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Limits to vehicle emission control: a case of Guangzhou

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Abstract

Despite the seriousness of the problem, the city government does not wield much power in its attempt to reduce exhaust gases. While vehicle emissions are the main source of local pollution, they have regional environmental consequences. So far, localized measures to address regional smog are far from effective. This paper explains that local efforts are confined by economic interests and priorities that lie within the jurisdictional boundaries which find addressing local air pollution through limiting car ownership and use as politically unacceptable. Also, incomplete pollution data in China in general makes it difficult for city officials to come up with targeted and innovative approaches that can bring additional emission reductions. The paper further argues that without a strong and direct commitment to radically reducing current levels of vehicle-based pollution through a set of complementary behavioral modification measures, continued reliance on temporary technical fixes is likely to exacerbate the urban air pollution problem.

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Keywords: Vehicle emissions; smog; air quality; China; policy review

1. Introduction

Driven by the advent of rapid motorization in the 1990s, major cities in the Pearl River Delta are increasingly beset with a new type of air pollution problem associated with the emission transition process. This pollution mix is characterized by a steady and steep upward trend of vehicle emissions, and it is further exacerbated by existing industrial emissions that remain a substantial source of air pollutants in the urban centers. The blending of these two major types of pollutants has resulted in a region-wide photochemical smog formation; hence an increased number

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of days in which cities are shrouded in smog. Because China's current economic development strategies generally favor the use of private vehicle transport, vehicle emissions will continue to be a growing and rampant source of air pollutants in rapidly motorizing cities.

A set of vehicle emission control measures, if effectively implemented, combined with an induced decline in car travel demand, can decrease total emissions. However, the path to realization of these control measures is not necessarily straightforward. Using a single-case case study approach, this paper examines the effectiveness of the policy measures in Guangzhou, the provincial capital city of Guangdong Province and located in the Pearl River Delta. Guangzhou is chosen because it represents a unique case in which the city government has simultaneously strived hard to create a robust automotive sector as one of its major pillar industries and has pioneered the use of various vehicle emissions control measures in the PRD region. In such circumstances, the single case study approach could help determine the magnitude of these ostensibly contradictory forces of economic growth and environmental protection in affecting the efficacy of implementation of various vehicle emission control measures in Guangzhou.

This paper strives to highlight first the nature of the vehicle emission control policy and second the localized measures to achieving the stated policy objectives of improving urban air quality and public health. The third section delves into the problems of localized measures to control vehicle emission as most city officials are just doing it without aiming at it. Data are gathered from Chinese-language newspaper articles, scholarly journals, national census and statistical yearbooks, and interviews with government officials at the Guangzhou Environmental Protection Bureau.

2.0 Vehicle emission problems and their corresponding measures in Guangzhou

Guangzhou has one of the highest densities of vehicle population and constitutes a large share of China's automobile market (Figure 1). The automotive industry has been declared as one of the city's three major pillar industries since the announcement of the "Ninth Five-Year Plan of Guangzhou (1996-2000)". Its advanced automotive industry is also indispensable to the national automotive development and has rendered Guangzhou to be one of the most important automobile manufacturing bases in China.

Back in the 1980s and early 1990s, the building of an automotive industry in Guangzhou was regarded by critics as a dream as the city lacked personnel, technology, and capital. It was only in 1997, when Guangzhou secured a joint-venture agreement with the Japanese automotive enterprise of Honda, could the local industry come to existence.[1] Since the millennium, the gross output value generated from the automotive industry has been blooming both in its amount and its annual growth rate. By 2006, the city's automotive industry has already replaced the other two pillar industries—petrochemical and electronic industries—and became the major vehicle for industrial growth in Guangzhou.[2,3]

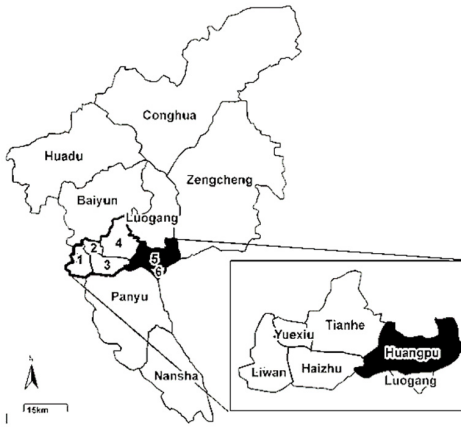

Fig. 1 Map of Guangzhou