115TH CONGRESS
2d Session
HOUSE OF REPRESENTATIVES
REPORT
115–1056

ADVANCED NUCLEAR FUEL AVAILABILITY ACT

NOVEMBER 29, 2018.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. WALDEN, from the Committee on Energy and Commerce, submitted the following

R E P O R T

[To accompany H.R. 6140]

[Including cost estimate of the Congressional Budget Office]

The Committee on Energy and Commerce, to whom was referred the bill (H.R. 6140) to require the Secretary of Energy to establish and carry out a program to support the availability of HA–LEU for domestic commercial use, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

CONTENTS

The amendment is as follows:

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE.

This Act may be cited as the "Advanced Nuclear Fuel Availability Act".

SEC. 2. PROGRAM.

(a) ESTABLISHMENT.—The Secretary shall establish and carry out, through the Office of Nuclear Energy, a program to support the availability of HA–LEU for domestic commercial use.

(b) PROGRAM ELEMENTS.—In carrying out the program under subsection (a), the Secretary—

(1) may provide financial assistance to assist commercial entities to design and license transportation packages for HA–LEU, including canisters for metal, gas, and other HA–LEU compositions;

(2) shall, to the extent practicable—

(A) by January 1, 2021, have commercial entities submit such transportation package designs to the Commission for certification by the Commission under part 71 of title 10, Code of Federal Regulations; and

(B) encourage the Commission to have such transportation package designs so certified by the Commission by January 1, 2023;

(3) not later than January 1, 2020, shall submit to Congress a report on the Department's uranium inventory that may be available to be processed to HA–LEU for purposes of such program, which may not include any uranium allocated by the Secretary for use in support of the atomic energy defense activities of the National Nuclear Security Administration;

(4) not later than one year after the date of enactment of this Act, and biennially thereafter through September 30, 2025, shall conduct a survey of stakeholders to estimate the quantity of HA–LEU necessary for domestic commercial use for each of the five subsequent years;

(5) shall assess options available for the Secretary to acquire HA–LEU for such program, including an assessment, for each such option, of the cost and amount of time required;

(6) shall establish a consortium, which may include entities involved in any stage of the nuclear fuel cycle, to partner with the Department to support the availability of HA–LEU for domestic commercial use, including by—

(A) providing information to the Secretary for purposes of surveys conducted under paragraph (4); and

(B) purchasing HA–LEU made available to members of the consortium by the Secretary under the program;

(7) shall, prior to acquiring HA–LEU under paragraph (8), in coordination with the consortium established pursuant to paragraph (6), develop a schedule for cost recovery of HA–LEU made available to members of the consortium pursuant to paragraph (8);

(8) may, beginning not later than 3 years after the establishment of a consortium under paragraph (6), acquire HA–LEU, in order, to the extent practicable, to make such HA–LEU available to members of the consortium beginning not later than January 1, 2025, in amounts that are consistent, to the extent practicable, with the quantities estimated under the surveys conducted under paragraph (4); and

(9) shall develop, in consultation with the Commission, criticality benchmark data to assist the Commission in—

(A) the licensing and regulation of category II spent nuclear material fuel fabrication and enrichment facilities under part 70 of title 10, Code of Federal Regulations; and

(B) certification of transportation packages under part 71 of title 10, Code of Federal Regulations.

(c) APPLICABILITY OF USEC PRIVATIZATION ACT.—The requirements of subparagraphs (A) and (C) of section 3112(d)(2) of the USEC Privatization Act (42 U.S.C. 2297h–10(d)(2)) shall apply to a sale or transfer of HA–LEU by the Secretary to a member of the consortium under this section.

(d) FUNDING FOR TRANSPORTATION PACKAGE DESIGN.—

(1) COST SHARE.—The Secretary shall ensure that not less than 20 percent of the costs of design and license activities carried out pursuant to subsection (b)(1) are paid by a non-Federal entity.

