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ClearPath Response to the Department of Energy'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

RFI/NOI title and reference number:

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
DOE-HQ-2022-0003-0001

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U.S. Department of Energy
1000 Independence Ave SW
Washington, DC 20585

Subject: ClearPath Response to the Department of Energy’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 (DOE-HQ-2022-0003-0001)

Dear Department of Energy Staff:

ClearPath appreciates the opportunity to provide a response to the Department of Energy’s (DOE) 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).^{1, 2}

ClearPath’s mission is to develop and advance policies that accelerate breakthrough innovations that reduce emissions in the energy and industrial sectors. To advance that mission, we develop cutting-edge policy solutions on clean energy and industrial innovation. An entrepreneurial, strategic nonprofit, ClearPath (501(c)(3)) collaborates with public and private sector stakeholders on innovations in nuclear energy, carbon capture, hydropower, natural gas, geothermal, energy storage, and heavy industry to enable private-sector deployment of critical technologies. ClearPath is supported by philanthropy, not industry, which gives us the flexibility to focus on policies that can support the commercialization of these technologies.

Disruptions to any fuel supply chain can have devastating effects, and an overreliance on foreign suppliers can create market uncertainty. Therefore, it is imperative that the U.S. has the ability to provide a domestic supply of HALEU. Today, dozens of advanced nuclear energy

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<https://www.federalregister.gov/documents/2021/12/14/2021-26984/request-for-information-rfi-regarding-planning-for-establishment-of-a-program-to-support-the>

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<https://www.federalregister.gov/documents/2022/01/07/2021-28543/request-for-information-rfi-regarding-planning-for-establishment-of-a-program-to-support-the>

companies, many of which will rely on HALEU, are looking to commercialize their technologies in the U.S. and abroad. Since currently the only commercial HALEU supply is from Russia and subject to the provisions of the Russian Suspension Agreement extension codified in the Energy Act of 2020, this creates a market risk for companies looking to deploy more than one reactor domestically. A domestic U.S. HALEU supply chain can provide investor confidence, solidify deployment timelines, and enable a robust U.S. advanced nuclear industry.

Similarly, Russia as a sole source supplier creates a market risk for our allies that are looking to build U.S. reactors in their own countries. This creates another opportunity for the U.S. to lead on HALEU production since other countries will also want a secure fuel supply. For example, Canada has a similar timelines to deploy advanced reactors.

The Energy Act of 2020's Advanced Nuclear Fuel Availability Program³ provides broad statutory authority for the DOE to support private industry in the creation of a domestic HALEU supply chain through procurement, transportation, criticality benchmarks, and programmatic operation. In general, the goal of this legislation is to "make HALEU available." The existing legislation is adequate and it does not require any modifications, only implementation. This RFI is an important step for the DOE to craft a program that meets the intent of the Energy Act.

In light of the bipartisan support from Congress for both the Energy Act and funding for the Advanced Reactor Demonstration Program (ARDP) through the Infrastructure Investment and Jobs Act (IIJA), DOE must ensure that the billions of dollars invested in the ARDP and other innovative nuclear programs are not squandered by the lack of a reliable fuel supply.

There are several guiding principles that should be the basis of the program. These principles will ensure that DOE gives industry the flexibility to be successful, but still ensure that the program is on track.

The program should target:

- the production of a target volume of material;
- material that is produced in specific fuel form(s) (i.e., the program should include deconversion);
- material that is available by realistic and useful target date(s); and
- material that is available at a target cost that is suitable to commercial users.

Conveniently, DOE-NE already has a great template for setting up a successful, competitive program. The Energy Act of 2020 also codified the ARDP, a competitive program that set clear timelines and mobilized the entire industry. This fuel program can, and should, be "ARDP-like" by developing program timelines and milestones within the broad authority of the Energy Act. In addition, an external review board can also provide feedback for the award selection process.

While there are many methods the DOE could use to meet these milestones, there are two pieces that are likely to be required – 1) supporting the infrastructure investment required to initially produce HALEU, and 2) providing some minimum market pull to bridge the gap between this program and when the advanced nuclear industry (both in the U.S. and abroad) is able to

³ Section 2001 of Division Z of the Consolidated Appropriations Act of 2021 (42 U.S.C. 16281)

sustain that demand. In addition to clearly articulating the goals of the program, DOE must allow for flexibility in how industry teams can meet these goals. By over relying on only one “method” to meet the targets, the DOE may be limiting innovative, cost-competitive solutions.

