

**Calendar No. 423**115<sup>TH</sup> CONGRESS  
2<sup>D</sup> SESSION**S. 1563****[Report No. 115–255]**

To authorize the Office of Fossil Energy to develop advanced separation technologies for the extraction and recovery of rare earth elements and minerals from coal and coal byproducts, and for other purposes.

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**IN THE SENATE OF THE UNITED STATES**

JULY 13, 2017

Mr. MANCHIN introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

MAY 22, 2018

Reported by Ms. MURKOWSKI, without amendment

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**A BILL**

To authorize the Office of Fossil Energy to develop advanced separation technologies for the extraction and recovery of rare earth elements and minerals from coal and coal byproducts, 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,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Rare Earth Element  
3 Advanced Coal Technologies Act”.

4 **SEC. 2. FINDINGS.**

5 Congress finds that—

6 (1) the United States is largely dependent on  
7 foreign imports for the domestic supply of rare earth  
8 elements and minerals in the United States;

9 (2) as of the date of enactment of this Act, the  
10 United States does not have domestic production ca-  
11 pability for, or a guaranteed supply chain of, rare  
12 earth elements and minerals, particularly in times of  
13 national crisis;

14 (3) access to certain rare earth elements and  
15 minerals is critical for the national security of the  
16 United States;

17 (4) China maintains a near monopoly of the  
18 global supply chain of rare earth elements and min-  
19 erals;

20 (5) the successful development of commercially  
21 viable refining methods of rare earth elements and  
22 minerals from coal byproducts could lead to new eco-  
23 nomic development opportunities in parts of the  
24 United States most affected by the downturn of the  
25 coal industry;

26 (6) rare earth elements—

1 (A) comprise 17 elements on the periodic  
2 table, including—

3 (i) the lanthanides, which are lan-  
4 thanum (La), cerium (Ce), praseodymium  
5 (Pr), neodymium (Nd), promethium (Pm),  
6 samarium (Sm), europium (Eu), gado-  
7 linium (Gd), terbium (Tb), dysprosium  
8 (Dy), holmium (Ho), erbium (Er), thulium  
9 (Tm), ytterbium (Yb), and lutetium (Lu);  
10 and

11 (ii) transition elements, which are  
12 scandium (Sc) and yttrium (Y); and

13 (B) can be divided into—

14 (i) light rare earth elements, which  
15 are lanthanum (La), cerium (Ce), praseo-  
16 dymium (Pr), neodymium (Nd), pro-  
17 methium (Pm), and samarium (Sm); and

18 (ii) heavy rare earth elements, which  
19 are scandium (Sc), yttrium (Y), europium  
20 (Eu), gadolinium (Gd), terbium (Tb), dys-  
21 prosium (Dy), holmium (Ho), erbium (Er),  
22 thulium (Tm), ytterbium (Yb), and lute-  
23 tium (Lu); and

24 (7) it is in the interest of the Federal Govern-  
25 ment—

1 (A) to guide responsible domestic produc-  
2 tion of rare earth elements and minerals to en-  
3 sure industry and consumers in the United  
4 States have access to a reliable domestic supply  
5 of valuable rare earth elements and minerals;  
6 and

7 (B)(i) to identify the areas of highest po-  
8 tential interruption in the global supply chain of  
9 rare earth elements and minerals; and

10 (ii) to strengthen the position of the  
11 United States in that supply chain by miti-  
12 gating potential interruptions through the de-  
13 velopment of advanced coal technologies.

14 **SEC. 3. PROGRAM FOR EXTRACTION AND RECOVERY OF**  
15 **RARE EARTH ELEMENTS AND MINERALS**  
16 **FROM COAL AND COAL BYPRODUCTS.**

17 (a) IN GENERAL.—The Secretary of Energy, acting  
18 through the Assistant Secretary for Fossil Energy (re-  
19 ferred to in this section as the “Secretary”), shall carry  
20 out a program under which the Secretary shall develop  
21 advanced separation technologies for the extraction and  
22 recovery of rare earth elements and minerals from coal  
23 and coal byproducts.

24 (b) AUTHORIZATION OF APPROPRIATIONS.—There is  
25 authorized to be appropriated to the Secretary to carry

1 out the program described in subsection (a) \$20,000,000  
2 for each of fiscal years 2018 through 2025.

3 **SEC. 4. ASSESSMENT AND REPORT.**

4 (a) IN GENERAL.—Not later than 1 year after the  
5 date of enactment of this Act, the Secretary of Energy,  
6 in consultation with the Secretary of Defense (referred to  
7 in this section as the “Secretary”), shall carry out, and  
8 submit to the Committee on Energy and Natural Re-  
9 sources of the Senate and the Committee on Energy and  
10 Commerce of the House of Representatives—

11 (1) an assessment—

12 (A) identifying and ranking the rare earth  
13 elements that—

14 (i) are most important to consumers  
15 in the United States;

16 (ii) are most jeopardized in the global  
17 supply chain; and

18 (iii) will have the greatest impact to  
19 consumers in the United States in the  
20 event of a disruption in the global supply  
21 chain;

22 (B) evaluating the development of ad-  
23 vanced separation technologies for the extrac-  
24 tion and recovery of rare earth elements and  
25 minerals from coal and coal byproducts (re-

1           ferred to in this subsection as the “tech-  
2           nologies”);

3           (C) identifying and evaluating the results  
4           of the development of the technologies, includ-  
5           ing the results with respect to the extraction  
6           and recovery of each rare earth element;

7           (D) determining what the technologies are  
8           capable of producing;

9           (E) evaluating the performance of the  
10          technologies, including what the technologies—

11                 (i) succeed and fail at accomplishing;

12                 and

13                 (ii) can and cannot do cost-effectively;

14                 and

15          (F)(i) evaluating the market impact on  
16          each rare earth mineral of the penetration of  
17          commercially viable technologies; and

18                 (ii) how the penetration of commercially  
19          viable coal-based technology will impact the  
20          global supply chain; and

21          (2) a report analyzing—

22                 (A) the additional resources required for  
23          the development of commercial-ready deploy-  
24          ment of technologies that are second generation  
25          and transformational; and

1           (B) the market impact of processes to  
2           treat and recover rare earth elements and min-  
3           erals from sludge generated during treatment of  
4           acid mine drainage from coal mines.

5           (b) REQUIREMENT.—In carrying out the assessment  
6 and report under subsection (a), the Secretary shall focus  
7 on the rare earth elements determined by the Secretary  
8 to be most critical to the national security of the United  
9 States.

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