Nuclear Power Doesn't Stop Global Warming

Nuclear Power increases the greenhouse effect drastically

Helen **Caldicott.** She is the founder of Physicians for Social Responsibility**,** International Physicians for the Prevention of Nuclear War which won the Nobel Peace Prize in 1985, and the Women's Action for Nuclear Disarmament (WAND). Founding President of the STAR (Standing for Truth About Radiation) Foundation**.** Dr Caldicott received the Lannan Foundation's 2003 Prize for Cultural Freedom**,** 19 honorary doctoral degrees, and was nominated for the Nobel Peace. Nuclear Power Is Not the Answer. August 15, **2006**

"Nuclear power is not "clean and green," as the industry claims, because large amounts of traditional fossil fuels are required to mine and refine the uranium needed to run nuclear power reactors, to construct the massive concrete reactor buildings, and to transport and store the toxic radioactive waste created by the nuclear process. Burning of this fossil fuel emits significant quantities of carbon dioxide (CO2)—the primary "greenhouse gas"—into the atmosphere. In addition, large amounts of the now-banned chlorofluorocarbon gas (CFC) are emitted during the enrichment of uranium. CFC gas is not only 10,000 to 20,000 times more efficient as an atmospheric heat trapper ("greenhouse gas") than CO2, but it is a classic "pollutant" and a potent destroyer of the ozone layer."

Nuclear Power will not stop greenhouse gas emissions any time soon!

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"The role of nuclear power in reducing greenhouse gas emissions will also be quite limited *for the next several decades at least*. This is partly because nuclear power, and indeed many renewable-energy technologies such as wind power and photovoltaics, are not now being used or planned for a significant role outside the electricity sector (even if eventually these technologies could become important for desalination, process heat, and hydrogen production). The emissions of carbon worldwide in both the electric and non-electric sectors are expected to be considerable. According to the principal business-as-usual demand scenario (IS92a) of the Intergovernmental Panel on Climate Change (IPCC), total carbon emissions from the energy sector are expected to grow from today's 6.5 billion tons to 13 billion tons in 2050, with total cumulative emissions of carbon through 2050 of 440 billion tons.[15]

Nuclear power is not likely to make a decisive dent in this period. Even if, as appears unlikely, nuclear power worldwide grew at just over 2% per year until 2050 to an installed capacity in that year of 1000 GWe,[16] that would lead to a cumulative avoided carbon emissions to that time of about 36 billion tons - roughly 8% of the total cumulative carbon emissions projected during this period.[17]"

We need to immediately cut Greenhouse Gasses! We can't wait for nuclear plants to be up and running.

Daniel A. **Lashof**. Science Director for the Climate Center at the Natural Resources Defense Council. Testimony at the Hearing on Rebalancing the Carbon Cycle. Committee on Government Reform, Subcommittee on Energy and Resources, House of Representatives. September 27, 2006 URL:http://reform.house.gov/UploadedFiles/Lashof%20Testimony%20Gov%20Reform%20Sept%2027%202006.pdf

"If we start cutting U.S. emissions soon, and work with other developed and developing countries for comparable actions, we can stay on the 450 ppm path with an ambitious but achievable annual rate of emission reductions – one that gradually ramps up to about 3.2% reduction per year. (See Figure 1.)

But if we delay a serious start and continue emission growth at or near the business-as-usual trajectory for another 10 years, the job becomes much harder – the annual emission reduction rate required to stay on the 450 ppm path jumps between two and three-fold, to 8.2% per year. In short, a slow start means a crash finish – the longer emissions growth continues, the steeper and more disruptive the cuts required later."

Nuclear Fuel

Future extractions of Uranium will be hugely expensive

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"While currently the creation of nuclear electricity produces only one-third the amount of CO_2 emitted from a similar-sized, conventional gas generator, this is a transitory statistic. Over several decades, as the concentration of available uranium ore declines, more fossil fuels will be required to extract the ore from less concentrated ore veins. Within ten to twenty years, nuclear reactors will produce no net energy because of the massive amounts of fossil fuel that will be necessary to mine and to enrich the remaining poor grades of uranium. (The nuclear power industry contends that large quantities of uranium can be obtained by reprocessing radioactive spent fuel. However, this process is extremely expensive, medically dangerous for nuclear workers, and releases large amounts of radioactive material into the air and water; it is therefore not a pragmatic consideration.) By extension, the operation of nuclear power plants will then produce exactly the same amounts of greenhouse gases and air pollution as standard power plants."

