Low Temp Task force Agenda

<table>
<thead>
<tr>
<th>Date</th>
<th>September 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>From Monday, 12th at 10:30 h to Tuesday 13th at 15:30h</td>
</tr>
<tr>
<td>Informal Document</td>
<td>Agenda Low Temp TF 2016-09-01</td>
</tr>
</tbody>
</table>

Location: Room Hermes; Visitors centre - Ispra
12th September

<table>
<thead>
<tr>
<th>Time</th>
<th>Agenda item</th>
<th>Lead/ contributions</th>
<th>Working Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30</td>
<td>Welcome Coffee and networking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00</td>
<td>Introduction and presentation of Terms of Reference; Mandate (Background &amp; purpose)</td>
<td>Coordinator JRC</td>
<td>ToR WLTP doc 14-14e</td>
</tr>
</tbody>
</table>

See WLTP-16-15e
(and previous ToR WLTP-14-14e)
WLTP Phase 2a

Supplemental tests

**Boundary Conditions**

Low and realistic winter temperature
Correction of R/L and fuel specifications

Ref = phase 2 document on “items & Schedule”

**Jan 2016**
IWG-WLTP: phase 2 (2017-2018?)

Overview of Task Forces in WLTP Phase 2

Please refer WLTP-13-08e for carryover items responsibility. JAPAN is willing to lead the “Cycle”, “EVAP”, “OBD” TF and “SG EV”.

Completion timing: Phase 2a Phase 2b
Low Temp TF Representation:

@araiindia.com
@adviron.de
@volkswagen.de
@utacceram.com
@ford.com
@tno.nl
@tno.nl
@minienm.nl
NL (Ministry I&M)
@rdw.nl
@clepa.be
@valeo.com
@daimler.com
@toyota-europe.com
@bmw.de
@hyundai-europe.com
@volvocars.com
@renault.com
@transportstyrelsen.se
@aecc.be
@horiba.com
@mpsa.com
@denso.be
@denso-auto.de
@opel.com
@n.t.rd.honda.co.jp
@jrc.ec.europa.eu
Low & Realistic Winter Temperature Task Force

Terms of Reference:

WLTP 14th meeting (doc no. 14)

1. Background & introduction
2. Mandate &
3. Terms of Reference
   3.1 Subgroup LowTemp-Emis &
   3.2 Subgroup LowTemp-Range
The purpose of the low temperature test is to check the level of specific pollutant emissions of vehicles in conditions that may easily be encountered during the winter season.
Test procedure should assess the impact of low temperature on the efficiency of after-treatment devices or other emission control technologies.
In order to properly reflect the conditions that are encountered in real world winter conditions, the road load should be representative of the increased resistance to progress at low temperatures due to the higher air density and other factors.

... A proper procedure to define the road load and consequently the dyno settings should be developed.
Should emissions be predominantly measured during the cold start and immediately after or during the whole WLTC cycle?
Low temperatures largely affect the range of electrified vehicles as a consequence of a reduced efficiency of the battery and also due to the additional energy consumption from auxiliaries (i.e. heating system).

However this is an important element for the information to customers whose choice at the moment of the purchase of an electrified vehicle can be heavily influenced by the available range.
Low & Realistic Winter Temperature Task Force

Terms of Reference:
WLTP 14th meeting (doc no. 14)

1. Background
2. **Mandate**
3. **Terms of Reference**
   3.1 Subgroup LowTemp-Emis &
   3.2 Subgroup LowTemp-Range
Mandate of the Low-Temp Task Force

be chaired by the European Commission;

be open to all experts, stakeholders and CP representatives that have an interest in WLTP;

act as a platform for the exchange of information and contributions of stakeholders, to be discussed and agreed during the development process;
WLTP Phase 2a
Minutes from the WLTP 14th PARIS, April 2016

See document
MINUTES of the 14th WLTP IWG Meeting
WLTP-14-24e

Including reference to Document WLTP 14-14e (ToR Low Temp TF)
IWG-WLTP: phase 2 (2017-2018?)

Overview of Task Forces in WLTP Phase 2

- **Cycle**
  - Classification & Gear shift
  - Normalization
  - Driving index

- **Supplemental test**
  - Low & Realistic winter temp
  - High altitude
  - MAC & Other Auxiliary device
  - Eco-Innovation
  - Crankcase & Idle

- **EVAP**

- **Durability**
  - ICE
  - HEV & PEV

- **OBD**

- **In Service**
  - COP (Emissions/CO2)
  - ISC (Emissions/CO2/Roadload)

Please refer WLTP-13-08e for carryover items responsibility. JAPAN is willing to lead the “Cycle”, “EVAP”, “OBD” TF and “SG EV”.

Completion timing: Phase 2a Phase 2b
Supplemental Tests:
(incl. **Low temp. & high altitude tests**, Auxiliary devices, Eco-Innovations, Crankcase & Idle)

- Starting note/overview by **C. Astorga-Llorens** (WLTP-14-14e)
C. Astorga gives a brief overview on the issues that will be dealt with in phase 2a and 2b and presented a first draft for terms and references.