(2) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out subsection (b)(1)—

(A) $1,500,000 for fiscal year 2019;

(B) $1,500,000 for fiscal year 2020; and

(C) $1,500,000 for fiscal year 2021.

(e) SUNSET.—The authority of the Secretary to carry out the program under this section shall expire on September 30, 2033.

SEC. 3. REPORT TO CONGRESS.

Not later than 12 months after the date of enactment of this Act, the Commission shall submit to Congress a report that includes—

(1) identification of updates to regulations, certifications, and other regulatory policies that the Commission determines are necessary in order for HA–LEU to be commercially available, including—

(A) guidance for material control and accountability of category II special nuclear material;

(B) certifications relating to transportation packaging for HA–LEU; and

(C) licensing of enrichment, conversion, and fuel fabrication facilities for HA–LEU, and associated physical security plans for such facilities;

(2) a description of such updates; and

(3) a timeline to complete such updates.

SEC. 4. DEFINITIONS.

In this Act:

(1) COMMISSION.—The term "Commission" means the Nuclear Regulatory Commission.

(2) DEPARTMENT.—The term "Department" means Department of Energy.

(3) HA–LEU.—The term "HA–LEU" means high-assay low-enriched uranium.

(4) HIGH-ASSAY LOW-ENRICHED URANIUM.—The term "high-assay low-enriched uranium" means uranium having an assay greater than 5.0 percent and less than 20.0 percent enrichment of the uranium-235 isotope.

(5) SECRETARY.—The term "Secretary" means the Secretary of Energy.

PURPOSE AND SUMMARY

H.R. 6140 was introduced on June 19, 2018, by Rep. Bill Flores (R–TX) with Rep. Jerry McNerney (D–CA). The legislation addresses the need to develop and deploy advanced nuclear fuel, known as high-assay low-enriched uranium (HA–LEU), for commercial use.

BACKGROUND AND NEED FOR LEGISLATION

The current fleet of commercial operating nuclear power plants were the extension of policy and technology choices that emerged during the development of the United States' nuclear industry and naval nuclear propulsion programs. Admiral Hyman Rickover's selection of a light-water reactor (LWR) design for use as naval propulsion translated to a nuclear infrastructure supply chain that supported the commercial deployment of large LWR technologies.

LWR designs use uranium enriched below five percent for sustained nuclear reactions, which produces heat to generate electricity. The reactors are designed to provide constant output, or baseload electricity, with little flexibility to adjust output. The reactors range in electric output from 550 megawatts to over 1,000 megawatts.

A number of private companies are currently pursuing advanced nuclear reactor designs. Many of the designs may provide a smaller and more versatile electric output, "load-following" capabilities, or co-generation benefits, such as excess heat for industrial purposes. To maximize reactor performance, the advanced reactor designs would utilize uranium-235 isotopes (U–235) enriched at levels greater than five percent and less than 20 percent. This material, known as high-assay low-enriched uranium, differs from the LEU utilized in the fleet of existing commercial nuclear power plants.

Challenges associated with advanced nuclear technologies

A recent survey of companies working to develop new technologies identified HA–LEU as the most significant issue to ad-

dress.[1] To ensure that HA–LEU is commercially available for the initial deployment of advanced reactors, commercial vendors, the Nuclear Regulatory Commission (NRC), and the Department of Energy (DOE) will have to complete a series of actions to build a supply chain. These include procuring and enriching uranium to the necessary levels, designing and securing NRC certification of transportation packages, and making necessary changes to licenses issued to fuel fabrication and commercial enrichment facilities.

