POLICY UPDATE

MAY 2014

FINAL PHASE 2 CHINA FUEL CONSUMPTION STANDARD FOR COMMERCIAL HEAVY-DUTY VEHICLES

ICCT **POLICY UPDATES** SUMMARIZE REGULATORY AND OTHER DEVELOPMENTS RELATED TO CLEAN TRANSPORTATION WORLDWIDE.

In February 2014, China's Phase 2 heavy-duty vehicle fuel consumption standards were finalized. The final rule remains unchanged from the late 2012 proposal by China's Ministry of Industry and Information Technology (MIIT). It stipulates limits on fuel consumption for new commercial trucks, dump trucks, tractors, coaches and buses with gross vehicle weight over 3,500 kg. The standard takes effect on July 1, 2014, for new type approvals and on July 1, 2015, for all new heavy commercial vehicles (except certain specialized vocational vehicles) sold in China. A separate rule must still be finalized to specify details of how import vehicles will be brought into compliance.

BACKGROUND

MIIT first announced its plan to develop fuel consumption standards for commercial HDVs in 2008. As a first step, the China Automotive Technology and Research Center (CATARC) was commissioned by MIIT to develop a fuel consumption test procedure that combined chassis dynamometer testing and simulation modeling.[1] In brief, the test procedure requires that fuel consumption of *base* models be measured using chassis dynamometer testing, whereas fuel consumption of *variants* may be measured using a computer simulation model developed by CATARC (see Box 1 for a definition of *base* and *variant* models). The final test procedure was formally adopted in December 2011.[2]

In order to determine the stringency of the HDV fuel-consumption standards, CATARC and two other testing laboratories conducted a study to estimate the fuel-consumption level of the newest vehicles from the existing fleet. This study was performed in 2010 and 2011 by following the previously mentioned test procedure on a number of vehicles. The resulting data, collected from a combination of chassis and simulation tests of over 300 HDVs, were then used as the basis for setting an Industry Standard for HDV fuel consumption (known as the Phase 1 standard), which was adopted by MIIT in January 2012.[3]

1 Zheng, T., Jin, Y., Wang, Z., Wang, M. et al., "Development of Fuel Consumption Test Method Standards for Heavy-Duty Commercial Vehicles in China," SAE Technical Paper 2011-01-2292, 2011, doi:10.4271/2011-01-2292. (http://papers.sae.org/2011-01-2292/).

2 MIIT. 2011. GB/T27840-2011. Fuel consumption test methods for medium- and heavy-duty commercial vehicles. (http://www.miit.gov.cn/n11293472/n11295142/n11299183/14415104.html) *(Chinese)*

3 MIIT. 2012. QC/T924-2011. Fuel consumption limits for heavy-duty commercial vehicles (Phase 1) (http://www.miit.gov.cn/n11293472/n11295023/n11310717/14442598.html). *(Chinese)* See the English summary in TransportPolicy.net (http://transportpolicy.net/index.php?title=China:_Heavy-duty:_Fuel_Consumption).

The original Phase 1 Industry Standard sets fuel consumption limits for three types of HDVs: tractors, straight trucks and coaches (Figure 1). It requires manufacturers to report fuel -consumption performance of all new models applying for type approval starting February 1, 2012. By July 1, 2012, the standard mandates all new models applying for type approval must not exceed the fuel consumption limits set in the Industry Standard. Starting July 1, 2014, all new vehicles manufactured in China from the three regulated vehicle categories are required to comply with the Industry Fuel Consumption Standard.

Figure 1. Fuel consumption limits stipulated in China's Industry Standard (Phase 1) for new commercial heavy-duty vehicles

Due to a relatively limited understanding of the HDV market and fuel consumption level at the time, the Industry Standard was intentionally set at a level that manufacturers could meet relatively easily,[4] and it focused on the three vehicle types with highest sales and highest expected overall fuel consumption. At that time, the plan was to develop a more comprehensive National Standard in 2012. Those standards were proposed in September 2012.

FINALIZED NATIONAL PHASE 2 STANDARD

Over the course of 2012, MIIT collected more fuel-consumption data through additional testing and simulation performed on the latest models of the five regulated vehicle categories, but with a special focus on city buses and dump trucks. The agency also obtained additional fuel-consumption data of new models through the new fuel-consumption type-approval process for the Industry Standard. Based on a broader set

4 MIIT. 2011. Industry Standard—Fuel Consumption Limits for Heavy Commercial Vehicles (Phase 1) (Disclosure Draft) Edition Description *(Chinese)*.

of fuel-consumption data, MIIT proposed the next stage of HDV fuel-consumption standards in September 2012. The following are the key elements of the now final Phase 2 national standards:

» Sets maximum fuel-consumption levels for five vehicle types—tractors, straight trucks, dump trucks, city buses and coaches. (Dump trucks and city buses were not included in the Industry Standard). The five regulated vehicle categories account for over 90% of new HDV sales.[5] Specialized vocational vehicles (like cement trucks), which contribute about 8% of new HDV sales, are exempted from the regulation (Figure 2).

