Policy Update Number 11
March 3, 2011

European CO_2 Emission Performance Standards for Light Commercial Vehicles

On February 15, 2011 the European Parliament adopted legislation that, for the first time, will regulate CO_2 emissions from light commercial vehicles (LCV) in Europe. The original legislative proposal was issued by the European Commission in October 2009, and since then it has been debated between the regulatory agencies in Europe. It is expected to **formally become law in the first half of 2011.**

Key elements of the European regulation

- The regulation applies to **new motor vehicles of category N1**, i.e., vehicles designed and constructed for the carriage of goods having a gross vehicle weight of less than 3,500 kg (7,716 lb) and a reference mass of less than 2,610 kg (5,754 lb).[1] M2 and N2 vehicles at this point in time will be included for monitoring purposes only. For vehicles of category M1 (passenger vehicles with less than 9 seats) a similar regulation was already adopted in 2009.[2] N1 vehicles in Europe account for approximately 10% of all light-duty vehicles.
- The **short-term target** set by the regulation is to reach an average CO_2 emission level of **175 g/km** for new light commercial vehicles by **2017** compared to an average emission level of approximately **185 g/km in 2009**.[3] For each manufacturer an individual target will be calculated based on the average weight of the manufacturer's vehicle fleet.[4] It is therefore possible for manufacturers to balance higher emissions of some of their models with lower emissions for other vehicles. Additionally, manufacturers are allowed to pool with each other in order to meet the targets. The **short-term target will be phased in**, with 70% of

1 For an exact definition of vehicle categories see 2007/46/EC and 2007/715/EC. Reference mass is defined as weight of vehicle in running order excluding driver plus 100 kg. Gross vehicle weight is vehicle mass plus maximum cargo capacity.

2 See 2009/443/EC.

3 According to data from the European Commission the level in 2007 was 203 g/km.

4 The exact formula is: CO_2 emission target = 175 + 0.093 x (M – M0), where M = average mass of new vehicle fleet and M0 = 1,706 kg. From 2018 on M0 will be revised every three years to reflect the average mass of new LCV in the previous three calendar years. The slope of 0.093 reflects today's correlation between vehicle weight and CO_2 emissions for LCV. It is therefore defined as a 100% slope, contrary to the flatter (60%) slope used in the passenger car CO_2 legislation (2007/46/EC).

ICCT Policy Updates summarize and comment on important regulatory and other developments related to clean transportation worldwide.

The International Council on Clean Transportation

Washington, DC
San Francisco, CA
Brussels, Belgium

www.theicct.org

each manufacturer's LCV to be taken into account in 2014, 75% in 2015, 80% in 2016 and 100% from 2017 onwards.

- Manufacturers failing to meet the emissions target will be required to pay an **excess emission premium** of €5 for the first g/km of excess emissions, €15 for the second g/km, €25 for the third g/km and €95 for any additional g/km of excess emissions.
- From 2014-2017 **super-credits** for new LCV with CO_2 emissions of less than 50 g/km will be in place in order to stimulate sales of low emission vehicles. These vehicles will be counted 3.5 times for the calculation of manufacturers' fleet averages in 2014 and 2015, 2.5 times in 2016, 1.5 times in 2017, and 1.0 times from 2018 on. The maximum number of new LCV with less than 50 g/km CO_2 to be taken into account in the application of the multipliers is limited to 25,000 per manufacturer.
- The CO_2 emissions of each LCV that is capable of running on a mixture of petrol with **85% bioethanol (E85)** will be reduced by 5% for calculating manufacturers' fleet averages by end of 2015.[5]
- Up to 7 g/km CO_2 credits per manufacturer may be obtained by applying innovative technologies **(eco-innovations)** that contribute to CO_2 emission reduction efforts but cannot demonstrate their full potential on the current NEDC test procedure.
- Manufacturers with less than 22,000 LCVs registered in the European Union (EU) per year can apply for individual emission targets **(derogation rules)**.
- CO_2 emissions of **multi-stage vehicles**, i.e. vehicles with a body retrospectively added not by the manufacturer of the base vehicle, will be generally allocated to the manufacturer of the base vehicle. A review with respect to specific monitoring procedures and necessary amendments to the relevant type-approval legislation in order to not place excessive burden on the manufacturer of the baseline vehicle will be carried out by end of 2011.
- The **long-term CO_2 emission target** for LCV is set at **147 g/km in 2020**. It is subject to confirmation of feasibility to be carried out in a **review by January 1, 2013**. This review will also evaluate the inclusion of N2 and M2 vehicles in a future regulation as well as the potential use of footprint or payload as basis for the calculation of emission targets instead of vehicle weight.
- Compared to the original proposal of the European Commission, the now adopted version of the legislation includes a less-stringent long-term target (147 g/km instead of 135 g/km). The 2020 target year was not changed as well as the short-term target of 175 g/km. However, the end of the phase-in of the short-term target was delayed by one year (now 2017 instead of 2016). The excess emission premium was lowered from the originally proposed €120 per g/km to €95. Furthermore, the multipliers for low emission vehicles (super-credits) were increased and extended compared to the original proposal.

