ENRE Online Seminars – 2020 Programme
(see also https://blogs.ed.ac.uk/enre**)**

29 October 2020 3.00-4.30pm GMT (on Zoom) | Frederic Murphy (Temple University) **& David Wogan** (Asia Pacific Energy Research Center)**: How to Model Price Controls Using Mixed-Complementarity Models**

Zoom link: **https://ed-ac-uk.zoom.us/j/88097951730** (Meeting ID: 880 9795 1730, Passcode: enre1234)

Linear programs require marginal cost pricing and regulated prices cannot be modeled, without introducing algorithms for solving sets of equations. With robust algorithms for solving mixed complementarity problems, it is now possible to model pricing regulations directly in MCP's. In this talk we provide formulations for when markets can clear despite price controls and when shortages occur. We also explain how to incorporate such pricing regimes as average-cost pricing. We have used these techniques to analyze policy alternatives as part of Saudi Arabia's restructuring of its domestic energy policies. We illustrate our approach with a study on improving the costs of electricity generation through a better utilization of the Gulf Coordinating Council Interconnector.

Frederic Murphy is professor emeritus, Fox School of Business, Temple University, where he taught for 30 years. He then became a Senior Visiting Research Fellow at the King Abdullah Petroleum Studies and Research Center in Riyadh, Saudi Arabia where he participated in the development of energy models and writing policy analyses in a range of areas, including domestic energy use in Saudi Arabia, market power in world oil markets, designing and managing income stabilization funds for resource-dependent economies, and China's and India's energy economies. He works mainly in the area of energy-market forecasting and energy policy analysis. Prior to joining Temple, he was at the Energy Information Administration of the US Department of Energy and its predecessor, the Federal Energy Administration, where he headed the group that did the economic impact analyses of the energy-related bills and laws passed during the Carter administration and developed and ran the forecasting models then used for policy analyses and the forecasts in the EIA Annual Report. He has authored over 100 refereed articles.. He was the editor in chief of the journal Interfaces, an area editor for Operations Research, and the Informs Journal on Computing, and the Vice President of Publications for INFORMS and its predecessor society, Operations Research Society of America. He has been involved in studying local economic policy issues, including advising the Tax Reform Commission of the City of Philadelphia, estimating the impact on jobs of building casinos in Philadelphia, and political redistricting. He also did a queueing study oil tank vessels on the Delaware River and a study of the market for Jones Act tankers in the United States, which caused the Maritime Administration to reduce subsidies for building new oil tankers. He has a B.A. in mathematics and a Ph.D. in operations research from Yale University.

David Wogan is Assistant Vice President and a Senior Visiting Researcher at APERC. He coordinates the APEC Energy Outlook, which provides supply and demand projections for the 21 economies of APEC. In addition, David leads data science and energy economic modelling research activities, including the development of the APEC Energy Model. His research interests are in the role of economic interventions in energy system planning, particularly in regional energy systems, and the impact on wider policy objectives. Previously, David was a Senior Research Associate at the King Abdullah Petroleum Research Center (KAPSARC) in Riyadh, Saudi Arabia. There he led projects on energy subsidy price reform, low carbon transition pathways, and integrating the electricity systems of GCC member states. David has policy experience at the White House Council on Environmental Quality and Austin Energy, the municipally-owned electricity utility for the city of Austin, Texas. David holds a Master of Science (M.S.) in Mechanical Engineering and Master of Public Affairs (MPAff) from The University of Texas at Austin. He is currently enrolled as a PhD student in energy economics at Université Paris Nanterre.

7-13 November 2020 | Virtual INFORMS Annual Meeting

The INFORMS Annual meeting is now virtual, but, as usual, will still have a large number of ENRE sessions and talks. See the **2020 Annual Meeting website** for details about registration and participation. If you sign up as a member of INFORMS, please consider ticking the ENRE membership box.

10 December 2020 3.00-4.30 GMT (on Zoom) | Andy Philpott & Tony Downward (University of Auckland): Capacity planning with JuDGE

Zoom link: **https://ed-ac-uk.zoom.us/j/88097951730** (Meeting ID: 880 9795 1730, Passcode: enre1234)

JuDGE is an open-source Julia package that solves multi-stage stochastic programming models for capacity expansion. It applies a form of Dantzig-Wolfe decomposition to decouple a scenario tree into nodes representing different states of the world. The first part of the talk will briefly cover the theory underlying JuDGE and describe some recent applications of JuDGE to problems in electricity transmission expansion planning and long-term planning for 100% renewable electricity systems. The second part of the talk will be more tutorial in nature, demonstrating the features of the package, and how to download and apply it to capacity planning problems.

Andy Philpott is Professor of Operations Research and director of the Electric Power Optimization Center at the University of Auckland. His research interests are in stochastic optimization and game theory and their application to electricity markets. Dr Philpott currently serves on the editorial board of Operations Research, and has previously served on the editorial boards of Mathematical Programming and Operations Research Letters. Dr Philpott is an Edelman Laureate and a Fellow of INFORMS.

Dr Anthony Downward is a lecturer in the Department of Engineering Science and a member of the Electric Power Optimization Centre, at the University of Auckland. His research spans micro-economic and optimization models of electricity systems, focussing on modelling competitive and oligopolistic behaviour over networks with transmission constraints. Recently Tony has been involved in the development of JuDGE, a flexible Julia package for modelling long-term capacity expansion problems under uncertainty.