

Towards a better understanding of consumption-based energy accounts: a comparison of MRIO results calculated from different energy extensions

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The International Energy Association reports each country's energy balance by energy supply tracing this through to total final consumption by industry, transport, non-energy use and other. This approach, while useful at a territorial level, does not account for the role of final consumers as drivers of energy supply. Input-output (IO) analysis can be used to reallocate energy associated with industrial sectors to products purchased by final consumers. This approach takes into account energy associated with the full supply chain of products, including those parts of the production process taking place abroad. Using IO techniques to understand energy flows within an economy is not a new technique but previous studies have been limited to single region IO tables. Recently, a number of multi-regional input-output (MRIO) databases have been developed which have allowed a better understanding of the role of traded goods in a country's emissions consumption-based account (CBA). The purpose of this paper is therefore to extend the MRIO approach to energy accounting.

This paper presents an MRIO framework for calculating the UK's energy CBA, and explores the implications of using different energy vectors alongside economic data taken from EXIOBASE. We compare results calculated using four energy vectors as inputs to the MRIO database: production; total primary energy supply; total final consumption; and total final consumption including losses, energy sector own use and bunker fuels. In addition we discuss the issues of using monetary data as a proxy for energy flows, and present an alternative mixed unit technique for better representing flows of energy within the economy.

This paper concludes by discussing the most appropriate vector to use for different types of energy research question.