

Nuclear Power Is Not the Answer, by Helen Caldicott

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Theme: [Militarization and WMD](#), [Oil and Energy](#)

No one writes with more passion, commitment and knowledge about the immense dangers of nuclear technology in all its forms than Australian physician and nuclear expert [Helen Caldicott](#). Since writing her first book (must reading for everyone), *Nuclear Madness*, in 1978, Dr. Caldicott has worked tirelessly to expose the real threat this technology from hell poses to human survival. In her first book she wrote: "As a physician, I contend that nuclear technology threatens life on our planet with extinction. If present trends continue, the air we breathe, the food we eat, and the water we drink will soon be contaminated with enough radioactive pollutants to pose a potential health hazard far greater than any plague humanity has ever experienced."

Dr. Caldicott has now written 6 important books on nuclear technology and its dangers. Her latest just published is *Nuclear Power Is Not the Answer*. In it she's written a carefully documented account of the reasons why. Like her other books, this one, too, is must reading, and those doing it will never forget its vital message. The book is a basic text on all things wrong with commercial nuclear power and why, as Dr. Caldicott explains, this technology must be abandoned before it destroys us as it surely will if its use and proliferation aren't halted everywhere. This book is about commercial nuclear power in contrast to her last one, *The New Nuclear Danger*, that was a powerful and convincing indictment of the military-industrial complex and its addiction to nuclear weapons of mass destruction and the Pentagon's intent to use them as needed preemptively.

In her new book, Dr. Caldicott makes her convincing case in 10 chapters, each one covering a separate crucial issue about commercial nuclear power. Eight of them explain in detail its dangers and problems, and the two final ones propose sensible and urgently needed solutions so far largely unaddressed. But she begins in her introduction with a clear statement that our government has now embarked on a disingenuous and sinister campaign to sell the acceptability of the use and expansion of commercial nuclear technology to the US public long turned off on it by the near disaster at the Three Mile Island (TMI) nuclear power plant in Pennsylvania in March, 1979 and the catastrophic Chernobyl meltdown and explosion in the Ukraine in April, 1986. She begins her detailed account that, contrary to government and industry propaganda, nuclear power is neither efficient, reliable, cheap, clean or safe. It's a very sophisticated, expensive and dangerous way to boil water, turn it to steam, which then turns a turbine to generate electricity.

Dr. Caldicott explains, contrary to government and industry propaganda, that the generation of nuclear power causes the discharge of significant emissions of greenhouse gases as well as hundreds of thousands of curies of deadly radioactive gases and other radioactive elements into the environment every year. It also requires huge and unjustifiable government subsidies including protection against catastrophic accidents to make it attractive to investors. In addition, and most disturbing, there's the real threat of an attack

against any of our 103 nuclear power plants in blowback retaliatory response to hostile US acts against other nations in the past, the two current illegal aggressions and occupations of Iraq and Afghanistan, our one-sided support for Israel's long-running conflict with and current aggression against the defenseless Palestinians and people of Lebanon, and our possible intent to spread the present Middle East conflict to Iran and Syria with the preemptive use of nuclear weapons. US nuclear power plants are notoriously inadequately protected and are thus vulnerable easy targets to strike if a committed antagonist wished to do so. If it happens, the result will be a catastrophic disaster irrevocably affecting the area struck and people now living there.

Adding further to the danger, these plants are atom bomb factories. A 1000 megawatt nuclear reactor produces 500 pounds of plutonium annually, only 10 pounds of which is needed as fuel for a bomb powerful enough to devastate a large city and make it unlivable essentially forever. Dr. Caldicott explains all this and much more in her book, and her mission in writing it and her others, as well as her role as President of the Nuclear Policy Research Institute is to counteract the false rhetoric of governments worldwide and the nuclear power industry touting the so-called benefits of nuclear technology. In her dual roles, she's become perhaps the world's leading advocate for the abolition of a technology too unsafe to be tolerated any longer. She spends all her time dedicated to writing and speaking out around the world telling the public the truths they never hear in the mainstream about this dangerous and unacceptable form of producing energy to get them to demand it be abandoned.

Below is an account of the clear evidence Dr. Caldicott explains and documents, chapter by chapter.

