

Household Energy Consumption and Rebound Effect

DURATION OF THE PROJECT
15/12/2009-31/01/2012

BUDGET
359.550€

KEYWORDS
(real) energy consumption, households, rebound effects

CONTEXT

To reduce the energy consumption and emissions from the combustion of fossil fuels, most governments dedicate a substantial part of their energy and climate change policies at improving energy efficiency in different economic sectors. Real-world observations indicate that energy savings realised in practice fall short of energy savings estimates based on physical principles incorporated in engineering models. A partial explanation of this fact consists in what is called “rebound effects”, but for which there is little extensive study in the household sector.

PROJECT DESCRIPTION

Objectives

The aim of the HECoRE project is to study the rebound effects linked to the increased efficiency of energy use by Belgian households, and to analyse the policy instruments to attenuate, neutralize or possibly prevent the counterproductive phenomena of rebound. This project focuses on dwelling energy consumption (fuels + electricity) and household mobility (work + leisure). Therefore we develop the theoretical framework of rebound effects as stated by the micro-economic approach that distinguishes direct rebound and indirect rebound effects, and link it to the real practices of households.

The size of the rebound effects is likely to vary widely for different technologies, practices and income levels. This is particularly true for those consumers that could not previously afford a particular energy service. We therefore analyse as far as possible the activities, results and data grouped by income deciles of the households. We examine also other important drivers of household energy consumption. For example, land occupation links different types of urbanisation, peri-urbanisation and countryside land-use, to mobility and the various types of housing constructions.

Methodology

The research applies an integrated mix of quantitative and qualitative methods. ULB (coordinator) is in charge of the large qualitative survey of households’ energy practices. The households survey starts from a ‘practice theory’ approach and select practices that are the most relevant for the rebound effects. Through qualitative methods, we analyse the meaning of rebound effects for households’ practices and the acceptability of different possible policy instruments. Focus groups and in-depth interviews are realised with households. Intermediary actors are also interviewed.

UA uses a modified version of the LEAP model to simulate the effects of different energy (pricing) policies to counter-act the rebound effects on the final energy consumption of households and their resulting emissions (greenhouse gases and other). Our attention goes mostly to the versatility of “energy pricing” for households. In the complex field of energy supply and demand, “price” covers a diverse reality. It is necessary to identify aspects like: the relation of price to cost, prices and budgets, etc. The analysis goes beyond formal estimations of price elasticity and income elasticity, although their interaction is an important aspect of the research.

ICEDD looks for and provides data that concerns household energy consumption.

produced in the different work packages. Different types of data are necessary to feed the different work packages of this proposal. Data are collected at Belgian or regional level. If possible, comparisons with other developed countries are made. When possible, we cover the period from 1960 (thus before the first oil shock) until today. Collected data covers a.o. household energy data, energy prices, socioeconomic data, equipment data, land use data, policies and measures data. A close attention is devoted to the link between poverty and energy consumption and to relations between fuel prices, mobility and land occupation.



HECORE

Household Energy Consumption and Rebound Effect

EXPECTED RESULTS AND/OR PRODUCTS

At the end of the project, we will have explored some relations between energy price and demand. We will have insights about the structuring factors of the demand for the past and present trends. We will have gathered information about energy-saving practices by households, as well as their perception and resilience to different policy instruments. We will have produced an analysis of existing energy policies applying to households, and will be able to make recommendations about suitable instruments to mitigate rebound mechanisms, with a focus on energy pricing issues, the impacts on households' welfare, and the social acceptability of these instruments.

PARTNERS

R&D organisation	Relevant core competence and know-how
ULB - Centre for Studies on Sustainable Development	Household energy consumption: sociological survey, policy analysis
UA	Household energy use, energy accounting models, energy and climate policy
ICEDD	Realisation of regional energy balances, policy analysis

CONTACT INFORMATION

Coordinator

Grégoire Wallenborn

IGEAT

Université Libre De Bruxelles
Avenue F.D. Roosevelt 50 - CP 130/02
B - 1050 Bruxelles

Promoters

Aviel Verbruggen

Universiteit Antwerpen - UA
Prinsstraat 13
B - 2000 Antwerpen

Didier Goetghebuer

ICEDD asbl (Institut de Conseil et d'Etudes en Développement Durable)
Boulevard Frère Orban, 4
B- 5000 Namur

Follow-up Committee

For the complete and most up-to-date composition of the Follow-up Committee, please consult our Federal Research Actions Database (FEDRA) by visiting <http://www.belspo.be/fedra> or <http://www.belspo.be/ssd>

