

*Foreword*

# **Insurmountable Risks:**

**The Dangers of Using Nuclear Power  
to Combat Global Climate Change**

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## Foreword: The return of the nuclear messiahs

Here is a book for the times. Uranium enrichment and reprocessing, once terms reserved for eggheads dealing in nuclear esoterica, are in the headlines everyday. Politicians and diplomats argue about them and the proliferation threats arising from the spread of commercial nuclear power technology.

Yet, strangely, in a parallel universe also being played out on the public stage, is the nuclear industry's claim, amplified by the megaphones of the media, that nuclear power can play a vital role in saving the Earth from another peril – severe climate disruption caused by the anthropogenic emissions of greenhouse gases.

Could it? Could nuclear power really help save the world from what is arguably the worst environmental scourge ever to confront humanity? History would suggest two things: caution about the nuclear industry's messianic proclamations and careful analysis of the problem.

The early promises of the fervent advocates of nuclear energy were of an economic paradise that nuclear energy would usher in for everyone from the needy to the greedy. No whim or need would go unfulfilled. But it was mainly fantasy and propaganda.

Almost two decades ago, browsing through the stacks of a well endowed library, I ran into a 1950 article written by a research engineer by the name of Ward Davidson from Consolidated Edison Company of New York. It was published in the then-nuclear industry journal *Atomics*. Updating an earlier 1947 opinion, he wrote that the technical problems facing nuclear power were even more daunting than he had imagined. For example, the materials requirements would be stringent, given the high temperatures and damage from high neutron fluxes. Testing of the alloys to ensure the quality and uniformity needed would be difficult. All this meant, of course, that nuclear power would be quite expensive.

Reading that prescient 1950 assessment was an eye opener. Like almost everyone else, I believed that the common technical conclusion prevalent in nuclear circles in the 1940s and 1950s was that the nuclear energy would soon be “too cheap to meter.” After all, that statement was made by the Chairman of the U.S. Atomic Energy Commission in 1954 and endlessly repeated. I had presumed that it was simply a mistake, but who doesn't make mistakes? This was the first inkling of what further research would decisively show: it was the uniform conclusion of all serious analyses at the time that nuclear electricity would be expensive.<sup>1</sup>

“Too cheap to meter” was part self-delusion, as shown by the florid and fantastic statements made by the most serious people such as Glenn Seaborg, who led the team that first isolated plutonium, and Robert Hutchins, the President of the University of Chicago during the Manhattan Project. And it was part organized propaganda designed to hide the horror of the hydrogen bomb.

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<sup>1</sup> This Foreword is based on Part I of Makhijani and Saleska 1999.

In September of 1953, less than a month after the detonation of the Soviet's first hydrogen bomb, AEC Commissioner Thomas Murray wrote to the commission's chairman that the U.S. could derive “propaganda capital” from a publicity campaign surrounding their recent decision to construct the Shippingport nuclear power plant.<sup>2</sup> Sterling Cole, the chairman of the Joint Committee on Atomic Energy in the U.S. Congress, reached a similar conclusion regarding the importance of demonstrating the “benefits” of nuclear power as a counter balance to the immense destructive force of the hydrogen bomb. This conclusion, in fact, led Cole to worry that the Soviets might beat the U.S. to a functional nuclear power plant, and thus steal the claim to being the true promoters of the “peaceful” atom. In a letter to a fellow Congressman, Sterling Cole wrote

It is possible that the relations of the United States with every other country in the world could be seriously damaged if Russia were to build an atomic power plant for peacetime use ahead of us. The possibility that Russia might actually demonstrate her “peaceful” intentions in the field of atomic energy while we are still concentrating on atomic weapons could be a major blow to our position in the world.<sup>3</sup>

As early of 1948, the Atomic Energy Commission reported to Congress that “the cost of a nuclear-fuel power plant will be substantially greater than that of a coal-burning plant of similar capacity.”<sup>4</sup> In the January 1949 issue of *Science*, Robert Bacher, one of the original members of the AEC and a member of the scientific team at Los Alamos during the war, cautioned that despite the progress that was being made, it was “far too early to make any predictions about the economic feasibility of atomic power.”<sup>5</sup>

One of the most direct of the early critiques of the economics of nuclear power came in a December 1950 speech before the American Association for the Advancement of Science by C.G. Suits. At the time, Suits was the Vice-President and Director of Research at General Electric which was then operating the Hanford plutonium production reactors in Washington State and was one of the principal companies developing nuclear reactors for the production of electricity. In his speech, which was reprinted in the industry journal *Nucleonics*, Suits stated bluntly that:

It is safe to say... that atomic power is *not* the means by which man will for the first time emancipate himself economically, whatever that may mean; or forever throw off his mantle of toil, whatever that may mean. Loud guffaws could be heard from some of the laboratories working on this problem if anyone should in an unfortunate moment refer to the atom as the means for throwing off man's mantle of toil. It is certainly not that!

