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Global Energy Demand in a
Warming Climate

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Summary

This paper combines an econometric analysis of the response of energy demand to temperature and humidity exposure with future scenarios of climate change and socioeconomic development to characterize climate impacts on energy demand at different spatial scales. Globally, future climate change is expected to have a moderate impact on energy demand, in the order of 7-17% around 2050, depending on the degree of warming, because of compensating effects across regions, fuels, and sectors. Climate-induced changes in energy demand are relatively larger in tropical regions. Almost all continents see unequivocal increases in final energy demand, driven by the commercial and industrial sectors. In Europe the reduction in the use of residential energy prevails, driving an overall reduction in aggregate final energy use. Total final energy goes up in almost all emerging G20 economies located in the tropics, whereas temperate G20 countries outside Europe can either increase or decrease total final energy use depending on the geographic incidence of changes in the frequency of hot and cold days. We find that climate change has a regressive impact on energy demand, with the incidence of increased energy demand overwhelmingly falling on low- and middle-income countries, raising the question whether climate change could exacerbate energy poverty.

Keywords: Panel Data, Climate Change, Adaptation, Energy

JEL Classification: N5, O13, Q1, Q54

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