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## West Sees New Age of Nuclear Development; Let's Hope It Works

Steve Ernst : 6-8 minutes

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It used to be that when a company announced it was developing a nuclear plant, the first thing that happened was the credit rating agencies put the developer on a credit watchlist.

That's not likely to happen with TerraPower's proposed Natrium project, planned for Kemmerer, Wyo. It's hard to see the two main financiers of the \$4 billion project—Bill Gates and Uncle Sam—having their credit downgraded.

The demonstration project would use TerraPower's 345 MW sodium-cooled reactor with an integrated molten salt-based energy storage system for increasing the facility's output to as much as 500 MW for more than 5 1/2 hours.

The company co-developed its Natrium reactor technology with GE Hitachi Nuclear Energy, with the backing of the U.S. Department of Energy's Advanced Reactor Demonstration Program.

It's safe to assume that the \$4 billion price tag will grow, but Gates is all in, Chris Levesque, president and CEO of TerraPower, said during a Nov. 16 press conference.

"Gates won't achieve a return on the first plant" and plans to continue to invest in the project, Levesque said.

"One important thing to realize is the first plant always costs more," he said. "There's a first-time design, and there's a very comprehensive licensing process overseen by the NRC that frankly is expensive."

**I have a million questions** about this project that I didn't get to ask during the press conference, and neither TerraPower nor Rocky Mountain Power would respond to questions and interview requests.

But today it appears the Natrium project would be Bill Gates' gift to PacifiCorp and the Western Interconnection.

TerraPower says it will "hand the project" over to Rocky Mountain Power when it's complete. Neither PacifiCorp's parent Berkshire Hathaway Energy nor RMP's ratepayers are shouldering any risk. If the project works, the utility gets an emissions-free capacity resource, with a storage component, that can ramp up or down—the Holy Grail of clean energy resources

## And if it doesn't work?

Well, PacifiCorp gets to spend the next seven years telling politicians and coal miners in Wyoming that it's transitioning from coal to nuclear, and is helping create "approximately 2,000 jobs during construction and 250 positions to support day-to-day activities," including plant security, when it's operational.

It's the perfect project for PacifiCorp—it comes with no risk and the hope of a dispatchable, emissions-free capacity resource, with storage, that would anchor thousands of megawatts of Wyoming-born wind energy heading to population centers in the West, and be the key talking point in PacifiCorp's coal retirement plans.

**Today we are** in the sales pitch phase of development and it all sounds too good to be true, especially given the history of nuclear development in the U.S. It's hard to believe the project will be operational in just seven years—a deadline set by DOE's ARDP—and still be within the \$4 billion budget.

"We are talking about some pretty intense science here," Robert McCullough, principal with McCullough Research, told me.

McCullough is an economist and a nuclear skeptic. Some might even say he's anti-nuclear, although he told me that he's a fan of small nukes, because the big ones are "scary as hell." His experience with nuclear goes back to his days as a senior executive at Portland General Electric during the early years of the short and expensive life of the Trojan Nuclear Plant.

What problem are they trying to solve? he asks.

"Renewables dominate the energy picture to an enormous degree," he said. "We know they are intermittent and that we need storage. But we have reached the point now where we have utility-scale commercial battery storage available and we aren't that far from having hydrogen available that will likely dominate batteries."

McCullough said there hasn't been much research published on the cost of electricity generated from small nuclear plants, but he says it will likely be somewhere around \$60/MWh, compared to \$30/MWh for utility-scale storage.

"They say it will be dispatchable, but the risk factor with ramping nuclear plants up or down is enormous," he said. "When it happens, it's a white-knuckle ride for the operators. It's an exceedingly scary part of a nuclear plant . . . Nobody goes out for coffee when you turn a plant up or down."

Why speculate with an unproven technology, with no cost data? McCullough asks.

"I can literally go onto the web and order the equipment for wind and solar—there really isn't a question there—and we'll have storage to firm it up because we are now getting utility-grade battery installations . . . I have a problem seeing what niche of the market this fits into."

**There are a lot of reasons** to be skeptical of this project, but you've got to applaud Gates for using his fortune to help people on Earth combat climate change, rather than going for self-aggrandizing joyrides into the atmosphere.

Because of him, financing the project likely won't be an issue. Has any nuclear project ever been able to say that? DOE is in for \$2 billion for the first five years of a seven-year agreement, according to news releases. As of this writing, Gates' fortune is reported to be nearly \$140 billion.

"Bill is a huge supporter and is very excited about the project," Levesque said.

Maybe the best question to ask is how much is Gates willing to invest in this project, and how long will it hold his attention? It's hard to find any credible research on decarbonizing the global energy system that doesn't include huge amounts of nuclear power, so like nuclear power or not, this is a hugely important project with global ramifications.

A veteran energy lawyer told me once that every generation of nuclear engineers thinks they've figured out how to make nuclear energy widespread and cost effective.

Let's hope this generation of nuclear engineers, with the help of the world's greatest software engineer, figures it out.