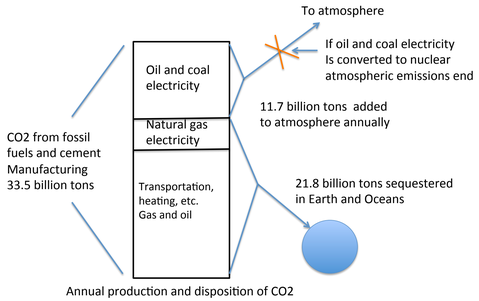
Manufactured Doubt: The Campaign Against Nuclear Energy - PA21A-1950

Norman Rogers, The Heartland Institute, normfrommiami@gmail.com
American Geophysical Union Fall Meeting 2012

Converting coal and oil electricity generating facilities (but not natural gas) to nuclear would *stop* the increase of CO2 in the atmosphere.

This would cost the world economy approximately $5 trillion. To do this with wind and solar would cost the world economy approximately $30 trillion.

There was a calculated and sophisticated campaign in the later part of the 20th century to create doubt and fear concerning nuclear power. In the United States this campaign has essentially destroyed the nuclear industry. No new plants have been commissioned for decades. Leadership in the nuclear power field has been ceded to other countries. Ironically the same organizations that are raising alarm concerning global warming are the same organizations that destroyed nuclear power in the United States.



Annual production and disposition of CO2

Most of the CO2 emitted by man is sequestered by the Earth and oceans. The amount of CO2 emitted by coal and oil electricity is very nearly equal to the amount of CO2 added to the atmosphere annually. If world coal and oil electricity generation were converted to nuclear the level of CO2 in the atmosphere would very nearly cease to increase.

A campaign based on spreading fear of nuclear energy and constant courtroom challenges raised barriers to building new generating plants. Between 1967 and 1971 the cost of building a nuclear plant in constant dollars tripled.[1] Key tactics were associating nuclear energy with nuclear bombs and associating radioactivity with cancer.

... our society persists in stumbling about on the dark side of exponential energy demand, trifling with atomic poisoning and gambling with the future of 1,333 generations of our descendants, not to mention all of life itself.

Sierra Club Bulletin April 1975 p 5

A more realistic approach to a sustainable-energy society is to gradually decentralize the energy supply system by utilizing small-scale solar, wind and bioconversion technologies.

Sierra Club Bulletin May 1977 p. 11

Nuclear energy is not the bargain it was once thought to be. Real (uninflated) construction costs for nuclear power stations have quintupled in the past 8 years.

Sierra Club Bulletin May 1976 p. 44

By the year 2000, such renewable energy sources could provide forty percent of the global energy budget...Coal combustion necessarily produces carbon dioxide ... raises the earth's temperature ... if nuclear advocates were forced to find a safe way to dispose of long-lived radioactive wastes ... solar equipment would be more economically competitive.

Sierra Club Bulletin Summer 1977 p. 13 (Denis Hayes)

Example of cost escalation

Millstone 1 Nuclear Power Plant
660 megawatts Cost $101 million 1966

Millstone 1, near New London, CT was constructed in 5 years and operated from 1970 to 1998. Two other reactors, units 2 and 3 are still operating on the site.

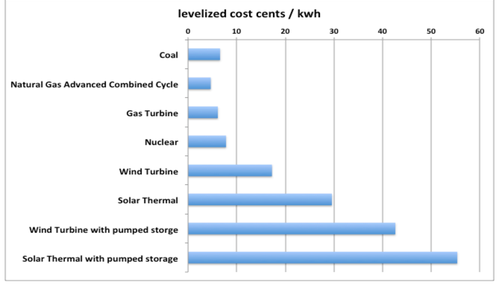
Shoreham Nuclear Power Plant
820 megawatts cost $6 billion 1973

The Shoreham plant on Long Island, NY was under construction for 11 years. In June, 1979 thousands of protestors gathered at the plant and 500 were arrested. The plant was finally scrapped In 1989 and never generated electricity.

Anti-nuclear agitation

Even though nuclear is an obvious solution to avoiding CO2 emissions, the clean development mechanism of the Kyoto accords prohibits credit for avoiding emissions by using nuclear power. This provision was inserted at the urging of the environmental lobby.

Green energy baloney
Cost of wind and solar 6 times greater than nuclear



Based on numbers from: **Updated Capital Cost Estimates for Electricity Generation Plants**, November 2010, U. S. Energy Information Administration, Office of Energy Analysis. Plant life 40 years, interest rate 6%, fuel cost coal 2.5 cents/ kwh, natural gas 3 cents/kwh, nuclear 0.7 cents/kwh. Pumped storage$ 5500/ kw and transmission lines for solar and wind $1000/kw. Utilization: 20% wind and solar, 80% Coal, 80% natural gas advanced, 60% gas turbine, 85% nuclear. Operation and maintenance per referenced document. Solar PV is similar to thermal.

The environmentalists are pursuing an irrational dream. Their dream is a political impossibility and the numbers don't add up.

Solar and wind power are very expensive and very unreliable. In small doses the grid can absorb the erratic solar and wind electricity. Large scale deployment requires long power lines and pumped storage, making wind and solar impossibly expensive.

Hydrogen cars or battery powered cars that receive their energy from wind and solar compounds the cost and problems. Good enough batteries are a dream. Hydrogen cars have many problems of cost, infrastructure and safety.

Is Nuclear Safe? Compared to what?

