

118TH CONGRESS
1ST SESSION

S. 452

To require the Secretary of Energy to establish a Nuclear Fuel Security Program, expand the American Assured Fuel Supply Program, and submit a report on a civil nuclear credit program, and for other purposes.

IN THE SENATE OF THE UNITED STATES

FEBRUARY 15, 2023

Mr. MANCHIN (for himself, Mr. BARRASSO, and Mr. RISCH) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

A BILL

To require the Secretary of Energy to establish a Nuclear Fuel Security Program, expand the American Assured Fuel Supply Program, and submit a report on a civil nuclear credit program, 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 “Nuclear Fuel Security
5 Act of 2023”.

6 **SEC. 2. U.S. NUCLEAR FUEL SECURITY INITIATIVE.**

7 (a) SENSE OF CONGRESS.—It is the sense of Con-
8 gress that—

1 (1) the Department should—

2 (A) prioritize activities to increase domes-
3 tic production of low-enriched uranium; and

4 (B) accelerate efforts to establish a domes-
5 tic high-assay, low-enriched uranium enrich-
6 ment capability; and

7 (2) if domestic enrichment of high-assay, low-
8 enriched uranium will not be commercially available
9 at the scale needed in time to meet the needs of the
10 advanced nuclear reactor demonstration projects of
11 the Department, the Secretary shall consider and
12 implement, as necessary—

13 (A) all viable options to make high-assay,
14 low-enriched uranium produced from inven-
15 tories owned by the Department available in a
16 manner that is sufficient to maximize the po-
17 tential for the Department to meet the needs
18 and schedules of advanced nuclear reactor de-
19 velopers, without impacting existing Depart-
20 ment missions, until such time that commercial
21 enrichment and deconversion capability for
22 high-assay, low-enriched uranium exists at a
23 scale sufficient to meet future needs; and

24 (B) all viable options for partnering with
25 countries that are allies or partners of the

1 United States to meet those needs and sched-
2 ules until that time.

3 (b) OBJECTIVES.—The objectives of this section
4 are—

5 (1) to expeditiously increase domestic produc-
6 tion of low-enriched uranium;

7 (2) to expeditiously increase domestic produc-
8 tion of high-assay, low-enriched uranium by an an-
9 nual quantity, and in such form, determined by the
10 Secretary to be sufficient to meet the needs of—

11 (A) advanced nuclear reactor developers;

12 and

13 (B) the consortium;

14 (3) to ensure the availability of domestically
15 produced, converted, enriched, deconverted, and re-
16 duced uranium in a quantity determined by the Sec-
17 retary, in consultation with U.S. nuclear energy
18 companies, to be sufficient to address a reasonably
19 anticipated supply disruption;

20 (4) to address gaps and deficiencies in the do-
21 mestic production, conversion, enrichment,
22 deconversion, and reduction of uranium by
23 partnering with countries that are allies or partners
24 of the United States if domestic options are not
25 practicable;

1 (5) to ensure that, in the event of a supply dis-
2 ruption in the nuclear fuel market, a reserve of nu-
3 clear fuels is available to serve as a backup supply
4 to support the nuclear nonproliferation and civil nu-
5 clear energy objectives of the Department;

6 (6) to support enrichment, deconversion, and
7 reduction technology deployed in the United States;
8 and

9 (7) to ensure that, until such time that domes-
10 tic enrichment and deconversion of high-assay, low-
11 enriched uranium is commercially available at the
12 scale needed to meet the needs of advanced nuclear
13 reactor developers, the Secretary considers and im-
14 plements, as necessary—

15 (A) all viable options to make high-assay,
16 low-enriched uranium produced from inven-
17 tories owned by the Department available in a
18 manner that is sufficient to maximize the po-
19 tential for the Department to meet the needs
20 and schedules of advanced nuclear reactor de-
21 velopers; and

22 (B) all viable options for partnering with
23 countries that are allies or partners of the
24 United States to meet those needs and sched-
25 ules.

