

The following comes from the website [Wyoming Advanced Energy](#) created by Rocky Mountain Power (PacifiCorp) and TerraPower to push the Sodium Nuclear Reactor demonstration and, ultimately, Washington and Oregon state energy policies on the State of Wyoming and unsuspecting Wyomingites.

The Demonstration Project

The specific retiring coal facility where the Sodium demonstration plant will be located is expected to be announced by the end of 2021.

In October 2020, the U.S. Department of Energy (DOE), through its Advanced Reactor Demonstration Program (ARDP), awarded TerraPower \$80 million in initial funding to demonstrate the Sodium technology. TerraPower signed the cooperative agreement with DOE in May 2021. To date, Congress has appropriated \$160 million for the ARDP and the DOE has committed additional funding in the coming years, subject to appropriations.

Along with PacifiCorp and GE Hitachi Nuclear Energy, members of the demonstration project team include engineering and construction partner Bechtel, Energy Northwest, Duke Energy and nearly a dozen additional companies, universities and national laboratories.

[VIEW THE FAQ](#)

25 FAQs listed as of June 28, 2021.

1

Are you engaging with the communities in potential plant locations?

Community stakeholder input will be an important part of the demonstration site evaluation process. The project team will be engaging with the community throughout the process and before a site is selected.

2

– Can an accident like Fukushima, Three Mile Island or Chernobyl happen with your reactor?

The Sodium technology enhances safety, relying on natural forces and advanced design. The reactor has a net negative power coefficient, which means that if the temperature goes up, the reactor will naturally respond by reducing power. In addition, the Sodium reactor operates at atmospheric pressure and uses sodium, instead of water, as its coolant. The reactor operates at a temperature more than 350 degrees C below the boiling point of sodium. This gives the operator plenty of time to respond to any unusual event. Further, the Sodium reactor is a pool-type reactor, so there are no penetrations in the reactor vessel below the lid, which eliminates the possibility of a leak or loss of coolant accident. The design also relies on natural forces, like gravity and hot air rising, to cool the reactor if an unexpected shutdown occurs.

3

– House Enrolled Act 60, signed into law by Gov. Gordon last year, allows owners of coal or natural gas plants to apply to replace such plants with SMRs, up to the current rated capacity of the retiring plant. How does a Sodium plant fit within the context of this relatively new law?

The intent of that law is to allow for smaller reactors to replace coal and gas plants slated to be retired. That's what PacifiCorp and TerraPower are trying to do here.

4

– How are you addressing nonproliferation concerns?

From its beginnings over a decade ago, TerraPower has made reduction of weapons risks a foundational principle. Sodium reactors are uranium fueled. No Sodium reactor—from the demonstration plant, to the first set of commercial plants, or the subsequent larger plants—will use plutonium as a fuel. The Sodium reactor will run on high-assay low-enriched uranium (HALEU). Sodium plants will not require reprocessing and will run on a once-through fuel cycle that limits the risk of weapons proliferation.

5

– **How big is a Natrium plant?**

The entire size of the nuclear island is approximately 16 acres. The overall site area is approximately 44 acres. When normalized to power rating, the Natrium system has a smaller footprint compared to other Generation IV reactors. Similarly, Natrium has a smaller footprint than most multi-unit plants with light water reactors operating today.

6

– **How does this move comply with Oregon HB 2021?**

House Bill 2021 continues to be negotiated in the Oregon legislature. The Natrium reactor does not generate greenhouse gas emissions and could present a unique opportunity to provide baseload energy and flexible energy storage in support of the renewable energy necessary for PacifiCorp to meet the greenhouse gas trajectory set forth in House Bill 2021.

<https://olis.oregonlegislature.gov/liz/2021R1/Downloads/MeasureDocument/HB2021/Enrolled>

7

– **How does this move comply with Wyoming laws?**

The Natrium project would be consistent with the intent of recent Wyoming laws, including SF 159 (2019), HB 74 (2020) and HB 166 (2021). SF 159 was passed in the 2019 Legislature and signed by the governor with a focus on preserving jobs in coal plant communities. HB 74 was enacted in 2020 and enables the replacement of a coal facility with a small nuclear reactor. Further, HB 166 enacted by the 2021 Legislature was intended to ensure that customers will continue to receive reliable electric service if a coal plant is retired. While minor changes in SF 159 may be needed to accommodate a new Natrium facility on a more efficient timeline, the potential for new jobs in coal plant communities is very much aligned with the intent of this legislation, while ensuring on-going reliability of the grid. PacifiCorp is working closely with state officials to ensure full alignment on this project.

