

## **Can a combination of efficiency initiatives give us "good" rebound effects?**

Topic: (6.3) Energy Input-Output Modeling (2)

Author: Cristina Sarasa

The increasing depletion of natural resources as well as pressures on the environment and natural resources has highlighted the need of a more efficient use of energy and a development process of alternative energy sources over the last years. Energy-saving and energy-efficiency improvement implies monetary and emissions savings. These savings are off-set by additional expenses in other sectors, called rebound effects. In a world of high pressures on the environment, more efficient uses of energy are required to be increased at all stages of the energy chain from generation to final consumption.

Taking Spain as a case study, we use the first energy-related CGE model that develops the inclusion of renewable energies and is calibrated on the 2010 input-output data. This paper evaluates the best combination of efficiency initiatives aimed at achieving a positive result through increased energy efficiency in household consumption and the production of more competitive electricity from renewable sources. Our central aim is to test which is the best combination of efficiency initiatives both production and consumption side to achieve positive rebound effects.

Our findings show that a package of improvements in electricity and petroleum household use and more competitive renewable energies achieve reductions in all energy uses with the related positive results in the economy. This strategy reaches the penetration targeted of renewable energies in the total energy use combined with reductions of non-renewable energies. This is the only one way to boost renewable energies use in the economy, reducing energy use of non-renewable sources and drives the economy forward in a sustainable path.