1 (c) DEFINITIONS.—In this section:

2 (1) ADVANCED NUCLEAR REACTOR.—The term
3 “advanced nuclear reactor” has the meaning given
4 the term in section 951(b) of the Energy Policy Act
5 of 2005 (42 U.S.C. 16271(b)).

6 (2) ASSOCIATED ENTITY.—The term “associ-
7 ated entity” means an entity that—

8 (A) is owned, controlled, or dominated
9 by—

10 (i) the government of a country that
11 is an ally or partner of the United States;

12 or

13 (ii) an associated individual; or

14 (B) is organized under the laws of, or oth-
15 erwise subject to the jurisdiction of, a country
16 that is an ally or partner of the United States,
17 including a corporation that is incorporated in
18 such a country.

19 (3) ASSOCIATED INDIVIDUAL.—The term “asso-
20 ciated individual” means an alien who is a national
21 of a country that is an ally or partner of the United
22 States.

23 (4) CONSORTIUM.—The term “consortium”
24 means the consortium established under section

1 2001(a)(2)(F) of the Energy Act of 2020 (42 U.S.C.
2 16281(a)(2)(F)).

3 (5) DEPARTMENT.—The term “Department”
4 means the Department of Energy.

5 (6) HIGH-ASSAY, LOW-ENRICHED URANIUM;
6 HALEU.—The term “high-assay, low-enriched ura-
7 nium” or “HALEU” means high-assay low-enriched
8 uranium (as defined in section 2001(d) of the En-
9 ergy Act of 2020 (42 U.S.C. 16281(d))).

10 (7) LOW-ENRICHED URANIUM; LEU.—The term
11 “low-enriched uranium” or “LEU” means each of—

12 (A) low-enriched uranium (as defined in
13 section 3102 of the USEC Privatization Act
14 (42 U.S.C. 2297h)); and

15 (B) low-enriched uranium (as defined in
16 section 3112A(a) of that Act (42 U.S.C.
17 2297h–10a(a))).

18 (8) PROGRAMS.—The term “Programs”
19 means—

20 (A) the Nuclear Fuel Security Program es-
21 tablished under subsection (d)(1);

22 (B) the American Assured Fuel Supply
23 Program of the Department; and

1 (C) the HALEU for Advanced Nuclear Re-
2 actor Demonstration Projects Program estab-
3 lished under subsection (d)(3).

4 (9) SECRETARY.—The term “Secretary” means
5 the Secretary of Energy.

6 (10) U.S. NUCLEAR ENERGY COMPANY.—The
7 term “U.S. nuclear energy company” means a com-
8 pany that—

9 (A) is organized under the laws of, or oth-
10 erwise subject to the jurisdiction of, the United
11 States; and

12 (B) is involved in the nuclear energy indus-
13 try.

14 (d) ESTABLISHMENT AND EXPANSION OF PRO-
15 GRAMS.—The Secretary, consistent with the objectives de-
16 scribed in subsection (b), shall—

17 (1) establish a program, to be known as the
18 “Nuclear Fuel Security Program”, to increase the
19 quantity of LEU and HALEU produced by U.S. nu-
20 clear energy companies;

21 (2) expand the American Assured Fuel Supply
22 Program of the Department to ensure the avail-
23 ability of domestically produced, converted, enriched,
24 deconverted, and reduced uranium in the event of a
25 supply disruption; and

1 (3) establish a program, to be known as the
2 “HALEU for Advanced Nuclear Reactor Dem-
3 onstration Projects Program”—

4 (A) to maximize the potential for the De-
5 partment to meet the needs and schedules of
6 advanced nuclear reactor developers until such
7 time that commercial enrichment and
8 deconversion capability for HALEU exists in
9 the United States at a scale sufficient to meet
10 future needs; and

11 (B) where practicable, to partner with
12 countries that are allies or partners of the
13 United States to meet those needs and sched-
14 ules until that time.

