

## Global Counsel Small Modular Reactor Matrix

	NuScale	TerraPower and GE Hitachi Nuclear Energy (GEH)	GE Hitachi Nuclear Energy (GEH)	Terrestrial Energy	X-Energy and Energy Northwest	Holtec	Rolls Royce	China National Nuclear Corporation
<b>Technology Model Name</b>	VOYGR	Sodium	BWRX-300	Integral Molten Salt Reactor (IMSR)	Xe-100	SMR-160	UK SMR	ACP100
<b>Estimated In- Service Date (based on company reports)</b>	2027 providing modules to clients; Operational by 2029, providing modules to clients by 2027	Licensing, construction and demonstration of Sodium by 2028	Could be operational as early as 2028, site preparation initiated in 2022	Operational in the early 2030s	Expected to be operational in the 2027-2028 timeframe	Aims to secure SMR- 160 construction license in 2025	Operational in 2029	Operational in 2026
<b>Regulatory Process</b>	Received US Nuclear Regulatory Commission Standard Design Approval in 2020	Plans US Nuclear Regulatory Commission application for construction permit in 2023, and an operating licence in 2026	Initiated regulatory process with US Nuclear Regulatory Commission in 2020. Pre- licensing vendor design (VDR) review at Canadian Nuclear Safety Commission	Pre-application phase with Canadian Nuclear Safety Commission.	Phase 2 of Canadian Nuclear Safety Commission Vendor Design Review licensing process underway, US Nuclear Regulatory Commission approval for safety-related applications	SMR-160 completed Vendor Design Review (VDR) Phase 1 process with Canadian Nuclear Safety Commission and licensing process underway with US Nuclear Regulatory Commission.	Submitted designs to UK Office of Nuclear Regulation to begin General Design Assessment (GDA)	Final approval for the construction of the plant given by China's National Development and Reform Commission in June 2021

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<b>Reactor type</b>	Pressurised light- water reactor	Molten salt reactor	Boiling water reactor	Molten salt reactor	High temperature, gas-cooled reactor (HTGR) with low pressure pebble bed	Pressurised light- water reactor	Pressurised water reactor (three-loop close-coupled)	Pressurised water reactor
<b>Capacity, mega watts (MW)</b>	77 MW per module	345 MW per module	300 MW per module	194 MW per module	80 MW per module	160 MW per module	470MW per module	125 MW per module
<b>Dimensions</b>	65 x 9 ft per module	16 acres for reactor, 44 acres for overall site	Plant 8,400 square meters, site 26,300 square meter footprint	17.3 acres	13 acres	4.5 acres of land for a single unit and 6 acres for a two-unit site	52 x 13 ft	60m x 53m
<b>Fuel</b>	Ceramic UO2 pellets (low enriched uranium (LER)	High assay low enriched uranium (HALEU)	GNF2 with highly enriched uranium (HER)	LEU	(Tristructural isotropic) uranium TRISO high assay low enriched uranium	Ceramic UO2 pellets	UO2 pellets	Fuel 235U enrichment
<b>Ramping Output</b>	Yes	Yes	Yes	Yes	Yes	Yes	Not available	No

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<b>Black Start Capable</b>	Yes	No	Yes	Yes	Unclear	Yes	Not available	No
<b>Passive Safety features</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Contracts</b>	Pilot project secured with US Department of Energy Idaho Natation Labs with Utah Associated Municipal Power Systems. Contract exploration reported in Poland and Missouri.	DOE/Rocky Mountain Power subsidiary of PacificCorp for a coal-to-nuclear demonstration project in Kemmerer, Wyoming	Selected by Ontario Power Generation for SMR project in Darlington. Obtained 2021 site preparation licence from CNSC	NA	Pilot to be built in Richland, Washington near Columbia Generating Station, plans also include a four-unit plant in Washington State	Examining viability of building at the Oyster Creek nuclear plant currently decommissioning in New Jersey	NA	China Zhongyuan Engineering Corporation (CZEC), Nucleoeléctrica Argentina S.A (NASA)
<b>Projected Lifetime</b>	60 years	Up to 100 years	60 years	NA	60 years	80 years	60 years	60 years
<b>Publicly Traded</b>	SMR, SMR WS	Privately held	GE, Hitachi	Privately held	Privately held	Privately held	Privately held	Privately held
<b>Headquarters</b>	US (Portland, OR)	US (Bellevue, WA)	US (Wilmington, NC)	Ontario, Canada	US (Rockville, MD)	US (Jupiter, FL)	UK	China

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Links	<a href="#">NuScale Power   SMR Nuclear Technology</a>	<a href="#">TerraPower and GE Hitachi Nuclear Energy Introduce Commercial Natrium™ Power Production and Storage System - TerraPower</a>	<a href="#">BWRX-300 (gepower.com)</a>	<a href="#">Terrestrial Energy   SMR Action Plan</a>	<a href="#">Reactor: Xe-100 – X-energy: HTGR   Nuclear Reactors (SMR) &amp; TRISO Fuel</a>	<a href="#">Holtec's Small Modular Reactor - Holtec International</a>	<a href="#">Small Modular Reactors   Rolls-Royce</a>	<a href="#">ACP100 (cnncc.com.cn)</a>
Expanded output functions; industrial steam generation, desalinisation, hydrogen production, etc.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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<b>Comments</b>	NuScale Power LLC signed agreement with Doosan Enerbility Co. Ltd. "to begin production of forging materials" for VOYGR SMR in 2022, "with expectations for full-scale equipment manufacturing by the latter half of 2023".	Sodium technology to include molten salt energy storage capable of boosting capacity to 500 MW over 5.5 hrs, molten salt substrate creates faster, hotter fission, reducing spent fuel waste.	The BWRX-300 SMR technology is an evolution of proven technologies which could mitigate delays and accelerate licensing and construction.	IMSR uses molten fluoride salts as coolant creates faster, hotter and more efficient fission, reducing spent fuel waste.	In the Xe-100 technology, HTGR can be refuelled online while operating. Employs a pebble-like tri-structural isotropic particle fuel (TRISO) fuel innovation. TRISO and Xe-100 reactor require regulatory approvals.	The SMR-160 has exceptionally small footprint (4.5 acres), Holtec offers a wide variety of nuclear services including decommissioning and site construction and services.	Designed to use UK supply chains for 80% of each SMR by value.	Passive safety features, built underground.