

115TH CONGRESS  
1ST SESSION

# S. 1563

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

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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,*

3       **SECTION 1. SHORT TITLE.**

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

6       **SEC. 2. FINDINGS.**

7       Congress finds that—

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

4           (2) as of the date of enactment of this Act, the  
5           United States does not have domestic production ca-  
6           pability for, or a guaranteed supply chain of, rare  
7           earth elements and minerals, particularly in times of  
8           national crisis;

9           (3) access to certain rare earth elements and  
10          minerals is critical for the national security of the  
11          United States;

12          (4) China maintains a near monopoly of the  
13          global supply chain of rare earth elements and min-  
14          erals;

15          (5) the successful development of commercially  
16          viable refining methods of rare earth elements and  
17          minerals from coal byproducts could lead to new eco-  
18          nomic development opportunities in parts of the  
19          United States most affected by the downturn of the  
20          coal industry;

21          (6) rare earth elements—

22                  (A) comprise 17 elements on the periodic  
23          table, including—

24                          (i) the lanthanides, which are lan-  
25                          thanum (La), cerium (Ce), praseodymium

(Pr), neodymium (Nd), promethium (Pm), samarium (Sm), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), and lutetium (Lu); and

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

(B) can be divided into—

(i) light rare earth elements, which are lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), promethium (Pm), and samarium (Sm); and

(ii) heavy rare earth elements, which are scandium (Sc), yttrium (Y), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), and lutetium (Lu); and

(7) it is in the interest of the Federal Government—

(A) to guide responsible domestic production of rare earth elements and minerals to ensure industry and consumers in the United States have access to a reliable domestic supply

1 of valuable rare earth elements and minerals;  
 2 and

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

6 (ii) to strengthen the position of the  
 7 United States in that supply chain by miti-  
 8 gating potential interruptions through the de-  
 9 velopment of advanced coal technologies.

10 **SEC. 3. PROGRAM FOR EXTRACTION AND RECOVERY OF**  
 11 **RARE EARTH ELEMENTS AND MINERALS**  
 12 **FROM COAL AND COAL BYPRODUCTS.**

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

20 (b) AUTHORIZATION OF APPROPRIATIONS.—There is  
 21 authorized to be appropriated to the Secretary to carry  
 22 out the program described in subsection (a) \$20,000,000  
 23 for each of fiscal years 2018 through 2025.

1 **SEC. 4. ASSESSMENT AND REPORT.**

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

9 (1) an assessment—

10 (A) identifying and ranking the rare earth  
11 elements that—

12 (i) are most important to consumers  
13 in the United States;

14 (ii) are most jeopardized in the global  
15 supply chain; and

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

20 (B) evaluating the development of ad-  
21 vanced separation technologies for the extrac-  
22 tion and recovery of rare earth elements and  
23 minerals from coal and coal byproducts (re-  
24 ferred to in this subsection as the “tech-  
25 nologies”);

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

5 (D) determining what the technologies are  
 6 capable of producing;

7 (E) evaluating the performance of the  
 8 technologies, including what the technologies—

9 (i) succeed and fail at accomplishing;

10 and

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

12 and

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

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

19 (2) a report analyzing—

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

24 (B) the market impact of processes to  
 25 treat and recover rare earth elements and min-

1           erals from sludge generated during treatment of  
2           acid mine drainage from coal mines.

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

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