TFEIP Transport Expert Panel  
Stockholm, May 2, 2011

Agenda

Welcome to the Panel meeting and update on 2010-2011 workprogramme  
L. Ntziachristos (LAT)

New COPERT developments  
L. Ntziachristos (LAT)

Recent research results concerning tires, brake and surface wear  
S. Hoehn (BAFU)

Alternative Fuels  
Ch. Sandstroem-Dahl (AVL-MTC)

Road transport inventory of Serbia  
N. Redzic (EPA Serbia)

EUROSTAT projects relating to transport GHG emissions  
M. Wrzesinska H. Cloodt

Update of AEIG chapter on aviation using new info from work done on ETS  
A. Astorino (EUROCONTROL)

The AEM model for aviation emissions  
M. Whiteley (EUROCONTROL)

Plans for next year and close of meeting  
Chairs

Minutes

The TFEIP transport panel was opened with the presentation of the Agenda.

1) Leonidas Ntziachristos presented the update of the work programme 2009-2010:
   - some activities have not started yet, as the update of the cold start methodology and the update of the NMVOC speciation;
   - some activities have been completed, as the development of the TIER1 road transport methodology in the Guidebook;
   - some activities are in course and will continue next year, as the work within the ERMES group to share road transport data and methodologies, the work with EUROCONTROL to improve the aviation chapter and emission estimates, the comparison between real LTO time and ICAO’s, the work to feed the NAMEA’s requirements.
   For the remaining activities, proposals have been presented, either last year or this year; in particular the update of heavy metals and non-exhaust PM emission factors, and the effects of biofuels and alternative fuels.

2) On behalf of Penny Dilara, Leonidas Ntziachristos provided a brief update on ERMES activities.

3) New Guidebook developments for Road transport have been introduced by Leonidas, in particular:
   - the update of NOX, EUROIV and EUROV Rigid HDV emission factors and the introduction of EGR and SCR technologies (a default percentage of EGR equal to 23% has been assumed on the basis of market information). As a consequence of this update, NOX emissions result higher than the expected figures and that is related to a reduction in fuel consumption and CO2 emissions of the vehicles. For some countries, the impact of the update of the software on estimates and projections has been calculated (e.g. for Austria it is equal to 4% on national total in 2009). The issue of the differences between the expected reduction in emissions related to the new
technologies and the availability of measured values higher than the expected, especially for road transport is particularly critical in the framework of the update of the Gothenburg Protocol (e.g. for the determination of Parties emission ceiling) and could be solved only with the introduction of a flexibility mechanism in the Protocol;

Other planned updated of the software will regard the chapter on bio fuels (Ethanol, ETBE, MBTE). It has been observed that these fuels could not be completely bio, and this could affect the calculation of CO2 emissions. It has been noted also that the information on fuel consumption could not be sufficiently clear and a request of clarification to EUROSTAT is needed (maybe in the frame of the WG1).

Also the production of CO2 emission factors for vehicles with the SCR Urea technology is planned (not a high contribute), as the CO2 emissions from lube oil calculation, and the N2O from diesel vehicle SCR De-NOX equipped. In this last case it has been noted that emissions could reach 20% of total CO2 equivalent emissions of the vehicle if working bad.

Regarding the EV vehicles and rechargeable vehicle a description of technologies will be introduced in the chapter of the guidebook.

Concerning Heavy Metals sources of emissions, more discussion is needed especially on the comparison of different references and on the consideration of HM emitted also if not in the fuel.

LPG/CNG conversion: it should be highlight that retrofitted vehicles have higher NOX emissions of gasoline fuelled vehicles and comparable with EURO3 and 4 diesel fuelled.

Regarding HCB emission factors an update of the guidebook is needed to clarify when they should be used to estimate emissions: an analysis of the reporting of countries is planned.

4) Sophie Hoehn (FOEN) reported on a research work regarding the non-exhaust PM10 EF for road transport. The Abrasion PArticles produced by Road Traffic (APART) study was conducted in Switzerland in 2009 to investigate PM10 non exhaust emission factors because of the weight of these emissions on total PM10 from road transport is expected to increase. Emission factors were calculated for brake wear, road surface wear and tyre wear; resuspension also was estimated resulting in a big impact especially for heavy duty vehicles (HDV) in urban while for highway the distribution of emissions between exhaust, non exhaust and resuspension is not different for the vehicles categories.

