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# **Advanced Biofuels and Circular Economy**

Technoeconomic,  
Socioeconomic, and  
Environmental  
Implications

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*Edited by*  
Rahil Akhtar Usmani  
Mudasir A. Dar  
Akram Ahmad Khan

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Editors

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ISSN 2524-5848

ISSN 2524-5856 (electronic)

Palgrave Advances in Bioeconomy: Economics and Policies

ISBN 978-3-031-86933-4

ISBN 978-3-031-86934-1 (eBook)

<https://doi.org/10.1007/978-3-031-86934-1>

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# Recent Developments in Mapping Environmental Sustainability of Advanced Biofuel

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Akram Ahmad Khan, and Jianzhong Sun*

## 11.1 INTRODUCTION

Worldwide, the energy sector is undergoing significant transformations, due to technological advancements, growing energy demands, environmental crisis affecting sustainability. The global energy landscape remains heavily dependent on fossil fuels, which supply approximately 84% of total energy and 96% of transportation fuels (Dar et al., 2022, 2024b). Some

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Switzerland AG 2025

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R. Akhtar Usmani et al. (eds.), *Advanced Biofuels and Circular  
Economy*, Palgrave Advances in Bioeconomy: Economics and  
Policies, [https://doi.org/10.1007/978-3-031-86934-1\\_11](https://doi.org/10.1007/978-3-031-86934-1_11)