5 This reduction only applies for vehicles registered in EU Member States where at least 30% of filling stations provide E85 fuel complying with the EU sustainability criteria for biofuels.

Figure 1 compares current CO_2 emission levels and future targets for passenger cars and LCV in the EU. Starting from an average emission level of 185 g/km in 2009 a reduction rate of 0.7% per year (p.a.) is necessary in order to meet the 2017 target of 175 g/km for LCV. From this level a 5.3% p.a. reduction is required to meet the long-term target of 147 g/km by 2020.

For passenger cars the average emission level in 2009 was 146 g/km. For meeting the respective short-term target of 130 g/km by 2015 an annual reduction of 2% is required. The long-term target set by regulation 443/2009 is 95 g/km by 2020. This would translate into an annual reduction rate of about 6% based on the 2015 emission level.

Given that LCV make up approximately 10% of the EU light-duty vehicle fleet the total CO_2 emission level for all light-duty vehicles currently is about 150 g/km and would need to be reduced to 100 g/km by 2020.

It should be noted that credits for vehicles with an emission level below 50 g/km, eco-innovations as well as other credits are not taken into account for the comparison in Figure 1 and are likely to result in higher real-world emissions and lower emission reduction requirements for manufacturers.

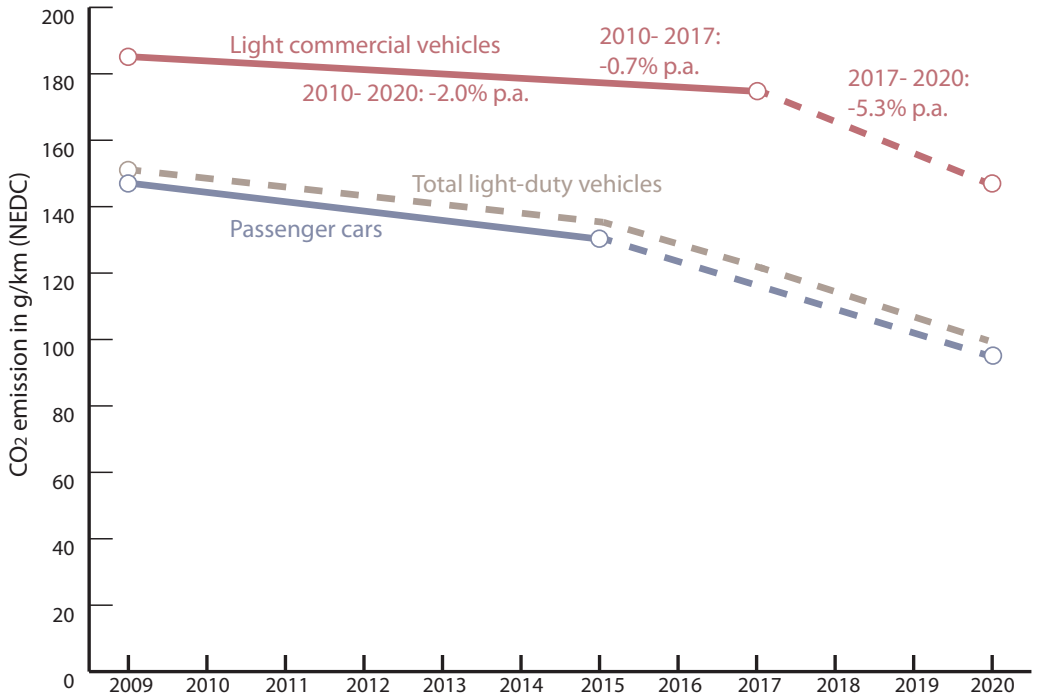

Figure 1. EU passenger car and light commercial vehicles CO_2 target standards. Solid lines indicate adopted targets; dashed lines indicate proposed targets. The total emission level for all light-duty vehicles is shows for illustration purpose only. Eco-innovations and other credits are not included.

International Comparison

CO_2 emission performance standards similar to the now adopted EU regulation are in place in the US, Japan and China. Figure 2 summarizes the different targets. A direct comparison of the existing standards is challenging. Apart from differences in the underlying metric for setting emission targets (the US uses footprint, EU and Japan use vehicle weight, China uses vehicle weight and engine displacement), the fleet compositions vary significantly across markets. For example, many mini freight vehicles are on the road in Japan (about 65% of LCV sales), while this vehicle category is usually not found on the EU or US market.

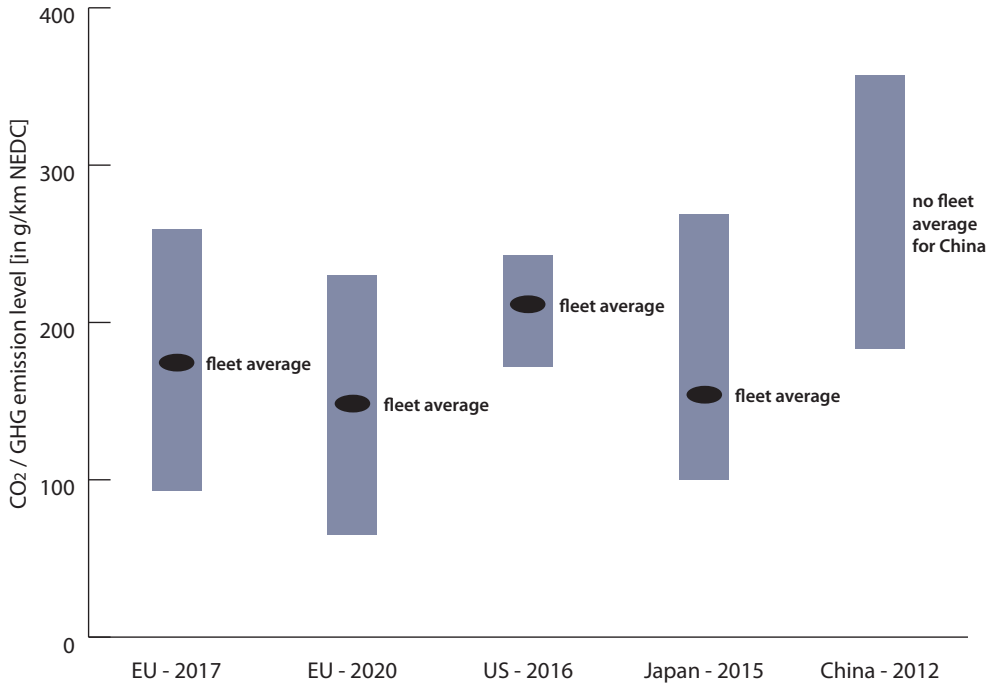

Figure 2. Comparison of light-commercial / light-truck emission standards in EU, US, Japan and China. Light blue bars represent range of emission targets depending on vehicle sizes; light brown dots represent sales-weighted fleet averages.[6]

