

Geographic Constraints in Green Electricity Accounting: Evidence from Germany and the European Guarantees of Origin Market

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Extended Abstract

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Abstract Summary

Geographic constraints in green electricity accounting are receiving increasing attention, yet empirical evidence on how stricter locational matching rules would operate in integrated electricity and certificate markets remains limited. This study examines how geographically unconstrained certificate markets interact with physically constrained electricity systems and how stronger geographic constraints would affect green electricity accounting.

Focusing on Germany, the largest net importer in the European Guarantees of Origin market, this study examines how physical electricity and certificate imports interact and how stronger geographic constraints would affect green electricity accounting at both the market and supplier level. Therefore, we combine proprietary data on GO cancellations with publicly available data on cross-border electricity flows for 2016–2024.

The results show substantial misalignment between certificate and electricity flows, with imported certificates exceeding electricity imports throughout the observation period. Ex-post introduction of geographic constraints improves alignment but reveals a pronounced trade-off. Stricter constraints reduce or eliminate positive import misalignment, but also substantially reduce certificate availability. Supplier-level effects are highly uneven, indicating significant differences in vulnerability depending on sourcing strategy.

Overall, the findings provide limited support for strict locational rules such as domestic-only sourcing or similarly narrow geographic restrictions, as these tend to induce substantial liquidity shortages. More moderate designs, such as country-specific import caps, appear better suited. From a policy perspective, this suggests that geographic constraints should reflect cross-border electricity relationships rather than concentrate on narrowly defined regions. Moreover, national rules governing domestic certificate issuance should be reviewed in light of potential import restrictions.

Presenting Author Biography

Hanna Scholta (ORCID: <https://orcid.org/0009-0002-1325-1784>) is a research associate and Ph.D. candidate at the Chair of Management Accounting at the Technical University of Munich (TUM). Her research focuses on decarbonization instruments, with a particular emphasis on green electricity claims and granular matching approaches to support renewable energy investments and storage.

In addition to her research, she lectures on management accounting, e.g., cost accounting and the effects of climate change on accounting practices and organizational structures. Hanna holds both a B.Sc. and an M.Sc. in Management and Technology from TUM and has gained international experience in the UK and Australia.