FACT SHEET: EUROPE

NOVEMBER 2017

communications@theicct.org WWW.THEICCT.ORG

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THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

REAL-WORLD FUEL CONSUMPTION AND CO_2 EMISSIONS OF NEW PASSENGER CARS IN EUROPE

"Real-world" fuel consumption and CO_2 emissions of new European passenger cars exceeded official type-approval values by approximately 42% in 2016, according to a new update to the International Council on Clean Transportation's *From Laboratory to Road* study. **Since 2001, the gap between official measurements of vehicle efficiency and actual performance in everyday driving has more than quadrupled**.

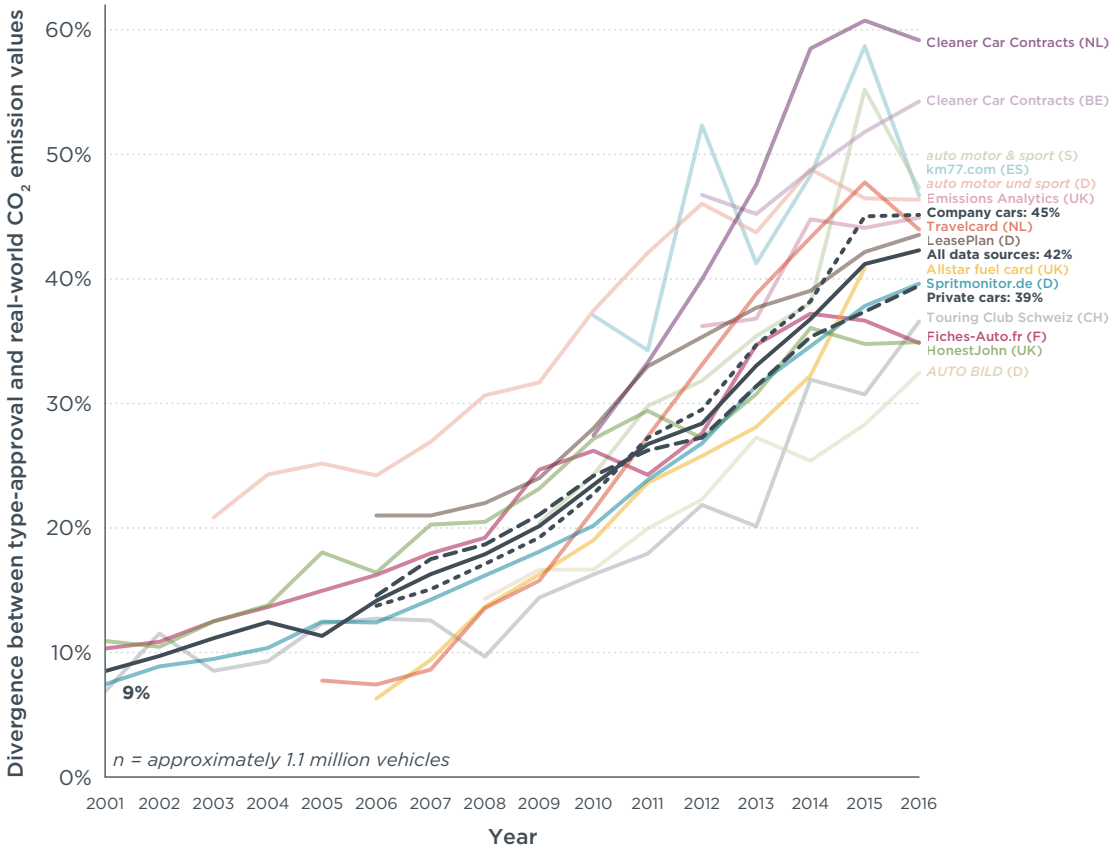

Figure 1. Divergence between real-world and manufacturers' type-approval CO_2 emission values for various European real-world data sources, including average estimates for private cars, company cars, and all data sources.

