

Where to Deploy Sustainable Aviation Fuel: An Integrated Assessment Model of Global SAF Development Potential

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Extended Abstract

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Abstract Summary

Global sustainable aviation fuel (SAF) faces challenges from uneven feedstock distribution and high production costs, with no existing global deployment strategy. This study uses a multi-dimensional evaluation framework, social network analysis, and a multi-regional input-output model to assess global SAF development potential and cooperation pathways. Results show: SAF feedstock and production potential are highly concentrated, with Brazil leading in sugar-based feedstocks, Indonesia in oil-based feedstocks, and China in agricultural residues and renewable energy. China and the U.S. have advantages across all four technology pathways, while Brazil and Indonesia excel in ATJ and HEFA respectively, and EU countries lead in advanced pathways like PTL. A collaborative production system based on five major trade clusters is constructed, featuring regional cooperation in Europe, Asia-Middle East, and Southeast Asia. Compared to a multi-center model, the cluster cooperation model increases total output by 3.0% and employment by 6.0%, with more balanced national benefits. Based on these findings, three policy recommendations are proposed: differentiated national positioning, regional cooperation mechanisms, and a global SAF governance framework.

Presenting Author Biography

Ms. Lishan Yang is a doctoral student at the Management School, Guizhou University, China. Her research interests focus primarily on low-carbon development in the aviation industry.

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