

## SEMICONDUCTORS ENABLE RENEWABLE ENERGY & EFFICIENCY

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### Semiconductors Allow Us to Do More for Less

Over the past decades and into the next, semiconductors can revolutionize how we generate, distribute, and consume energy, transforming the economy much as semiconductors enabled the information economy through the internet and mobile communications over the past twenty years.

Semiconductors are the key technology that will enable us to harness alternative energy sources more effectively, distribute it more efficiently and intelligently, and consume it in the most efficient manner.

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

Recent studies have found that:

- Accelerated adoption of semiconductor enabled technologies can lower electric demand by 1.2 trillion kilo-watt hours, 11% below today's level.<sup>1</sup>
- For every kilowatt hour of electricity consumed by information technologies over the period 1949-2006, an estimated 8.6 kWh were saved economy-wide.<sup>2</sup>
- A sizeable percentage (15-20%) of U.S. electricity can be saved by optimizing the performance of motor systems.<sup>3</sup>
- Using state-of-the-art technologies and practices to improve the energy efficiency of servers and data centers would reduce electricity use by up to 55 percent compared to current efficiency trends – representing annual savings in 2011 of approximately 74 TWh, the equivalent of up to 15 new power plants.<sup>4</sup>
- 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%.<sup>5</sup>



### KEY FACTS

- Semiconductors can improve the energy efficiency of electric motors used in pumps compressors and heating/air conditioners by up to 88 percent..
- Semiconductor based Light-emitting diodes (LEDs) are 10 times more energy efficient than conventional lamps.
- Utilizing state-of-the-art technologies and practices could reduce the nation's data center electricity use by up to 55 percent by 2011.
- Semiconductor technologies can maximize solar panel and wind turbine system efficiencies on cloudy and low-wind days.

## SIA Supports Investments in a Green Energy Future

- SIA supports 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.
- SIA supports federal grants and tax incentives for manufacturers of energy efficient and renewable energy components, products and/or technologies.
- To meet a goal of reducing electricity demand 15 percent from DOE's projected levels by 2020, SIA supports 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.
- SIA supports increased tax credits for alternative energy investments that will allow for 10 percent of the nation's electricity to derive from renewable sources by 2012.
- SIA supports doubling Federal science and research funding for clean energy projects.
- SIA supports Federal investments to help achieve the goal of having 1 Million Plug-in Electric Vehicles by 2015.
- SIA urges that any change legislation supports rather than hinders the domestic production of products such as semiconductors that enable a net energy savings.



“Next, we can put Americans to work today building the infrastructure of tomorrow. From the first railroads to the Interstate Highway System, our nation has always been built to compete. There's no reason Europe or China should have the fastest trains, or the new factories that manufacture clean energy products.”

President Obama  
State of the Union  
January 27, 2010

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.