

August 22, 2006

## Slow Start for Revival of Nuclear Reactors

By [MATTHEW L. WALD](#)

BALTIMORE — Nobody in the United States has started building a nuclear power plant in more than three decades. Mayo A. Shattuck III could be the first.

As the chief executive of Constellation Energy, a utility holding company in Baltimore that already operates five nuclear reactors, Mr. Shattuck is convinced that nuclear power is on the verge of a renaissance, ready to provide reliable electricity at a competitive price. He has already taken the first steps toward achieving that, moving recently to order critical parts for a new reactor.

But Constellation's neighboring utility, the PPL Corporation, takes a different view. Even though PPL has successfully operated two reactors since 1983, its chairman, William F. Hecht, said that he had no plans for new nuclear plants.

When nuclear reactors were first commercialized almost half a century ago, every self-respecting electric utility wanted one. They were encouraged by a government that saw nuclear energy as a peaceful, redemptive byproduct of the deadly power unleashed at Hiroshima. The federal official for promoting nuclear energy, Lewis L. Strauss, said it would produce electricity "too cheap to meter."

It has never given consumers anything like that. But with the industry now consolidated so that most reactors are in the hands of a comparatively few operators, utility executives are sharply divided over whether nuclear power offers an attractive choice as they seek to satisfy a growing demand for electricity.

For them, the question comes down not so much to safety and environmental impact but to whether the potential reward is worth the financial risk. And those who already operate several reactors are prone to want more.

The debate within the utility industry over reviving nuclear power has taken on added importance, though, because unlike plants that burn coal and other fossil fuels, reactors do not produce gases that contribute to [global warming](#).

And once again, Washington is encouraging utilities to push ahead. The summer of 2005's energy bill offered a generous production tax credit, insurance against regulatory delays and loan guarantees. Earlier legislation gave the industry money to help plan new plants. And they continue to benefit from a ceiling on liability damages in case of an accident.

Despite nuclear power's promise as a clean energy source that could hold down emissions of global warming gases, most environmentalists are skeptical of the latest claims by its advocates. They say that utilities, at best, will move ahead with a handful of plants that will receive lavish incentives from the government. But the risks of nuclear power are still so high, they argue, that no utility will be willing to put its own money

into building a plant unless the federal government heavily subsidizes it.

“What dismays me about the present situation is the extent to which the Congress and the administration, and now an occasional state legislature, have rushed to anoint it as the solution to climate change,” said Peter A. Bradford, a former member of the [Nuclear Regulatory Commission](#) and former chairman of the public service commissions of both Maine and New York. If nuclear plants cannot compete without subsidies, he said, they should not be built.

Today, nuclear power supplies just under 20 percent of the electricity used in the United States. Its share has been slipping lately as new plants running on other fuels have come online.

With the price of natural gas increasing, coal has emerged once again as the most popular way to generate electricity, a trend that — if it continues — is expected to lead to a significant rise in emissions of carbon dioxide. The utility sector emits about a third of the carbon dioxide produced in this country, nearly all of that from coal.

Adding dozens more nuclear reactors to that mix could reverse the rise in carbon dioxide from the electricity-generating system, but its advance would also run up against certain limits.

Nuclear plants cannot replace all of the fossil fuel used in power generation because current nuclear designs do not easily alter the power output. Plants running on natural gas and coal, by contrast, can adjust their output over the course of a day to match demand.

For a long time, the underlying confidence of utilities in nuclear technology was moot because the economics would not support a new reactor; all those ordered after 1973 were canceled.

But now, because of high prices for natural gas and uncertainty about how emissions from coal plants will be regulated in the future, the nuclear industry is moving from near death to the prospect that perhaps a handful of plants will be ordered in the next few years. The Nuclear Regulatory Commission counts 27 potential reactors under consideration; 103 are now operable.

For all the momentum behind the push, however, there is still a high degree of skepticism within the utility industry.

PPL, for example, has successfully operated two reactors in Berwick, Pa., for 23 years. But with some utilities around the country making preliminary moves or joining consortiums to explore new designs, PPL is absent.

There are better places to put the money of shareholders, Mr. Hecht of PPL said. At the moment he sees a much greater advantage in cleaning up his coal-fired plants, investing \$1.5 billion to scrub out most of the sulfur dioxide. That would not only benefit the environment but also generate pollution credits PPL can profitably sell.

That decision was “dull and basic,” Mr. Hecht said, but adheres to a paramount goal: maximizing shareholder returns. He won’t rule out nuclear plants forever, Mr. Hecht said in an interview, but the business case would have to be a lot clearer than it is now.

