

Request for Information Key Facts	
Issuing Agency	Department of Energy, Hydrocarbons and Geothermal Energy Office (HGEO)
Request for Information Title	Gauging Investor Interest in the Development and Commercialization of Subsurface Energy Technologies
Request for Information Number	DE-FOA-0003671
Request for Information Issue Date	September 3, 2026
Request for Information Responses Due Date	October 5, 2026
Request for Information Responses Submit To	DE-FOA-0003671@netl.doe.gov

Description

The U.S. Department of Energy (DOE)'s Hydrocarbons and Geothermal Energy Office (HGEO) is issuing this RFI to notify parties of its potential interest in connecting private capital/public-private partnership programs to industry opportunities. This initiative provides HGEO's technical expertise across the Office of Subsurface Energy's three core program areas: Coal, Oil & Gas, and Geothermal. Ultimately, the goal is to use HGEO's research and development (R&D) capabilities to support industry and capital.

Through this RFI, DOE requests input from all stakeholders, particularly the financial sector, to gauge investor interest in the development and commercialization of subsurface-energy technologies.

Purpose

This RFI requests feedback from capital providers (Venture Capital, Angel Investors, Financial Institutions, etc.) and adjacent organizations (Incubators, Accelerators, Venture Studios, etc.) as well as industry, academia, research laboratories, government agencies, and other stakeholders on investment in technologies identified below within HGEO's Office of Subsurface Energy.

This is a Request for Information (RFI) only. HGEO will not pay for information provided under this RFI and no project will be supported as a result of this RFI. This RFI is not accepting applications for financial assistance or financial incentives.

Background

DOE's HGEO is unleashing the full potential of America's hydrocarbon and geothermal resources to provide affordable, reliable, and secure energy. Through applied innovation and U.S. energy leadership, HGEO develops and advances breakthrough technologies that lower costs and power American prosperity, freedom, and human flourishing. By harnessing America's hydrocarbon and geothermal resources, including coal, HGEO works to enhance reliable baseload power, strengthen grid reliability, and improve long-term energy security for communities nationwide.

Historically, capital-intensive, hardware-focused energy technologies have faced a "valley of death" between initial laboratory validation and commercial viability. This gap is particularly pronounced in the coal sector, where evolving market dynamics have constrained traditional debt and equity financing.

To bridge the "valley of death," HGEO intends to provide focused technical support and direction through its program emphasis areas and capitalize on public-private partnerships from other agencies to reduce the capital costs that historically have limited the sector's attractiveness.

DOE HGEO Areas of Interest

Example technology areas for prospective investors include:

Oil & Gas

- **Modular Liquefied Natural Gas (LNG) Component and Process Technology**
Development: Develop low-footprint, high-efficiency components for micro- to small-scale LNG systems (e.g., optimized micro-channel heat exchangers, modular Boil-Off Gas recovery systems, and high-efficiency compressors) and targeted thermodynamic modeling software to improve liquefaction efficiency without requiring facility-scale capital
- **Midstream Sensor and Materials Innovation:** Engineer novel non-destructive testing sensors, robotic internal inspection tooling (smart pigs), and high-durability internal coatings
- **Modular and Mobile Produced Water Treatment Units:** Design and validate bench-to-pilot scale compact, skid-mounted treatment technologies (e.g., advanced membrane materials, selective electrodialysis, or low-energy thermal Evaporators) and high-

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selectivity sorbents targeting extraction of critical minerals (e.g., lithium) from high-TDS oilfield brines