Downblending could be a part of the program, but should not take away from the overall goal of creating a domestic HALEU supply chain. Thus, it is unlikely that downblending is a viable approach particularly to the exclusion of new enrichment capability or near-term import needs. However, DOE should ensure that it meets its current obligations with the downblending of the used EBR-II fuel, and it should be clear that the EBR-II effort is outside of the scope of the program that is the subject to this RFI.

This program needs to be competitively awarded, with at least two awardees (i.e., teams) that can meet the specific milestones. Additional awards could be given for enrichment technologies that are farther away from commercialization but have significant potential; however, these awards should not be at the expense of establishing a near-term, robust domestic industry. Similar to the ARDP, this program should mobilize teams of industry partners that meet the specific goals. These teams would likely include more than just enrichment companies as they would need to consider topics like deconversion and transportation. They would also need to consider how to procure raw materials and required components, as well as create and execute a licensing strategy. Fuel fabrication would likely be outside of the scope of this program unless it’s integration provides significant overall cost and implementation savings.

The program should utilize milestone based payments and/or Other Transactional Authority. This will provide DOE the ability to be good stewards of taxpayer dollars. The DOE must be good stewards of federal funding and ensure that the program is meeting its intent and the overall goal of supporting the establishment of a domestic HALEU supply chain. The successful NASA COTS program can provide a template. Implementing this approach should not – and need not – slow down the creation of the program. DOE must rapidly set up the program so it can set-up the U.S. industry for success.

Thank you for the opportunity to provide a response and for thoughtfully establishing this incredibly necessary program. Please do not hesitate to reach out if you need additional information or have any questions.

Sincerely,

Nicholas McMurray
Managing Director, Public Policy
ClearPath

Enclosures:

1. ClearPath Response to Request for Information Questions

ClearPath Response to Request for Information Questions

Establishment of a HALEU Consortium & Market Development

Question 1:

Sec. 2001 of the Energy Act of 2020 directs the establishment and periodic updating of a HALEU Consortium to partner with DOE to support the availability of HALEU for civilian domestic demonstration and commercial use. Among other things, the Act envisions that the HALEU Consortium could: provide information to DOE for purposes of biennial surveys on the quantity of HALEU needed for commercial use for each of the subsequent five years; purchase HALEU made available by the Secretary for commercial use by members of the consortium; and carry out demonstration projects using HALEU provided by the Secretary under the program.

What types of organizations or other entities should be included in the HALEU Consortium? If your organization or entity might be interested in becoming a member of a HALEU Consortium, please describe the contribution your organization or entity could provide to the consortium. The description should include examples of the type of activity or activities for which your organization or entity is interested in partnering with the Department. Please also provide a point of contact for your organization or entity, including name, affiliation, email, and phone number.

Response:

The HALEU Consortium can serve a key role in advising DOE and making sure this program stays on track, as well as provide clarity on the near-term needs for HALEU. As will be discussed, DOE should purchase initial quantities of material to create a market pull that incentivizes both enrichment and deconversion companies as well as reactor developers. However, DOE should not undercut, or be positioned to take the place of, the roles of either group. The Consortium can help ensure this does not happen.

Members of the Consortium should be slightly broader than just companies looking to purchase HALEU. They should include private industry across the entire HALEU supply chain (e.g, mining, enrichment, deconversion, transportation, supporting companies, etc.); HALEU end users (e.g., reactor companies); fuel fabricators; and industry trade organizations that can leverage their members' resources to coordinate wider groups of companies.

Question 2:

Please identify any issues, including energy justice concerns, that may affect the implementation of the HALEU Availability Program under Sec. 2001 of the Energy Act of 2020, in an equitable manner that would further the development and deployment of advanced reactors and the establishment of a domestic commercial source of HALEU.

Response:

Nuclear energy can provide low-carbon electricity, heat, desalinated water, hydrogen, and other valuable products. This program supports the deployment of nuclear energy, as such it provides clear benefits to the U.S. and international communities that are interested in nuclear energy. As these facilities will be Nuclear Regulatory Commission (NRC) licensed, they will meet the NRC's requirement to protect public health and safety, and the environment.