Emissions from brake wear are also important in urban streets while road surface are negligible and tyre wear bigger than pm10 exhaust emissions. The comparison with the Guidebook (GB) shows that, for passenger cars, emissions are lower than those in the GB while for HDV are higher only for brake wear (in urban) and lower for road surface. The paper has been published on Atmospheric Environment.

5) Charlotte Sandstrom-Dahl (AVL) did a presentation on alternative fuels. AVL is a company developing powertrain system with internal combustion engines and test systems and coordinate work on alternative fuels for Sweden. In the framework of the European GHG emission reduction policies and measures, it is expected a strong increase of alternative fuels consumption in Europe in the next years. Research studies should regard EFs, testing both LDV and HDV vehicles, and evaluating the effects on emissions different than CO2 of ethanol (as low blend in petrol), E85, biodiesel, methane (CNG, LNG, CBG and LBG) and LPG fuel use. Research issues have been shared within the ERMES group, emission standard EURO4 and later have been considered, results by fuel driving cycles and test temperatures have been analyzed. First results show that E85 compared to gasoline (E5 conventional fuel) emits more CO and HC in the regulated cycle and less in the ARTEMIS cycle, both urban and road driving, while the opposite for NOX (with large uncertainty). E85 fuel consumption is about 30% higher but CO2 is slightly lower.
6) Nebojsa Redzic (Serbian EPA) presented the COPERT4 application for Serbia. The work has been done in cooperation with University of Belgrade and official transport institutional departments. The time series 1990-2009 has been estimated and 2010 is under preparation. Information has been collected by questionnaire from 8500 private car owners while 40,000,000 records data from the Ministry of internal affairs have been analyzed. The road network in highway and urban areas (from Corine Land Cover data) gridded at 10x10 km2 has been used to distribute emissions from the model on the Serbia map. The increase of the volume of freight and passengers transported is an indicator of the economical increase and the times series, especially for freight, reflect the trend of Serbian economy. It was necessary to clear the database of vehicles to correct gaps and inconsistencies. Average annual mileages have been estimated on the basis of the interviews and questionnaires (including question on petrol leaded vs unleaded which is not available in the official statistics). The main result is a general increase of emissions due to the increase of mileages and vehicles. A strong decreased in 1993 and 1999 has been observed (maybe statistical error, cars not registered). VOC and CO started to decrease in 2006, due to an higher quality of fuels sold and NOx from 2008, while the other pollutants increase. A sensitivity analysis has been done comparing the results with another calculation using default values showing in general higher emission results applying the COPERT model. The research highlighted the need for improvement of basic data vehicle according to the EU regulation supplied, also because 50%-70% of old cars are imported.

7) EUROSTAT, Monika Wrzeniska presented the projects that are currently being run by EUROSTAT related on transport. There are projects related to maritime, aviation, freight and mobility of passengers. A lot of data may be already useful in the framework of the inventory compilation, such as road freight vkm. More data are expected to become available soon, such as mileage according to vehicle type and age. The long term target is to have activity and emission data available for public use.

8) EUROSTAT, Hubertus Clodt presented a EUROSTAT project in developing a portal on aviation emissions using data from EEA, EUROCONTROL and the AEIG methodology. This is an internal project in EUROSTAT aiming to act as a showcase of capabilities and possibilities of organizing such data in a centralized way.

9) EUROCONTROL, Antonio Astorino, presented a revised methodology to calculate fuel consumption and CO2 emissions from all flights in Europe. The model calculates real fuel consumption of a flight which can be quite variable for the same O-D and aircraft type because of initial weight, actual distance travelled, weather conditions, pilot behavior, etc. The model is robust for common aircraft type and more uncertainty for less popular ones. The methodology applied will become available in the AEIG relevant chapter through a collaboration of EUROCONTROL with JRC. It does not cover other pollutants.

10) EUROCONTROL, Mark Whiteley, presented the EUROCONTROL model that can calculate emissions of aircraft (AEM). In conjunction with EUROCONTROL's global flight movement data base (WISDOM), AEM has been used to calculate CO2 and NOx emissions for the entire globe and this information is available via a web-portal (INVENTAIR), which is publicly available. Future applications of AEM include the SESAR project. It could also be used to calculate emissions in the context of an emissions inventory portal. AEM is available for use by paying a small, one-time fee.