

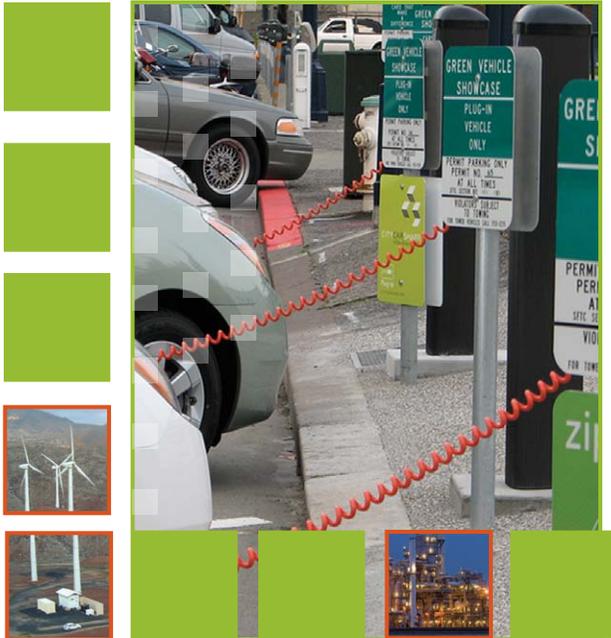
Great Promise for the Future ...

The United States is among the countries highest in per capita use of electricity and total emissions of carbon dioxide (CO₂)—a greenhouse gas. According to the U.S. Environmental Protection Agency, electricity generation currently produces about 40 percent of our CO₂ emissions. Transportation produces 33 percent of the total emissions, and industrial use of fossil fuels accounts for 16 percent.

Nuclear energy can play a significant role in reducing CO₂ emissions.

- Nuclear power plants emit no significant greenhouse gases and already represent over 70 percent of our Nation's low-carbon electricity generation.
- Technological advancements are making nuclear power more relevant than ever.
- With its unparalleled history of safe nuclear science development, the United States is well equipped to be a leader in the future of nuclear energy.

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U.S. DEPARTMENT OF
ENERGY

Nuclear
Energy

print brochure

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What Does the Future Hold?

Opportunities for Nuclear Power



More than just Making Electricity ...

While current nuclear power plants provide low-carbon and low-cost electricity to many Americans, further advances in nuclear plants and technologies can expand the use and application of nuclear energy. Additional research and development can improve performance and sustainability, increase fuel efficiencies, and provide better economics and enhanced protection against dangerous nuclear proliferation. Through technological advances, nuclear energy has the opportunity to help replace conventional energy sources in many fields and substantially reduce CO₂ emissions in those fields. For example, nuclear energy could be applied to produce heat for industrial uses and hydrogen for transportation. Through new reactor designs called Small Modular Reactors (SMRs) nuclear energy can be implemented at smaller sites, for reduced construction costs and more flexibility.

Small Modular Reactors ...

SMRs have the opportunity to increase the application of nuclear energy. SMRs are smaller, more compact, and more flexible. They can be manufactured in a factory and transported by truck or rail to a nuclear plant site. SMRs may reduce construction costs, and provide the ability to add power incrementally. Sites can start with a small number of modules and add modules to increase generating capacity as needed.

Hybrid Energy Systems ...

A hybrid energy system consists of two or more energy sources used together to increase efficiency and reliability. Nuclear energy is unique and flexible. It can be combined with other energy sources, such as fossil fuels and renewables, in a "hybrid" system to produce electricity, heat for industrial uses, and other products. Nuclear hybrid energy systems can be used in fields such as transportation fuels production and refining, petro-chemical production, agriculture, mining, and steel, glass, and cement production. Combining nuclear energy with traditional energy sources in these fields could increase resource security, and environmental and economic sustainability.

Hydrogen Production ...

Nuclear energy could also be used to produce hydrogen. Hydrogen is an energy storage medium. As a storage medium, hydrogen can be used to transport energy to other locations. This means that hydrogen can be used for diverse and far-reaching applications.

DOE's Office of Nuclear Energy continues to push the frontiers of advanced nuclear energy research and development (R&D). Using advanced engineering techniques and modeling and simulation, nuclear energy R&D can lead to increased efficiency, new materials and fuels capable of enhancing nuclear plant operation, advanced reactor technologies, and new applications for nuclear power.

