Firm renewable power generation – resolving grid integration issues & facilitating a transition to 100% renewables

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Civil Engineering Department, Room 105, Steinman Hall

https://ccny.zoom.us/j/85839128635?pwd=YXQ4TW9YY1RncVF1UjN4R1g0MkhFQT09

Abstract  The presentation will address two pressing issues faced by the US solar industry: Grid interconnection and siting issues.

The two largest clean renewable resources on the planet capable of entirely displacing conventional resources — PV and wind — are variable energy resources (VRE). Their intermittency does not pose issues when their grid penetration is small, operating at the margin of conventional baseload and dispatchable generation. However, as their penetration increases, load management issues gradually arise (steeper ramps, deeper duck curves, etc.) until their deployment reaches the limits of grid hosting capacities, leading to issues such as reactive VRE curtailments, negative market prices and a growing opposition to further renewable deployments (e.g., California’s NEM3 legislation acting as a de facto moratorium on new residential PV deployments). The presentation will argue that facilitating a transformation of VREs from intermittent to firm with new regulatory thinking could resolve all issues associated with their penetration on transmission and distribution circuits.

The presentation will also delve into the VRE deployment [physical and economic] numbers implied with a full replacement of conventional energy resources for the electric, transportation and building sectors.

Biography: After an extensive tenure spearheading solar energy research at the University at Albany’s Atmospheric Sciences Research Center, Richard Perez now serves as Consulting Scientist for Clean Power Research where he leads a task force focused on firm renewable power generation under the aegis of International Energy Agency.

With a prolific output of over 300 journal articles, conference papers, books, and chapters, Perez has made significant contributions to the field. His dedication is evident through multiple terms served on the boards of organizations like the
American Solar Energy Society and the GW University Solar Institute. As a current board member of the United Solar Energy Supporters, Perez actively engages in grassroots efforts to educate local communities on the benefits of renewable energy.

Beyond his leadership roles, Perez holds patents in energy storage and load management. His solar resource models, integrated into many engineering and data simulation platforms, have played a pivotal role in designing a substantial portion of global solar power plants.

Recognized with international accolades, including a US Department of Energy's Certificate for Outstanding Research and the American Solar Energy Society’s Charles Greeley Abbot Award, Perez continues to receive honors for his visionary contributions. His recent distinctions include a Visionary Scientist Distinction from the Clean Tech Business Club, jointly with his son Marc, and a Solar Champion Award from the New York Solar Energy Industry Association, acknowledging his foundational research in advancing solar energy.

Dr. Perez received PhD in Atmospheric Sciences, SUNY-Albany, MS in Electrotechnics, University of Nice, France, and DEA in External Geophysics, University Pierre & Marie Curie, France.