[SF159 \(2019\) New opportunities for Wyoming coal fired generation.](#)

[HB74 \(2020\) Small modular nuclear reactor permitting.](#)

[HB166 \(2021\) Utilities-presumption against facility retirements.](#)

8

– **How is a Natrium plant different from conventional nuclear plants?**

The Natrium reactor builds on existing nuclear energy plant technology on a number of fronts, but differs from existing plants in two key design functions. First, by using sodium at atmospheric pressure, the plant both enhances safety and can reduce costs by using a much simpler architecture. Secondly, instead of just producing electricity, the heat from the reactor can be used to operate a molten salt storage system that can store more energy than the largest battery storage system currently deployed on the grid. This gives operators flexibility and allows a Natrium plant to operate as a baseload power source or as a flexible, load-following system to integrate into grids with high levels of variable renewables.

9

– **How is a Natrium plant safer?**

The Natrium technology enhances safety, relying on natural forces and advanced design. The reactor has a net negative power coefficient, which means that if the temperature goes up, the reactor will naturally respond by reducing power. In addition, the Natrium reactor operates at atmospheric pressure and uses sodium, instead of water, as its coolant. The reactor operates at a temperature more than 350 degrees C below the boiling point of sodium. This gives the operator plenty of time to respond to any unusual event. Further, the Natrium reactor is a pool-type reactor, so there are no penetrations in the reactor vessel below the lid, which eliminates the possibility of a leak or loss of coolant accident. The design also relies on natural forces, like gravity and hot air rising, to cool the reactor if an unexpected shutdown occurs.

10

– **How much will this project cost? What's the cost to taxpayers?**

The Natrium demonstration project is being funded through a precedent-setting, public-private partnership. In October 2020, the U.S. Department of Energy (DOE), through its Advanced Reactor Demonstration Program (ARDP), awarded TerraPower \$80 million in initial funding to demonstrate the Natrium technology. To date, Congress has appropriated \$160 million for the ARDP and DOE has committed additional funding for this public-private partnership in the coming years, subject to appropriations.

11

– How will this technology be analyzed in the IRP? Will the demonstration project be offered as a benchmark in a future RFP?

The cost of this technology will be evaluated in the 2021 IRP to establish whether it is cost effective relative to other resource options. It's premature to say whether and how this resource might be analyzed in a resource request for proposals process.

12

– Is the Natrium reactor needed when we could just invest in renewables and storage?

America's energy system is going through tremendous change. The grid in Wyoming and throughout the country will rely more heavily on wind and solar. A Natrium plant is specifically designed to integrate into a grid with high levels of variable renewables. The Natrium technology will use the high temperature heat from the reactor to power a molten salt storage system that can store tremendous amounts of energy, levels of magnitude larger than the energy stored in typical battery storage facilities. That energy can be used to power the grid at peak demand when the wind isn't blowing, or the sun isn't shining. The Natrium technology is a key enabler of wind and solar technologies and integral to the clean energy future.

13

– Is this a commitment to retire the coal plants? On the IRP schedule or sooner?

The IRP has and will continue to be the venue where potential benefits from coal retirements are evaluated. Independent of the TerraPower Natrium demonstration project, the 2019 IRP showed that customers would benefit if certain coal facilities are retired. The 2021 IRP will confirm if those findings are maintained when analyzed using updated planning assumptions. The demonstration project presents an opportunity to leverage existing infrastructure and workforce associated with retiring coal plants while creating additional employment opportunities through new resource development at an existing site.

14

– What are you committing to?

At this stage, PacifiCorp's commitment is limited to due diligence on siting, development and overall project economics. PacifiCorp will not make a decision to move forward with purchasing the project or the project output until more thorough review has concluded.

