False Starts and False Solutions: Current Approaches in Dealing with Climate Change

Karen Charman

Up until Al Gore's documentary, *An Inconvenient Truth*, was released two years ago, the public debate, particularly in the U.S., was still in the phase of trying to work out whether global warming—human caused or not—was a real phenomenon. Since *An Inconvenient Truth* hit the theaters, it is now accepted, at least in an abstract sense, that global warming is, in fact, real. The carbon polluter-funded skeptics are still out there, but now they are given much less credence than they were a relatively short time ago, while the mainstream media—what I like to think of as the public's shared reality—is, finally, presenting this as a real, albeit future catastrophic problem.

This newfound acceptance is a step in the right direction, though much work still needs to be done to convey the urgency of the problem to the public at large. The vast complexity and unknown number of feedback loops that will play out in global warming make it difficult to convince people in the global North, who, like the capitalist society they are part of, tend to be more focused on everyday, bottom-line kinds of concerns—and are likely to feel overwhelmed by the existential as well as conceptual difficulties of grappling with something like runaway global warming. In any case, it seems that most people are still content, for the most part, to continue with business as usual.

The Actual Problem

In 1998, the warmest year on record so far, Hurricane Mitch ripped through Central America, killing more than 10,000 and leaving more than 2 million homeless. In 2003, a heat wave in Europe killed at least 35,000 people. 2005 brought us Hurricane Katrina, which killed approximately 1,300, displaced hundreds of thousands of people, and turned New Orleans into a toxic stew. At the end of April 2008, Cyclone Nargis, the deadliest named cyclone in the North Indian Ocean Basin, rampaged Myanmar, leaving 130,000 dead or missing in its wake. Without making the dramatic reductions necessary to stabilize the climate, here are a few glimpses into the future offered by the best-informed sources: Island nations and coastal cities under water, creating refugees out of hundreds of millions of people. The disappearance of coral reefs. Permafrost no longer frozen, releasing another much more potent greenhouse gas, methane, on a grand scale—an occurrence science writer Fred Pearce describes (in reference to Stanley Kubrick's classic film *Dr. Strangelove*) as "nature's own doomsday device." Increasing concentrations of carbon in the oceans, acidifying and turning the oceans, the largest habitat on the planet, into an equivalent of marine deserts. Up to 70 percent of the species on the planet extinct. Massive desertification, and in northern Europe and the northeastern United States, a possible return of the Ice Age. So besides increased frequency of extreme, violent weather, we can expect a much less hospitable environment for growing food and providing the natural resources that those in the First World have come to take for granted. Welcome to the Anthropocene, an era

warmer than any time in the last million years, brought on by capitalist-driven human industrialization.

The picture from the scientific community is becoming clearer over time, and alarming changes that scientific models have predicted for years are occurring much faster than scientists originally thought. However, there still is enough uncertainty about exactly how this will play out to enable those who profit from burning fossil fuels—the coal, oil, and gas industries as well as all industries connected to and reliant on these technologies—to get away with delaying the substantial and immediate reductions in carbon and other greenhouse gas emissions needed to prevent the worst effects of global warming. This uncertainty—along with the strong human impulse to deny impending disaster—is, of course, overlaid with the very powerful carbon polluters' short-term interest in squeezing out their profits and continuing to burn fossil fuels, which created the problem to begin with.

Most discussions of climate change mitigation point to 2050 as the date by which we need to reduce our current greenhouse gas emission by 70-80 percent in order to stabilize the climate. More recently a number of sources are saying that we really only have six to eight years in which to begin making radical reductions in order to avoid runaway climate change.

Market Solution

Despite the increasing urgency, the solutions being put forth as "realistic"—that is, what the capitalist system will allow—reinforce the status quo.

At the individual level, people are encouraged to "be part of the solution, not the problem" and shop their way out of the crisis by buying more energy-efficient, "carbon neutral," non-toxic products. Indeed, environmentally friendly products are hot—the newest marketing fad—and already a multibillion dollar market. But, not everyone can always afford to purchase all of the newer more energy-efficient and less-polluting products. And if greener products, which tend to be a lot pricier than their conventional counterparts, are only available to the relatively small, elite group of people who can afford them, we won't make enough of a dent in reversing climate change. Global warming is a collective problem that requires a comprehensively collective solution.

