**6450-01-P**

**DEPARTMENT OF ENERGY**

# Notice of Availability of the Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)

**AGENCY:** Office of Nuclear Energy, U.S. Department of Energy.

**ACTION:** Notice of availability and public hearings.

**SUMMARY:** The U.S. Department of Energy (DOE) announces the availability of the *Draft Environmental Impact Statement for Department of Energy Activities in Support of Commercial Production of High-Assay Low-Enriched Uranium (HALEU)* (Draft HALEU EIS) (DOE/EIS-0559). DOE is also announcing a public comment period and public hearings to receive comments on the Draft HALEU EIS. DOE prepared the Draft HALEU EIS to evaluate the potential environmental impacts of DOE's Proposed Action for the acquisition of HALEU produced by a commercial entity using enrichment technology and making it available for commercial use or demonstration projects.

**DATES:** Comments will be accepted during the comment period, which will extend for 45 days after the date that the U.S. Environmental Protection Agency (EPA) publishes its Notice of Availability in the *Federal Register* March 8, 2024. DOE plans to hold three public hearings on the Draft HALEU EIS. DOE will host internet-based, virtual public hearings in place of in-person hearings. The dates of the hearings will be on Wednesday, April 3, 2024, at 6:00 p.m. ET, 8:00p.m. ET, and 10:00 p.m. ET. Further information on the public hearings is available on the following website: *https://www.energy.gov/ne/haleu-environmental-impact-statement*. DOE will hold the hearings no earlier than 15 days from the posting of the EPA Notice of Availability.

**ADDRESSES:** DOE invites Federal and state agencies, state and local governments, Native American Tribes, industry, other organizations, and members of the public to review and submit comments on the Draft HALEU EIS. Written comments on the Draft HALEU EIS should be sent to Mr. James Lovejoy, HALEU EIS Document Manager, by mail at: U.S. Department of Energy, Idaho Operations Office, 1955 Fremont Avenue, MS 1235, Idaho Falls, Idaho 83415; or by email to *HALEU-EIS@nuclear.energy.gov*. The Draft HALEU EIS is available for viewing or download at *https://www.energy.gov/ne/haleu-environmental-impact-statement*.

**FOR FURTHER INFORMATION CONTACT:** For information regarding DOE HALEU activities or the Draft HALEU EIS, visit *https://www.energy.gov/ne/haleu-availability-program or https://www.energy.gov/ne/haleu-environmental-impact-statement* or contact Mr. James Lovejoy at the mailing address listed in the **ADDRESSES** section or via email at *HALEU-EIS@nuclear.energy.gov* or telephone: (208) 526-4519. For general information on DOE's National Environmental Policy Act process, contact Mr. Jason Anderson at the mailing address listed in the **ADDRESSES** section or via email at *HALEU-EIS@nuclear.energy.gov* or telephone: (208) 526-0174.

**SUPPLEMENTARY INFORMATION:**

**Background**

The Energy Act of 2020 directs the Department of Energy "to establish and carry . . . out a program to support the availability of HA-LEU for civilian domestic research, development, demonstration, and commercial use." DOE is committed to support the development and deployment of the HALEU fuel cycle and to acquire and provide HALEU as authorized by Congress in Section 2001 of the Energy Act of 2020.

Low-enriched uranium (LEU) is enriched to less than 20% uranium-235 (U-235), the main fissile isotope that produces energy during a chain reaction. The current U.S. commercial power reactor

fuel cycle is based on LEU enriched to less than 5% of U-235, but many advanced reactor designs require HALEU.

HALEU is defined as ‘‘uranium having an assay greater than 5.0 weight percent and less than 20.0 weight percent of the uranium-235 isotope’’ (42 U.S.C. 16281(d)(4)). In the United States, HALEU is currently made, in limited quantities, by blending down highly enriched uranium (HEU) (enriched to 20% or greater), with natural uranium or lower enriched uranium (*i.e.*, “downblending”). Anticipated demand from research reactors, isotope production facilities, and advanced nuclear reactors will require more HALEU to be manufactured for commercial purposes. The capability to downblend provides insufficient capacity to support commercialization of domestic HALEU supply. A commercial capability to produce HALEU through enrichment of natural uranium or LEU does not exist in the United States.

DOE predicts that by the mid-2020s, approximately 22 metric tons (MT) of HALEU will be needed for initial core loadings to support reactor demonstratirons and DOE test and research reactors that were converted from HEU fuel. DOE also predicts a HALEU demand of between 8 and 12 MT of HALEU annually into the early 2030s increasing to over 50 MT of HALEU per year by 2035, and ultimately over 500 MT of HALEU per year by 2050. The lack of an adequate domestic, commercial fuel supply could impede both reactor demonstrations and deployment of advanced reactor technologies requiring HALEU.

As indicated by many commercial entities that responded to DOE’s *Request for Information (RFI) Regarding Planning for Establishment of a Program to Support the Availability of High-Assay Low Enriched Uranium (HALEU) for Civilian Domestic Research, Development, Demonstration, and Commercial Use* (86 FR 71055, December 2021) (referred to as the “RFI”), there is a potential timing/coordination issue with developing that capability.

There is currently insufficient private incentive to invest in commercial HALEU production due to the current market base, resulting in those interested in designing, building, and operating

advanced reactor designs that use HALEU fuel being hesitant to invest in the technology without a reliable source of HALEU fuel. There is also insufficient incentive to invest in the necessary commercial deployment of advanced reactors because the domestic HALEU fuel cycle does not currently exist. The Energy Act of 2020 aims to stimulate HALEU supply to support the development, demonstration, and deployment of advanced reactors in a manner that establishes a diversity of supply and healthy market forces for the future. This concern is a consistent theme in the industry responses to DOE's RFI. These responders emphasized the importance of the HALEU consortium that is called for in the Energy Act of 2020 and that DOE established on December 7, 2022 (87 FR 75048). Responders also emphasized the opportunity for DOE to be an agent for stability (both in assuring HALEU availability and market price certainty) during the initial phase of HALEU fuel production.