One justice concern is the speed of the program as it relates to the just transition. The fuel in this program will be used for both commercial and demonstration applications. One of the reactors selected under ARDP, the TerraPower Sodium deployment in Kemmerer, Wyoming, will be located at the site of a retiring coal plant. The coal plant in Kemmerer is a significant economic driver for the community and the new advanced reactor demonstration is crucial to supporting the town's continued vitality. Ensuring the timely availability of HALEU should be seen as an energy justice issue because there is significant interest in using advanced nuclear energy to repower coal plants and there could be significant economic hardship if this program is delayed. Future deployments of advanced nuclear technology can provide value to communities, and this program is essential to those future deployments.

Question 3:

What are the most significant barriers to the establishment of a reliable market-driven, commercial supply of HALEU for advanced reactor research, demonstration, and commercial deployment? Please describe these barriers in detail, identify potential actions to address these barriers, and include the timeframes in which the issues should be addressed.

Response:

The most significant barriers are the absence of a demand signal that would lead companies to invest the required capital in HALEU facilities and capabilities (e.g., enrichment, deconversion, transportation, etc.) as well as the uncertainty of a stable supply chain for HALEU end users. This program can address both of these barriers. A DOE and industry cost-share can help address the upfront capital investment that is required for a commercial-scale facility, and a demand signal can give companies the confidence in the near-term that there is a reliable market that will sustain them after program completion.

By addressing both the demand signal and up front capital for companies, HALEU end users can more confidently make the long-term investment in building advanced reactors knowing there will be a domestic HALEU market available. After both HALEU facilities and capabilities are established, as well as sufficient advanced reactor demand for HALEU is established, the DOE can reduce their artificial demand signal. Thereafter, the supply chain can scale as industry demand increases.

However, time is of the essence. DOE needs to publish the Request for Proposal (RFP) and/or Funding Opportunity Announcement (FOA) as soon as practicable. Similarly, it should set up the Consortium as soon as practicable. The information that is produced through these actions will enable policymakers to submit adequate, defensible appropriation requests over the next several years.

Luckily, there is a template. The ARDP provides a useful template for DOE to follow including expeditiously publishing, reviewing, and awarding the RFI and RFP/FOA; setting clear timelines and milestones; and catalyzing private industry. DOE quickly progressed through these steps and should implement the Advanced Nuclear Fuel Availability Program with similar urgency.

Question 4:

If the Department were to address the objectives of Sec. 2001 of the Energy Act of 2020 related to the creation of a fuel bank to supply HALEU for civilian domestic research, development, demonstration, and commercial use:

- What is the quantity (in metric tons/assay) of HALEU necessary for domestic commercial use for each of the next five years (2022-2026)?
- If a “stockpile” of HALEU were established to build confidence in the supply of HALEU supporting early orders for the deployment of advanced reactors in the commercial market, how large (in metric tons/assay) a stockpile would be needed?
- What siting and energy justice issues should the Department take into account as it considers the development of a program and how might the Department address those issues?

Response:

There have been multiple estimates for HALEU quantities including Idaho National Laboratory, INL/EXT-21-64913, “Estimated HALEU Requirements for Advanced Reactors to Support a Net-Zero Emissions Economy by 2050,” dated 2021,⁴ as well as the NEI letter to Secretary Granholm, “Updated Need for High-Assay Low Enriched Uranium,” dated December 20, 2021.⁵

However, DOE should focus on *what is the minimum viable amount required* to incentivize industry, maintain production, have reasonable costs for the material, and be scalable. Multiple industry sources have targeted 10 metric-tons (MTU)/year/team (i.e., 20 MTU/year total if two awardees/teams) to accomplish these goals. As such, in addition to a public-private partnership to build out the HALEU facilities and capabilities, DOE should also create short term market pull for these companies by purchasing 10 MTU/year/team until private industry can take over the demand itself.

Regarding a stockpile, there should not be a specific metric for how large it should be, but it should be based on yearly offtake and have flexibility to sell to interested parties. The Consortium can play a role in advising on the size and duration of this agreement.

For siting that material, it does not have to be a new location. Likely the best option is to have it stored on the site where it is produced, but transfer title to DOE. As part of an application to this program, industry teams could justify how they intend to meet these requirements. Finally, if material is stored on the same site as production, the site would be NRC licensed and address any concerns described in the response to Question 2 above.

Question 5:

Please identify any additional specific actions that would provide confidence in the short-term supply of HALEU and thereby to ensure the development of a commercial market for advanced reactor orders.

- What actions might be most useful for the U.S. Government to carry out?
- What actions might be most appropriate for the private sector to carry out?

