Behavioural Responses to Photovoltaics in the UK Domestic Sector

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This document outlines my current research as a doctoral student at the Environmental Change Institute, University of Oxford. My supervisor is Dr. Brenda Boardman and I work as part of the Lower Carbon Futures research group. A brief description of the project is outlined below; further information is available on the project's website at http://www.geog.ox.ac.uk/~jkeirst/solar.

Project Abstract

Renewable energy technologies have enjoyed significant growth in recent years, largely due to concerns over anthropogenic climate change. In the UK, the government aims to provide 20% of electricity from renewable sources by 2020 and one such technology, photovoltaics (PV), is currently the focus of a £20 million installation grant scheme. Many of these grants are awarded for domestic sector installations, providing households with the opportunity to generate their own electricity. Household PV studies from other countries have indicated that behavioural changes can result from owning a PV system and the use of energy-use monitors (which are frequently installed with PV systems). This can cause either an increase or decrease in consumption but the mechanisms for such a change have not been studied in any detail.

This study will therefore examine behavioural responses to photovoltaics in the UK domestic sector and seek to identify the mechanisms by which PV systems impact household behaviour. Domestic energy consumption will be presented using an integrated framework, facilitating an analysis of agent interactions (i.e. between households, society, government and so on). Further theoretical guidance comes from literature on technologies and society, providing insight on the symbolism of PV technologies. Energy-use monitors will also be studied in detail, with regard to their role in informing households and enabling PV as a conserving technology.

The methodology consists of exploration and inspection phases. In the first stage, existing data on PV households and their energy consumption will be gathered. This material will then inform detailed interviews and monitoring of individual PV households, as well as government and industry actors. Finally an agent-based model will be created, consolidating this knowledge and guiding an analysis of current policy initiatives. The outputs of the research will be focused on promoting positive behavioural responses to PV via current metering, green electricity and distributed generation initiatives.