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AUTHOR(S):

McLellan, Benjamin C.; Tang, Xu; Meng, Jing

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Editorial: Sustainable Energy Production and Consumption: System Accounting, Integrated Management, Policy Responses

Benjamin C. McLellan¹, Xu Tang^{2*} and Jing Meng³

¹Graduate School of Energy Science, Kyoto University, Kyoto, Japan, ²School of Economics and Management, China University of Petroleum, Beijing, China, ³The Bartlett School of Sustainable Construction, Faculty of the Built Environment, University College London, London, United Kingdom

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Editorial on the Research Topic

Sustainable Energy Production and Consumption: System Accounting, Integrated Management, Policy Responses

INTRODUCTION

This Research Topic was proposed with the intent to: 1) share and catalog experiences of how to conduct system accounting for energy production and consumption from different perspectives, 2) to promote a deeper understanding of the resource nexus by considering integrated management of “Energy+” systems, and 3) to encourage critical discussion of policy responses for sustainable energy production and consumption, to connect academic research and practical management. The eventual submissions covered a range of themes, although the Energy+ (or Energy-X-Nexus) approach was less covered. Energy and the potential economic opportunities for reducing greenhouse gas emissions were considered at a variety of scales—national, provincial, sectoral, company—and using various alternative techniques.

ARTICLES

Nine papers have been published under this topic, covering a broad range of areas in the field, but with an overall tendency towards examining macro-economic and sectoral environmental and economic performance, and the influence of factors such as innovation, investment, and subsidization.

Industrial environmental efficiency was focused on by (Sun et al.), who considered overall environmental efficiency as being composed of two serial elements—economic development and environmental governance. They evaluated the two elements, considering the effects of a variety of indicators, including urbanization, and demonstrated that the economic development focus was in general more related to industrial environmental efficiency.

Similarly, the study by (Xie et al.) examined the improvement of environmental performance in resource-based cities in China, demonstrating that the introduction of technology from external sources was not as effective as indigenous technological innovation in improving green

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Simone Bastianoni,
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*Correspondence:

Xu Tang
tangxu@cup.edu.cn

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transformation. This study suggests that direct research and development investment is an effective tool in achieving the desired outcomes. The effect of research and development investment was also indicated as important for regions to improve total factor coal productivity (Wang et al.). The positive impact of government subsidies on technology innovation up to a certain threshold was demonstrated by (Wang et al.).

The influence and efficiency in value creation for online platform-based companies in transitioning towards more sustainable options was examined by (Xie et al.). This case study on the energy sector tried to model the mechanism of this choice in transition.

Divisia techniques were used to consider sub-sectoral influences and opportunities for improvement in emissions, indicating the strength of the energy structure for Xinjiang Production and Construction Corps (Wang et al.). While (Zeng et al.) considered provincial level opportunities for reducing carbon emissions from electricity production, finding a cooperative model in which provinces could combine or trade efforts in emissions reduction, to be more effective and fair than each province being forced to seek emissions reductions internally.

Energy embodied in trade was analyzed for China at the sectoral and international level by (Zhang et al.), using trade in value-added methods. They show a difference between the sectors that produce the most economic value and those that have the highest embodied energy, thus indicating a potential to create mutual benefit by restructuring the embodied energy export structure.

On a very different topic, (Wei et al.) developed methods to diagnose the performance of hydraulic turbines.

CONCLUDING REMARKS

The editors hope that the published papers will interest the readers and initiate some interesting and informative discussion in the open review process.

AUTHOR CONTRIBUTIONS

The editorial was drafted by BM, checked by XT and JM.

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