The Atomic Energy Act (AEA), the primary statute governing peaceful use of atomic energy technology, defines enriched uranium as Special Nuclear Material (SNM). Any person receiving, possessing, using, or transferring SNM must have a license, with different licenses required depending on the enrichment level.[2] Per NRC regulations, SNM is separated into three categories: Category 1, which encompasses U–235 enriched greater than 20 percent, uranium-233, and plutonium; Category 2, which covers U–235 enriched between 10 percent and 20 percent; and Category 3, which includes U–235 enriched up to 10 percent.[3] Under these guidelines, HA–LEU would necessitate a Category 2 SNM facility, but at present, the only operating commercial fuel fabrication facilities are licensed for Category 3. Upgrading a facility to Category 2 presents a major regulatory challenge to the wider use of this fuel.[4]

Legislative provisions and purpose

H.R. 6140 provides a direct path to align advanced nuclear fuel supply with initial demand for the deployment of next generation nuclear technologies. The program authorized by the legislation addresses targeted challenges that are most critical and urgent to provide timely HA–LEU development.

The nation's sole NRC-licensed enrichment facility is currently operated by Urenco, USA and located in Eunice, New Mexico. In testimony to the Subcommittee on Energy on May 22, 2018, Mellissa Mann, the President of Urenco, USA, noted that with adequate investment certainty and predictability with associated regulatory steps, Urenco's facility could be developed to enrich uranium to the necessary levels to manufacture HA–LEU.

The Committee is aware of long-term needs for a domestic-owned enrichment facility for atomic energy defense purposes. The National Nuclear Security Administration (NNSA) states that DOE currently has adequate uranium for Naval Reactor Program needs until 2060.[5] NNSA has also entered into a Memorandum of Understanding (MOU) with the Tennessee Valley Authority to downblend HEU in support of national security missions. The MOU will extend the deadline to provide new enrichment needs for national security needs by nearly a decade. While NNSA considers its en-

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[1] Nuclear Energy Institute, "Addressing the Challenges with Establishing the Infrastructure for the front end of the Fuel Cycle for Advanced Reactors," Jan. 2018.

[2] 10 CFR § 70.1–70.2

[3] 10 CFR § 70.4.

[4] To upgrade one of the existing Category 3 facilities to a Category 2 facility, the operator would have to file a license modification application with the NRC, which must contain the basis for the changes as well as a detailed description of how the change would affect safety of the workers, the public, and the environment. Upon approval, Category 2 facilities are subject to considerably more stringent reporting and security requirements, as well as a different fee structure.

[5] Government Accountability Office, "Nuclear Weapons NNSA Should Clarify Long-Term Uranium Enrichment Mission Needs and Improve Technology Cost Estimates," GAO–18–126. February 2018.

richment capability needs, GAO found that NNSA must better define enrichment needs and associated cost estimates. The Congressional defense committees will continue to monitor enrichment needs to meet national security missions.

It is not the intent of the Committee for HA–LEU needs to artificially support or justify reconstituting enrichment capabilities for defense programs, as those needs require a much longer timeframe than what H.R. 6140 will address.

Transportation packages are currently certified to move small quantities of HA–LEU used for research reactors, but the Committee recognizes the quantity of HA–LEU for commercial use will need larger, more economical packaging. Subsection 2(a) and (b) of H.R. 6140 will provide a discreet level of funding to develop HA–LEU transportation packages.

DOE maintains an inventory of uranium that supports the Department's broad missions. H.R. 6140 requires the Secretary to assess DOE's inventory to determine what material may be available to support commercial HA–LEU deployment. Uranium that is allocated to atomic energy defense programs shall not be considered to support commercial needs, due to the obligations to provide for long-term national defense activities.

To assist private entities to secure HA–LEU nuclear fuel, DOE is directed to establish a public-private partnership as a consortium. The consortium will capture economies of scale to reduce pricing, while still assuring private entities develop a robust HA–LEU market to establish a long-term supply chain.

The consortium allows advanced nuclear development companies to aggregate demand, which will provide investment certainty for the nuclear supply chain including uranium production, conversion, enrichment, and fuel fabrication. Due to stringent materials management controls imposed through the AEA, DOE's participation should provide the benefit of uranium management expertise in the Department, as well as the National Laboratory system. For example, DOE has scientific infrastructure to gather scientific data, known as criticality benchmark data, to validate NRC's regulations to predict potential safety issues.

