

INTERVENTION 1

Cleaner Buses

SUMMARY

The bus—often simple and inexpensive—is the most common form of public transport in many countries. Barriers to entry are very low and, therefore, buses range greatly in quality. Upgrading buses and their operation is an essential part of increasing clean and functioning cities. Buses, especially in developing countries, are often individually owned, but in larger centers they are usually in fleets, either privately or publicly owned. Ownership is an important factor in being able to bring improvements in fleet performance.

CACC and partners including C40 are implementing a “Soot-Free Urban Bus Fleet” program to support cities to switch to soot free engines. The project is actively targeting 20 cities in 20 countries. Eleven of

these cities are in CCAC member states. A “Megacities” Program was launched 2017 by major manufacturers with C40, CCAC, and ICCT to trial “low emissions technology” buses in 20 megacities.

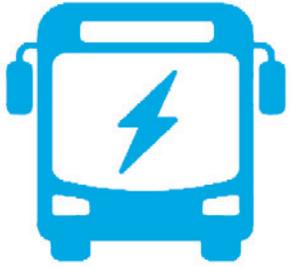
Air Quality and Health benefits: Medium to high. Particulate and black carbon emissions can be reduced significantly by moving a bus fleet to “soot-free.” The overall impact on a city’s pollution will depend on the contribution of the buses to the particulate levels and on the time it takes to reduce the fleet emissions levels.

Carbon benefits: Medium. High levels of black carbon. The carbon benefits of moving from “average” buses to soot-free can be significant. Switching to electric buses eliminates both CO₂ and black carbon emissions.

Costs: High. Cleaner buses are more expensive than typical buses in many countries. The cost gap depends fundamentally on which emissions standard applies to the current bus fleet. Where the standard is equivalent of Euro III or IV or similar, the additional cost can be up to 50% greater. Where the standard is nearing Euro VI, then the costs of ultra-clean diesel and other clean vehicles, including electric, are all similar.

Political Feasibility: Cleaner buses are generally very positive on all aspects, apart from cost. If practical financing can be determined, then cleaner buses will be widely accepted.

Ownership: Cities and regional agencies



INTERVENTION 1

Cleaner Buses

EXAMPLES

DELHI. During the debate about cleaner buses following the 1998 Supreme Court order to move to CNG, there were disagreements about this technology-driven approach, as diesel technology and standards were improving at the time. By the end of 2002 it was claimed that all buses were running on CNG in Delhi and by 2005, there were more than 10,000 CNG buses, of which 7,000 were run by private operators. In 2018, the Delhi government provided 2,000 new CNG busses and committed to a number of electric buses to run as shuttles to the Delhi Metro system. At the time, concerns were expressed about the high costs of electric buses compared to the new CNG buses and about the need for new bus depots for the electric buses.

HONG KONG. In 2010, the franchised bus companies completed retrofitting their Euro II and III buses with DPF, where technically feasible, aiming to reduce particulate emissions from diesel vehicles by over 80% and “low emission zones” were established in three busy corridors in central Hong

Kong. Subsequently, the government subsidized the bus companies to retrofit some 1,030 Euro II and Euro III franchised buses with selective catalytic reduction devices to upgrade their performance to Euro IV or above level by the end of 2017. The government subsidized the franchised bus companies to procure six hybrid buses and 36 electric buses for trial runs to assess their operational efficiency and performance under the local conditions.

SHENZHEN, CHINA, has switched to an electric bus fleet and now has 16,000 electric buses in total, reducing not only pollution but also noise. In this fast-growing megacity of 12 million, the switch from diesel buses to electric is expected to achieve an estimated reduction in CO₂ emissions of 48% and reductions in pollutants, including particulate matter. This upgrade has been expensive (each bus cost more than £200,000) and has been subsidized up to 50% by both national and local government. Establishing the all-electric fleet has also required a network of charging stations, including 180 depots with their own charging facilities installed.

“CLEAN BUSES IN LATIN AMERICAN CITIES.”

This review by World Bank and others examined drivers and barriers for cleaner technologies in public transport in five LAC cities. The potential emissions reductions available depend on the specific technology (Euro VI, CNG, battery-electric, hybrid, etc) but all the approaches are significantly costly compared to the current fleets. The clean bus has a higher up-front cost but is competitive in terms of total costs of ownership. Currently, there are a number of low-emissions buses in operation in the five cities, but in reality these represent only about 1% of the city bus fleets. Despite the apparent advantages, operators are reluctant to adopt unfamiliar technologies, citing cost, performance, maintenance, and other issues. It is hoped that recent decreases in costs and growing share of renewables in the power grids will help to expand the clean component of the fleets.