⁴ <https://www.osti.gov/biblio/1838156>

⁵ <https://www.nei.org/resources/letters-filings-comments/2021-doe-updated-need-for-high-assay-low-enriched>

Response:

Overall, the most important thing the U.S. Government can do is swiftly establish a program, as enacted under the broad authority of the Energy Act of 2020. The Energy Act's Advanced Nuclear Fuel Availability Program⁶ provides broad statutory authority for the DOE to support private industry in the creation of a domestic HALEU supply chain. Specifically, the program:

- makes HALEU available at specific quantities and in certain fuel forms (i.e., deconversion);⁷
- develops fuel amounts and, if applicable, costs based on industry feedback and the specific items within the Energy Act;
- assists commercial entities and lays out timelines to design and license transportation packages for multiple compositions of HALEU;⁸ and
- assists commercial entities to develop criticality benchmark data.⁹

DOE needs to clarify its implementation strategy for the program and request adequate appropriations. Throughout the process, DOE should be a partner with industry and let the private sector lead on the best way to provide cost competitive HALEU; however, DOE should ensure clear goals and milestones for industry to be a good steward of taxpayer dollars. If industry is unable to meet established milestones, DOE should adjust the awards as needed, including the possibilities of providing funding to other awardees and/or selecting new awardees.

The private sector has continued to state the importance of this program. Stakeholders must clearly articulate what is required for a successful program by participating in the Consortium. Enrichment companies will need a clear understanding of HALEU quantities and timelines. Similarly, deconversion companies will need to understand the fuel forms advanced reactor companies need for their particular fuel fabrication process. DOE should ensure flexibility to allow industry teams to determine what makes the most sense. Similar to the ARDP, robust industry teams would likely be best equipped to meet the programmatic requirements.

Question 6: What level of market demand for HALEU over what timeframe is needed to stimulate investment in the infrastructure required to support a HALEU supply chain?

Response:

As described in the response to Question 4, there are multiple references regarding market demand. However, these are based on models or reporting from industry without vetting on realistic timelines. Thus, they are useful, but do not address this question. DOE's focus should be on establishing a program that creates public-private partnerships with industry teams that addresses the upfront capital costs of HALEU facilities and capabilities and then purchase the minimum viable amount required (i.e. 10 MTU/year/team) over a certain period of years to create a short term market demand until the private advanced reactor industry is established enough to provide a sufficient market demand signal.

⁶ Section 2001 of Division Z of the Consolidated Appropriations Act of 2021 (42 U.S.C. 16281)

⁷ In accordance with subparagraph (a)(2)(H) of Section 2001 Division Z of the Consolidated Appropriations Act of 2021 (42 U.S.C. 16281)

⁸ In accordance with subparagraph (a)(2)(C) of Section 2001 Division Z of the Consolidated Appropriations Act of 2021 (42 U.S.C. 16281)

⁹ In accordance with subparagraph (a)(2)(A) of Section 2001 Division Z of the Consolidated Appropriations Act of 2021 (42 U.S.C. 16281)

Question 7:

On what basis should HALEU be priced or valued? Please consider the options for the pricing of HALEU based on enrichment, weight, and/or separative work units and provide the pros and cons for each option or combination of options. Please discuss how pricing options would provide DOE with reasonable compensation and commercial entities with sufficient incentive to deploy domestic capacity to supply HALEU. What is your long-term estimated “price point” for the range of assays/enrichment (2030 and beyond)? Please consider and note the form of HALEU (e.g., metal, oxide, UF₆, etc.) in your response.

Response:

Industry will be the best resource on cost. However, this program should ideally produce HALEU that allows companies to have competitive costs to other suppliers. Beyond cost, the main priority should be creating a program that can support reasonable prices and kick start the industry to incentivize deployment.

The price at which the DOE purchases HALEU should not undermine any additional production above the minimum required amount by either under-paying and not enabling companies to maintain and scale production, or overpaying and reducing interest for end users to purchase. The goal is to enable the deployment of initial capacity while facilitating additional investment by enrichers to scale capacity modularly as demand grows. Overall, DOE’s goal is to support industry in the short-term and should not negatively impact the scalability of industry.

HALEU Supply Chain Development

Question 8:

Advanced reactors under development (including awardees under the Advanced Reactor Demonstration Program) would utilize HALEU in various chemical and physical fuel forms, including oxides, metals, and potentially salts. Additionally, centrifuge enrichment requires uranium in hexafluoride form. What additional fuel cycle infrastructure, or additions or modifications to existing infrastructure, would enable the deployment of commercial HALEU production and assure the availability of different forms of HALEU in sufficient quantities for use in advanced reactors?

