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S. 598

To establish a mineral and mining innovation program within the Department of Energy to advance domestic mineral resources, economic growth, and national security, and for other purposes.

IN THE SENATE OF THE UNITED STATES

FEBRUARY 13, 2025

Mr. HICKENLOOPER (for himself and Mr. TILLIS) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

A BILL

To establish a mineral and mining innovation program within the Department of Energy to advance domestic mineral resources, economic growth, and national security, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Unearth Innovation
5 Act”.

6 **SEC. 2. MINERAL AND MINING INNOVATION INITIATIVE.**

7 (a) **DEFINITIONS.**—In this section:

1 (1) INDIAN TRIBE.—The term “Indian Tribe”
2 has the meaning given the term in section 4 of the
3 Indian Self-Determination and Education Assistance
4 Act (25 U.S.C. 5304).

5 (2) INITIATIVE.—The term “initiative” means
6 the mineral and mining innovation initiative estab-
7 lished under subsection (b).

8 (3) MINING UNIVERSITY.—The term “mining
9 university” means an institution of higher education
10 (as defined in section 101(a) of the Higher Edu-
11 cation Act of 1965 (20 U.S.C. 1001(a))) with a min-
12 ing, metallurgical, geological, or mineral engineering
13 program accredited by the Accreditation Board for
14 Engineering and Technology, Inc.

15 (4) SECRETARY.—The term “Secretary” means
16 the Secretary of Energy.

17 (b) ESTABLISHMENT.—Not later than 180 days after
18 the date of enactment of this Act, the Secretary shall es-
19 tablish an initiative within the Department of Energy, the
20 purposes of which are—

21 (1) to support the research, development, de-
22 ployment, and commercialization of emerging tech-
23 nologies and practices suitable for responsibly identi-
24 fying, characterizing, mining, extracting, processing,
25 recycling, and reprocessing the minerals required

1 across multiple industries in the United States to
2 advance domestic mineral resources, circularity, eco-
3 nomic growth, national security, and other goals, as
4 determined by the Secretary;

5 (2) to accelerate the research, development, and
6 integration of advanced technologies, data analytics,
7 responsible mining and mineral recovery practices,
8 advanced techniques for separation or processing fa-
9 cilities to minimize human impacts, and extractive
10 processes intended to minimize environmental im-
11 pact, increase per-unit productivity, optimize re-
12 source utilization, and promote technology adapta-
13 tion, community engagement, and social acceptance
14 of mining; and

15 (3) to coordinate with the National Institute of
16 Occupational Safety and Health of the Centers for
17 Disease Control and Prevention, the Office of Sur-
18 face Mining Reclamation and Enforcement, and the
19 Mine Safety and Health Administration of the De-
20 partment of Labor on safety and mining innovation.

21 (c) DUTIES.—

22 (1) IN GENERAL.—In carrying out the initia-
23 tive, the Secretary, in coordination with the Sec-
24 retary of the Interior, shall identify, study, evaluate,
25 test, and demonstrate hard rock mineral mining, un-

1 conventional mineral recovery, refining, and proc-
2 essing technologies and practices to improve—

3 (A) identification of new potential domestic
4 mineral resources and trends;

5 (B) characterization and mapping of do-
6 mestic mineral resources;

7 (C) statistical capabilities of the United
8 States, with respect to domestic and global min-
9 eral resources;

10 (D) environmental performance of mining
11 and mineral recovery, including—

12 (i) reducing air emissions and improv-
13 ing water management;

14 (ii) improving energy efficiency; and

15 (iii) minimizing tailings and other
16 waste, mining footprint, and environmental
17 impact;

18 (E) efficiency and productivity of mining,
19 including co-mineral and byproduct recovery,
20 mineral processing, and resource utilization;

21 (F) data collection, analytics, and sharing;

22 (G) mine safety;

23 (H) mine reclamation, remediation, and
24 reuse;

1 (I) community engagement, consultation
 2 with Indian Tribes, and social perception of
 3 mining;

4 (J) emerging and new technologies for
 5 mineral recovery from unconventional sources;

6 (K) training and education for the mining
 7 workforce; and

8 (L) the usable lifespan of products con-
 9 taining critical minerals through reuse,
 10 repurposing, and repairability.