Chapter 1 – The Energetic Costs of Nuclear Power – It Takes Fossil Fuel Burning Power to Produce Nuclear Energy

The American nuclear industry's task of selling its technology to the public is the responsibility of its trade association – the Nuclear Energy Institute (NEI). They do it through a false and misleading campaign of deception to convince the public that nuclear energy is "cleaner and greener" than conventional sources of generating electricity. The truth, however, is quite different. Although a nuclear power plant releases no carbon dioxide (CO₂), the primary greenhouse gas, into the atmosphere causing global warming, it requires a vast infrastructure, called the nuclear fuel cycle, which uses huge and rapidly growing amounts of fossil fuels. Each stage of the cycle contributes to the problem starting with the largest and unavoidable energy cost to mine and mill uranium fuel which requires fossil fuel to do it. It continues with the problem of what to do with the mill tailings produced in the uranium extraction process that require great amounts of these greenhouse emitting fuels to remediate when this process is undertaken as it always should be. Other steps in the nuclear fuel cycle also require the use of fossil fuels including the conversion of uranium to hexafluoride gas prior to enrichment, the enrichment process, and the conversion of enriched uranium hexafluoride gas to fuel pellets. In addition, nuclear power plant construction, dismantling and cleanup at the end of their useful life require large amounts of energy. But the process and problems don't end there. The contaminated water that cools the reactor core must be dealt with, and the enormous problem of radioactive nuclear waste handling, transportation and disposal/storage remains unresolved.

Chapter 2 – The True Economic Costs of Nuclear Energy – The Price in Dollars and Cents

Nuclear industry and government propaganda notwithstanding, nuclear power is expensive, and when an inevitable catastrophic meltdown eventually occurs near or in a US city we'll know in grim detail just how much so. The industry falsely claims nuclear power costs 1.7 cents per kilowatt hour to produce compared to 2 cents for coal and 5.7 cents for natural gas. But a report by the New Economic Foundation titled "Mirage and Oasis - Energy Choices in An Age of Global Warming" calculated the true cost to be three times the industry figure if all costs, including capital ones, in the nuclear cycle are included. And even these costs exclude the additional ones of managing pollution, accidents that occur, insurance and security to protect against an attack or internal sabotage.

The true costs and risks of nuclear power are so unattractive to investors that this industry couldn't exist without the many billions of dollars of government spending support it gets including most of the \$111.5 billion on energy R & D spent from 1948 - 1998. But heavy government funding will now become even greater as a result of the 2005 Energy bill that's part of an attempt to jump-start this moribund industry. This outrageous bill offers a lavish array of "cradle to grave" subsidies that include tax credits and breaks, loan guarantees, R & D help and risk insurance. It also assures the government will cover the cost of the complex infrastructure needed to transport and store nuclear waste, provide military protection against potential blowback attacks and more. In addition, it reauthorizes the current Price-Anderson Act that will make taxpayers and not the industry pay 98% of the cost in case of a worse case nuclear meltdown that's sure to occur one day. It's part of the same scam that's in place for all other major US industries. It's called socialism for large corporations that write the legislation serving their interests guaranteeing them huge government subsidies and other benefits and capitalism for the rest of us who must pay for them through our taxes.

One of the major and most egregious provisions of the 2005 Energy bill is the repeal of the important Public Utilities Holding Company Act (PUHCA) passed in 1935 as a cornerstone of New Deal financial reform that corrected the abuses of utility holding companies that scammed ratepayers. Now it's again open season for giant power monopolies and other dominant corporations to own nuclear power plants and exploit the public free from regulatory oversight or competition to restrain them. It's all part of a business-government scheme to develop a dangerous industry, largely free it from regulatory oversight, make it profitable for giant US corporations to own and dominate, and get the public to assume all the risks and foot the bill at inflated prices.

