EUROPEAN COMMISSION
ENTERPRISE AND INDUSTRY DIRECTORATE-GENERAL

Consumer Goods and EU Satellite navigation programmes
Automotive industry

Brussels, 08 April 2010
ENTR.F1/KS D(2010)

European feed back to USEPA proposal for WLTP test procedure work submitted on 15 March 2010

1. GENERAL

The European stakeholder group for the WLTP process (EU-WLTP) acknowledges that USEPA has submitted its existing test procedure as a basis for the discussions in the WLTP-DTP group. Notwithstanding any future specific comments, which may come up during the detailed discussions, EU-WLTP wants to highlight three issues that have to be considered from the start:

1.1. Flexibility of USEPA procedures

EU-WLTP has some concern about the high degree of "flexibility" of USEPA test procedures. The legal text seems to describe test methods with relatively high margins and to allow for "alternative" procedures, if they are agreed between approval authorities and vehicle manufacturers. While such approach seems to work in the US system with a central approval authority, it is expected to create significant difficulties in the EU, where 27 national authorities issue type approvals, with only loose co-operation and information exchange (if at all) and sometimes even in a competitive environment.

For EU-WLTP it is of high importance that "default" test procedures of the WLTP-GTR are defined with sufficient accuracy and future European legislation can refer to them in an editorially transparent and consistent manner. In addition to the "default" test procedures the WLTP-GTR may also have more flexible provisions, which individual contracting parties (e.g. US) may use for their regional purposes.

1.2. Reference to standards and units of measurements

EU-WLTP has noticed that the USEPA proposal mainly refers to American standards, e.g. for material properties or physical and chemical measurements. Since the future WLTP-GTR will be an international document, such references should be changed into ISO standards. If no appropriate ISO standard exists, it should be investigated whether an existing regional standard can be converted into an ISO standard.

Only in exceptional cases references to regional standards should be made, preferably offering several alternatives (e.g. Japanese, EU and US standard). In such cases it has to be ensured that the regional standards are accessible for

Commission européenne, B-1049 Bruxelles / Europese Commissie, B-1049 Brussel - Belgium. Telephone: (32-2) 299 11 11.
Office: BREY 10/027. Telephone: direct line (32-2) 2958557. Fax: (32-2) 2969637.

E-mail: nikolaus.steininger@ec.europa.eu

reasonable costs and their further development is open for the collaboration of international experts.

In addition it is essential that international SI units of measurements are used everywhere.

1.3. Costs of implementation

EU-WLTP has some concerns about the costs of implementation of test procedures, which are based on the USEPA proposal, in an EU environment, since it may require type approval authorities and vehicle manufacturers to buy new test equipment without a direct benefit for the quality of tests. The relevance of these general concerns has of course to be assessed on a case-by-case basis, for the moment EU-WLTP would however like to raise a certain general reservation.

2. SPECIFIC ISSUES THAT SHOULD BE ADDRESSED BY WLTP-DTP

In addition to existing test procedures EU-WLTP would like to address the following issues during the work of WLTP-DTP.

2.1. NO_2 measurements

NO_2 concentrations in ambient air, which are regulated by the European Air Quality Directive, are considered to become a health problem in many urban locations. NO_2 concentrations in urban "hot spots" are believed to be mainly determined by direct NO_2 emissions. In addition, catalytic DPFs and new combustion technologies, which are expected to penetrate the markets during the next few years, lead to higher tailpipe NO_2 emissions.

It might therefore be necessary to regulate NO_2, either by a specific limit value or as percentage of total NOx emissions and an appropriate test procedure for type approval should be developed.

2.2. More differentiated measurements of hydrocarbons (HC) , e.g. methane or oxidised hydrocarbons like ethanol or aldehydes.

Today total HC emissions are determined by the FID method, where a single signal is used to determine the HC mass emissions, making some assumptions about the relative concentration of different chemical HC components in the exhaust stream and the component-specific FID sensitivities. Such approach seems to be valid for vehicles operated with traditional fuels, for which the relative concentration of different chemical HC components in the exhaust stream is expected to be similar for all engines. In these cases the emitted total HC mass should be a good indication for environmental/health effects and can be used as the parameter to be limited by regulation.

This conclusion is not true anymore for "novel" bio- or gaseous fuels, which become increasingly relevant on the market and whose chemical composition is substantially different from petrol and diesel, resulting in a different spectrum of emitted HC components. For example, the current mass-based regulation of HC emission "penalises" ethanol vehicles, since due to its molecular weight ethanol has a strong contribution to the emitted HC mass,

which is (probably) not justified by its environmental/health effects. On the other hands there may be HC components, like aldehydes, which are not properly detected by the FID method and "escape" the HC regulation.

In the future therefore a more differentiated regulation of HC components rather than a mass-based limit for total (or total non-methane) HC emissions should be considered. Obviously such regulation would have to be based on environmental and health effect assessments of different HC components, the whole complexity of which is probably beyond the scope of the WLTP-DTP group. If however a more differentiated regulation of HC component emissions should be possible at all, as a precondition appropriate measurement procedures must be available.

