

## CHINA'S CLEAN DIESEL ACTION PLAN: 2018–2020

### ICCT POLICY UPDATES

SUMMARIZE  
REGULATORY  
AND OTHER  
DEVELOPMENTS  
RELATED TO CLEAN  
TRANSPORTATION  
WORLDWIDE.

To combat air pollution, nine Chinese central agencies, led by the Ministry of Ecology and Environment (MEE), launched a plan in January 2019 to substantially clean up diesel-powered transportation fleets, including on-road diesel vehicles and off-road diesel equipment and shipping engines.<sup>1</sup> The plan is a critical component of the broader, three-year National Plan of Blue-Sky Defense, announced last summer.

Diesel vehicles are less than 10% of China's vehicle population, but they disproportionately account for nearly 70% of all on-road nitrogen oxide (NO<sub>x</sub>) emissions and more than 90% of particulate matter (PM) emissions in the country.<sup>2</sup> The new clean diesel plan sets three targets by 2020 and specifies 18 actions under four program areas: clean vehicles, clean engines, clean transportation, and clean diesel fuel.

Priority has been given to the so-called key regions—the dozen air pollution-prone provinces and municipal cities of Beijing, Tianjin, Hebei, Shanxi, Shandong, Henan, Shanghai, Jiangsu, Zhejiang, Anhui, Shaanxi, and Nei Mongol (see Figure 1). These key regions are subject to tougher requirements and closer supervision, as detailed in the following sections.

1 MEE, “柴油货车污染治理攻坚战行动计划” [“Action Plan for Battle Against Diesel Truck Pollution”], (2018), <http://203.187.160.134:9011/www.mee.gov.cn/c3pr90ntc0td/xxgk2018/xxgk/xxgk03/201901/W020190104656772362578.pdf>

2 MEE. “2018年中国机动车环境管理年报” [“China Vehicle Environment Annual Report”], (2019), <http://www.vecc-mep.org.cn/huanbao/content/944.html>



**Figure 1.** The key regions for the Clean Diesel Action Plan are highlighted in blue

## PLAN TARGETS

- » Ensure 90% of diesel vehicles are in compliance with current emission standards (95% in key regions)
- » Ensure that 95% of diesel fuel meets 10 ppm sulfur content limit, and that 95% diesel emission fluid (urea) by volume is in compliance with current national standards (98% in key regions)
- » Increase railroad freight transportation by 30% compared with 2017 level

## PROGRAMS

### CLEAN DIESEL VEHICLES

The goal of this program is to enhance the emission compliance of new and in-use diesel vehicles. The program calls for early implementation of the China VI emission standards, which were finalized last year, in the 12 key regions, the cities of the Pearl River Delta (PRD), and Sichuan and Chongqing by July 1, 2019—two years ahead of the national schedule. Each new vehicle is required to have an environmental information disclosure form throughout its useful life. Regulatory agencies will verify the emissions conformity of new vehicles by checking the emission control devices against the environmental information form, the on-board diagnostic (OBD) system, and possibly real-world emissions tests at the point of vehicle production, import,

or sale. Such inspections and tests will be performed on at least 80% of new engine families produced in a given region, covering all manufacturers and import companies, and more than 60% of new engine families sold in a given region, considering that a portion of vehicles are sold and operated elsewhere. In the key regions, more than 80% of new engine families sold must be inspected. The program also requires that more than 95% of the vehicles inspected be in compliance with the current standards in all regions. Violated vehicle models will be removed from the vehicle product catalogues published by the Ministry of Industry and Information Technology (MIIT) and from the CCC certification catalogue by the General Administration of Quality Supervision, Inspection and Quarantine; this prohibits the vehicles from registering.<sup>3</sup>

The Clean Diesel Vehicles Program also includes measures to accelerate the retirement of in-use high emitters. Recent studies have shown that the real-world emissions of in-use diesel vehicles can be substantially higher than laboratory-certified levels, mainly due to end-user tampering and the malfunctioning of emission control devices.<sup>4</sup>

To identify high-emitting in-use vehicles, the program describes a comprehensive, in-use vehicle emissions inspection and monitoring system based on the inspection/maintenance (I/M) program, remote OBD, remote sensing, and random roadside and onsite inspections targeting primarily large fleets. In key regions, at least half of the in-use trucks need to be retrofitted with a remote OBD kit, if suitable, by 2020; other regions are encouraged to do this also.

