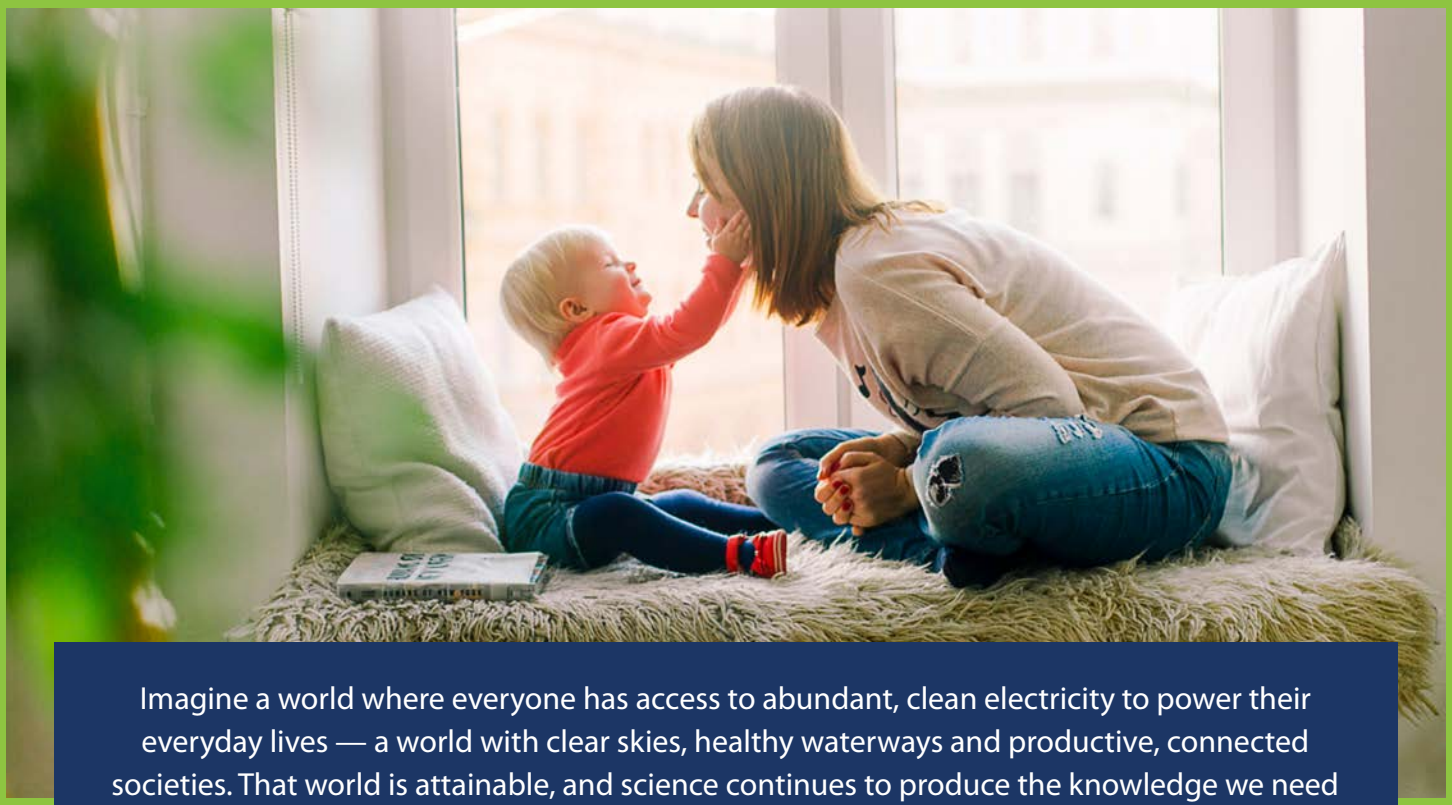
Idaho National Laboratory

Fostering
New Technologies
for the World's
Clean-Energy Future



Imagine a world where everyone has access to abundant, clean electricity to power their everyday lives — a world with clear skies, healthy waterways and productive, connected societies. That world is attainable, and science continues to produce the knowledge we need to achieve sustainability goals. The U.S. Department of Energy's (DOE) Versatile Test Reactor (VTR) represents important progress along the pathway to discover, test and advance the technologies we need to help our planet prosper.

