

SEMICONDUCTORS ENABLE RENEWABLE ENERGY & EFFICIENCY

Semiconductors are the key technology that will enable us to harness alternative energy sources

Virtually every communications tool, electronic device, machine, vehicle, electrical system and medical device runs and operates using a semiconductor. The technology is ubiquitous in modern life, and because it touches almost everything we touch it has tremendous potential to preserve our renewable resources by increasing the efficiency of electronic devices.

Advances in semiconductor technology form the electronic components that will open new doors in energy savings. Here are just a few examples;

- power management and virtualization in computers and data centers,
- electronic-controlled efficient motors in factories,
- light emitting diodes to replace compact fluorescent and incandescent bulbs in offices and homes,
- plug-in electric vehicles on highways,
- solar panels and wind turbines generating electricity, and
- smart meters and sensors that will intelligently monitor and control power lines.

Energy savings are limitless with ongoing advances in semiconductor technology.

Studies from the American Council for an Energy-Efficient Economy show that;

- From 1978 to 2008, automobile miles per gallon have improved 40%,
- Lighting lumens per watt have improved 339%,
- While computer system instructions per second per watt has improved 2,387,000%.⁵
- A sizeable percentage (15-20%) of U.S. electricity can be saved by optimizing the performance of motor systems.³



KEY FACTS

- Semiconductors can improve the energy efficiency of electricity by up to 88 percent.
- Semiconductor based Light-emitting diodes (LEDs) are 10 times more energy efficient than conventional lights..
- Semiconductor technologies can maximize solar panel and wind turbine system efficiencies on cloudy and low-wind days.

We Must Investment in Green Energy Now

- Support a Federal investment of \$150 billion over 10 years to accelerate the commercialization of plug-in hybrids, commercial-scale renewable energy, and policies that encourage energy efficiency and the development a Smart Grid.
- Support federal grants and tax incentives for manufacturers of energy efficient and renewable energy components, products and/or technologies.
- To reduce electricity demand 15% from DOE's projected levels by 2020, support regular updates of efficiency standards, zero emissions for all new federal buildings by 2025, accelerated depreciation on energy conservation expenses, decoupling utility profits from increased electricity usage, and tax credits and other incentives for reductions in data center power consumption.
- Increase tax credits for alternative energy investments that will allow for 10% of the nation's electricity to derive from renewable sources.
- Double Federal science and research funding for clean energy projects.
- Increase Federal investments to help achieve the goal of having 1 Million Plug-in Electric Vehicles by 2015.
- Support the domestic production of products such as semiconductors that enable a net energy savings.



LCD screen power savings delivered by a single chip company have resulted in 20 million kilowatt-hours of energy savings per year--enough to **prevent 16 million pounds** of carbon dioxide from entering the atmosphere.

1. American Council for an Energy-Efficient Economy.. 2009. "Semiconductor Technologies: The Potential to Revolutionize U.S. Energy Production".
2. American Council for an Energy-Efficient Economy.. 2008. "Information and Communication Technologies: The Power of Productivity, How ICT Sectors Are Transforming the Economy While Driving Gains in Energy Productivity".
3. American Council for an Energy-Efficient Economy. . 2002. "Energy-Efficient Motor Systems: A Handbook on Technology, Program, and Policy Opportunities," Second Edition.
4. U.S. Environmental Protection Agency, 2007, "Report to Congress on Server and Data Center Energy Efficiency Public Law 109-431," Washington, DC.
5. Technology CEO Council, "A Smarter Shade of Green", February 6, 2008.