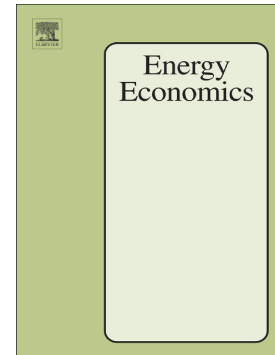


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Climatic impacts on energy consumption: Intensive and extensive margins

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## Clean Version

## Climatic impacts on energy consumption: Intensive and extensive margins

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**Abstracts:** Contrary to "greenhouse effect", climate change might in turn impact energy consumption due to its influences on usage pattern and purchasing decisions for heating and cooling appliances, which are defined as intensive and extensive margins respectively in literature. As the largest energy consumer and carbon dioxide (CO<sub>2</sub>) emitter worldwide, China has already raised great concerns for its energy consumption and the potential effect on global warming. However, the reverse impacts of climate change on China's energy consumption are still unanswered. This paper tries to fill the research gap by conducting the first estimates about the climatic impacts on residential energy consumption in China, including both intensive and extensive margins. Random and exogenous temperature shocks are used to identify the effects of climatic change on households' electricity consumption and air conditioner adoption. Differences of responses by season and by climate zone are particularly explored, especially considering the possible effect of government-provided central heating system in North China during wintertime. We find that hotter summer would result in larger impact than colder winter, implying increased electricity consumption in the whole year from global warming. Furthermore, intensive margin dominates in summer while its role is only minor in winter. We also find that there is substantial differences by climate zone in responses of electricity consumption and air conditioner adoption, potentially due to central heating system and different tolerance to temperature. The findings can help us make informed decisions on planning future energy/electricity development, as well as climate and energy policies. We also anticipate our paper to provide knowledge and broader implications directed toward alleviating global climate warming.

**Keywords:** Climatic impacts, energy consumption, residential sector, intensive margin, extensive margin

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