



INTERVENTION 2

Reducing Emissions from Diesel Vehicles

SUMMARY

In the context of controlling particulates from vehicles, the major issue is diesel engines, and in particular older diesels, of which there are millions still in use in developing countries. The challenge in countries where older, dirty, diesel vehicles (often heavy-duty vehicles) predominate is to ensure that new vehicles meet higher standards and to retire and replace older polluting models. However, with diesel buses, trucks and minivans playing an important role in public transport and in commerce, change has to be managed carefully. In general, diesel and gasoline engines can produce similar levels of carbon emissions, although EURO V and EURO VI compliant diesels should produce less CO gas.

Uncontrolled diesel emissions from road and non-road engines can be one of the major sources of particulates, especially in rapidly growing cities. Reducing vehicle fleet levels from the equivalent of Euro I to Euro IV would achieve a reduction of about 80% in fleet emissions. Moving further to Euro V would reduce the remaining emissions by a further 80%. Progressive application of increasingly

stringent standards will result in the overall fleet becoming cleaner and emissions dramatically reduced. The greatest benefits are in dealing with the heavy polluters: the marginal benefits of increasing standards reduce at each stage but are critical in achieving overall cleaner ambient air.

Air Quality and Health benefits: Medium to High. In urban areas where diesel is the main fuel and transport is the biggest polluter, achieving Euro IV could reduce particulate levels in the air by 20% or more.

Carbon benefits: Medium to High. Moving to Euro IV could reduce the CO emitted by diesels by half, which would bring down the carbon footprint of the city by a few percent. At the same time, diesel combustion is a major source of black carbon and so Euro IV standards would also deliver significant Short Lived Climate Pollutant (SCLP) benefits. For this reason, reducing diesel emissions has been identified as an important example of co-benefits.

Costs: High. To upgrade the diesel vehicles in a city to moderate pollution standards would be a very large and costly task, which

can only be carried out over a period of years. Staging of implementation can reduce the impacts: requiring new vehicles to meet higher standards can mean that costs are absorbed in new and more efficient vehicles. The age and average life of the fleet—especially HDVs—largely control the natural replacement rate. Requiring earlier upgrading or replacement just to meet emissions requirements would impose larger costs on individual vehicle owners. In many places, governments have provided some form of incentive to speed up replacement.

Political Feasibility: Governments have to balance the public demand for cleaner air with the costs imposed on vehicle owners. This balance varies across cities and cultures and can be affected by severe pollution incidents. The case studies demonstrate that one consequence often is a slow and sequenced introduction of emissions standards, aimed at tackling one part of the problem at a time. Related practical approaches include beginning with government controlled (or influenced) fleets, such as buses and taxis, where the costs of vehicle upgrading can be subsidized to some extent.



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EXAMPLES

BANGKOK. As a major metropolitan area, Bangkok's emissions are dominated by mobile emissions sources and diesel vehicles have been the major contributor of PM_{2.5} in Bangkok since they do not have diesel particulate filters.

EMISSIONS STANDARDS FOR DIESEL ENGINES, MEXICO. By the end of 2018, Mexico affirmed its decision to ban high-sulfur diesel throughout the country and switch to consumption of ultra-low sulfur diesel (ULSD) exclusively. Proposed revisions to NOM 044 emission standards will require manufacturers/importers of new heavy-duty vehicles to move directly to either EPA

2010 or Euro VI standards, skipping over any interim steps. Currently, most of the heavy-duty vehicles (HDV) in Mexico meet EPA04 standard (which began implementation in the US in 2004), which reflects that the fleet has been lagging clean technologies for about 15 years. EPA 2010 and Euro VI are functionally equivalent standards, which take advantage of commercially available and cost-effective technologies capable of reducing emissions of PM up to 98%, and NO_x by 89-96% below EPA 2004 levels. The implementation of NOM044 will be coordinated with ensuring the nationwide availability of ultralow-sulfur diesel (ULSD) with fewer than 15 parts per million (ppm) sulfur.

ELIMINATING HIGH EMITTERS, DELHI. Old vehicles were a major source of pollution in Delhi. De-registration of 10- to 15-year old diesel vehicles, requiring them to be taken off the road, has been conducted in a phased manner. Consequently, by 2018, most older diesel vehicles were removed from Delhi roads.