Congressional Budget Office
Cost Estimate

December 5, 2023

At a Glance

H.R. 1042, Prohibiting Russian Uranium Imports Act

As reported by the House Committee on Energy and Commerce on December 1, 2023

By Fiscal Year, Millions of Dollars	2024	2024-2028	2024-2033
Direct Spending (Outlays)	*	1	20
Revenues	0	0	0
Increase or Decrease (-) in the Deficit	*	1	20
Spending Subject to Appropriation (Outlays)	*	1	not estimated

Increases *net direct spending* in any of the four consecutive 10-year periods beginning in 2034?	< $2.5 billion	Statutory pay-as-you-go procedures apply?	Yes
Increases *on-budget deficits* in any of the four consecutive 10-year periods beginning in 2034?	< $5 billion	**Mandate Effects**	
		Contains intergovernmental mandate?	No
		Contains private-sector mandate?	No

* = between zero and $500,000.

The bill would

- Prohibit imports of low-enriched uranium (LEU) to the United States from the Russian Federation through 2040
- Allow the Secretary of Energy to issue waivers allowing limited imports through 2027, after which no further waivers would be issued
- Require the Department of Commerce to continue to administer limitations on LEU imports through 2027
- Require the Department of Energy to report to the Congress on sources of replacement supplies of LEU and on assistance necessary to expand domestic LEU production

Estimated budgetary effects would mainly stem from

- An increase in spending under the Civil Nuclear Credit Program because of higher nuclear fuel prices

Areas of significant uncertainty include

- Predicting the changes in nuclear fuel prices that could result from the bill's enactment
- Anticipating the terms of future LEU supply contracts
- Projecting the future prices that reactors will receive for the electricity they generate
- Anticipating other external factors that could affect reactors' operations and finances

Detailed estimate begins on the next page.

See also
CBO's Cost Estimates Explained, *CBO Describes Its Cost-Estimating Process*, *Glossary*

Bill Summary

H.R. 1042 would prohibit imports of low-enriched uranium (LEU) from the Russian Federation, starting 90 days after enactment. Through December 31, 2027, the bill would allow the Secretary of Energy, in consultation with the Secretaries of State and Commerce, to issue waivers for imports up to amounts allowed under current law; after that date, no further imports would be permitted. The bill's restrictions would end on December 31, 2040.

The bill also would require the Department of Commerce to continue to administer import limitations on Russian LEU fuel imports, as it does under current law.

Finally, the bill would require the Department of Energy (DOE) to report to the Congress concerning the anticipated supply of LEU available to replace imports from the Russian Federation during the five years following enactment. DOE also would need to describe the assistance necessary to expand domestic LEU production.

Estimated Federal Cost

The estimated budgetary effect of H.R. 1042 is shown in Table 1. The costs of the legislation fall within budget function 270 (energy).

Table 1.
Estimated Budgetary Effects of H.R. 1042

	By Fiscal Year, Millions of Dollars											
	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2024-2028	2024-2033
Increases in Direct Spending												
Budget Authority	0	0	0	0	0	0	0	0	0	0	0	0
Estimated Outlays	0	0	0	0	1	2	4	5	4	4	1	20
Increases in Spending Subject to Appropriation												
Estimated Authorization	*	*	*	*	*	n.e.	n.e.	n.e.	n.e.	n.e.	1	n.e.
Estimated Outlays	*	*	*	*	*	n.e.	n.e.	n.e.	n.e.	n.e.	1	n.e.

* = between zero and $500,000; n.e. = not estimated.

Basis of Estimate

For this estimate, CBO assumes that the bill will be enacted near the end of calendar year 2023.

Background

Low-enriched uranium, which is an input to the fuel used by nuclear power plants to generate electricity, is produced by increasing, or enriching, the concentration of the reactive uranium-235 isotope in uranium ore. Nuclear power plants generally purchase uranium ore

and then contract with domestic or foreign entities to produce the enriched product. Enrichment services typically are obtained under long-term contracts, and delivery periods can continue for as long as a decade.

Imports From the Russian Federation. Nuclear power plants in the United States currently purchase about 73 percent of their enrichment services from abroad, with 24 percent of all U.S. enrichment services purchased from Russia.[1] The Russian Federation is the world's largest provider of enrichment services, controlling slightly less than half of the global uranium enrichment capacity. As a result, actual or perceived changes in supply can significantly disrupt the global market for enrichment services, as was seen in the spike in prices after the February 2022 invasion of Ukraine.

The Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation, which was signed in 1991 and last amended in 2020, restricts U.S. imports of certain uranium products.[2] The document established a phase-down schedule for Russian LEU imports as a percentage of U.S. demand through 2028 and, through 2040, allows imports at a maximum of 15 percent of U.S. enrichment demand. Some operators of U.S. nuclear reactors have continued to purchase Russian enrichment services under that agreement.

