

InfraTrain 2011 Autumn School

Infrastructure Modeling and Policy: Electricity and Water

October 3-8, 2011
Berlin University of Technology

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
- Keynote lectures given by renown researchers and policy makers
- The Conference on Applied Infrastructure Research, an international forum for academics and policymakers

Training Sessions 2011 (choose one)

1) *One and Two-Level Energy Market Equilibrium Modeling*

In this course, we examine both one and two-level models for determining equilibria in energy markets. In the former case, the mixed complementarity problem (MCP) format is used which generalizes optimization and Nash-Cournot games as well as a host of other problems in engineering-economic systems. In the latter case, we explore leader-follower (Stackelberg) games, their generalizations called mathematical programs with equilibrium constraints (MPEC) and equilibrium problems with equilibrium constraints (EPEC) in which there are multiple Stackelberg leaders. Applications in energy, with a focus to electricity, as well as some examples of methodologies are presented.

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 forthcoming book "Complementarity Modeling In Energy Markets" (Springer)*

2) *Modeling Watershed Economics and Policy*

This course explores principles of optimization modeling in GAMS (General Algebraic Modeling System) with application to a range of policy debates that are important to the management of watersheds. This session will explore the use of optimization models that account for several important uses and values of water. We will examine and develop small GAMS models that optimize each of several uses of water, including agriculture, hydroelectric, urban, and environmental, in the face of various



hydrologic, ecological, agronomic, and institutional constraints. After examining models that optimize the economic performance of several single uses, we will examine models that account for multiple uses at the watershed scale. Finally, we plan to address policy options for promoting efficient, equitable, and sustainable water uses.

Trainer: Dr. Frank A. Ward, Professor of Water Economics, New Mexico State University, one of the leading water economists, with ample research and policy experience in modeling water systems and international river basin management

3) 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) and cross-section and panel data models for stochastic frontier analysis (SFA). Topics are the estimation of economies of scale and scope, horizontal and vertical integration/separation, decomposition of productivity change.

Trainer: Dr. David Saal, Senior Lecturer and Research Convenor, Aston Centre for Critical Infrastructure & Services (ACCIS) at Aston University, and Research Professor at the German Institute for Economic Research (DIW Berlin). Dr. Saal has considerable experience in the economic modeling of infrastructure industry costs and its application to infrastructure industry issues; moreover, he also teaches post graduate modules on efficiency and cost modeling which are regularly attended by representatives of both infrastructure firms and their regulators.

Cost

The participation fee for INFRATRRAIN is 350 €. This fee includes tuition, course and training materials, snacks, and the participation fee for the 10th Conference on Applied Infrastructure Research (**INFRADAY**). 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, 2010 to:

infratrtrain2011@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

INFRATRRAIN 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 INFRATRRAIN are Prof. Dr. Georg Meran (TU Berlin) and Prof. Dr. Christian von Hirschhausen (TU Berlin / DIW Berlin)

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Program

	Mo 03.10.	Tue 04.10	Wed 05.10	Thu 06.10	Fri 07.10	Sa 08.10
9:00		Training Session 3	Training Session 6	Training Session 9	Training Session 12	Conference (INFRA-DAY)
10:30	Arrival/ Registration (13:00-14:00)	Seminar 1	Seminar 2	Seminar 3	Plenary Session Presentation of Training Session Results & Discussion	Conference (INFRA-DAY)
10:45						
12:15						
14:00	Welcome Address	Training Session 4	Training Session 7	Training Session 10	Conference (INFRA-DAY)	Conference (INFRA-DAY)
15:30	Training Session 1					
16:00	Training Session 2	Training Session 5	Training Session 8	Training Session 11	Conference (INFRA-DAY)	Conference (INFRA-DAY)
17:30						
E V E N I N G	Reception Introduction to software	Continuation of Training Sessions, Exercises	Informal Get-together	Preparation of the Final Presentation	Reception	Informal Get-together

