

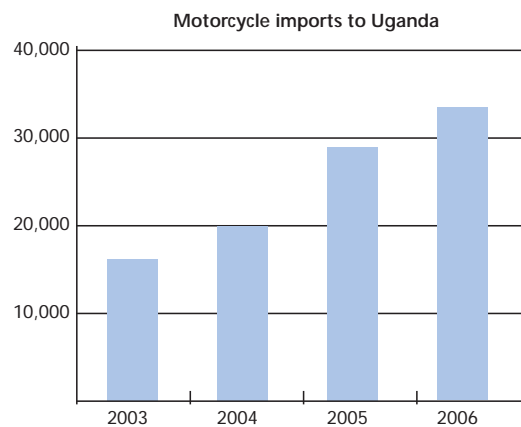
THE NEED FOR CLEANER MOTORCYCLES: UN INITIATIVE PROMOTING CLEANER FUELS AND VEHICLES

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Photo by UNEP and Richard Stanley, Make Roads Safe Campaign

The unmistakable rattle and hum of two-wheelers (motorcycles, mopeds) and three-wheelers is becoming more and more common on tarmac in cities throughout Africa, whereas in Asia and Latin America they are already well-established forms of affordable rapid transport.

Two and three wheelers already make up over 70 percent of urban fleets in Asia, and their popularity is growing rapidly in Africa¹. In fact it's now common to hop onto a 'tuk-tuk' in Kenyan towns and cities rather than the 'boda-boda' bicycle taxi or an overcrowded minibus. In neighboring Uganda, motorcycle imports increased three-fold between 2003-2006; in 2006 the country imported three times more motorcycles than personal cars.



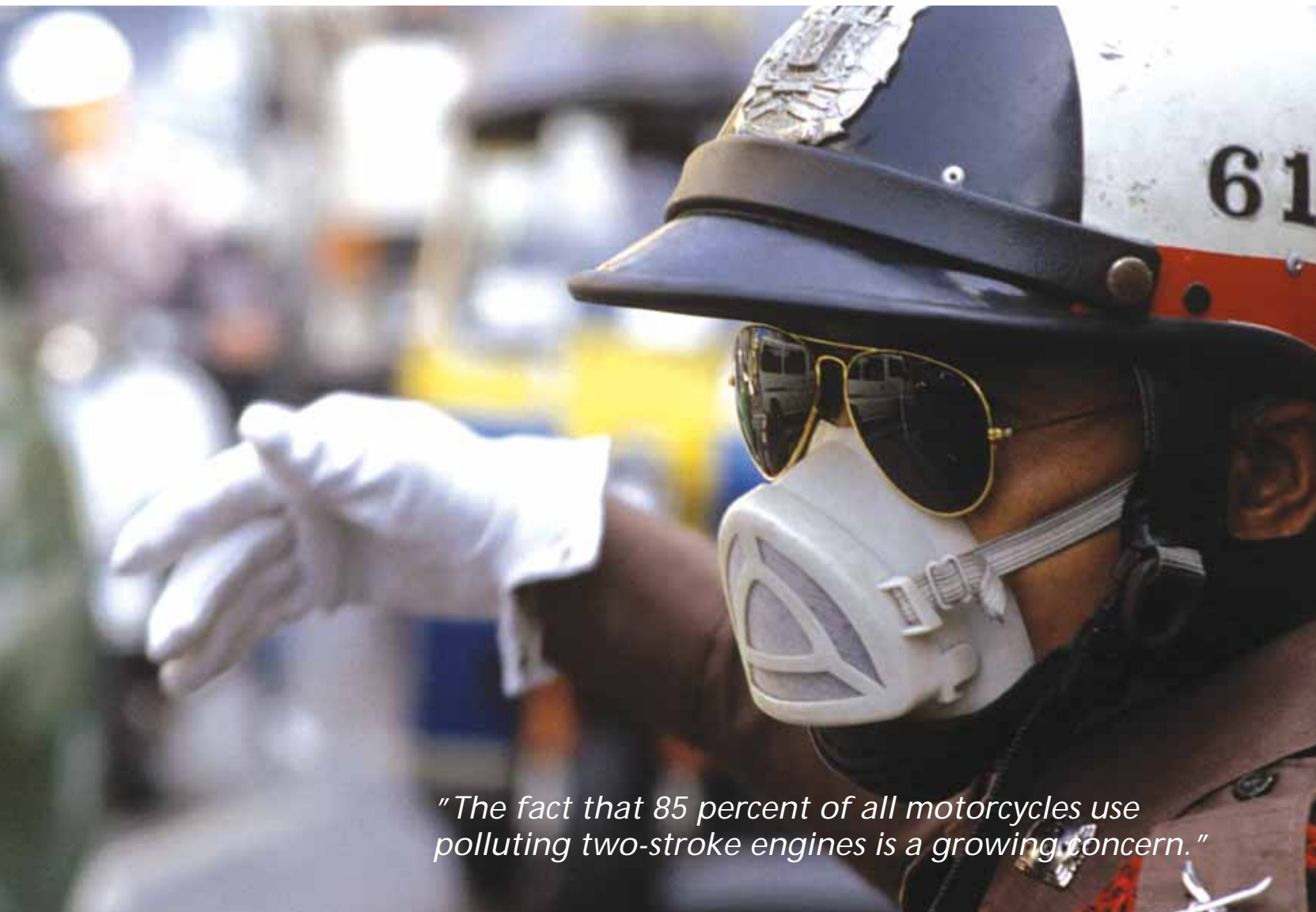
Yet while these engines represent increased economic activity and reliable personal mobility for millions, the fact that 85 percent of all motorcycles use polluting two-stroke engines is a growing concern. In many cities in developing countries, they are already the main source of urban air pollution, contributing to the 800,000 deaths attributable to air pollution around the world each year through high particulate, nitrogen oxide, and volatile organic compound emissions².

