Key Points

- China is urbanizing at an unprecedented rate. By 2025, some 1 billion people will live in cities, and China is expected to have 221 cities with more than 1 million people (the United States currently has 9).
- To address the increased emissions urbanization promotes, China is pursuing a range of policies designed to improve building efficiency, mass transit, and energy use by common household appliances.
- Although cities can exacerbate environmental problems, they also have the potential to be the engine for improved efficiency and environmental protection.

China's Fast Growing Cities

URBANIZATION IN CHINA

China is becoming a nation of city-dwellers. And while cities are typically blamed for many environmental ills, China's urbanization could ultimately bring some good news for efforts to curb climate change. That's because, with the right policies, urbanization can also bring more efficient energy use and slower emissions growth.

The massive scale and pace of China's urbanization is unprecedented in human history, and hard for many outsiders to grasp. A few numbers help tell the story. Forecasters predict that by 2025:[i]

- Nearly 1 billion people will live in China's cities. Nearly a quarter of these urbanites will have migrated into cities from rural areas.
- 64% of China's population will live in cities, up from about 44% today and about 20% in 1980.
- 221 cities will have more than 1 million residents (compared with 9 in the United States and 35 in Europe today).
- 23 cities will have more than 5 million residents.
- Two new megacities, with populations of some 20 million, will spring up.
- Builders will erect 5 million new buildings, including 20,000 to 50,000 new skyscrapers – the equivalent of 10 New York Cities.
- Road builders will pave some 1,900 square miles of streets and highways.

Exactly how China urbanizes, however, will make a big difference in efforts to curb its emissions of greenhouse gases. In general, urbanization is predicted to push up emissions, since it is closely associated with increases in wealth and the consumption of products – ranging from meat to appliances and vehicles – that promote greater burning of fossil fuels. By one estimate, for instance, China's urbanization could help increase its greenhouse gas emissions 45% by the end of the century.[ii]

Still, that number will depend greatly on the shape of China's future cities. Sprawling, inefficient development , for instance, could exacerbate efforts to curb emissions. Smarter growth, however, could actually help, since dense cities can actually reduce per-capita energy use and emissions. Tokyo is much bigger than San Diego, for instance, but produces less CO2 emissions (thanks largely to its mass transit system).[iii]

GREEN CITIES AND BUILDINGS

To create greener cities, China is pursuing policies that:

Encourage energy-efficient urban transport. China already has implemented fuel economy standards for urban vehicles.[iv] It is also investing heavily in urban mass transit, including new subways and rapid bus transit systems that have dedicated lanes. The central government has set goals for increasing the proportion of commuters using mass transit in urban areas. In the largest cities (over 10 million people), it aims to boost transit use to 60% from the current 35%. In medium-sized cities (2 million), the goal is 40% from 24%, and in small cites (less than 1 million), 30% from 15%.[v]

By 2025 China is projected to have some 170 large cities with population densities necessary to support new subways, light rail or rapid bus lines. To serve these cities, China may need to build up to 9 times more subway miles than currently exist, 300 times more light rail track (up to 19,000 miles of track), and buy up to 3 million buses.[vi] Funding this infrastructure is expected to be a major challenge.

Promote energy efficient structures. China's millions of new urban homes, stores and office buildings will require enormous quantities of steel, concrete, wood and glass – all of which take energy to produce. In recent years, for instance, China has produced and consumed about half of the world's annual production of concrete and about one-third of steel.[vii] To make the best use of these materials, China has adopted building codes and other regulations designed to make buildings more energy-efficient.

Overall, the new rules aim to make new buildings up to 50% more energy efficient than past structures.[viii] Some cities, including Beijing, have higher targets. In general, the regulations have three key goals: improving building insulation; promoting the installation of efficient heating, ventilation and air conditioning equipment; and encouraging the use of "green" lighting, including compact fluorescent bulbs.

Nevertheless, challenges remain: responsibility for implementation is often in the hands of local officials , so enforcement can vary according to local conditions. Compared with modern coastal cities such as Shanghai and Beijing, China's less-developed urban areas are relatively lacking in resources and expertise; as such, capacity-building may be required before new energy-saving regulations can be fully implemented.

Help consumers buy energy efficient products. China's urban consumers have more discretionary income, and are buying growing numbers of household appliances. To curb future emissions from this consumption, China is implementing energy efficiency and labeling standards for a wide range of appliances, from refrigerators to clothes washers. U.S. researchers, for instance, have helped Chinese officials develop standards for more than 20 products, which are expected to reduce China's CO_2 emissions by more than 100 million metric tons by 2020.[ix] China has also rolled out subsidies that encourage consumers to purchase more efficient appliances.

These policies could help reduce some of the downsides of China's urbanization. They could also add to the economic improvements that urbanization tends to bring, freeing up funds to address climate change and other environmental problems.[x] China's challenge now is to reap the economic and cultural benefits that cities provide, while at the same time maximizing potential environmental benefits.

This fact sheet is a product of ChinaFAQs, a joint project of the World Resources Institute and experts from leading American universities, think tanks and government laboratories. Find out more about the ChinaFAQs Project at: http://www.ChinaFAQs.org/.

Notes

[i] These statistics and forecasts are found in Preparing for China's Urban Billion, a report by the McKinsey Global Institute, March 2009. See: http://www.mckinsey.com/mgi/publications/china_urban_summary_of_findings.asp.

[ii] Dalton, M. Jiang, L. Pachauri, S. and O'Neill, B. C. 2007. "Demographic Change and Future Carbon Emissions in China and India." May 23, 2008 Draft [Update of March 16, 2007, draft presented at the Population Association of America Annual Meeting, New York, NY, 2007]. http://www.iiasa.ac.at/Research/PCC/pubs/dememiss/ Daltonetal_PAA2007.pdf.

[iii] United Nations HABITAT. 2008. State of the World's Cities 2008/2009: Harmonious cities. Earthscan, London.

[iv] At 36.7 miles per gallon (mpg), China has higher standards than the United States, Canada and Australia for urban vehicles. And in 2007 it also established an average standard of 34 mpg for rural vehicles. In late 2008, China's Ministry of Finance also imposed "gas-guzzler" taxes designed to create incentives to buy more efficient vehicles (see China FAQs: Transportation).

[v] These statistics and forecasts are found in Preparing for China's Urban Billion, a report by the McKinsey Global Institute, March 2009. See: http://www.mckinsey.com/mgi/publications/china_urban_summary_of_findings.asp.

[vi] These statistics and forecasts are found in Preparing for China's Urban Billion, a report by the McKinsey Global Institute, March 2009.

[vii] U.S. Geological Survey. Commodity Statistics and Information, 2009 Fact Sheets. See: http://minerals.usgs.gov/minerals/pubs/commodity/.

[viii] Lin Jiang, Nan Zhou (2008) "The Reality and Future Scenarios of Commercial Building Energy Consumption in China," p. 13. Lawrence Berkeley National Laboratory: Berkeley, CA. Available at: http://china.lbl.gov/publications/reality-and-future-scenarios-commercial-building-energy-consumption-china.

[ix] Testimony by Mark D. Levine, Staff Senior Scientist and China Energy Group Leader, Lawrence Berkeley National Laboratory, before the U.S.-China Economic and Security Review Commission, August 13, 2008.

[x] Preparing for China's Urban Billion, a report by the McKinsey Global Institute, March 2009. See: http://www.mckinsey.com/mgi/publications/china_urban_summary_of_findings.asp.

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