- **Subsurface Diagnostic Tools and Chemical Agents for Enhanced Oil Recovery (EOR):** Synthesize novel chemical surfactants, nanomaterials, or particulate tracers and develop high-resolution reservoir simulation software to optimize sweep efficiency and enhanced carbon dioxide (CO₂) EOR in mature reservoirs
- **Edge-Computing Sensors, Controls, and Agile Artificial Intelligence (AI) Models:** Engineer low-power, plug-and-play wireless sensor nodes and targeted machine learning algorithms (e.g., predictive maintenance modules for specific assets such as reciprocating compressors or artificial lift systems) that can be integrated into existing supervisory control and data acquisition (i.e., SCADA) systems
- **Small-Scale Remote Power Generation and Energy Efficiency Components:** Develop modular waste-heat recovery systems (e.g., Organic Rankine Cycle systems under one megawatt), high-efficiency micro-turbines utilizing field gas, and intelligent microgrid control software designed to electrify remote well-pad operations
- **Wellbore Integrity and Intervention Technologies:** Develop advanced solutions including cement evaluation, casing inspection, leak detection, plug integrity, and low-cost remediation tools
- **Pipeline and Compression Reliability:** Develop engineering solutions including corrosion monitoring, compressor optimization, predictive maintenance, and inspection robotics
- **Produced Water Analytics and Reuse:** Develop analytics and treatment solutions including real-time water quality sensors, treatment optimization software, mineral recovery, and fit-for-purpose reuse
- **Enhanced Recovery Diagnostics:** Improve subsurface tools including tracers, conformance tools, reservoir surveillance, and AI-assisted field optimization for CO₂ EOR and other mature field applications
- **Remote Operations and Field Electrification:** Integrate systems including modular power, waste-heat recovery, microgrid controls, and automation for well pads and small facilities

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Geothermal

- **Advanced Exploration and Reservoir Characterization:** Technologies including high-resolution fracture imaging, geothermometry, geochemical modeling, and multi-physics/AI-enabled data integration for improved resource identification and conceptual model development
- **Next-Generation Power Plant and Surface-Facility Performance:** Improvements including plant repowering, advanced thermodynamic cycles and working fluids, parasitic-load reduction, and enhanced scaling and corrosion mitigation systems
- **High-Temperature Drilling and Well Construction:** Advancements such as automated control logic, directional/high temperature drilling tools, look-ahead sensing, harsh-environment materials, high-temperature electronics/telemetry, temperature-management systems, and improved lost-circulation and wellbore-stability solutions
- **Reservoir Stimulation and Sustainability:** Technologies to increase permeability; improve durability of stimulation components; and enhance long-term productivity in enhanced geothermal systems through advanced materials, proppants, and flow-control systems
- **Commercial Deployment and Scale-Up Innovations:** Solutions including geothermal-integrated energy storage, data-center and industrial-heat integration, streamlined permitting and regulatory processes, advanced grid valuation/offtake tools, and AI-driven data and visualization systems for development optimization

Coal

- **Powerplant Modernization and Reliability:** Systems and technologies for coal-fired powerplant modernization, reliability, and life extension
- **Critical Minerals and Materials Recovery:** Technologies focused on critical minerals and materials recovery from coal and coal combustion residuals
- **Advanced Mining and Extraction:** Engineering next-generation advanced mining and extraction technologies
- **Non-Fuel Coal Conversion:** Processes for non-fuel coal-to-materials or product conversion
- **Advanced Electric Generation Designs:** Systems featuring improved fuel and operational flexibility

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- **Improved Emission Control Systems:** Solutions for lower-cost and higher-efficiency reduction of sulfur oxides, nitrogen oxides, mercury, particulates, and other emissions
- **Advanced Sensors and Controls:** Systems (possibly coupled with AI or advanced models) for power plant optimization and increased efficiency
- **Economical Waste Stream Treatment:** Technologies capable of economically treating regulated waste streams from coal-electric generation facilities (e.g., wastewater, ash, CO₂) to enable enhanced recovery of water and other commercial byproducts (e.g. cement additives, fertilizer, critical minerals, oil and gas through CO₂-EOR)
- **Integrated Energy Storage Systems:** Systems that integrate with coal-electric generation facilities to increase capacity factors
- **Integrated Energy-Water Campuses:** Reliable power, low-cost cooling, and proximity to existing industrial infrastructure to position coal communities as competitive data-center hosts
- **Integration Opportunities with Data Centers:** Coal-mine water and geothermal resources that, together, create sustainable, cooperative energy-water infrastructure

This list is an illustrative guide and is not all-inclusive; DOE is soliciting all technologies that can enhance the use of coal and coal byproducts.

RFI Questions

This Request for Information (RFI) is issued solely for information and planning purposes and does not constitute a Request for Proposals (RFP) or a promise to issue an RFP in the future. Responders may elect to respond to all, a portion, or none of the questions contained herein. Any response received, whether addressing a single question or the entire set, will be accepted for review by the Government.

Capital Providers / Investors

1. SBIC Program Participation & Structure:

Question: To what extent would access to Small Business Administration (SBA) low-cost leverage through the SBIC program (such as Standard, Accrual, Non-Leveraged, or Reinvestor licenses) incentivize your organization to allocate capital to subsurface energy technologies (Oil & Gas, Geothermal, or Coal), and what specific fund structures or leverage levels best align with your investment strategy?

