

A Review of Policy Analysis Purpose and Capabilities of Electricity System Models

R.H.E.M. Koppelaar^{1,2}, J. Keirstead³, N. Shah⁴, J. Woods¹

Corresponding author: Rembrandt Koppelaar, r.koppelaar12@imperial.ac.uk,
rembrandtkoppelaar@gmail.com

¹ Centre for Environmental Policy, Imperial College London, SW7 2AZ, London, United Kingdom.

² Institute for Integrated Economic Research, P.O. Box 506, Meilen CH-8706, Switzerland.

³ Department of Civil and Environmental Engineering, Imperial College London, SW7 2AZ, London, United Kingdom

⁴ Centre for Process and Systems Engineering, Imperial College London, SW7 2AZ, London, United Kingdom

Abstract

The aim of this study is to investigate the ability of electricity system models to provide scenario based insights for policy purposes. A framework is built from a review of existing studies of model characteristics and their linkages to model scenario types, which are linked to the purpose of policy problem analyses. The framework can be used as a tool to structure the examination of electricity system models, and guide electricity system model selection and enhancement in light of policy problem driven analyses. An illustration of the framework is presented by a review of German electricity model scenario studies. The review shows that current models are used for the policy purpose of indicator assessment and instrument comparison by quantification of indicators such as monetary or pollution impacts. However, they are not suitable to provide the means for option reduction, problem exploration, and political or societal paradigm change exploration, as the endogenous model structure for these is missing. A particular lack of endogenous treatment was found for renewable technology capacity change and policies, learning and productivity growth based technological change, socio-political-technical interactions, and limited demonstrated use of uncertainty treatment techniques.

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