

(C) decrease water use and other environmental impacts, as determined by the Secretary; and

(D) demonstrate a path to commercial viability.

(f) Flexible operations

The Secretary shall support a research initiative on flexible operation of geothermal power plants.

(g) Integrated energy systems

The Secretary shall identify opportunities for joint research, development, and demonstration programs between geothermal systems and other energy generation or storage systems.

(h) Drilling data repository

(1) In general

The Secretary shall, in consultation with the Secretary of the Interior, establish and operate a voluntary, industry-wide repository of geothermal drilling information to lower the cost of future geothermal drilling.

(2) Repository

(A) In general

In carrying out paragraph (1), the Secretary shall collaborate with countries utilizing a significant amount of geothermal energy, as determined by the Secretary.

(B) Data system

The repository established under paragraph (1) shall be integrated with the National Geothermal Data System.

(Pub. L. 110-140, title VI, §614, Dec. 19, 2007, 121 Stat. 1680; Pub. L. 116-260, div. Z, title III, §3002(c), Dec. 27, 2020, 134 Stat. 2488.)

AMENDMENTS

2020—Pub. L. 116-260 amended section generally. Prior to amendment, section related to general geothermal systems research and development.

EFFECTIVE DATE

Section effective on the date that is 1 day after Dec. 19, 2007, see section 1601 of Pub. L. 110-140, set out as a note under section 1824 of Title 2, The Congress.

§ 17194. Enhanced geothermal systems research and development

(a) In general

The Secretary shall support a program of research, development, demonstration, and commercial application for enhanced geothermal systems, including the programs described in subsection (b).

(b) Enhanced geothermal systems technologies

In collaboration with industry partners, institutions of higher education, and the national laboratories, the Secretary shall support a program of research, development, demonstration, and commercial application of the technologies to achieve higher efficiency and lower cost enhanced geothermal systems, including—

(1) reservoir stimulation;

(2) drilled, non-stimulated (e.g. closed-loop) reservoir technologies;

(3) reservoir characterization, monitoring, and modeling and understanding of the surface area and volume of fractures;

(4) stress and fracture mapping including real time monitoring and modeling;

(5) tracer development;

(6) three and four-dimensional seismic imaging and tomography;

(7) well placement and orientation;

(8) long-term reservoir management;

(9) drilling technologies, methods, and tools;

(10) improved exploration tools;

(11) zonal isolation; and

(12) understanding induced seismicity risks from reservoir engineering and stimulation.

(c) Frontier observatory for research in geothermal energy

(1) In general

The Secretary shall support the establishment and construction of up to 3 field research sites, which shall each be known as a “Frontier Observatory for Research in Geothermal Energy” or “FORGE” site to develop, test, and enhance techniques and tools for enhanced geothermal energy.

(2) Duties

The Secretary shall—

(A) provide financial assistance in support of research and development projects focused on advanced monitoring technologies, new technologies and approaches for implementing multi-zone stimulations, nonstimulation techniques, and dynamic reservoir modeling that incorporates all available high-fidelity characterization data; and

(B) seek opportunities to coordinate efforts and share information with domestic and international partners engaged in research and development of geothermal systems and related technology, including coordination between FORGE sites.

(3) Site selection

Of the FORGE sites referred to in paragraph (1), the Secretary shall—

(A) consider applications through a competitive, merit-reviewed process, from National Laboratories, multi-institutional collaborations, institutes of higher education and other appropriate entities best suited to provide national leadership on geothermal related issues and perform the duties enumerated under this subsection;

(B) prioritize existing field sites and facilities with capabilities relevant to the duties enumerated under this subsection;

(C) determine the mission need for and potential location of subsequent FORGE sites following the completion of construction and one year of operation of two FORGE sites; and

(D) ensure geologic diversity among FORGE sites when developing subsequent sites, to the maximum extent practicable.

(4) Existing forge sites

A FORGE site already in existence on December 27, 2020, may continue to receive support.

(5) Site operation

(A) Initial duration

FORGE sites selected under paragraph (3) shall operate for an initial term of not more

than 7 years after the date on which site operation begins.

