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**CLIMA.C.4 - Road Transport**

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# IMPLEMENTATION AND PHASE-OUT OF THE NEDC/WLTP CORRELATION PROCEDURES FOR CARS AND LIGHT COMMERCIAL VEHICLES

## 1. INTRODUCTION

This note provides further information on the implementation and phase-out of the NEDC/WLTP correlation procedures set out in Commission Implementing Regulations (EU) 2017/1152 (vans) and 2017/1153 (cars) (Correlation Regulations)[1].

This version of the note replaces the version published in April 2020.

## 2. CORRELATION PROCEDURES CEASE TO APPLY FROM 1 JANUARY 2021

**From 1 January 2021, the obligation to determine NEDC $CO_2$ emission values pursuant to Implementing Regulations (EU) 2017/1152 and 2017/1153 ceases to apply.**

Only $CO_2$ emission values determined in accordance with Regulation (EU) 2017/1151 (WLTP) will be required to determine a manufacturer's average specific $CO_2$ emissions for the purposes of meeting its targets under Regulation (EU) 2019/631.

The $CO_2$MPAS correlation tool will therefore not be available for determining NEDC $CO_2$ emission values as of 1 January 2021, with the exceptions referred to in point (b) below and in point 3.

**For new cars and vans that are placed on the market in 2021, this means that only $CO_2$ emission values determined in accordance with the WLTP have to be recorded in the certificates of conformity.**

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[1] **Cars**: Commission Implementing Regulation (EU) 2017/1153 of 2 June 2017 setting out a methodology for determining the correlation parameters necessary for reflecting the change in the regulatory test procedure and amending Implementing Regulation (EU) No 1014/2010, OJ L 175. (Consolidated version of 1 January 2020: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02017R1153-20200101)

**Vans**: Commission Implementing Regulation (EU) 2017/1152 of 2 June 2017 setting out a methodology for determining the correlation parameters necessary for reflecting the change in the regulatory test procedure with regard to light commercial vehicles and amending Implementing Regulation (EU) No 293/2012, OJ L 175. (Consolidated version of 1 January 2020: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02017R1152-20200101)

**NEDC $CO_2$ emissions should continue to be determined only in the following cases:**

(a) In the case of passenger cars for which a manufacturer intends to claim super-credits pursuant to Article 5 of Regulation (EU) 2019/631, where evidence in the form of a certificate of conformity must be provided that the emissions are less than 50 g $CO_2$/km as determined under NEDC conditions (i.e. by way of a physical vehicle test in accordance with Regulation (EC) No 692/2008 – see Article 5 of Implementing Regulation (EU) 2017/1153);

(b) In the case of re-testing as referred to in point 2.2.b. of Annex I to the respective Implementing Regulations (EU) 2017/1152 (vans) and (EU) 2017/1153 (cars), where the correlation procedure ($CO_2$MPAS simulation + DICE) is to be performed until 30 April 2021.

## 3. CORRECTIONS OF ALREADY RECORDED CORRELATION RESULTS

In the case where a type approval authority, or a manufacturer with the agreement of the type approval authority, considers that correlation results already recorded in type approval documentation and certificates of conformity relating to vehicles that have been registered in the period 1 September 2017 to 31 December 2020 need to be corrected and this requires a revision of the input data and a new run of the $CO_2$MPAS tool, a duly justified request to correct the data should be sent to

DG CLIMA: EC-CO2-LDV-IMPLEMENTATION@ec.europa.eu

JRC: JRC-CO2MPAS@ec.europa.eu and JRC-CO2DICE@ec.europa.eu

Such requests should be submitted by **30 September 2021** at the latest. The correction procedures outlined in point 7 of this note should continue to be used, where applicable.

## 4. REPORTING OF INPUT DATA

The Commission has proposed that WLTP Type 1 test data relating to an approval or extension of an approval granted in respect of vehicles that are to be placed on the market from 2021 onwards should continue to be reported. Pending the adoption of the Implementing Regulation, type approval authorities and their technical services are invited to prepare on a voluntary basis the input data using the provisional input data template:

See: https://dice.jrc.ec.europa.eu/JET/Input_template

The completed input data templates should be uploaded on the JRC DICE site once the new Implementing Regulation is adopted. Further information about the reporting procedure will be provided at that moment.

