

An Overview of Rebound Research and Policy Focus in the EU

By Karen Turner, University of Stirling, Scotland*

Paper prepared for the CEDM Rebound Workshop, Washington DC, 27-28 June 2011

* Workshop input partly funded supported by the UK Economic and Social Research Council (ESRC grant ref: RES-061-25-0010). The input of Steve Sorrell, ESRC-funded Sussex Energy Group, University of Sussex, and UK Energy Research Centre (UKERC).

EU PRESENTATION

The main EU focus with respect to rebound concerns the ability of member states to meet one of the three 20-20-20 targets, which is that there should be a 20% reduction in energy consumption through increased energy efficiency by 2020.¹ At present, we are not on track to meet this objective, and economy-wide rebound may provide one explanation for this.

This type of question was explicitly raised in the UK context in a report by the House of Lords in 2005.² Again this focused on macro energy use so that economy-wide rebound, rather than just direct rebound effects (which simply relate to the price responsiveness of energy demand). The House of Lords report led to surge in rebound research in UK, initially through a far-reaching study carried out by the UK Energy Research Centre³, which directly led to other pieces of work, including a comparative modelling project on economy-wide rebound effects commissioned by the UK Department for Environment, Food and Rural Affairs (DEFRA) and this author's ESRC project (see above).

This author's initial interaction at EU level was with the European Economic and Social Committee in 2009⁴, who raised the question as to whether there is a need to adjust targeting setting in energy efficiency in allowing for rebound in meeting energy consumption targets?⁵ That is, are larger energy efficiency improvements required to deliver energy consumption targets taking rebound into account rather than trying to eliminate it? The response would seem to be that this may be an appropriate approach as long as we are not dealing with rebound of more than 100%, or backfire (where a larger efficiency improvement would lead to a larger increase in energy consumption).

¹ See for example: European Commission (2009) EU action against climate change: leading global action to 2020 and beyond. Available to download at: http://ec.europa.eu/clima/publications/docs/post_2012_en.pdf; European Commission (2010) The European Strategic Energy Technology Plan - SET-Plan- towards a low carbon future, SET-Plan brochure available at: http://ec.europa.eu/energy/technology/set_plan/doc/setplan_brochure.pdf. See also http://ec.europa.eu/energy/efficiency/action_plan/action_plan_en.htm for the 2011 Energy Efficiency Action Plan.

² House of Lords (2005) Energy efficiency, science and technology committee, 2nd report of session 2005-06, Volume 1 report. The Stationary Office: London; 2005.

³ UK Energy Research Centre (2007) The rebound effect: an assessment of the evidence for economy-wide energy savings from improved energy efficiency, Report edited by S. Sorrell and produced by the UK Energy Research Centre. Download report at: <http://www.ukerc.ac.uk/Downloads/PDF/07/0710ReboundEffect>.

⁴ <http://www.eesc.europa.eu/?i=portal.en.energy-efficiency-policy-for-end-users>

⁵ Note that targets are set at EU level, and guidance provided for member states, specific policy actions to meet targets are determined at member state level.

However, more recently the EC DG Environment has invested resources in better understanding the rebound effect, in particular distinguishing between direct, indirect and economy-wide rebound effects, reviewing the current State of the Art, analysing ways to prevent, reduce or counteract the rebound effect (and their effectiveness), and ultimately to develop guidelines with clear recommendations for member states in considering and addressing rebound. This has been done through a project titled 'Addressing the Rebound Effect in Policy', which has involved consultation with the international research community. The web-site for this project is <http://rebound.eu-smr.eu/>, where the interim and final project reports can be accessed, along with details of and a report on a stakeholder workshop held in Brussels in February 2011. A number of findings and recommendations have been presented. However, a crucial one is that EU policymakers, who are hungry for empirical models to allow them to assess the magnitude of direct, indirect and economy-wide rebound effects in different member states and different types of activity, should interact with the research community now in order to identify data needs to construct useful empirical frameworks and to begin fulfilling these through existing and new reporting channels.

