Aggregation Issues in Environmental Input-Output Modeling and Analysis

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With the introduction of the extended input-output framework, traditional economic input-output modeling and analysis can be easily used in energy and emission studies. Indeed in the last decade many studies have been reported using the environmental input-output framework to investigate the emission flows and driving forces of emission changes, especially energy-related CO2 emissions. The advantage of using input-output structure is its ability to account for the indirect effects from intermediate consumptions. However, these studies rely heavily on the availability of input-output tables and energy/emission data, and as such various aggregation issues are inherent in the results obtained. We propose a framework to analyze three such aggregation problems, namely (1) sector aggregation, (2) spatial aggregation and (3) temporal aggregation, in a systematic manner. Findings from recent empirical studies on these aggregation problems are summarized. Related methodological and application issues and the possible solutions are discussed.