

InfraTrain 2012 Autumn School

Advanced Infrastructure Modeling: Numerical Models and Efficiency Analysis

October 8-12, 2012

Structure

INFRATRAIN is a series of events in **INFRA**structure research and policy **TRAIN**ing designed for graduate scholars, practitioners, and policy makers. Each INFRA**TRAIN** event consists of several training sessions among which the participants select one. **INFRA**TRAIN thus addresses:

- Advanced Master students
- PhD students, post-docs, and other scholars from universities and research institutions
- Junior staff from ministries, regulatory agencies and other governmental bodies
- Young practitioners from industry, consulting firms and financial companies dealing with infrastructure issues

Students in a Master or PhD program will receive a certificate corresponding to 6 ECTS (European Credit Transfer System) upon the completion of a term paper resulting from the training course. The core element of each **INFRA**TRAIN are the Training Sessions, which cover a specific topic. Each participant chooses one session for the entire week. Senior practitioners or faculty lecture on a focused topic, propose exercises and computer simulations, and discuss theoretical and policy issues. Training Sessions are accompanied by seminars, where participants present and debate either their PhD theses or other current work in smaller groups.

Training Sessions 2012 (choose one)

1) *One and Two-Level Energy Market Equilibrium Modeling (Electricity, Natural gas, Renewables)*

This course investigates strategic interaction in energy markets and covers several optimization and equilibrium concepts to solve the associated models. We aim to provide (PhD-) students with a strong theoretical understanding of Generalized Nash games and leader-follower Stackelberg games, and the related mathematical concepts of (Quasi-) Variational Inequalities (VI and QVI), Mixed Complementarity Problems (MCP), Mathematical/Equilibrium Problems under Equilibrium Constraints (MPEC/EPEC). Applications of these methodologies to energy market problems will be covered in the practical part of the course, based on examples from recent literature.

Participants should have a thorough knowledge of nonlinear optimization, mixed complementarity problems, Karush-Kuhn-Tucker conditions and convexity in higher dimensions as well as hands-on experience in GAMS.

Trainer: Dr. Steven A. Gabriel, Professor of Operation Research and Project Management, University of Maryland, Research Professor at DIW Berlin, and co-author of the book "Complementarity Modeling In Energy Markets" (Springer)



2) Regulatory Benchmarking for Network Industries - Theory and Application to Electricity and Water

Given the current challenges in international infrastructure regulation, this session focuses on the advanced methods of parametric and nonparametric efficiency analysis for regulatory purposes. State-of-the-art econometric and nonparametric models for regulatory benchmarking are derived and applied to network industries like e.g. water and electricity utilities. Beside the introduction into production theory and into the general principles of efficiency analysis this course covers advanced models for data envelopment analysis (DEA), cross-section and panel data models for stochastic frontier analysis (SFA) and the combination of both concepts, the stochastic non-smooth envelopment of data (StoNED). Topics are the estimation of economies of scale and scope, horizontal and vertical integration/separation, decomposition of productivity change.

Trainers:

Dr. Endre Björndal (tbc), Associate Professor at NHH Bergen, has considerable experience in the economic modeling of infrastructure industry costs and its application to infrastructure industry issues. Further research and teaching areas are: management science/decision modeling, operations management production planning and control, benchmarking/efficiency analysis, electricity markets, regulation of Electricity Networks.

Dr. Astrid Cullmann, Senior Researcher at DIW Berlin, is specialized in nonparametric and parametric efficiency analysis in regulated and non-regulated industries and also works on issues concerning knowledge production and research efficiency.

Cost

The participation fee for INFRATRAN is 350 €. This fee includes tuition, course and training materials, and snacks. Eligible are researchers and practitioners with an interest in economic research and policy implications. Particular emphasis is placed on young researchers (PhD students, post-Docs). We also welcome advanced participants in Master Programs. If you are interested in participating, please send your CV including fields of scientific interest and your preferred topic for the training session until August 31, 2012 to:

infratrains@wip.tu-berlin.de

If you are interested in presenting a paper or a research project, please add an extended abstract (one page, about 300 words). Preference will be given to participants presenting own work. Participation in each training session is limited. Information on acceptance will be given by early September.

Convenors

INFRATRAN is organized by WIP, the Workgroup for Infrastructure Policy, at Berlin University of Technology, in cooperation with DIW Berlin, the German Institute for Economic Research. With a staff of 13 researchers and an international scientific and consulting network, WIP is one of the leading German institutes in infrastructure research and policy. DIW Berlin is one of the leading economic research institutes in Germany, carrying out basic research and policy advice, with a focus on transport, energy, and telecommunication economics.

Scientific coordinators of INFRATRAN are Prof. Dr. Georg Meran (TU Berlin) and Prof. Dr. Christian von Hirschhausen (TU Berlin / DIW Berlin)

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[Infratrains Homepage](#)

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Program

	Mo 08.10.	Tue 09.10	Wed 10.10	Thu 11.10	Fri 12.10
Morning		Group work	Group work	Group work	Group work 10:45-12:15 Plenary Session Presentation of Training Session Results & Discussion
Lunchtime		12:30 -13:30 Lunch	12:30 -13:30 Lunch	12:30 -13:30 Lunch	
Afternoon	Arrival/ Registration (13:00-14:00) Welcome Address Group work	Group work	Group work	Group work	
Evening	Reception	Group work	Group work Informal Get-together	Group work	