Chapter 3 - Nuclear Power, Radiation and Disease - The Unaddressed Human Toll

The overall cost of nuclear energy rarely, if ever, includes the very significant toll it takes on human health. Those paying the price include uranium miners, nuclear industry workers and potentially everyone living close to these operations. Also affected are residents in areas close to nuclear power plants that routinely or accidentally emit toxic radioactive releases that can cause illness, disease and death over time. Chicago is a prime example of what may go wrong. The city is surrounded by 11 nuclear power plants, many of them aging and all of them with histories of safety violations caused by aging and shoddy maintenance. Even if accident free, these facilities (and all others everywhere) discharge enough radiation daily in their normal operations to contaminate the food we eat (even organic food), water we drink and air we breathe into our lungs. But if a core meltdown ever occurs at any of these plants (a real possibility no one is prepared for) and Chicago is downwind of the fallout, the city and suburbs alone would become uninhabitable forever and would have to be evacuated quickly with all possessions left behind and lost (including people's homes)

except for what could be carried in suitcases or family vehicles.

Two other groups especially also have and continue to pay an overwhelming and largely hidden price from the toxic effects of radiation poisoning – the people of Iraq and US military force invaders and occupiers who now serve there, have served or will in the future as well as those participating in the 1991 Gulf war. Most of them have potentially been exposed to the deadly effects of so-called depleted uranium (DU) poisoning because of the extensive use of DU munitions by the US military in both Iraq conflicts. These weapons were first developed for the Navy in 1968 and tested by Israel in the 1973 Yom Kippur war under US supervision. Except for that test, they were never before used by any country prior to the US Operation Desert Storm in 1991. Since then, the US has used them freely, routinely and with deadly consequences to those affected by their fallout.

DU is part of the radioactive waste resulting from the enrichment process used to produce enriched uranium fuel for nuclear reactors. When the Pentagon discovered that solid “dense metal” (1.7 times the density of lead) DU projectiles in all forms (missiles, bombs, shells and bullets) greatly increased their ability to penetrate and destroy a target, they knew they had a new technology they could use advantageously in combat and now have done so for the last 15 years in four wars. Despite their effectiveness as a weapon, however, DU munitions have a serious and deadly side effect. In all their forms, they’re radioactive and chemically toxic after striking, penetrating and incinerating inside a target after which they aerosolize in a fine spray which then contaminates the air, soil and water around and beyond the target area. The toxic residue is permanent and those ingesting this ceramic uranium oxide have a permanent dose that potentially can cause many diseases including cancer, leukemia, birth defects and ultimately death or at least a shorter, more painful life.

No one has kept track of the precise toll DU poisoning has had on the Iraqis although it’s known the cancer rate in the country is far higher now than before 1991. But much is known about how DU toxicity has affected the US military who served in the Gulf war. Thirty percent or more of them are now on some kind of disability or have died from a serious illness likely the result of their military service in the Gulf. We’re also just beginning to learn that those serving in Iraq since March, 2003 are reporting disturbing symptoms. Over time, it’s likely they’ll multiply greatly, affect a greater number of our forces than those serving in the Gulf war because of longer and repeated deployments to the region and eventually cause an even greater number of serious illnesses and deaths because the DU weapons now used contain plutonium, neptunium and the highly radioactive uranium isotope U-236. A UK Atomic Energy Authority 1991 study found these latter two isotopes were 100,000 times more dangerous than the U-238 used earlier in DU munitions. By any interpretation of the appropriate Hague and Geneva Conventions banning the use of all chemical, biological or any other “poison or poisoned weapons” in war, the US use of DU munitions constitutes a war crime that has and will continue to take an immense and tragic toll on those individuals exposed to them.

The danger to human health from the use of nuclear power in any form is unavoidable even under the best of circumstances outside of a war zone. But whenever serious accidents happen, as they have and will again, the consequences can be calamitous. The link between radiation exposure and disease is irrefutable dependent only on the amount of cumulative exposure over a long enough period of time. Dr. Caldicott explains that “If a regulatory gene is biochemically altered by radiation exposure, the cell will begin to incubate cancer, during a ‘latent period of carcinogenesis,’ lasting from two to sixty years.” As little as a single gene

mutation can eventually turn out to be fatal and too often is. No amount of radiation exposure is safe, and it's thought that 80% of known types of cancers are environmentally caused by such exposure combined with the potentially carcinogenic effects of about 80,000 different inadequately or untested chemicals in common use acting synergistically in our bodies to harm us.

