

MILESTONES FOR ADVANCED NUCLEAR FUEL ACT

SEPTEMBER 18, 2024.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. LUCAS, from the Committee on Science, Space, and Technology, submitted the following

R E P O R T

[To accompany H.R. 8674]

The Committee on Science, Space, and Technology, to whom was referred the bill (H.R. 8674) to establish milestone-based development and demonstration projects relating to nuclear fuel, and for other purpose, having considered the same, reports favorably thereon without amendment and recommends that the bill do pass.

CONTENTS

	Page
Purpose and Summary	1
Background and Need for Legislation	2
Legislative History	2
Section-by-Section	3
Related Committee Hearings	3
Committee Consideration	3
Roll Call Votes	4
Application of Law to the Legislative Branch	4
Statement of Oversight Findings and Recommendations of the Committee	4
Statement of General Performance Goals and Objectives	4
Duplication of Federal Programs	4
Federal Advisory Committee Act	4
Unfunded Mandate Statement	4
Earmark Identification	4
Committee Cost Estimate	4
New Budget Authority, Entitlement Authority, and Tax Expenditures	5
Congressional Budget Office Cost Estimate	5
Changes to Existing Law Made by the Bill, as Reported	5

PURPOSE AND SUMMARY

H.R. 8674, the Milestones for Advanced Nuclear Fuels Act, establishes milestone-based development and demonstration projects relating to nuclear fuels at the Department of Energy. This bill amends the Nuclear Fuels Security Act within the National De-

fense Authorization Act for Fiscal Year 2024 and the Energy Policy Act of 2005 to require the Secretary of Energy to award milestone-based advanced fuel cycle technologies development and demonstration projects in accordance with the existing authority granted through Sec. 9005 of the Energy Act of 2020.

Specially, H.R. 8674 directs DOE to award milestone-based projects across the domestic nuclear supply chain, including uranium production, conversion, fabrication, enrichment, deconversion, and recycling. Through a competitive process, projects will prioritize novel technologies and processes while consulting with experts from the private sector, utilities, the investment community, and the nuclear fuel supply chain to evaluate proposals and assist in establishing milestones.

BACKGROUND AND NEED FOR LEGISLATION

In 2022, Russia supplied 20% of the U.S. reactor fleet's nuclear fuel. Globally, Russia controls 40% of the world's uranium conversion infrastructure and 46% of the total uranium enrichment capacity. In comparison, the U.S. has a miniscule share of the nuclear supply chain with one milling facility, one conversion facility, two enrichment facilities, three main fuel fabrication facilities, and no recycling facilities.

For next generation advanced nuclear reactors, the challenge is further exasperated due to the fact that Russia's state cooperation, Rosatom, is the only commercial producer of High-Assay Low Enriched Uranium (HALEU). Both awardees in the Advanced Reactor Demonstration Program have indicated that their projects could be delayed as a result of having to seek other sources for HALEU.

Although Section 9005 of the Energy Act of 2020 granted authority for the Secretary of Energy to use a milestone-based structure for all demonstration projects, the Department has been slow to take advantage of this mechanism. In the past, milestone-based projects have achieved success while limiting the government's exposure to risk of overbudget and underperforming projects. NASA's Commercial Orbital Transportation Services (COTS) program was highly successful in stimulating a competitive market for launch providing services, decreasing costs, and reducing dependence on Russia for International Space Station transportation.

A milestone-based program requires that particular technical and financial goals or benchmarks, including those related to timelines and costs, be met before a participant is awarded the full amount of an award. A milestone-based approach to development and demonstration projects is instrumental in accelerating innovative technologies from lab to market. It also decreases barriers to entry for new participants, reduces dependence on potential monopolies, and protects taxpayers from waste, fraud, and abuse.

LEGISLATIVE HISTORY

H.R. 8674 was introduced on June 7, 2024, by Rep. Williams (R-NY) and cosponsored by Rep. Sorensen (D-IL).

On June 13, 2024, the Committee on Science, Space, and Technology met to consider H.R. 8674.

Chairman Lucas moved that Committee favorably report the bill, H.R. 8674, to the House of Representatives with the recommenda-

tion that the bill be approved. The motion was agreed to by voice vote.

SECTION-BY-SECTION

Section 1. Short title

The short title of this legislation is “Milestones for Advanced Nuclear Fuel Act.”

