



Benefits of Copper

Reliable
Copper's high-quality, long-life, and proven performance ensure long-term reliability of energy systems and equipment.

Efficient
Copper's electrical conductivity is unmatched by any other engineering metal. Copper's conductivity, plus its ability to create high-quality, low-resistant connections is the basis for highly-efficient electrical equipment and lower energy losses.

Sustainable, Renewable, Recyclable
Copper plays a vital role in sustainable electric energy, increasing the efficiency and reliability of wind and solar installations and their related power transmission systems. Copper can be easily and effectively recycled over and over again without degradation of its properties.

Copper outlasts, outperforms and works more efficiently time and time again.



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Copper: Essential to Sustainable Energy

For more information about copper in sustainable energy contact Zolaikha Strong, Director, Sustainable Energy at zolaikha.strong@copperalliance.us or visit www.copper.org.





Copper Development Association Inc.

Copper Alliance

Copper is an integral part of sustainable energy initiatives because of its reliability, efficiency and performance. Its superior electrical and thermal conductivities increase the energy

efficiency of countless energy-driven systems that rely on electric motors and transformers. The same physical properties are vital in the collection, storage and distribution of energy from solar, wind and other renewable sources.

Renewables

Commercial, industrial and utility sectors throughout the U.S. are installing photovoltaic panels and building high-megawatt wind farms to generate clean, efficient power to meet our rising energy demands. These alternative energy sources (sun and wind) are free and plentiful, and the energy plants required to harvest and deliver this energy do not continuously generate carbon or other emissions. Such alternative energy plants are clean and reliable.



Solar Photovoltaic by the Numbers

76 percent: compounded annual growth rate of solar installations since 2008. Utility scale photovoltaic (PV) installations have quadrupled since 2010.

5: top states using PV are California, Arizona, New Jersey, North Carolina, Nevada*

4,984,881: Annual photovoltaic module shipments in 2013 (peak kilowatts)

* Source: U.S. Energy Information Administration and Solar Energy Industries Association

Wind Power by the Numbers

13 percent: average annual growth rate for wind power capacity over the past 5 years. Windpower in the U.S. has quadrupled since 2008.

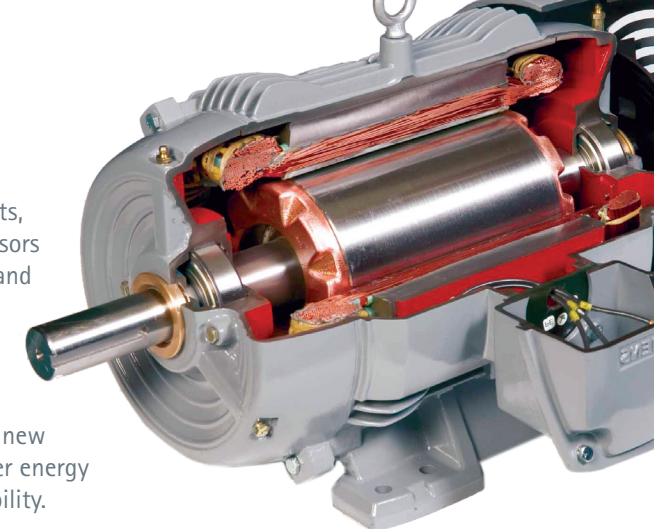
73,992: total MW of installed wind capacity in the United States and Puerto Rico as of 2015.

20 percent: U.S. Department of Energy's goal for renewable energy growth of "20 percent by 2030," which offers opportunities for onshore wind energy but more particularly for offshore wind energy.

* Source: American Wind Energy Association

Electric Motors

Electric motors are found everywhere in commercial facilities and industrial plants, where they power fans, pumps, compressors and exhausts as well as manufacturing and assembly equipment. Electrical energy consumption can be greatly reduced by replacing older, worn-out motors with energy-efficient equivalents and by specifying energy-efficient motors in new equipment. Such practices not only lower energy costs, but also improve equipment reliability.



Transformers

About a million distribution transformers are produced and sold annually in the United States alone. Virtually all electric power in the country passes through at least one of these units before it's consumed. The purchase of a premium, high-efficiency, copper-wound unit instead of a lower-cost, low-efficiency, aluminum-wound unit, will result in significant savings over the life of a transformer.



Energy Storage

Advancements in technology have enabled the grid energy storage market to grow from a "future concept" to an accepted tool in certain applications, according to the Copper Development Association (CDA) commissioned DNV GL (formerly KEMA) study*. And, because storage plays an important role in facilitating renewables in the U.S. grid, it will continue to play a contributing role in the ongoing development of utilities. Copper is now, and will continue to be, a partner in this growth because its qualities of reliability, efficiency, durability and safety are fundamental to the design of properly-functioning battery cells.

**Market Evaluation for Energy Storage in the United States" prepared for the Copper Development Association Inc. by DNV GL (formerly KEMA) Fairfax, Virginia, copyright 2012.