Idaho National Laboratory (INL) is one of two locations being considered to host this unique reactor, which will provide valuable research information not possible with DOE's current reactors or accelerators. **VTR will help scientists and engineers create safer, longer-lasting and more efficient fuels, materials, sensors and instrumentation required for nuclear technologies.** It will streamline the development of new nuclear technologies that can help bring reliable, affordable electricity to remote areas or turn brackish water into drinking water.

Experts from six national labs, 19 universities and 10 industry partners are contributing to the design of this one-of-a-kind science facility. Once operational, VTR will welcome researchers and developers from all over, creating a collection of shared knowledge that will **stimulate industry and boost economies across the U.S., including Idaho.**

VTR Job Creation

1,300 Workers needed to build VTR

51 Estimated number of months to build VTR

500 Engineering support and fuel fabrication during construction phase

250-750 Additional jobs during design

225-300 Jobs once VTR is operational

** All numbers shown above are estimated projections*

With VTR, the U.S. can catch up to the scientific testing and research and development capabilities already available in other countries, like Russia — where U.S. researchers and developers currently encounter significant barriers, such as export control and intellectual property rights, when seeking access to the BOR-60 reactor. Having this innovative scientific facility located on U.S. soil will **reestablish our nation as a global leader in nuclear energy research and development.**

What's Next for VTR?

2021 Record of decision for siting VTR and determining fuel fabrication location.

2023 Anticipated approval of Critical Decision 2/3

2026 Reactor startup with five-year contingency

**Projected dates based on current VTR schedule.*

To see the full project timeline and learn more about the VTR, visit inl.gov/vtr or contact 208-526-1151 or email Kortny.Rolston-Duce@inl.gov.

"Academia provides a pipeline of knowledgeable scientists and engineers that contribute to exploring cutting-edge science and engineering topics. VTR is a unique asset to U.S. research infrastructure that enables exploration in areas which are not presently capable. It is paramount that our next generation of engineers be integrated so they have the tools necessary to support our advanced reactor vendors and those utilities which operate them in the future."

-Wade Marcum,
Associate Dean for Undergraduate Programs,
Oregon State University

FREQUENTLY ASKED QUESTIONS

Why can't we just use DOE's existing test reactors?

Existing test reactors, like the Advanced Test Reactor at INL and the High Flux Isotope Reactor at Oak Ridge National Laboratory, are thermal neutron reactors and do not sustain neutrons at very high concentrations and speeds. VTR's fast neutrons will allow researchers to perform accelerated testing of innovative nuclear technologies and create unique, sustained conditions for experiments that would otherwise not be possible.

Isn't there somewhere else this testing can be done?

Not in the U.S. The only viable capability for testing fast spectrum irradiation is the BOR-60 reactor in the Russian Federation, where U.S. researchers and developers encounter significant barriers including export control concerns for materials and fuels testing, intellectual property rights, quality assurance and transportation issues.

Is VTR safe for nearby residents?

Yes, the facility will be safe for residents, on-site researchers and the environment. Since the 1940s, many of DOE's national laboratories have hosted continuous nuclear energy research, demonstrating world-leading safety behavior, safety performance and environmental stewardship.

Can VTR be safely and quickly shut down?

Yes, the VTR is a sodium fast reactor design. It will use metallic fuel, which sits in a bath of a liquid metal (sodium) at atmospheric pressure. This introduces many natural safety features, such as gravity and convection, which will safely and quickly shut down the plant, if needed.

Will VTR create waste?

Some waste will be generated; it will be treated, packaged and shipped to appropriate locations and is similar to other waste streams that are regularly and proactively managed at INL and other DOE sites.

Will VTR require a lot of water?

Water usage for the VTR will be very low - similar to an office building. It will be for drinking water and plumbing. The VTR design does not use water for cooling.

What kind of fuel will the VTR use? Is it dangerous?

Several options of a metallic-alloy fuel, including uranium, plutonium and zirconium, are being considered. Using this type of metal fuel provides numerous safety benefits. VTR incorporates safety features that enable it to shut down on its own if operations are disrupted.

When will VTR be built?

If final design and construction begin in 2023, VTR will be fully operational by the end of 2026, subject to funding appropriations by Congress.