104 reactors providing 20% of U.S. electricity and nobody has ever been killed in a nuclear accident.

Worst ever nuclear accident: Chernobyl accident in the Soviet Union in 1986. In that case the reactor was badly designed with no containment vessel and the operators were incredibly irresponsible. At Chernobyl 56 people were killed.

Coal mining routinely kills 5,000 people per year world wide.

The 1984 Bhopal chemical plant disaster in India killed nearly 4,000 people.

The Indian Ocean tsunami of 2004 killed more than 200,000 people.

Smoking prematurely kills 443,000 per year in the U.S. Yet the government is in partnership with tobacco manufacturers and makes about $30 billion a year from tobacco.

If the environmentalist really believe in man-caused global warming is a serious problem, why are they so opposed to nuclear power?

Could it be that nuclear power interferes with their dream of a sustainable society powered by sun and wind? Nuclear power is the obvious cure for global warming, but it is so much cheaper and more practical that it would drive sun and wind from the market. The only solution for the dreamers is to demonize nuclear power.

Will adoption of nuclear power lead to the proliferation of nuclear bombs?

Development of nuclear bombs requires resources that are beyond terrorist groups. Terrorist groups could only obtain nuclear bombs by obtaining complete bombs or possibly by obtaining bomb grade uranium. Unfortunately countries with weak or corrupt governments have been or are being allowed to develop bombs. Examples are North Korea, Pakistan, and Iran. Bomb material is either highly enriched uranium, not used for civilian nuclear power, or plutonium. Plutonium is present in used fuel but it is difficult to extract due to the intense radiation and it is difficult to fabricate into a bomb due to the high proportion of PU 240 present in the used fuel, and the more complicated technology required to make bombs from plutonium. The real problem is political.

Nuclear waste? Dirty Bombs? Radiation?

The danger of nuclear waste, otherwise known as spent fuel rods, is always exaggerated as a part of the ongoing war on nuclear energy. By making the disposition of this material seem impossibly difficult the environmentalists hope to block nuclear power.

The dirty bomb is a conventional explosive that is packaged with radioactive material. The idea is that the radioactive material will contaminate a large area and make it uninhabitable. In general it is not a serious threat. If enough radioactively hot material was used it would also be extremely hot thermally and could not be assembled or transported. The dirty bomb is a psychological weapon. If one is detonated it will be cleaned up and life will continue.

No doubt high doses of radiation are bad for you. Low level radiation is something that we are exposed to everyday. It's part of the environment and there is a lot of evidence that it is not harmful and even that it is beneficial.[2]

Prospects for advance in nuclear technology

There is vast room for improvement in nuclear power. The theories are well understood but developing practical technology takes time. This engineering development has been on hold for many years due to the anti-nuke environment that resulted from the many years of intensive propaganda against nuclear power.

The possible developments are in these major areas:

Reactors that cannot "melt down" due to their design

Small modular reactors that can be manufactured in factories and transported to the site.

Reactors that use thorium fuel, a more plentiful radioactive element.

Reactors that breed more fuel than they consume (breeders)

Reactors that are resistant to being use in a weapons program, for example thorium fueled reactors.

Reactors that use molten salt coolant or even use molten salts to hold the fissile elements.

Reactors that "burn" up nuclear waste.

See: http://www.gizmag.com/small-modular-nuclear-reactors/20860/

How junk science can be used to manufacture doubt

The basic technique used by the environmental lobby to make people scared of things they don't like is to make unsupported extrapolations. For example, ionizing radiation in large amounts is dangerous. However it is very difficult to show empirically that small amounts of radiation are harmful. In fact there is considerable evidence that the human immune system and cellular repair is stimulated by small doses of radiation. However if you want to make people scared and it is known that an amount of radiation X causes Y harm, then you can simply claim that X/ 10,000 causes Y/10,000 harm. This is known as the linear, no threshold theory.

The Sierra club doesn't like electric plants that burn coal. Mercury can be a serious poison if ingested in the right amounts and the right form. Most of us have mercury-silver amalgam fillings in our teeth and they cause no harm. Coal has microscopic amounts of mercury, so when coal is burned a certain microscopic amount of mercury goes out the smokestack. This is the Sierra Club scare story:

"Burning coal releases toxic mercury that rains down onto rivers and streams and contaminates fish. The pollution then makes its way into our bodies when we eat the fish. Mercury is especially dangerous to pregnant women and young children because it's a powerful neurotoxin that can damage the brain and nervous system — causing developmental problems and learning disabilities." From the Sierra Club *beyond coal* website

Is there a real reason why people believe in dangerous man-caused global warming (AGW)?

We have shown in this poster that the solutions proposed by the environmental lobby for stopping the increase of CO2 in the atmosphere are faulty and that they oppose real solutions, like nuclear power. This indicates hidden motives different than their announced motives.

It is common knowledge that there has been no statistically significant global warming for 16 years, although CO2 continues to increase rapidly. The basis of global warming projections are complicated IPCC climate models that are tuned to please the modelers. Further, the climate models disagree with each other by more than 2-1 about the magnitude of the projected global warming. Further there are many highly qualified scientists that have studied this situation and who are very skeptical.

The mystery is why so many people take AGW and green energy and as incontrovertible; even people who are technically qualified and who should be able to see the weakness of the case?

1 - Power Plant Cost Escalation by Charles Komanoff page 19
2 - http://www.americanthinker.com/2012/07/forbidden_science_low_level_radiation_and_cancer.html