# SUPERHOT Project Descriptions

Stimulate Utilization of Plentiful Energy in Rocks Through High-Temperature Original Technologies

## Blade Energy Partners, Ltd. – Houston, TX

Enabling Robust SHR Well Design and Construction - $6,300,000
Blade Energy Partners, Ltd. will develop and validate, using advanced plasticity and creep modeling and testing, an integrated well system designed to enable long-lasting superhot geothermal wells. The project will evaluate new steel alloys, iron-chromium-aluminum (FeCrAl) alloys, Zirconia-toughened Alumina liners, and advanced cements to improve performance under extreme geothermal conditions. If successful, the project will help maintain well integrity for more than 15 years and reduce a key barrier to commercial-scale superhot geothermal development.

## Oak Ridge National Laboratory – Oak Ridge, TN

Polymer Composites for Superhot Geothermal Well Design - $3,000,000
Oak Ridge National Laboratory will develop a glass fiber-reinforced, inorganic matrix composite pipe system designed to withstand the extreme temperatures and corrosive conditions found in superhot geothermal environments. The project will address the limitations of current carbon-steel casing and make possible a 15-year well lifetime. By advancing durable well infrastructure for superhot geothermal applications, the project will help unlock new sources of reliable baseload power and strengthen grid security.

## University of Southern California – Los Angeles, CA

Thermally Adaptive, Corrosion-Resistant Composite Casing System for Supercritical Geothermal Wells - $3,000,000
The University of Southern California, Los Angeles will develop new well casing architecture designed to withstand the extreme conditions of superhot geothermal environments. The project will address three key barriers—extreme thermal loading, corrosive conditions, and cost constraints—by combining advanced cement-based materials with strategically placed metal components. This design will aim to improve durability, extend well life, and reduce reliance on expensive specialty alloys. If successful, the project will help remove a major barrier to superhot geothermal deployment and expand access to reliable domestic energy resources.

## The University of Oklahoma – Norman, OK

Production of Heat from Stimulated Superhot Systems (PHI-S$^3$) - $3,100,000
The University of Oklahoma will develop and validate a predictive modeling framework for fracture-based superhot geothermal systems to reduce the technical and financial risks of developing previously inaccessible geothermal resources. The project aims to validate superhot geothermal deployment and unlock abundant domestic energy resources and advance reliable U.S. geothermal production.

## Lawrence Livermore National Laboratory – Livermore, CA

Evaluation of Novel Gravity Assisted Geothermal Energy Development (ENGAGED) - $5,500,000
Lawrence Livermore National Laboratory will develop an integrated approach to enable long-lived, high-output geothermal energy production from superhot. The project will use advanced well designs, high-pressure fluid techniques, and densified fluids for improved heat extraction, sustained fracture pathways, and efficient downward fracture growth. If successful, the project will expand access to geothermal resources and support reliable, continuous domestic electricity generation.

*Superhot geothermal wells are defined as having temperatures greater than 375 °C and pressures greater than 22 MPa.

## XGS Energy – Houston, TX

High Thermal Conductivity Materials System for Supercritical Geothermal Energy Production - $3,000,000
XGS Energy will develop and validate a new approach for generating reliable electricity deep underground from superhot rock. The project will adapt key materials, well designs, and predictive models to ensure the system can operate reliably in extreme superhot conditions over a multi-decade lifespan. The project will address technical barriers to the development of superhot geothermal as a domestic supply of baseload power.

## Pacific Northwest National Laboratory – Richland, WA

Superhot Innovation Multi-lab for Geothermal Experimental and Predictive Simulation (SIM-GEO) - $2,600,000
Pacific Northwest National Laboratory will develop a groundbreaking “well-in-a-box” laboratory simulator to evaluate how rock, cement, and other well materials perform under the extreme heat and pressure conditions of superhot geothermal. The project will generate a reliable testing and predictive toolkit to help engineers design and operate more durable wells. By improving well performance and reducing development risk, SIM-GEO will help make superhot geothermal energy more cost-effective and accelerate access to this abundant energy resource.

## Los Alamos National Laboratory – Los Alamos, NM

Advanced Laboratory Testing and Validation Tools for Superhot Well Construction - $3,500,000
Los Alamos National Laboratory will develop integrated testing and verification capabilities to evaluate how well materials and structures degrade over time under repeated heating and cooling cycles, high stress, and exposure to corrosive fluids. The project aims to improve well performance, design, and longevity (beyond 15 years). By making these capabilities available through cloud-based software and service options, the project could accelerate superhot geothermal deployment, while lowering development risk.



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