15

– **What are your options for site location within Wyoming?**

PacifiCorp and TerraPower are currently evaluating several options and will build the reactor in a community that knows what it takes to support a major energy project. The team expects to use a site that currently hosts a coal plant, already scheduled to retire, that has existing connections to the grid. The team is evaluating a variety of factors in selecting the site, including community support, the physical characteristics of the site, the ability of the site to obtain a license from the Nuclear Regulatory Commission, access to existing infrastructure, and the needs of the grid.

16

– **What factors are you evaluating for potential sites?**

TerraPower, PacifiCorp and the demonstration project team will evaluate a variety of factors when selecting the site. This includes community support, the physical characteristics of the site, the ability of the site to obtain a license from the Nuclear Regulatory Commission, access to existing infrastructure, and the needs of the grid.

17

– **What is the Natrium reactor?**

The Natrium technology has a 345MW sodium fast reactor coupled with a molten salt-based integrated energy storage system that will provide clean, flexible energy and stability for the grid. The system can boost output to 500MW for more than five and a half hours to serve peak demand. The reactor maintains its thermal power constant during its entire operating period, maximizing its capacity factor and value. The technology provides dispatchable power at a scale that can make a difference in efforts to decarbonize electricity and stabilize grids with high penetrations of renewables.

18

– **What type of analysis will you perform to support acquisition of this resource?**

PacifiCorp engages in a robust long-term resource planning every two years in what is known as its Integrated Resource Plan. This resource will be analyzed as part of the upcoming Integrated Resource Plan, which will be filed with regulators in September 2021.

19

– **When will you announce the selected site?**

TerraPower and PacifiCorp are evaluating several potential sites in Wyoming. The location of the Natrium demonstration plant is expected to be announced by the end of 2021.

20

– **Why build a reactor in Wyoming?**

Wyoming has a lot to offer and has been a leader in energy for more than 100 years. PacifiCorp is adding a significant amount of renewables and energy storage to the grid to reliably and affordably power Wyoming. The Natrium technology is specifically designed to integrate into a grid with high levels of renewables. Aside from being a great match for meeting grid needs with firm and flexible generation, there is another basic yet vital reason to build a Natrium plant here. Wyoming is home to highly-skilled, well-trained workers who understand the value of always-on electricity for their communities.

21

– **Why did TerraPower decide to demonstrate in the U.S.?**

Since its founding, TerraPower has recognized the need for the private sector to take action to develop advanced nuclear energy to meet growing electricity needs and lift billions out of poverty. Given this goal, the company's Traveling Wave Reactor (TWR) design was originally set to deploy in the Chinese market to meet increased demand for clean energy. However, U.S. policy changed in 2018, and the American market opened up new opportunities for deployment with the establishment of the Advanced Reactor Demonstration Program at the U.S. Department of Energy. This prompted the company to explore opportunities to demonstrate its advanced technology in the United States. TerraPower subsequently partnered with GE Hitachi Nuclear Energy to develop the Natrium system, which combines molten salt energy storage with the best of TerraPower's TWR and GE Hitachi's PRISM technologies, along with additional innovations and improvements.

22

– **Will there be nuclear waste?**

The Natrium technology will reduce the volume of waste per megawatt hour of energy produced by five times because of the efficiency with which it uses the fuel. The waste the Natrium reactor does produce will be stored safely and securely at the same site as the reactor until the United States identifies a permanent geologic repository.

23

– Will this be in the CEAP/CEIP?

PacifiCorp's Clean Energy Action Plan and Clean Energy Implementation Plan will be informed by the company's upcoming 2021 Integrated Resource Plan. At this time, it is premature to say whether and how the Natrium reactor might influence these plans associated with Washington's Clean Energy Transformation Act.

24

– Will this impact or accelerate coal unit closures?

This does not impact or accelerate coal unit closures. The 2021 Integrated Resource Plan is expected to be filed no later than Sept. 1, 2021. The IRP will continue to be the venue where potential benefits from coal retirements are evaluated. Independent of the TerraPower Natrium demonstration project, the 2019 IRP showed that customers would benefit if certain coal facilities are retired. The 2021 IRP will confirm if those findings are maintained when analyzed using updated planning assumptions.

