

Input-Output Analysis of Energy: An Application to Indian Economy (1979-80 to 1991-92)

U K Dash*

K K Saxena**

In this article an attempt has been made to apply hybrid units formulation of energy input-output analysis for the energy intensity variations in the different sectors of the economy for a period of ten years i.e. from 1979-80 to 1991-92. The analytical results indicate that about 56 per cent of the economic sectors showed remarkable downward trend in the total primary energy intensity, implying the effectiveness of energy conservation measures.

I Introduction

The economic development of a country implies a process of transformation and it is closely linked with structural changes resulting from the interaction of supply and demand factors. The transformation of an economy from a low productivity, predominantly rural, and agrarian economy to one predominantly urban, industrial with increased productivity is not automatic. It is a gradual process during which productivity has to be higher in most sectors of the economy, side by side, the center of focus has to shift towards the efficient use of natural resources. And hence, in the process of development the importance of energy in an economy can not be overemphasized. A wise energy policy creates both a healthier economy and environment. Since the energy policy does not work in isolation, a coherent national approach, combining energy and environment policy only, can help a country securing a global position, in the highly competitive and market oriented economy of the 21st century. Sensible energy policies reduce the costs and the risks of importing foreign oil and frees up huge amount of domestic capital, which can be used in more productive investments.

In this paper an attempt has been made to study the energy intensities of different sectors, which represent a set of measurable coefficients of the direct and indirect energy requirement for the formation of a unit of produced goods or services. Energy intensity analysis is a prerequisite numerical exercise for the discussion on structural changes in energy demand evaluation of a particular industry or area. Our study covers the overall period, as well as, the four sub-periods of 1979-80, 1984-85, 1989-90, and 1991-92. We will thus provide insight into both short term and long term responses. In this study the Hybrid units formulation of the energy I-O framework pioneered by Bullard and Herendeen(1975) and extended by Hannon et. al. (1977) is used. In this type of analysis, energy used in physical units may be directly inserted into the technological matrix to create a hybrid matrix, with the energy sectors in physical units and the non-energy sectors in value terms. This approach yields energy intensities per unit value of final demand for each industry.

* Faculty in Economics, Birla Institute of Technology and Sciences, Pilani, Rajasthan 333 031.

** Professor of Economics, I.I.T., Kanpur 208 016.