The solutions - cleaner, more efficient four-stroke engines, tighter emission regulations, and inspection and maintenance regimes - are increasingly considered as authorities grapple with air quality and transport emissions. Cities such as Beijing, Dhaka, and Bangkok already have measures in place, while Delhi mandated a conversion to natural gas to address the suffocating pollution caused by dirty two-stroke three-wheelers.

The Importance of Cleaner Fuels and Vehicles

Since 2002 the Partnership for Clean Fuels and Vehicles (PCFV), based at the United Nations Environment Programme (UNEP) in Nairobi, Kenya, has worked with governments, industry, international organizations, and NGOs worldwide to promote lead-free, low sulphur fuels along with cleaner vehicles and technologies in developing and transition countries. Cleaner fuels and vehicles are one of the most cost-effective and efficient methods of improving air quality, especially in cities. When introduced as a system, clean fuels and vehicles have the potential to significantly reduce pollutant emissions and enable the use of emission control technology and advanced efficient vehicle technologies.

The concentrated negative health effects of urban air pollution impose high economic costs on developing countries. The global burden of disease attributed to air pollution is around 13% in developing countries, whereas in developed countries the estimate drops to 2-6%³. Fuel quality and vehicle emission control measures in the US, Europe, and Asia have yielded significant



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benefits. A 2006 report by the European Environment Agency (EEA) states that decreased transport emissions in EEA member countries since 2003 are "mainly due to innovations in exhaust gas treatment and improved fuel quality."⁴

Cost-benefit analyses of fuel sulphur reductions performed in the US, Canada, Europe, Mexico, China, Brazil (included incremental costs of fuels and vehicles) have all concluded that benefits of reducing sulphur from fuels far outweigh the costs.

The PCFV's support for lead phase-out activities in sub-Saharan Africa resulted in the complete ban on import and production of leaded gasoline in the subregion as of 1 January 2006. Building on the success of its sub-Saharan Africa campaign, the PCFV launched a global campaign to eliminate leaded gasoline globally by the end of 2008, and is promoting low-sulphur fuels (50 parts per million for sulphur in diesel and petrol) worldwide concurrent with clean vehicles and vehicle technology.

A Call for Cleaner Motorcycles

Through close partnership with Kjaer Group, UNEP and the PCFV are now addressing cleaner motorcycles by promoting the use of four-stroke engines and emission controls. While two-stroke engines have traditionally been used in motorcycles because of lower manufacturing costs and smaller size when compared to four-stroke engines, their hidden costs in terms of long-term maintenance and fuel consumption and high pollution mean that two-strokes end up being more costly to the owner and to society throughout its lifecycle. The total cost of buying, fuelling, and maintaining a two-stroke vehicle is higher as four-strokes are more fuel efficient. The added cost of lubricating oil added to the petrol used in two-strokes means additional maintenance and higher emissions. This is caused by incorrect dosage or use of improper oil, along with poor maintenance.



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In addition to increased pollutants and carbon dioxide, any existing catalyst on that vehicle will be poisoned. Standard oxidation catalysts reduce emissions by 50-80%. But higher exhaust temperatures on two-stroke engines will deactivate an oxidation catalyst over time. In the long-term, the cleanest motorcycles are four-strokes using three-way catalysts, reducing emission by over 90 percent. However, it should be noted that advanced two-stroke design with direct injection systems and catalysts are also comparative in terms of emissions while maintaining smaller engine size. Yet with the added technology required to meet stricter environmental standards (e.g. the US, EU, India and Taiwan require catalysts on motorcycles), the cost of a two-stroke is comparable with a four-stroke.

Yet despite the clear advantages of four-stroke technology, many organizations, public and private, local and international, continue to source outdated and polluting two-stroke motorcycles for a variety of applications. Given that four-stroke

engines using lead-free, low-sulphur fuel are cleaner, more fuel efficient and cost saving over their lifecycle, organizations must seriously consider the costs and impacts of buying two-stroke motorcycles for use in developing countries. A lack of proper inspection and maintenance, strict enforcement of emission standards, means that even modern two-strokes will deteriorate rapidly and the catalyst will cease to function, increasing emissions and air pollution.

 [Read more www.unep.org/pcfv](http://www.unep.org/pcfv)

1. http://www.cseindia.org/aboutus/press_releases/press_20040331.htm
2. WHO 2002, World Health Report
3. Ibid
4. Transport and environment: facing a dilemma, page 19, <http://reports.eea.eu.int/>



The Partnership for Clean Fuels and Vehicles (PCFV) is the leading global initiative promoting better urban air quality through the use of cleaner fuels and vehicles.

Established at the World Summit for Sustainable Development in 2002, as of 1 January 2006 it has over 90 member organizations including governments, international organizations, industry groups, and non-governmental organizations involved in efforts to eliminate leaded gasoline worldwide and promote low sulphur in fuels concurrently with the introduction of cleaner vehicles and vehicle technology.

Partnership activities focus on building consensus between all sectors and facilitating the transfer of knowledge and technology on cleaner fuels and vehicles from developed to developing countries.

The PCFV, whose Clearing-House is based at the United Nations Environment Programme (UNEP) headquarters in Nairobi, Kenya, provides technical, networking and financial support for regional, national and local activities promoting cleaner fuels and vehicles.

For more information on the benefits of four-stroke engines, consult the joint Kjaer Group, UNEP and PCFV brochure enclosed this edition of CarNation.