All emission inspection and testing data will be reported to a central information platform that enables cross-source validation, evaluation, and analysis of the “big data.” The program requires accelerated deployment of both remote sensing and the data reporting system from the city level to the provincial level, and ultimately to the central platform (aka three-tier reporting); in key regions this was to have happened by the end of 2018, and the requirement is 2020 for the rest of the nation.

To improve the effectiveness of China's decade-long I/M program, the Clean Diesel Vehicles Program for the first time requires that data regarding in-use emissions inspections (the “I” end of the I/M program) and vehicle maintenance (the “M” end of I/M program) be shared between the two relevant regulatory authorities—the local environmental and transportation agencies. This kind of “closed-loop” management system serves to ensure that the emissions issues identified by the inspection program get fixed in the maintenance program, and that real-world emissions reduction benefits from the I/M program are realized. Prior to this program, without direct “communication” between the I and M ends, owners of vehicles that failed the initial I testing could circumvent repair and still be able to pass the second test at the I station by illegal means such as temporarily leasing a functional emissions aftertreatment part. The program also requires multiple in-use emissions data sources, such as remote sensing and comparing images with testing data, to verify I/M test results, and that at least 80% of the annual I/M data be verified. This further reduces the risk of fraudulent passing of inspection tests, which was another issue with the current program in China.<sup>5</sup>

3 For China CCC certification, see <https://www.china-certification.com/en/3c-certificate-the-compulsory-certification-of-china/>, or [http://www.aqsiq.gov.cn/xxgk\\_13386/tsxx/bmts/200808/t20080813\\_320419.htm](http://www.aqsiq.gov.cn/xxgk_13386/tsxx/bmts/200808/t20080813_320419.htm).

4 Liuhanzi Yang, *Real-world emissions in China: A meta-study of PEMS emissions data from China 0 to China 5/V light- and heavy-duty vehicles*, (ICCT: Washington, DC, 2018). [https://www.theicct.org/sites/default/files/publications/ICCT\\_China\\_PEMS\\_emissions\\_meta-study\\_20180212.pdf](https://www.theicct.org/sites/default/files/publications/ICCT_China_PEMS_emissions_meta-study_20180212.pdf)

5 Renmei Wan. “机动车尾气检测造假全揭秘” [“Unveil Motor Vehicle Emission Inspection Frauds”], Cnautonews.com, April 11, 2017, [http://cnautonews.com/jrtt/201704/t20170410\\_531704.htm](http://cnautonews.com/jrtt/201704/t20170410_531704.htm).

In addition, the program plans to eliminate one million pre-China IV diesel trucks and retrofit natural gas vehicles without a three-way catalyst in Beijing, Tianjin, Hebei, Shanxi, Shaanxi, and Henan by 2020. Measures to achieve this include providing subsidies for early retirement of high-emitting vehicles and encouraging local governments to examine incentives for replacing them with new energy vehicles (NEVs). To encourage the use of NEVs, the program also urges local governments to provide road-access privileges for them. For retrofit-appropriate in-use diesel trucks, in-use diesel particulate filters and selective catalytic reduction retrofitting are encouraged. Retrofit vehicles are required to have an onboard monitoring system that reports location, fuel and diesel emission fluid levels, and NO<sub>x</sub> and PM emissions.

## CLEAN DIESEL ENGINES

The Clean Diesel Engines Program focuses on strengthening the supervision of new and in-use off-road equipment and shipping vessels. In China, off-road equipment is a major source of air pollution, and the sector contributes a nearly equal amount of NO<sub>x</sub> and PM emissions as on-road vehicles.<sup>6</sup>

The program requires that the China IV off-road emissions standard be implemented by the end of 2020, and this applies to both domestic new production and second-hand imports. Similar to the requirement for new trucks, at a minimum, 60% of locally produced off-road equipment engine families must be verified for their emissions control parts and emissions levels via inspection and testing in all regions; in key regions, at least 80% is required. For non-local off-road equipment production, the requirements are 50% for all regions and 60% for key regions. According to the program, more than 95% of the engine families inspected must be in compliance with the standard in all regions. By the end of 2019, all off-road engines must be registered in an online management system and they must attach an emissions sticker generated from the system. Global Positioning System (GPS) and on-board emissions monitoring systems are required in all new engines beginning in 2020, and are also encouraged for in-use equipment in key regions, to allow instantaneous reporting and monitoring of the location and functionality of key emission control components.

