

NUCLEAR ENERGY — AN OVERVIEW

The U.S. Department of Energy's Office of Nuclear Energy

A plentiful, reliable supply of energy is the cornerstone of sustained economic growth and prosperity.

The demand for energy in the United States is rising. By 2030, domestic electricity demand is projected to grow almost 26 percent, according to the Energy Information Administration (EIA). Global energy demand is expected to almost double by 2030, according to EIA's *International Energy Outlook*.

Nuclear energy today provides 19.4 percent of U.S. electricity, and 70 percent of its carbon free electricity. It does not produce greenhouse gases, and so does not contribute to climate change. Nuclear energy produces large quantities of continuous "baseload" electricity at very competitive prices, and has the added advantage of reducing dependence on foreign oil.

Today in the U.S., more than 100 nuclear plants provide carbon-free electricity to help drive the American economy.

Globally, nuclear energy is undergoing renewed growth with 20 countries constructing 44 new nuclear power units and 25 countries in the planning stages for 110 more. In the United States, a renewed interest in nuclear energy has resulted in blueprints for the first new nuclear plants in over 30 years.

Despite the advantages of nuclear energy, the question of how to deal safely and securely with nuclear waste over the long term remains a concern. The Department of Energy's Office of Nuclear Energy (NE) is sponsoring the research and technology development that will allow nuclear energy to continue to deliver large quantities of safe, reliable electricity to the marketplace, while developing options to address waste disposal and non-proliferation concerns.

Over the past 15 years, U.S. utilities have become the best operators of nuclear power plants in the world. Consolidation of plant ownership to a fewer number of excellent operators has made the operation of U.S. plants:

- Safer,
- More cost-effective, and
- More reliable.

More efficient operation has allowed nuclear plant operators to produce more energy than ever before, adding the equivalent of nearly 10 new nuclear plants to the U.S. grid through efficiency improvements. American plants, which were available to produce energy only 70 percent of the time on average in the early 1990s, are now producing power around 92 percent of the time. Nuclear power plants do not release air pollutants or carbon dioxide in

the production of electricity, providing an important option for improving air and environmental quality.



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Program Budget

Nuclear Energy
(\$ in Millions)

FY 2009 Actual	FY 2010 Request
\$870.8*	\$844.6

* Excludes funding (\$487 million) for Mixed Oxide Fuel Fabrication Facility in FY 2009, which is managed by the National Nuclear Security Administration

As a result of this success, essentially all U.S. nuclear plants are expected to apply for renewed licenses that will keep most plants in operation into the middle of the century. The Tennessee Valley Authority (TVA) went a step further and refurbished a plant that was shut down in 1985. TVA invested \$1.8 billion in Brown's Ferry Unit 1, a 1,200-megawatt boiling water reactor, and brought it back online in June 2007.

The role of the Department of Energy (DOE) is to work with the private sector, our overseas partners, and other agencies to assure that the benefits of nuclear technology continue to contribute to the security and quality of life for Americans—and other citizens of the world—now and into the future. By focusing on the development of advanced nuclear technologies, the Office of Nuclear Energy supports the Administration's goals of providing domestic sources of secure energy, reducing greenhouse gases, and enhancing national security.

NE leads the development of new nuclear energy generation technologies that provide significant improvements in sustainability, economics, safety, security, proliferation resistance and waste management. NE serves the present and future energy needs of the country by providing the critical nuclear research infrastructure that will help regain U.S. technology leadership and train tomorrow's workforce. These capabilities and technologies will help meet the needs of a growing economy and help address climate change by reducing greenhouse gas emissions.

The benefits of nuclear power as a safe, low carbon, reliable, and secure source of energy are essential elements in the Nation's energy and environmental future.

LOCATION OF 104 U.S. NUCLEAR POWER REACTORS