To align supply and demand, DOE is required to conduct biennial surveys through 2025 to project fuel demand, which will then be used to inform front-end industrial needs. It is the Committee's intent that information to meet the required Department's survey will be collected in a manner that protects proprietary business information. By requiring DOE to conduct a biennial survey, the Committee intends for the Department only to facilitate the acquisition of material to meet demand and reduce the potential for oversupply. In the event that HA–LEU is acquired in excess of commercial needs, the Department may have the option to purchase the material at cost for its own research and programmatic needs, including use for medical isotope production, and in doing so extend the timeframe for DOE to rebuild its uranium inventory. However, it is the Committee's intent that the primary purpose of the program authorized by H.R. 6140 is to support commercial use.

It is also the Committee's intent that the program authorized for HA–LEU will not become a permanent DOE program. Subsection 2(e) of the legislation sunsets the Secretary's authority for this program in 2033. The Committee believes 15 years provides an appro-

priate opportunity for first-of-a-kind nuclear technologies to be deployed while the HA–LEU infrastructure is established and matured to fully support commercial demand.

The legislation requires that any HA–LEU made available to consortium members for commercial use recover the cost of such material. The Committee recognizes the financial, logistics, and regulatory challenges associated with developing and managing radioactive material. The intent of the legislation is to reduce the overall cost burden associated with developing a new supply chain, not to have the Department subsidize the material.

During the Committee's markup of the legislation, H.R. 6140 was amended to clarify that HA–LEU would only be transferred at fair market value, as required by the USEC Privatization Act. Nuclear fuel made available under the program will not necessitate a Secretarial determination regarding market impacts that apply to the Department's existing uranium inventory because the HA–LEU could be acquired by DOE for the sole purpose of supporting market development. Such Secretarial determinations are time consuming and would result in a cumbersome program, thereby limiting the efficiency of the HA–LEU program.

Many steps must be initiated concurrently to successfully provide HA–LEU in the timeframe necessary for first movers. For example, the NRC's regulatory requirements applicable to physical security and material accountability for Category 2 facilities may require an analysis due to the lack of existing licensed Category 2 facilities. The report required under section 3 of H.R. 6140 does not prejudge what regulations, certifications, or policies may need to be updated; however, the report should be comprehensive to provide certainty for fuel cycle facility licensees and associated nuclear supplier companies. Established regulations must be predictable and adequate for long-term private sector investment.

COMMITTEE ACTION

On May 22, 2018, the Subcommittee on Energy held a hearing on H.R. 6140. The Subcommittee received testimony from:

- Brent Park, Deputy Administrator for Defense Nuclear Nonproliferation, National Nuclear Security Administration, Department of Energy;
- Ed McGinnis, Principal Deputy Assistant Secretary, Office of Nuclear Energy, Department of Energy;
- Jeffrey S. Merrifield, Partner, Pillsbury Winthrop Shaw Pittman LLP; Advisor, ClearPath Foundation;
- Melissa Mann, President, URENCO USA, Inc.; Member, U.S. Nuclear Industry Council;
- Nick Irvin, Director, Research and Development for Strategy and Advanced Nuclear Technology, Southern Company; Member, Advanced Reactor Working Group, Nuclear Energy Institute; and,
- Edwin Lyman, Senior Scientist, Global Security Program, Union of Concerned Scientists.

On June 21, 2018, the Subcommittee on Energy met in open markup session and forwarded H.R. 6140, without amendment, to the full Committee by a voice vote. On July 12, 2018, the full Committee on Energy and Commerce met in open markup session and

ordered H.R. 6140, as amended, favorably reported to the House by a voice vote.

OVERSIGHT FINDINGS AND RECOMMENDATIONS

Pursuant to clause 2(b)(1) of rule X and clause 3(c)(1) of rule XIII, the Committee held a hearing and made findings that are reflected in this report.

NEW BUDGET AUTHORITY, ENTITLEMENT AUTHORITY, AND TAX EXPENDITURES

Pursuant to clause 3(c)(2) of rule XIII, the Committee finds that H.R. 6140 would result in no new or increased budget authority, entitlement authority, or tax expenditures or revenues.