The program requests that local governments establish low-emission zones for off-road equipment to prohibit the use of high-emitting equipment and eliminate black-smoking engines, and promote the use of clean or new energy (electric) equipment. Additionally, the concept of a low-emission zone also extends to inland (river) ships, and key regions are encouraged to develop policies to ban high-emitting ships.

Other key actions include early implementation of the Stage II shipping engine emissions standards, expansion of the scope of domestic emissions control areas for ships, promotion of new energy off-road equipment and ships, and prioritization of the deployment of shore power and new energy port equipment.

## CLEAN TRANSPORTATION

The Clean Transportation Program mainly focuses on expanding railroad use for freight transport and promoting NEVs. China's freight sector is heavily dependent on diesel trucks, and this leads to excessive pollutant emissions and energy consumption, and

6 Zhenying Shao. "China IV non-road standards: A golden opportunity to advance stringent limits and mandate filters," ICCT (blog), August 25, 2017, <https://www.theicct.org/blogs/staff/china-iv-non-road-standards-a-golden-opportunity>

higher costs. In 2017, road freight accounted for 77% of total freight activity in China, whereas rail only accounted for 8%.<sup>7</sup> According to the program, railroad use needs to be 30% higher than the 2017 level, and that is about 10% by volume of total freight transportation. To achieve this goal, specific tasks include: banning coal, ore, and coke shipment by diesel trucks in key ports; accelerating construction of freight railways; and increasing railway and port connections.

Another key measure in the Clean Transportation Program is to promote new energy and clean energy vehicles.<sup>8</sup> By 2020, 8% of new urban fleets in key regions—including buses, sanitation trucks, postal vehicles, taxis, and commuting coaches—should be powered by new energy. The program also prioritizes the use of new energy and clean vehicles in the urban logistics fleet, port and airport freight transportation corridors, freight transport interchanges, logistics and business parks, and large shopping centers.

## CLEAN DIESEL FUEL

Fuel quality, especially low-sulfur fuel, is the foundation of deploying modern, advanced emission control technologies. Since 2017, China has phased in a 10 ppm sulfur limit for diesel fuels for road vehicles, off-road engines, and ships (except for marine ships).<sup>9</sup> This uniting of standards for road and off-road diesel fuels will essentially eliminate the long-lasting problem of misfuelling road trucks with higher-sulfur off-road engine diesel fuel, as both were available in the market before the new standards took effect.

Nevertheless, diesel fuel quality in general is still a major concern right now. A random inspection conducted by MEE in 2017 showed that the diesel compliance rate of private fuel stations in the Beijing-Tianjin-Hebei area was less than 50%, and the compliance rate of diesel extracted from the fuel tanks of trucks was less than 10%.<sup>10</sup>

The Clean Diesel Fuel Program calls for strengthening the supervision of fuel quality throughout the supply chain, including refinery, storage, distribution, retail, and usage. The program targets a compliance rate of 95% nationwide and 98% in key regions by 2020 for diesel and urea quality. To achieve this goal, China plans to: establish a supply-chain supervision program for diesel fuel and urea; strengthen random checks at retail stations and sampling from the fuel tanks of in-use vehicles; and carry out special campaigns against violating fuel stations.

Details of the above and other minor actions, measures, and associated targets are summarized in Table 1, below, along with the corresponding agencies. Following that, the full names of the agencies are detailed in Table 2.

7 Liuhanzi Yang, *Real-world emissions in China: A meta-study of PEMS emissions data from China O to China 5/V light- and heavy-duty vehicles*, (ICCT: Washington, DC, 2018). [https://www.theicct.org/sites/default/files/publications/ICCT\\_China\\_PEMS\\_emissions\\_meta-study\\_20180212.pdf](https://www.theicct.org/sites/default/files/publications/ICCT_China_PEMS_emissions_meta-study_20180212.pdf)

8 New energy vehicles refer to pure electric, plug-in hybrid and hydrogen fuel cell vehicles. Clean energy vehicles refer primarily to natural gas vehicles and also include other clean alternative fuel vehicles.

