ENV-723

Models for applied environmental economics

Vöhringer Frank

Cursus	Sem.	Type
Civil & Environmental Engineering		Opt.

Language of teaching	English
Credits	1
Session	
Exam	Oral presentation
Workload	30h
Hours	**13**
Courses	13
Number of positions	

Frequency

Every 2 years

Remark

Next time: Spring 2025, Min. 5 persons

Summary

Mainly based on the discussion of peer reviewed academic papers, the course introduces non economists to the main types of applied models used in environmental economic analysis: linear programming, partial and general equilibrium, game theory, and agent based models.

Content

For each type of applied environmental economic model, there is a brief general introduction, followed by a discussion of a peer-reviewed academic paper on an applied topic using that type of model.
Families of models presented and discussed:
- Linear programming (paper topic: acidification; model features in paper: spatial)
- Partial equilibrium (paper topic: timber industry and wildlife conservation; model features in paper: integrated assessment)
- Computable general equilibrium (paper topic: carbon taxes; model features in paper: multi-regional)
- Game-theoretic (paper topic: climate negotiations; model features in paper: cooperation)
- Agent-based (paper topic: adoption of residential photovoltaics; model features in paper: spatial, bounded rationality)

Keywords

environmental economics
economic modeling

Learning Prerequisites

Required courses

Some prior familiarity in applied modeling of any kind or in economics is an advantage, but not a formal prerequisite.

Recommended courses

ENV-610 Ecological Economics or
ENV-724 Climate Economics for Engineers

Learning Outcomes

By the end of the course, the student must be able to:

- to understand the differences between simulation and optimisation models
- to describe the main characteristics of each model type
- to discuss the main merits and limitations of each modeling approach
- to recognize attributes of well written papers

Resources

Bibliography

Cofala, J. et al. (2004) : Cost-effective control of SO2 emissions in Asia, Journal of Environmental Management 72, 149-161.
Nalle, D.J. et al. (2004): Modeling joint production of wildlife and timber, Journal of Environmental Economics and Management 48, 997-1017.
Beck, M. et al. (2015): Carbon tax and revenue recycling: Impacts on households in British Columbia, Resource and Energy Economics 41, 40-69.
Carraro, C. et al. (2006): Optimal transfers and participation decisions in international environmental agreements, The Review of International Organizations 1, 379-396.
Rai, V. and S.A. Robinson (2015): Agent-based modeling of energy technology adoption: Empirical integration of social, behavioral, economic, and environmental factors, Environmental Modelling & Software 70, 163-177.

Ressources en bibliothèque

- Carbon tax and revenue recycling: Impacts on households in British Columbia, In: Resource and Energy Economics
- Agent-based modeling of energy technology adoption: Empirical integration of social, behavioral, economic, and environmental factors, In: Environmental Modelling & Software
- Optimal transfers and participation decisions in international environmental agreements, In: The Review of International Organizations
- Modeling joint production of wildlife and timber, In: Journal of Environmental Economics and Management
- Cost-effective control of SO2 emissions. In: Asia, Journal of Environmental Management 72, 149-161

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- https://go.epfl.ch/ENV-723