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2. Risk Tolerance, Stage, and Sector Alignment:

Question: What specific Technology Readiness Levels (TRLs) and target sectors within HGEO's areas of interest fit your mandate; what technical validation, techno-economic analysis (TEA), or life-cycle assessment (LCA) data do private capital providers require before committing capital to pilot-to-commercial transitions; and what are the expected internal rates of return (IRR) and payback periods for subsurface energy investments?

3. Value of Investment:

Question: How would the SBIC initiative drive due diligence, risk assessment, and co-investment decisions in early-to-mid-stage startups, and what deal structures (such as matching-fund requirements, off-take agreements, or blended finance frameworks) would incentivize private investment firms and institutional investors?

Technology Providers / Startups

1. Technology Alignment, Maturity, and Performance Metrics:

Question: Which specific HGEO topic area (Oil & Gas, Geothermal, or Coal) does your technology address, what is its current Technology Readiness Level (TRL), and what are the primary quantitative technical performance metrics (e.g., efficiency gain, cost reduction, or operating envelope under harsh subsurface conditions) that distinguish your solution?

2. Commercialization Capital Requirements & Financial Runway:

Question: What capital expenditure (CapEx) and operational expenditure (OpEx) funding and timelines are required to transition your technology through full commercial scale; how much equity or debt capital has your company raised to date across government and private sources; and why is traditional private capital (e.g., venture capital, private equity, or debt markets) hesitant to invest in this technology without federal support?

3. Technical Bottlenecks & Resolution:

Question: What specific technical barriers (e.g., severe corrosion, high-temperature electronics, thermodynamic modeling, waste-stream scaling, etc.) currently impede your scale-up, and which technical capabilities (e.g., chemical/mechanical engineering expertise, specialized testing labs, or supercomputing) will be accessed with investment funding to overcome these barriers?

Additional Resources

DOE has additional resources available to support technology development with small businesses.

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DOE National Energy Technology Laboratory Technical Advisory Capacity

The National Energy Technology Laboratory (NETL) possesses core expertise and experience in fossil energy technologies within HGE0's portfolio. Throughout its 100-plus year history, NETL has contributed materially to major energy and environmental achievements such as acid rain mitigation, the shale gas revolution, and advanced materials development. NETL boasts a multi-disciplinary professional staff that includes: many engineering disciplines and sub-disciplines with particular strengths in chemical and mechanical engineering; physical sciences, including chemistry, physics, and mathematics; earth sciences; and economics. The staff function as researchers, computer modelers, sensor developers, technical project managers, etc. NETL maintains three research and development facilities in Morgantown, WV; Pittsburgh, PA; and Albany, OR. Taken together, these facilities feature 97 operational laboratories and a supercomputer, with a total replacement value in excess of \$1 billion.

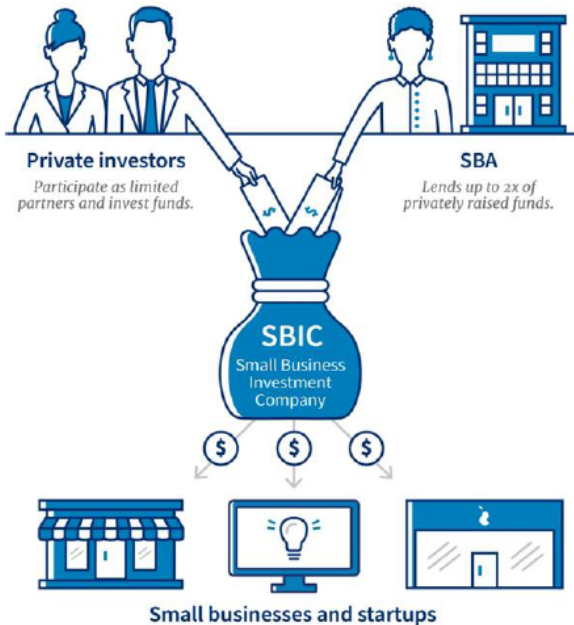
Small Business Investment Companies Program to Reduce Cost of Capital / Investment Hurdle

Potential investors in this DOE HGE0 initiative can apply to be licensed Small Business Investment Companies (SBIC) through the Small Business Association's (SBA) SBIC program. The SBA's SBIC program is a highly successful public-private partnership authorized under the Small Business Investment Act of 1958. SBICs are privately owned and managed investment funds that magnify private capital with SBA-guaranteed leverage, to make equity and debt investments in qualifying U.S. small businesses.