Figure 3 provides a more detailed comparison of the EU and US vehicle fleets. The market in the EU is split into approximately 90% passenger cars with an average weight of 1,300 kg and 10% LCV with an average weight of 1,600 kg. The US market is split into approximately 60% passenger cars with an average weight of 1,500 kg and 40% light trucks with an average weight of 2,000 kg. The current average

6 For EU emission target values for light commercial vehicles between 825-2,610 kg reference mass are shown. For US emission limits are based on vehicle footprint; values shown are for light-truck fleet. For Japan mini freight vehicles, light-freight vehicles (less than 1,700 kg gross vehicle weight) and medium-freight vehicles (gross vehicle weight between 1,700 kg and 3,500 kg) are included. For China vehicle standards are based on vehicle weight and engine displacement; values for N1 (only those with design speed above 50 km/h) and M2 vehicles are shown; no fleet average value available for China). All emission values have been converted into the NEDC test cycle.

emission limit for new light trucks in the US is about 275 g/km and the adopted 2016 limit is 213 g/km.[7] As it can be seen from Figure 3 the EU LCV fleet is significantly different in terms of weight from the US light truck fleet. The EU 2017 LCV target value of 175 g/km therefore is not directly comparable to the 213 g/km US limit for light trucks.[8] Yet, given the heavier weight of the light trucks in the US, the amount of technology required to meet the standards appears to be roughly similar in the US and EU.

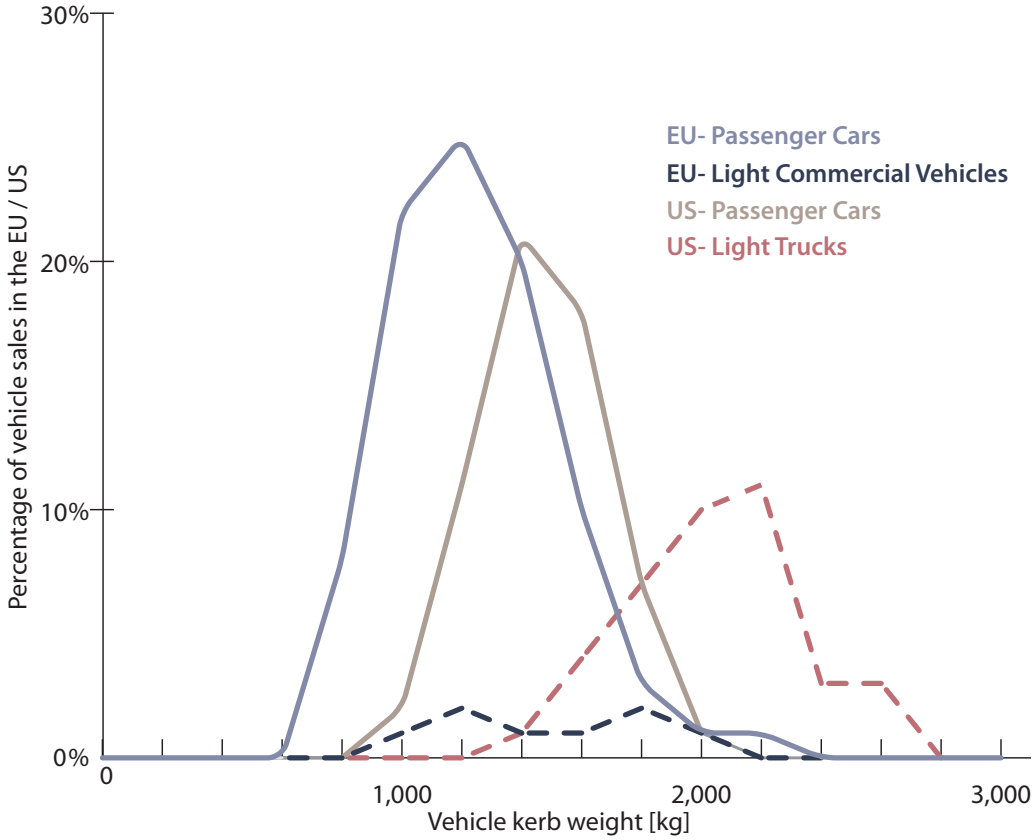

Figure 3. Vehicle weight distribution for the EU new passenger car and light commercial vehicle fleet as well as the US new passenger car and light truck fleet.

