

CHINA

Urban Transport, Energy Efficiency and Climate Change Management

(Concept Note)

Introduction

Urban transport in China is a rapidly growing sector with significant potential to contribute to the national climate change management agenda. However, the sector has not yet developed a clear policy and coherent strategies/tools to address the energy efficiency and climate change issues. This concept note proposes a multi-year, collaborative program of analytical works and implementation support activities that aim at enabling China's urban transport sector to address these issues systematically and contribute to the reduction of the rate of growth of green house gas (GHG) emissions.

Background

With sustained rapid economic growth, China has become the world's second largest emitter of GHG. Albeit from a comparatively low starting point, transport is the fastest-growing sector in terms of energy consumption and GHG emissions. Estimates suggest that for a 15-year period between 2005 and 2020, energy consumption from China's light duty transport fleet would increase over 300 percent. As private automobiles are heavily used in urban areas, urban transport bears a significant share of the total transport energy use and GHG emissions. This share is expected to grow with the continuing motorization in cities that is strongly driven both by urbanization and per capita income growth.

Motorization is also causing severe urban road congestion and worsening urban air quality. These problems affect all urban residents, but the lower-income groups who rely on buses and non-motorized transport (NMT) suffer a disproportionately higher share of the problems, in the form of lower mobility, and higher accident rates (especially for non-motorized traffic) and poorer air quality. In recent years, the national and local governments have made significant effort to alleviate traffic congestion and auto pollution by promoting public transport and cleaner transport modes. In the State Council Opinion #46 of 2006, the national government urged cities to give priority to public transport. Key actions at the local level include heavy investment in mass rail transit (MRT) in the largest cities, increasing government financial support to bus transport, development of bus rapid transit (BRT), public transit fare subsidies, bus priority schemes, adoption of better vehicle emission standards and cleaner bus fuels (e.g. CNG).

The policy and actions are mainly designed to address the localized urban transport problems (i.e. those with direct impacts on urban residents such as congestion, pollution, and accidents). Although they are expected to contribute to energy saving and GHG reduction, the climate consideration is secondary at best in the decision making

process. It can be argued that the urban transport sector could contribute much more to the national climate change management agenda if the sector policy and actions include an explicit emphasis on the climate issues and if strategies and tools are available to cities to address the climate issues. One study by the World Resource Institute researchers indicates this great potential: China could half urban transport related energy consumption and GHG reduction in the next 20 years (comparing to the business-as-usual scenario), if a range of oil-saving technological and policy measures are implemented; and could cut by an even bigger margin if an additional range of comprehensive urban land use and road pricing policies are implemented.¹

Climate change receives increasing attention in China's development policy agenda. The National Climate Change Program prepared under the auspices of NDRC in June 2007 has given a strong focus on energy efficiency improvement. However, when it comes to the transportation sector, the proposed key actions are mainly technological ones, including eliminating the old energy-intensive automobiles, adopting better vehicle fuel efficiency standards, and development of electrified rail. There are no suggested actions to deal with travel behavior and modal choices. There is no specific policy guidance for city planning and urban transport planning, to help achieve energy-saving urban land use and travel patterns and induce more energy-efficient transport modal choices.

Urban transport related energy efficiency and climate change issues can not be fully addressed out of the broader context of urban development. China faces a pressing challenge to make its cities environmentally and socially sustainable. The linkages of urban transport with urban land use and quality of life stand at the core of the challenge. It is now increasingly recognized that sustainable urban development is critically dependent on identifying paradigms that would facilitate a less carbon-intensive urban transport system. The Chinese and international experience in the sector suggests that any successful strategies would need to integrate: (i) priority for public transport, (ii) encouraging non-motorized traffic; (iii) ensuring that users of private automobiles fully internalize the costs they impose; and (iv) urban planning and the dynamics of urban expansion to create compact cities.

The strategies should aim to achieve real results at different points of the time horizon: (i) in the short term, by improving the fuel efficiency of existing vehicle fleets; (ii) in the medium term by facilitating a shift away from private car use; and (iii) in the long term by supporting the development of compact cities built about public transport corridors.