At the global level, we have seen years' long, drawn-out battles to forge an international agreement. And so far, under the ruling regime of capitalism, the best our leaders have been able to come up with is the Kyoto Protocol. But Kyoto is doomed to failure, first, because the federal government of the United States—up until very recently the world's largest contributor to global warming—has thus far refused to sign on. Second, Kyoto only mandates that First World nations reduce their greenhouse gas emissions 5 percent below 1990 releases by 2012, and this doesn't include international aviation or shipping. But even worse, the main mechanism the Kyoto Protocol uses to achieve these reductions is deeply flawed.

The Kyoto Protocol came out of the UN Framework Convention on Climate Change, which was adopted in 1992 at the Rio Earth Summit, though it took until February

2005 before the treaty actually came into force. A backgrounder on the Kyoto Protocol says that because it affects virtually all sectors of the economy, the Kyoto Protocol is considered "the most far-reaching environmental agreement ever adopted." As such, it points out that "any treaty not only has to be effective in tackling a complicated worldwide problem, it must also be politically acceptable." And while that is true, the need to pass political muster has been the treaty's biggest obstacle to crafting a solution that could actually deal with the problem.

Kyoto splits countries into two categories. The Annex 1 countries are the approximately 30 First World developed nations that have signed, plus several of the countries of the former Soviet Union, the Baltic states, and several Central and Eastern European countries. Non-Annex 1 countries are the 150 Third World developing nation signatories. The Annex 1 countries have binding targets in GHG reductions, while the Non-Annex 1 countries are only obligated to monitor and report their emissions, a distinction that opponents—especially the U.S.—claim is unfair. In order to make the emission cuts politically palatable, the Kyoto Protocol adopted "flexibility" via "market-based mechanisms" to allow signatories meet their obligations.

The market-based mechanism is emissions trading, also known as "cap and trade." Kyoto allows Annex 1 countries or large polluters within those countries to meet their reduction requirements by buying reductions from:

- Carbon exchanges, like the European Emissions Trading Scheme;
- Projects in Non-Annex 1 countries that are certified to qualify under the "Clean Development Mechanism";
- Other Annex 1 countries under the "Joint Implementation," which is similar to the Clean Development Mechanism but applies to "transitional" economies, mainly those in the former Soviet Union and Eastern Europe; and
- Annex 1 countries with excess allowances.

"Cap and trade" essentially turns pollution into a commodity that the polluters and others can sell—as it turns out, at huge profits. Heidi Bachram of the Transnational Institute explained this system in the December 2004 issue of *Capitalism Nature Socialism*: Under Kyoto, Annex 1 countries are given a certain number of "emission credits," equivalent to their 1990 emission levels minus their reduction commitment. These credits are licenses to pollute up to those levels. The quota of credits are then allocated on a nationwide basis to industry. This is normally done by "grandfathering," so the most polluting industries end up with the largest amount of carbon credits. And in this way, they are essentially rewarded—handsomely—for their bad behavior.

If those holding carbon credits pollute less than their quota, they can sell the difference between what they were allowed to emit and what they actually did emit to others who didn't bother or couldn't meet their own emission targets. The Clean Development Mechanism and the Joint Implementation are vehicles for polluters who didn't meet their targets to purchase them elsewhere. But Clean Development Mechanism projects too often end up being punishing to the citizens and environments that host them. Put another way, it's a way for First World signatories to literally dump their responsibility on the Third World signers.

One example is the notorious Bisasar Road toxic landfill in Durban, South Africa (Africa's first pilot project in carbon trading) in which methane from the decomposing garbage is extracted to generate both electricity and GHG carbon credits available for sale to Northern investors. Despite several promises that the dump would close, once the Clean Development Mechanism converted the Bisasar Rd. dump into a cash cow, the likelihood of its closing all but vanished. Meanwhile, in July 2007, climate justice activist, Sajida Kahn, who lived across the street and was a tireless campaigner against the dump, died from cancer, which she and others are convinced resulted from her constant toxic exposures.

