

Executive Summary

Household energy demand in Urban China: Accounting for regional prices and rapid income change

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Due to its rapid urbanization and economic growth, China's energy consumption is rising at one of the fastest rates in the world – at nearly 8% per year over the 2000–2011 period – and residential energy consumption has grown even more rapidly. In fact, Chinese household energy consumption patterns are converging on those of the western world, with rising demand on gasoline and electricity use as income level and household demographics change over time. These changes will have a significant impact on China's total energy consumption, which, in turn, will have important implications for urban air quality.

Therefore, understanding the rapidly rising demand for energy in China is essential to any policy efforts to reduce the country's energy use and environmental damage. In response to the rising income, price changes and demographics shift, household use of various fuels, electricity and gasoline has changed dramatically for the last decade in China. In this paper, we estimate both income and price elasticities for various energy types using Chinese urban household micro-data collected by National bureau of Statistics, by applying a two-stage budgeting AIDS model. We find that total energy is price and income inelastic for all income groups after accounting for demographic and regional effects. Our estimated electricity price elasticity ranges from -0.49 to -0.57, gas price elasticity ranges from -0.46 to -0.94, and gasoline price elasticity ranges from -0.85 to -0.94. Income elasticity for various energy types range from 0.57 to 0.94. Demand for coal is most price and income elastic among the poor, whereas gasoline demand is elastic for the rich.

Our results are important for analyzing government policies regarding energy use and the environment, such as carbon control policies and gasoline taxes. As incomes rise and more automobiles are put into use, rising vehicle emissions in China will continue to add to the already serious air pollution problem. Given our estimated elastic demand for gasoline, higher gasoline taxes may be an effective way to reduce pollution. In addition, the Chinese government has invested heavily on electricity and pipe infrastructure. Given our estimated elasticities for electricity, gas and coal, it would appear to be good policy to make piped gas even more widely available to help make the transition toward cleaner fuels.