9 Zhenying Shao, *Early adoption of China VI vehicle fuel standards in Jing-Jin-Ji and surrounding areas*, (ICCT: Washington, DC, 2018). <https://www.theicct.org/publications/early-adoption-china-vi-vehicle-fuel-standards-jing-jin-ji>

10 The People's Daily. “攻坚战为何瞄准柴油货车” [Why the war targets diesel trucks]. August, 4, 2018. [http://www.xinhuanet.com/fortune/2018-08/04/c\\_1123221467.htm](http://www.xinhuanet.com/fortune/2018-08/04/c_1123221467.htm)

**Table 1.** Summary of actions and targets in China's Clean Diesel Action Plan 2018-2020

Category	No.	Action	Measure	Target	Responsible Agency
Clean diesel vehicles	1	Strengthen supervision of new vehicles	Implement national vehicle-emissions and fuel-consumption standards	Early adoption in key regions, PRD, Sichuan, and Chongqing by July 1, 2019	MEE, MOT
			Strengthen environmental information disclosure	—	MEE, MOT
			Limit the production, import, and sale of non-compliant vehicles	New vehicle engine family production sample rate 80% in other regions, higher in key regions New engine family sales sample rate 60% in other regions, 80% in key regions New engine family production and sales compliance rate should reach 95% Violated vehicles are not allowed to register	MEE, MIIT, GAC, SAMR
	2	Strengthen surveillance of in-use vehicles	Establish and improve supervision and enforcement program	If 10% or more of the trucks from a freight enterprise are non-compliant, the enterprise will be blacklisted.	MEE, MPS, MOT
			Strengthen roadside inspection (on emission control parts, OBD, fuel quality, urea)	—	MEE, MPS, MOT
			Strengthen onsite inspection for key enterprises (logistics, industries, buses/coaches)	—	MEE
			Strengthen diesel emission management during heavy pollution days	—	MEE, MPS, MOT
			Increase the frequency of inspection of high-emitting vehicles	In-use vehicle supervision test sample rate: 80% of diesel vehicle population in key regions, 50% in other regions	MEE, MPS, MOT
	3	Strengthen emission testing and maintenance of in-use vehicles	Strengthen supervision of emission inspection agencies	—	MEE, SAMR
			Strengthen supervision of maintenance stations	—	MOT, MEE
			Improve I/M program by punishing fraud	Real-time monitoring and information disclosure of I/M facilities nationwide by the end of 2019	MOT, MEE
	4	Accelerate the elimination and retrofit of old vehicles	Accelerate the elimination of old, dirty trucks	Eliminate one million pre-China IV diesel and dirty natural gas commercial trucks in Beijing, Tianjin, Hebei, Shanxi, Shaanxi, and Henan by the end of 2020	MOT, MEE, MOF, MOC
			Promote retrofit of high-emitting vehicles (retrofit or renew aftertreatment systems and remote OBD)	—	MEE, MOT
	5	Promote construction and deployment of monitoring systems	Accelerate construction of a comprehensive monitoring system (including remote sensing, I/M, remote OBD, on-road inspections)	Establish three-tier reporting to emissions data platform in key regions (to have happened by the end of 2018), and in other regions by 2020. 50% of qualified diesel trucks should be equipped with remote OBD and connected to MEE by the end of 2019	MEE
			Strengthen analysis of emissions "big data"	Verify at least 80% of annual emission data for high-emitters or old diesel vehicles	MEE
	6	Consolidate and strengthen emission control related industries	Eliminate backward vehicle manufacturers	—	MIIT
Scale up emission testing facilities and maintenance stations			—	SAMR, MEE, MOT	
Clean diesel engines	7	Strengthen supervision of new engines, off-road equipment, and shipping vessels	Implement China IV off-road emissions standards	Implement China IV off-road emissions standard nationwide by the end of 2020	MEE, MOT, GAC, SAMR
			Strengthen supervision of new engines and off-road equipment	New production engine family sample rate of 60% in other regions, 80% in key regions. New sales engine family sample rate of 50% in other regions, 60% in key regions. New production and sales compliance rate should reach 95%	MEE, MOT, GAC, SAMR
			Implement China Stage I emissions standards for shipping engines and adopt China Stage II standards early	—	MEE, MOT, GAC, SAMR
	8	Strengthen management of emission control zones	Establish low-emission zones for off-road engines	Establish low-emission zones in key regions by the end of 2019, in other regions by the end of June 2020. Inspect the implementation of low-emission zones, especially during fall and winter seasons, and ensure at least 50% of inspected off-road equipment is in compliance in key regions	MEE, MOT
			Adjust and expand the scope of domestic emission control areas (DECA) for shipping vessels	By the end of 2019	MEE, MOT
	9	Accelerate retrofit and retirement of old engines	Eliminate old off-road equipment and shipping vessels	—	MOA, MOT, NRA, CAAC, China Railway
			Promote new energy off-road equipment and shipping vessels	—	MOA, MOT, NRA, CAAC, China Railway
	10	Strengthen comprehensive supervision and management	Complete registration and labeling for off-road equipment.	By the end of 2019	MEE
			Promote GPS and on-board emissions monitoring system for off-road	New production and sales should be equipped with GPS and remote OBD by the end of 2020	MEE
	11	Promote construction and application of shore power system	Accelerate construction and retrofit of shore power facilities	50% of berth to have capacity to provide shore power in key ports and in DECA by the end of 2020	MOT
				Beginning July 1, 2019, new or replaced tugboats in key ports give priority to new or clean energy boats	MOT

