

Why the primary energy intensities of the EU15 differ? An input-output approach

Topic: Designing of Energy Policies with I-O

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The European Union is committed to increase renewable energy production and reduce greenhouse gas emissions up to 2050. The EU15* are all developed countries though with significantly different economic structures and energy consumption characteristics. Therefore, the path to follow towards EU energy and emissions targets should be specific to each country. The present study has the objective to understand the differences in primary energy intensity between the EU15 in 1995-2010. To do so, an energy input-output (EIO) model with a better description of energy flows is used for the analysis, i.e. the primary-to-final EIO model, developed by Guevara (2014). This model corresponds to the hybrid-unit EIO model of Bullard and Herendeen (1975) though allows accounting separately for two economy-wide energy efficiency indicators (i.e. primary-to-final energy conversion efficiency and energy intensity), the energy sector structure and other economic variables (e.g. economic structure, magnitude and composition of final demand, etc.). The model is build with the supply a use tables of the EU15 from EUROSTAT and with energy use data from the Energy Balances and Statistics of the International Energy Agency. Primary energy intensities of EU15 are then compared to the primary energy intensity of a benchmark country (Germany). The results will point out which of the determinant factors of primary energy intensity** were accountable for the differences between countries in 1995-2010. Moreover, the results also give insights into the energy efficiency trends of these countries and into other factors that determine the energy performance of an economy. This study can provide information to define country-specific energy policy guidelines towards EU energy and emissions targets.

Guevara, Z., 2014. Three-level energy decoupling: Energy decoupling at the primary, final and useful levels of energy use. Ph.D. Dissertation. University of Lisbon,Lisboa.

Bullard, C. W. and R. A. Herendeen (1975). "The energy cost of goods and services." *Energy Policy* 3(4): 268-278.

* Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

** The determinant factors of primary energy intensity are economic structure, efficiency and structure of primary-to-final energy conversion, efficiency and structure of final-to-useful energy conversion, useful energy demand composition and intensity, and magnitude and composition of final demand