25

– Will this impact the All-Source RFP and other explorations of renewable resources?

PacifiCorp's 2020 All-Source Request for Proposals is nearing conclusion. PacifiCorp will select the final shortlist of bids and present that shortlist to regulators in June 2021. PacifiCorp's ongoing due diligence work associated with the Natrium demonstration plant will not impact the analysis or results of the 2020 All-Source Request for Proposals.

Project Supporters

Our state continues to pave the way for the future of energy.

"I am thrilled to see Wyoming selected for this demonstration pilot project, as our great state is the perfect place for this type of innovative utility facility and our coal experienced workforce is looking forward to the jobs this project will provide. I have always supported an all-of-the-above energy portfolio for our electric utilities. Our state continues to pave the way for the future of energy, and Wyoming should be the place where innovative energy technologies are taken to commercialization."

– Wyoming Gov. Mark Gordon

Good-paying jobs and clean energy for years to come.

"Together with PacifiCorp, we're creating the energy grid of the future where advanced nuclear technologies provide good-paying jobs and clean energy for years to come. The Natrium technology was designed to solve a challenge utilities face as they work to enhance grid reliability and stability while meeting decarbonization and emissions-reduction goals."

– Chris Levesque, president and CEO of TerraPower

Our producers stand ready, willing, and able to safely provide vital fuel.

"This is an exciting opportunity for Wyoming to open a new chapter in the nuclear power industry. Advanced nuclear generation clearly fits the bill for zero-emission, reliable and dispatchable electricity necessary to power our country into the future. Wyoming is the nation's leader in the production of domestic uranium. Our producers stand ready, willing and able to safely and responsibly provide the vital fuel for America's next generation of nuclear power."

– Travis Deti, Executive Director, Wyoming Mining Association

Helps Wyoming's communities remain viable and thriving.

"I commend Rocky Mountain Power for joining with TerraPower in helping Wyoming develop solutions so that our communities remain viable and continue to thrive in a changing economy, while keeping the state at the forefront of energy solutions."

– Dan Dockstader, Wyoming Senate President

- Chris Levesque, president and CEO of TerraPower

An exciting economic opportunity for Wyoming.

"This project is an exciting economic opportunity for Wyoming. Siting a Natrium advanced reactor at a retiring Wyoming coal plant could ensure that a formerly productive coal generation site continues to produce reliable power for our customers. We are currently conducting joint due diligence to ensure this opportunity is cost-effective for our customers and a great fit for Wyoming and the communities we serve."

- Gary Hoogeveen, President and CEO of Rocky Mountain Power, a division of PacifiCorp

We welcome those willing to step up and embrace these opportunities with us.

"Wyoming has long been a headwaters state for baseload energy. This role is proving to be ever more important. This effort takes partnerships, and we welcome those willing to step up and embrace these opportunities with us."

- Eric Barlow, Wyoming Speaker of the House

Advanced nuclear technology has the potential to create long-term, well-paying jobs for Wyomingites.

"Wyoming is home to the most experienced energy workforce in the country and has a proven record of success with advancing innovative new energy technologies. I congratulate PacifiCorp and TerraPower on their work to get the project to this stage and am excited for the opportunities this brings to Wyoming. Advanced nuclear technology has the potential to create long-term, well-paying jobs for Wyomingites as well as provide low-carbon options for utility customers. As the Wyoming Energy Authority works to advance the state's energy strategy and provide the nation with carbon net negative baseload power, we stand ready to assist the Governor and his office with any needs they may have in supporting this project."

- Dr. Glen Murrell, Executive Director of Wyoming Energy Authority

Wyoming Advanced Energy is a joint effort
between PacifiCorp and TerraPower.

PacifiCorp

TerraPower

Natrium Technology

General Inquiries

info@wyomingadvancedenergy.com


TerraPower Contact

press@terrapower.com

Contact PacifiCorp

tiffany.erickson@pacificorp.com

Wyoming Advanced Energy

FAQ 

Project Supporters