The Bank has been active in supporting sustainable urban transport development in China. In addition to lending operations in a number of cities, the Bank has actively engaged in knowledge sharing activities with stakeholders in China and published several policy and technical papers on the topics of sustainable urban transport, public transport reform and urban mass rail transit. Very recently, the Bank initiated a GEF-funded urban transport partnership program, which is supporting public transport related planning

¹ Wei-shiuen Ng, and Lee Shipper (2005), "China Motorization Trends: Policy Options in a World of Transport Challenges," in World Resource Institute, *Growing in the Greenhouse: Protecting the Climate by Putting Development First*.

activities in 14 cities. All these works have laid a solid technical foundation and created an extensive client base for the Bank operation to move to a new focus on the urban transport related energy and climate change issues.

Specific Objectives

- To help China develop a climate change management agenda in urban transport sector and operationalize climate consideration into the processes of urban transport policy making, strategy formulation, program implementation and sector management, through collaborated analytical works;
- To help selected cities implement pilot actions and demonstrate how the urban transport sector could contribute to the reduction of the growth of GHG emissions.
- To support Ministry of Transport to provide advice to cities on issues related to urban transport.

Scope of Work

This is a multi-year, collaborative program of analytical works and implementation support activities that share the same specific objectives highlighted above. It is envisaged that the Bank supported activities under the program would eventually evolve into a platform for all interested parties (e.g. national and local governments, academics, research institutions, industries, and international agencies) to come together to support the expanded range of activities with a common objective.

Illustrative Analytical Works

Activity 1: review of urban transport energy efficiency. This proposed analytical work will provide a quick review of the current situation of energy consumption and GHG emissions in China's urban transport sector, analyze the relative contribution of various policy and technological aspects of urban transport (vehicle standards, fuel efficiency, modal splits, travel characteristics, land use patterns, etc), identify strategic issues, and frame the climate change agenda in the context of sustainable urban transport and land use development. This activity will be carried out by the Task Team in collaboration with relevant domestic research institutions.

Activity 2: financing urban rail – lessons from international experience and strategies for Chinese cities. This issue was raised by MoF/NDRC as a priority in the 'innovations' day discussions between the Bank and the Chinese Government in June 2007. Subsequently, the Task Team initiated activities, including (i) field visits to cities with urban rail (such as Beijing, Guangzhou, Wuhan) and to those in the process of developing systems (Zhengzhou and Hangzhou) to assess the current Chinese planning, institutional and financing context for urban rail development; and (ii) a high level seminar that includes financiers, operators, suppliers, designers as well as Chinese cities and national government representatives. The proposed program will support an analytical work that would build on the above activities, deepen understanding through

case studies in Chinese cities currently developing rail plans, and recommend strategies appropriate for Chinese cities.

Activity 3: energy and carbon footprint of urban transport. At the national level there is high and increasing interest in developing tools that will facilitate measurement of a city's energy and carbon footprint. Ultimately, a modeling tool that enables cities/local leadership estimate the energy/carbon footprint of their transport network could be used to develop a performance management framework which allows Mayors to be evaluated on productivity and normalized by carbon impact. Alternatively, it supports the development of a credible bottom-up estimate of energy consumption from this fast growing sector in China. The GEF Urban transport project provides the Bank access to a nationwide network of 14 participating cities including Guangzhou, Donghuan (in Guangzhou), Jinan, Weihai (both in Shandong), Linfen and Changzi (both in Shanxi), Jiaozuo, Zhengzhou and Luoyang (Henan), Nanchang (Jiangxi), Chongqing, Xian and Xianyang (Shaanxi) and Urumuqi (Xinjiang) and medium cities in Liaoning province. This proposed activity aims to (i) develop a credible robust database of energy consumption in the transport sector of each GEF city based on verifiable and regularly obtainable, comparable data; (ii) develop estimates of energy consumption (and CO2 emissions) by city; (iii) sample estimates of impact of control transport policies and investments on BAU estimates; and (iv) develop a methodology for transforming these city level estimates to a national estimate. This activity will provide a methodological underpinning for developing innovative 'wholesale' lending instruments through the national government to develop urban mobility approaches consistent with a low carbon growth path.

Illustrative Implementation Support Activities

Activity 4: development of sustainable fare strategies for public transport. Public transport fare policy remains an important issue that many municipalities in China remain concerned about. Key concerns include issues related to subsidy levels and urban-rural integration. Cities need to develop a fact and data-based strategy on public transport fares that balances the concerns of sustainability, affordability and ridership. This activity provide guidance to cities on issues of fare policy based on international good practice, a review of several cities and the development of detailed survey data and financial estimates in one interested city.

