

Nuclear Power: An Abundant, Safe, Affordable, and Clean Source of Energy

Nuclear power has been recognized throughout the world as an abundant source of clean energy.

This memo examines:

1. **Nuclear Capabilities:** Nuclear power currently generates approximately 20% of U.S. electricity, but its low cost per kilowatt hour and ability to run uninterrupted for 24 hours a day makes it an affordable and reliable source of clean energy.
2. **Safety Record:** Nuclear facilities in the United States have an excellent safety record, with a very low accident rate and capable of operating during Hurricane Katrina on the Gulf coast. Radiation concerns from nuclear plants are fueled by extremist alarmism, not the hard facts.
3. **Excessive Regulation:** While regulation from the Nuclear Regulatory Commission (NRC) guarantees the safe operation of nuclear power, unfounded health concerns have resulted in over a thousand pages of bureaucratic regulation, driving up the initial costs of expanding nuclear energy.

NUCLEAR CAPABILITIES

As Energy Demand Grows, Nuclear Power Must Expand, Creating Jobs In The Process.

The EIA projects that by 2030 U.S. electricity demand will increase by roughly 45 percent. Since nuclear power currently supplies 20 percent, the U.S. will need to have 35 additional nuclear power plants to meet future demand. Each new reactor will employ 1,400 to 1,800 people during construction, rising as high as 2,400 jobs as the facility is built. During operation, a nuclear plant typically has a skilled workforce of between 400 and 700 employees.

“Nuclear Energy: Just the Facts” (Washington, DC: Nuclear Energy Institute, 2008): http://www.nei.org/filefolder/just_the_facts_brochure_1.pdf

Operating Costs Of Nuclear Energy Are Extremely Low. Nuclear power costs less than two cents per kilowatt hour. This is six times cheaper than petroleum and four times cheaper than natural gas. Even coal is more expensive, costing about two-and-a-half cents per kilowatt hour.

“U.S. Electricity Production Costs: 1995-2007” (Washington, DC: Nuclear Energy Institute, 2008): http://www.nei.org/filefolder/US_Electricity_Production_Costs.ppt

Nuclear Energy Currently Reduces Emissions Of Large Amounts Of Carbon Dioxide. In 2006, nuclear plants prevented 681 million metric tons of carbon dioxide from entering the

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atmosphere in 2006. This amount equals the total carbon dioxide released from nearly all U.S. passenger cars.

“U.S. Needs New Nuclear Plants to Meet Energy Demand, Maintain Supply Diversity” (Washington, DC: Nuclear Energy Institute, 2008):
<http://www.nei.org/keyissues/reliableandaffordableenergy/policybriefs/usneedsnewplantspage3>

Cost Of Reducing Emissions With Nuclear Is Substantially Lower Than Wind Power.

Using nuclear energy, the cost of eliminating one ton of carbon dioxide emissions is about 60 cents. In comparison, the cost of eliminating the same amount of CO₂ is around \$100 using wind power.

Iain Murray, “Nuclear Power? Yes Please.” *National Review*, June 16, 2008.

International Nuclear Program To Advance Safest, Most Efficient Nuclear Plants Ever.

Developed during the Generation-IV International Forum (GIF), the new Generation-IV nuclear power plants are based upon the promotion of 6 nuclear fuel systems, four of which operate in a “closed” fuel cycle, meaning the spent fuel is recycled and reprocessed. One of the remaining two uses both closed and “open” cycles, the latter of which refers to a process whereby the spent fuel is disposed of after use. These new plants, while still in the research and development phase, are set to be ready for deployment by 2030.

“Gen IV International Forum: 2007 Annual Report.” OECD Nuclear Energy Agency, 2007: http://www.gen-4.org/PDFs/annual_report2007.pdf

SAFETY RECORD

Three Mile Island Meltdown Galvanized Anti-Nuclear Activists. There were zero deaths or serious injuries as a result of the Three Mile Island incident in 1979. In 1996 [ck] a judge sided against those who claimed to have been harmed by the incident due to a lack of evidence demonstrating a linkage to the incident. U.S. District Court Judge Sylvia Rambo made the following statement: “The parties... have had nearly two decades to muster evidence in support of their respective cases.... The paucity of proof alleged in support of Plaintiffs' case is manifest. The court has searched the record for any and all evidence which construed in a light most favorable to Plaintiffs creates a genuine issue of material fact warranting submission of their claims to a jury. This effort has been in vain.”

“Three Mile Island: 1979.” London: World Nuclear Association, 2001:
<http://www.world-nuclear.org/info/inf36.html>

Nuclear Facilities Have Accident Rates Near Zero. From 2000 to 2007, the accident rate for workers at nuclear plants was extremely low, averaging less than 0.2 accidents per 200,000 worker hours.

“U.S. Nuclear Industry Safety Accident Rate.” Washington, DC: Nuclear Energy Institute, 2008:
http://nei.org/filefolder/US_Nuclear_Industrial_Safety_Accident_Rate_1.ppt

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Radiation From Nuclear Plants Is Miniscule. People living near a nuclear plant receive only a tiny amount of radiation from the plant itself. Less than one percent of the average person's exposure to radiation comes from the nuclear facility. Cosmic and solar rays, including UV rays, constitute a significant amount of a person's everyday exposure to radiation. Other man-made sources, such as microwaves, smoke detectors, computer monitors, and X-rays, also expose people to more radiation than nuclear facilities.

