

The Nonproliferation Policy Education Center

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January 3, 2022

Executive Director

Henry Sokolski

The Honorable Jennifer M. Granholm
Secretary of Energy

Board of Advisors

U.S. Department of Energy

Mark Albrecht

*Former Executive Secretary,
National Space Council*

Madam Secretary,

My name is Henry Sokolski. I am Executive Director of the Nonproliferation Policy Education Center, a 501 (c)3 nonpartisan, nonprofit, educational organization interested in nuclear issues, especially those concerning nuclear proliferation. This submission is in response to the Department of Energy (DOE) invitation (Response to RFI, dated 12/14/2021) for input on the planning for establishment of a DOE HALEU Availability Program.

Peter Bradford

Vermont Law School

Torrey Froscher

*Former Senior
CIA Official*

Robert Jervis

Columbia University

My principal concern as regards HALEU is that widespread use of it would encourage acquisition of independent national enrichment facilities throughout the world and that these would be producing product close (in enrichment terms) to weapons grade uranium. It is for this reason that the United States has objected to Iran producing such material.

Daniel M. Kammen

*UC Berkley, Nuclear
Engineering Dept.*

The Energy Act of 2020 authorized the Department to establish and carry out a program to support the availability of high-assay low-enriched uranium (HALEU) for civilian domestic research, development, demonstration, and commercial use. The question remains of timing. The Department poses this question in its RFI as the last of its twenty-one questions:

Richard P. Lawless

NVM Consulting, LLC

John Lauder

*Former Director, CIA
Nonproliferation Center*

(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?

David Rapoport

*University of California,
Los Angeles*

I regard this as the most important issue and will restrict my comments to it. Question 21 asks about the timing of the various actions involved in making HALEU available. There is, however, a more important preliminary question: Does it make sense at all, at this point, to launch a major program to produce HALEU?

Harvey Rishikof

*Former Dean,
National War College*

William Tobey

*Belfer Center, Harvard
University*

The major customers for HALEU would be owners and operators of commercial reactors that rely on this type of fuel. At this point there is research and development activity on a number of reactor designs that might employ HALEU, and even two designs planned for construction of modest demonstration projects. It is, however, unclear whether any of these projects will be able to compete successfully in America's electrical power markets. In short, we are nowhere near commercial nuclear activity requiring amounts of HALEU beyond what is available today. Before launching a major HALEU program, we should wait at least until the commercial prospects of HALEU-using reactors are promising in America's electrical power markets. The enthusiastic predictions of designers and government funders are not a substitute.

Simon "Pete" Worden

Breakthrough Initiatives

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The argument for launching into HALEU production assumes the technical and economic success of the designs in the DOE pipeline and wanting to have the fuel ready to encourage an early commercial take-off. But that assumes a great deal. We don't even know yet whether the currently supported advanced nuclear projects will even be completed. Will it be possible to control costs? Will industry continue to contribute its share of funding?

The Department is making the same mistake it and its predecessor, the Atomic Energy Commission (AEC), made from the beginning of the nuclear age concerning "advanced reactors": trying to accelerate progress by trying to do in parallel what needs to be done in sequence. It can work when both paths are well established, but it is risky when dealing with first-of-a-kind technology.

The DOE and AEC nuclear record in trying to speed up commercial acceptance of advanced technology is littered with failures. Consider the AEC's fast breeder program, once the largest energy project in the country. The AEC attempted to develop a fast reactor demonstration plant, the Clinch River Breeder Reactor, the material technology, and the fuel reprocessing technology in parallel and the whole edifice tumbled to the ground. Here is what Glenn Seaborg, the AEC chairman during this time, had to say in a 1993 book:

"It might have been possible to overcome the difficulties over a period of time in a more moderately paced, smaller scale program. . . . But the LMFBR program's sponsors, including me, had persuaded themselves and eventually persuaded others, including the president, that there was an economic urgency to proceeding rapidly with an all-out effort . . ."

DOE tried to promote advanced (fast) reactors again during the George W. Bush administration with the Global Nuclear Energy Partnership (GNEP). Again, the idea was to accelerate progress to commercial application by doing everything in parallel before the necessary technology was proven. This was taken so far as to plan construction of some large fuel facilities while the national laboratories were developing the technology, on the model of the World War II Manhattan project. The DOE's GNEP plan was reviewed in 2008 by a committee of the National Academies in the course of a review of DOE's Nuclear Energy Research and Development Program. Here is what the Committee had to say in its Findings and Recommendations:

"The committee concludes that the rationale for the GNEP program, as expressed through the stated goals, objectives, and criteria, has been unpersuasive. The program is premised on an accelerated deployment strategy that will create significant technical and financial risks by prematurely narrowing the technical options. Moreover, there has been insufficient external input, including independent, thorough peer review of GNEP."

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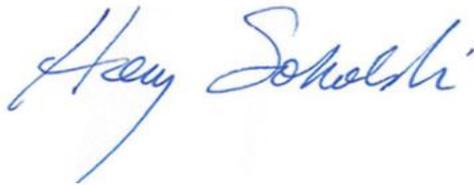
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The program was stillborn. There are many parallels here with the current DOE advanced reactor program. The notion of an independent peer review remains a good idea. The current request for information is a step in the right direction but does not substitute for an independent expert peer review.

There are other examples, including the proposed waste repository at Yucca Mountain and the MOX (mixed oxide) plant in Georgia. In fact, no major DOE/AEC nuclear project intended for commercial has been remotely successful since the commercialization a half-century ago of the light water reactor, and even that was a mixed success. The AEC urged utilities to leap ahead to larger size light water plants before the supporting technology was ready with the result that a great deal of “backfitting” was needed. Costs shot up and the landscape was littered with as many abandoned projects as went into operation. No operating US nuclear power plant was ordered after 1973, and the only two that remain (the Westinghouse Vogtle reactors) of the “Nuclear Renaissance” are wildly over budget and years late.

My recommendation for the HALEU program is that DOE heed the advice of Glenn Seaborg for patience “a more moderately paced, smaller scale program” that awaits a reliable signal that there will in fact be a market for it. That time has not yet arrived. In the meanwhile, DOE should create an independent, balanced, expert peer review group that includes knowledgeable experts that are not yet on record promoting the program to examine its merits and timing.

Sincerely,



Henry D. Sokolski
Executive Director
The Nonproliferation Policy Education Center