Figure 4 illustrates the differences between the EU and US using some of the top-selling vehicles as an example. The EU light commercial vehicle fleet consists mainly of two different types of vehicles: Car-derived vans primarily intended for transport of goods (with a vehicle weight of approximately 1,300-1,800 kg) and larger goods vans (with a vehicle weight up to 2,610 kg). The top-selling light-trucks in the US on the other hand consist of mini-vans and sport-utility-vehicles (SUV), mainly for transportation of passengers (approximately 1,500 kg – 2,200 kg vehicle weight), as well as pick-up trucks (more than 2,200 kg vehicle weight).

7 Combined test results. Conversion of test cycles to NEDC.

8 It should furthermore be noted that the EU is currently in the process of revising its vehicle category definitions. It is expected that in the future less vehicles will qualify as N1 and instead will be counted as M1 vehicles. Similarly, the US will introduce a new classification system for passenger cars versus light trucks in 2012.

European CO_2 emission performance standards for light commercial vehicles

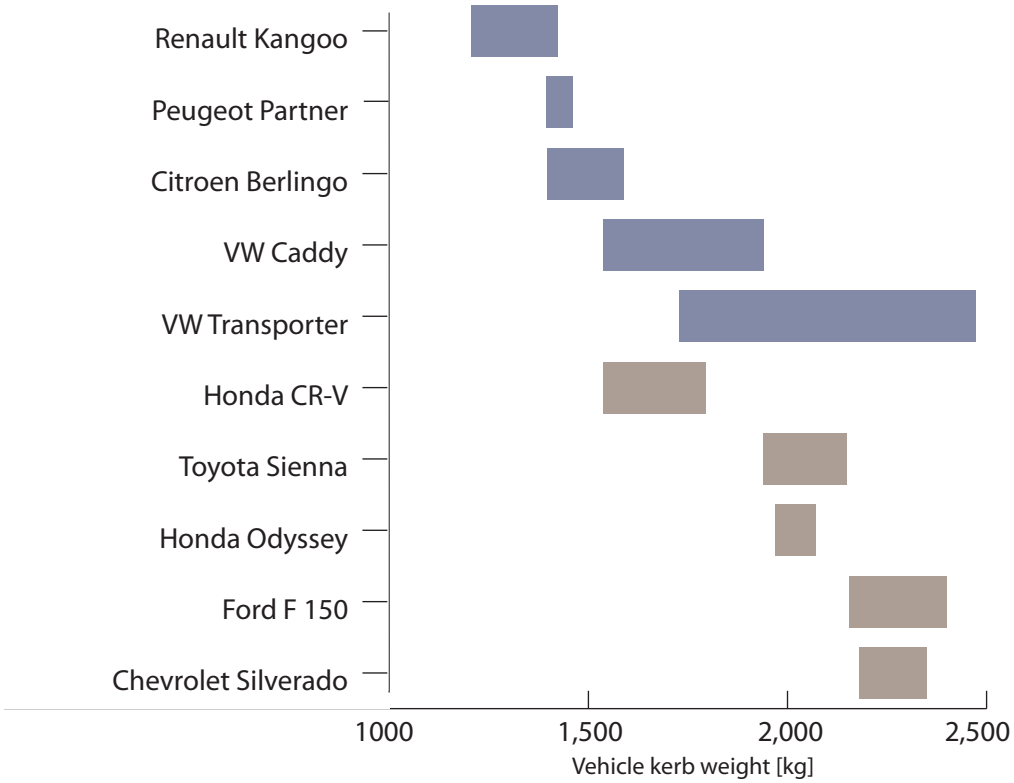

Figure 4. Top-selling light commercial vehicles in Europe / light trucks in the US. The bars for vehicle weight indicate the range for available vehicle variants on the market.

For further information, contact Peter Mock, peter@theicct.org.