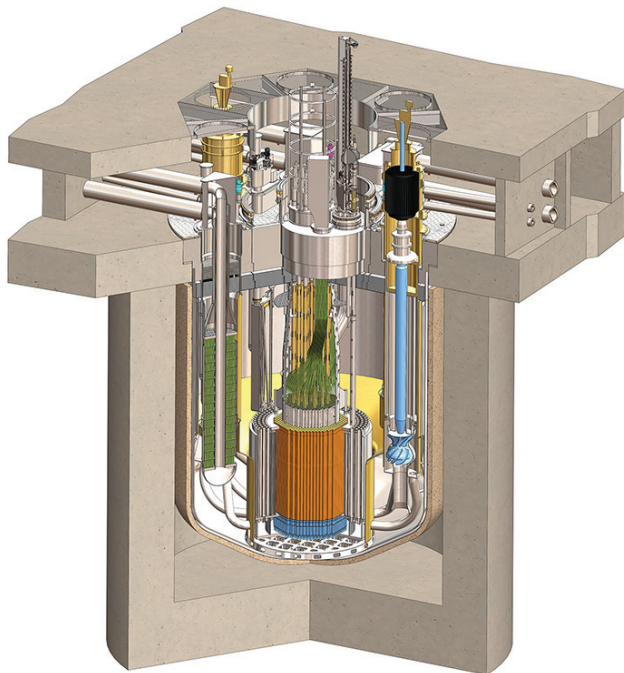


# TERRAPOWER'S TRAVELING WAVE TECHNOLOGY: BRINGING ADVANCED NUCLEAR TO MARKET

**TerraPower's traveling wave reactor (TWR) is designed to be a liquid sodium-cooled fast reactor that uses depleted uranium as fuel.** It will greatly simplify the current nuclear fuel cycle, reducing the need for uranium mining and spent fuel storage facilities. Eventually, it will eliminate the need for enrichment facilities and reprocessing plants. This will result in enormous cost savings, highly enhanced safety, greatly reduced toxic waste, greater ease in waste disposal and a high level of proliferation resistance.

The value of the TWR technology extends beyond the traditional benefits of nuclear energy. It also expands America's nuclear industrial base. Over the last 10 years, TerraPower has started to create the necessary supply chain for TWR materials, components and fuel. TerraPower continues to utilize American companies to provide best-in-class products and services. By establishing a reliable domestic supply chain, TerraPower enables American businesses to participate in the growing global market for fast reactors. The TWR technology is expected to be operational in the mid-2020s, years earlier than projections for other Generation IV technologies.



*TWR conceptual design*

The recently signed Nuclear Energy Innovation Capabilities Act (NEICA) enacts legislation in support of a versatile test reactor (VTR). The VTR represents a critical capability addition to America's advanced nuclear sector. Access to fast spectrum irradiation capabilities in the U.S. will support advanced nuclear development by providing testing and data for fuels, materials and sensors. This will accelerate innovation and give American regulators a role in shaping the future safety and security of new technologies.

The first TWR plant will provide a wide range of benefits and benchmarks in the development of advanced nuclear technology. It will demonstrate reliable operation of TWR plant components and provide experience with integrated operations. This experience will build the regulatory basis for the more advanced commercial units that will follow.

## MAJOR TWR BENEFITS

**SAFE.** TWR systems rely on the natural laws of physics to maintain the safety of the plant without operator intervention.

**AFFORDABLE.** Atmospheric pressure operation and very low fuel costs allow for lower capital and operating costs.

**CLEAN.** Used fuel is stored inside the core, slashing the need for external storage and transportation of waste. Longer operating high-efficiency cycles keep carbon-free electricity reliably supplied with reduced needs for mining, enrichment and waste disposal.

**SECURE.** The traveling wave makes the reactor capable of sustaining a fission chain reaction without interruption. Eliminating the need for reprocessing radioactive used fuel and eventual elimination of enrichment facilities greatly reduces risk.

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## THE PATH TO COMMERCIALIZATION

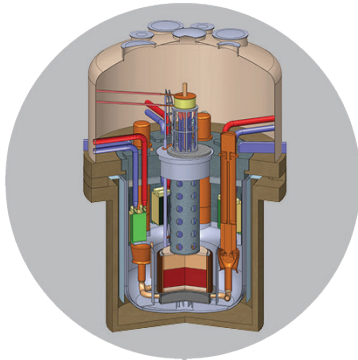
TerraPower has developed a sound, three-phased approach to guide its network from the conceptual design to commercial TWR plants.

After 10 years of research and development, the conceptual design is complete. TerraPower has now embarked on engineering. This involves testing fuels and materials, building a database of experience, fabricating metallic fuel, obtaining required licenses and permits and continuing the development of a supply chain of companies that will be able to fabricate the necessary equipment and components for the TWR plant. To accomplish this, TerraPower works closely with numerous universities, national laboratories and corporations in research, testing and prototyping. These partnerships open doors to information exchange and talent pools that benefit the rapid deployment of advanced nuclear technologies.

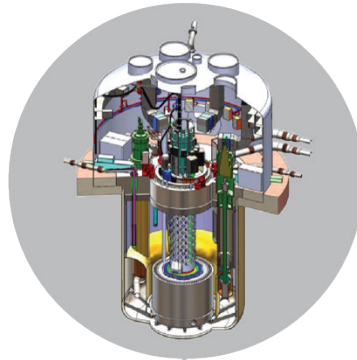
The commercialization of the TWR technology is expected to be operational in the mid-2020s, 10-20 years earlier than projections for other Generation IV technologies.

*The TWR design produces 1/5<sup>TH</sup> as much waste as current plants, utilizing mostly depleted uranium as its fuel and improving fuel efficiency. Over a plant's 60-year life, the total waste volume of the TWR plant would only equal the capacity of about 1.5 rail cars.*

### PHASE 1: TWR Core & Plant Concept Design



### PHASE 2: Prototype Plant Design, Engineering & Construction



### PHASE 3: TWR-C Commercial Plant Design, Engineering & Construction

