Copper: Essential to Sustainable Energy

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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

60-70 percent: compounded annual growth rate of residential and commercial sectors. Utility scale photovoltaic (PV) installations have quadrupled since 2008.

5: top states using PV are California, New Jersey, Florida, Arizona and New York*

601,133: number of U.S. Shipments of Photovoltaic Cells and Modules in 2009

*Source: U.S. Energy Information Administration

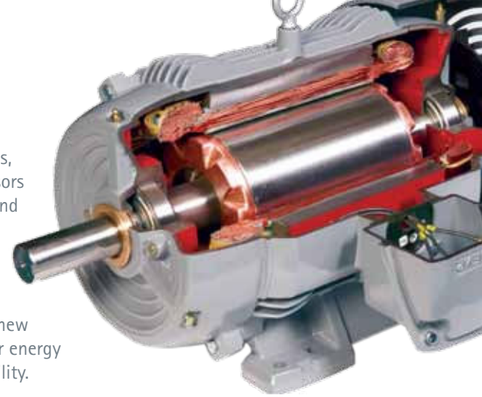
Wind Power by the Numbers

25 percent: compounded annual growth rate of the onshore wind energy program in the U.S. It has surpassed $60 billion in size.

20 percent: the U.S. wind power capacity ratio compared to the world's total installed wind power, according to the American Wind Energy Association.

20 percent: U.S. Energy Department'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.

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 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 KEMA, Inc. Fairfax, Virginia, copyright 2012.

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 Development Association Inc.
260 Madison Avenue
New York, NY 10016
www.copper.org

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

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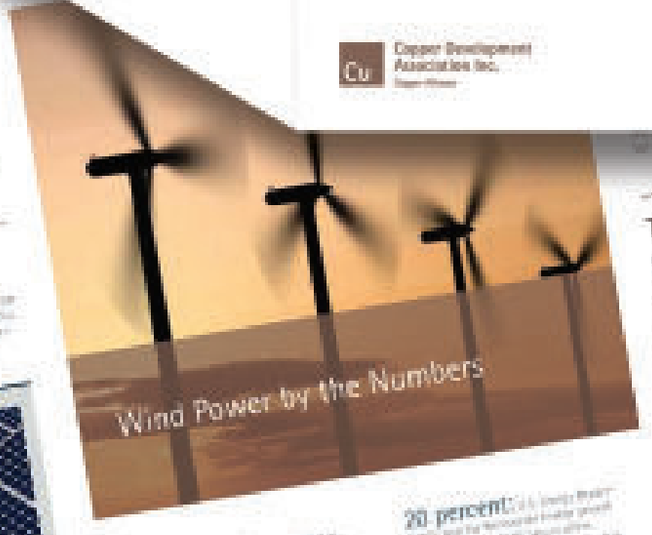

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