Uranium is not renewable and will be exhausted

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"Nuclear power is exorbitantly expensive, and notoriously unreliable. Wall Street is deeply reluctant to re-involve itself in any nuclear investment, despite the fact that in the 2005 Energy Bill the U.S. Congress allocated $13 billion in subsidies to revive a moribund nuclear power industry. To compound this problem, the global supplies of usable uranium fuel are finite. If the entire world's electricity production were replaced today by nuclear energy, there would be less than nine more years of accessible uranium. But even if certain corporate interests are convinced that nuclear power at the moment might be a beneficial investment, one major accident at a nuclear reactor that induces a meltdown would destroy all such investments and signal the end of nuclear power forever."

Only a small amount of Plutonium Fuel is needed to make a nuclear explosive

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"Regardless of its isotopic composition, the minimum amount of **plutonium** required to make a pure fission nuclear explosive, with a yield equivalent to one to 25 kilotons of chemical high explosives, is quite small, on the order of 1 to 3 kilograms (kg), with the exact amount depending on the level of design expertise and the desired nuclear explosive yield.12 The minimum amount of highly enriched uranium required is a few times larger—5 to 10 kg."

Light Water Reactor fuel is susceptible to clandestine enrichment

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But even in the absence of any commercial enrichment—in the case of a country with one or more stand-alone light water reactors—the presence of light water reactors means that a substantial supply of fresh light water reactor fuel would also be present at times. That such fresh fuel can provide a source of uranium for clandestine enrichment is another possibility that has received essentially no attention in the proliferation literature. Since the fuel is already low-enriched uranium, a much smaller gas centrifuge plant would suffice to raise the enrichment to bomb levels than would be the case if the starting point is natural uranium. By starting with such low-enriched uranium fuel pellets, which are uranium oxide, the enricher would be able to skip the first five processes required to go from uranium ore to uranium hexafluoride gas, the material on which the gas centrifuge operates. To go from the uranium oxide pellets to uranium hexafluoride, the would-be bomb-maker would crush the pellets and react the powder with fluorine gas. Suitably processed, the low-enriched uranium pellets could provide feed for clandestine enrichment.16"

PBR

Pebble Bed Reactors don't stop proliferation and material can be enriched

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"Neither the Radkowsky fuel cycle or that of the pebble bed reactor can be said to be proliferation proof; no fuel cycle can be completely so. In general, they have three potential weaknesses. First, while the proliferation-resistance advantages derive in part from the very high burn-up, the reactors do not have to be operated to full burn-up; removing the fuel early can make the weapons-quality of plutonium produced quite high. However, since the build-up of plutonium is relatively slow, extraction of plutonium at lower burn-ups would require correspondingly larger amounts of material to be diverted. Secondly, over time the decay of the 30-year half life fission products will lower the radiation barrier of spent fuel, while the decay of the 88-year half life Pu-238 will make it easier to use the extracted plutonium for weapons. Thirdly, and perhaps more importantly, they use uranium that is more highly enriched than typical today. Uranium enriched to 8-20% cannot be used for weapons, but the routes to weapon-grade uranium from such feed materials are easier than if one started with natural or 4% low-enriched uranium.[11] The fabrication of the pebble-bed fuel and the fuel handling operations will require special attention when safeguards are developed."

Harms of Nuclear Power Plants

Nuclear Power Plants are a threat to the safety of Americans

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"In this day and age, nuclear power plants are also obvious targets for terrorists, inviting assault by plane, truck bombs, armed attack, or covert intrusion into the reactor's control room. The subsequent meltdown could induce the death of hundreds of thousands of people in heavily populated areas, and they would expire slowly and painfully, some over days and others over years from acute radiation illness, cancer, leukemia, congenital deformities, or genetic disease. Such an attack at the Indian Point reactors, thirty-five miles from Manhattan, for instance, would effectively incapacitate the world's main financial center for the rest of time. An attack on one of the thirteen reactors surrounding Chicago would wreak similar catastrophic medical consequences. Amazingly, security at U.S. nuclear power plants remains at virtually the same lax levels as prior to the 9/11 attacks."