11 (2) RESEARCH AND DEVELOPMENT AREAS OF
 12 FOCUS.—In carrying out the initiative, the Sec-
 13 retary, in coordination with the Secretary of the In-
 14 terior, shall focus research, development, deploy-
 15 ment, and commercialization activities in areas re-
 16 lated to—

17 (A) mineral exploration, discovery, and
 18 characterization science and technology, includ-
 19 ing—

20 (i) geophysical surveys;

21 (ii) geochemical surveys;

22 (iii) uncrewed survey platforms, in-
 23 cluding uncrewed aerial vehicles;

1 (iv) proximal sensing, including auto-
 2 matic spectroscopic scanning of drilling
 3 cores;

4 (v) characterizing mine waste, includ-
 5 ing mine-influenced water; and

6 (vi) other advanced technologies;

7 (B) mineral production and mine remedi-
 8 ation and closure, including—

9 (i) advanced drilling, sampling, and
 10 extraction technologies;

11 (ii) mine design, including innovations
 12 that maximize resource use, environmental
 13 benefit, and end uses of land;

14 (iii) digital mining solutions;

15 (iv) in-situ mineral recovery and other
 16 advanced extraction techniques;

17 (v) processing techniques, including—

18 (I) geometallurgy;

19 (II) beneficiation;

20 (III) extraction from increasingly
 21 low-grade ores and deeper mines;

22 (IV) co-mineral and byproduct
 23 recovery;

24 (V) multimineral refining;

25 (VI) whole rock processing; and

1 (VII) greenhouse gas reduction
2 and sequestration; and

3 (vi) remediation techniques, includ-
4 ing—

5 (I) reclamation;

6 (II) tailings and waste manage-
7 ment; and

8 (III) extraction and reprocessing
9 of valued materials from waste on
10 abandoned mine land and at active
11 and inactive mine sites;

12 (C) critical mineral recycling technologies,
13 including battery recycling;

14 (D) social acceptance of mining and min-
15 eral processes, technologies, and projects, in-
16 cluding—

17 (i) research to identify perspectives
18 and priorities of communities local to pro-
19 spective mining sites;

20 (ii) research to identify strategies for
21 community engagement and potential
22 short-term and long-term benefits of min-
23 ing for local communities;

1 (iii) research to provide socially-in-
 2 formed technology research, design, and
 3 development priorities;

4 (iv) best practices for developing com-
 5 munity benefit agreements and plans that
 6 address community priorities and mitigate
 7 potential environmental and economic
 8 harm that may result from mining; and

9 (v) consultation and engagement with
 10 Indian Tribes; and

11 (E) other research areas, as determined by
 12 the Secretary, to support the program.

13 (3) AREAS OF FOCUS FOR REEVALUATION.—

14 Not less frequently than once every 5 years, the Sec-
 15 retary, in carrying out the initiative in coordination
 16 with the Secretary of the Interior, shall consult with
 17 Indian Tribes, representatives from academic insti-
 18 tutions (including mining universities), National
 19 Laboratories, and the mining industry—

20 (A) to reevaluate the status of, and oppor-
 21 tunities for, mineral and mining research and
 22 development; and

23 (B) to revise the list of areas described in
 24 paragraph (2)(E).

1 (d) COORDINATION.—In carrying out this section, the
2 Secretary shall coordinate with the Secretary of the Inte-
3 rior through, at a minimum—

4 (1) interagency activities associated with the re-
5 search, development, deployment, and commer-
6 cialization of hard rock mining and unconventional
7 mineral recovery technologies;

8 (2) leveraging existing mineral research within
9 Federal agencies;

10 (3) engagement with industry, academia, Indian
11 Tribes, and nongovernmental entities to identify in-
12 novation gaps and opportunities related to minerals
13 and mining;

14 (4) alignment of applied academic and Federal
15 mineral and mining research and development with
16 economic, energy, and national security needs; and

17 (5) certification or validation of emerging tech-
18 nologies or best practices that demonstrate signifi-
19 cant economic, environmental, and security benefits,
20 including resource optimization, environmental sus-
21 tainability, community engagement, and workforce
22 development; and

23 (e) COLLABORATION.—

24 (1) IN GENERAL.—In carrying out this section,
25 the Secretary and the Secretary of the Interior may

1 enter into cooperative agreements, contracts, or
2 other arrangements, including partnerships, with In-
3 dian Tribes and academic, public, private, and non-
4 governmental entities located in the United States,
5 any territory or possession of the United States, or
6 a country described in subparagraph (B) or (C) of
7 section 12(3) of the Strategic and Critical Materials
8 Stock Piling Act (50 U.S.C. 98h–3(3)).

9 (2) PRIORITIZATION.—In carrying out para-
10 graph (1), the Secretary and the Secretary of the In-
11 terior shall, to the maximum extent practicable,
12 prioritize entering into cooperative agreements, con-
13 tracts, or other arrangements with academic institu-
14 tions, including mining universities.

15 (f) REPORT.—Not later than 3 years after the date
16 of enactment of this Act, the Secretary and the Secretary
17 of the Interior shall submit to Congress a report describ-
18 ing the results of the duties carried out under subsection
19 (c).

20 (g) AUTHORIZATION OF APPROPRIATIONS.—There is
21 authorized to be appropriated to the Secretary to carry
22 out this section \$100,000,000 for each of fiscal years 2026
23 through 2035, to remain available until expended.