In terms of focus, a number of EU member states, including the UK (through the Department of Energy and Climate Change, DECC) have been focussing most on efficiency improvements in household energy use (which in some cases involves interaction with energy suppliers). DECC have informally stated that this focus may change in the next few years. However, at EU level, the focus is on different areas where it is believed that energy efficiency improvements are most likely to bring about reductions in energy consumption. These include household energy use but also production activities including transport, construction and energy supply itself.

Links to other current rebound research in Europe:

UK – Universities of Stirling and Strathclyde

See second Turner paper presented to this workshop: Determinants and Potential Magnitude of Economy-wide Rebound Effects: Overview of Key Findings from a Research Project Funded by the UK Economic and Social Research Council. Also see ESRC project web-page: <http://www.esrc.ac.uk/my-esrc/grants/RES-061-25-0010/read>.

UK – Universities of Sussex and Surrey

Steve Sorrell (Sussex) is currently working with Angela Druckman and Mona Chitnis at Surrey on a project estimating rebound effects for households. This three year project is part of the Sustainable Lifestyles Research Group, funded by the UK Economic and Social Research Council, ESRC, and Department for Environment, Food and Rural Affairs, DEFRA.

The project relies upon Angela Druckman's environmental extended, multiregional Input-Output model which provides estimates of the embodied GHGs in 40+ categories of household expenditure. The work involves combining the input-output model with econometric models of household expenditure, from which expenditure and price elasticities are calculated. At present, the team is using Surrey's existing econometric models, which use ONS data for an average UK household. However, work is in progress to employ other datasets with the aim of conducting a more disaggregated analysis.

An initial paper on this work may be accessed at the following link:

<http://www.sciencedirect.com/science/article/pii/S0301421511002473>

The team is currently working on a second paper, investigating a range of cost effective energy efficiency improvements by households (e.g., condensing boilers, cavity wall). The analysis explores rebound effects over different time periods, relying solely upon expenditure elasticities (income effects).

It incorporates the embodied energy of the relevant measure (e.g. mineral wool), and examines different methods of financing the investment and we forecast changes in income, grid carbon intensity etc. over the relevant time period. Early results will be presented by Mona Chitnis at the upcoming IAEE meeting in Stockholm.

Lester Hunt at the Surrey Energy Economics Centre is currently working on a co-authored paper with David Ryan at the University of Alberta – see DOC] [Catching on the Rebound: Determination of Rebound Effects in Energy Economics](#)
DL Ryan

Spain:

Jeroen van den Bergh has recently published a paper 'Energy Conservation Policy More Effective With Rebound Policy in Environ Resource Econ (2011) 48:43–58
DOI 10.1007/s10640-010-9396-z. Contact Jeroen at J. C. J. M. van den Bergh (B)
Department of Economics and Economic History, & Institute for Environmental Science and Technology, Universitat Autònoma de Barcelona, Edifici Cn - Campus UAB, Bellaterra, 08193 Cerdanyola, Spain, e-mail: jeroen.bergh@uab.es

Also at Barcelona, Ferran Sancho and Ana Isobel Guerra are active in rebound research, particularly in distinguishing between partial and general equilibrium rebound effects. For example see http://works.bepress.com/ferran_sancho/1/.

Belguim:

The above-mentioned EU Rebound project workshop also involved input from Wallenborn and Nemoz at the Centre for Studies on Sustainable Development (IGEAT – Free University of Brussels), which involves multidisciplinary research in to household rebound.

Germany:

Another large rebound project that we are aware of in Europe (Turner and Sorrell are project advisors) is one titled 'The Rebound-Effect: Threat for Energy and Climate Policy Goals? An Empirical Analysis for Germany' being run by Klaus Renning at ZEW in Germany and funded by the German Federal Ministry of Education and Research (BMBF). For details, please see <http://kooperationen.zew.de/en/rebound/home.html>.

Other Europe:

We have come across several other pieces of work in Europe that may be of interest:

<http://www.sciencedirect.com/science/article/pii/S0301421510007664>

<http://www.sciencedirect.com/science/article/pii/S0301421511002862>

<http://www.sciencedirect.com/science/article/pii/S0301421511001480>

<http://www.sciencedirect.com/science/article/pii/S0301421510008682>

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1715904

Please note that this overview of European research is likely to be incomplete. It is merely a sample of current research that we are aware of.