“Technology often has zealots, it seems, behind it,” he said of companies moving forward on nuclear power.

By contrast, Constellation Energy not only wants to build reactors for itself, it also has formed a partnership with a reactor manufacturer to build and operate them for other utilities.

“This organization has a history of feeling that they have done well in nuclear,” Mr. Shattuck said. Constellation executives think that they “can continue to do well in nuclear and shouldn’t shy away from their responsibility.”

Constellation plans to apply for a reactor-operating license by the end of 2007, probably at either the Calvert Cliffs site in Maryland where it runs two nuclear reactors built in the 1960’s and 1970’s, or at Nine Mile Point, in Scriba, N.Y., on Lake Ontario, where it operates two reactors it bought in 2001.

Its decision has implications beyond the corporate bottom line for the global environment. There are also arguments over nuclear waste and the risk of accidents. Around New York City, especially, there is concern over reactors as terrorist targets.

But the risk that really matters to utility executives is financial. Among the companies that would actually build these plants, executives focus more on uncertain factors like the future price of power, the cost of producing competing fuels, and the cost of cleaning up coal plants to meet standards for the pollutants that Washington does regulate — sulfur dioxide, nitrogen oxides and soot.

At this point companies do not face any constraints on carbon emissions.

Companies that want to build — among them [Entergy](#), Dominion and [Duke Energy](#) — talk about new designs intended to further reduce the risk of an accident and their ability to manage nuclear waste until the government eventually opens a national waste repository.

Opponents often cite the risk of accidents and the problem of nuclear waste, but the companies that do not want to build say that those are not factors in their decisions.

When PPL builds a power plant, it usually sells the power first, and uses the signed contracts to reassure the investors and the bankers from whom it is seeking financing. “I’m not going to build any large generation unhedged,” Mr. Hecht said.

But this is not easy with a nuclear plant. For one thing, Mr. Hecht said, no one could be sure when it would be finished. And despite the industry’s efforts to shorten the time from order to completion, it could still be 10 years, he said.

“If you build 1,000 megawatts,” he asked, “how are you going to find someone to buy it 10 years out, for 10 years after it is finished?”

A nuclear plant ordered in 2007 could well turn out to be a more economical power source in 2020 than a coal plant ordered at the same time, he said, but the range of uncertainty is much larger. He is content to let others take the lead.

Constellation Energy insists it is driving risk out of the proposition. Constellation, which doubled its nuclear

bet in the 1990's by buying more reactors as the utility industry reorganized, contends that it has demonstrated one marketable skill — running reactors profitably — and that it could quickly follow a new plant with a copycat, building both on time and on budget.

Constellation has an expertise gained in the early, difficult years of nuclear power, Mr. Shattuck said, citing Michael J. Wallace, president of his company's generation division.

"Mike is the only executive in the utility sector today who was an executive responsible for building new nuclear plants last time around," he said. Mr. Wallace oversaw the construction and start-up of two nuclear plants built in Illinois: Byron, which fully entered commercial service in 1987, and Braidwood, the following year.

Constellation proposes a fleet of plants, identical down to the "carpeting and wallpaper," Mr. Shattuck said, reducing the design costs on subsequent reactors to near zero. Operating processes would be identical, and operators could be shuffled among the plants, something that is often impossible today even with adjacent reactors. The company wants partners that would offer either equity or operating skills.

Constellation has a partnership, called UniStar Nuclear, with [Areva](#), the French-German company, which is owned by Framatome and Siemens, to build a model. One model is under construction in Finland.

"A lot of it is establishing a model that mitigates risk as you move forward," Mr. Shattuck said. "A lot of players out there haven't quite figured out how they're going to go to their boards and ask for \$4 billion, for which I'll get cash flows in 13 years."

Last December, Constellation and FPL, parent of [Florida Power and Light](#), announced that they would merge, creating the country's largest competitive marketer of power. That would put the company in an even better position to build new reactors, Mr. Shattuck said.

Some experts, however, remain skeptical that new reactors should be built, although they acknowledge this is increasingly likely. In the last 20 years or so, said Mr. Bradford, the former regulator, utility restructuring has often shifted the risks of new construction from ratepayers to investors.

"What the Congress has done now, for the first six or so plants, is to find a third pocket," he said. "Now they've called upon the taxpayer to pony up."

But even if a few plants are built, industry insiders do not expect nuclear power to assume a significantly greater role. Roger W. Gale, an electricity expert and former Energy Department official, asks several hundred utility executives each year what they foresee in their industry.

While they are convinced that a new plant will be ordered soon, the more than 100 senior utility executives who responded also said they do not expect "a future where nuclear generation represents a larger share of generation" than today.

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