(B) Performance metrics

The Secretary shall establish performance metrics for each FORGE site supported under this paragraph, which may be used by the Secretary to determine whether a FORGE site should continue to receive funding.

(6) Additional terms

(A) In general

At the end of an operational term described in subparagraph (B), a FORGE site may—

- (i) be transferred to other public or private entities for further enhanced geothermal testing; or
- (ii) subject to appropriations and a merit review by the Secretary, operate for an additional term of not more than 7 years.

(B) Operational term described

An operational term referred to in subparagraph (A)—

- (i) in the case of an existing FORGE site, is the existing operational term; and
- (ii) in the case of new FORGE sites selected under paragraph (3), is the initial term under paragraph (5)(A) or an additional term under subparagraph (A)(ii) of this paragraph.

(7) Funding

(A) In general

Out of funds authorized to be appropriated under section 17202 of this title, there shall be made available to the Secretary to carry out the FORGE activities under this paragraph—

- (i) \$45,000,000 for fiscal year 2021;
- (ii) \$55,000,000 for fiscal year 2022;
- (iii) \$65,000,000 for fiscal year 2023;
- (iv) \$70,000,000 for fiscal year 2024; and
- (v) \$70,000,000 for fiscal year 2025.

(B) Considerations

In carrying out this subsection, the Secretary shall consider the balance between funds dedicated to construction and operations and research activities to reflect the state of site development.

(d) Enhanced geothermal systems demonstrations

(1) In general

Beginning on December 27, 2020, the Secretary, in collaboration with industry partners, institutions of higher education, and the national laboratories, shall support an initiative for demonstration of enhanced geothermal systems for power production or direct use.

(2) Projects

(A) In general

Under the initiative described in paragraph (1), 4 demonstration projects shall be carried out in locations that are potentially commercially viable for enhanced geothermal systems development, while also

considering environmental impacts to the maximum extent practicable, as determined by the Secretary.

(B) Requirements

Demonstration projects under subparagraph (A) shall—

(i) collectively demonstrate—

(I) different geologic settings, such as hot sedimentary aquifers, layered geologic systems, supercritical systems, and basement rock systems; and

(II) a variety of development techniques, including open hole and cased hole completions, differing well orientations, and stimulation and nonstimulation mechanisms; and

(ii) to the extent practicable, use existing sites where subsurface characterization or geothermal energy integration analysis has been conducted.

(C) Eastern demonstration

Not fewer than 1 of the demonstration projects carried out under subparagraph (A) shall be located an area east of the Mississippi River that is suitable for enhanced geothermal demonstration for power, heat, or a combination of power and heat.

(D) Milestone-based demonstration projects

The Secretary may carry out demonstration projects under this subsection as a milestone-based demonstration project under section 7256c of this title.

(3) Funding

Out of funds authorized to be appropriated under section 17202 of this title, there shall be made available to the Secretary to carry out the demonstration activities under this subsection \$21,000,000 for each of fiscal years 2021 through 2025.

(Pub. L. 110-140, title VI, §615, Dec. 19, 2007, 121 Stat. 1680; Pub. L. 116-260, div. Z, title III, §3002(d), Dec. 27, 2020, 134 Stat. 2489.)

REFERENCES IN TEXT

December 27, 2020, referred to in subsecs. (c)(4) and (d)(1), was in the original “the date of enactment of this Act” and “the date of enactment of this section”, respectively, and were translated as meaning the date of enactment of Pub. L. 116-260, which was approved Dec. 27, 2020.

AMENDMENTS

2020—Pub. L. 116-260 amended section generally. Prior to amendment, section related to enhanced geothermal systems research and development.

EFFECTIVE DATE

Section effective on the date that is 1 day after Dec. 19, 2007, see section 1601 of Pub. L. 110-140, set out as a note under section 1824 of Title 2, The Congress.

§ 17195. Geothermal energy production from oil and gas fields and recovery and production of geopressured gas resources

(a) In general

The Secretary shall establish a program of research, development, demonstration, and commercial application to support development of