Hamm Institute for American Energy
OKLAHOMA STATE UNIVERSITY

Hamm Institute Laboratory



CREATING ENERGY SOLUTIONS

The Hamm Institute Laboratory is the only applied research facility with two configurable, working wellbores designed for side–by–side testing under real subsurface conditions. This setup lets partners validate technologies from early readiness levels through customer–ready deployment.

The lab supports research in oil and natural gas, geothermal, carbon capture, produced–water management, and other advanced energy systems. One well is currently configured for geothermal testing with 365 feet of available depth, a heated casing rated to 450°F (232°C), 750 kilowatts of electrical heat, and a 5,000 pounds per square inch wellhead.

Modular flow and pressure equipment enables rapid assembly of custom flow loops. Outdoor lab space accommodates large equipment with available utilities. The facility is designed for quick turnaround between test configurations.

Research Facilities

Test Wells
+ 5,000 psi multi–section wellhead for configurable wellbores
+ 400–foot well: 365 feet available depth, 450°F (232°C) heated casing, 750 kW electrical heat
+ 65–foot well: 20–inch cased open hole
+ Support: 30–ton crane, power tongs, 750 kW electrical service

Pressure Vessel
+ 650°F (343°C) at 5,000 psi / 450°F (232°C) at 7,000 psi
+ 6.5 inch diameter x 42–inch length
+ Multizonal temperature control
+ Liquid and gas injection control
+ Any angle between horizontal and vertical

Flow & Pressure Equipment
+ Modular design for rapid custom flow loop creation

Outdoor Lab Space
+ Large equipment testing with available utilities

Other Lab & Office Space
+ Flexible, plug–and–play laboratory
+ Large equipment manipulation in controlled environments
+ Advanced environmental monitoring research
+ Open to researchers and engineers

Strategic Data Center

The Hamm Institute building, formerly a Baker Hughes/GE energy lab, includes dedicated backup and primary power systems, integrated racks with cooling system, secure access zones, and space ready for immediate AI cluster deployment. On–site data center infrastructure supports real–time processing of field data, with capacity for expanded compute over time.

Data Center Specifications

+ [4] 8–ton CRAC unit split systems
+ Expandable up to 700 kW (200 tons refrigeration)
+ 550 kW of available UPS/generator backup power
+ Mix of 25 kW and 5 kW connections (main and backup) at each rack
+ 7 available 42U racks, space for additional 18 racks
+ Multiple ISPs available on–site
+ Secure facility with controlled access zones



Integrated Use Cases

Use Case	Description	Impact
AI Model Training	High–performance compute for AI models in grid optimization, carbon tracking, demand prediction and energy dispatch.	Accelerates applied energy research and AI innovation.
Real–Time Simulation and Digital Twins	Simulations of power systems, carbon capture, geothermal wells and grid infrastructure for reliability and crisis response.	Informs infrastructure planning and energy resilience.
Testbed for Energy Efficiency	Deploy and monitor advanced power and cooling systems, including geothermal cooling loops and hybrid baseload energy.	Validation for energy companies and technology providers.
Defense AI Applications	AI training and modeling for DoD, DHS and defense contractors. Focus: ISR, energy logistics, cybersecurity resilience.	Supports national security and defense readiness.
Secure Data Hosting	Physically and digitally secure location for storing and processing sensitive data for federal, academic and corporate partners.	Builds federal trust, attracts data–sensitive projects.
Baseload Power Validation	Demonstrate how domestic natural gas, geothermal and nuclear energy support high–uptime, mission–critical compute.	Promotes U.S. energy sovereignty.
Resilient Infrastructure	Hardened infrastructure to maintain operations through grid disruptions, cyber events or natural disasters.	Critical for emergency response and defense.
Workforce Training	Hands–on learning for students and professionals in AI systems, energy operations, data center management.	Grows the U.S. energy + AI talent pipeline.
Oilfield Simulation	AI–driven simulation of the oil and natural gas lifecycle, from exploration to production, to optimize well placement, field development, and operational performance.	Improves efficiency and recovery across exploration, drilling, completions, and production while enabling better management and reuse of produced water.

Partnership Opportunities

We seek sponsors and innovation partners to help shape and co–power this mission. Partnership options include naming rights or powered–by branding of the Hamm Institute Data Center, joint research and white papers on AI and energy applications, exclusive access to a real–world AI testbed for energy, cyber and infrastructure, and early pilot implementation with visibility in national demonstrations.

CONTACT US

Email: info@hamminstitute.org
hamminstitute.org

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