“Radiation Safety at Nuclear Power Plants: Studies Look at Public, Workers.”
Washington, DC: Nuclear Energy Institute, 2008:
<http://www.nei.org/keyissues/safetyandsecurity/factsheets/safetystudiespublicworkers/>

Study: No Increased Risk For Cancer Mortality Near Nuclear Plants. In a 1990 study, the National Cancer Institute of the National Institutes of Health found no increased incidence of cancer mortality for people living near 62 nuclear facilities in the U.S. The study also showed no increased incidence of childhood leukemia mortality in the surrounding counties after the nuclear facilities began operating.

“Radiation Safety at Nuclear Power Plants: Studies Look at Public, Workers.”
Washington, DC: Nuclear Energy Institute, 2008:
<http://www.nei.org/keyissues/safetyandsecurity/factsheets/safetystudiespublicworkers/>

Nuclear Waste Transportation Less Toxic Than Commercial Flight. “Estimates for radiation dose from transportation, based on the exposure of a person standing 100 feet from a vehicle that is carrying [nuclear] waste and moving 15 miles per hour, is about 0.0004 millirem. A person would receive 5,000 to 12,500 times more radiation dose on a round-trip flight from Los Angeles to New York on a commercial airline (2.5 millirem).” This radiation comes from cosmic and solar rays, and at higher altitudes this form of radiation is more intense.

“Americans’ Average Radiation Exposure – Fact Sheet.” Washington, DC:
Department of Energy, Office of Civilian Radioactive Waste Management,
2004: <http://www.ocrwm.doe.gov/factsheets/doeymp0337.shtml>

Nuclear Plants Withstand Hurricane Katrina With No Threat to Safety. Nuclear plants near Baton Rouge, Louisiana, and Jackson, Mississippi, safely produced electricity for the duration of Hurricane Katrina. During and after the storm the plants operated at less than full capacity due to damaged delivery infrastructure and reduced demand. A plant in St. Charles Parish near New Orleans shut down in advance of the hurricane according to special operating procedures. The NRC authorized the plant to start running less than two weeks after the storm.

“Nuclear Plants’ Structural Strength, Emergency Plans Perform Well Through Hurricane Katrina.” Washington, DC: Nuclear Energy Institute, 2005:
<http://www.nei.org/keyissues/safetyandsecurity/factsheets/nuclearplantsstructuralstrengthkatrinapage2/>

EXCESSIVE REGULATION

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High Costs Of Nuclear Due To Regulatory Burden. During the period 1981-1988, operations and maintenance costs for nuclear energy increased by 80 percent. Somewhere between a third and a half of this cost was due directly to NRC regulation. As of 2006, the Nuclear Regulatory Commission (NRC) had over 80 sources of regulation, which includes over 1,300 pages of laws, statutes, executive orders, and authorizations.

Jack Spencer, "Competitive Nuclear Energy Investment: Avoiding Past Policy Mistakes." Washington, DC: Heritage Foundation, November 15, 2007:
<http://www.heritage.org/Research/EnergyandEnvironment/bg2086.cfm>

As World Moves Forward With Nuclear Power, America Is Left Behind. No new nuclear power plants have been built in the United States since the 1970s. In contrast, between 1979 and 2008, Japan constructed 36 new nuclear facilities, and France built 56.

"Nuclear Power in Japan" and "Nuclear Power in France." London: World Nuclear Association, 2008: <http://world-nuclear.org/info/inf79.html> and <http://world-nuclear.org/info/inf40.html>

United States Still Mired In Carter Malaise Due To Initial Ban On Reprocessing. In 1977 President Jimmy Carter issued Presidential Directive 8 (PD-8) which outlawed reprocessing (recycling) nuclear fuel in the United States. For this reason, each volume of potential fuel only yields about 5 percent of its potential. Nations such as France (which chose to use reprocessing from the beginning of its nuclear program), Great Britain, China, and Russia all safely use recycling technology today. While President Reagan lifted the U.S. ban in 1981, by that point the nuclear industry had already invested four years into researching disposal techniques, making reprocessing not economically viable.

Jack Spencer, "Competitive Nuclear Energy Investment: Avoiding Past Policy Mistakes." Washington, DC: Heritage Foundation, November 15, 2007:
<http://www.heritage.org/Research/EnergyandEnvironment/bg2086.cfm>

Prior To President Carter's Ban, Several U.S. Facilities Used Reprocessing Technology. In 1956, the chairman of the Atomic Energy Commission announced a program to encourage private industry's entry into reprocessing spent nuclear fuel. A year later the AEC announced it was no longer going to provide reprocessing services, but continued to authorize private industry's usage of fuel recycling. The West Valley plant, operated by Nuclear Fuel Services near Buffalo, NY, operated from 1966 until 1972, when the plant was shut down for upgrades due to new regulations. In 1976 that plant was permanently shut down because those stricter regulations could not be met. Also in 1976, Exxon applied for a license to construct a large reprocessing plant but received no final action on its application.

"Nuclear Fuel Reprocessing: U.S. Policy Development." Washington, DC: Congressional Research Service, November 29, 2006:
<http://fpc.state.gov/documents/organization/77703.pdf>

Bush Administration Emphasizes Need For Reprocessing Technology. In 2001, President George W. Bush recommended, as part of the National Energy Policy, that America should

develop technologies in cooperation with other nations that use reprocessing systems and advanced fuel treatment to be cleaner, more efficient, and more proliferation-resistant. The Department of Energy in 2006 announced it would, as part of its Advanced Fuel Cycle Initiative, begin experimenting with new methods of extracting uranium from used nuclear fuel. This is all in accordance with the Global Nuclear Energy Partnership, which was formed to expand nuclear capabilities around the world.

“Nuclear Fuel Reprocessing: U.S. Policy Development.” Washington, DC:
Congressional Research Service, November 29, 2006:
<http://fpc.state.gov/documents/organization/77703.pdf>