But just the combined effects of routine allowable radiation from nuclear power plants, uranium mining and milling operations, uranium enrichment, and fuel fabrication can be devastating to all those exposed to any of their effects. Add to that the insoluble problem of radioactive waste disposal/storage and the certainty of devastating nuclear accidents, it's no exaggeration to say the human species is playing an insane game of nuclear Russian roulette it can't win and that will eventually have a disastrous and possibly fatal ending if we can't stop it in time.

Chapter 4 – Accidental and Terrorist-Induced Nuclear Meltdowns – A Devastating Nuclear Event is Certain

Many experts agree it's only a matter of when and where, not if, a devastating meltdown will occur in one or more of the 438 nuclear power plants located in 33 countries worldwide. It may result from human error, a plant owner's unwise or unsafe attempt to minimize operating costs, the Nuclear Regulatory Commission's (NRC) imprudent accession to industry pressure to allow 20 year operating extensions to plants designed to run only for 40 years, the effects of a tsunami or high enough magnitude earthquake in areas vulnerable to them or from a deliberate attack or internal sabotage. When this does happen, if it's near a large city and its full impact is felt and known, the world may never be the same again. But it will be too late for the residents in and around that city (which could be New York, Chicago or Paris) who'll lose all their possessions, be forced to evacuate their homes, and never again be able to return to them because of the permanent irremediable toxic radiation there.

Dr. Caldicott explains that "Every US power plant is moving into the old-age cycle" because no new ones have been built here since the TMI accident in Pennsylvania in 1979. As a result, the number of near-misses and near-meltdowns has increased mostly resulting from human error, aging equipment and inadequate maintenance and regulatory oversight. With the dangers so high and inevitable and the supposed benefits totally without merit, why would the leaders and residents of any community ever be willing to allow the construction or operation of a nuclear power plant near enough to them to destroy their lives should a catastrophic nuclear event happen as it surely will potentially at any of the world's nuclear plants.

Chapter 5 – Yucca Mountain and the Nuclear Waste Disaster – This Congressionally Chosen Area for Storage is Known to Be Unsafe

For a geological nuclear waste storage site to be safe, it must be able to prevent any leakage and seepage into the environment for at least 500,000 years. The chosen Yucca site can't achieve this mandate for many reasons. It's close to groundwater that will be contaminated from leakage from corroded casks that will spread to spring water irrigation areas used for farming and by protected species. Yucca is also located in an active earthquake zone where in 1992 a major 7.4 Richter measured quake occurred followed two days later by an additional 5.2 quake that caused \$1 million of damage to the Department of Energy (DOE) building located six miles from the Yucca site. Yucca Mountain was thought

to be waterproof as its soil must be dry to prevent corrosion. But much more water inside was discovered there than originally estimated meaning this site is far too dangerous for a permanent home for nuclear waste storage. In addition, this site is located close to Nellis Air Force Base, Nevada where new military jet aircraft are tested, war exercises are held and crashes happen that may have serious and unacceptable consequences.

Finally and crucially is the issue of radioactive waste transport from around the nation to this one site on highways and by rail. It will take 30 years to move the 70,000 metric tons of civilian and military spent fuel Yucca is authorized to store from its temporary sites around the country to this one location. Currently there's no prohibition on the shipping of this waste through highly populated areas nor during periods of bad weather like severe snow storms making driving hazardous. But it's been predicted as many as 50 accidents a year may result, three of them involving serious releases of toxic radiation that will contaminate the surrounding environment. In addition, and compounding the problem, all 11 of the storage casks currently approved and used by DOE for radioactive waste transport have been found to be defective. But none of these concerns have diminished the Bush administration's determination to proceed with the Yucca storage plan. Clearly, it has no concern whatever for public safety. For those in the administration, only corporate profits matter along with their plan for world dominance to enhance them.

Chapter 6 – Generation IV Nuclear Reactors – They Will Increase Operational Risks and Are Unacceptable

The majority of the world's operating nuclear power reactors are so-called Generation II types. But there are serious and potentially fatal problems associated with them, and yet the industry wishes to move ahead to new designs that promise to be even more dangerous. Currently there are Generation III reactors operating in the US only slightly different from the Generation II ones. A 2005 Greenpeace study of nuclear reactor hazards showed most of these newer versions to be little different than their dangerous predecessors despite false industry claims about their added safety. Still about 20 different Generation III designs are now under development which the industry expects to be built and operational by 2010.

