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Editorial

# Green building finance and investments: Practice, policy and research

The Stern Review (Stern, 2008) has put the debate regarding climate change firmly in the economics literature. Nordhaus (2007) and Weitzmann (2007) have challenged some of the key assumptions made by Stern, but the main conclusion stands: the world needs to reduce its greenhouse gas emissions as a precaution against the possible effects of global warming. An influential McKinsey report (Enkvist et al., 2007) has shown that the building and property sector can play a central role in this reduction. Research into the performance of energy-efficient buildings and green markets, and of firms' behavior in these markets (Kotchen, 2006; Eichholtz et al., 2010; Kitzmueller and Shimshack, in preparation) is becoming part of the mainstream literature.

To strengthen this development, the University of California, Berkeley, and Maastricht University have joined forces in organizing a series of conferences concerning these issues. The second conference in this series took place in Maastricht, on March 22–24, 2011. The event covered 2 days, the first of which was mostly policy-oriented, and the second firmly academic in nature. On that second day, six papers were presented, and five of those are included in this special issue of the *European Economic Review*. The five papers all focus on green investments in the residential sector, which is the largest real estate market, and which could therefore have most impact on energy use and greenhouse gas emissions. The papers take quite different approaches to this general theme.

The first paper in this issue is "*Building Vintage and Electricity Use*: *Old Homes Use Less Electricity In Hot Weather*" by Howard Chong. His paper analyzes the relation between the age of a house and its electricity consumption when temperatures change; this is important to understand how peak electricity use will grow over time. The paper finds that houses built after 1970 use more electricity than older buildings, which is due to things like house size, central air conditioning, and type of residential structure. So, as new housing will be added to the existing stock, average electricity use will likely increase not decline.

The second paper focuses on housing in the Netherlands. The paper "*Residential Energy Use and Conservation: Economics and Demographics*" by Dirk Brounen, Nils Kok, and John M. Quigley analyzes energy consumption in owner-occupied housing. The paper investigates the effect household behavior may have on electricity consumption, by measuring whether the use of gas and electricity is determined more by the technical specifications of the dwelling or by the demographic characteristics of the residents. The authors analyze more than 300,000 Dutch homes and their occupants, and the results of this analysis suggest that residential gas consumption is determined mostly by dwelling characteristics, such as age, house type and other characteristics, while the use of electricity depends more on composition and the income of the resident household. When the authors combine these results with economic and demographic predictions, they conclude that the effects of increases in age and wealth will roughly offset improvements in the energy efficiency of the housing stock.

The paper "*The Behavioral Response to Voluntary Provision of an Environmental Public Good: Evidence from Residential Electricity Demand*," by Grant D. Jacobsen, Matthew J. Kotchen, and Michael P. Vandenbergh first develops a model for the voluntary provision of a public good, in this case the participation in a green electricity program. They test the predictions of the model with billing data of a green electricity program in Memphis, Tennessee, in the United States, combining data for participants as well as nonparticipants. Households consuming more electricity are more likely to participate, participating at higher levels as well. Households that participate at the minimum level required to enter the program increase their electricity consumption by 2.5 percent. Despite this increase, the net effect for the participating households is a lowering of greenhouse gas emissions: The behavioral effect is smaller than the environmental benefit of going green.

The next paper to take a behavioral approach to private sustainability investments is "*Understanding the Solar Home Price Premium: Electricity Generation and "Green" Social Status*" by Samuel Dastrup, Joshua Graff Zivin, Dora L. Costa, and Matthew E. Kahn. They analyze homes in San Diego and Sacramento, both in California in the United States, and provide an

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estimate of the house value effects of solar panels. Despite the ongoing growth of the residential solar home market, little is known about this market capitalization effect. The authors use various model specifications, which all point to a premium of about three or four percent. The premium goes up in neighborhoods with more college graduate adults and Prius owners.

The last paper to be published in this issue is entitled "*The Nascent Market for* "*Green*" *Real Estate in Beijing*" by Siqi Zheng, Jing Wu, Matthew E. Kahn, and Yongheng Deng. The paper analyzes housing in Beijing, and is based on a dataset that enables the authors to study separate features of Beijing's emerging green economy. They build a new measure of the greenness of a housing tower, and they apply hedonic pricing to measure the capitalization effects of greenness. It appears that building greenness is associated with a price premium in the presale stage, but with a subsequent rent or price discount. These results are the first to measure the effects of sustainability investment in China, possibly the country for which such investments are most important in terms of their impact on the quality of life in that country, and in terms of their bearing for global climate change.

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