



香港城市大學
City University of Hong Kong
三十周年紀念

City University Distinguished Lecture Series

Speaker

Professor Roger J-B Wets

*Distinguished Research Professor of Mathematics
University of California, Davis*



Renewable Energy: New Challenges and Rewards

on
Tuesday, 28 October 2014 at 4:30 pm

at
Connie Fan Multi-media Conference Room
4/F Cheng Yick-chi Building
City University of Hong Kong
Tat Chee Avenue, Kowloon

Abstract

The major mission of a System Operator (governmental, paragonovernmental, independent, . . .) is to manage the electricity-grid so as to satisfy the demand, avoiding serious disruptions (blackouts, etc.) and to do this at a reasonable and potentially minimal cost. Traditionally, energy supply came from highly controllable sources: nuclear, hydro or thermal (coal, gas). Day ahead planning and intraday management, although relatively involved, came down to a (detrministic) forecast for the load (= demand) complemented by spinning contracts (stand-by generators) to be activated when required (reliability measures). However, due to crucial ecological considerations, there has been a sustained insistence on substituting traditional by renewable resources: wind and solar. Many countries and regions are aiming at a policy where around 50% of the load would be generated by renewables. So, in addition to the intrinsic load uncertainty (related to weather conditions), the System Operator must now take into account serious uncertainties in the supply since wind and solar power are both extremely variable, in time and place, and renders the dispatching management significantly more complex. It requires a radically redesigned approach that comes with some practical and interesting technical challenges. The lecture will provide an overview of these challenges and how a team involving a number of university-researchers, a National Lab, a major software provider for System Operators, assembled by the Department of Energy, dealt with these challenges, in the process developed new technology and pioneered potential implementation.

Biographical Sketch

Professor Roger J-B Wets is a Distinguished Research Professor of Mathematics at the University of California, Davis. He guided nineteen students to their Ph.D. His main research interests have been stochastic optimization and variational analysis. For this work he has received a number of prizes that include Guggenheim and Erskine Fellowships, the SIAM-MPS Dantzig Prize in Mathematical programming and the INFORMS Lanchester prize for the book "Variational Analysis" that he co-authored with R.T. Rockafellar. During the last decade his research has been focused on equilibrium problems, in particular equilibrium problems in a stochastic environment, and on nonparametric estimation, in particular on the fusion of hard and soft information. Over time, he has been associated with the Boeing Scientific Research Labs, the International Institute of Applied Systems Analysis (Laxenburg, Austria), the IBM-T.J. Watson Research Center (Yorktown Heights, N.Y.), the Center for Mathematical Modeling of the University of Chile and the World Bank. This resulted in getting involved in projects related to aerospace, telecommunications, finance, soil management and water resources, manufacturing and energy. He has published about 200 technical articles, mostly in pure and applied mathematical journals, but also in journals dealing with probability, statistics, economics and ecology. He held, or holds, editorial positions on a number of leading journals in mathematics and operations research.

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