Other examples of projects that are eligible for CDM certification include huge chemical-intensive monoculture tree plantations, including the use of genetically modified trees, which theoretically absorb carbon from the atmosphere; industrial—and again, chemical-intensive—biofuel production, which theoretically provides cleaner-burning fuel; renewable energy, like wind and solar, and, according to Kevin Smith of Carbon Trade Watch, even notoriously dirty manufacturing operations, like the JSPL sponge-iron plant—the world's largest—in India, which despite enormous local opposition is expanding its operations. Smith says the JSPL plant has

> four separate CDM projects, generating millions of tonnes of supposed carbon reductions that could be imported into the E.U. Emission Trading Scheme…In this case, the CDM is not only providing financial assistance to JSPL in making the expansion but also providing them with "green" credibility by putting them at the forefront of the emerging carbon market.

Heidi Bachram explains that the amount of credits each project earns is calculated by subtracting

> the difference between the level of emissions with the project and the level of emissions that would occur in an imagined alternative future without the project. With such an imagined alternative future in mind, a corporate polluter can conjure up huge estimates of the emissions that would be supposedly produced without the company's CDM or JI project. This stratagem allows for a high (almost limitless) number of pollution credits that can be earned for each project…Its long-term consequences are (1) increased greenhouse gas emissions and (2) increased corporate profit obtained from their production.

Kevin Smith points out that carbon trading is designed "with the express purpose of providing an opportunity for rich countries to delay in making costly, structural changes towards low-carbon technologies." Indeed, it was at the urging of the U.S., and Al Gore in particular, that carbon trading was adopted in the Kyoto Protocol. This carbon market is in the process of being fully integrated into the capitalist financial system. Financial investors can now buy carbon allowances and "carbon credits" on the spot market or futures markets. Banks, brokers, funds, arbitrageurs, and private traders are all now plugged into what the World Bank says was a $64 billion market in 2007. Vandana Shiva estimates that the carbon market will grow to a multitrillion dollar giveaway to the very people who caused the bulk of the problem.

Initial experience with the European Union Emissions Trading System (EU-ETS) does not inspire confidence that carbon emissions trading will do much more than enrich

polluters. In order to provide a real incentive to reduce carbon emissions, economists calculate that the credits would have to be priced at 30-50 euros per tonne. But the ETS was skewed in the beginning as governments, bending to corporate lobbyists, grossly overallocated carbon permits and gave them to industry for free. This had two key results. First, in 2005, the first year of trading, the cap exceeded the actual emissions of the participating industries by 66 million tonnes, effectively gutting the market's ability to force any cuts in carbon emissions. Second, toward the end of the first round of trading in the ETS, the price of permits regularly fell below one euro per tonne. The overallocation also resulted in significant windfalls for some companies, which, despite getting the permits for free, turned it into a cost that they then passed on to consumers. Smith explains:

> A study of the UBS Investment Bank showed that the first round of the ETS has added 1.3 euro cents to each kilowatt hour of electricity sold. This sounds negligible until you consider that the German minister for the environment estimated that the four biggest power providers in the E.U.—Eon, RWE, Vattenfall, and EnBW—had profited by between €6 billion and €8 billion from overallocations and passing on the imaginary cost of the first phase of the ETS onto consumers.

A more effective way to curb carbon emissions is a direct carbon tax, which is much less vulnerable to manipulation. A carbon tax was first proposed in the European Union back in 1991, but so far only a handful of governments have adopted one.

Technological Saviors?

