

THE EU'S CBAM AND CARBON PRICE UNCERTAINTY: IMPACTS ON UPSTREAM EMISSIONS AND SUPPLY RISKS IN THE GLOBAL LNG MARKET

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This study quantitatively assesses the impact of the European Union's Carbon Border Adjustment Mechanism (CBAM) on the global Liquefied Natural Gas (LNG) market, with a focus on upstream emissions and supply dynamics. We apply a multi-objective mixed-integer linear programming model that optimizes LNG supply costs, supply risks, and upstream emissions. (The applied model builds upon [1] and has been further developed and presented in [2]) A key innovation is the recycling of CBAM revenues to exporters, which incentivizes emission reductions at the source. (We refer the interested reader to [3]) Through scenario analysis accounting for carbon policy stringency and price volatility, we explore how CBAM could reshape global LNG trade. Unlike previous studies that concentrate on importer costs, our approach uniquely incorporates supply disruption risks and supply concentration dynamics. This holistic perspective provides actionable insights into the economic and geopolitical implications of extending CBAM to LNG, offering a comprehensive understanding of its potential to drive sustainable change in the energy sector.

Referenzen

- [1] Zwickl-Bernhard, Sebastian, and Anne Neumann. "Modeling Europe's role in the global LNG market 2040: Balancing decarbonization goals, energy security, and geopolitical tensions." *Energy* 301 (2024): 131612.
- [2] Zwickl-Bernhard, Sebastian, Anna Creti, and Anne Neumann. "The EU's CBAM Trinity in LNG Supply: Modeling Global Trade Flows, Supply Risks and Upstream Emissions." *Energy Economics* (1st round of revisions).
- [3] Zhang, Weimin, and Benjamin K. Sovacool. "The "triple burden" effect and "pressure-opportunity paradox" of net-zero transitions: Exploring the political economy of Carbon Border Adjustment Mechanism (CBAM) implementation in the Global South." *Energy Strategy Reviews* 62 (2025): 101913.

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