Section 2. Milestone-based development and demonstration projects

Subsection (a) of this section amends the Nuclear Fuel Security Act of 2023, which was enacted in the National Defense Authorization Act for Fiscal Year 2024 (P.L. 118–31). This subsection directs the Secretary of Energy to award milestone-based advanced fuel cycle technologies development and demonstration projects in accordance with Sec. 9005 of the Energy Act of 2020 in carrying out the Nuclear Fuel Security Program and the HALEU for Advanced Nuclear Reactor Demonstration Projects Program.

Subsection (b) of this section amends Sec. 953 of the Energy Policy Act of 2005 (42 U.S.C. 16273). This subsection directs the Secretary of Energy to carry out milestone-based demonstration projects under DOE’s Fuel Cycle Research and Development program in accordance with Sec. 9005 of the Energy Act of 2020.

Subsection (b) also directs the Secretary of Energy, acting through the Assistant Secretary for Nuclear Energy, to conduct a study on the practicability, potential benefits, and estimated lifecycle costs of advanced nuclear fuel recycling and spent nuclear fuel reprocessing.

RELATED COMMITTEE HEARINGS

Pursuant to clause 3(c)(6) of rule XIII, the following hearing was used to develop or consider H.R. 8674.

On September 14, 2023, the Full Committee held a hearing entitled *An Update on the Department of Energy’s Science and Technology Priorities*. Members and the witness discussed the Department of Energy’s goals and priorities for its civilian research, development, demonstration, and commercial application programs, including those related to advanced nuclear fuels.

Witness:

- The Honorable Jennifer Granholm, Secretary of Energy, Department of Energy.

On June 26, 2024, the Full Committee held a hearing entitled *An Overview of the Budget Proposal for the Department of Energy for Fiscal Year 2025*. Members and the witness discussed the Department of Energy’s budget priorities for FY25, including activities related to advanced nuclear fuels.

Witness:

- The Honorable David M. Turk, Deputy Secretary, Department of Energy.

COMMITTEE CONSIDERATION

On June 13, 2024, the Committee met in open session and ordered reported favorably the bill, H.R. 8674, without amendment, by voice vote, a quorum being present.

ROLL CALL VOTES

Clause 3(b) of rule XIII requires the Committee to list the record votes on the motion to report legislation and amendments thereto. The following reflects the record votes taken during the Committee consideration: Voice vote was agreed to by Members in order to avoid a scheduling conflict with a Conference-wide meeting. Ordered to be reported favorably on the yeas, without amendment.

APPLICATION OF LAW TO THE LEGISLATIVE BRANCH

The Committee finds that H.R. 8674 does not relate to the terms and conditions of employment or access to public services or accommodations within the meaning of section 102(b)(3) of the Congressional Accountability Act (Public Law 104–1).

STATEMENT OF OVERSIGHT FINDINGS AND RECOMMENDATIONS OF THE COMMITTEE

In compliance with clause 3(c)(1) of rule XIII and clause (2)(b)(1) of rule X, the Committee's oversight findings and recommendations are reflected in the descriptive portions of this report.

STATEMENT OF GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause (3)(c)(4) of rule XIII, the goal of H.R. 8674 is to establish milestone-based development and demonstration projects relating to nuclear fuel at the Department of Energy.

DUPLICATION OF FEDERAL PROGRAMS

Pursuant to clause 3(c)(5) of rule XIII, the Committee finds that no provision of H.R. 8674 establishes or reauthorizes a program of the Federal Government known to be duplicative of another Federal program, including any program that was included in a report to Congress pursuant to section 21 of Public Law 111–139 or identified in the most recent Catalog of Federal Domestic Assistance.

FEDERAL ADVISORY COMMITTEE ACT

The Committee finds that the legislation does not establish or authorize the establishment of an advisory committee within the definition of section 5(b) of the Federal Advisory Committee Act.

UNFUNDED MANDATE STATEMENT

The Committee adopts as its own the estimate of Federal mandates prepared by the Director of the Congressional Budget Office pursuant to section 423 of the Unfunded Mandates Reform Act.

EARMARK IDENTIFICATION

Pursuant to clauses 9(e), 9(f), and 9(g) of rule XXI, the Committee finds that H.R. 8674 does not include any congressional earmarks, limited tax benefits, or limited tariff benefits.

COMMITTEE COST ESTIMATE

Pursuant to clause 3(d)(1) of rule XIII, the Committee adopts as its own the cost estimate prepared by the Director of the Congress-

sional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974. At the time this report was filed, the estimate was not available.

