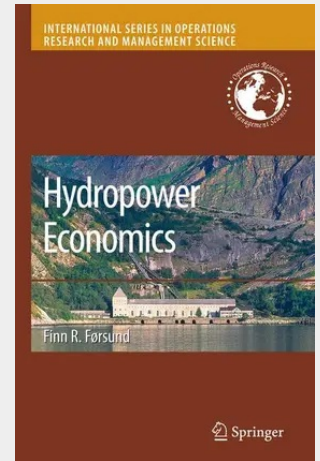


Hydropower Economics

There are few more urgent topics in today's world, so full of ecological uncertainty. Hydropower Economics uses various econometric measures to examine sustainable alternative energy sources. It kicks off by modeling hydropower, yes, but it does not end there. Forsund has extended his model to include thermal power and wind power, too – forms of alternative energy that are taking on an ever larger profile.

The state organisation responsible for coordinating the hydropower electricity system in Norway ("Samkjøringen") contacted me in 1990 about the advanced plan for deregulating the electricity system, separating generation, transmission, and distribution and introducing a wholesale market for electricity. It was felt that insights about the fundamental nature of running an electricity system based on hydropower was somewhat lacking within the team of academic economists engaged to write background reports by the Oil and Energy ministry responsible for driving the reform of the electricity system. When talking to engineers I was fascinated by the world of electricity, with its physical laws and weird concepts such as reactive power and electric phase angles. Externalities of hydraulic interdependence between river-based power stations and highly fluctuating loss and congestion externalities involved in a meshed transmission network had to be recognised. Furthermore, capturing all these elements required advanced mathematical methods of dynamic programming in a stochastic environment. My conclusion was that a market design that neglected these aspects did it at its own peril. I predicted volatile prices coming out of a competition between producers facing zero short-run variable costs and problems with investments coming forth sufficiently from a social perspective. However, I can safely say that my report had no impact whatsoever on the Norwegian electricity reform of 1991, that must be regarded, not the least by me, as being highly successful.



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