Response:

At least two competitively awarded public-private partnerships that utilize milestone based payments or Other Transactional Authority can enable industry teams to overcome the significant upfront capital costs of building infrastructure. Each partnership should produce a minimum of 10 MTU of HALEU per year, and based on feedback from the Consortium, in metallic and/or oxide fuel forms at competitive prices.

In addition, DOE creating a short-term market demand by purchasing 10 MTU/year/team, will enable the awardees to maintain this investment until private industry is able to meet the demand itself. DOE and the consortium can determine if it is most advantageous to procure UF₆, uranium oxide, or uranium metal. In addition, it may also be possible that that commercial industry is ready to purchase the 10 MTU/year/team output from the outset, which would negate the need for DOE to create this short term market demand. The Consortium, and enabling

flexibility to meet the goals of the program from the beginning, can help ensure that DOE is maximizing their role and not inhibiting industry to be successful.

Similar to the ARDP, cost-shares could be provided for both technology development and deployment. Funding in later years of the program can be used to demonstrate production costs and reliability through the DOE purchase agreements.

These cost, schedule, material amounts, and fuel form requirements should be part of a payment for milestones approach or utilize Other Transactional Authority to ensure that the awardees are meeting the necessary performance metrics.

When awarding funds, DOE should clearly articulate the goals teams are required to fulfill. If DOE clearly articulates the goals of this program, industry teams will be able to make thorough, long-term plans on how they will meet those goals.

Question 10:

What are some approaches or contracting vehicles that could be used by the Department to help enable the necessary commercial deployment of a domestic HALEU supply chain, including but not limited to mining, conversion, enrichment, deconversion, transportation, and fuel fabrication? For each, please discuss potential federal versus private sector actions; in addition, discuss leveraging robust partnerships for co-development of sub-elements of the supply chain.

Possible approaches that might be considered include:

- Production contracts (of what volume and length);
- Take-or-pay contracts (U.S. Government agrees to take specified volume of goods and/or services for a specified time period);
- Partnerships and/or cost-sharing of infrastructure development, including with allies and partners; and
- Payment-for-production milestones.

Response:

Previous responses to questions in this document address how DOE can best incentivize industry, and a combination of the listed approaches can provide industry the best way to meet the goals of the program. DOE should not prescribe only one approach, but allow flexibility for industry teams to meet the requirements.

Question 11:

What specific technological, regulatory, and/or legal gaps or challenges currently exist for transporting HALEU in various chemical forms (e.g., oxide, hexafluoride, metal) throughout the HALEU fuel supply chain? How do these challenges change depending upon the enrichment level? What actions could be taken, when, and by whom, to address the identified gaps or challenges?

Response:

Today there are no major technology, regulatory, and/or legal gaps or challenges for transporting HALEU; this work has already been completed. Creating the HALEU facilities and capabilities,

as well as market pull, are the best ways to incentivize transportation package companies to scale and support a domestic front-end of the fuel cycle.

However, in accordance with subparagraph (a)(2)(C) of Section 2001 Division Z of the Consolidated Appropriations Act of 2021 (42 U.S.C. 16281), DOE should assist commercial entities to design and license transportation packages for HALEU, including canisters for metal, gas, and other HALEU compositions, in order to meet the stated timelines.

Question 13:

Co-location of facilities for the front end of the fuel cycle (such as enrichment, and conversion/deconversion, and fabrication) may be a practicable solution to address some HALEU transportation issues. Is co-location considered otherwise beneficial? Are there other solutions that should be considered?

Response:

It is likely the most cost effective option is to co-locate facilities as that can decrease transportation and security costs. However, DOE should ensure flexibility to allow industry teams to determine what makes the most sense. Similar to the ARDP, robust industry teams would likely be best equipped to justify how they meet the programmatic requirements.

Question 14:

What factors affect the ability of U.S. uranium producers to provide uranium for advanced reactor fuel? Please indicate the importance of such factors and how they may be addressed.

Response:

The biggest factors are a lack of market demand and up front infrastructure cost. The Advanced Nuclear Fuel Availability Program can catalyze a domestic front-end of the fuel cycle. This, along with the successful demonstration and commercialization of advanced reactor technologies domestically and abroad, will foster the production of uranium.

