Nuclear Reactor Construction Costs
FACT SHEET

What is the construction cost of a nuclear power reactor?

Because nuclear power reactors take so long to build, their estimated capital costs include the "overnight" cost, which is the cost of the reactor if it could be completed immediately, and the additional costs incurred during construction, including interest.

The Keystone Center, a joint fact-finding committee which includes nuclear industry personnel, estimates the completed nuclear power reactor capital costs to be in the range of $3,600 to $4,000 per kilowatt of generating capacity.

Once a nuclear reactor is operating, what is the kilowatt hour cost of actual electricity?

Fuel costs and other maintenance costs are estimated by the Nuclear Energy Institute at 1.72 cents per kilowatt hour. The Keystone report estimated the cost of decommissioning the power reactor at 0.1 cent, and the federal charge for nuclear waste storage is 0.1 cent per kilowatt hour. Using the Keystone estimates result in a kilowatt hour cost of 8.3-to-11.1 cents per kilowatt hour.

The Wall Street firm Moody's estimated in October 2007 that the capital cost of new nuclear reactors would be in the range of or $5,000 to $6,000 per Kilowatt, or 6.2 to 9 cents per kilowatt hour. *Moody's estimate brings the overall kilowatt hour cost of nuclear generated electricity from new nuclear reactors up to about 14 cents per kilowatt hour.*

What is the kilowatt hour cost of alternatives to coal and nuclear power?

Wind energy is already more economical than nuclear energy, and expansion of wind capacity is taking place already in many states.

According to the U.S. Department of Energy, solar energy is "on track to reduce the cost of electricity produced by photo voltaic from current levels of 18- to- 23 cents per kilowatt hour to five to ten cents per kilowatt hour for commercial use and seven to twelve cents per kilowatt hour for residential use by 2015, the earliest possible date at which a new nuclear power reactor could come on line in the United States. Nuclear power reactors could become economically obsolete before any new reactors begin power generation.

Are companies ordering new nuclear power reactors now?

No. No company has ordered a nuclear power reactor in the United States since 1978. The nuclear industry is waiting for 100 percent loan guarantees from the federal government. Without this taxpayer subsidy nuclear power reactor construction remains too risky an investment. Rising uranium prices and shortages of skilled labor have the potential to drive operating and maintenance costs even higher. In addition construction delays and overruns pose additional risk. The French company AREVA is currently two years behind on construction in Finland of the only reactor currently being built in the West. Originally estimated at 3 billion euros the construction cost has now risen to 4.5 billion euros and the reactor is not yet complete.

The escalating costs of finding, characterizing and developing a deep geologic repository program for nuclear waste provide an added element of economic risk. Expanding nuclear power reactor capacity significantly will likely require a second repository, when it is already unclear whether the proposed Yucca Mountain repository for disposing of irradiated fuel can ever be licensed. Adding more nuclear power reactors risks more repositories, higher costs for repositories, or higher costs for reprocessing, or all three. Further, heat waves and droughts may cause nuclear power reactors to be shutdown for extended periods at times of peak demand. Since such events are expected more frequently in a warming world, an element of intermittency may be introduced into nuclear energy, making it an even more risky investment for electric companies.

Standard & Poor's, the well-known Wall Street credit rating agency, has stated that: "…an electric utility with a nuclear exposure has weaker credit than one without and can expect to pay more on the margin for credit."

Is some of the bill for nuclear power paid by the taxpayers?

Yes. The nuclear industry has always benefited from federal subsidies for research and development, and the federal government retains responsibility for the long-term storage of nuclear waste. Due to the risk of a catastrophic accident nuclear power still gets a significant subsidy in the form of government-provided accident insurance under the Price-Anderson Act. Additional federal subsidies for license application and other costs were enacted into law as part of the Energy Policy Act of 2005. Now Congress is considering 80 to 100 percent loan guarantees for new nuclear power reactors.

Sources:
Nuclear Energy Institute, www.nei.org/reswourcesandstats/nuclear_statistics/costs

Keystone Center, Nuclear Power Joint Fact-Finding, ((Keystone, CO: Keystone Center, June 2007) www.keystone.org/spp/documents/FinalReport_NJFF6_12_2007(1).pdf

Arjun Makhijani, Carbon-Free and Nuclear-Free: A Roadmap for U.S. Energy Policy, www.ieer.org/carbonfree/CargonFreeNuclearFree.pdf

United States DOE Selects 13 Solar Energy Projects, www.energy.gov/news/4855,htm