CONGRESSIONAL BUDGET OFFICE ESTIMATE

Pursuant to clause 3(c)(3) of rule XIII, the following is the cost estimate provided by the Congressional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974:

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, November 28, 2018.

Hon. GREG WALDEN,
Chairman, Committee on Energy and Commerce,
House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed cost estimate for H.R. 6140, the Advanced Nuclear Fuel Availability Act.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Kathleen Gramp.

Sincerely,

KEITH HALL,
Director.

Enclosure.

H.R. 6140—Advanced Nuclear Fuel Availability Act

Summary: H.R. 6140 would direct the Department of Energy (DOE) to conduct various studies and activities related to the supply of new types of fuels for commercial nuclear reactors. In particular, the bill would authorize DOE to acquire certain materials on behalf of other entities and to develop a schedule for recovering those costs. Other provisions in the bill would authorize the appropriation of $1.5 million for each of fiscal years 2019 through 2021 to assist in the development of new methods for transporting new nuclear materials. Finally, DOE's authority to implement the programs would expire at the end of 2033.

CBO estimates that implementing H.R. 6140 would increase net direct spending by $120 million over the 2019–2028 period as a result of provisions authorizing DOE to purchase materials. CBO estimates, however, that this net cost would be offset in subsequent years by income from commercial sales of the material. In addition, CBO estimates that the programmatic costs associated with implementing the bill would total $20 million over the 2019–2023 period, assuming appropriation of the authorized amounts.

Because enacting H.R. 6140 would affect direct spending, pay-as-you-go procedures apply. The bill would not affect revenues.

CBO estimates that enacting H.R. 6140 would not increase net direct spending or on-budget deficits by more than $5 billion in any of the four consecutive 10-year periods beginning in 2029.

H.R. 6140 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA).

Estimated cost to the Federal Government: The estimated budgetary effect of H.R. 6140 is shown in the following table. The costs of the legislation fall within budget function 270 (energy).

	By fiscal year, in millions of dollars—											
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2019–2023	2019–2028
INCREASES IN DIRECT SPENDING												
Acquisition Costs:												
Estimated Budget Authority	0	0	150	0	0	0	1	5	5	5	150	166
Estimated Outlays	0	0	8	15	45	45	38	5	5	5	68	166
Cost Recovery Fees:												
Estimated Budget Authority	0	0	0	0	0	0	−1	−9	−18	−18	0	−46
Estimated Outlays	0	0	0	0	0	0	−1	−9	−18	−18	0	−46
Total Direct Spending:												
Estimated Budget Authority	0	0	150	0	0	0	0	−4	−13	−13	150	120
Estimated Outlays	0	0	8	15	45	45	37	−4	−13	−13	68	120
INCREASES IN SPENDING SUBJECT TO APPROPRIATION												
Estimated Authorization Level	2	4	6	6	5	5	5	5	5	5	23	48
Estimated Outlays	*	3	5	7	5	5	5	5	5	5	20	45

* = between zero and $500,000.

Basis of estimate: For this estimate, CBO assumes that the legislation will be enacted near the start of 2019.

CBO estimates that implementing purchase agreements authorized by H.R. 6140 would increase net direct spending by $120 million over the 2019–2028 period, reflecting gross capital and operating costs of $166 million and offsetting receipts from recoveries of $46 million. CBO estimates that the net costs incurred through 2028 would be offset in subsequent years by income from sales of the materials. In addition, CBO estimates that implementing the bill would cost $20 million over the 2019–2023 period, assuming appropriation of the authorized and necessary amounts.

Direct spending

H.R. 6140 would authorize DOE to acquire high-assay, low-enriched uranium (HALEU) for new commercial uses. DOE would be directed to establish a consortium of entities involved in the nuclear fuel cycle to assess the potential supply and demand for such materials and to develop a schedule for recovering any acquisition costs that the department incurs. Under the bill, DOE would be expressly prohibited from including materials allocated for defense purposes in its assessment of available supplies. Because the legislation does not expressly make those transactions subject to further appropriation, CBO views the acquisition authority as a form of direct spending.