Although huge increases in greenhouse gas emissions are coming from emerging economies with enormous populations, such as China and India, much could be done to reduce carbon emissions in the countries of the global North, which saturate the atmosphere with carbon and have created the climate crisis. The simplest and most painless action is conserving energy. According to a 2002 report by the Rocky Mountain Institute, in the average home, electronic appliances like telephone answering machines, VCRs, and stereos, which draw electricity even when they are turned off, waste 587 kilowatt hours, or approximately 840 lbs. of carbon a year. Multiplying that by the number of households counted in the 2000 U.S. Census, that electricity usage alone represents more than 41 million tons of carbon unnecessarily burned and released into the atmosphere each year. Including energy-saving measures on computer equipment and lighting would generate much greater savings. Aside from requiring responsible manufacturing standards, the obscene level of public subsidies that the fossil fuel and nuclear industries have received and continue to enjoy—some $58 billion a year, according to energy economist Doug Koplow—could be redirected to not only ramping up real non-polluting renewable forms of energy but helping individual citizens pay for solar, wind, geothermal, or other installations to reduce their dependency on carbon now.

While such measures alone would not solve the problem of global warming, they would be an excellent first step and serious attempt toward drastically reducing carbon emissions so that we could begin to stabilize the climate. Despite the fact that making the transition to a carbon-free existence would spark an enormous global economic revival, the members of the capitalist old guard of the military-industrial complex are doing everything they can to retain their choke-hold on power. Not surprisingly, the technological "solutions" they offer merely extend their dominance.

Clean Coal

"Clean Coal" is widely promoted by government officials, the energy industry, mainstream economists, corporate journalists, and even some big environmental groups, like the Natural Resources Defense Council (NRDC), as one of the solutions we need to pursue to deal with global warming. The U.S., China, and India all have enormous coal reserves, which, though a dirty source of power, is cheap for the producers. Conventional coal-fired power plants burn pulverized coal in a boiler to produce steam that powers a turbine to generate electricity. More than half of the electricity in the U.S. is coal-powered, producing 36 percent of its CO_2 emissions as well as significant amounts of mercury, acid rain, and other compounds. Coal emissions are said to contribute to the death of 24,000 people each year in the U.S. alone.

"Clean Coal" refers to coal power produced using a process called integrated gasification combined cycle, or IGCC, where coal powder is mixed with oxygen and water in a sealed chamber. There it is heated to around 2,000° to make "syngas," which has much lower emissions of mercury, sulfur dioxide, nitrous oxides, and particulates. Syngas requires less water and generates less solid waste than the burning of pulverized coal. Besides lower emissions, these compounds and the carbon dioxide are much easier to separate out in gas form.

From a global warming standpoint, however, in order to be truly clean, coal would have to employ another technology, carbon sequestration and storage, to capture the carbon and put it somewhere besides into the atmosphere. The "somewhere elses"under consideration are deep under the ocean, in underground coal seams, saline reservoirs, or in declining oil fields, a technology that has been used for about 20 years to force more oil out of the ground. Another possibility is mineral storage, or "mineral carbonation," a process that would combine $C0_2$ with minerals found in the earth's crust such as calcium, magnesium, iron, sodium, and potassium. Mineral carbonation would transform the minerals into carbonates that would hold the carbon, a process that would rush and attempt to mimic what occurs naturally over time and is responsible for much of the limestone found on the surface of the earth. The U.S. National Academy of Sciences has said that 5-10 billion tons of CO_2 a year—about 40 percent of the 25 billion tons of human-made carbon emissions released each year up until 2005—could be "removed from the atmosphere and tucked safely away."

However, this technology is expensive and energy-intensive. Clean coal with carbon sequestration would increase the price of coal power 40-90 percent. And according to the UN Intergovernmental Panel on Climate Change, a power plant capturing and storing carbon in a geological formation or straight into the ocean would require 10-40 percent more energy than a power plant of the same capacity without sequestration. Mineral carbonation would require 60-180 percent more energy.

Aside from the cost and additional energy required, serious questions have arisen about whether vast amounts of carbon injected into various parts of the earth will actually stay there long enough, what effect such quantities of this introduced substance would have

in this new environment, and what would happen if it escaped back into the atmosphere. Acidification of the oceans is garnering increasing attention as a catastrophic global warming spinoff that could render the oceans—a key element in the planetary food chain—lifeless. Experiments have shown that continuous high-volume injections of CO_2 would kill off ocean organisms and alter the ocean ecosystem. Mineral storage would require vast new mining operations "similar to those of large-scale surface mines" that would not only pollute and scar the landscape but leave behind huge quantities of waste products to be transported to landfills.