NEW BUDGET AUTHORITY, ENTITLEMENT AUTHORITY, AND TAX
EXPENDITURES

Pursuant to clause 3(c)(2) of rule XIII, the Committee finds that H.R. 8674 would result in no new or increased budget authority, entitlement authority, or tax expenditures or revenues.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

Pursuant to clause 3(c)(3) of rule XIII, at the time this report was filed, the cost estimate prepared by the Director of the Congressional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974 was not available.

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

In compliance with clause 3(e) of rule XIII of the Rules of the House of Representatives, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new matter is printed in italics, and existing law in which no change is proposed is shown in roman):

NUCLEAR FUEL SECURITY ACT OF 2023

**DIVISION C—DEPARTMENT OF ENERGY
NATIONAL SECURITY AUTHORIZA-
TIONS AND OTHER AUTHORIZATIONS**

**TITLE XXXI—DEPARTMENT OF ENERGY
NATIONAL SECURITY PROGRAMS**

* * * * *

Subtitle C—Other Matters

SEC. 3131. U.S. NUCLEAR FUEL SECURITY INITIATIVE.

(a) **SHORT TITLE.**—This section may be cited as the “Nuclear Fuel Security Act of 2023”.

(b) **SENSE OF CONGRESS.**—It is the sense of Congress that—

(1) the Department should—

(A) support increased domestic production of low-enriched uranium; and

(B) accelerate efforts to establish a domestic high-assay, low-enriched uranium enrichment capability; and

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

- (A) all viable options to make high-assay, low-enriched uranium produced from inventories owned by the Department available in a manner that is sufficient to maximize the potential for the Department to meet the needs and schedules of advanced nuclear reactor developers, without impacting existing Department missions, until such time that commercial enrichment and deconversion capability for high-assay, low-enriched uranium exists at a scale sufficient to meet future needs; and
- (B) all viable options for partnering with countries that are allies or partners of the United States to meet those needs and schedules until that time.
- (c) OBJECTIVES.—The objectives of this section are—
- (1) to support domestic production of low-enriched uranium;
 - (2) to expeditiously increase domestic production of high-assay, low-enriched uranium by an annual quantity, and in such form, determined by the Secretary to be sufficient to meet the needs of—
 - (A) advanced nuclear reactor developers; and
 - (B) the consortium;
 - (3) to ensure the availability of domestically produced, converted, enriched, deconverted, and reduced uranium in a quantity determined by the Secretary, in consultation with U.S. nuclear energy companies, to be sufficient to address a reasonably anticipated supply disruption;
 - (4) to address gaps and deficiencies in the domestic production, conversion, enrichment, deconversion, and reduction of uranium by partnering with countries that are allies or partners of the United States if domestic options are not practicable;
 - (5) to ensure that, in the event of a supply disruption in the nuclear fuel market, a reserve of nuclear fuels is available to serve as a backup supply to support the nuclear nonproliferation and civil nuclear energy objectives of the Department, including collaborative research and development activities with other Federal agencies;
 - (6) to support enrichment, deconversion, and reduction technology deployed in the United States; and
 - (7) to ensure that, until such time that domestic enrichment and deconversion of high-assay, low-enriched uranium is commercially available at the scale needed to meet the needs of advanced nuclear reactor developers, the Secretary considers and implements, as necessary—
 - (A) all viable options to make high-assay, low-enriched uranium produced from inventories owned by the Department available in a manner that is sufficient to maximize the potential for the Department to meet the needs and schedules of advanced nuclear reactor developers; and
 - (B) all viable options for partnering with countries that are allies or partners of the United States to meet those needs and schedules.
- (d) DEFINITIONS.—In this section:
- (1) ADVANCED NUCLEAR REACTOR.—The term “advanced nuclear reactor” has the meaning given the term in section 951(b) of the Energy Policy Act of 2005 (42 U.S.C. 16271(b)).

(2) ASSOCIATED ENTITY.—The term “associated entity” means an entity that—

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

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

(ii) an associated individual; or

(B) is organized under the laws of, or otherwise subject to the jurisdiction of, a country that is an ally or partner of the United States, including a corporation that is incorporated in such a country.

(3) ASSOCIATED INDIVIDUAL.—The term “associated individual” means an alien who is a national of a country that is an ally or partner of the United States.

(4) CONSORTIUM.—The term “consortium” means the consortium established under section 2001(a)(2)(F) of the Energy Act of 2020 (42 U.S.C. 16281(a)(2)(F)).

