

SME Statement

Nuclear power currently produces almost 20% of the electricity in the US, with 100 operational nuclear power plants located in 30 states. Five new plants are currently under construction and another 25 are proposed. The commercial US nuclear industry contributes nearly \$5 billion annually to the US economy. The industry will require that 20,000 new jobs be filled in the next 5 years. The operating reactors use uranium oxide fuel enriched to about 4% U_{235} and fission is the process used to generate heat to form steam to drive the turbine generators.

Nuclear energy is an important element in the US generation portfolio and represents the largest producer of nearly emission-free electricity. Most of the operating plants will secure an extended 20 years of operation or more. New smaller, modular reactors are under design to provide less expensive, expandable generation options.

Issue

- New large plants are very costly and represent a major challenge for US utilities to finance.
- The management of used nuclear fuel is problematic, but the near- to medium-term solution is to store the used fuel at the operating plant sites.
- Proven safe operation of adequately designed nuclear plants is a prerequisite for the construction of new nuclear power plants.
- While increasing, public support for nuclear power needs to strengthen.

Background

There is a growing need to have more baseload generation capability in certain parts of the U.S. These are the plants that provide electricity around the clock. Many nuclear and coal baseload plants were ordered and built in the 1970's and 80's. There became a glut of baseload generation because the electricity demand growth was less than predicted. The electricity demand has grown to a point in numerous regions of the country that the local reserve margin on electricity is not sufficient to assure system reliability. Consequently, additional baseload generation is needed to restore acceptable levels of reserve margin in the coming decade.

All new generating equipment has escalated in price due to the demand for commodities such as concrete, structural steel and copper in China and India. Nuclear plants are among the most capital intensive of the baseload generating stations. However, nuclear fuel costs are very low. What is important in the long run is the cost of electricity produced by the various forms of generation. The Electric Power Research Institute tracks the projected levelized cost of electricity for all forms of new generation for deployment in 2015. See table below:

Nuclear Power

Technology	Projected Levelized Cost of Non-subsidized Electricity Generation for Deployment in 2018 (\$/MW-hr) *
Nat' Gas – conventional combined cycle	\$67
Wind@34% capacity factor	\$87
Nat'l Gas – advanced CC with CCS	\$93
Hydro	\$90
Conventional Coal	\$100
Advanced Nuclear	\$108
Biomass	\$111
Advanced Coal with CCS	\$135
Solar Thermal @ 20% capacity factor	\$261

*The estimated cost of electricity does not include any CO₂ charge. If one were to add a \$30/MT of CO₂ cost to the emitting technologies, the cost of electricity for the coal fueled technologies would increase by about \$25/MW-hr. The gas fired technologies would incur a \$12/MW-hr increase. The cost of electricity for the other generation technologies would remain unaffected. Reference: *Program on Technology Innovation: Integrated Generation Technology Options*; Electric Power Research Institute, Palo Alto, California 2009. 1019539.

SME Statement of Technical Position

SME supports the continuing research and development of nuclear power in four principal areas. These include Research & Development to support:

1. The safe and economic operation of the current fleet of nuclear plants for operation over 60 years. The Department of Energy has a program called the Light Water Sustainability Program to help fund this R&D in collaboration with industry.
2. The development of small, light water, modular reactors for deployment in the next decade. These reactors utilize much of the technology used in the operating reactors. DOE has a program called Small Modular Reactors to support the design and licensing effort.
3. The development and demonstration of high temperature gas cooled reactors to provide process heat to refineries, chemical and fertilizer production facilities. This nuclear process heat can reserve precious fossil fuels for feedstock uses. DOE has a program called the Next Generation Nuclear Plant which is part of a public-private partnership.
4. The development and demonstration of used nuclear fuel recycling techniques to help manage the high level wastes. Recycling of the fuel provides for greater resource utilization, and reduced burden on deep, geological repositories. The recycling process will not pose a proliferation threat. DOE has a program, Advanced Fuel Cycle, that will provide proven recycling technologies in the post 2020 timeframe.