**Priority in phase 2a:** *High altitude and Low & realistic Winter temp.*

**Low & realistic winter temperatures:**

**Background:** ICE, emissions, EV temperature has an effect on EV vehicles.

**Issues:**
- Whole cycle, or parts of the cycle?
- Road load should be representative: Dyno setting should be developed.
- Efficiency of the battery (EV vehicles) – consumer information on electric range.
Mandate of the Low-Temp Task Force (3)

report to the WLTP-IWG on the progress;
deliver technical advice and a GTR text proposal;

focus only on the technical issues regarding the procedure to be developed, while political decisions are made at the WLTP-IWG level.
Mandate of the Low- and realistic Temp Task Force (2)
develop a harmonised low and realistic
temperature test procedure (Type 6 test) for the assessment of the emissions of specific pollutants in conditions that may be easily encountered during the winter season;

propose a harmonised test procedure to assess the impact of low temperatures on the range of electric vehicles for a proper information of the consumers;
Low & Realistic Winter Temperature Task Force

Terms of Reference:
WLTP 14th meeting (doc no. 14)

1. Background
2. Mandate
3. Terms of Reference
   3.1 Subgroup LowTemp-Emis &
   3.2 Subgroup LowTemp-Range
Presentation of 2 subgroups as defined in the ToR
Subgroup LowTemp-Emis
Subgroup LowTemp-Range

Not accepted
one in charge of the procedure for assessing the pollutant emissions in conventional and electrified vehicles (LowTemp-Emis)

the second in charge of the procedure for assessing the impact of the low temperature test on the range of electrified vehicles (LowTemp-Range)

6 October 2016
Proposal not accepted:
Only one group?

See minutes of the kick off meeting

Only one group in close collaboration with the EV group for what it refers to Low Temp and Range?
The scope of the activity of this sub-group is the development of a test procedure to check specific pollutant emissions. The specific objectives are the following:

Define the temperature at which the low temperature test should be carried out in order to be representative of realistic winter temperatures.

Define the driving cycle to be used for the test at low temperature and more specifically whether the whole WLTC cycle should be used or just the first phase(s).
Define the procedure for the adjustment of the road load and consequently of the dyno settings.

Define the test procedure to measure the distance specific emissions of the following pollutants: total HC, CH4 and NMHC (??), CO, NOx and Particle Number.

Define specific provisions to extend the low temperature test to diesel and hybrid vehicles.

**OBJECTIVES OF THE Subgroup LowTemp-Emis (2)**

GHG ??? CO₂
The scope of the activity of this sub-group is the development of a test procedure to determine the impact on the range of electrified vehicles at low temperature.

Define the driving cycle to be used for the test at low temperature and more specifically whether the whole WLTC cycle should be used.
OBJECTIVES of the Subgroup LowTemp-Range (2)

Assess whether the shortened test procedure for range measurement is appropriate at low temperatures or develop a new procedure for range determination.

Develop a test procedure to assess the impact of auxiliary systems (e.g. heating device, ...) on the energy consumption and the range of electrified vehicles. A similar approach to A/C testing could be followed.
For both subgroups a general approach is proposed which can be adapted to the specific purpose of each deliverable.

- Start with an analysis of the existing normative and literature on the method;  
  - ok

- Prepare a **comparative analysis amongst the different regional** procedures;  
  - On-going

- Propose a way forward for the development of a harmonized procedure, including considerations on whether **there is need for experimental activities** and to what extent;

- Develop the **harmonized method**;

- **Validate** the method
<table>
<thead>
<tr>
<th>T  C</th>
<th>Cycle</th>
<th>Road-Load</th>
<th>Vehicles</th>
<th>Pollutants</th>
</tr>
</thead>
<tbody>
<tr>
<td>°</td>
<td>UDC</td>
<td>Determined at -7 C or 10% reduction of coast-down time</td>
<td>S.I. including hybrids + information regarding NOx after-treatment for diesel vehicles</td>
<td>HC, CO</td>
</tr>
<tr>
<td>-7.0 ±3</td>
<td>UDC</td>
<td>&quot;</td>
<td>&quot;</td>
<td>THC, CO</td>
</tr>
<tr>
<td>-7.0 ±1.7</td>
<td>FTP</td>
<td>Performing coast-down tests and calculating road-load coefficients</td>
<td>Otto-cycle and diesel including multi-fueled, alternative fueled, hybrid electric, and zero emission vehicles</td>
<td>NMHC, CO</td>
</tr>
<tr>
<td>-7.0 ±3</td>
<td>Low+ Medium of WLTC</td>
<td>Determined at -7 C or 10% reduction of coast-down time</td>
<td>S.I. + C.I. including hybrids</td>
<td>THC, CO, NOx</td>
</tr>
</tbody>
</table>
**Timing**

For subgroup LowTemp-Emis (to be agreed)

For subgroup LowTemp-Range (to be agreed)
### WLTP Phase2 Working Items and Schedule