A comparison carried out by the ICCT of the discrepancy between real-world and official CO_2 values in the four largest vehicle markets worldwide—China, the EU, Japan, and the United States—indicates that **since 2001 that gap has increased in all markets. The EU saw the largest increase in the gap while the United States saw the lowest increase. China and Japan placed in the middle in terms of growth. Japan stands out with the highest gap level.**

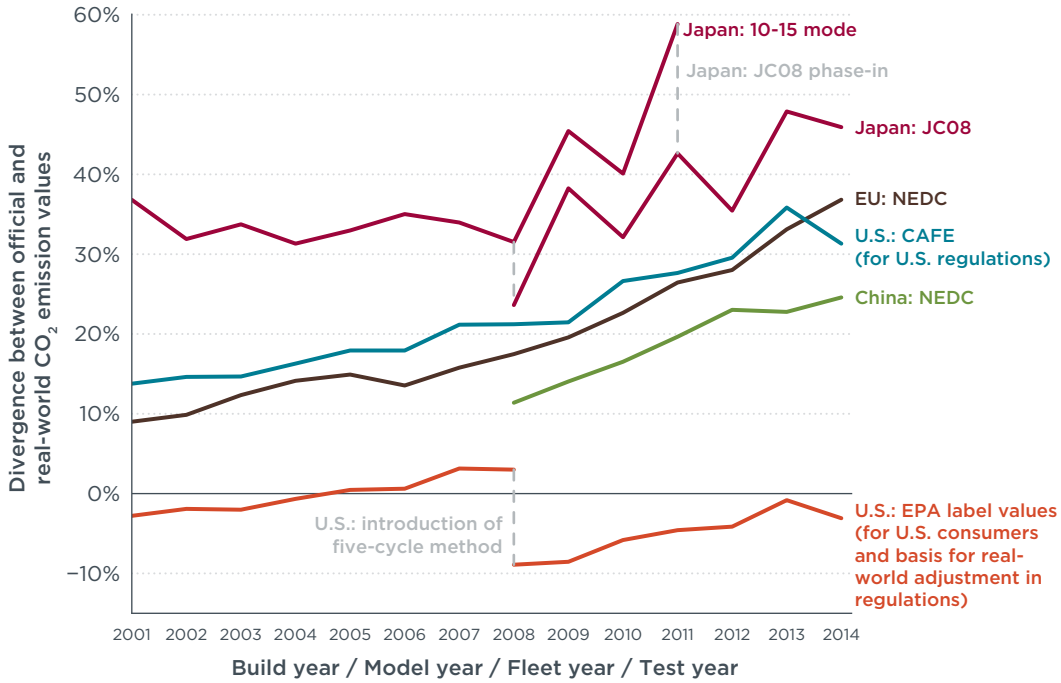

Figure 2. Divergence between real-world and manufacturers' type-approval CO_2 emission values for China, Europe, Japan, and the United States.

KEY FINDINGS: EUROPE

» **Average divergence of real-world from type-approval CO_2 emissions in Europe increased from roughly 9% in 2001 to about 42% in 2016**. The trend was particularly pronounced from 2009 to 2015, when the gap more than doubled. The growth in the gap shows signs of slowing down in 2016.

» As a result of the gap, only one-third of the on-paper reductions in CO_2 emission figures since 2001 have been realized in practice. **Since 2010, hardly any real-world reductions in CO_2 emission values have been achieved**.

» Company cars generally show a higher divergence (approximately 45%) than private vehicles (approximately 40%). **The size of the gap differs significantly among vehicle manufacturers and market segments**. Plug-in hybrid electric vehicles stand out with particularly high divergence values.

» For an average vehicle owner, **the discrepancy translates into additional fuel expenses of approximately €400 per year**.

» **The gap is a result of increasingly unrealistic type-approval CO_2 values rather than changes in driving behavior**.