Background on HA–LEU. Producing fuels for nuclear reactors involves a multistep process to turn uranium ore into a form that can be used to generate electricity. Historically, electric utilities have purchased the raw materials and then entered into contracts with

domestic or foreign companies to increase—or enrich—the concentration of uranium isotope from less than 1 percent to up to 3 percent to 5 percent. Such materials are known as low-enriched uranium (LEU). Most enrichment services are purchased under long-term contracts.

According to academic and industry experts, most new technologies for advanced nuclear reactors will require uranium with higher concentrations of uranium isotopes, ranging from over 6 percent to nearly 20 percent. In addition, some have proposed using such materials—known as high-assay LEU, or HA–LEU—for new types of fuel for conventional nuclear power plants. At this time, however, there are no large commercial sources of HA–LEU anywhere in the world.[1]

Private companies have been reluctant to invest in new enrichment facilities for HA–LEU because of uncertainty surrounding the technical and economic viability of new nuclear technologies. A recent industry assessment suggests that the annual demand for HA–LEU in the 2020s could range from less than 5 metric tons to more than 100 metric tons a year—the equivalent of less than 1 percent to 5 percent, respectively, of the current demand for conventional LEU.[2] In addition, the timing of any sales will depend on the availability of new shipping containers and fuel fabrication facilities, which may take several years to design and build.

Estimated Budgetary Effects of the Bill. H.R. 6140 would direct DOE to make HA–LEU available, to the extent practical, for commercial uses by the end of 2025. CBO anticipates that DOE would acquire the materials by making commitments to purchase HA–LEU that would be produced in the future. Assuming those agreements follow standard industry practice, CBO expects that the value of DOE's purchases would cover the capital cost of the new production facilities as well as the operating costs incurred during the first 8 to 10 years of production. For this estimate, CBO assumes DOE would minimize the net cost of the HA–LEU by reimbursing the enrichers' construction and operating costs as they are incurred.

The cost of implementing H.R. 6140 would depend on the type and scale of enrichment services purchased by DOE. Based on information from industry experts and historical trends in enrichment prices and costs, CBO estimates that DOE would spend between $100 million and $200 million for new enrichment capacity for HA–LEU, with a midpoint of $150 million. That estimated cost reflects CBO's expectation that DOE would require buyers to provide raw materials in the form of LEU and that DOE would purchase the minimum quantities necessary for testing and demonstrating new nuclear reactor and fuel technologies, which could range from a few metric tons to over 10 metric tons per year.

Using information from industry studies, CBO estimates that most of the construction-related outlays would occur by 2026, as-

[1] DOE produces small quantities of HA–LEU for research and medical purposes by modifying materials in defense stockpiles, but most of the stockpiled materials available for civilian uses are projected to be used by 2030. Although some foreign entities also produce materials that could be imported for use by commercial users, such imports would require specialized licenses, transportation systems, and marketing arrangements. For more information, see Massachusetts Institute of Technology, *The Future of Nuclear Energy in a Carbon-Constrained World: An Interdisciplinary MIT Study* (2018), p. 88, http://tinyurl.com/ycdxnugt.

[2] See Nuclear Energy Institute, letter to Secretary Rick Perry on the Need for High-Assay Low-Enriched Uranium (July 5, 2018), http://tinyurl.com/yaqvkwoc.

suming that developers receive the necessary regulatory and marketing approvals in the next few years.[3] Once the facilities are operational, CBO estimates, DOE would spend another $5 million a year for operating expenses, or a total of $16 million over the 2019–2028 period. CBO estimates that DOE would recover about one-quarter of the capital costs and two-thirds of the operating costs by 2028, resulting in receipts totaling $46 million over the 10-year period.