In addition to those drawbacks, "clean coal" does nothing to address the wantonly destructive method of coal mining—mountaintop removal—which since the 1980s has been devastating the oldest mountains on the planet, the Appalachians. This practice began in Appalachia and has destroyed hundreds of mountains in West Virginia, eastern Kentucky, and Tennessee—creating a truly bizarre wasteland that looks more like a moonscape than the lushly forested mountains it has replaced. Mountaintop removal requires stripping the mountains of trees and topsoil, digging deep holes into the mountain, and loading them with massive amounts of explosives, thereby adding ammonium nitrate and diesel fuel into the mix. The explosives are detonated, blowing up the mountain into rubble so that the coal seams are much more easily accessible. After the coal is extracted, the debris and rubble are simply shoved down into the surrounding valleys, burying them and the waterways coursing through them. As this practice has increased, it has devastated adjacent communities, which are subject to flash floods, mudslides, and contaminants from the blasting and coal slurry left behind. Between 1985 and 2001, 6,700 "valley fills" were approved in central Appalachia, and more than 700 miles of mountain streams had been completely buried, with thousands more damaged.

Nuclear Delusions

Talk of a "nuclear renaissance" is commonplace these days due to the supposed fact that nuclear power doesn't generate any greenhouse gases. The inaccuracy of that claim aside, the conversation is decidedly one-sided, leaving out or downplaying many of the problems with nuclear energy.

In 2001, I wrote an article that began with the following:

> "Nuclear Follies," a February 11, 1985 cover story in *Forbes*, declared U.S. nuclear power "the largest managerial disaster in business history." With $125 billion invested, the magazine wrote, "only the blind, or the biased, can now think that most of the money has been well spent. It is a defeat for the U.S. consumer and for the competitiveness of U.S. industry, for the utilities that undertook the program and for the private enterprise system that made it possible."

In researching the story, I read hundreds of articles in the nuclear and energy trade press, which revealed that in the late '80s and all through the '90s—what could be considered the nuclear industry's Dark Ages—the industry and its supporters were wringing their hands at the industry's unenviable position as a global pariah. Nuclear proponents were also fretting about what it would take to revive their dream of a bright nuclear future. Then the ads—full-page spreads in the *New York Times*, *Washington Post*, and other big mainstream

publications—touting nuclear energy as the "clean air energy" began appearing in the late '90s. Despite the fact that the National Advertising Division of the Better Business Bureau found the ads misleading, the industry expanded on this theme and began selling itself as the environmentally friendly solution for global warming. The nuclear industry's mantra seems to have stuck. Today, nuclear power is widely referred to as a source of energy that will prevent catastrophic climate change by prominent mainstream journalists, scientists, and government officials, all of whom are well positioned to influence public opinion.

Currently 439 nuclear reactors are in operation around the world, 104 of them in the U.S. Thirty-four new reactors are now under construction in the world, and the International Atomic Energy Agency (IAEA) is forecasting up to 60 percent more nuclear power reactors operating worldwide by 2030. The U.S. has more nuclear reactors than any other country, though nuclear power only accounts for 19.4 percent of U.S. electricity generation. In contrast, France, with the second highest number of reactors, has 59 which produce 76.9 percent of its electricity. The country with the third highest number of reactors is Japan. Its 56 reactors generate 27.5 percent of its electricity. Aside from the renewed push for nuclear power in the U.S., the Canadian government is on board, as are the U.K., Italy, China, India, and South Africa.

Considering the expense, risk, and unresolved issues that come with nuclear energy, it might seem surprising that so many countries seem to be jumping on the nuclear bandwagon during this time of increasing global economic and political instability. Alison Katz, who has an insider's view after spending 18 years at the World Health Organization, points out that "the nuclear lobby is incomparably more powerful" than sectors of the economy that we readily associate with a lot of power and influence: the tobacco, agrochemical and petrochemical lobbies. The reason, she says, is that the nuclear lobby "comprises governments of nuclear states, most significantly, the United States, the United Kingdom and France," as well as powerful intergovernmental organizations. This not only helps explain why nuclear power seems to have been able to rise from its death bed, but also why so many of its problems and harms have been so successfully covered up or concealed altogether. In that larger context, nuclear energy is being transformed from what was recently a pariah technology into a "reasonable" and perhaps necessary solution to climate change.