...

... At present, atomic power presents an exceptionally costly and inconvenient means of obtaining energy which can be extracted more economically from conventional fuels... The economics of atomic power are not attractive at present, nor are they likely to be for

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<sup>2</sup> Murray 1953

<sup>3</sup> Cole 1953

<sup>4</sup> AEC 1948

<sup>5</sup> Bacher 1949 p. 6 and LANL Biography

a long time in the future. This is expensive power, not cheap power as the public has been led to believe.<sup>6</sup>

In 1953, an official AEC study concluded that “no reactor could be constructed in the very near future which would be economic on the basis of power generation alone.” Significantly, this language was identical to that in a study published by industrial companies and major utilities including Bechtel, Monsanto, Dow Chemical, Pacific Gas and Electric, Detroit Edison, and Commonwealth Edison.<sup>7</sup>

The dismal assessment of the prospects of nuclear went back to the Manhattan Project. In a star-studded 1948 report, authored by Enrico Fermi, Glenn Seaborg, and J. Robert Oppenheimer, the authors concluded that there was “unwarranted optimism” about the speed with which the technical difficulties facing nuclear power could be overcome as well as the speed. Ironically, the self-same Glenn Seaborg waxed eloquent about how plutonium fuel could transport everyone into a technical wonderland of “planetary engineering” – which, of course, could only be done if energy were actually very cheap..

Now, over half a century after the fantasies and the propaganda, and over a quarter of a century since the last reactor order in the United States, the nuclear industry is returning. Then it was the promise of an endless supply of fuel – what Alvin Weinberg, the first Director of Oak Ridge National Laboratory called a “magical” energy source. Uranium-238, not a reactor fuel, would be turned into fuel in breeder reactors, even as those same reactors consumed plutonium fuel. The net result would be more fuel at the end of the cycle. With supplies of uranium-238 being rather vast, the physics of the fantasy was only slightly exaggerated.

***But physics is not enough.*** An energy source must still meet the tests of safety, reliability, and cost. In the case of nuclear energy, there is also the unique problem of nuclear proliferation, in part hidden in the form of the plutonium content of the spent fuel and in part in the form of the spread of know-how. Taken together, these factors made the physics “magic” evaporate the first time around. Breeder reactors and the associated reprocessing have yet to be commercialized after over \$100 billion in expenditures worldwide (constant 1996 dollars) and more than fifty years of effort.<sup>8</sup>

It is the same today. As Brice Smith notes, and as several careful analyses have shown, the carbon dioxide emissions from a nuclear electricity system can be kept very small, in fact, an all nuclear-energy-system could theoretically reduce them to zero. But the physics is not the problem now; nor was it then.

The problems are:

1. How much will nuclear energy cost relative to other means of getting rid of carbon dioxide emissions?

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<sup>6</sup> Suits 1951

<sup>7</sup> Makhijani and Saleska 1999 p. 67-68

<sup>8</sup> Makhijani 2001.

2. What kinds of subsidies will be required, given that Wall Street is skittish about nuclear power?
3. What will be the risks of catastrophic accidents if we build reactors at the rate of one a week or more, cookie-cutter style around the world?
4. What will happen to the security of power supply in case of terrorist attacks or disastrous accidents on the scale of Chernobyl?
5. What about all the plutonium in the waste?

In *Insurmountable Risks*, Brice Smith carefully analyzes all these questions and more. It is a meticulously researched work that points to the great dangers of attempting to solve the problem of reducing carbon dioxide emissions by resorting to large-scale use of nuclear energy. Were there no alternative, the severity of the threat facing humankind and other species as well from global climate change might well warrant serious consideration of the risks of nuclear energy. But we do have alternatives that will not leave proliferation headaches and risks of radioactive landscapes like the ghostly zone around Chernobyl to future generations.

Before buying into the idea that nuclear energy is going to save us from global climate change because of its theoretical potential for low carbon dioxide emissions, read this book. And then work for the alternatives.

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