



1828 L Street, N.W.
Suite 906
Washington, D.C. 20036

Tel 202.785.3756
Fax 202.429.9417
www.asme.org

Securing America's Energy Future

ASME General Position Statement

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Reliable and affordable sources of energy are essential for America's economic and national security. Continued price volatility, dependence upon politically unstable regimes for oil and gas, and global climate change concerns have brought the critical nature of energy into the public eye and underscore the need for a comprehensive energy strategy to ensure a sustainable supply of energy for the United States. The Energy Policy Act of 2005 provides a step toward planning and securing America's energy future. Major energy and environmental challenges, however, call on our engineers and policymakers to take further steps towards more efficient and innovative energy technologies. In response to this need, ASME offers the following recommendations to support a technologically based and economically sound national energy policy that will ensure a secure, sustainable, and environmentally friendly supply of energy for America.

Our Guiding Principles

1. For the economic health and security of the nation, the United States must be assured of an adequate, sustainable supply of energy.
2. The nation must maintain a balanced energy supply mix, which includes coal, petroleum, nuclear, natural gas, biomass, solar, wind and hydroelectric power, and accelerate the development of advanced energy technologies for transportation, heating and cooling, and utility-scale power production.
3. To ensure the recommendation, development, and use of the most efficient energy production technologies, the national energy policy must adopt standardized, technically rigorous methods for calculating net energy contributions, life cycle costs, production processes, and environmental impacts of all energy sources.
4. The nation must encourage energy conservation and increase the efficient use of all energy resources.
5. The national energy policy must decrease the nation's dependence on petroleum by increasing supplies of non-petroleum-derived fuels, increasing automotive fuel efficiencies, and encouraging development and implementation of new transportation technologies.
6. The US must establish a leadership position in international energy policy that addresses energy security, traditional environmental issues, and global climate change.
7. The federal and state governments should encourage and expedite socially and technically responsible licensing and permitting processes that result in the development, installation and continued operation of energy technologies from a broad portfolio of energy resources.
8. The U.S. policy should reflect the global importance of energy and the global reach of energy markets in influencing national policies.

In order to achieve these goals, ASME offers technical recommendations in six different areas: energy efficiency and technology development; nuclear power; renewable energy; natural gas; coal; and energy research.

Energy Efficiency and Technology Development

Energy efficiency and conservation represent the least expensive, lowest risk, and most effective means of immediately reducing energy consumption and our dependence on fossil fuels. Continuous technological development increases the efficiency of energy usage. The U.S. made great strides in energy efficiency beginning in the 1970s and through the 1990s, with many of those programs still bearing fruit. Though institutionalized programs exist such as the CAFE automobile and EnergyStar appliance standards to support energy conservation, the per capita energy consumption in the US has dropped only slightly in the last 30 years and remains far higher than in any other nation. U.S. energy efficiency policy should provide stable, agile, outcomes-based objectives given the changing world markets, global and regional politics, and environmental priorities through both conservation and technical development.

ASME recommends:

- Establishing visible and substantial national energy efficiency goals that quantitatively improve energy security, sustainability, economics, and environment, with an emphasis on the transportation sector and commercial and residential building HVAC.
- Building on/contributing to the activities of successful, national and regional energy efficiency initiatives that have been implemented by federal and state agencies, non-governmental organizations and utilities.
- Incorporating energy conservation as part of the mission of every government agency.
- Establishing a national campaign to instill an energy conservation ethic through social and institutional leadership for relative immediate improvements in most areas of energy concerns.
- Increasing energy efficiency awareness in education, primarily through higher education and in the workplace.

Coal

Coal is the nation's most plentiful domestic fossil fuel resource. Coal supplies almost 23% of the energy consumed in the U.S. (50% of the electric power generated) at relatively low cost. All coal-fired power plants are constructed and operated in conformance with stringent federal, state and local regulatory requirements. New coal-fired power plants are essential to the future of reliable U.S. base-load power and mid-range generating capacity supply. In the coming decades, new coal-fired capacity will be needed to replace older plants and to support U.S. economic growth.

ASME recommends:

- Continuing government and private industry R&D to develop and demonstrate clean coal technologies including:
 - Gasification of coal
 - Hybrid power plants; i.e., partnering coal with renewable energy sources
 - Mercury removal from flue gas combined with efficient SO₂, NO_x, and particulate removal systems
 - Sequestration of CO₂ from coal fired power plants.
- Continuing cooperation between government and private industry to develop stable regulatory requirements that are essential for predicting financial risk and attracting prudent investment in new coal-fired power plants.

- Increasing R&D and education to improve the efficiency, safety and environmental impact of coal mining and production to support any increased use of coal.

Natural Gas

The U.S. relies on clean-burning, domestically produced natural gas for almost one quarter of all energy used (18% of electric power generated), throughout all sectors of the economy, including home heating, power generation, industrial processes, and transportation. Unfortunately, domestic production of natural gas is being outpaced by demand, causing price increases and in extreme cases shortages during times of peak usage. Domestic production currently accounts for more than 85% of U.S. consumption, but this percentage is predicted to drop steadily over the next 25 years. The current high price of and projected increased demand for natural gas underlines the need to improve the storage and distribution infrastructure, increase exploration and production efforts, and improve energy use efficiency for this important fuel.

ASME recommends:

- Encouraging the distribution and use of natural gas primarily for home heating and industrial processes including as chemical feedstocks for agricultural products.
- Using federal tax incentive to encourage domestic production of natural gas from unconventional sources such as deep wells, tight gas beds, shale gas beds, coal beds, and methane hydrates and to encourage consumers and industries to replace aging and inefficient gas burning equipment and appliances with modern, high efficiency equipment.
- Increasing federal and private support for R&D to improve the efficiency of natural gas exploration, extraction, distribution, storage, and end use.
- Supporting the expansion of infrastructure needed to receive and store Liquefied Natural Gas (LNG) from the international market to reduce supply disruptions and stabilize pricing.

