

Book Review of *Environmental and Economic Impacts of Decarbonization: Input-Output Studies on the Consequences of the 2015 Paris Agreement. 2017*. Edited by Óscar Dejuán, Manfred Lenzen, and María-Ángeles Cadarso.

During the Paris UNFCCC Summit in December 2015, a crucial global agreement on the reduction of carbon emissions was reached. The agreement aims “[h]olding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change” (UNFCCC 2105, 3). Various studies have shown realizing such goals is tough and poses various challenges.

The Paris Agreement prompted a number of practitioners from the input-output analysis community to analyze the carbon mitigation trajectories using an input-output perspective. This tool has certain limitations in comparison to, for example, the Integrated Assessment Models (IAMs) that usually are applied toward analysis of socioeconomic trajectories to a low-carbon society. Limitations include a lack of modeling of the climate system and land use. At the same time, input-output models have various advantages. Sectoral and temporal resolution is much higher as in IAMs. Multiregional input-output (MRIO) models provide a very detailed and coherent coverage of the global economy, allowing for calculating changes in final consumption patterns, or changes in value-chain structures if fossil energy technologies are replaced by renewables.

The book¹ contains 17 chapters grouped in four parts preceded by an introduction. It goes too far to discuss every chapter in detail here. Part I of the book discusses electricity generation and how a cleaner mix can be realized. A chapter of Óscar Dejuán and colleagues discusses, for example, how decarbonizing electricity production in Europe has indirect implications of emissions and employment outside Europe—a typical analysis for which MRIO analysis is well suited. Part II takes a consumption angle to the problem. Klaus Hubacek and colleagues look at the different carbon emissions associated with the consumption baskets of different income groups at a global scale. They make clear that the global upper and middle class is responsible for a large part of carbon emissions and that the attempt to lift people out of poverty conflicts with the lifestyles and carbon emissions of higher-income consumers. Haiyan Zhang and Michael Lahr discuss the historical changes in direct and

indirect energy use of rural and urban population and how more carbon-intensive lifestyles have developed—which makes a policy that guides Chinese consumers to low-carbon consumption pivotal. Part III of the book gives various examples of key drivers in carbon emissions and energy efficiency. In this part, Pablo Ruiz Napoles and colleagues analyze, for instance, what are the key emitting sectors in the five countries responsible for the highest carbon dioxide (CO₂) emissions in 2011, combined with two scenarios. One would change just gross domestic product (GDP) and final demand, whereas another one would implement technical change in four selected key sectors using multipliers from the best-performing countries. This simple scenario leads to CO₂ emissions not much higher as in 2011. Sangwon Suh and colleagues use a life cycle approach to analyze the natural resource implications of energy efficiency technologies. Finally, in part IV, policy tools are analyzed. For instance, Rocío Roman analyzes the impacts of a new carbon tax in Chile in terms of changes of greenhouse gas emissions, energy consumption, and emissions factors by sector.

It is a rich book with many examples showing how input-output techniques can be used for policy analysis. The large variety of author groups that contributed to this book implies that very different approaches and perspectives were taken. The main critique may be that despite its promising title, to analyze the consequences of the 2015 Paris Agreement, a concluding chapter where this ambition is made true, is missing. But despite this potential shortcoming, the book is an interesting read that can inspire input-output analysts to apply new methodological approaches, but less interesting for readers with a more general background that are mainly interested in how to make the Paris Agreement reality.

Note

1. Dejuán, O., M. Lenzen, and M. A. Cadarso, Eds. 2017. *Environmental and economic impacts of decarbonization: Input-output studies on the consequences of the 2015 Paris Agreement*. London; New York: Routledge, Taylor and Francis Group. ISBN: 978-0-415-78740-6. 402 pp. Hardcover \$160.

Reference

UNFCCC. 2105. Paris Agreement, FCCC/CP/2015/L.9/Rev.1. UN-FCCC secretariat. http://unfccc.int/paris_agreement/items/9485.php. Accessed 2 April 2018.

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