IEEE★USA

POSITION STATEMENT

Energy Efficiency

Adopted by the IEEE-USA
Board of Directors (17 Nov. 2017)

IEEE-USA views the pursuit of energy efficiency, in all sectors of the economy, as an essential part of a policy portfolio aimed at achieving energy security and economic growth, while reducing greenhouse gas emissions.

In this document, ***efficiency*** means: *the ability to provide the same or better, product or service, using less energy*. This is in contrast to ***conservation,*** which means: *reducing energy use by no longer performing a task, or not delivering a service.* Further, ***demand response****, which means: a capability to modify customers' energy use in real time, so as to provide a resource for power systems operations*.

IEEE-USA urges federal, state, and local governments, along with quasi- governmental and private sector organizations, to work toward improving energy efficiency. Specifically, IEEE-USA makes the following recommendations:

EDUCATION

Recommendation No. 1

Promote education and user awareness of energy efficiency opportunities.

Education about the economic value of energy efficiency can influence individual decisions; the larger environmental consequences of the impacts can also provide a motivation for action beyond strictly economic value.

When the government, utility companies, and other public/private organizations sponsor programs that encourage capital investment in energy efficient technologies, consumer behavior may significantly change with economic and environmental benefits.

IEEE-USA | 2001 L Street, N.W., Suite 700, Washington, D.C. 20036-4928 USA
Office: +1 202 785 0017 | Fax: +1 202 785 0835 | E-mail: ieeeusa@ieee.org | Web: https://www.ieeeusa.org

CAPITAL INVESTMENT

Recommendation No. 2

Promote capital investment in energy-efficient technologies and processes for residential, commercial, transportation and industrial sectors.

Energy efficiency is increased through a combination of technological innovation, knowledgeable design, installation expertise and predictable economic incentives. Opportunities for improving energy efficiency through improved design, process improvement and redirected investment are available in all sectors.

Capital or O&M investments in energy system management, electrical power distribution optimization, high efficiency “intelligent” lighting systems, variable speed drives, waste heat recovery (combined heat and power), and combined cycle power generation all represent potential energy efficiency improvements.

Many of the existing U.S. buildings have inadequate insulation; leaky building envelopes, obsolete lighting systems, and inefficient heating, ventilation, and air conditioning (HVAC) systems.

STANDARDS

Recommendation No. 3

Promulgate minimum efficiency standards for new buildings and products consistent with lifecycle analysis.

Minimum efficiency standards have been the basis for some of the most successful policies used by states and the federal government to save energy in the United States. Efficiency standards eliminate products with excessive energy operating costs and hasten development of innovations that bring improved performance. Standards complement consumer education and incentive-based programs in promoting energy savings.

ELECTRIC TECHNOLOGIES IN TRANSPORTATION

Recommendation No. 4

Develop, commercialize and use efficient electric technologies in transportation systems.

Opportunities exist to reduce transportation energy use. In addition, there are options to make energy efficiency improvements in vehicle design-- through new materials and controls, as well as in new transportation technologies.

The transportation sector runs almost entirely on petroleum. Opportunities to reduce oil consumption and carbon emissions, and improve energy efficiency in the transportation sector are discussed in a separate IEEE-USA Position Statement on Transforming Transportation.

INFORMATION TECHNOLOGY

Recommendation No. 5

Adopt intelligent transportation systems to reduce energy consumption.

Energy efficiency benefits are possible in all sectors, including the electric utility sector. Intelligent energy management and control systems can provide energy efficiency benefits. System-level intelligent transportation systems would manage the flow of vehicles to reduce start-stop operation, which is the major factor contributing to lower efficiency of conventional, fossil fuel driven vehicles.

POWER SYSTEM LOSSES

Recommendation No. 6

Develop system designs and technologies to reduce energy losses in electric power generation, transmission and distribution.

Distributed generation from renewable sources may reduce the amount of power transmitted over long distances. Additional reductions may be possible if energy storage technology is developed and used close to load centers.

In the power transmission system itself, improving existing technologies and applying new technologies, such as composite conductors, superconducting materials, high-voltage direct current (HVDC), and global network optimization will also help reduce systems losses.

Recently developed power flow controllers regulate the active and reactive power flows in transmission lines independently, so that active power flow is maximized, while reactive power flow is minimized. Reduction in reactive power flow leads to freed up capacity of the line, increased flow of active power, reducing demand of reactive power from generators, and increased efficiencies of generators and step-up transformers.

COMMUNICATION SYSTEMS

Recommendation No. 7

In order to improve system efficiencies and access to efficiency-related information, promote the use of high-speed communications networks and information technologies.

High-speed secure communications networks and information technologies will enable efficiency improvements. Continued legislative support and funding is necessary to derive the benefits of secure, high-speed communications networks and information technologies.

DEMAND RESPONSE

Recommendation No. 8

Demand response should be given as much emphasis as the traditional approach to energy efficiency, focused on input/output ratios.

Demand response to alter electric load shapes has been in broad use for decades and its strengths and weaknesses are well known. The best candidates for demand response are commercial/industrial customers. Numerous residential demand response programs are in operation as well, but are more difficult to implement to contribute to system operations. While the impacts of load shifting programs accomplished through energy storage are fairly predictable, multi-day forecasts for interruptible/curtailable programs may be more difficult to provide with adequate certainty. With advances in communications and control technology, such forecasts will become simpler to accomplish.

This statement was developed by the IEEE-USA Energy Policy Committee, and represents the considered judgment of a group of U.S. IEEE members with expertise in the subject field. IEEE-USA advances the public good, and promotes the careers and public policy interests of the nearly 180,000 engineering, computing and allied professionals who are U.S. members of the IEEE. The positions taken by IEEE-USA do not necessarily reflect the views of IEEE, or its other organizational units.