Non-paper

CO_2 Regulations for cars/vans

Risk of inflated starting point for calculating the 2025 and 2030 targets

1. Introduction

This non-paper concerns an issue that has recently emerged as regards the Commission proposal for a Regulation setting post-2020 CO_2 emission targets for new passenger cars and vans (COM(2017)676 final, 8 November 2017). It is related to the implementation of the new test procedure WLTP for the vehicles to be registered in 2020.

In the current Regulations, CO_2 emission targets for new passenger cars and vans are established up to 2020/2021 and compliance will be assessed based on the old NEDC test procedure. In view of the transition to the new WLTP test procedure, which applies since September 2017, the NEDC and WLTP emission values will be correlated in order to ensure that the reduction requirements under the two test procedures are of comparable stringency. This correlation methodology has been established in the "correlation" implementing acts[1], which were adopted in 2017.

Furthermore, from 2021 on, the NEDC targets for manufacturers will be "translated" into WLTP targets while maintaining a comparable stringency. This has been established through an amendment of the existing CO_2 Regulations through delegated acts[2] adopted in 2017. According to this, the 2021 WLTP targets of a manufacturer will depend on the ratio between its WLTP emissions and its NEDC emissions in 2020.

In the Commission proposal on post-2020 CO_2 emission standards, the 2025 and 2030 targets are defined as a **percentage** emission reduction compared to the average 2021 WLTP targets.

With data on the first WLTP based type approvals becoming available, evidence is emerging that **WLTP emission values officially declared by manufacturers may be inflated,** without a corresponding increase of their NEDC emission values. As vehicles being type approved as of now will be placed on the market and registered in 2020, without further action this would cause an increase of the 2021 WLTP targets.

As a result, the targets for 2025 and 2030 would also be weakened due to the inflated 2021 starting point. This would *de facto* reduce the level of ambition of the proposal.

Section 2 of this non-paper provides an overview and analysis of the issue as well as options considered to tackle it.

2. Summary of the issue

In the Commission proposal setting post-2020 CO_2 emission performance standards for cars and vans, the average of the specific emissions targets for manufacturers in 2021 under WLTP is the **starting point** for calculating the 2025 and 2030 targets. The 2021 specific emissions targets are determined according to the "target translation" formula set out in the current Regulations.

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[1] Commission Implementing Regulations (EU) 2017/1153 (passenger cars) and 2017/1152 (light commercial vehicles) of 2 June 2017

[2] Commission Delegated Regulations (EU) 2017/1502 (passenger cars) and 2017/1499 (light commercial vehicles) of 2 June 2017

The main element affecting the level of the 2021 specific emissions target of a manufacturer is the ratio between its average WLTP emissions and its average NEDC emissions in 2020. This means that an increase of the average specific WLTP emissions in 2020 relative to the NEDC emissions in that year would lead to an inflated 2021 WLTP target. In turn, this would increase the starting point for calculating the future targets and undermine their effectiveness in reducing emissions.

The WLTP emissions of a registered vehicle are derived from the type approval values of the family of vehicles to which it belongs. These type approval values are determined on the basis of a comparison between a value **declared** by the manufacturer and the result of an emission **measurement** under the supervision of the type approval authority. In order for the declared value to be validated as the official type approval value, it should be equal to or higher than the measurement result. Otherwise, the measurement result will become the official type approval value.

As explained below, both the measured and the declared values could be artificially inflated.

i) Inflated declared WLTP emission values

Under WLTP, manufacturers may declare an emission value that slightly exceeds the measured value(s). In order to avoid a second measurement, the value declared by the manufacturer has to exceed the WLTP measured value by at least 1%. When a second or a third measurement is performed, the allowed margin of exceedance becomes smaller.

While the WLTP Regulation contains safeguards to avoid that manufacturers declare too low WLTP emission values with the purpose of achieving compliance, it does **not** contain specific provisions for avoiding too high values. However, such safeguard would only be relevant during the transition phase from NEDC to WLTP.

As a result, the possibility exists, in the context of currently on-going type approvals, for a manufacturer to declare in 2020 WLTP emission values that are significantly higher than the measured emission values. Vehicles placed on the market and registered in 2020 are de facto being type approved already now.

Preliminary data collected by the JRC (see Annex) provides **evidence** of inflated WLTP type approval emission values declared by manufacturers. The available data indicate that the declared WLTP emission values exceed the measured WLTP values **on average by 4.5%**. For individual type approvals, this difference was **up to 13%.** The final impact on the average WLTP emissions of a manufacturer in 2020 will depends not only on such absolute numbers, but also on the number of vehicles from each type sold and registered in that year.

ii) Inflated measured WLTP emission values

The main aim of changing from NEDC to WLTP was to obtain emission values closer to those in real-world conditions. For this, the driving cycles and test procedure were made more representative of real-world conditions and a number of flexibilities were removed. Therefore, the measured WLTP emissions are expected to be higher than those under NEDC.

However, there is some evidence of manufacturers configuring their test vehicles in such a way that the measured WLTP emission values are inflated, while a different configuration is used for the NEDC test to achieve as low CO_2 emissions as possible on that test.

There also appears to be a significant variability between different Technical Services and manufacturers in the way the WLTP test is being performed for the purpose of the correlation as well as for the level of the over-declaration.