15 (e) NUCLEAR FUEL SECURITY PROGRAM.—

16 (1) IN GENERAL.—In carrying out the Nuclear
17 Fuel Security Program, the Secretary—

18 (A) shall—

19 (i) not later than 180 days after the
20 date of enactment of this Act, enter into 2
21 or more contracts to begin acquiring not
22 less than 100 metric tons per year of LEU
23 by December 31, 2026 (or the earliest
24 operationally feasible date thereafter), to
25 ensure diversity of supply in domestic ura-

1 nium mining, conversion, enrichment, and
2 deconversion capacity and technologies, in-
3 cluding new capacity, among U.S. nuclear
4 energy companies;

5 (ii) not later than 180 days after the
6 date of enactment of this Act, enter into 2
7 or more contracts with members of the
8 consortium to begin acquiring not less than
9 20 metric tons per year of HALEU by De-
10 cember 31, 2027 (or the earliest operation-
11 ally feasible date thereafter), from U.S.
12 nuclear energy companies;

13 (iii) utilize only uranium produced,
14 converted, enriched, deconverted, and re-
15 duced in—

16 (I) the United States; or

17 (II) if domestic options are not
18 practicable, a country that is an ally
19 or partner of the United States; and

20 (iv) to the maximum extent prac-
21 ticable, ensure that the use of domestic
22 uranium utilized as a result of that pro-
23 gram does not negatively affect the eco-
24 nomic operation of nuclear reactors in the
25 United States; and

1 (B)(i) may not make commitments under
2 this subsection (including cooperative agree-
3 ments (used in accordance with section 6305 of
4 title 31, United States Code), purchase agree-
5 ments, guarantees, leases, service contracts, or
6 any other type of commitment) for the purchase
7 or other acquisition of HALEU or LEU un-
8 less—

9 (I) funds are specifically provided for
10 those purposes in advance in appropria-
11 tions Acts enacted after the date of enact-
12 ment of this Act; or

13 (II) the commitment is funded en-
14 tirely by funds made available to the Sec-
15 retary from the account described in sub-
16 section (i)(2)(B); and

17 (ii) may make a commitment described in
18 clause (i) only—

19 (I) if the full extent of the anticipated
20 costs stemming from the commitment is
21 recorded as an obligation at the time that
22 the commitment is made; and

23 (II) to the extent of that up-front ob-
24 ligation recorded in full at that time.

1 (2) CONSIDERATIONS.—In carrying out para-
2 graph (1)(A)(ii), the Secretary shall consider and, if
3 appropriate, implement—

4 (A) options to ensure the quickest avail-
5 ability of commercially enriched HALEU, in-
6 cluding—

7 (i) partnerships between 2 or more
8 commercial enrichers; and

9 (ii) utilization of up to 10-percent en-
10 riched uranium as feedstock in demonstra-
11 tion-scale or commercial HALEU enrich-
12 ment facilities;

13 (B) options to partner with countries that
14 are allies or partners of the United States to
15 provide LEU and HALEU for commercial pur-
16 poses;

17 (C) options that provide for an array of
18 HALEU—

19 (i) enrichment levels;

20 (ii) output levels to meet demand; and

21 (iii) fuel forms, including uranium
22 metal and oxide; and

23 (D) options—

24 (i) to replenish, as necessary, Depart-
25 ment stockpiles of uranium that were in-

1 tended to be downblended for other pur-
2 poses, but were instead used in carrying
3 out activities under the HALEU for Ad-
4 vanced Nuclear Reactor Demonstration
5 Projects Program;

6 (ii) to continue supplying HALEU to
7 meet the needs of the recipients of an
8 award made pursuant to the funding op-
9 portunity announcement of the Depart-
10 ment numbered DE-FOA-0002271 for
11 Pathway 1, Advanced Reactor Demonstra-
12 tions; and

13 (iii) to make HALEU available to
14 other advanced nuclear reactor developers
15 and other end-users.

16 (3) AVOIDANCE OF MARKET DISRUPTIONS.—In
17 carrying out the Nuclear Fuel Security Program, the
18 Secretary, to the extent practicable and consistent
19 with the purposes of that program, shall not disrupt
20 or replace market mechanisms by competing with
21 U.S. nuclear energy companies.