Nuclear

Nuclear power currently provides for about 8% of U.S. energy consumption (20 percent of electric power generated). Nuclear power, as a non-greenhouse gas-emitting resource, is a critical component of a diverse U.S. power generation fuel mix and should play a larger role in the nation's base electric power supply.

ASME recommends:

- Expediting construction of new nuclear power plants in the U.S. by continuing to streamline the regulatory process at federal, state, and local levels.
- Expediting the completion and use of a central waste repository to store spent nuclear fuel, rather than having storage of spent fuel at each nuclear power plant site. Resolution of this issue is of concern to the continued viability of nuclear power.
- Developing spent fuel reprocessing for maximum energy extraction from the initial uranium in the reactor fuel cycle.
- Continuing re-licensing of older nuclear plants.
- Strongly encouraging international nuclear power cooperation to permit U.S. technology to compete in the international market.

Renewable Energy

Renewable energy technologies, such as solar, wind, biomass, and hydroelectric commonly represent the most environmentally benign energy conversion technologies. Currently, renewable energy technologies, including hydroelectric and biomass from waste products, provide only 6% of the energy consumed (8.8% of electric power generated) in the United States. Renewable resources can and should meet a larger portion of the national energy needs. Market barriers to renewable energy deployment such as high cost and infrastructure availability can be overcome through government policies such as tax incentives or required renewable energy production levels. In addition, significant gains can be made by using hybrid technologies that can integrate renewables into the existing energy infrastructure. Renewable energy conversion technologies could more readily compete in the market place if policies addressed the true cost of each energy source, including environmental costs, health costs (often referred to as externalities) and other incentives. The potential to reduce the production of greenhouse gases and to meet the growing demand for energy in the US and abroad justifies a major investment in renewable energy.

ASME recommends:

- Developing a federal renewable energy portfolio standard (RPS) or other outcomes-based renewable energy standard that mandates that a specified percentage of electricity be generated from renewable sources.
- Increasing funding to support R&D of improved and new renewable energy and storage technologies such that funding levels are comparable to other energy technologies.
- Providing incentives to enable wider implementation of distributed solar systems, including domestic hot water, as these technologies dramatically reduce energy consumption
- Supporting the construction and operation of commercial demonstration of renewable energy projects.
- Promoting agricultural, forest, and municipal residues and other low-cost, low-impact material as valuable renewable energy resources.
- Providing tax and regulatory incentives to enable U.S. industries to recapture leadership positions in key renewable technologies. The U.S. industry could provide innovative and cost-effective technology advances in renewable energy and become a world supplier of efficient technology.

Transportation Fuels

The continued over-reliance on foreign sources of petroleum, particularly as applied to transportation fuels, is of great concern to ASME. The U.S. must maintain a secure, domestic source of transportation fuels to maintain the economic health of the nation. Increasing fuel efficiency and conservation combined with increased development of domestic petroleum production and refining facilities as well as the development of non-petroleum derived fuels will reduce the nation's dependence on foreign oil. The use of many special mix (boutique) fuels in various areas results in a lack of flexibility to use the fuels in regions other than where the particular fuel is produced or required, limiting supply and increasing costs.

ASME recommends:

- Supporting policies to increase environmentally sensitive petroleum and natural gas exploration on U. S. owned lands.

- Supporting efforts to encourage petroleum conservation measures to reduce the use of gasoline, by increasing the average fuel economy of vehicle fleets and hybrid and high mileage vehicle programs.
- Encouraging research, development, demonstration and production of biofuels including biodiesel and, preferably, cellulosic ethanol.
- Reducing the number of boutique fuels currently produced for a measure of uniformity.
- Supporting the development, application and use of new technologies that encourage drilling and production from deepwater fields.
- Supporting tax incentives for states to accelerate the infrastructure development needed to enable greater use of alternative fuels for vehicles.

Next Generation of Energy Technologies

While the technologies supported in this paper are very important for the nation's near-term energy future, there is a need to look farther into the future and determine what R&D needs to be done today to meet the nation's long-term energy needs. As the primary supporter of high-risk, high-potential basic research, the federal government should embark on a focused effort to identify and develop the next generations of energy technologies. In addition to R&D efforts, funding should continue to support commercial demonstrations of the more promising emerging technologies. Such investments can contribute significantly to managing greenhouse gas emissions and producing affordable sources of power and fuel.

ASME Recommends:

- Launching bold initiatives to further long-term, breakthrough that can further U.S. energy security, diversity, and efficiency
- Supporting scientific discovery and innovation including increased research in new technologies, such as plasma and fusion energy sciences, to the point where a determination of commercial feasibility is possible.

Conclusion

The United States faces difficult security, economics, and environmental issues intricately tied to its energy supply. Tackling these challenges will require that the government, academia, and the private sector work together to promote solutions based on sound scientific research and engineering principles. Public policy and education can play a critical role in allowing the U.S. to help its citizens use our current resources more effectively and facilitate the research and development that can lead to more advanced energy technologies. ASME's energy policy recommendations would help our country achieve a more secure energy future by promoting a diverse energy mix while meeting our current and future energy challenges. We look forward to entering into a continuous dialogue with local and national political and business leaders on these vital issues.

This General Position Paper was approved by the Board of Governors on June 10, 2007. Because of the continuing developments that impact energy policy, this paper may be periodically updated. Please contact ASME's Washington office for any updates to this paper.