Air Pollution in India: Mumbai and its Environment Protection

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Mumbai has been the ideal setting for global environmental issues including disaster management and climate change management. The question here is, however, how well is it implementing solutions to these threats? Mumbai ranks among the top three most polluted cities in the world and even rising pollution levels in cities like Delhi are more alarming than some Indian cities like Mysore, Dehradun, or Bhubaneswar. Media reports are suggesting that not only Mumbai but any city with growth of about 3,000 people every year, faces the same problems. Like air pollution caused by rising vehicle usage and vehicles burning black carbon from diesel burning, a combined heat/power plant, and solar and biomass power plants. There are efforts to regulate these pollutants but they are not stringent enough. The responsibility lies with the government to get systems in place and ensure implementation is comprehensive, but then, the government lacks the ability to handle the problem effectively. This places huge stress on the industry to help address the problem.

Mumbai is now looking at automation technology to tackle pollution. Several studies (Renzo Serafini-Guillemard 2011 and Heijde and Settekes 2010) suggest that passengers of vacuum trucks, which destroy vehicular fuel, are subject to smog, because vacuum trucks are not equipped with air pollution filters, hence, combustion emissions remain undetected. According to the Sixty percent of all office workers in India are exposed to smog that can affect their health, affecting their mental well-being, and hence their productivity. Next time your office tower is being evacuated, thought not, it may be because of a vacuum truck in the building. Unlike regular trucks, vacuum trucks are allowed on Mumbaiâ€™s roads. Because of these trucks, sources of black carbon air pollution are controlled only partially. Reportsters suggest that the amount of black carbon in Delhi which is affecting the health of people is about 80 times the level of black carbon that we can expect in our air. So, how do we bring vacuum trucks in line with regulations? One approach is to replace the vacuum trucks with cleaner trucks. Another view is to deploy over 500 vacuum trucks. Researchers suggest that the best solutions to deal with smog are on the lines of air cleaning in the Clean Diesel technology. Studies (Renzo Serafini-Guillemard 2011) have suggested that the smartest solution is for cleaner gas-turbine air filtration systems that use only the collected gas. The buses in the Dehradun system clean only 75% of air, like a motor scooter, and then return the other 25% to the environment. The Le Corbusier in the Netherlands system makes the 100% clean gases returned to the environment. These systems help to reduce smog not only in the air but the appearance of the buildings. The vacuum trucks also remove the black carbon without maintaining exhausts.

For the Indian solution to bring cleaner trucks in sync with regulations to control black carbon in the air, it is important to follow the Leadership in Energy and Environmental Design (LEED) under the Indian Green Building Council (NGBC) guidelines, which impose stricter and more stringent requirements for all major building projects that require compliance with Low VOC (vaporized condensate) standards and reducing as much non-recyclable carbon as possible (99%).

Mumbaiâ€™s government needs to introduce tougher regulations for cleaning of black carbon from the vacuum trucks by using technology available from the European Union in order to reduce smog problems.

Bio-fuel plants, solar power plants, and power-generation capacity that can generate waste heat into hydrogen could also be effective to meet the smog management challenges of the city. These investments in Clean Diesel, hybrid engines, and sustainable technologies to reduce car emissions will help Mumbai, a city with sprawling populations, to become the leader in energy efficiency and climate change management in India.

Residential and industrial buildings can also be cleaned of smog by using air cleaning systems.

This is the first of a series of articles with double-sentence articles on these issues. Each article is written by Prabuddha Dey, a professor in the department of Civil Engineering at IIT Madras, and represented by Munaf Maiti, an assistant professor in civil engineering at IIT Madras.

A Brown Bear Standing Next To A Tree