

NREL estimates economically viable US renewable generation

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Analysts at the Energy Department's National Renewable Energy Laboratory (NREL) are providing, for the first time, a method for measuring the economic potential of renewable energy across the United States.

A study applying this new method found that [renewable energy](#) generation is economically viable in many parts of the United States largely due to rapidly declining technology costs.

The report, Estimating Renewable Energy Economic Potential in the United States: Methodology and Initial Results, describes a geospatial analysis method used to estimate the economic potential of several renewable resources. Economic potential is a metric that quantifies the amount of economically viable renewable generation that is available at a specific location. Analysis to date includes photovoltaics (PV), wind, geothermal, biomass and hydropower resources.

"This report presents one method for estimating economic potential," NREL Energy Analyst Philipp Beiter said. "The initial results are intended to explore this method as a screening metric for understanding the economic viability of renewable generation at a detailed geospatial resolution."

Looking at the potential at developable sites, the report found that when the social cost of carbon is taken into account, renewable generation is economically viable in many parts of the country. At 2014 costs, the

technologies combine for 820 terawatt-hours of estimated economic potential beyond the generation from renewable energy facilities already in operation. This additional potential is equivalent to nearly 20 percent of total U.S. annual electricity generation from all sources in 2014.

"Declining renewable technology costs are a significant driver for these results," Beiter said. "Economic potential has more than tripled as a result of cost reductions already realized for renewable generation technologies between 2010 and 2014, particularly for wind and solar PV."

The study also found that projected future renewable energy cost reductions yield further increases. At 2020 projected costs, economic potential equals almost half of U.S. annual generation; in 2030, further cost reductions result in over 75 percent of generation, showing the significant impact that could be realized through continued research, development and deployment that drive down renewable energy costs.

This work is a follow-on analysis to NREL's 2012 [report](#) that estimated the technical potential of U.S. renewable generation. While technical potential is a measure of renewable potential based on system performance and land use constraints, the new report also considers renewable generation costs in comparison to prevailing electricity prices. This initial application of the method shows a large range of outcomes for the new metric, depending on specific factors considered. This report includes national level estimates of economic potential, along with maps and tables documenting state-level estimates for specific cases.

Economic potential differs from other projections of renewable energy deployment in that it does not directly consider market dynamics, customer demand, exports from one location to another, or most policy drivers that may incentivize renewable energy generation. The methodology represents a first-level screening that identifies where

renewable energy can be cost-competitive. As technology costs and other relevant factors change, economic potential may be a useful metric to assess the evolving role of renewable generation in the energy landscape.

NREL is the U.S. Department of Energy's primary national laboratory for renewable energy and energy efficiency research and development. NREL is operated for the Energy Department by The Alliance for Sustainable Energy, LLC.

More information: Report: www.nrel.gov/gis/re_econ_potential.html

Provided by National Renewable Energy Laboratory

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