

# ***RESOURCE ADEQUACY WITH INCREASING SHARES OF WIND AND SOLAR POWER: A COMPARISON OF EUROPEAN AND U.S. ELECTRICITY MARKET DESIGNS***

Hans Auer  
Institute of Energy Systems and Electrical Drives, Energy Economics Group (EEG)  
Vienna University of Technology, Austria, Email: [auer@eeg.tuwien.ac.at](mailto:auer@eeg.tuwien.ac.at)

Audun Botterud  
Laboratory for Information and Decision Systems, Massachusetts Institute of Technology, U.S. &  
Energy Systems Division, Argonne National Laboratory, U.S., Email: [audunb@mit.edu](mailto:audunb@mit.edu)

## **Overview**

We raise the question if improvements to current energy-only markets are sufficient to maintain resource adequacy in electricity markets or whether the rapid increase in wind and solar power gives stronger arguments for additional capacity mechanisms.

## **Methods**

A comparative analysis between Europe and the United States reveals some fundamental differences, but also many similarities in electricity market design on the two continents. We provide a list of general and specific recommendations for improved electricity markets and argue that lessons can and should be learned in both directions.

## **Results**

The key to achieve a market-compatible integration of renewable energy is to focus on correct price formation in the short-term. Increased demand-side participation, improved pricing during scarcity conditions, and a transition from technology-specific subsidies of renewables towards adequate pricing of carbon emissions are important measures towards this end.

## **Conclusions**

In contrast, an increasing reliance on administrative capacity mechanisms would bring the industry back towards the centralized integrated resource planning that prevailed at the outset of electricity restructuring more than 25 years ago.

## **References**

Botterud Audun, Hans Auer: Resource Adequacy with Increasing Shares of Wind and Solar Power: A Comparison of European and U.S. Electricity Markets Designs, MIT Center for Energy and Environmental Policy Research, Working Paper Series CEEPR WP 2018-008, April 2018. <http://ceepr.mit.edu/files/papers/2018-008.pdf>