Fact or Fiction?



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"A generation or more thinks of nuclear power plants—when it thinks of them at all—as bad accidents waiting to happen, despite a remarkable safety record." 1

Greater than one-third of the world's population (more than two billion people), live today without access to any electricity. Further, another two billion people in the world exist on less than 100 watts of electricity per capita. By comparison, the large economies of Japan and France use more than 800 watts of electricity per capita, and the United States uses nearly 1500 watts of electricity per capita.²

In the U.S., 103 nuclear power plants generated 20 percent of the country's electricity (nearly 730 billion kWh) in 1999. Although much has been made of the fact that no new nuclear power plant orders have been placed in the U.S. since the early 1970s, the electricity generation from nuclear power has, in fact, risen eight percent per year for the past 20 years. Forty plants placed on order in the 1970s have

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tors have risen steadily to a high of 88 percent in 1999. The total electrical output from U.S. nuclear plants has, therefore, risen from something less than 300 billion kWh in 1980 to 730 kWh today.² Worldwide, by the end of 1998, 32 other countries besides the U.S. were operating a total of 429 nuclear reactors, providing about 17 percent of the world's electricity.

This picture is changing, however. As already mentioned, no nuclear reactors have been ordered in the U.S. for almost a quarter of a century. The DOE predicts that nuclear power could wither away almost entirely over the next 20 years.⁴ Deregulation could force 27 nuclear plants to close. If all this happens, by 2020, nuclear's share of the nation's power supply could dwindle to seven percent.⁵

France, which leads the world with nearly 80 percent of its electricity produced by nuclear energy, has adopted a moratorium on further construction.³ In Germany, Chancellor Gerhard Schroeder and leading energy companies have formally signed an agreement to shut down this country's 19 nuclear power plants, making it the world's largest industrialized nation to willingly forego the technology.⁶ Sweden is on a path toward complete phase-out of nuclear power, and Italy has already done so.⁷

Why Not Nuclear?

Nuclear power is associated with rising costs, problems of waste disposal, accidents, and fierce citizen opposition.8 Further, even those who believe nuclear power to be safer and cleaner than many of its alternatives are often troubled by the possibility that the development of nuclear power may lead to the proliferation of nuclear weapons. Little has been done, therefore, to encourage the its use. In fact, it is just the opposite. In the U.S., the public, with ample assistance from the media and the anti-nuclear movement, was frightened by Three Mile Island (TMI) and Chernobyl events. Unfortunately, they were not effectively informed that TMI, though certainly a major accident, led to no loss of life because the plant was well engineered to contain any accident. Chernobyl was not a safe design, and although it is not physically possible for a Western reactor to do what the Chernobyl reactor did, this fact has been lost on many people.9

Looking Back

In March 1978, the worst nuclear "accident" in U.S. history occurred at the Three Mile Island plant in Middleton, PA. The problem at TMI began when the cooling system failed, leading to the overhauling and partial melting of the uranium fuel core. The fail-safe system worked and the power station switched itself off. There was a scare, but no disaster.¹⁰ While core damage was major, the release of damag-ing radiation was minimal with TMI—one-millionth of Chernobyl's.¹¹

Fox and $Milloy^{12}\ point$ out that most Americans never bothered to learn about

the TMI accident, and a new generation has been born into this ignorance, having little or no knowledge of the accident nor what's been learned. People living near the TMI plant received an average dose of 1.2 rem. This amounts to one chance in seven million of getting a fatal cancer from that exposure. Or, putting it another way, their increased risk of death is the same as they would face in five extra street crossings or four puffs on a cigarette.13 Carl Sagan14 reported that Edward Teller, "father of the hydrogen bomb," claims himself to be the only casualty of TMI. Teller had a heart attack debating the issue, Sagan says. The most serious damage from TMI was the psychological trauma and over-exaggeration from the mishandling of this incident by politicians and the media.¹⁵

At the time of the TMI accident, the worldwide nuclear industry had compiled about 1,700 reactor years of experience. When the Chernobyl accident occurred in 1986, the industry had compiled about 4,000 reactor years of experience. Early in 2001, we exceeded 10,000 reactor years. There hasn't been a nuclear reactor accident at a commercial nuclear power plant since Chernobyl.¹⁶

No nuclear power plant in the U.S. has ever released a dangerous level of radiation—or of anything else—because nuclear reactors emit no smog precursors, no acid rain, no air toxins, and no greenhouse gases. No one in the U.S. general public has ever been harmed by a power reactor, either outright, through accidental death, or gradually through radiation. In the U.S., no nuclear plant, including TMI, has ever come close to exploding.¹⁷

U.S. nuclear plants have an industrial accident rate less than one-tenth that of all U.S. industries.² Petroleum and coal, which cause substantial pollution and kill dozens to hundreds of people annually, continue to be viewed as preferable forms of power.¹⁷ Between 1985 and 1993, 21 workers died in U.S. atomic power plants—all from falls, steam burns, and similar industrial accidents, but none from radiation. By contrast, use of coal for electric power condemns an average of 101 U.S. miners to death. And between 1986 and 1992, 150 workers were killed in accidents at petroleum refineries, and dozens more died in drilling accidents.¹⁷

Here are some radiation facts for the believe-it-or-not category. A 1,000-MWe coal plant releases about 100 times as much radioactivity into the environment annually as a 1,000-MWe nuclear plant.¹⁸

Greenhouse Gases

In 1997 alone, emissions of sulfur dioxide in the U.S. would have been 3 million tons

higher and emissions of nitrogen oxides would have been 2.1 million tons higher if utilities had built fossil plants instead of nuclear plants. Just to put that figure in perspective, it takes about 50,000 rail cars filled with coal to produce 2.1 million tons of sulfur dioxide and nitrogen oxide.¹⁹ If, by some misfortune, all of America's 103 nuclear plants were shut down tomorrow and replaced by fossil plants, it would be necessary to remove 90 million automobiles from the nation's highways just to keep emissions at the current levels. That is just slightly less than half of the 200 million vehicles on the road today.¹⁹

Summary

Nuclear power-which would appear to be the logical substitute for coal, because it creates very few greenhouse emissions-is as unpopular with most proponents of the Kyoto Protocol as is fossil fuel.20 Alternate energy sources, such as solar and wind power, have long been touted as the answer to our desires for non-polluting energy sources. Today, their total contribution stands at less than 0.5 percent of America's energy needs. And they take up lots of space. Former Deputy Energy Secretary Ken Davis²¹ has calculated that, to produce the 218 gigawatts of additional electricity America will need by 2010, using only wind or solar power, we would have to blanket 9,400,000 acres with wind mills or solar panels. This is an area about 10-percent the size of California-or equal to Connecticut, Delaware and Massachusetts, combined!

If the world is really serious about eliminating the burning of fossil fuels to produce electricity, and considers nuclear power to be an anathema, it's going to be a long time before alternate energy sources can even come close to providing the electricity that is used today—let alone take care of future needs with the continued growth in population.

Recently, the U.S. has seen some renewed interest in nuclear power. The Bush administration has called for a greater reliance on this technology,²² and public suport for nuclear energy has seen a turnaround, in part because of the highly publicized electricity shortages in California.²³ Stay tuned.

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