



Master Thesis

Short-Run vs. Long-Run Energy Demand Elasticities: A Meta-Regression Analysis for Europe

The planned launch of the EU ETS2 in 2027 might drive carbon prices sharply upward ([EWI, 2025](#); [Günther et al., 2024](#)). While these price signals are intended to encourage both short-term behavioral adjustments and long-term investment responses, the heterogeneity of household energy demand elasticities across EU member states remains insufficiently captured in prevailing energy system models. Although individual studies have estimated price elasticities for specific countries and sectors, a systematic synthesis that accounts for cross-country differences and methodological variations is lacking.

This thesis aims at addressing this gap by conducting a comprehensive meta-regression analysis of published short-run and long-run energy demand elasticities across the EU. By systematically collecting elasticity estimates from peer-reviewed studies, working papers, and national research reports, this analysis will quantify regional patterns in household energy price responses for heating and/or transportation sectors. The approach may involve clustering EU member states based on economic characteristics (GDP per capita), climate conditions (heating degree days), and/or energy infrastructure (renewable energy share, gas vs. electricity dependence) to identify distinct regional behavioral patterns that may inform EU ETS2 policy design.

Potential research questions include: How do short-run and long-run elasticities vary across EU? Which economic, climatic, or institutional factors drive systematic differences in household energy price responses? What are the policy implications of elasticity heterogeneity for EU ETS2 effectiveness and distributional impacts?

Key tasks

- Systematic literature review: Compile published estimates of short-run and long-run price elasticities for residential energy demand across EU member states, covering electricity, heating fuels, and/or transport fuels.
- Country clustering: Develop and validate 3-4 country clusters using economic, climatic, and/or energy infrastructure.
- Meta-regression analysis: Estimate cluster-specific pooled elasticities using weighted least squares and random-effects models, controlling for study characteristics (methodology, sample period, fuel type, etc.).
- Discussion of implications: Evaluate implications of elasticity heterogeneity for EU ETS2 and discuss potential policy recommendations for different country clusters.

Your profile

- Master's student in economics with background in econometrics and quantitative methods, preferably with focus on environmental or energy economics
- Experience with statistical software such as Stata, R, or Python
- Interest in energy economics and EU climate policy

Literature

- Labandeira, X., Labeaga, J. M., & López-Otero, X. (2017). A meta-analysis on the price elasticity of energy demand. *Energy Policy*, 102, 549-568.
- Schulte, I., & Heindl, P. (2017). Price and income elasticities of residential energy demand in Germany. *Energy Policy*, 102, 512-528.
- Pellini, E. (2021). Estimating income and price elasticities of residential electricity demand. *Energy Economics*, 101, 105444.

Contact



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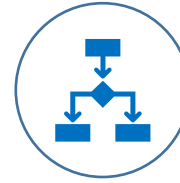
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Topics



- Household energy demand elasticities
- EU climate policy and carbon pricing

Methods



- Meta-regression analysis
 - Country clustering
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