Plan does not fix the harms that already exist with nuclear power

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"Because of the sheer magnitude and urgency of the global climate challenge, the United States must consider all forms of energy—as long as they do not otherwise undermine international and environmental security. Unfortunately, the nuclear power industry in its present state suffers from too many security, safety, and environmental exposure problems and excessive costs to qualify as a leading means to combat global warming pollution.
Large-scale nuclear plants remain uneconomic to build. And while the nuclear fuel cycle emits little global warming pollution, nuclear power still poses globally significant risks *that need to be further reduced*, including:

- Diversion of "peaceful" nuclear facilities and materials to secret nuclear weapons programs;
- Theft and terrorist use of nuclear materials;
- Accidental releases of radioactivity, ranging from locally harmful to potentially catastrophic;
- The vulnerability of some spent nuclear fuel storage pools to terrorist attack;
- Occupational and public health risks associated with uranium mining and milling; and
- Long-term leakage from underground repositories intended to isolate high-level radioactive waste and
- spent fuel from the human and natural environment for tens to hundreds of thousands of years."

Nuclear Power bad for other forms of renewable energy

US creating Nuclear power plants saps money for renewables

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"Meanwhile, every billion dollars spent on the supremely misguided attempt to revivify the nuclear industry is a theft from the production of cheap renewable electricity. Think what these billions could do if invested in the development of wind power, solar power, cogeneration, geothermal energy, biomass, and tidal and wave power, let alone basic energy conservation, which itself could save the United States 20% of the electricity it currently consumes."

Other renewable energy sources are better than Nuclear power

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"According to Amory Lovins, CEO of the Rocky Mountain Institute, in 2004 the amount of electricity supplied by renewable energy sources—wind, co-generation, biomass, geothermal, solar, hydro (excluding electricity generated from large hydro dams)—added 509 times the total capacity worldwide that nuclear power contributed, and raised the global electricity production 2.9 times more than nuclear power contributed. These "minor" electricity sources already dwarf the annual growth of nuclear power generation, and experts predict that by 2010, they will add 177 times more capacity than nuclear power provides."

Nuclear Power is not economical

New Nuclear Power in the US doesn't make sense economically

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Not one utility or energy-generation company in the United States has been willing to order and construct a new nuclear plant in more than 30 years. Energy companies and Wall Street have been decidedly uninterested in bankrolling new construction, despite decades of large federal subsidies to the nuclear power industry. This is not because of public opposition over safety or national security concerns. Rather, it is because new commercial nuclear power plants are uneconomical in the United States: They simply cannot compete with other sources of electricity.

But now the nuclear industry and a wide range of advocates are touting nuclear energy as one of the answers to global warming, and are calling for a new round of federal subsidies to build several new plants in the United States.

Subsidizing detailed engineering design, licensing, and construction of a few large nuclear power plants will cost the taxpayers billions of dollars, but will not significantly reduce the high capital cost of subsequent nuclear plants relative to alternative sources. Hence, these subsidies are unlikely to stimulate the widespread deployment of noncarbon– emitting technology needed to make a dent in reducing global warming emissions, and will be counterproductive by siphoning scarce government resources away from more productive investments that have the actual potential to transform energy markets on a global scale. Moreover, the subsidies do nothing to address the enormous security and public health risks that plague the nuclear industry.

Push to nuclear power will not be sustained in the Public Sphere

Steve **Thomas** Senior Research Fellow at the Public Service International Research Unit University of Greenwich, UK "The Economic Impact of the Proposed Demonstration Plant for the Pebble Bed Modular Reactor Design" August **2005**
URL: http://www.psiru.org/reports/2005-09-E-PBMR.pdf Last Access: Nov 26, 2006

"Conclusion 10: The current high fossil fuel prices and the measures to reduce greenhouse gas emissions seem to give a new impetus to generation technologies that do not use fossil fuels. However, it should be remembered that previous oil price spikes (1974 and 1980) were short-lived and resulted in little nuclear investment apart from in France. Investors are unlikely to make multi-million dollar investments in new nuclear power plants on the basis of a short-term oil price spike which could have disappeared long before a nuclear plant could be brought on-line. On greenhouse gas emissions, nuclear power faces competition from renewable technologies and energy efficiency measures, options that generally do not encounter the public acceptability problems that nuclear power suffers from."