THE WSU-PNNL ADVANCED GRID INSTITUTE

RESILIENCE TO ENERGY SUPPLY & DEMAND CHANGES

Part of the Grid Resilience @ PNNL Webinar Series

~ by ~

GOKUL IYER & JENNIE RICE
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Tuesday, October 25 • 11:00 AM – Noon (PT) • EME 26*

In-person Attendees

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ABSTRACT

We will describe ongoing research that holistically evaluates the implications for resilience due to alternative energy transitions, socioeconomic shifts, technology change, climate change, and extreme weather simultaneously affecting supply resources and electricity demands. We will first present a suite of long-term decarbonization scenarios for the U.S. energy system created using GCAM-USA—PNNL's flagship global multisector model with state-level details in the U.S.—that simulates energy, water, land, socioeconomic, and climate systems along with their interactions with policy and technology. We then present research that further analyzes these scenarios at higher spatial and temporal resolutions within the U.S. using policy-, resource-, and land-constrained infrastructure siting, weather-dependent electricity demand, weather-dependent grid operations, and equity impact models.

BIOS

Dr. Iyer Gokul is a systems engineer at the Joint Global Change Research Institute (JGCRI), a partnership between Pacific Northwest National Laboratory (PNNL) and the University of Maryland. Iyer is a team leader for the Human-Earth Systems Science: Analysis team within JGCRI. He also holds a joint appointment with the University of Maryland's School of Public Policy and has over a decade of research experience in integrated modeling of energy, economy, climate, water, agriculture, and land systems at global to national to subnational scales.

At JGCRI, Iyer leads and manages a variety of projects related to modeling of energy and minerals trade; long-term energy system transitions; deep decarbonization strategies; electricity capacity expansion; climate impacts on energy systems; and energy-water system interactions. Additionally, he has experience leading research on topics related to the sustainable development implications of decarbonization and the role of technology diffusion, technological change, and institutions in long-term energy system transitions. Iyer has a vast publishing record of over 60 peer-reviewed publications with more than a dozen in top journals, such as *Science* and the *Nature* family of journals. Iyer was also a contributing author to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

Jennie Rice is a senior research scientist at PNNL in the Atmospheric Sciences and Global Change Division. Her technical background includes decision sciences, economics, and systems engineering, and she has an MS in Management Science and Engineering from Stanford University. Before joining PNNL in 2009, she spent 15 years in private and public sectors consulting, primarily in the energy and natural resource sectors. At PNNL, she leads

fundamental science research to represent the co-evolutionary dynamics of human and natural systems, including their vulnerability and resilience to short-term shocks and long-term stressors such as drought, heat waves, and climate change.

She is currently the PI for the Integrated Multisector, Multiscale Modeling (IM3) Science Focus area for DOE's Office of Science – a collaboration between four national labs and seven universities. Currently, IM3 is studying the influences of future heat waves on urban microclimates and the supply, demand, and operations of the regional electric grids; the impact of future droughts and land use and land cover change on surface and groundwater management across the U.S.; and the potential benefits of drought adaptations in the Upper Colorado River Basin in the Western U.S., including the use of novel financial risk instruments. She is also the co-PI for a PNNL internal research effort, the Grid Operations, Decarbonization, Environmental and Energy Equity Platform (GODEEEP), that is exploring the challenges of decarbonization for future electricity system infrastructure and operations and the subsequent impacts on equity.

*For EME 26 attendees, no registration is required as ESIC will register for that specific location.
** For non-campus/remote viewers, registration is required in order to watch this PNNL webinar.