



SUSTAINABLE ENERGY REVIEW

Current and Projected Wind and Solar Renewable Electric Generating Capacity in the Domestic Market

The Copper Development Association conducted a study and examined renewable energy (RE) production, including land-based and offshore wind; residential, commercial and utility-scale photovoltaic installations; concentrating thermal-solar electric plants; and geothermal plants. Following are the study's major conclusions:

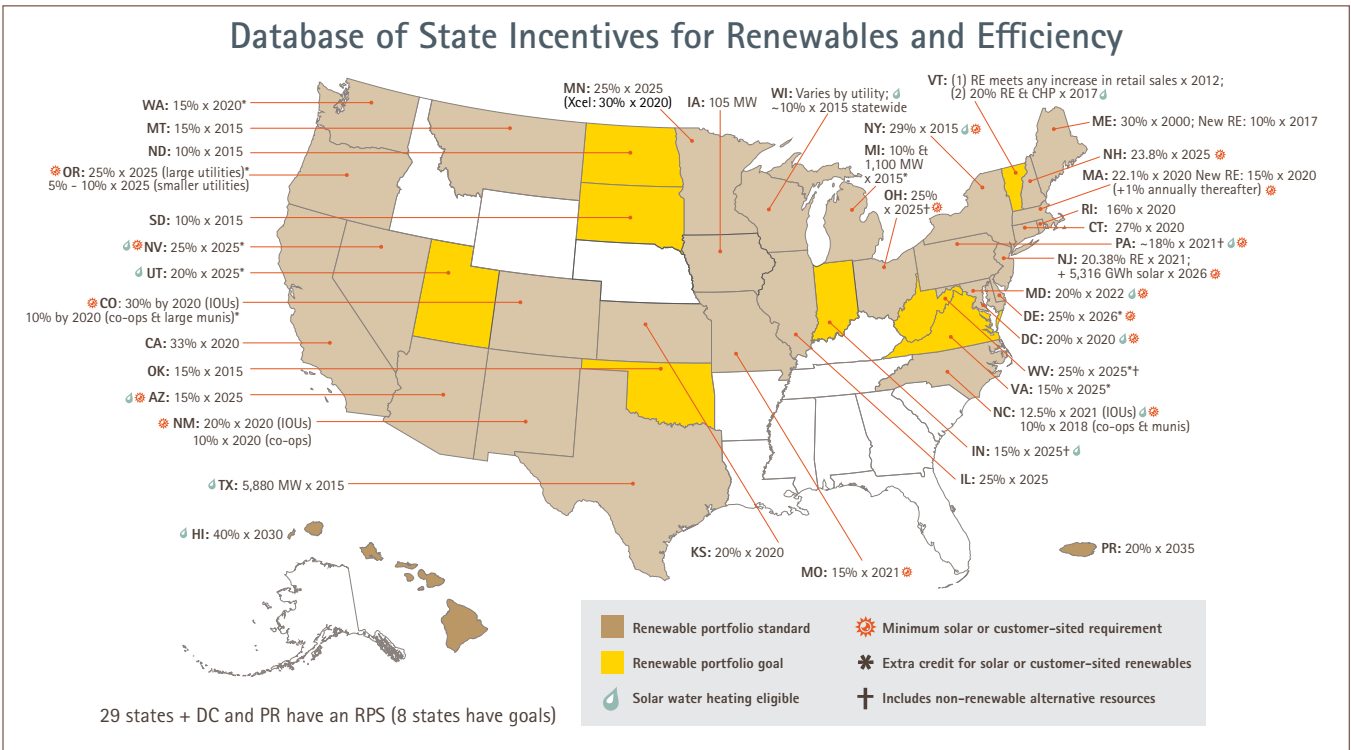
- **Wind-energy market is growing.** Wind energy generation recently attained 40 gigawatts (GW), all land-based, with major offshore wind installations still under discussion and/or development. The U.S. Department of Energy has set a 50 GW target by 2030, and is creating a dedicated offshore wind program with an expected \$50 million in RFPs.

- **Solar power is growing fast.** PV solar power projects generated 2.6 GW in 2010 – achieving 60-70% compounded annual growth in commercial and residential sectors since 2008, while utility-scale PV installations have quadrupled. Major PV grid installations are underway in several states. Industry sources expect grid parity for PV solar power to be achieved by 2015.

As of June 2011, 29 states had **officially established or were developing renewable energy standards (also called Renewable Portfolio Standards)**. States have adopted standards that require a percentage of renewable-sourced energy that range from 10 percent (North Dakota, South Dakota, Wisconsin) to a high of 40 percent (Hawaii, Maine). Most states' renewable portfolios call for 20 to 25 percent renewables in the energy mix.



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Source: U.S. Department of Energy: Database of Sustainable Incentives for Renewables and Efficiency (DISRE)

- Investment in renewable energy projects have been hindered by low natural gas prices and the perception of natural-gas fired power as a "clean" technology. Coal and nuclear-generated power also compete very aggressively on pricing with renewable sources. However, the renewable energy market is becoming more competitive as the industry addresses equipment costs, economies of scale and reliability.

- Copper plays a vital role in sustainable electric energy.** Copper is a key component of PV and wind energy systems, increasing the efficiency and reliability of turbines and photovoltaic cells and modules. Copper is also essential to the entire energy generation and transmission system, including the development of energy efficient motors and transformers. Copper is sustainable and recyclable, with electrical conductivity that is unmatched by any other metal.

Copper. Essential to Sustainable Energy.

Source: "Market Study: Current and Projected Wind and Solar Renewable Electric Generating Capacity and Resulting Copper Demand," 2011, BBF Associates & Konrad J.A. Kundig, Ph.D.

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