

**Essays on China's Energy Consumption, Carbon Emissions and
Economic Growth**

by

Chunbo Ma

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Examining Committee:

David I. Stern, Thesis Adviser

David Hess, Member

Faye Duchin, Member

John Gowdy, Member

Rensselaer Polytechnic Institute
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ABSTRACT

This thesis investigates the relationship between China's energy consumption, carbon emissions, and economic growth. Three analytical articles are conducted aiming to answering three questions:

1) In the first article, we use the well-established logarithmic mean Divisia index (LMDI I) method to decompose changes in energy intensity in the period 1980-2003 and try to find out what factors have driven the changes in China's energy intensity since 1980s;

2) The second study investigates China's carbon emissions during 1971-2003, with particular focus on the role of biomass, and, the fall and resurgence in emissions since the mid-1990s. The analysis is based on an extended Kaya identity and we again use the LMDI I techniques to decompose the carbon emissions into effects of various driving forces;

3) The third study adopts a neoclassical production function with energy incorporated and aims to examine the role of energy in China's economy. The dynamic analysis is conducted through a multivariate co-integration examination and an estimate of a vector error correction model (VECM). With newly estimated data on capital stock and refined data on labor, the bench case study covers the period of 1970-2004.

4) Finally, the limitations of the current thesis and, areas of improvements and extensions are outlined for further research.

The three articles are interconnected and meanwhile they are also independent studies viewed separately.