22 (f) EXPANSION OF THE AMERICAN ASSURED FUEL
23 SUPPLY PROGRAM.—The Secretary, in consultation with
24 U.S. nuclear energy companies, shall—

1 (1) expand the American Assured Fuel Supply
2 Program of the Department by merging the oper-
3 ations of the Uranium Reserve Program of the De-
4 partment with the American Assured Fuel Supply
5 Program; and

6 (2) in carrying out the American Assured Fuel
7 Supply Program of the Department, as expanded
8 under paragraph (1)—

9 (A) maintain, replenish, diversify, or in-
10 crease the quantity of uranium made available
11 by that program in a manner determined by the
12 Secretary to be consistent with the purposes of
13 that program and the objectives described in
14 subsection (b);

15 (B) utilize only uranium produced, con-
16 verted, enriched, deconverted, and reduced in—

17 (i) the United States; or

18 (ii) if domestic options are not prac-
19 ticable, a country that is an ally or partner
20 of the United States;

21 (C) make uranium available from the
22 American Assured Fuel Supply, subject to
23 terms and conditions determined by the Sec-
24 retary to be reasonable and appropriate;

1 (D) refill and expand the supply of ura-
2 nium in the American Assured Fuel Supply, in-
3 cluding by maintaining a limited reserve of ura-
4 nium to address a potential event in which a
5 domestic or foreign recipient of uranium experi-
6 ences a supply disruption for which uranium
7 cannot be obtained through normal market
8 mechanisms or under normal market conditions;
9 and

10 (E) take other actions that the Secretary
11 determines to be necessary or appropriate to
12 address the purposes of that program and the
13 objectives described in subsection (b).

14 (g) HALEU FOR ADVANCED NUCLEAR REACTOR
15 DEMONSTRATION PROJECTS PROGRAM.—

16 (1) ACTIVITIES.—On enactment of this Act, the
17 Secretary shall immediately accelerate and, as nec-
18 essary, initiate activities to make available from in-
19 ventories or stockpiles owned by the Department and
20 made available to the consortium, HALEU for use
21 in advanced nuclear reactors that cannot operate on
22 uranium with lower enrichment levels or on alternate
23 fuels, with priority given to the awards made pursu-
24 ant to the funding opportunity announcement of the
25 Department numbered DE-FOA-0002271 for Path-

1 way 1, Advanced Reactor Demonstrations, with ad-
2 ditional HALEU to be made available to other ad-
3 vanced nuclear reactor developers, as the Secretary
4 determines to be appropriate.

5 (2) QUANTITY.—In carrying out activities
6 under this subsection, the Secretary shall consider
7 and implement, as necessary, all viable options to
8 make HALEU available in quantities and forms suf-
9 ficient to maximize the potential for the Department
10 to meet the needs and schedules of advanced nuclear
11 reactor developers, including by seeking to make
12 available—

13 (A) by September 30, 2024, not less than
14 3 metric tons of HALEU;

15 (B) by December 31, 2025, not less than
16 an additional 8 metric tons of HALEU; and

17 (C) by June 30, 2026, not less than an ad-
18 ditional 10 metric tons of HALEU.

19 (3) FACTORS FOR CONSIDERATION.—In car-
20 rying out activities under this subsection, the Sec-
21 retary shall take into consideration—

22 (A) options for providing HALEU from a
23 stockpile of uranium owned by the Department,
24 including—

1 (i) uranium that has been declared ex-
2 cess to national security needs during or
3 prior to fiscal year 2023;

4 (ii) uranium that—

5 (I) directly meets the needs of
6 advanced nuclear reactor developers;
7 but

8 (II) has been previously used or
9 fabricated for another purpose;

10 (iii) uranium that can meet the needs
11 of advanced nuclear reactor developers
12 after removing radioactive or other con-
13 taminants that resulted from previous use
14 or fabrication of the fuel for research, de-
15 velopment, demonstration, or deployment
16 activities of the Department, including ac-
17 tivities that reduce the environmental li-
18 ability of the Department by accelerating
19 the processing of uranium from stockpiles
20 designated as waste;