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

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

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

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

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

(8) NATIONAL LABORATORY.—*The term “National Laboratory” has the meaning given such term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).*

[(8)] (9) PROGRAMS.—The term “Programs” means—

(A) the Nuclear Fuel Security Program established under subsection (e)(1);

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

(C) the HALEU for Advanced Nuclear Reactor Demonstration Projects Program established under subsection (e)(3).

[(9)] (10) SECRETARY.—The term “Secretary” means the Secretary of Energy.

[(10)] (11) U.S. NUCLEAR ENERGY COMPANY.—The term “U.S. nuclear energy company” means a company that—

(A) is organized under the laws of, or otherwise subject to the jurisdiction of, the United States; and

(B) is involved in the nuclear energy industry.

(e) ESTABLISHMENT AND EXPANSION OF PROGRAMS.—The Secretary, consistent with the objectives described in subsection (c), shall—

(1) establish a program, to be known as the “Nuclear Fuel Security Program”, to increase the quantity of HALEU and, if determined to be necessary after completion of a market evaluation, LEU produced by U.S. nuclear energy companies;

(2) expand the American Assured Fuel Supply Program of the Department to ensure the availability of domestically pro-

duced, converted, enriched, deconverted, and reduced uranium in the event of a supply disruption; and

(3) establish a program, to be known as the “HALEU for Advanced Nuclear Reactor Demonstration Projects Program”—

(A) to maximize the potential for the Department to meet the needs and schedules of advanced nuclear reactor developers until such time that commercial enrichment and deconversion capability for HALEU exists in the United States at a scale sufficient to meet future needs; and

(B) where practicable, to partner with countries that are allies or partners of the United States to meet those needs and schedules until that time.

(f) NUCLEAR FUEL SECURITY PROGRAM.—

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

(A) shall—

(i) if determined to be necessary or appropriate based on the completion of a market evaluation, not later than 90 days after the date of enactment of this Act, take actions, including cost-shared financial agreements, milestone-based payments, or other mechanisms, to support commercial availability of LEU and to promote diversity of supply in domestic uranium mining, conversion, enrichment, and deconversion capacity and technologies, including new capacity, among U.S. nuclear energy companies;

(ii) not later than 180 days after the date of enactment of this Act, enter into 2 or more contracts with members of the consortium to begin acquiring not less than 20 metric tons per year of HALEU by December 31, 2027 (or the earliest operationally feasible date thereafter), from U.S. nuclear energy companies;

(iii) utilize only uranium produced, converted, enriched, deconverted, and reduced in—

(I) the United States; or

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

(iv) to the maximum extent practicable, ensure that the use of domestic uranium utilized as a result of that program does not negatively affect the economic operation of nuclear reactors in the United States; and

(B)

(i) may not make commitments under this subsection (including cooperative agreements (used in accordance with section 6305 of title 31, United States Code), purchase agreements, guarantees, leases, service contracts, or any other type of commitment) for the purchase or other acquisition of HALEU or LEU unless funds are specifically provided for those purposes in advance in appropriations Acts enacted after the date of enactment of this Act; and

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

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

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

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

(A) options to ensure the quickest availability of commercially enriched HALEU, including—

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

(ii) utilization of up to 10-percent enriched uranium as feedstock in demonstration-scale or commercial HALEU enrichment facilities;

(B) options to partner with countries that are allies or partners of the United States to provide LEU and HALEU for commercial purposes;

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

(i) enrichment levels;

(ii) output levels to meet demand; and

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

(D) options—

(i) to replenish, as necessary, Department stockpiles of uranium that were intended to be downblended for other purposes, but were instead used in carrying out activities under the HALEU for Advanced Nuclear Reactor Demonstration Projects Program;

(ii) to continue supplying HALEU to meet the needs of the recipients of an award made pursuant to the funding opportunity announcement of the Department numbered DE-FOA-0002271 for Pathway 1, Advanced Reactor Demonstrations; and

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

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

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

(1) expand the American Assured Fuel Supply Program of the Department by merging the operations of the Uranium Reserve Program of the Department with the American Assured Fuel Supply Program; and

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

(A) maintain, replenish, diversify, or increase the quantity of uranium made available by that program in a manner determined by the Secretary to be consistent with the purposes of that program and the objectives described in subsection (c);

(B) utilize only uranium produced, converted, enriched, deconverted, and reduced in—

(i) the United States; or

(ii) if domestic options are not practicable, a country that is an ally or partner of the United States;