## 5. OFFICIAL VERSION OF THE $CO_2$MPAS CORRELATION TOOL

$CO_2$MPAS version 4.1.10 is the official version to be used for the purposes referred to in points 2(b) and 3.

## 6. RECORDING OF DATA

In the case of new correlation results in accordance with points 2(b) or 3 of this note, type approval authorities and/or technical services shall record the information listed in point 5 of Annex I to the Correlation Regulations. This means that a type approval certificate should include **both the NEDC and the WLTP $CO_2$ values of vehicle high and, where applicable, vehicle low** (see Annex I to Regulation (EU) 2017/1151 – addendum to the appendix to the type approval certificate) and, as applicable, a **deviation and verification factor.**

**It is recommended to carefully verify the values recorded for the deviation and verification factors as this may have an impact on the calculation of the average specific emissions of a manufacturer.**

## 7. ERRORS AND CORRECTIONS IN THE $CO_2$MPAS INPUT FILE

In case an error is detected in the input file after the random selection procedure ("dicing") has been performed, corrections may be made in accordance with the procedures described below. **Type approval authorities and technical services are responsible for all corrections made, their proper documentation and traceability.**

In all cases where errors are detected, the $CO_2$MPAS user should inform the JRC (JRC-CO2MPAS@ec.europa.eu). See also point 3 above.

### 7.1. Correction of interpolation family ID

When only the interpolation family ID has to be corrected, the $CO_2$MPAS user should inform the JRC (JRC-CO2MPAS@ec.europa.eu) and DG CLIMA (EC-CO2-LDV-IMPLEMENTATION@ec.europa.eu), and provide a description of the error and specify the correct interpolation family ID. The email exchange with the JRC/DG CLIMA shall be recorded in the type approval documentation.

After receiving the email, JRC will allow the user to submit the corrected $CO_2$MPAS input file (new co2mpas.ta file) where only the interpolation family ID has been changed. Once the new co2mpas.ta file is submitted, the user will receive an email confirmation (DICE receipt) with no random number. The previous random number will remain valid for this new family ID, meaning that also the deviation and verification factors (if available) are taken over from the old family ID.

### 7.2. Corrections of the declared NEDC $CO_2$ values

It follows from the rationale of the correlation procedure, that a change in the declared NEDC value for an interpolation family should normally only take place following a formal change in the WLTP values for that family (e.g. as a result of an extension or extrapolation in accordance with Regulation 2017/1151). In those cases, the change in values is clearly traceable through the type approval numbering of the interpolation family and the corresponding NEDC values may be determined in accordance with the correlation procedure as set out in the Correlation Regulations.

Changing the NEDC declared value of an interpolation family after the finalisation of the $CO_2$MPAS simulation, without a corresponding change in the WLTP values, may create a loophole through which the 4% tolerance allowed in the NEDC procedure can be

unduly exploited. Moreover, the safeguard represented by the random selection procedure ("dicing") in the correlation procedure may in that way be by-passed.

**A change in the NEDC declared value should therefore only be allowed exceptionally, where it is clear that a correction is needed due to a clerical error in the original declaration.**

It is important that type approval authorities/technical services check carefully, before proceeding with the $CO_2$MPAS simulations, that the manufacturer has provided an NEDC declared value and that that value is consistently recorded throughout the type approval documentation.

If the type approval authority/technical service considers that a change of the NEDC declared value is needed to correct a clerical error, **all of the following steps shall be taken**:

- The $CO_2$MPAS user informs JRC (JRC-CO2MPAS@ec.europa.eu) and DG CLIMA (EC-CO2-LDV-IMPLEMENTATION@ec.europa.eu) about the change proposed.

- A new $CO_2$MPAS simulation is performed with the new declared NEDC value and the new co2mpas.ta file submitted to DICE3. The user will receive an email confirmation with no random number.

- A physical vehicle NEDC test is performed to confirm the declared value.

- A deviation factor and verification factor are recorded and added to the type approval certificate as well as in the certificate of conformity.

All e-mail correspondence between the type approval authority/technical service and the JRC/DG CLIMA, including the two output files, shall be recorded in the type approval documentation.

In very exceptional cases, where both NEDC-L and NEDC-H declared values have to be corrected, the average of the two deviation factors and the highest verification factor shall apply and be recorded in all type-approval documentation.