21 (iv) uranium from a high-enriched
22 uranium stockpile, which can be blended
23 with lower assay uranium to become
24 HALEU to meet the needs of advanced
25 nuclear reactor developers; and

1 (v) uranium from stockpiles intended
2 for other purposes (excluding stockpiles in-
3 tended for national security needs), but for
4 which uranium could be swapped or re-
5 placed in time in such a manner that
6 would not negatively impact the missions
7 of the Department;

8 (B) options for expanding, or establishing
9 new, capabilities or infrastructure to support
10 the processing of uranium from Department in-
11 ventories;

12 (C) options for accelerating the availability
13 of HALEU from HALEU enrichment dem-
14 onstration projects of the Department;

15 (D) options for providing HALEU from
16 domestically enriched HALEU procured by the
17 Department through a competitive process pur-
18 suant to the Nuclear Fuel Security Program es-
19 tablished under subsection (d)(1);

20 (E) options to replenish, as needed, De-
21 partment stockpiles of uranium made available
22 pursuant to subparagraph (A) with domestically
23 enriched HALEU procured by the Department
24 through a competitive process pursuant to the

1 Nuclear Fuel Security Program established
2 under subsection (d)(1); and

3 (F) options that combine 1 or more of the
4 approaches described in subparagraphs (A)
5 through (E) to meet the deadlines described in
6 paragraph (2).

7 (4) LIMITATIONS.—

8 (A) CERTAIN SERVICES.—The Secretary
9 shall not barter or otherwise sell or transfer
10 uranium in any form in exchange for services
11 relating to—

12 (i) the final disposition of radioactive
13 waste from uranium that is the subject of
14 a contract for sale, resale, transfer, or
15 lease under this subsection; or

16 (ii) environmental cleanup activities.

17 (B) CERTAIN COMMITMENTS.—In carrying
18 out activities under this subsection, the Sec-
19 retary—

20 (i) may not make commitments under
21 this subsection (including cooperative
22 agreements (used in accordance with sec-
23 tion 6305 of title 31, United States Code),
24 purchase agreements, guarantees, leases,
25 service contracts, or any other type of com-

1 mitment) for the purchase or other acquisi-
2 tion of HALEU or LEU unless—

3 (I) funds are specifically provided
4 for those purposes in advance in ap-
5 propriations Acts enacted after the
6 date of enactment of this Act; or

7 (II) the commitment is funded
8 entirely by funds made available to
9 the Secretary from the account de-
10 scribed in subsection (i)(2)(B); and

11 (ii) may make a commitment de-
12 scribed in clause (i) only—

13 (I) if the full extent of the antici-
14 pated costs stemming from the com-
15 mitment is recorded as an obligation
16 at the time that the commitment is
17 made; and

18 (II) to the extent of that up-front
19 obligation recorded in full at that
20 time.

21 (5) SUNSET.—The authority of the Secretary to
22 carry out activities under this subsection shall termi-
23 nate on the date on which the Secretary notifies
24 Congress that the HALEU needs of advanced nu-
25 clear reactor developers can be fully met by commer-

1 cial HALEU suppliers in the United States, as de-
2 termined by the Secretary, in consultation with U.S.
3 nuclear energy companies.

4 (h) DOMESTIC SOURCING CONSIDERATIONS.—

5 (1) IN GENERAL.—Except as provided in para-
6 graph (2), the Secretary may only carry out an ac-
7 tivity in connection with 1 or more of the Programs
8 if—

9 (A) the activity promotes manufacturing in
10 the United States associated with uranium sup-
11 ply chains; or

12 (B) the activity relies on resources, mate-
13 rials, or equipment developed or produced—

14 (i) in the United States; or

15 (ii) in a country that is an ally or
16 partner of the United States by—

17 (I) the government of that coun-
18 try;

19 (II) an associated entity; or

20 (III) a U.S. nuclear energy com-
21 pany.

