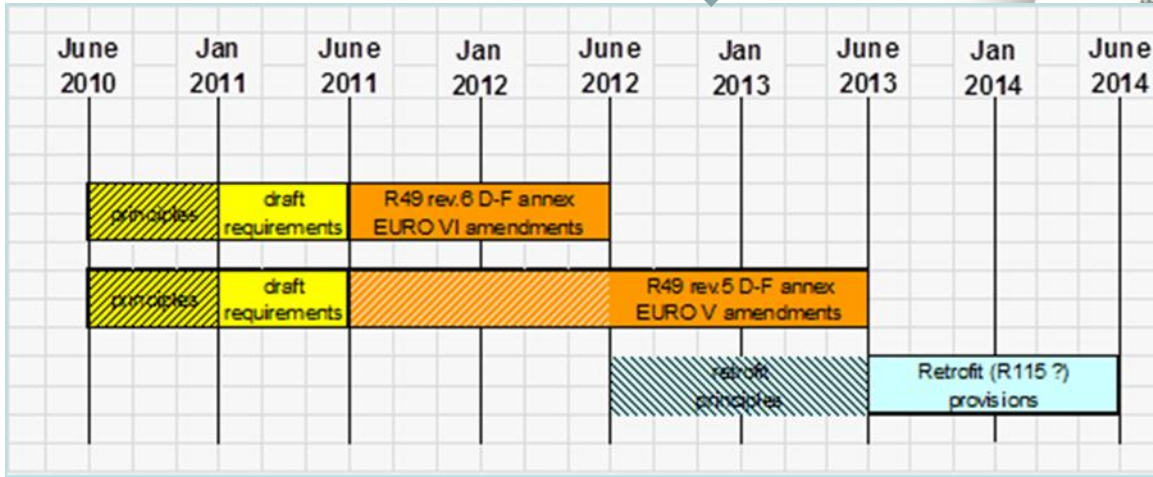
Heavy Duty Dual-Fuel Task Force

UNECE R.49 rev 6 (Euro VI)

UNECE R.49 rev 5 (Euro V)

UNECE R.85 (net power)

UNECE (R.115) retrofit LPG/NG





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Dual-Fuel (gaseous/diesel) Engines

Retrofit system manufacturers convert trucks in use.



**What are National Authorities doing today?
NL, Italy, Germany, Uk, Sweden, etc.**



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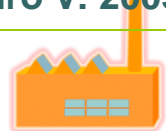
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Registration and Retrofit

OEM

Euro V: 2005/55/EC

Diesel
COC

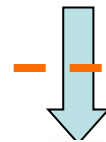


Registration diesel
(COC/WVTA)



WVTA 2007/46/EC

National registration



Emission check
Safety check



Authority



diesel

Retrofit System manufacturer



gas



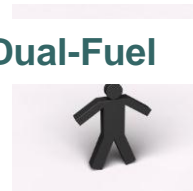
National



Change of registration
into dual-fuel



Dual-Fuel



Dual-fuel



UNECE retrofit requirements

Conversion of a type approved trucks/engine

No OEM responsibilities anymore?

Overrule national requirements (prohibition)?

Most severe requirements needed?

because it should be acceptable for all parties (incl. EC)

Should it be restricted for HDV only and for old type approvals Euro III, IV, Euro V and not applicable for and VI trucks?

Should avoid competition between OEM and retrofit



10.00 Meeting Commences

- Welcome and introduction, André Rijnders (RDW-NL), Chairman of the GFV

10.15 -11.15 Perspectives on HDDF retrofit systems

- Dual-fuel system manufacturers will give their views.

11.15 -11.30 Coffee Break

11.30 - 13.00 National regulatory approaches to retrofit HD dual-fuel systems

- National authorities will give their views. (NL, DE, UK, SE, IT)

LUNCH 13.00-14.15.

14.30 - 15.00 U.S. EPA & European Commission regulatory approaches to gaseous fuel retrofits

- US EPA three tier approval scheme for gaseous fuel retrofit systems,
- DG Enterprise, European Commission view on HDDF regulations, (Bernardo Martinez)

15.00 – 16.45 Discussion

(including 16.00-16.15 Coffee Break)

How should heavy duty dual-fuel retrofit requirements be handled?

- Internationally (UNECE) or only at the national regulatory level?
- Regulatory framework proposed?
 - R.115 or a new regulation?
 - (Euro V? Euro VI?)
 - Only engine type 2B?
 - Others?



- Technical requirements:
 - Family definition developments (EGR and SCR separate)
 - System approval
 - Vehicle approval
 - Emission limit values
 - OBD & inducement remaining operational
 - Engine testing/PEMS/SEMS testing
 - Durability / in-service (Retrofit Emissions Control (REC) relationship)
 - In-service conformity (?)
 - In use compliance (?)
 - Other
- Organizational approach & expertise required to create the regulations
- Timing of the work to be performed
- Other issues of concern

16.45 – 17.00 Conclusions & Closing Remarks,

- André Rijnders, Chairman GFV



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