



Copper & Sustainable Energy Backgrounder

Sustainable Energy

Sustainability is defined as the responsible use of limited natural resources by the present generation so as to not endanger their use by future generations. Energy drawn from fossil fuels is a scarce resource. Efficiencies in the use of electrical and thermal power, and the increasing use of renewable energy are essential components of a sustainable energy (SE) system. SE addresses pressing concerns in our global society, such as how to secure energy supply, and improve the environmental performance of our energy systems, while maintaining economic efficiency. It is estimated that the world marketed energy consumption will grow by 53 percent from 2008 to 2035¹, without incorporating prospective legislation or policies that might affect energy markets.

Efficient products consume less energy than standard products. This benefit is often described in terms of a product's "energy efficiency."

Sustainable energy offers stakeholders opportunities to achieve desirable financial, environmental, and health-related benefits. These benefits can be realized throughout the entire chain of electrical systems – from electrical power generation to the transmission, distribution, and end use of electricity.

Energy Efficiency Contributes to Sustainable Development and Economic Growth

Wasted energy depletes the world's natural resources and creates a financial impact, because it requires fossil-fueled power plants to work harder, thus emitting more Greenhouse gasses (GHG) and contributing to climate change.

Over the past thirty years sustainable energy has become a top priority for those seeking a sustainable future. With facts in hand and increasing concern over climate change, energy security and sustainable economic development, there's never been a more important time and opportunity to focus on ways to use energy more efficiently.

Energy Efficiency Saves Money; Copper Increases Energy Efficiency

Energy Efficiency brings a competitive advantage. Improving energy efficiency contributes significantly to the reduction of greenhouse gas emissions arising from fossil-fuel generated electricity, thus mitigating climate change. In short, it is a desirable environmental, social and economic option for both industrialized and developing nations.

Copper is an essential material for the energy systems of the future – as the best, most cost-effective electrical conductor available, it has economic benefits and enables the progression towards a low-carbon economy. Copper is a key driver to increased efficiency in all electrical equipment and is the standard benchmark for electrical conductivity. Using more copper, such as larger-sized wires, results in lower heat losses. As a result, energy is conserved and demand on generating capacity is reduced. Additionally, copper is 100% recyclable.

Energy Efficiency at Home

Energy resources should not be squandered. We use energy not only when we use electricity for lighting, but also through the use of electrical motors in major appliances. Electrical motors featuring copper

components are present in our everyday lives (for example in refrigerators, air conditioners, water pumps, etc.). Copper-intensive motors used to run appliances are generally more energy-efficient.

Copper is the Key for Industrial Electrical Efficiency

Typically, as much as half of all electricity used by industry is used to run electrical motors, and copper is the key component of increased efficiency in all electrical equipment. Highly efficiency motors depend on copper components and the more copper used in motors, the more energy efficient they become.

Premium efficiency motors not only reduce the electricity bill, they generate less heat and may last longer as they are generally more reliable.

Higher Energy Efficiency Levels Save Consumers and Industry Money

Energy Efficiency (EE) increases shareholder value of industrial and commercial businesses by reducing energy losses in industrial motors, distribution transformers and other electrical equipment, wiring and power cable. Instead of being evaluated on a first-cost basis, investments in energy-efficient equipment should be evaluated by long-term financial results. EE improves corporate profitability by cutting operating costs.

Promoting EE Leads to Consumer and Industry Savings

Both voluntary measures and government regulations transform the markets towards a more energy-efficient economy. Government and civil society play fundamental roles in creating and promoting solid energy efficiency policies. Countries that opt for sound energy policies can prove that their infrastructure and industry can be “green” and responsible.

Energy Efficiency Contributes to Sustainable Development

One mechanism for meeting the world’s energy needs is efficiency, which should be a priority whether there is a crisis or not. Higher efficiency through the use of copper in transformers and motors, as well as optimal-sized wiring and bars in industrial/commercial establishments and residential premises, is an investment that all economies should make. The economic, social and environmental aspects of sustainable development rely on the complex optimization of many factors, including resource conservation, waste minimization, energy efficiency, climate change mitigation, longer product life cycles, and effective recycling. Copper, the “green” material, plays an important role in all of these solutions.