



INTERVENTION 5

Upgrading Two- and Three-wheel Motorcycles

SUMMARY

Motorized bicycles and tricycles have long been used for personal transport and for moving goods. With increasing economic growth, great numbers of such motorbikes have also led to congestion, pollution, and accidents in many urban areas. In 2004, it was reported that more than 75% of the vehicles in many Asian cities were motorcycles, providing mobility, although with social and environmental costs. Two-stroke engines have no separate lubrication systems and use oil mixed into their fuel to lubricate the engine. Many cities have taken measures to eliminate two-stroke vehicles in favor of four-stroke.

Air Quality and Health benefits: Can be high. Motorcycles provide the main source of mobility for millions of people, especially in Asia and Africa, but they are also often a major pollution source. Switching from two-stroke to four-stroke engines results in about a 70-80% reduction in vehicle particulate emissions. It is reported that in Dhaka that there was a 40% decrease in overall particulate levels when two strokes were banned.

Carbon benefits: Low. The carbon emissions of individual motorbike are modest in relation to overall emissions inventories. Moving to

four-stroke engines would have limited carbon benefits.

Costs: Medium. Motorcycles (two- and three-wheeled) are prevalent in many cities and suburban areas because they are cheap and easy to maintain. The costs of upgrading to four-stroke engines are significant in relation to the costs of basic two-stroke models.

Political Feasibility: In developing countries, motorcycles are an important asset for the poorer segment of the population and for informal and small-scale business. Changes have been imposed in cities where the expected benefits are clear (Bangkok, Delhi), but wider upgrading is difficult.

EXAMPLES

TWO-STROKE ENGINES, BANGKOK. Emissions standards imposed in Thailand in 1997 were challenging for the manufacturers of two-stroke engines. When Thailand adopted the next level of Euro emissions regulations in 2001 motorcycle manufacturers switched to produce only four-stroke motorcycles. The number of motorcycles on the streets of Bangkok was about 4.4 million in 2012, and the near universal adoption of four-stroke engines had a

significant beneficial impact on the air quality, especially at street level.

DHAKA BANGLADESH. In 2002, two-stroke “baby taxi” three-wheelers were banned from the streets of Dhaka, and it was reported that this resulted in a 40% reduction in particulates in the city center.

DELHI. Many of the three-wheelers in Delhi converted to CNG fuel following a 2001 Supreme Court order.

HANOI. Hanoi is one of the most polluted cities in the region and has about 5 million motorbikes. The Hanoi People's Council voted in 2018 to ban motorcycles in the inner city by 2030, citing pollution and road accidents. The city plans to spend the next 12 years investing in improved public transportation around the city and then gradually introducing no-go areas for motorcycles that will cover the entire inner city by 2030.

CHINA. In some Chinese cities, motorcycles have been banned altogether from the city center, so less powerful but cleaner electric bicycles are more common. The increasing numbers of electric bicycles are beneficial from a pollution point of view (apart from battery disposal concerns) but may increase accidents and congestion.