(C) make uranium available from the American Assured Fuel Supply, subject to terms and conditions determined by the Secretary to be reasonable and appropriate;

(D) refill and expand the supply of uranium in the American Assured Fuel Supply, including by maintaining a limited reserve of uranium to address a potential event in which a domestic or foreign recipient of uranium experiences a supply disruption for which uranium cannot be obtained through normal market mechanisms or under normal market conditions; and

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

(h) HALEU FOR ADVANCED NUCLEAR REACTOR DEMONSTRATION PROJECTS PROGRAM.—

(1) ACTIVITIES.—On enactment of this Act, the Secretary shall immediately accelerate and, as necessary, initiate activities to make available from inventories or stockpiles owned by the Department and made available to the consortium, HALEU for use in advanced nuclear reactors that cannot operate on uranium with lower enrichment levels or on alternate fuels, with priority given to the awards made pursuant to the funding opportunity announcement of the Department numbered DE-FOA-0002271 for Pathway 1, Advanced Reactor Demonstrations, with additional HALEU to be made available to other advanced nuclear reactor developers, as the Secretary determines to be appropriate.

(2) QUANTITY.—In carrying out activities under this subsection, the Secretary shall consider and implement, as necessary, all viable options to make HALEU available in quantities and forms sufficient to maximize the potential for the Department to meet the needs and schedules of advanced nuclear reactor developers, including by seeking to make available—

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

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

(C) by June 30, 2026, not less than an additional 10 metric tons of HALEU.

(3) FACTORS FOR CONSIDERATION.—In carrying out activities under this subsection, the Secretary shall take into consideration—

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

(i) uranium that has been declared excess to national security needs during or prior to fiscal year 2023;

(ii) uranium that—

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

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

(iii) uranium that can meet the needs of advanced nuclear reactor developers after removing radioactive or other contaminants that resulted from previous use or fabrication of the fuel for research, development, demonstration, or deployment activities of the Department, including activities that reduce the environmental liability of the Department by accelerating the processing of uranium from stockpiles designated as waste;

(iv) uranium from a high-enriched uranium stockpile (excluding stockpiles intended for national security needs), which can be blended with lower assay uranium to become HALEU to meet the needs of advanced nuclear reactor developers; and

(v) uranium from stockpiles intended for other purposes (excluding stockpiles intended for national security needs), but for which uranium could be swapped or replaced in time in such a manner that would not negatively impact the missions of the Department;

(B) options for expanding, or establishing new, capabilities or infrastructure to support the processing of uranium from Department inventories;

(C) options for accelerating the availability of HALEU from HALEU enrichment demonstration projects of the Department;

(D) options for providing HALEU from domestically enriched HALEU procured by the Department through a competitive process pursuant to the Nuclear Fuel Security Program established under subsection (e)(1);

(E) options to replenish, as needed, Department stockpiles of uranium made available pursuant to subparagraph (A) with domestically enriched HALEU procured by the Department through a competitive process pursuant to the Nuclear Fuel Security Program established under subsection (e)(1); and

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

(4) LIMITATIONS.—

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

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

(ii) environmental cleanup activities.

(B) CERTAIN COMMITMENTS.—In carrying out activities under this subsection, the Secretary—

(i) may not make commitments under this subsection (including cooperative agreements (used in accordance with section 6305 of title 31, United States Code), purchase agreements, guarantees, leases, service contracts, or any other type of commitment) for the

purchase or other acquisition of HALEU or LEU unless funds are specifically provided for those purposes in advance in appropriations Acts enacted after the date of enactment of this Act; and

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

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

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

(5) SUNSET.—The authority of the Secretary to carry out activities under this subsection shall terminate on the earlier of—

(A) the date on which the Secretary notifies Congress that the HALEU needs of advanced nuclear reactor developers can be fully met by commercial HALEU suppliers in the United States, as determined by the Secretary, in consultation with U.S. nuclear energy companies; and

(B) September 30, 2034.

(i) DOMESTIC SOURCING CONSIDERATIONS.—

(1) IN GENERAL.—Except as provided in paragraph (2), the Secretary may only carry out an activity in connection with 1 or more of the Programs if—

(A) the activity promotes manufacturing in the United States associated with uranium supply chains; or

(B) the activity relies on resources, materials, or equipment developed or produced—

(i) in the United States; or

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

(I) the government of that country;

(II) an associated entity; or

(III) a U.S. nuclear energy company.