Regulatory Issues

Question 15:

What are the technical barriers and/or regulatory requirements (e.g., safety, security, material control and accountability) to licensing front-end fuel cycle facilities (e.g., enrichment, deconversion, and/or fuel fabrication facilities) for the production and availability of HALEU?

- For existing facilities to upgrade to a HALEU capability?
- For new facilities?

Response:

Based on ClearPath's conversations with industry, there do not seem to be any major technical and/or regulatory challenges. The biggest barrier to overcome is high capital costs and the creation of a short-term market demand to incentivize companies and provide confidence to advanced reactor companies.

Industry teams, in order to meet the goals of the program, will justify how they meet the necessary technical requirements and will have to go through NRC licensing. This will be required if located at either an existing or new facility.

Question 16:

What, if any, additional criticality and/or benchmark data is needed to meet U.S. Nuclear Regulatory Commission (NRC) safety and regulatory requirements that must be met in order to establish a supply chain capable of making HALEU available for the development and deployment of advanced reactors? Please consider and address both front-end fuel cycle facilities and transportation packages (including for metal, gas, and pertinent chemical forms).

Response:

From conversations with industry, there are no data gaps to meet NRC requirements. However, in accordance with subparagraph (a)(2)(A) of Section 2001 Division Z of the Consolidated Appropriations Act of 2021 (42 U.S.C. 16281), DOE should assist commercial entities to develop criticality benchmark data.¹⁰ This work can support more efficient regulatory reviews and reduce conservatism in designs to make them more cost competitive. This work should closely coordinate with the transportation package portion of the Advanced Nuclear Fuel Availability Program. However, this program should be a lower priority than the cost-share/purchase of material.

Financial Barriers

Question 19:

Please describe the financial challenges associated with developing a sustainable commercial fuel supply chain for HALEU. Specifically, what are the challenges related to the acquisition of funds for investment in HALEU production infrastructure? How might these challenges be mitigated?

Response:

As previously described, this program would help address both the significant upfront capital costs required for the HALEU facilities and capabilities, as well as short-term market pull until a sufficient demand signal exists. This will facilitate long-term demand.

With both of the ARDP Demonstration awardees and at least one Risk Reduction awardee requiring HALEU by 2024, time is of the essence. Even if this program is unable to support the first cores for these companies, the subsequent core refueling requirements will be a predictable future demand signal. Without this DOE program, it would be challenging for these and other companies to build future reactors either domestically and abroad due to the market risk of having Russia as a sole source supplier.

The HALEU availability program can work in concert with other efforts being undertaken at the DOE such as the DOE's Loan Programs Office, which can support nuclear supply chain projects.

¹⁰ Oak Ridge National Laboratory, "Assessment of Existing Transportation Packages for Use with HALEU," dated October 2020, <https://www.osti.gov/biblio/1731046-assessment-existing-transportation-packages-use-haleu>

Human Resources

Question 20:

What are the human resource-related considerations related to the buildout of commercial HALEU production?

- Are there specific recruitment and/or training challenges that must be overcome?

What types of skillsets are needed to develop and deploy the domestic commercial production of HALEU? Would this increase the number of union jobs?

- Please describe the nature of any anticipated shortage in subject matter expertise and its potential impact.

Response:

There are no specifically identified human resource challenges, but a successful program will enable the future deployment of additional advanced nuclear reactors. This will have a positive feedback loop with the development of nuclear-skilled human capital.

Other

Question 21:

Are there additional considerations or recommendations, including the timing of various actions, that should be considered with respect to key challenges to HALEU availability for civilian domestic research, development, demonstration, and commercial use in the United States?

Response:

DOE should move quickly to implement a flexible program that centers around key goals/milestones; this is the best way to incentivize industry. DOE should set the goals, but let industry determine the best way to meet the requirements and partner with them throughout the process. However, milestones ensure that the teams are on target, and DOE should retain the ability to relocate funds if necessary as this program's success is extremely important to the future of the advanced nuclear industry.

Similar to ARDP, as these projects will be located at commercial entities and regulated by the NRC, DOE is not required to develop a Programmatic Environmental Impact Statement.

While not a requirement for setting up this program, a whole-of-government approach could be useful for creating a demand signal across multiple federal agencies such as the DOE Office of Nuclear Energy (DOE-NE), DOE National Nuclear Security Administration (NNSA), NASA, the Department of Defense, and others. DOE can coordinate with other government entities that would need to purchase HALEU. This can be useful in the longer term when DOE starts procuring specific amounts per year.