The Generation III and a so-called III+ design represent “evolutionary changes” from their predecessors despite the dangers associated with them. Undeterred, a newer Generation IV “revolutionary” design is under development that relies on fuel and plant performance standards that have not been tested and may turn out to be unachievable. Despite the danger involved, and with the public footing the bill and risk, the industry has made the outrageous and unproved claims that these reactors are ideal fuel providers, safe, proliferation resistant, economically competitive and free from greenhouse gas emissions. Dr. Caldicott debunks all these notions and calls them as “baseless today as (the absurd) ‘too cheap to meter’ (claim) was fifty years ago.” She goes on to explain that “People with an intimate understanding of the nuclear industry are severely opposed to a nuclear renaissance” because of the unacceptable risks and most all other falsely claimed benefits associated with it. Dr. Caldicott concludes that so-called Generation III and IV reactor designs “are controversial and contentious, and seem not to be based upon sound economic, environmental safety, or proliferation-resistant principles.” Based on the industry/government's long-standing record of lies and deception in promoting the safety and benefits of nuclear power, one can hardly disagree with her.

Chapter 7 – Nuclear Energy and Nuclear Weapons Proliferation – This is Madness and An

Unacceptable Risk

Experts who know, explain that the nuclear arms supermarket and the dissemination of nuclear technology is vast, growing and dangerous. It's likely only a matter of time before a rogue nation or element obtains and makes one or more crude highly-enriched uranium nuclear bombs and sets one of them off in a major city probably located in the US. New York and Washington, DC are clearly the most obvious likely targets, and if it happens, those cities will have to be evacuated and will be uninhabitable forever if the bomb is large enough and strategically placed.

The chance of that happening will increase if, as proposed, 2,000 nuclear power plants are built in countries wanting them in the decades ahead. Those plants in operation would produce an inventory of about 20,000 metric tons of plutonium, the most deadly of all toxic substances known (as little as one-millionth of a gram is a carcinogenic dose), dwarfing the current amount in the world today and increasing the potential danger from it enormously. Dr. Caldicott calls this "plutonium madness." Twelve years ago, the National Academy of Sciences called the US and Russian military-derived plutonium stockpiles alone "a clear and present danger to national and international security" because of the chance of any of it falling into rogue hands. If a vastly larger stockpile is produced in so many places, it would be much harder to secure or keep track of. It's generally accepted that it takes just five kilograms (11 pounds) of weapons grade plutonium or 8 kilograms (17.6 pounds) of reactor grade plutonium to make a nuclear bomb. With so much of this substance around, and much of it likely inadequately secured, the temptation to do it would be enormous.

The danger is even greater because today 18 countries have uranium enrichment facilities enabling them, if they wish, to produce fuel for nuclear weapons. Nine of these countries are now known to possess nuclear weapons, and the IAEA estimates that within 10 years as many as 40 or more nations may be able to make them, and many likely will to have available at least in self-defense. In addition, 70 countries now have legally acceptable small nuclear reactors, mostly fueled by highly enriched uranium. These reactors also manufacture plutonium, and both fuels can be used to make nuclear bombs if elements in any of these countries have the know-how and wish to do so. Many of them will be forced to do it in response to threats posed by hostile neighbors and especially by the US that openly claims the right to use nuclear bombs preemptively in any future conflict for any reason it claims is justifiable and certainly will unless restrained. If this happens, it's only a matter of time until a nuclear bomb is set off on US soil with all the devastation that will follow from it.

Chapter 8 - Nuclear Power and "Rogue Nations" - Those Having Nuclear Weapons or Threaten to Use Them Are the "Rogue" Ones to Fear

Two nations clearly are at the head of the "rogue" nuclear pack - the US and Russia that combined have 97% of the total known arsenal of about 30,000 nuclear bombs. Because these two nations maintain thousands of these weapons on "hair-trigger" alert, a nuclear exchange between them would cause a nuclear winter and likely end all life on all or most of the planet. It could happen despite the end of the cold war as relations between the two countries have become more frosty and Russia's early warning system is hopelessly outdated, flawed, inadequate and subject to false alerts with only moments to react before it's too late. In addition, other countries having nuclear weapons or sure to develop them in the future, will certainly respond with them (if able) if they're attacked with these weapons or possibly even by conventional ones. Responsible leaders of any nation are likely to develop and use whatever weapons they have in self-defense if forced to do so. It's a very

real and dangerous possibility and reason enough to argue for the abolition of this technology from hell that may destroy all human life if left unchecked.