22 (2) WAIVER.—The Secretary may waive the re-
23 quirements of paragraph (1) with respect to an ac-
24 tivity if the Secretary determines a waiver to be nec-

1 essary to achieve 1 or more of the objectives de-
2 scribed in subsection (b).

3 (i) REASONABLE COMPENSATION.—

4 (1) IN GENERAL.—In carrying out activities
5 under this section, the Secretary shall ensure that
6 any LEU and HALEU made available by the Sec-
7 retary under 1 or more of the Programs is subject
8 to reasonable compensation, taking into account the
9 fair market value of the LEU or HALEU and the
10 purposes of this section.

11 (2) AVAILABILITY OF CERTAIN FUNDS.—

12 (A) IN GENERAL.—Notwithstanding sec-
13 tion 3302(b) of title 31, United States Code,
14 revenues received by the Secretary from the
15 sale or transfer of fuel feed material acquired
16 by the Secretary pursuant to a contract entered
17 into under clause (i) or (ii) of subsection
18 (e)(1)(A) shall—

19 (i) be deposited in the account de-
20 scribed in subparagraph (B);

21 (ii) be available to the Secretary for
22 carrying out the purposes of this section,
23 to reduce the need for further appropria-
24 tions for those purposes; and

25 (iii) remain available until expended.

1 (B) REVOLVING FUND.—There is estab-
2 lished in the Treasury an account into which
3 the revenues described in subparagraph (A)
4 shall be—

5 (i) deposited in accordance with clause

6 (i) of that subparagraph; and

7 (ii) made available in accordance with
8 clauses (ii) and (iii) of that subparagraph.

9 (j) NUCLEAR REGULATORY COMMISSION.—The Nu-
10 clear Regulatory Commission shall prioritize and expedite
11 consideration of any action related to the Programs to the
12 extent permitted under the Atomic Energy Act of 1954
13 (42 U.S.C. 2011 et seq.) and related statutes.

14 (k) USEC PRIVATIZATION ACT.—The requirements
15 of section 3112(d)(2) of the USEC Privatization Act (42
16 U.S.C. 2297h–10(d)(2)) shall not apply to activities re-
17 lated to the Programs.

18 (l) NATIONAL SECURITY NEEDS.—The Secretary
19 shall only make available to a member of the consortium
20 under this section for commercial use or use in a dem-
21 onstration project material that the President has deter-
22 mined is not necessary for national security needs, subject
23 to the condition that the material made available shall not
24 include any material that the Secretary determines to be

1 necessary for the National Nuclear Security Administra-
2 tion or any critical mission of the Department.

3 (m) INTERNATIONAL AGREEMENTS.—This section
4 shall be applied in a manner consistent with the obliga-
5 tions of the United States under international agreements.

6 (n) AUTHORIZATION OF APPROPRIATIONS.—In addi-
7 tion to amounts otherwise available, there are authorized
8 to be appropriated to the Secretary to carry out activities
9 under this section \$3,500,000,000 for fiscal year 2023,
10 to remain available until September 30, 2032, of which
11 the Secretary may use up to \$1,000,000,000 by Sep-
12 tember 30, 2028, to carry out the HALEU for Advanced
13 Nuclear Reactor Demonstration Projects Program.

14 **SEC. 3. REPORT ON CIVIL NUCLEAR CREDIT PROGRAM.**

15 Not later than 180 days after the date of enactment
16 of this Act, the Secretary of Energy shall submit to the
17 appropriate committees of Congress a report that identi-
18 fies the anticipated funding requirements for the civil nu-
19 clear credit program described in section 40323 of the In-
20 frastructure Investment and Jobs Act (42 U.S.C. 18753),
21 taking into account—

22 (1) the zero-emission nuclear power production
23 credit authorized by section 45U of the Internal
24 Revenue Code of 1986; and

- 1 (2) any increased fuel costs associated with the
- 2 use of domestic fuel that may arise from the imple-
- 3 mentation of that program.

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