(2) WAIVER.—The Secretary may waive the requirements of paragraph (1) with respect to an activity if the Secretary determines a waiver to be necessary to achieve 1 or more of the objectives described in subsection (c).

(j) REASONABLE COMPENSATION.—In carrying out activities under this section, the Secretary shall ensure that any LEU and HALEU made available by the Secretary under 1 or more of the Programs is subject to reasonable compensation, taking into account the fair market value of the LEU or HALEU and the purposes of this section.

(k) NUCLEAR REGULATORY COMMISSION.—The Nuclear Regulatory Commission shall prioritize and expedite consideration of any action related to the Programs to the extent permitted under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) and related statutes.

(l) USEC PRIVATIZATION ACT.—The requirements of section 3112(d)(2) of the USEC Privatization Act (42 U.S.C. 2297h-10(d)(2)) shall not apply to activities related to the Programs.

(m) NATIONAL SECURITY NEEDS.—The Secretary shall only make available to a member of the consortium under this section for com-

mercial use or use in a demonstration project material that the President has determined is not necessary for national security needs during or prior to fiscal year 2023, subject to the condition that the material made available shall not include any material that the Secretary determines to be necessary for the National Nuclear Security Administration or any critical mission of the Department.

(n) INTERNATIONAL AGREEMENTS.—This section shall be applied in a manner consistent with the obligations of the United States under international agreements.

(o) REPORT ON CIVIL NUCLEAR CREDIT PROGRAM.—Not later than 180 days after the date of enactment of this Act, the Secretary shall submit to the appropriate committees of Congress a report that identifies the anticipated funding requirements for the civil nuclear credit program described in section 40323 of the Infrastructure Investment and Jobs Act (42 U.S.C. 18753), taking into account—

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

(2) any increased fuel costs associated with the use of domestic fuel that may arise from the implementation of that program.

(p) SUPPLY CHAIN INFRASTRUCTURE AND WORKFORCE CAPACITY BUILDING.—

(1) SUPPLY CHAIN INFRASTRUCTURE.—Section 10781(b)(1) of Public Law 117-167 (commonly known as the “CHIPS and Science Act of 2022”) (42 U.S.C. 19351(b)(1)) is amended by striking “and demonstration of advanced nuclear reactors” and inserting “demonstration, and deployment of advanced nuclear reactors and associated supply chain infrastructure”.

(2) WORKFORCE CAPACITY BUILDING.—Section 954(b) of the Energy Policy Act of 2005 (42 U.S.C. 16274(b)) is amended—

(A) in the subsection heading, by striking “Graduate”;

(B) by striking “graduate” each place it appears;

(C) in paragraph (2)(A), by inserting “community colleges, trade schools, registered apprenticeship programs, pre-apprenticeship programs,” after “universities,”;

(D) in paragraph (3), by striking “2021 through 2025” and inserting “2023 through 2027”;

(E) by redesignating paragraph (3) as paragraph (4); and

(F) by inserting after paragraph (2) the following:

“(A) FOCUS AREAS.—In carrying out the subprogram under this subsection, the Secretary may implement traineeships in focus areas that, in the determination of the Secretary, are necessary to support the nuclear energy sector in the United States, including—

“(i) research and development;

“(ii) construction and operation;

“(iii) associated supply chains; and

“(iv) workforce training and retraining to support transitioning workforces.”.

(q) APPLICATION OF CERTAIN MILESTONE-BASED DEVELOPMENT AND DEMONSTRATION PROJECTS.—

(1) IN GENERAL.—*The Secretary shall award milestone-based advanced fuel cycle technologies development and demonstra-*

tion projects in accordance with section 9005 of the Energy Act of 2020 (42 U.S.C. 7256c; enacted as part of title IX of division Z of the Consolidated Appropriations Act, 2021) in carrying out the Nuclear Fuel Security Program and the HALEU for Advanced Nuclear Reactor Demonstration Projects Program (established pursuant to subsection (e), and carried out in accordance with subsections (f) and (h), respectively) in the same manner and to the same extent as such section 9005 applies to section 846(g) of the Department of Energy Organization Act (42 U.S.C. 7256(g)).

(2) PURPOSE.—In carrying out milestone-based advanced fuel cycle technologies development and demonstration projects referred to in paragraph (1), the Secretary shall support the development and demonstration of an economically competitive, nuclear fuel supply chain by not later than three years after the date of the enactment of this subsection that includes domestic uranium production, conversion, enrichment, deconversion, and waste reduction for advanced fuels, such as HALEU and other advanced nuclear reactor fuels, for the following:

(A) Department research, development, and demonstration projects for advanced nuclear reactors, including civilian research and experimental reactors.

