RADWIND[1] Webinar: *Modeling Tools for Distributed Wind Hybrid System Sizing, Integration & Optimization*

Description

Distributed wind projects continue to offer unique, local benefits where the correct combination of resource, land, electrical load, policy, and rates intersect. When combined with other distributed generation resources, such as solar and batteries, these benefits can be expanded. This upcoming informational webinar will introduce viewers to the fundamentals of hybrid system sizing and integration from an optimization perspective. Electric cooperatives will gain an appreciation for optimization model types, their capabilities, and their strengths and weaknesses. While cooperatives may not run the models themselves, it is valuable to have an appreciation for modeling options, model input requirements, and the proper use and interpretation of model results to effectively evaluate and communicate project feasibility and economics.

Agenda and Time Marks

1. **Overview of RADWIND Project** – Michael Leitman – NRECA (0:00)
2. **Introductions** – Charles Newcomb – Hoss Consulting (1:45)
3. **Overview of Need & Process for Evaluating Hybrid System Component Sizing** – David Pinney, NRECA (3:30)
4. Examples of Commercial Modeling Products
   4.1. Peter Lilienthal – Homer (18:40)
   4.2. Zack Pecenak – Xendee (33:10)
5. **Examples of Research-Grade Products** – Amanda Farthing – NREL (48:26)
   5.1. SAM
   5.2. ReOpt
   5.3. WISDEM
6. **Q&A** (1:00:14)

Company & Speaker Bios

NRECA – David Pinney
David is the Analytics Research Program Manager at the National Rural Electric Cooperative Association (NRECA). He coordinates software and analytics research efforts among the cooperatives and their partners in academia, industry and the government. Current research projects include cost-benefit analysis of distributed energy resources; distribution and transmission system simulation; sensor, machine intelligence and modeling platforms; and decision models for resiliency investments. Prior to these efforts, David developed research software for NRECA, led consulting engagements for software and data mining company MicroStrategy, and built

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biological models at the UCLA Institute for Pure and Applied Mathematics. He has a degree in mathematics from Cornell University. Contact David at david.pinney@nreca.coop.

UL HOMER Software – Dr. Peter Lilienthal
HOMER (Hybrid Optimization of Multiple Energy Resources) software navigates the complexities of building cost effective and reliable hybrid microgrid and grid-connected systems that combine traditionally generated and renewable power, storage, and load management. With over 250,000 users in 193 countries, HOMER is the established global leader for design optimization and feasibility, and the UL HOMER software community is a nexus for the microgrid market.

Dr. Peter Lilienthal is Global Microgrid Lead for UL, LLC and a member of the Advisory Panel for the City of Boulder's Partnership with Xcel Energy. Previously, he was the CEO of HOMER Energy. Since 1992, he has been the developer of the National Renewable Energy Laboratory's HOMER® hybrid power optimization software, which has been used by over 250,000 energy practitioners in 193 countries. NREL licensed HOMER Energy to be the sole world-wide commercialization licensee to distribute and enhance the HOMER model.

Dr. Lilienthal was the Senior Economist with International Programs at NREL from 1990 – 2007. He was one of the creators of NREL's International and Village Power Programs. He has a Ph.D. in Management Science and Engineering from Stanford University. He has been active in the field of renewable energy and energy efficiency since 1978. This has included designing and teaching courses at the university level, project development of independent power projects, and consulting to industry and regulators. His expertise is in the economic and financial analysis of renewable and micro-grid and hybrid power projects.

XENDEE – Zachary K. Pacenak, Ph.D.
XENDEE develops world-class Microgrid decision support software that helps designers and investors optimize and certify the Fight-Through™ resilience and financial performance of projects with confidence.

Zack Pecenak is an inventor with multiple patents in Distributed Energy Resources design and optimization, and has authored publications in the most reputable power industry forums including IEEE Transactions, Elsevier journals, and Greentech Media. He holds a Ph.D. and M.S. from the University of California at San Diego (UCSD), where he was funded by the Center for Energy research. His research at UCSD included unbalanced distribution system modeling, power flow simplification, scheduling of controllable resources, solar forecasting, optimal voltage control, Microgrid design, and software development. Zack received a management certification from the Rady school of management, with a specialization in technology management and entrepreneurship. He also holds a dual B.S. from the honors college at the University at Buffalo in Mechanical and Aerospace Engineering where he authored a thesis on turbulence and cloud formation. Before joining XENDEE, Zack has worked with Sempra energy and the US Air Force Research Lab.

National Renewable Energy Laboratory – Amanda Farthing
The National Renewable Energy Laboratory (NREL) accelerates energy transitions through a system-of-systems approach that considers technology, policy, social, and market systems. NREL informs technology and policy research through mission-driven work to assist partners at home and around the world in meeting ambitious energy goals.

Amanda Farthing is a Researcher and Model Engineer in the Integrated Application Center. Her current work includes expanding off-grid capabilities and climate and health emissions accounting within NREL's REopt tool, a techno-economic model that determines optimal deployment of on-site generation and storage technologies. Farthing also utilizes REopt to provide technical assistance for domestic and international stakeholders to support their renewable energy, resilience, climate, and financial goals. Farthing has experience in energy optimization, techno-economic modeling of distributed energy technologies, community solar, and supporting local government's energy plans.

Additional Information on NRECA Research's RADWIND Project

For more information on the Rural Area Distributed Wind Integration Network Development (RADWIND) project and additional resources, please visit the project landing page at www.cooperative.com/radwind.

Want to stay informed of our progress with the RADWIND project, and provide your input and feedback? We welcome all NRECA voting members to join the project as advisors. Contact our team at: RadwindProject@nreca.coop.

Contact for Questions

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