Despite this new spin, nuclear power remains a terrible idea and one that cannot deal with catastrophic climate change. Here are the main reasons why:

First, enough reactors could never be built to address the problem. A widely quoted MIT report from 2003 says that 1,000 to 1,500 new 1000 mw reactors would have to be built by 2050 just to displace 15-25 percent of the expected *growth* in carbon emissions from electricity generation over that time. If we are supposed to be *reducing* carbon emissions, displacing a portion of projected growth in carbon emissions does not address the problem.

In addition, the MIT authors say that those reactors would create enough deadly, high-level nuclear waste—the irradiated spent fuel that comes out of the reactor core 2.5 million times more radioactive than when the uranium fuel pellets went in—to require a repository the size of Yucca Mountain in Nevada (which is mired in problems) to be created

somewhere in the world every three to four years. It has been 50 years since the start of the commercial nuclear power industry, yet no country has actually built a repository, though Sweden and Finland are closest to it and seem to be approaching it in a responsible way. That means sparing no expense to make sure that their waste remains isolated from the environment. In contrast, the U.S. is attempting to turn a geologically unstable, leaky site into an acceptable repository by installing titanium drip shields to keep corrosive water from getting onto the waste casks, along with loosening environmental, health and safety regulations. This difficulty in constructing high-level nuclear waste repositories and the consequent lack of places to put the waste make a "nuclear revival" completely unrealistic.

Second, nuclear power as a source of electricity is mind-bogglingly expensive. A new 1600 mw reactor is estimated to cost about $6 to 7 billion and at least $9 billion if it is financed. In the United States, power companies and private investors are not willing to gamble on the investment of building the reactors themselves, and in 2005, the U.S. Congress approved nearly $13 billion in cradle-to-grave subsidies to help jump-start the nuclear revival. The package provided $2.9 billion in research and development subsidies, $3.25 billion in construction subsidies, $5.7 billion in operating subsidies, and $1.3 billion for shutting old reactors down. Some of the more notable details of this package were $2 billion for "risk insurance," which would reimburse a nuclear utility for construction delays, even those that might occur if a whistleblower finds serious safety issues and a citizen group sues to get those concerns addressed. These recently allocated subsidies come on top of a history of public assistance that includes longstanding and lucrative tax benefits for mining the uranium for the reactor fuel; manufacturing the fuel and cleaning up the heavily radioactively contaminated manufacturing sites (an ongoing cost in the billions); favorable accounting mechanisms that significantly reduced the capital costs of building the first fleet of reactors; allocation of the remaining debt to electricity ratepayers (by 1997, these "stranded costs" were worth about $98 billion); responsibility for the high-level waste (at least $60-$100 billion for the existing fleet of reactors); and potentially trillions of dollars in the event of a catastrophic accident, particularly one near a densely populated area. At a time of escalating economic uncertainty and increasing strains on the public purse, the U.S. nuclear industry is not content with that generosity. It is now seeking more than $500 billion in additional subsidies to finance a new generation of nuclear reactors—an amount that would dwarf the billions this very privileged energy sector has already received.

Third, nuclear reactors are really dangerous, as Three Mile Island and Chernobyl demonstrated, though there have been attempts to rewrite the history of the impacts of both of those accidents. This effort has been particularly successful in the case of Three Mile Island, where the accepted conclusion is that nobody beyond the boundaries of the plant was injured or made sick by the accident, because it is claimed that no more radiation than a chest x-ray's worth was released outside the plant. Although that has been the contention of the nuclear industry, Pennsylvania officials, and the Nuclear Regulatory Commission (NRC) since the accident, one NRC staffer admitted in testimony before the commission that the radiation monitors placed in the vent stacks to measure radiation releases went "off scale" (i.e., they melted), which means that nobody knows how much radiation actually escaped in the Three Mile Island accident. I have personally met people who lived around Harrisburg, just miles from Three Mile Island, who reported experiencing classic symptoms of radiation poisoning, like a metallic taste in the mouth, skin rashes, nausea and vomiting on the day of the accident. Two thousand people who were in the path of the radiation plumes filed a