The case of Iran stands out at this time as it's become a target of the Bush administration for regime change which the Iranian government knows and realizes it must act in its own self-defense to prevent. Iran is pursuing a nuclear option it claims is for commercial use only. The country is a signatory to the Nuclear Non-Proliferation Treaty (NPT) and, as far as known, is in full compliance with it while India, Pakistan and Israel (all having known nuclear arsenals) are not, haven't signed it and don't comply with it. There is no way to know what Iran's intentions are, but it would be irresponsible for its leaders not to be undertaking all measures it can to prevent a hostile attack or deter one if it occurs. The Iranian President Mahmoud Ahmadinejad pointedly observed in September, 2005: "Every day they (the Americans) are threatening other nations with nuclear weapons." He added that Western countries were "relying on their power and wealth to try to impose a climate of intimidation and injustice over the world." It's logical and likely to assume most or all nations with concerns for their security will take whatever measures they can to protect themselves and retaliate if attacked. But it must also be pointed out that no nation ever has or is now or in the near future likely to threaten the US with a hostile attack – not Iran, North Korea, Syria, Venezuela or any other. It's quite clear to them all and to the West that if any did, the US would destroy them.

Only one nation above all others is a threat to world security and peace, and that nation is the most "roguish" of all. It's the US, and all other countries know it. The US is now waging two illegal wars in the Middle East and Central Asia, unconditionally supports Israel's right to do the same against the defenseless Palestinians and Lebanese and is threatening additional conflicts against Iran, Syria, Venezuela (to remove a three-time democratically elected President loved by the great majority of his people), and possibly North Korea. In addition, the US claims the right and intent to preemptively use nuclear weapons if it wishes and went to great lengths to undermine the Nuclear Non-Proliferation Review conference at the UN in May, 2005. It happened under the aegis of the thuggish US Under Secretary for Disarmament at the time John Bolton (now UN ambassador) who deliberately sabotaged the meeting by refusing to participate in meaningful discussions. Other nations at the conference were outraged and disgusted with his actions and the nation he represents – to no avail, especially after Bolton assumed his UN role and prevented any disarmament discussions in that capacity. Even UN Secretary General Kofi Annan, who nearly always is unreservedly submissive to US authority, uncharacteristically expressed his disgust calling the US action a "real disgrace" as it surely was. Nonetheless, because of the total US dominance over the UN and its actions, no progress on nuclear disarmament and non-proliferation has been made nor is any likely to be at least as long as the Bush administration remains in office, and probably much longer. Can the world afford to take a chance and wait, hoping for the best that may never come without forceful action?

Chapter 9 – Renewable Energy: The Answer – Alternatives Exist but Are So Far Unaddressed and Insufficiently Developed

Dr. Caldicott makes an impassioned plea throughout her book and her others to free the planet from the scourge of the nuclear threat that may destroy us. In this chapter she states: "there is no need to build new nuclear power plants to provide for the projected energy needs of the future.....it would be possible, using other forms of electricity generation to close down most of the existing nuclear reactors with a decade. There is enough wind (power) between the Rocky Mountains and the Mississippi River alone to

supply three times the amount of electricity that America needs.”

There are other alternatives as well to the use of nuclear power that hold some promise including the conversion of coal to a synthetic fuel. Dr. Caldicott, however, concentrates on renewables in this chapter. She mentions that today that about 2% of electricity in the US comes from this safe and clean source whereas nuclear power supplies 20%. However, if hydroelectric power is included in the mix, about 9% of our electricity came from renewables in 2004 and 18.6% of it worldwide. Clearly, the rest of the world is far ahead of us, and the main problem in this country is the power of the fossil fuel and nuclear industries that have a stranglehold on US policy making and the politicians who make it. Unless they decide it's profitable to move to renewables, it won't happen and we'll continue down the same destructive road to an inevitable bad ending.

