

Thematic and Geographic Structures in Renewable Energy Literature on Japan: A Text Mining Analysis Using Correlated Topic Modeling

Myrjam Klemt¹, Daiju Narita²

¹Georg-August University, Göttingen, Germany. ²University of Tokyo, Tokyo, Japan

Extended Abstract

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Abstract Summary

Japan's 2020 net-zero pledge and subsequent Green Transformation (GX) Strategy (2023) have established ambitious decarbonization targets, yet renewable energies accounted for only 8% of primary energy supply in 2023, underscoring a persistent ambition-implementation gap relative to the OECD average of 14%. No text-mining analysis of the renewable energy literature on Japan exists to systematically reveal thematic priorities, patterns of author affiliation and empirical geographic focus, and alignment with the GX Strategy. This study provides the first reproducible text-mining analysis of 4,178 peer-reviewed articles (1979-2024) via correlated topic modeling, collaboration network analysis, and spatial statistics. Thematically, we identify six major clusters, with persistent dominance of energy conversion and core technology research, alongside a marked but still secondary expansion of climate- and policy-oriented work over time. Geographically, knowledge production is heavily concentrated in Japan and a small set of partners, with China and the United States emerging as central collaborators, spatial clustering among Asian and OECD countries, and pronounced asymmetries between where research is produced and where empirical focus lies. In terms of the knowledge-policy interface, scholarly attention clusters around technology-oriented regulatory support, while market-based instruments, transition finance, and participatory governance, central pillars of the GX Strategy, remain comparatively underexplored. These patterns document epistemic concentrations and absences that correspond to gaps in the evidentiary basis for Japan's transition governance, and provide a reproducible baseline for future work examining how knowledge production may interact with GX implementation. The integrated combination of correlated topic modeling, spatial statistics, and policy benchmarking constitutes a transferable framework for systematic epistemic audits of national energy transition literatures.

Presenting Author Biography

Myrjam Klemt is a PhD candidate and research associate at the Chair of Economic Policy and SME Research at Georg-August-University Göttingen, Germany. Her research focuses on energy economics, with a particular emphasis on heat markets and consumer behavior. She holds a Bachelor's degree in Economics, a Master of Arts in Organizational Sociology, and a Master of Science in Development Economics. Her current work is conducted in the context of energy research projects funded by the Federal Ministry for Economic Affairs and Climate Action (BMWK) and the German Environment Agency (Umweltbundesamt).