The WLTP-DTP group should therefore address the following tasks:

– Identify groups of HC components, which should be regulated separately, taking into account known environmental/health effects and the HC component emission spectrum of "novel" fuel vehicles.

– Develop cost-efficient methods to measure these groups of HC components separately at type approval.

2.3. Particle number measurements

In addition to particle mass limits, European type approval legislation sets limits for particle number (PN) emissions. Therefore, in principle the future WLTP GTR should include procedures for the measurement of particle numbers, possibly as optional procedures that may or may not be implemented by individual contracting parties on a regional level. Alternatively PN emission measurements could be excluded from the WLTP GTR and defined on a regional level.

If they are considered for the WLTP GTR, WLTP-DTP should revise and possibly extend existing PN measurement procedures. In particular the following questions should be addressed taking into account recent scientific research about environmental/health effects as well as technical feasibility of measurement procedures:

– Lower limit of particle size, i.e. should particles smaller than 20 nm be taken into account?

– Volatile particles: should they be taken into account?

– Chemical composition of particles: is it necessary/possible to differentiate particles according to their chemical composition (e.g. carbon, metal oxides, sulphides)

2.4. Ammonium measurements

WLTP-DTP should develop an ammonium measurement method that could be applied to vehicles equipped with a SCR-system.

2.5. Electric (EV) and hybrid (HEV) vehicles

USEPA seems to suggest the use of the respective CARB procedures. For EU-WLTP the availability of accountable test procedures for EVs and HEVs that are harmonised on an international level is essential.

Among others the following issues should be addressed:

2.5.1. Test cycle (for determining pollutant and CO_2 emissions and electric consumption, if applicable). Amongst others the following issues need to be addressed:

- WLTP-DTP should define criteria ensuring that the balance between electric and combustion engine use of HEV in the test cycle properly reflects the real driving situation and can not be manipulated.

- Procedures for the determination of the state of charge (SOC) of the battery as well as the (positive or negative) work of the battery over the test cycle should be defined.

- Pollutant and CO_2 emissions and electric consumption should be measured and recorded separately.

- For non-plug-in HEVs: correction procedures for emissions according to the work of the battery over the test cycle should be defined

2.5.2. Electric range & battery charge duration determination

The electric range and battery charge duration are main purchase criteria for an EV or plug-in HEV, therefore the availability of internationally comparable information is important.

The WLTP GTR should define an "electric range driving cycle (ERDC)" for determining the electric range, which will probably be a repetition of the emission test cycle. While the driving pattern of the ERDC as such will have to be developed by WLTP-DHC (and there is a priori no reason, why the driving pattern should be different for EV, HEV and combustion engine vehicles), the WLTP-DTP group will have to define (for example):

- the pre-conditioning of the vehicle,

- ambient conditions, like temperature (probably it makes sense to determine the electric range at different temperatures, e.g. at 0° C and 20° C),

- break-off criteria (i.e. will the end of the electric range of a plug-in HEV be determined by the first start of the combustion engine or the "complete exhaust" of the battery)

Similarly methods for determining the duration of charging the battery (e.g. from a well-defined "exhaust" state to "full charge"), possibly under different ambient conditions, should be defined.

3. PRACTICAL ARRANGEMENTS

3.1. Definition of tasks

It appears necessary that the separation of tasks between the WLTP-DHC and WLTP-DTP groups is well-defined from the very beginning to avoid double work and contradictions. Potential overlaps exist for example with respect to the determination of certain test cycle elements like the preconditioning of vehicles, soaking (if applicable) or idling periods, possibly even with respect to the gear shift procedures.

It is suggested that WLTP-DTP & -DHC prepare a more precise definition of the respective responsibilities of the two groups in fields where potential overlaps exist and submit it for approval by the WLTP informal group..

3.2. ACEA comments

The European vehicle manufacturers association ACEA has announced a detailed technical note on various aspects of the USEPA test procedures, which should be submitted for the discussions of the 1st WLTP-DTP meeting in April 2010. EU-WLTP wants to emphasise that this note does not necessarily reflect a common European position, which is agreed by Member States and the European Commission.

EU-WLTP recommends however to accept the ACEA note as a basis for the technical discussions.

3.3. Organisation of work

Due to the high technical variety of the tasks to be performed EU-WLTP would recommend to organise the work of WLTP-DTP into various sub-groups dealing with specific issues, e.g. the definition of a NO_2 or new HC measurement procedures. These sub-groups could meet independently and could be chaired by experts from the stakeholders, which have the most experience and/or interest in the specific matter. Organising the work in this way could substantially reduce travel expenses and expert resources.

The main WLTP-DTP group would then be responsible for the overall co-ordination of the sub-groups, the consistent drafting of the procedures and possibly for dealing with the development of some issues of a more generic nature (e.g. reference to standards).