Spending subject to appropriation

CBO estimates that implementing H.R. 6140 would cost $20 million over the 2019–2023 period, assuming appropriation of the authorized amounts. That total includes the $4.5 million specifically authorized for DOE to assist in the design and licensing of transportation systems needed to transport HA–LEU and related materials.

CBO also estimates that DOE would spend about $16 million over the 2019–2023 period to operate the consortium and implement agreements to acquire HA–LEU and to sell it to commercial users. For this estimate, CBO assumes that DOE would review and execute about 10 contracts under the acquisition program and that the administrative costs of processing and servicing those agreements would be similar to the costs incurred by DOE in processing applications for loans and loan guarantees.

In addition, CBO expects that implementing H.R. 6140 could affect the workload of the Nuclear Regulatory Commission (NRC), which licenses and regulates civilian facilities that use radioactive materials. In particular, that agency would be heavily involved in the design and licensing of facilities and transportation containers required to develop a commercial supply of HA–LEU. To the extent that the legislation results in an overall increase or acceleration of such activities, the bill could increase the NRC's costs, which are subject to appropriation. However, because the NRC is required under current law to offset most of its funding through fees charged to entities it regulates, CBO estimates that any net changes in the agency's spending under the bill would not exceed $500,000 in any year.

Uncertainty: CBO aims to produce cost estimates that generally reflect the middle of a range of the most likely budgetary outcomes that would result if the legislation was enacted. In estimating the effects of H.R. 6140, CBO had to account for several sources of uncertainty:

- CBO does not know the quantity or price of the HA–LEU that DOE would acquire to implement the bill. Spending could be higher or lower than the estimated amounts depending on the size of the commercial market for HA–LEU, DOE's role in meeting the needs of that market, and the cost of supplying those materials.
- CBO cannot determine the form or terms of the contractual arrangements that DOE would use to acquire materials under the bill. Costs also could differ if DOE chose to purchase materials from Russia or another foreign entity.

[3] For more information, see Nuclear Energy Institute, *Addressing the Challenges with Establishing the Infrastructure for the front-end of the Fuel Cycle for Advanced Reactors*, NEI White Paper (January 2018), http://tinyurl.com/ydamptz6 (PDF, 504 KB).

• CBO cannot predict the amount or timing of collections from fees paid by private entities for the use of the fuel. Advanced nuclear reactor projects face technological and market risks, which could affect the timing and amount of their purchases or payments.

Pay-As-You-Go considerations: The Statutory Pay-As-You-Go Act of 2010 establishes budget-reporting and enforcement procedures for legislation affecting direct spending or revenues. The net changes in outlays that are subject to those pay-as-you-go procedures are shown in the following table.

CBO ESTIMATE OF PAY-AS-YOU-GO EFFECTS FOR H.R. 6140, THE ADVANCED NUCLEAR FUEL AVAILABILITY ACT, AS ORDERED REPORTED BY THE HOUSE COMMITTEE ON ENERGY AND COMMERCE ON JULY 12, 2018

	By fiscal year, in millions of dollars—											
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2019–2023	2019–2028
NET INCREASE IN THE DEFICIT												
Statutory Pay-As-You-Go Effect	0	0	8	15	45	45	37	−4	−13	−13	68	120

Increase in long-term direct spending and deficits: CBO estimates that enacting H.R. 6140 would not increase net direct spending or on-budget deficits by more than $5 billion in any of the four consecutive 10-year periods beginning in 2029.

Mandates: H.R. 6140 contains no intergovernmental or private-sector mandates as defined in UMRA.

Estimate prepared by: Federal costs: Megan Carroll and Kathleen Gramp; Mandates: Jon Sperl.

Estimate reviewed by: Kim P. Cawley, Chief, Natural and Physical Resources Cost Estimates Unit; H. Samuel Papenfuss, Deputy Assistant Director for Budget Analysis.

FEDERAL MANDATES 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.