SBA leverage significantly reduces an investor's cost of capital and investment hurdle because the SBA-guaranteed leverage is 10-year Treasury notes plus an agency spread (generally 25-50 basis points) and an agency fee.

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How does the SBIC program work?



SBA

Licenses and regulates qualified investment managers to operate as an SBIC

Private Investors

Limited partners invest equity as matching capital for the SBIC to access SBA-guaranteed leverage

Small Businesses and Startups

Ensures financing to small businesses and startups that would otherwise be in short supply

Fund Managers

Responsible for all investment decisions and fund operations, including deal sourcing, due diligence, investment selection, investment monitoring, and compliance

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Flexible Licenses for a Range of Investment Strategies

Private Credit, Structured Equity or Mezzanine	Venture, Growth, or Buyout	Benefits of an SBIC License, without SBA leverage	Fund-of-Funds
Standard SBIC	Accrual SBIC	Non-Leveraged SBIC	Reinvestor SBIC
- Uses Standard Debenture - Eligible for up to 2 tiers of leverage - Maximum of \$250 million Individual Fund - Maximum of \$475 million for family of funds	- Uses Accrual Debenture - Eligible for up to 1.25 tiers of leverage - Maximum of \$175 million Individual Fund - Maximum of \$350 million for family of funds	- No Funding from SBA - Benefits of an SBIC License (other than access to government-guaranteed loans) - Includes an ability to accept commitments from banks	- Uses Accrual Debenture - Must invest $\geq$ 50% of capital in private funds - Eligible for up to 2 tiers of leverage - Maximum of \$175 million Individual Fund - Maximum of \$350 million for family of funds

Disclaimer and Important Notes

This RFI is solely a request for information and not a Notice of Funding Opportunity (NOFO). HGEO does not intend to issue a NOFO at this time and is not accepting applications.

Any information obtained as a result of this RFI is intended to be used by the Government on a non-attribution basis for planning and strategy development. This RFI does not constitute a formal solicitation for proposals or abstracts. Your response to this notice will be treated as *information only*. HGEO will review and consider all responses in its formulation of program strategies for the identified materials of interest that are the subject of this request. HGEO will not reimburse costs incurred in responding to this RFI. Respondents are advised that HGEO is under no obligation to acknowledge receipt of the information received or provide feedback on any information submitted under this RFI. Responses to this RFI do not bind HGEO to any further actions related to this topic.

Confidential Business Information

Pursuant to 10 CFR § 1004.11, any person submitting information he or she believes to be confidential and exempt by law from public disclosure should email, postal mail, or hand deliver two well-marked copies: one copy of the document marked “confidential” including all

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the information believed to be confidential, and one copy of the document marked “non-confidential” with the information believed to be confidential deleted. Submit these documents via email or on a CD, if possible. DOE will make its own determination about the confidential status of the information and treat it accordingly.

Evaluation and Administration by Federal and Non-Federal Personnel

Federal employees are subject to the non-disclosure requirements of a criminal statute, the Trade Secrets Act, 18 U.S.C. § 1905. The Government may seek the advice of qualified non-Federal personnel. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The respondents, by submitting a response, consent to HGEO providing the response to non-Federal parties. Non-Federal parties given access to responses must be subject to an appropriate obligation of confidentiality prior to being given access. Submissions may be reviewed by support contractors and private consultants.

Request for Information Response Guidelines

Responses to this RFI must be submitted electronically to DE-FOA-0003671@netl.doe.gov no later than 5:00 PM (ET) on October 5, 2026. Responses must be emailed as a Microsoft Word (docx) attachment that is no more than 10 pages long, 12-point font, one-inch margins. Attachments with file sizes exceeding 25MB should be compressed (i.e., zipped) to ensure message delivery.

HGEO will not respond to individual submissions or publicly publish a compendium of responses. A response to this RFI will not be viewed as a binding commitment to develop or pursue the project or ideas discussed.

Respondents must provide the following information at the start of their response:

- Company/institution name
- Company/institution contact
- Contact's address, phone number, and e-mail address

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