Closing the CO$_2$ gap: Origin, characteristics and evolution of the gap (Session 2)

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Until recently, discrepancies between official and on-road data were attributed to the customer.
It is true, everyone drives differently, but there are clear overall trends observable.

The gap between laboratory and real-world CO₂ emissions increased to 40% on average.
The new car CO₂ regulation and CO₂ based vehicle taxation have increased the incentive to ‘cheat’
The gap increased drastically for all manufacturers, although for some earlier than for others
The increasing gap is a problem for consumers, society and also for manufacturers and suppliers.

Real world: 9% CO₂ reduction

Expected: 25% CO₂ reduction
What are the reasons for the growing gap?
The overall decrease of new vehicle CO$_2$ levels is not a significant reason for the growing gap.

Changes in customer driving behaviour are also not a significant reason for the growing gap.
Every time a new vehicle model generation is introduced, the gap suddenly increases.

A “creative” interpretation of the coast down procedure explains one third of the overall gap.

**Coast Down Test (outside test track)**
- 120 km/h

**Chassis Dynamometer Test (inside laboratory)**
- 20 km/h
- Fuel consumption and emissions
- Recorded in vehicle type approval documents, not accessible to public
- Road load coefficients: $f_0, f_1, f_2$

Source: http://www.theicct.org/future-of-vehicle-testing
A ‘creative’ interpretation of the coast down procedure explains one third of the overall gap.
Results of coast down tests are treated confidential in the EU while publicly available in the US

<table>
<thead>
<tr>
<th>Country</th>
<th>Authority</th>
<th>Number of evaluated vehicles falling within the authority's remit</th>
<th>Provided official coastdown data?</th>
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<td>Centre National de Reception des Vehicules (DRIRE), Montlhery</td>
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Source: http://www.theicct.org/effect-roadload-coeffs-co2-emissions-eu
‘Inertia class’ thresholds are one example for the many loopholes during NEDC laboratory testing.

There is a large number of loopholes in the test procedure that are being systematically exploited.
Plug-in hybrid vehicles are particularly favoured by the laboratory test procedure

- 25 km electric range = half the CO₂ emissions
- One third less of CO₂ for any additional 25 km electric range

Example Porsche Panamera:
- Normally about 200 g/km
- 71 g/km as plug-in with about 30-40 km electric range
What to expect from the future?
Broadening the coverage of the testing procedure is one important pillar: NEDC $\rightarrow$ WLTP $\rightarrow$ RDE-CO$_2$
The best test procedure will remain toothless without independent re-testing and penalties.
For more information, please visit our website and/or get in touch with our team at ICCT

- From Laboratory to Road – A 2015 update of official and “real-world” fuel consumption and CO₂ values for passenger cars in Europe: http://www.theicct.org/laboratory-road-2015-update
- Official vs. real-world road-load parameters in EU vehicle efficiency testing: http://www.theicct.org/effect-roadload-coeffs-co2-emissions-eu
- Quantifying the impact of real-world driving on total CO₂ emissions from UK cars and vans https://www.theccc.org.uk/publication/impact-of-real-world-driving-emissions/
- The future of vehicle emissions testing and compliance – Aligning regulatory requirements, customer expectations, and environmental performance in the EU: http://www.theicct.org/future-of-vehicle-testing
- The WLTP: How a new test procedure for cars will affect fuel consumption values in the EU: http://www.theicct.org/wltp-how-new-test-procedure-cars-will-affect-fuel-consumption-values-eu

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