STATEMENT OF GENERAL PERFORMANCE GOALS AND OBJECTIVES

Pursuant to clause 3(c)(4) of rule XIII, the general performance goal or objective of this legislation is to make high-assay low-enriched uranium nuclear fuel available for commercial use in advanced nuclear reactor technologies.

DUPLICATION OF FEDERAL PROGRAMS

Pursuant to clause 3(c)(5) of rule XIII, no provision of H.R. 6140 is 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 the most recent Catalog of Federal Domestic Assistance.

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 Congres-

sional Budget Office pursuant to section 402 of the Congressional Budget Act of 1974.

EARMARK, LIMITED TAX BENEFITS, AND LIMITED TARIFF BENEFITS

Pursuant to clause 9(e), 9(f), and 9(g) of rule XXI, the Committee finds that H.R. 6140 contains no earmarks, limited tax benefits, or limited tariff benefits.

DISCLOSURE OF DIRECTED RULE MAKINGS

Pursuant to section 3(i) of H. Res. 5, the Committee finds that H.R. 6140 contains no directed rule makings.

ADVISORY COMMITTEE STATEMENT

No advisory committees within the meaning of section 5(b) of the Federal Advisory Committee Act were created by this legislation.

APPLICABILITY TO LEGISLATIVE BRANCH

The Committee finds that the legislation 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.

SECTION-BY-SECTION ANALYSIS OF THE LEGISLATION

Section 1. Short title

This section provides the short title of "Advanced Nuclear Fuel Availability Act."

Section 2. Program

This section requires the Secretary of Energy to establish and carry out, through the Office of Nuclear Energy, a program to support the availability of high-assay low-enriched uranium, or HA–LEU, for domestic commercial use, and establishes several HA–LEU program elements

Section 2(b) establishes the HA–LEU program elements which (1) provide financial assistance to design and license transportation packages for HA–LEU; (2) have such designs submitted to the NRC for certification by January 1, 2021 and encourage the Commission to have such designs certified by January 1, 2023; (3) report on DOE's uranium inventory that may be processed to HA–LEU not later than January 1, 2020; (4) conduct a periodic survey to estimate quantities necessary for domestic commercial use of HA–LEU; (5) assess options to acquire HA–LEU, including cost and time required for each option assessed; (6) establish a consortium, which may include representatives of companies involved in any stage of the nuclear fuel cycle, to partner with DOE to support the availability of HA–LEU for domestic commercial use, including by providing information for the surveys and purchasing HA–LEU made available by the Secretary; (7) develop a cost recovery schedule for HA–LEU made available to members of the consortium; (8) make HA–LEU available to members of the consortium beginning not later than January 1, 2025, consistent with quantities estimated under the surveys; and, (9) develop criticality benchmark data to assist the Commission in licensing and regulation of nuclear facilities and certification of transportation packages.

Section 2(c) makes subparagraphs (A) and (C) of section 3112(d)(2) of the USEC Privatization Act applicable to transfers of HA–LEU for commercial use.

Section 2(d) requires financial assistance agreements under section 2(b)(1) for the design and licensing of transportation packages to have a minimum of a twenty percent cost share and authorizes $1,500,000 for each of the fiscal years 2019 through 2021.

Section 2(e) sunsets the program on September 30, 2033.

Section 3. Report to Congress

Section 3 requires the NRC to submit a report to Congress not later than 12 months from the date of enactment of the Act that identifies updates to regulations, certifications, and other regulatory policies that the Commission determines are necessary in order for HA–LEU to be commercially available, including guidance for material control and accountability of Category 2 special nuclear material, certifications relating to transportation packaging, and licensing of enrichment, conversion, and fuel fabrication facilities for HA–LEU and associated physical security plans for such facilities, with a description of such updates and timeline to complete such updates.

Section 4. Definitions

Section 4 defines the terms "Commission"; "Department"; "HA–LEU"; "high-assay low-enriched uranium"; and "Secretary."

CHANGES IN EXISTING LAW MADE BY THE BILL, AS REPORTED

This legislation does not amend any existing Federal statute.

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