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Dirty, Dangerous and Expensive: The Truth about Nuclear Power

The nuclear industry is trying to revitalize itself by manipulating the public's concerns about global warming and energy insecurity to promote nuclear power as a clean and safe way to curb emissions of greenhouse gases and reduce dependence on foreign energy resources. Despite these claims by industry proponents, a thorough examination of the full life-cycle of nuclear power generation reveals nuclear power to be a dirty, dangerous and expensive form of energy that poses serious risks to human health, national security and U.S. taxpayers.

Nuclear Power is Dirty

Each year, enormous quantities of radioactive waste are created during the nuclear fuel process, including 2,000 metric tons of high-level radioactive waste[1] and 12 million cubic feet of low-level radioactive waste[2] in the U.S. alone. About 63,000 metric tons of highly radioactive spent fuel already has accumulated at reactor sites around the U.S. The only proposed permanent repository site, at Yucca Mountain in Nevada, has been cancelled. It could not safely contain the radioactivity and protect the public. Another 42,000 metric tons will be produced by operating reactors. US taxpayers have already paid out $565 million in contract damages to nuclear utilities, because the US government has failed to dispose of the existing inventory of spent fuel by the contractual deadline of 1998.[3] An additional billion dollars of damage payments are expected every year for the next decade.

Uranium, which must be removed from the ground, is used to fuel nuclear reactors. Uranium mining, which creates serious health and environmental problems, has disproportionately impacted indigenous people because much of the world's uranium is located under indigenous land. Uranium miners experience higher rates of lung cancer, tuberculosis and other respiratory diseases. The production of 1,000 tons of uranium fuel generates approximately 100,000 tons of radioactive tailings and nearly one million gallons of liquid waste containing heavy metals and arsenic in addition to radioactivity.[4] These uranium tailings have contaminated rivers and lakes. A new method of uranium mining, known as in-situ leaching, does not produce tailings but it does threaten contamination of groundwater water supplies.

Serious Safety Concerns

Despite proponents' claims that it is safe, the history of nuclear energy is marked by a number of disasters and near disasters. The 1986 Chernobyl disaster in Ukraine is one of the most horrific examples of the potentially catastrophic consequences of a nuclear accident. An estimated 220,000 people were displaced from their homes, and the radioactive fallout from the accident made 4,440 square kilometers of agricultural land and 6,820 square kilometers of forests in Belarus and Ukraine unusable. It is extremely difficult to get accurate information about the

health effects from Chernobyl. Government agencies in Ukraine, Russia, and Belarus estimate that about 25,000 of the 600,000 involved in fire-fighting and clean up operations have died so far because of radiation exposure from the accident.[5] According to an April 2006 report commissioned by the European Greens for the European Parliament, there will be an additional 30,000 to 60,000 fatal cancer deaths worldwide from the accident.[6]

In 1979, the United States had its own accident at the Three Mile Island Nuclear Reactor in Pennsylvania. Although there were no immediate deaths, the incident had serious health consequences for the surrounding area. A 1997 study found that those people living downwind of the reactor at the time of the event were two to ten times more likely to contract lung cancer or leukemia than those living upwind of the radioactive fallout.[7] The dangers of nuclear power have been underscored more recently by the close call of a catastrophic meltdown at the Davis-Besse reactor in Ohio in 2002, which in the years preceding the incident had received a near-perfect safety score.[4]

Climate change may further increase the risk of nuclear accidents. Heat waves, which are expected to become more frequent and intense as a result of global warming, can force the shut down or the power output reduction of reactors. During the 2006 heat wave, reactors in Michigan, Pennsylvania, Illinois, and Minnesota, as well as in France, Spain and Germany, were impacted. The European heat wave in the summer of 2003 caused cooling problems at French reactors that forced engineers to tell the government that they could no longer guarantee the safety of the country's 58 nuclear power reactors.[4]

Proliferation, Loose Nukes and Terrorism

The inextricable link between nuclear energy and nuclear weapons is arguably the greatest danger of nuclear power. The same process used to manufacture low-enriched uranium for nuclear fuel also can be employed for the production of highly enriched uranium for nuclear weapons. As it has in the past, expansion of nuclear power could lead to an increase in the number of both nuclear weapons states and 'threshold' nuclear states that could quickly produce weapons by utilizing facilities and materials from their 'civil' nuclear programs – a scenario many fear may be playing out in Iran. Expanded use of nuclear power would increase the risk that commercial nuclear technology will be used to construct clandestine weapons facilities, as was done by Pakistan.