Based on the above, there is a clear risk of an artificial increase of the WLTP emissions in 2020, because of (i) manufacturers declaring too high WLTP values and (ii) changes made to the vehicle configuration for the WLTP test compared to the NEDC test.

3. Proposed way forward

The Commission proposes the following three actions to tackle the issues identified:

1. **In the proposed Regulation on CO_2 emission standards for cars and vans which is currently under examination by the co-legislators, it should be made clear that the starting point for determining the future targets has to be calculated on the basis of the "WLTP values measured" instead of the "WLTP values declared" by manufacturers for vehicles registered in 2020. This would eliminate the effect of any over-declaration. This issue should be dealt with in the context of the legislative procedure in order to maintain the level of ambition of the Commission proposal.**

   Apart from this, a number of other options have been considered, but not retained. In particular, as regards the option of defining a not-to-exceed limit for the gap between type approval and real-world emissions, using a real-world driving test for assessing compliance with such a limit is not a feasible option in view of the inherent variability of the CO_2 emissions under different driving conditions. This option is also analysed in the Impact Assessment but has not been retained. It would also completely change the target compliance assessment under the Regulation by no longer relying on type approval emissions.

   As regards the use of fuel consumption monitoring (FCM) for this purpose, the data collection procedure still needs to be elaborated and questions around data quality still need to be addressed. While FCM will be a key element in the future monitoring of the gap, it needs to be assessed further whether FCM could also provide a robust basis for target setting and compliance assessment. Even if so, an FCM-based compliance assessment system cannot be operational by 2020 or 2021. For these reasons, this option is not feasible at this point in time.

2. **The Commission is considering amendments to the correlation legislation (implementing acts) to be submitted to the Climate Change Committee for its opinion early autumn. These amendments would aim to collect the necessary data, ensure consistent implementation of the two test procedures and increase transparency by allowing a close and continuous monitoring of the implementation:**
   - **add the 'WLTP measured values' to be reported for each vehicle by the manufacturers in order to ensure that the data on the measured WLTP CO_2 values for individual vehicles registered in 2020 is available to the Commission,**
   - **add provisions to ensure that the configuration of the vehicles tested under the NEDC and WLTP procedure is the same,**
   - **require additional parameters to be used in the CO_2MPAS tool (used to simulate the NEDC emissions as part of the correlation legislation), in order to allow a more thorough verification and quality control by the JRC of the data reported by manufacturers.**

   The issue has been raised with Member States in the Technical Committee on Motor Vehicles on 3 July.

3. **The Commission will continue to support a correct implementation of the WLTP Regulation by Member States and monitor its proper enforcement. The abovementioned additional reporting and data verification will facilitate such future enforcement of WLTP legislation. The Commission could also consider the opportunity to amend the WLTP legislation, should this become necessary.**

Annex - Summary of the currently available evidence

1. Data sources

Evidence was mainly gathered by the JRC and DG CLIMA from the following data sources:

- The 'dice reports' of CO_2MPAS[3] used to simulate the NEDC emissions as part of the correlation legislation. Every time a WLTP type approval is carried out, a short report is sent to JRC and CLIMA. So far, around 1000 reports have been received.
- Data received on an ad-hoc and informal basis from two type approval authorities, containing i.a. the WLTP CO_2 measurement results (which are not in the 'dice' reports). So far, data on about 100 type approvals have been received.
- Data on measured WLTP values for 19 type approvals from a third type approval authority.
- Detailed type approval test data for two vehicles from one type approval authority and information received in the context of the implementation of the correlation procedure.

2. Evidence for an inflation of the declared WLTP value

The measurement results of 114 data sets show an uplift of around **4.5%** on average between the measured and the declared WLTP values. The highest deviations found were **up to 13%.** The final impact on the average WLTP emissions of a manufacturer in 2020 will depend not only on such absolute numbers, but also on the number of vehicles from each type sold and registered in that year.

Under NEDC, the declared value is found to be systematically ca. 4% **lower** than the measured value.

3. Evidence for an inflation of the measured WLTP value

a. The analysis of the detailed test data of two vehicles received from one type approval authorities revealed that:

   - The WLTP tests were carried out starting with a depleted battery, so that additional fuel was consumed to charge the battery during the test,
   - Start-stop did not operate during the test,
   - The engine speed was higher than the one assumed in CO_2MPAS by implementing the regulatory gear-shifting provisions.

   The combined effect on fuel consumption (CO_2 emissions) of these factors is estimated to be **in the order of +5%.** It is not yet clear whether the factors are independent or not.

b. The use of different gear-shifting strategies for the WLTP and the NEDC test of a vehicle with an automated transmission has been identified on one occasion during a technical exchange for the operation of CO_2MPAS. This would translate into a significant CO_2 difference over the NEDC and is anticipated to lead also to a significant increase of the WLTP CO_2 result.

c. The statistical analysis of the 'dice reports' shows different distributions and average values of the deviation between the declared NEDC value and the value simulated by CO_2MPAS, both among type approval authorities (technical services) and manufacturers. For vehicles with conventional technologies, such high deviations could be an indication of WLTP measurements carried out under procedural conditions very different from those assumed in the correlation tool.

[3] https://co2mpas.io/