

A structural decomposition analysis of primary energy use in Portugal

Topic: Input-output analysis for policy making I

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The Portuguese energy mix changed dramatically in the last two decades, with the adoption of natural gas and an exponential increase in the penetration rate of wind power complementing the conventional use of hydropower and fossil fuels. During the same period, the Portuguese economy also suffered a phenomenon of de-industrialization, with a loss of manufacturing sectors and an increase in services. The combination of these two phenomena led to a decline of the primary energy intensity of the Portuguese economy after the year 2000. The goal of this paper is to identify the main driving factors of this energy transition over the period 1990-2010, during which the largest shift in primary energy intensity took place. To do so, we perform a Structural Decomposition Analysis, using both the Dietzenbacher and Los and the Mean Log Divisia Index methods. The energy data used in this study was obtained primarily from the National Energy Budget, from which a detail of 35 energy carriers and 15 energy technologies could be characterized. The economic data, obtained from INE and DPP, had differing economic detail across years, and had to be harmonized, interpolated and converted to constant prices. In this study we performed a decomposition in terms of final demand composition, production structure, final energy use, energy transformation and primary energy use. The results of this study may provide insights on the most suitable areas of policy intervention to boost energy decoupling in the Portuguese economy.