» Uses liter per 100km as the evaluation metric, consistent with the Industry Standard.

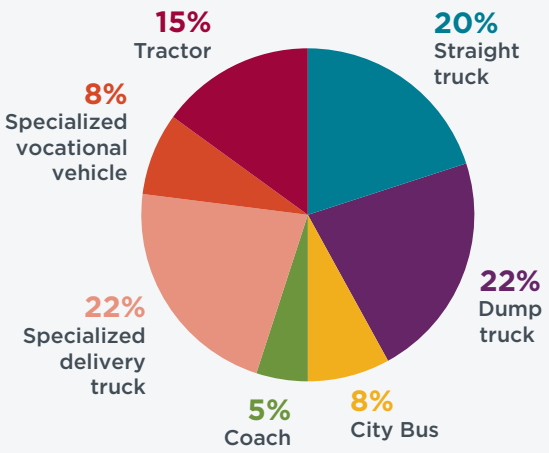

Figure 2: Heavy-duty vehicle registration by vehicle type

Based on registration data of vehicles with gross vehicle weight over 3.5 tons; R.L. Polk & Co.

DEFINITION OF BASE AND VARIANT MODEL

Commissioned by MIIT, the China Vehicle Technology Service Center issued the definitions of *base* and *variant* vehicle, specifying that a vehicle can be considered a variant of a base vehicle only if there are **no changes in the following design parameters:**

» Vehicle type (tractor; dump truck; truck, other than dump truck; city bus; bus, other than city bus)
» Fuel type
» Power required to operate engine-driven accessories (unless power is reduced)
» Chassis bearer (load-, semi-, and non load-bearing)
» Body style of buses/coaches (i.e. double decker, articulated, low floor, etc)
» Type of truck cab
» Frontal area (unless area is reduced)
» Type of drive train and position of drive axle
» Transmission type and number of gears
» Gross mass (within same mass bin)
» Number of axles

Within the same vehicle family, which encompasses the base and its variant models, the base model must be the model with:

» the highest gross vehicle weight within the vehicle family
» the highest rated power for engines from the same manufacturer and same engine family, or model using an engine with the highest certified fuel consumption
» the largest frontal area
» the smallest net load tire rolling radius, widest cross-section area
» largest gross transmission ratio
» or combination of the above

Source: China Vehicle Technology Service Center. 2012. "Specific regulation regarding implementing the management of heavy-duty vehicle fuel consumption catalog (provisional)". January. (http://www.cvtsc.org.cn/cvtsc/zcfg/692.htm, accessed Nov. 26, 2012). *(Chinese)*

