

International Comparison of Energy Use: the Usefulness of Structural Decomposition Analysis Across Countries

Michiel de Nooij and Daan P. van Soest

Tilburg University, the Netherlands

d.p.vanSoest@kub.nl

René van der Kruk

Free University Amsterdam, the Netherlands

and

Alex R. Hoen

CPB, the Netherlands

Governments of many countries have committed themselves to substantially reduce the emission of greenhouse gases. Although to some extent the debate about a ‘fair’ allocation of reduction efforts over the industrialised countries has been resolved in the Kyoto Protocol, there are still disagreements as to which countries should reduce most. Efficiency considerations dictate that those countries where emission reduction can be achieved at lowest cost should reduce most. Past performance is an imperfect indicator: if a country has reduced its emissions (per unit of output) substantially over the past decades, does that mean that it has a comparative advantage in emission reduction or does it mean that the cheapest reduction options have been exhausted? In other words, what is the reduction potential of the various countries? The extent to which emission reduction can be achieved in a specific country not only depends on past efforts, but the structure of the country’s economy is important as well: there may be physical limits to the energy reduction potential.

To increase insight in the changes in energy efficiency Structural Decomposition Analysis (SDA) is often applied, where the change in a country’s energy use is analysed over time. In this paper we argue that SDA can also be applied to compare relative performance across countries, where not only sectoral energy efficiencies are compared between nations, but also differences in final demand and technological structure of the economy. We apply SDA to analyse energy use in nine OECD countries.

Key words: energy use, structural decomposition analysis, international comparison

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