CHINA'S CLEAN DIESEL ACTION PLAN: 2018-2020

Category	No.	Action	Measure	Target	Responsible Agency
Clean transportation	12	Increase railroad freight transportation	Ban road transport of coal, ore, and coke	In key ports including Tangshan and Huanghua this was required by winter 2018 for coal, and is required by winter 2020 for ore and coke	MOT, NDRC, MEE, NRA, China Railway
			Increase freight volume by rail	Rail freight volume should reach 50% in key industries (steel, electrolytic aluminum, electricity, coking) in key regions by 2020	MOT, NDRC, MEE, NRA, China Railway
	13	Promote green freight	Promote multi-mode transport (railway, waterway)	—	MOT, NDRC, MEE, NRA
			Promote container freight, drop and hook, intermodal transportation	—	MOT, NDRC, MEE, NRA
			Promote urban green delivery demonstration program	—	MOT, NDRC, MEE, NRA
	14	Optimize fleet structure	Promote new energy and clean energy vehicles	80% of new urban vehicles should be NEV (buses, sanitation, postal, taxi, light delivery trucks) in key regions	MOT, MEE
			Promote new energy logistics vehicles	—	MOT, MEE
			Encourage fuel cell vehicle demonstration programs	—	MOT, MEE
	Clean diesel fuel	15	Accelerate upgrade of fuel quality standards	Implement China VI diesel/gasoline standards nationwide	Beginning on January 1, 2019
Accelerate development and implementation of fuel standards for inland vessels				—	NEA, MOT, SAMR
Research and develop more stringent fuel quality standards				—	NEA, MOT, SAMR
16		Improve fuel and urea management systems	Strengthen supervision of and punishment for violating enterprises	—	SAMR, NEA, MEE
			Promote information disclosure for urea and fuel additives	—	SAMR, NEA, MEE
			Establish a life-cycle supervision file for fuel and urea	—	SAMR, NEA, MEE
17		Promote vapor recovery and treatment	Install vapor recovery systems at fuel stations, storage tanks, and fuel tankers	To be completed in key regions by the end of 2019, and in other regions by the end of 2020	MEE, MOT
			Promote auto-monitoring pilot programs for vapor recovery systems in key regions	—	MEE, MOT
			Carry out vapor recovery and treatment for crude oil/oil product terminals and ships	—	MEE, MOT
18		Strengthen supervision of production, sales, storage, and use	Strengthen random checks on fuel stations and fuel/urea tanks	—	SAMR, NDRC, MOC, MOT, MEE
	Carry out special campaigns against violating fuel stations/fuel tankers		Illegal production, sales, storage, and use of non-compliant fuel should be eliminated by the end of 2019	SAMR, NDRC, MOC, MOT, MEE	

**Table 2.** Government agencies involved in the new Clean Diesel Action Plan.

<b>NDRC</b>	National Development and Reform Commission
<b>MOT</b>	Ministry of Transport
<b>NRA</b>	National Railway Administration
<b>MIIT</b>	Ministry of Industry and Information Technology
<b>MEE</b>	Ministry of Ecology and Environment
<b>NEA</b>	National Energy Administration
<b>MOF</b>	Ministry of Finance
<b>MOA</b>	Ministry of Agriculture
<b>SAMR</b>	State Administration for Market regulation
<b>GAC</b>	General Administration of Customs
<b>MPS</b>	Ministry of Public Security
<b>MOC</b>	Ministry of Commerce
<b>CAAC</b>	Civil Aviation Administration of China
<b>MOJ</b>	Ministry of Justice