5 Based on the China HDV sales data from January 2007 to August 2010.

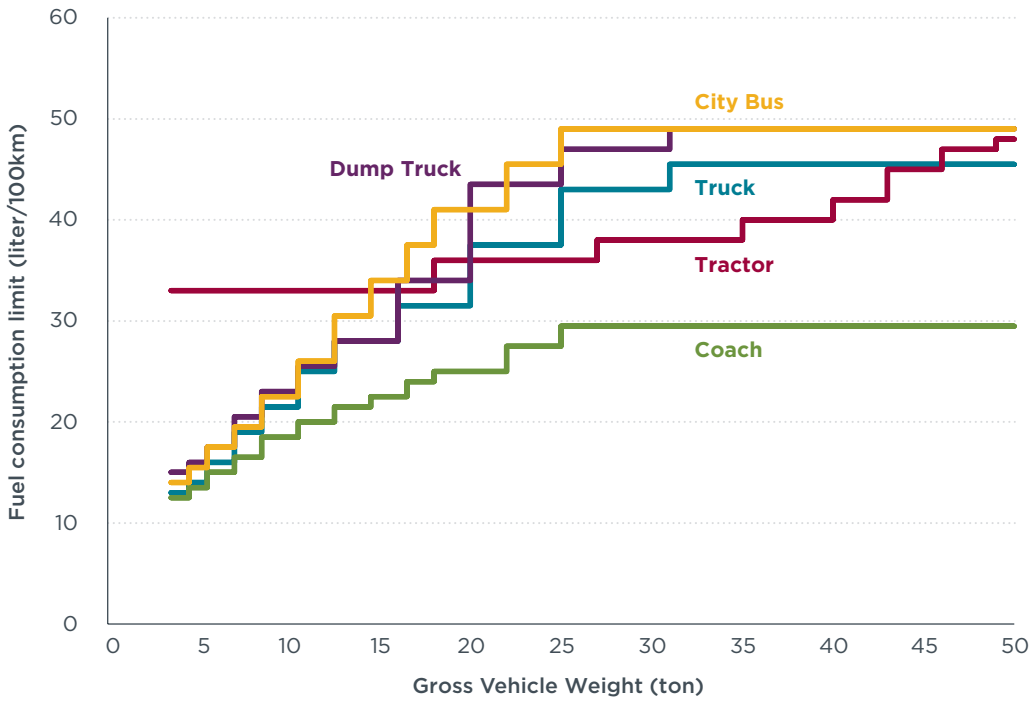

Figure 3. Fuel consumption limits stipulated in the Phase 2 China National Fuel Consumption Standard for new commercial heavy-duty vehicles

- Similar to the Phase 1 Industry Standard, the Phase 2 National Standard sets fuel consumption limits following a step function, using gross vehicle weight as the utility parameter (Figure 3).
- Tightens vehicle consumption limits for tractors, trucks and coach buses by an average of 10.5% to 14.5% compared to the limits under the Industry Standard (Figure 4).[6]
- About half of the models tested for fuel consumption through mid-2012 could not meet the Phase 2 fuel consumption limits; under this new regulation, new fleet average HDV fuel consumption is expected to drop approximately 11% by 2015, resulting in 5–6 million tons of reduced annual oil consumption.[7]
- Specifies less stringent fuel-consumption limits for gasoline straight trucks and coaches: gasoline models are subject to 20% higher fuel-consumption limits than diesel models.
- The Phase 2 standards are to be implemented for new HDV models applying for type approval starting from July 1, 2014. By July 1, 2015, all new commercial HDVs sold in China (except specialized vocational vehicles) will be required to comply with the Phase 2 standards. A separate rule will specify details concerning compliance for imported vehicles.

6 MIIT. 2012. National Standard - Fuel Consumption Limits for Heavy Commercial Vehicles (Phase 2) (Disclosure Draft) Edition Description. *(Chinese)* Simple arithmetic average, has not accounted for sales share of each weight bin.

7 Jin, Y. 2012. Control strategies for China heavy-duty commercial vehicle fuel consumption. Presentation at ICCT 2012 Council Summit. November.

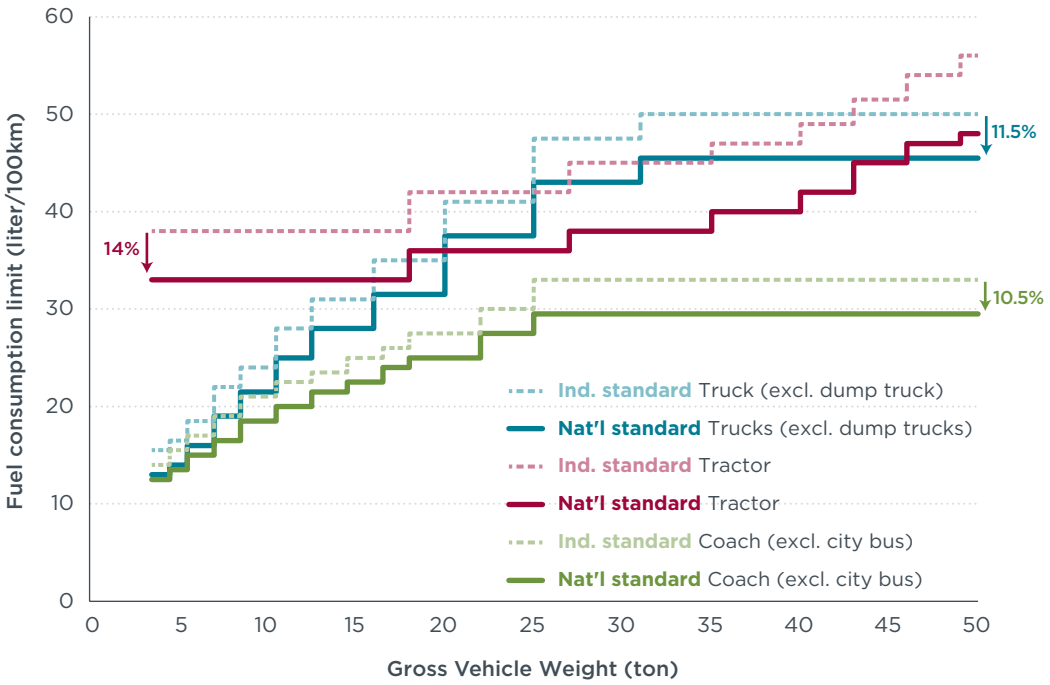

Figure 4. Comparison of the stringency of the Phase 1 Industry Fuel Consumption Standard and the Phase 2 National Fuel Consumption Standard for new commercial heavy-duty vehicles