Those on opposite sides debate whether alternatives alone can solve this nation's electricity needs. However, the respected journal, *The New Scientist*, recently wrote that the combination of wind and tidal power, micro-hydro, and biomass make renewable power increasingly practical. It said wind power and biomass are now almost as cheap as coal, and wave power and solar photovoltaics are becoming more competitive. A report from the New Economics Foundation supports these conclusions. It said renewables are easy to build, cheap to harvest, economical to use overall, safe, flexible and clean.

Despite industry resistance and support for it by complicit governments, especially in the US, the mounting evidence of the destructiveness of carbon emissions and nuclear proliferation dictates the urgent need to implement safe alternative solutions to our energy needs and do it now. The threat of global warming is the most obvious one, and that issue has entered mainstream discussion to some degree. It's now clear the planet is becoming warmer, the number and intensity of destructive storms are increasing, and the phenomenon of catastrophic environmental events are becoming more common. Still, the US pretends it isn't so as evidenced by its refusal to sign the Kyoto Protocol in 2001, weak and ineffective as it is. It's now up to the public and individual states to act in lieu of the federal government and hope a future administration may be more responsible than this one – a faint hope given the power and influence of energy industry that so far refuses alternatives to its interests and has been able to get its way. But the public can't stop trying because the alternative is catastrophic and mustn't be allowed to happen if at all possible.

Chapter 10 – What Individuals Can Do: Energy Conservation and Efficiency – If the Government Won't Do It, People on Their Own Can

Western Europeans are able to maintain a high living standard similar to people in the US using half the amount of energy we do. If they can do it comfortably, so can we, but we need the urging and mandating of reduced energy standards by government at the state and local levels combining to pressure the federal government to do the same. Dr. Caldicott lists a menu of ways we can live responsibly using energy-efficient technologies that have been available for many years and are becoming more sophisticated and cost effective all the time. They range from what we can do in our homes, the type of cars we drive and way we use them to how new buildings are constructed and much more. The key is the urgency to act, and the goal is energy efficiency and safety and the benefits to be gained from them.

Everyone needs to be involved and many cities, states and businesses already are if only for the cost savings achieved by acting responsibly. A 2004 study by Synapse Energy Economics titled “A Responsible Electricity Future,” offered a pragmatic and workable plan.

It concluded that energy efficiency can reduce US electricity demand by almost 28% by 2025; nonhydro renewable energy, including geothermal, landfill gas, biomass, solar thermal, solar power generation, and especially wind power can provide 15% of US electricity needs by 2025; combined heat and power generation will produce 10% of it; oil, coal, and gas-fired generators can be retired after fifty operating years; and no new nuclear plants need be built and all old ones can be closed after 45 years of operation.

The net result of this plan is many billions of dollars saved, a reduction in global warming, and a cleaner and safer environment free from the destruction guaranteed by the continued use of fossil fuels and nuclear power. Can it be done, and is there still time to do it? Some experts claim no on both counts, and they may be right. But that's no excuse for giving up and allowing a fate too frightful and devastating to allow to happen without a concerted effort to prevent it. Hope sustains us and when combined with commitment and enough effort by those of us willing to expend it, anything is not only possible, it quite likely can be attained. We have no time to waste because we've already wasted so much of it.

Everyone should read Helen Caldicott's important new book and her previous one *The New Nuclear Danger*. The two combined clearly explain how threatening the military and commercial use of nuclear technology is to human survival. It's no exaggeration to say either we must destroy it or it will destroy us. Albert Einstein, whose theories led to the development of atomic power, knew this well and believed the splitting of the atom changed everything and threatened us all. In 1946, he said, after he understood the horror of Hiroshima: "Our world faces a crisis as yet unperceived by those possessing the power to make great decisions for good and evil. The unleashed power of the atom has changed everything save our modes of thinking, and thus we drift toward unparalleled catastrophe." Einstein believed and was saying that unless nuclear technology is abolished, we face the real threat of our extinction. Helen Caldicott in her new book and her others is saying the same thing. Are we listening, do we understand, and will we act in time to save ourselves and our progeny?

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