

Policy strategies to tackle rebound effects: A comparative analysis

Topic: Input-Output Modelling: Energy Policies - I

Author: Jaume Freire-González

Co-Authors: MUN Sing HO

Promoting energy efficiency is generally assumed to be an effective strategy to reduce energy use and tackle climate change. However, an extensive literature has shown that rebound effects reduce its effectiveness and can even be counterproductive. We show how a more complex policy strategy, with coordinated measures, could provide the desired results by offsetting energy and carbon rebound effects.

Along with the energy-efficiency improvement, we establish and analyze the implementation of six different scenarios or policy strategies: (1) energy efficiency promotion with no additional policies or measures, (2) energy efficiency plus carbon taxes, (3) energy efficiency plus energy production taxes, (4) energy efficiency plus ETS, (5) energy efficiency plus energy conservation in households, and (6) energy efficiency plus a shift to services consumption in households. These are 3 market-based and two behavioral strategies suggested in previous works including van den Bergh (2011, 2015), Santarius (2012), Freire-González and Puig-Ventosa (2015) and Font Vivanco et al. (2016a).

These policies are assessed using an economy-“energy”-environment dynamic Computable General Equilibrium (CGE) model developed for Catalonia, and compared in economic, energy, and environmental terms. The simulations show that all the strategies tested are able to offset rebounds at a low cost, with a proper design. All of them improve GDP in relation to the no-efficiency improvement base case. If tax revenues from the parallel policies are used to encourage investment, the long-term effect on GDP may even be positive.

This is the first study, to the best of our knowledge, to assess the potential effectiveness and economic impact of a set of different instruments in avoiding rebound effects and compare them within the same framework.