

Systematic Optimization of Transmission Expansion and Transmission Charges based on Benefits

Speaker: Ross Baldick, University of Texas at Austin

Abstract:

There have been many formulations of “optimal” electric transmission expansion in the academic literature; however, with very few exceptions systematic optimization techniques have not been applied to transmission planning in practice. For example, the recent planning of over \$5 billion of transmission expansion for Texas to support increased wind involved trial and error addition of candidate lines into a power flow modeling process to develop a plan. I discuss some of the various issues that are involved with transmission planning, and argue that at least some of them are susceptible to systematic techniques. Moreover, I will argue that approaches to charging beneficiaries for construction costs according to benefits received, as mandated by the Federal Energy Regulatory Commission effectively requires an optimization framework in order to evaluate those benefits.

Speaker Bio:

Ross Baldick is Professor and Leland Barclay Fellow in the Department of Electrical and Computer Engineering at The University of Texas at Austin. He received his B.Sc. and B.E. degrees from the University of Sydney, Australia and his M.S. and Ph.D. from the University of California, Berkeley. From 1991-1992 he was a post-doctoral fellow at the Lawrence Berkeley Laboratory. In 1992 and 1993 he was an assistant professor at Worcester Polytechnic Institute. Dr. Baldick has published over fifty refereed journal articles and has research interests in a number of areas in electric power. His current research involves optimization and economic theory applied to electric power system operations, the public policy and technical issues associated with electric transmission under electricity market restructuring, the robustness of the electricity system to terrorist interdiction, electrification of the transportation industry, and the economic implications of integration of renewables. His book, *Applied Optimization*, is based on a graduate class, “Optimization of Engineering Systems” that he teaches in the electrical and computer engineering department at The University of Texas. He also teaches a three-day short-course “Introduction to Electric Power for Legal, Accounting, and Regulatory Professionals” and a one-day short-course “Locational Marginal Pricing” for non-technical professionals in the electricity industry. He is a former editor of *IEEE Transactions on Power Systems* and former chairman of the System Economics Sub-Committee of the IEEE Power Engineering Society Power Systems Analysis, Computation, and Economics Committee. Dr. Baldick is a Fellow of the IEEE and Director of the NSF I/UCRC on Electric Vehicles: Transportation and Electricity Convergence. With Pecan Street Project support, Dr. Baldick and graduate students are leveraging ERCOT plans for EVSEs at an employee parking lot in Taylor to test and implement charging strategies for plug-in hybrid vehicles.