### 7.3. Correction of other parameters

This section concerns corrections in the $CO_2$MPAS input file other than those mentioned under points 7.1and 7.2.

The $CO_2$MPAS user should inform JRC (JRC-CO2MPAS@ec.europa.eu) and DG CLIMA (EC-CO2-LDV-IMPLEMENTATION@ec.europa.eu) and provide a description of the error.

After receiving the email, JRC will allow the user to submit the corrected $CO_2$MPAS input file (new co2mpas.ta file) for a new $CO_2$MPAS simulation and dicing.

**If the $CO_2$MPAS output does not change**, i.e. the correction has no impact on the simulated combined NEDC $CO_2$ result, after submission the user will receive an email confirmation (DICE receipt) with **no random number**. Where applicable, the existing deviation and verification factors are maintained.

**If the $CO_2$MPAS output differs from the original output**, i.e. the correction has had an impact on the simulated combined NEDC $CO_2$ result, a new random number will be issued. If this is higher than the previous random number, the new random number applies and, where applicable, new deviation and verification factors shall be recorded. If the new random number is lower than the previous number, the original deviation and verification factors are maintained, where applicable.

The type approval authority/technical service should document both the original and the new $CO_2$MPAS summary reports and e-mail correspondence with JRC and DG CLIMA.

## 8. OTHER ISSUES

### a) the input template version 3.1.1

**The CO2MPAS input template version 3.1.1 is mandatory, together with CO2MPAS version 4.1.10, since 1 January 2020.** Input template 3.1.1 includes the input fields added by the amendments to the Correlation Regulations adopted in December 2018 and October 2019.

### b) Interpolation family IDs - parent/child approach:

Where for two or more interpolation family IDs (either with the same or with different WMI codes), the WLTP physical tests and all other inputs in the $CO_2$MPAS input template are the same and these inputs are used in the type-approval process (documentation) the input template refers to the concept of a **parent/child approach** with regard to the interpolation family IDs.

This means that the WLTP physical tests are assigned to the first interpolation family ID (future parent) and this ID has to be provided in the template field "Interpolation Family ID".

After running $CO_2$MPAS, the co2mpas.ta file of that interpolation family ID should be submitted to the DICE3 and the random number will be received.

When the same input template (the same WLTP vehicle H and L test results) is used for another interpolation family ID ("child"), $CO_2$MPAS/DICE3 should be executed again, but this time the parent interpolation family ID should be provided in the field "Parent Interpolation Family ID", and the new (child) interpolation family ID has to be provided in the field "Interpolation Family ID".

The user will receive an email confirmation (DICE receipt) with no random number.

**The random number of the parent family will be valid also for child family**, meaning that the child family inherits the same deviation and verification factors (if available) from the parent family ID.

### c) Bi-fuel vehicle:

If the vehicle is bi-fuel, the results of the WLTP physical tests for **both fuels** should be submitted to the DICE3 server.

When running the first $CO_2$MPAS input template with the results of the first fuel test, a value of "1"in the field "Bi-fuel vehicle" should be selected. The co2mpas.ta file of the

first fuel should be submitted to DICE3, but the email with random number will not be received until the second co2mpas.ta file of the second fuel test is submitted to DICE3 (for the second file also a value of "1"in the field "Bi-fuel vehicle" should be selected).

**d) ATCT FCF:**

Exceptionally, where WLTP physical test results of vehicle H and L are the same, but the interpolation family IDs are different and ATCT FCFs are also different, the $CO_2$MPAS/DICE3 procedure described in point (b) shall be followed. The only difference is that ATCT FCF should be provided in the first step for the parent interpolation family ID and in the second step, if another interpolation family ID uses the same physical test results, the ATCT FCF should be provided for that child interpolation family ID.

**e) WLTP re-test (section 2.2a of Annex I to the Correlation Regulations):**

If $CO_2$MPAS needs to be executed for the same interpolation family ID again due to a WLTP re-test (new physical test) in accordance with point 2.2b of Annex I, this should be specified in the field "WLTP re-test, point 2.2b of Annex I".

