Understanding Impacts of High Renewable Penetration: An EPRI, DOE, NREL, EPA, EIA Multi-Model Exploration

December 12, 2017

The Capitol Hilton, 1001 16th ST NW, Washington DC

Wind and solar deployment in the United States has grown at unprecedented rates in recent years. Over the past decade new capacity installations have been comprised almost solely of new wind, solar, and natural gas-based technologies. This growth and accompanying rapid technological progress have led operating wind capacity (82 GW) to surpass hydropower as the leading renewable technology on an installed capacity basis. Meanwhile new solar installation records (15 GW) were broken in 2016.

Whether this growth trajectory will continue is a key question for policy-makers and industry stakeholders. It is also a challenging question, given significant uncertainties surrounding competing technologies, demand growth, policies, and the degree of continued technology changes. U.S. power sector capacity expansion models are widely used to navigate this uncertainty and inform policy making, investment decisions, technology assessments, and evaluations of drivers and impacts of electric sector evolution.

Capacity expansion models represent a complex power system over long time-scales, typically decades. Doing so requires many simplifications. Tradeoffs between detail and computational tractability are required. The location-dependence, variability, and uncertainty of renewable energy add to the modeling challenges and, at high renewable energy penetrations, might call into question the validity of existing simplifications in the models.

To address these challenges, four national-scale capacity expansion modeling teams—from the Electric Power Research Institute, the Energy Information Administration, the Environmental Protection Agency, and the National Renewable Energy Laboratory—participated in a research project supported by the U.S. Department of Energy to compare modeling methods and results under high-penetration variable renewable energy scenarios.

This seminar will present findings and insights from the four modeling teams and Department of Energy. Speakers will discuss insights into high-penetration renewable scenarios and the strengths, limitations, and opportunities from the four capacity expansion models used. These findings will help analysts, policy-makers, and stakeholders better understand and interpret results from these modeling tools.

Tuesday, December 12, 2017

8:30 am – 1:15 pm

Lunch will be provided

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RSVP name, title, and company to: wsmith@epri.com

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Agenda

TUESDAY, DECEMBER 12, 2017		
TIME	**TOPIC**	**PRESENTER**
8:30 a.m.	*Continental Breakfast*	
9:00 a.m.	Welcome and Introductions	*David Hunter, Senior Government and External Representative, EPRI*
9:10 a.m.	The Importance of Modeling Renewable Energy: Policy and Modeling Considerations	*Steve Capanna, Director, Strategic Priorities and Impact Analysis, DOE*
9:20 a.m.	Capacity Expansion Models and the Electricity Sector: Impact of the EPRI, EIA, NEMS, and EPA models	*Francisco de la Chesnaye, Head, Energy and Environment Analysis, EPRI*
Session 1	**A Multi-Model Renewables Exploration: Study Design and Results** *Moderator: David Hunter, EPRI*	
9:30 a.m.	EPRI, DOE, NREL, EPA, EIA Variable Renewable Energy Multi-Model Project: Overview and Insights	*Wesley Cole, Energy System Modeler and Analyst, NREL*
9:50 a.m.	Insights into the Future of Variable Renewable Energy: A Multi-Model Perspective of the U.S. Electricity System	*John Bistline, Senior Technical Leader, EPRI*
10:10 am.	Discussion	
10:30 a.m.	*Coffee Break*	
Session 2	**Modelling High-Penetration Renewables: Insights and Perspectives** *Moderator: Christopher Namovicz, Team Leader for Renewable Electricity Analysis, EIA*	
11:00 a.m.	Insights from NEMS: 3 Keys to Renewables Modeling: Resolution, Resolution, and Resolution	*Cara Marcy, Renewable Electricity Analyst, EIA*
11:15 a.m.	Insights from IPM	*Ryan Sims, Economist, EPA*
11:30 a.m.	Insights from ReEDS: Better Models = Better Projections	*Bethany Frew, Energy Analyst, NREL*
11:45 a.m.	Insights from US-REGEN: The Importance of Capturing Renewable Co-Variation with Load	*David Young, Principal Technical Leader, EPRI*
12:00 p.m.	*Discussion*	
12:15 p.m.	*Networking Lunch*	
1:15 p.m.	*End*	