(B) Advanced nuclear reactors.

(C) Strategic radioactive and stable isotopes producers, such as energy, medical, space-based heating and power, and national security application, and for basic research.

(D) Interagency and intra-agency partnerships and collaborations, including with the National Laboratories, the Advanced Research Projects Agency-Energy, the National Aeronautics and Space Administration, the Department of Defense, and other relevant Federal and State departments and agencies, as determined appropriate by the Secretary.

(3) ELIGIBILITY.—Any associated entity is eligible to participate in the projects under this subsection if the Secretary has determined such entity has the necessary resources and expertise. In selecting eligible associated entities, the Secretary shall select, to the maximum extent practicable, associated entities that—

(A) prioritize novel technologies and processes;

(B) utilize technologies and processes that reduce non-proliferation risks; and

(C) leverage matching funds from non-Federal sources.

(4) REQUIREMENTS.—In carrying out such projects, the Secretary shall consult with developers of advanced nuclear reactors and owners and operators of electric utilities to review proposed technical and financial milestones and assist in the development of such milestones.

(5) SELECTION.—For the associated entities selected under this subsection, the following conditions shall apply:

(A) Consistent with the existing authorities of the Department, the Secretary may terminate an agreement with a selected associated entity for cause during the performance period.

(B) Support under this subsection may not be used to cover any costs or reimbursement of expenses that are cov-

ered by Federal funding provided through other support, including awards.

(6) APPLICATIONS.—A project proposal submitted under this subsection shall be evaluated based upon the scientific, technical, and business merits of such proposal, including consideration of waste management benefits, through a peer-review process, which shall include reviewers with appropriate expertise from the private sector, electric utilities, the investment community, and nuclear fuel and supply chain experts.

(7) PROJECT MANAGEMENT.—In carrying out projects under this subsection and assessing the completion of the milestones developed pursuant to paragraph (4), the Secretary shall consult with nuclear fuel and supply experts representing diverse perspectives and professional experiences, including developers of advanced nuclear reactor owners and operators of electric utilities, to ensure a complete and thorough review.

(8) ANNUAL BRIEFING.—As part of the annual budget request submitted for each fiscal year, the Secretary shall provide the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a briefing describing the selected projects under this subsection during the previous fiscal year, the benefits and drawbacks of milestone-based projects as compared to traditional project structure funding models, and lessons-learned from project operations.

* * * * *

ENERGY POLICY ACT OF 2005

* * * * *

TITLE IX—RESEARCH AND DEVELOPMENT

* * * * *

Subtitle E—Nuclear Energy

* * * * *

SEC. 953. FUEL CYCLE RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION.

(a) USED NUCLEAR FUEL RESEARCH, DEVELOPMENT, DEMONSTRATION, AND COMMERCIAL APPLICATION.—

(1) IN GENERAL.—The Secretary shall conduct an advanced fuel cycle research, development, demonstration, and commercial application program to improve fuel cycle performance, minimize environmental and public health and safety impacts, and support a variety of options for used nuclear fuel storage, use, and disposal, including advanced nuclear reactor and non-reactor concepts (such as radioisotope power systems), which may include—

(A) dry cask storage;

- (B) consolidated interim storage;
- (C) deep geological storage and disposal, including mined repository, and other technologies;
- (D) used nuclear fuel transportation;
- (E) integrated waste management systems;
- (F) vitrification;
- (G) fuel recycling and transmutation technologies, including advanced reprocessing technologies such as electrochemical and molten salt technologies, and advanced redox extraction technologies;
- (H) advanced materials to be used in subparagraphs (A) through (G); and
- (I) other areas as determined by the Secretary.

(2) REQUIREMENTS.—In carrying out the program under this subsection, the Secretary shall—

- (A) ensure all activities and designs incorporate state of the art safeguards technologies and techniques to reduce risk of proliferation;
- (B) consult with the Administrator of the National Nuclear Security Administration to integrate safeguards and security by design;
- (C) consider the potential benefits and other impacts of those activities for civilian nuclear applications, environmental health and safety, and national security, including consideration of public consent; and
- (D) consider the economic viability of all activities and designs.

(3) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary to carry out the program under this subsection \$60,000,000 for each of fiscal years 2021 through 2025.