class-action lawsuit to try to get some help with various kinds of health problems—cancers, pregnancy problems, birth defects, and more—but after the judge, Sylvia Rambo, threw out most of the evidence they presented to support their claims, she ruled that there wasn't enough evidence to prove the Three Mile Island accident was responsible for their illnesses. Of the few cases that did settle, the terms of the settlement were sealed, and many, many died waiting for the case to crawl through the legal process, before it was finally dismissed in 1997.

In the wake of Chernobyl, there is open discussion of a "demographic doomsday" in Belarus, one of the areas hardest hit by Chernobyl's radioactive fallout. Yet a 2005 UN report says that only 50 deaths can so far be attributed to that accident and ultimately only 4,000 will die. As with Three Mile Island, the government officials in charge at the time were less than rigorous in keeping track of those exposed—the 800,000 "liquidators" who were called in to clean up the mess, the 350,000 people who lived in and were evacuated from the contaminated zones, the 1.6 million others who moved, as well as the 5 million who remained. Government agencies in Belarus, Ukraine and Russia have reported that 25,000 of the clean-up workers have died, and in Gomel, a city of 700,000 in Belarus just 80 km from the destroyed reactor, the incidence of thyroid cancer is 10,000 times higher than before the accident, congenital birth defects are up 250 percent, and infant mortality is 300 percent higher than the rest of Europe. Nevertheless, the new received wisdom about Chernobyl is that the health problems of its victims are due to poverty and—as is also claimed with Three Mile Island—"lifestyle," like smoking, poor diet, and stress.

Aside from the incredible injustice done to both the people of central Pennsylvania and those in the Chernobyl regions, the fact that the full truth about these accidents has been concealed from the public places us all at risk for the same fate if there is another major nuclear accident. David Lochbaum, the director of the nuclear safety program at the Union of Concerned Scientists, monitors the U.S. fleet of 104 operating reactors. According to Lochbaum, sheer luck has prevented another major accident in the U.S.—though there have been some scary near misses, most recently at the Davis-Besse reactor in Ohio in 2002. Lochbaum says because of the combination of aging plants, increasingly inadequate government safety oversight, and the nuclear industry's focus on cutting costs, it's a matter of when, not if, there is another major accident. He likens it to a slot machine, where the "winning combination" is an initiating event, equipment failure, and human error.

Beyond the risk of catastrophic accident, nuclear reactors emit radioisotopes into the atmosphere as part of their normal operation. So the claim that nuclear power is a "clean energy source" is untrue. Because you can't see, taste, or smell radiation unless the dose is big enough to constitute radiation poisoning, nulcear power is only "clean" in the sense that its pollution isn't readily detected.

The Radiation and Public Health Project has revived the collection of baby teeth from children living close to reactors. The collected teeth are ground down and checked for the presence of Strontium-90 (Sr-90), which mimics calcium in the body. The collection and analysis of baby teeth back in the early 1960s convinced U.S. President John F. Kennedy and Soviet Prime Minister Nikita Krushchev to halt atmospheric atomic bomb testing. According to Joe Mangano, the Radiation and Public Health Project's executive director, the

contemporary study has found alarming rates of Sr-90 in children living near nuclear plants, in some cases exceeding levels found in the early 1960s.

The radiation from the reactors is also taken up by the surrounding grass and other plants, and becomes concentrated as it moves up the food chain. Thus, animals on nearby farms ingest radioisotopes which can be measured in their meat and milk. The government knows this. In order to measure levels of radioactivity in the environment, since 1970 the State of New York has collected samples of air, milk, and water at specific sites around most of the commercial nuclear power plants, research reactors, and other industrial facilities that use radioactive materials. Vegetation, beef, fish, and sediment are also monitored around some of these sites.