**note:** Completion timing of Phase2a may have a chance to be shifted based on each item progress

<table>
<thead>
<tr>
<th>Working Items</th>
<th>brief description</th>
<th>remark</th>
<th>collaboration with EVE</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>gtr amendment</strong></td>
<td></td>
<td></td>
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<tr>
<td>CYCLE TF</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Classification&amp;Gear shift</td>
<td>Annex1&amp;2</td>
<td>downscale/gear shift per system power of HEV</td>
<td>Germany/Korea</td>
<td>✓</td>
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<tr>
<td>Power to mass ratio</td>
<td>n_min_drive</td>
<td>Annex1&amp;2</td>
<td>Definition of mass VCC proposal for n_min_drive</td>
<td>carryover from Phase1b</td>
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<tr>
<td>Normalization</td>
<td>Annex7</td>
<td>mainly ICE (remaining item)</td>
<td>ICE vehicles: completed by EU</td>
<td>Electrified vehicle: JAPAN will lead</td>
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<tr>
<td>Drive Index</td>
<td>Annex6</td>
<td>Collaborate with “Normalization”</td>
<td>re-visit necessity of trace index when apply normalization</td>
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<tr>
<td><strong>Supplemental Test TF</strong></td>
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<tr>
<td>Boundary Conditions</td>
<td>Annex6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low &amp; Realistic Winter Temp</td>
<td></td>
<td></td>
<td>Option</td>
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<tr>
<td>High Altitude</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Auxiliary Devices</td>
<td>Annex6</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>MAC</td>
<td></td>
<td></td>
<td>vehicle test? Component evaluation? Simplified test?</td>
<td>✓</td>
</tr>
<tr>
<td>others</td>
<td></td>
<td></td>
<td>vehicle test? Component evaluation? Simplified test?</td>
<td>Electrified vehicle: JAPAN will lead</td>
</tr>
<tr>
<td>Eco-Innovation</td>
<td>new Annex</td>
<td>i.e. sailing ....</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Crankcase &amp; Idle Emissions</td>
<td>new Annex</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td><strong>EVAP TF</strong></td>
<td>new Annex</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td><strong>Durability TF</strong></td>
<td>new Annex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICE</td>
<td></td>
<td>pollutants only (rapid aging method)</td>
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</tr>
</tbody>
</table>

**Jan 2017?**
## Open Questions #

| OQ 0 | Low & Realistic Winter Temperature Task Force WLTP 14th meeting (doc no. WLTP14-14) 
Background & introduction [correction done] 
HIGH ALTITUED NOT INCLUDED IN THIS TF 
COLLABORATION WITH OTHER TF OR GROUPS NEEDED |
|-------|---------------------------------------------------------------------------------------------------|
| OQ1   | **CP expectations including reference to the Scope of this TF (i.e. Environmenta? ...)** 
**Contacts on-going** |
| OQ2   | **Terms of Reference & Mandate of the TF – WLTP iWG** 
**Minutes of the 14th WLTP?** 
(A question on the existence of a mandate for the Task Force was raised by VW) |
| OQ3   | **Timing? 74th WLTP?** |
| OQ4   | **A Web- solution/ site to locate the information of the TF; 7 presentations were delivered during the Meeting** 
**Next meeting Nov 2016 (21st? 22nd in Paris?) OICA?** |
## Open Questions #

| OQ 5 | It was proposed that CP should state their willing and expectations regarding the work of this TF and stated that the test should be focused on environmental targets and achievements independently of the technology of the vehicles. |
| OQ 6 | VW asked if it is planned to work towards an Annex of an existing GTR or a new GTR. |
| OQ 7 | Open question on whether the Information to customer is within the scope of this TF? |
| OQ 8? | The RDE was suggested as a possible alternative to the Low Temp test (COMMENTS)  
*The cycle and the issue of RDE questions raised on the cycle. On this regard, It may depend on the problem that it is needed to be addressed and boundaries.* |
<table>
<thead>
<tr>
<th>Open Questions #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OQ 9</td>
<td>Describe interaction with other groups and drafting coordinator. The targets will need to be defined before performing a/the validation.</td>
</tr>
<tr>
<td>OQ10</td>
<td>JAMA suggested that for EV the temperature should be defined at political level.</td>
</tr>
<tr>
<td>OQ11</td>
<td>Volvo: Is it range and AC testing in the scope of this Task Force? All vehicles should have the same approach and conventional vehicles do not include testing with heater. If a MAC type program will have to be done, maybe there will be the need of a group on its own to perform the job.</td>
</tr>
<tr>
<td>OQ12</td>
<td>It was stated that the discussion on which part of the WLTC (or the cycle as a whole) should be discussed once it is clear which are the measure criteria: and/or CO₂, FC, EC, range.</td>
</tr>
<tr>
<td>OQ13</td>
<td>Regarding the road-load, BMW suggested to use corrections such as those used for the 14 C test of the WLTP.</td>
</tr>
</tbody>
</table>