» The European Union began to phase in a new procedure for vehicle type approval, the Worldwide Harmonized Light Vehicles Test Procedure (WLTP), in September 2017. While it is expected to reduce the gap, the WLTP has its own shortcomings and should therefore be complemented by other forms of vehicle testing: **random conformity testing of production vehicles by independent bodies** (as already mandated by U.S. fuel economy regulations) and **on-road testing of CO_2 emissions** (as mandated for nitrogen oxide emissions in the EU since 2016).

KEY FINDINGS: INTERNATIONAL COMPARISON

» **The U.S. Environmental Protection Agency's so-called label values, which are designed to represent real-world conditions, offered the most realistic fuel consumption figures in the analysis, with virtually no gap at all in 2014. These label values show that it is possible to produce realistic point estimates of fuel consumption** that, on average, match what consumers experience on the road.

» **Global best practices for vehicle efficiency standards include: independent retesting of vehicles; stringent policy enforcement,**

including financial penalties and vehicle recalls; collecting empirical real-world data; and using realistic fuel-consumption values in impact assessments and to inform consumers.

- The United States has the most stringent policy enforcement practices, which helps hold down the increase in the gap in the U.S. market.
- The introduction of new testing procedures in Japan (transition from 10-15 mode to JC08 in 2008–2011) and in the United States (introduction of the five-cycle method for label values in 2008) reduced the gap in those markets.

BACKGROUND AND METHODOLOGY

- Official CO_2 and fuel consumption values of new passenger cars (so-called *type-approval* or *certification* values) are determined in laboratory tests. The EU uses the New European Driving Cycle (NEDC), but began to transition to the WLTP in September 2017. The United States uses Corporate Average Fuel Economy (CAFE) values in regulatory texts, but also estimates so-called label values for consumers. These label values, on average, accurately reflect real-world fuel consumption. China uses the NEDC, while Japan transitioned from 10-15 mode to JC08.
- In 2013, collaborating with the Institute for Energy and Environmental Research Heidelberg (IFEU) and the Netherlands Organisation for Applied Scientific Research (TNO), the ICCT published *From Laboratory to Road,* documenting for the first time a discrepancy between real-world and type-approval CO_2 emission values that was increasing over time. The report has been updated each year since.
- The 2017 update to the *From Laboratory to Road* series brings together data for more than 1.1 million vehicles from eight countries and 14 data sources. The data includes user entries from free web services (Spritmonitor.de in Germany, HonestJohn.co.uk in the United Kingdom, Fiches-Auto.fr in France), fuel-consumption measurements from company cars (Travelcard in the Netherlands, LeasePlan in Germany, Cleaner Car Contracts in Belgium and the Netherlands, Allstar fuel card in the United Kingdom), and vehicle tests from magazines and websites (*AUTO BILD* and *auto motor und sport* in Germany, *auto motor & sport* in Sweden, km77.com for Spain, Emissions Analytics for United Kingdom, Touring Club Schweiz for Switzerland).
- The international comparison of the gap between real-world and official CO_2 emission values adds data from the United States (from the MyMPG service on FuelEconomy.gov), China (from the fuel consumption app XiaoXiongYouHao), and Japan (from the web service e-nenpi.com). In total, data for more than 1.5 million passenger cars from 2001 to 2014 were analyzed.
- The divergence of real-world from official CO_2 emission values is expressed as a percentage of the official figure. Fuel economy values (in miles per gallon or kilometer per liter) were converted to CO_2 values (in grams per kilometer) before calculating the gap.
- While driving style, vehicle characteristics, and driving conditions vary, aggregating large amounts of real-world data reveals clear trends in the average performance gap.

FURTHER INFORMATION

From Laboratory to Road: A 2017 update of official and "real-world" fuel consumption and CO_2 values for passenger cars in Europe

AUTHORS

Uwe Tietge, Peter Mock, John German, Anup Bandivadekar, Norbert Ligterink

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CONTACT

Peter Mock, +49 30 847129-102, peter@theicct.org