Nuclear Reactors also leak radioactivity into the groundwater near them and contaminate the soil around the reactors. According to the Union of Concerned Scientists, 99 reactors in the United States have reported tritium (radioactive hydrogen) leaks. In the case of the Indian Point nuclear power plant, a plume of tritium is threatening the Hudson River, 35 miles north of New York City.

Beyond emitting radioactivity into the air or leaking it into the soil and groundwater, the plants themselves become radioactive messes which eventually have to be cleaned up. That's because the process of fission eventually makes the physical components of the plant—the concrete, metal, soil, and even some plant worker's uniforms—radioactive. Much of this is considered "low-level waste" which is governed by much less stringent disposal requirements than spent fuel. In fact, the industry has been trying to offload this into consumer products by "recycling" the contaminated metals, soil, and concrete. Richard Meserve, a former NRC chairman, said in January 2001 that releasing radioactively contaminated solid waste materials into everyday commerce is necessary to ensure both the continued viability of the nuclear power industry as well as the U.S. Department of Energy's clean-ups of its nuclear weapons' complexes (for example, Hanford in eastern Washington state, the Idaho National Laboratory, and Savannah River Site in South Carolina).

Besides the risk of catastrophic accident or routine contamination through normal operation, in our increasingly politically unstable world nuclear reactors are sitting-duck targets for terrorist attack. With renewed interest in the United States to pursue reprocessing of spent nuclear fuel, nuclear power plants become much more tied to the proliferation of nuclear weapons. Reprocessing separates plutonium and uranium from other nuclear waste elements, and according to Union of Concerned Scientists nuclear weapons expert Edwin Lyman, would triple the growing stockpile of plutonium—some 250 metric tons, or enough for 40,000 nuclear weapons already in storage worldwide as of the end of 2005. Contrary to current claims that reprocessing reduces the amount of nuclear waste, it actually increases the amount and types of nuclear waste by a factor of 20 or more.

Real Energy Alternatives

One has to ask, with all of these problems—and with the demonstrated response to deny and cover up problems when they do occur—why take the risk? Especially when there are increasing indications that the switch to a carbon-free, nuclear-free energy system could meet our energy needs. According to the U.K.-based New Economics Foundation, a broad

mix of renewable energy sources that includes micro, small-, medium- and large-scale technologies applied flexibly could "more than meet all our needs." Besides solar and wind power, the mix includes tidal, wave, small-scale hydro, geothermal, biomass, and landfill gas. Rather than relying exclusively on large baseload suppliers of electricity like nuclear plants, or single sources of renewable energy that are not always available, NEF says the key is setting up an extensive, diverse, and decentralized network of power sources, which would also be much less susceptible to widespread power outages.

The NEF report and other information indicate that there are real non-polluting, safe alternatives that could be implemented to help all of humanity as well as the species with which we share the planet avoid the worst impacts of catastrophic global warming. However, the most powerful sectors of the capitalist system—the military, the fossil fuel and nuclear power industries, various other industries tooled to the status quo, the resource extraction industries, the huge corporate media conglomerates who often have financial entanglements with these industries—all of these actors provide an enormous obstacle that must be overcome.

Alternative energy guru, Amory Lovins, argues that contrary to helping to solve the climate crisis, the current move to re-embrace nuclear power is a huge step backwards, because of the high cost and length of time it would take to get enough carbon-displacing reactors up and running. In a 2005 paper on the economics of using nuclear power to deal with climate change, he writes: "In practice, keeping nuclear power alive means diverting private and public investment from the cheaper market winners—co-generation, renewables, and efficiency—to the costly market loser. Its higher cost than competitors, per unit of net CO_2 displaced, means that every dollar invested in nuclear expansion will *worsen* climate change."

The false solutions currently on offer by the global capitalist system reinforce the status quo by supporting the power structure which both benefits from and is there to defend it. While embracing technologies like so-called clean coal or nuclear power would extend and maintain capitalist hegemony for a while longer, as far as saving us from catastrophic climate change, it's a fantasy. Furthermore, these fantasies of sustainability will only hasten the catastrophic breakdown of the planetary ecology—and bring us all down with it.