Where in accordance with section 2.2a (a) of Annex I to the Correlation Regulations, a physical test is not required, the results can be corrected through calculations and the input be sent again to DICE3. The user will receive an email confirmation (DICE receipt) with no random number. Please note that deviation and verification factors (if available) stay the same for this family ID.

Where in accordance with section 2.2a (b-d) of Annex I to the Correlation Regulations, physical tests are required, new input will be submitted to $CO_2$MPAS and DICE3 and the $CO_2$MPAS user will receive the new random number. Where applicable, new deviation and verification factors should be recorded for the vehicle family concerned.

**f) WLTP test a, b, c – Section 2.2 of Annex I:**

In the case of one WLTP test (test 'a') this test is selected for the purpose of determining the input data in accordance with section 2.2 of Annex I to the Correlation Regulations. In cases where more than one WLTP physical test is performed, these results should be provided in the fields reserved for WLTP test b (second test) and test c (third test).

**g) 10Hz speed data:**

This input is the driven speed profile (not theoretical) for vehicle H and L for the purpose of speed and distance correction. If more than one WLTP test is performed, results should be provided for these WLTP physical tests as well.

**h) Prediction WLTP:**

This input is not mandatory and should be provided only in the cases where the speed profile is different from class 3b (also in cases where capped speed is applied and/or downscaling).

**i) Incomplete vehicle:**

If the vehicle is incomplete, only representative NEDC-R is foreseen. NEDC-H should be used as NEDC-R.

However, test results are available both for WLTP-HM (WLTP-H) and WLTP-LM (WLTP-L). To overcome this discrepancy, NEDC-R's values should be applied both for NEDC-H and NEDC-L. (i.e., insert the vehicle_mass NEDC-R to both `vehicle_mass NEDC-H` and `vehicle_mass NEDC-L`, etc.). Moreover, the parameter `dice.incomplete` in the Inputs sheet should be marked as 1 to report that the vehicle is incomplete.

**j) HDV-derived vans**

If the vehicle is an HDV-derived van and falls within the scope of point 5.8.2 of Annex VIII to Regulation (EU) No 582/2011, the `dice.regulation` parameter needs to be changed from `-` to `5.8.2 of Annex VIII to Regulation (EU) No 582/2011 (N1 vehicles only)`.

**k) Vehicle types, pure ICE, NOVC-HEV, OVC-HEV**

The type of vehicle to be simulated, i.e. Pure ICE, NOVC-HEV, OVC-HEV, has to be filled in the corresponding cell. According to that selection, the respective fields in the input file will be coloured as yellow (mandatory input), orange (optional), red (not needed).

**l) Special instructions for NOVC-HEV and OVC-HEV:**

In the case of NOVC-HEVs time-series test results should be provided as in the case of Pure ICE vehicles in spreadsheets named "WLTP-H" and "WLTP-L".

In the case of OVC-HEVs time-series test results of charge-sustaining (CS) tests should be provided in spreadsheets named "WLTP-H" and, where applicable, "WLTP-L". Charge-depleting (CD) tests (only first CD test) should be provided in spreadsheets named "meta.WLTP-H.test_b.ts" and, where applicable, "meta.WLTP-L.test_b.ts".

**m) T1 map power (entry 13 in the input matrix)**

In cases where maximum engine power values at engine speeds close or equal to the engine idle are not provided as input in the T1_map tab of the CO2MPAS input file, CO2MPAS may fail to execute. On such rare occasions, it is advisable to introduce the maximum engine power value at engine idling speed (or an engine speed value close to idle). If such a value is not available to the manufacturer, and in order to proceed with the CO2MPAS simulation, the technical service may accept a fictive RPM-Power value pair to be introduced at an engine speed 100 RPM lower to the declared engine idling speed with zero engine power output, (P=0 at idle_engine_speed_median-100). In the field "DICE procedure comments" in the $CO_2$MPAS input file, the technical service should indicate that this is a fictive input introduced for the purpose of $CO_2$MPAS simulation only, not to be recorded in type approval documentation nor considered to be declared by the OEM.

For more information and for all exchanges with JRC and DG CLIMA, please use the following functional e-mail addresses:

DG CLIMA: EC-CO2-LDV-IMPLEMENTATION@ec.europa.eu

JRC: JRC-CO2MPAS@ec.europa.eu and JRC-CO2DICE@ec.europa.eu