Activity 5: development of appropriate operational strategies and technological options to increase the fuel efficiency of the vehicle fleet. This activity would support the design and implementation of mechanisms for the operationalization of the interventions related to urban spatial growth, restrictions on automobiles and interventions to upgrade managed vehicle fleets (buses, taxis, trucks) and enhance their operation to attain fuel efficiency gains. The main performance indicator will be the development of a plan and agreement with a city to pilot at least one actionable intervention as part of that plan that would reduce urban transport CO2 emissions in a measurable manner.

Activity 6: design of pricing policy to restraint auto use. In Wuhan, which has been identified for a new IBRD loan focusing on urban transport, there has been interest in developing approaches that would increase the cost of driving, by means such as

pricing policies (including parking and congestion pricing). The city is discussing congestion pricing issues as part of the identification of a proposed IBRD loan. Under this activity, the Bank would advise the municipal government to analyze the consequences (pros and cons) of different pricing schemes, to formulate the pricing schemes, and if implemented, to monitor the outcomes.

Methodological Framework and Institutional Arrangements

The appropriate methodological framework and institutional arrangements will be activity-specific. Some activities (such as activities 5 and 6) will be primarily carried out in the context of particular pilot cities. In such cases, the counterpart institutions will consist of the appropriate municipal agencies including the public transport company, construction commission and the municipal government. Other activities (such as activities 2, 3 and 4) will be carried out jointly with a national counterpart such as the Ministry of Transport as well as a set of particular cities. Methodologically, the case-based analysis will rely on a combination of analysis of secondary data (such as financial statements, transport survey data etc.), interviews and selected primary data (such as surveys of bus transport riders needed to calculate fare elasticities).

A separate product (report, workshop) will be produced for each activity. Products will be reviewed at completion, separately, or in bunches as appropriate.

Strategic Fits

The proposed activity fits in Government of China's priority. It also fits in the Bank's main theme for climate change management, and one of the main themes of the Bank's China Country Partnership Strategy 2006-2010—"addressing resources scarcity and environmental challenges." It is also linked to the ongoing air quality AAA and will feed into the future EAP strategy.

Main Partners

NDRC, MoF (GEF division), MoT, and SEPA;

Institute of Comprehensive Transport, China Academy of Transport (Sustainable Urban Transport Center), China Academy of Urban Planning and Design, Shanghai City Comprehensive Transport Research Institute,

GEF partner cities

Tsinghua University, Tongji University, University of California Berkeley

ADB, GTZ, and the Energy Foundation

Justification to the Multi-Year, Programmatic Approach

The proposed program includes both analytical works and implementation support activities that would be carried out in a span of three years. This is considered to be a suitable modality for several reasons:

- The knowledge on the subject is largely lacking and thus requires analytical works to lay the foundation for defining strategies and actions.
- The urban transport related climate change issues are both long term and urgent. Actions based on international experiences could be supported as pilot in the Bank's client cities, in parallel to the analytical works.
- The program builds on the Bank's current engagement with Chinese cities to develop practical interventions to operationalize the climate change management activities thus supporting the transition to more sustainable urban transport systems. The Bank is supporting this agenda with a series of urban transport investment projects in preparation and under implementation (including in Anhui, Wuhan, Xian, Taiyuan, Liaoning, Fuzhou and Shijiazhuang) as well as a policy focused GEF project. However, much remains to be done – especially on the policy and analytical front – to complement these efforts.
- The Bank has already been working in partnership with the government, academics, research institutes, industry associations, and other international agencies (e.g. ADB, GTZ, and the Energy Foundation). The proposed program (instead of individual tasks) is expected to be an effective platform for the partnership to come together.
- The program could also make better use of various funding resources available to support the climate change management agenda.

Deliverables and Timetable

Component	Expected Delivery Date
1. Overview of issues	FY09Q4
2. Urban Rail	FY09Q3
3. Energy and carbon footprint	FY10Q3
4. Dissemination	Throughout the program implementation period
5. Jinan	
6. Wuhan	FY11Q3

Resources: Financing Plan (in thousand of USD)

Bank Budget	AusAID	ESMAP	Counterpart	Total
100	200	240	In kind	