(b) ADVANCED FUELS.—

(1) IN GENERAL.—The Secretary shall conduct an advanced fuels research, development, demonstration, and commercial application program on next-generation light water reactor and advanced reactor fuels that demonstrate the potential for improved—

- (A) performance;
- (B) accident tolerance;
- (C) proliferation resistance;
- (D) use of resources;
- (E) environmental impact; and
- (F) economics.

(2) REQUIREMENTS.—In carrying out the program under this subsection, the Secretary shall focus on the development of advanced technology fuels, including fabrication techniques, that offer improved accident-tolerance and economic performance with the goal of initial commercial application by December 31, 2025.

(3) REPORT.—Not later than 180 days after the date of enactment of this section, the Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report that describes how the technologies and concepts studied under this program would im-

pact reactor economics, the fuel cycle, operations, safety, proliferation, and the environment.

(4) **AUTHORIZATION OF APPROPRIATIONS.**—There are authorized to be appropriated to the Secretary to carry out the program under this subsection \$125,000,000 for each of fiscal years 2021 through 2025.

(c) **MILESTONE-BASED DEMONSTRATIONS PROJECTS.**—*The Secretary shall carry out demonstration projects under this section as a milestone-based demonstration project in the same manner and to the same extent as under section 9005 of the Energy Act of 2020 (42 U.S.C. 7256c; enacted as part of title IX of division Z of the Consolidated Appropriations Act, 2021), with priority placed on awarding milestone-based awards to projects that increase domestic fabrication and recycling capacity of spent nuclear fuel for advanced fuels.*

(d) **REPORT.**—*Not later than 180 days after the date of the date of the enactment of this subsection, the Secretary, acting through the Assistant Secretary for Nuclear Energy, shall complete and make publicly available a study that analyzes the practicability, potential benefits, including relating to waste reduction through separation of high- and low-level waste or utilization of transuranic materials, and estimated lifecycle costs of the following:*

(1) *Dedicated recycling facilities, and co-location with other nuclear energy infrastructure, that utilize spent nuclear fuel from existing nuclear reactors and future advanced nuclear reactors into usable nuclear fuel for the following:*

- (A) *Commercial light water reactors.*
- (B) *Advanced nuclear reactors.*
- (C) *Space-based heating and power.*
- (D) *Research reactors.*
- (E) *Nuclear battery applications.*
- (F) *Such other applications as determined appropriate by the Secretary.*

(2) *Dedicated recycling facilities, and co-location with other nuclear energy infrastructure, to utilize high-assay low-enriched uranium (HALEU) (as such term is defined in section 2001(d) of the Energy Act of 2020 (42 U.S.C. 16281(d)), or other feedstocks, such as uranium and transuranic materials, into usable nuclear fuel for the following:*

- (A) *Commercial light water reactors.*
- (B) *Advanced nuclear reactors.*
- (C) *Space-based power.*
- (D) *Research reactors.*
- (E) *Nuclear battery applications.*
- (F) *Such other applications as determined appropriate by the Secretary.*

(3) *Utilizing recycled fuel in advanced nuclear reactors or existing light water reactors as compared to non-recycled fuel.*

(4) *Dedicated spent nuclear fuel reprocessing facilities, and co-location with other nuclear energy infrastructure, to extract certain radioactive and stable isotopes needed for domestic and international use, including for the following:*

- (A) *Advanced nuclear reactors.*
- (B) *Medical, industrial, space-based power, and nuclear battery applications.*

(C) Such other applications as determined appropriate by the Secretary.

(5) Commercial associated entities acquiring spent fuel from operating or shutdown reactors and any contract or policy revisions that could better facilitate such transactions.

(6) Private sector associated entities that take title of spent nuclear fuel from commercial nuclear reactor sites for any of the following:

(A) Research or reuse.

(B) Recycling.

(C) Strategic radioactive or stable isotope extraction.

(7) Comprehensive cost-benefit analysis associated with spent fuel recycling, including considerations of net reduction in spent fuel inventory, separation of high- and low-level waste with new storage requirements, disposal of byproducts from spent fuel recycling, supply chain impacts, and list of industries that would benefit from spent fuel recycling byproducts.

(8) Policy, legal, or regulatory changes to support the safe and secure development and deployment of recycling and waste utilizing reactor technologies, and any impacts such changes would have on domestic storage of spent nuclear fuel and disposal through the recycling of spent nuclear fuel.

* * * * *