In addition to uranium, plutonium can also be used to make a nuclear bomb. Plutonium, which is found only in extremely small quantities in nature, is produced in nuclear reactors. Reprocessing spent fuel to separate plutonium from the highly radioactive barrier in spent fuel rods, as is being proposed as a 'waste solution' by some nuclear proponents, increases the risk that the plutonium can be diverted or stolen for the production of nuclear weapons or radioactive 'dirty' bombs. Reprocessing is also the most polluting part of the nuclear fuel cycle. The reprocessing facility in France, La Hague, is the world's largest anthropogenic source of radioactivity and its releases have been found in the Arctic Circle.

In addition to the threat of nuclear materials, nuclear reactors are themselves potential terrorist targets. Nuclear reactors are not designed to withstand attacks using large aircraft, such as those used on the September 11, 2001.[8] A well-coordinated attack could have severe consequences for human health and the environment. A study by the Union of Concerned Scientists concluded

that a major attack on the Indian Point Reactor in Westchester County, New York, could result in 44,000 near-term deaths from acute radiation sickness and more than 500,000 long-term deaths from cancer among individuals within 50 miles of the reactor.[9]

Nuclear Power Doesn't Mean Energy Independence

Assertions that nuclear power can lead us to energy independence are incorrect. In 2007, more than 90 percent of the uranium used in U.S. nuclear power reactors was imported.[10] The U.S. only has the ninth largest reasonably assured uranium resources in the world.[11] Most of it is low to medium grade, which is not only more polluting but also less economical than uranium found in other nations. The U.S.'s high-priced uranium resources and world uranium price volatility mean that current dependence on foreign sources of uranium is not likely to change significantly in the future.

One country that the U.S. continues to rely on for uranium is Russia. The Continuing Resolution signed into law in September 2008 extended and expanded the program to import Russian highly enriched uranium that has been down-blended for use in U.S. commercial reactors. This program, which was set to expire in 2013, has been extended through 2020 and expanded to allow more uranium imports per year from Russia. While the program is an important non-proliferation measure (highly enriched uranium can be used to make a nuclear weapon), it means that the U.S. will continue to rely on Russia for a significant amount of uranium for commercial nuclear reactors.

Nuclear is Expensive

In 1954, then Chairman of the Atomic Energy Commission Lewis Strauss promised that the nuclear industry would one day provide energy "too cheap to meter." More than 50 years and tens of billions of dollars in federal subsidies later, nuclear power remains prohibitively expensive. The cost of nuclear reactors built between 1974 and 1996 went up – not down – over time. The estimated cost for new reactors has quadrupled since the early 2000s.[12] Despite the poor economics, the federal government has continued to pour money into the nuclear industry – the Energy Policy Act of 2005 included more than $7 billion in production subsidies and tax breaks, plus loan guarantees and other incentives for nuclear power.

The most important subsidy for the nuclear industry – and the most expensive for U.S. taxpayers – comes in the form of loan guarantees, which are promises that taxpayers will bail out the nuclear utilities by paying back their loans when the projects fail. There are currently $18.5 billion authorized for nuclear loan guarantees; the nuclear industry is seeking over $100 billion in guarantees. According to the Congressional Budget Office, the failure rate for nuclear projects is "very high – well above 50 percent."[13] Moody's has called new reactors a "bet the farm" investment.

Making the Safe, Sustainable Investment

It is clear that alternatives to fossil fuels must be developed on a large scale. However, nuclear power is neither renewable nor clean and therefore not a wise option. Even if one were to disregard the waste problems, safety risks and dismal economics, nuclear power is both too slow a solution to global warming and energy insecurity. Given the urgent need to begin reducing

greenhouse gas emissions, the long lead times required for the design, permitting and construction of reactors render nuclear power an ineffective option for addressing global warming.

Taxpayer dollars would be better spent on increasing energy conservation, efficiency and developing renewable energy resources. In fact, numerous studies have shown that improving energy efficiency is the most cost-effective and sustainable way to concurrently reduce energy demand and curb greenhouse gas emissions. New reactors will cost two to three times more than renewable and efficiency technologies.[14] Even the price of electricity from photovoltaic power, one of the most expensive renewable technologies, is falling quickly. Conversely, the cost of nuclear power continues to rise.

When the very serious risk of accidents, proliferation, terrorism and nuclear war are considered, it is clear that investment in nuclear power as a climate change solution is not only misguided, but also highly dangerous. As we look for solutions to the dual threats of global warming and energy insecurity, we should focus our efforts on improving energy conservation and efficiency and expanding the use of safe, clean renewable forms of energy to build a new energy future for the nation.

Call the Capital Switch Board (1-202-224-3121) to ask for your Congressional Representative and your Senators and urge them to oppose subsidies to the dirty, dangerous and expensive nuclear industry.

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