To address this issue, an initial public/private partnership is intended to accelerate development of a sustainable commercial HALEU supply capability. If successful, this partnership could provide the incentive for the private sector to incrementally expand the capacity in a modular fashion as a sustainable market develops.

On June 5, 2023, the DOE Idaho Operations Office published for comment two Draft Requests for Proposals (RFPs) for: (1) HALEU enrichment capability in the United States; and (2) U.S. capabilities in HALEU deconversion to oxide, metal, or other forms (a final RFP for the deconversion RFP was published on November 28, 2023, and the final RFP for the enrichment RFP was published on January 9, 2024). Under the RFP for *Purchase of High-Assay Low-Enriched Uranium (HALEU) – Enrichment* (the "Enrichment RFP"), DOE solicited response from industry regarding DOE's proposal to acquire, through procurement from commercial sources, HALEU as uranium hexafluoride ($UF_6$) enriched to a minimum of 19.75 and less than 20 weight percent U-235 as soon as possible to secure a more robust, longer-term HALEU production capability.

The enriched $UF_6$ must be deconverted to other forms, like oxide or metal, before it can be fabricated into HALEU fuel or put to other use. Under the RFP for the *Purchase of High-Assay Low-Enriched Uranium (HALEU) – Deconversion Services* (the "Deconversion RFP"), DOE solicited response from industry regarding DOE's proposal to acquire domestic HALEU deconversion services for HALEU and storage until future fuel fabrication.

**Alternatives**

The Draft HALEU EIS evaluates potential environmental impacts for the Proposed Action and the No Action Alternative. The Proposed Action is to acquire, through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20.00 weight percent U-235 over a 10-year period of performance, and to facilitate the establishment of commercial HALEU fuel production. The Proposed Action implements section 2001(a)(2)(D)(v) of the Energy Act of 2020 for the acquisition of HALEU produced by a commercial entity using enrichment technology and making it available for commercial use or demonstration projects.

This Draft HALEU EIS addresses the following activities facilitating the commercialization of HALEU fuel production and acquisition of up to 290 MT of HALEU under the Proposed Action: (1) mining, extraction, and recovery of uranium ore producing triuranium octoxide ($U_3O_8$) (from domestic or foreign in-situ recovery or conventional mining and milling sources); (2) uranium conversion from $U_3O_8$ to $UF_6$ for input to enrichment facilities; (3) enrichment in up to three steps (a) from natural uranium to LEU of no more than 5 weight percent U-235, (b) from LEU to HALEU of less than 10 weight percent U-235, and (c) to HALEU of less than 20 weight percent U-235; (4) HALEU deconversion from $UF_6$ to uranium oxide, metal, and other forms; (5) storage; (6) transportation of uranium/HALEU between facilities; and (7) DOE acquisition of HALEU of between at least 19.75 weight percent and less than 20 weight percent U-235. In addition to the activities above, the following actions could result from implementation of the Proposed Action: (1) fuel fabrication for a variety of fuel types in a U.S. Nuclear Regulatory

Commission (NRC) Category II facility; (2) HALEU-fueled reactor (demonstration and test, power, isotope production) operations; and (3) spent fuel storage and disposition. While not specifically a part of the Proposed Action, these activities are reasonably foreseeable and therefore acknowledged and addressed to the extent possible in the Draft HALEU EIS.

While the Draft HALEU EIS provides information that could be used to identify impacts from the construction and operation of HALEU fuel cycle facilities, the selection of specific locations and facilities will not be a part of the Record of Decision for this EIS.

**Preferred Alternative**

The Preferred Alternative is the Proposed Action, to acquire, through procurement from commercial sources, HALEU enriched to at least 19.75 and less than 20 weight percent U-235 over a 10-year period of performance, and to facilitate the establishment of commercial HALEU fuel production. The No Action Alternative would not implement the Proposed Action, leaving development of a domestic commercial supply of HALEU to industry or industry would remain reliant on foreign supplies of HALEU, contrary to Congressional direction under section 2001 of the Energy Act of 2020.

**Virtual Public Hearings**

DOE will host three interactive, virtual public hearings during the public comment period on Wednesday, April 3, 2024, at 6 p.m. ET, 8 p.m. ET, and 10 p.m. ET. During these public hearings, DOE will give a brief presentation on the Draft HALEU EIS, followed by a period during which DOE will accept oral comments on the Draft HALEU EIS. Parties interested in providing oral comments are encouraged to preregister for the public hearings and indicate their desire to comment. Oral comments will be transcribed. Written comments on the Draft HALEU EIS may also be submitted during the public comment period as indicated under the **ADDRESSES** section. All comments, received before the end of the comment period, whether oral or written, will be considered by DOE as the HALEU EIS is finalized. DOE will post

information regarding the public hearings on the HALEU EIS website at *https://www.energy.gov/ne/haleu-environmental-impact-statement*. The hearings will also be announced in newspapers.

**Signing Authority**

This document of the Department of Energy was signed on March 1, 2024, by Dr. Kathryn Huff, Assistant Secretary for Nuclear Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by the Department of Energy. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned Department of Energy Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the *Federal Register*.

Signed in Washington, DC, on March 1, 2024.

**Treena V. Garrett,**
*Federal Register Liaison Officer,*
*U.S. Department of Energy.*

[FR Doc. 2024-04799 Filed: 3/6/2024 8:45 am; Publication Date: 3/7/2024]