Civil Nuclear Credit Program. The Infrastructure Investment and Jobs Act (IIJA) created the Civil Nuclear Credit (CNC) Program to provide financial support for nuclear reactors that otherwise could not operate because of economic factors. To receive funding under the program, a reactor operator must demonstrate a risk, over a four-year award cycle, of closing for economic reasons as defined under DOE's current application guidance. In general, the program is designed to provide reactors with enough financial support to break even over the award period.

IIJA provided a total of $6 billion for the CNC Program. As long as funds remain unobligated, the program's award cycles can continue through 2031, with outlays from those awards continuing through 2035. However, based on anticipated industry demand, CBO expects that the full amount will not be spent under current law.

Direct Spending

Using information from industry experts, CBO expects that enacting H.R. 1042 would restrict access to relatively low-cost Russian enrichment services and cause disruptions in the market for nuclear fuel, thereby increasing the average price of fuel for U.S. nuclear reactors and lowering their average operating margins. CBO estimates that those higher prices would increase the number of nuclear reactors not expected to break even and lead to an

1. Energy Information Administration, *Uranium Marketing Annual Report* (June 2023), www.eia.gov/uranium/marketing.
2. International Trade Administration, *2020 Amendment to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation* (October 2020), www.trade.gov/uranium.

acceleration in applications for, and awards of, CNC Program funds that would increase direct spending by $20 million over the 2024-2033 period.

Two mechanisms create the estimated increase in spending under the CNC Program. First, higher fuel costs would increase the chance that a given reactor will anticipate an operating loss in any year; thus, some reactors that would not apply for funding under current law would be more likely to do so under the bill. Second, higher fuel costs would increase the operating losses for reactors that already are expected to receive program funding under current law, and those reactors would be expected to request more funding from the program.

Higher Fuel Prices. Under the bill, CBO estimates that the price of nuclear fuel would increase by 13 percent. That estimate is based on a range of potential price scenarios and CBO's expectation of their respective likelihoods. Based on discussion with industry experts, CBO expects that a moderate price increase driven by a gradual replacement of Russian suppliers with higher-cost sources of enrichment services under the bill's waiver provisions is the most likely scenario. Alternatively, the bill's restrictions could be interpreted as a basis for terminating contracts for enrichment services by Russian LEU exporters, leading to a greater degree of market disruption. CBO expects that this scenario is much less likely.

Fuel typically represents about 20 percent of a nuclear reactor's annual costs. Some nuclear reactors can pass cost increases on to customers through higher rates, but merchant reactors provide electricity in competitive markets and must accept market prices; therefore, any increase in costs reduces their operating margins. While some such reactors have contracted for their future fuel supplies for multiple years, others have not. Thus, CBO expects that those merchant reactors that have not contracted for a substantial portion of their future fuel supplies would face higher fuel prices and see lower operating margins under H.R. 1042. Whether that would lead to operating losses would depend on each reactor's operating costs and revenues.

Simulations of Reactor Costs. Because financial data are not publicly available for most nuclear reactors, CBO simulated several groups of reactors using cost and revenue profiles and accounting for regional differences in projected electricity prices. Using those simulations, CBO modeled the likelihood and size of operating losses that would occur at any simulated reactor over time and under a range of scenarios for electricity prices, under current law and under the bill. Since increased fuel prices would increase reactors' costs, CBO estimated how much more likely a scenario in which a reactor experiences an operating loss would be under the bill than under current law. For scenarios where reactors were already projected to experience an operating loss under current law, CBO estimated how much higher the loss would be under the bill.

CBO's assessment accounts for projected effects from the nuclear power production credit established in Public Law 117-169, an act to provide reconciliation pursuant to title II of S. Con. Res. 14.

Effect on Civil Nuclear Credit Program. CBO expects that U.S. nuclear reactors with a larger likelihood of experiencing an operating loss, or a higher level of operating loss, under the bill would apply for more CNC Program funding than they would under current law. Because CBO projects that a portion of those funds will not be awarded under current law, we estimate that additional CNC Program demand under the bill would increase total CNC Program spending by about $20 million over the 2024-2033 period.

CBO estimates that those effects would start in 2028, because the bill's waiver provisions extend through 2027 and some reactors have long-term contracts in place that will lock in their fuel prices for several years.

Spending Subject to Appropriation

H.R. 1042 would require DOE to report to the Congress on other possible sources of LEU supply, relative to market demand, anticipated over the five years following enactment. DOE also would be required to identify the assistance necessary to support expanded domestic production. Using information about similar activities, CBO estimates that the cost would not be significant over the 2024-2028 period. The bill also would require the Department of Commerce to administer the waiver program through January 1, 2028. Using information from the department, CBO estimates that implementing those requirements would cost $1 million over the 2024-2028 period. That spending would be subject to the availability of appropriated funds.

Uncertainty

CBO's estimates of the budgetary effects of the bill are subject to uncertainty. Specific sources of uncertainty include:

- The bill's effect on nuclear fuel prices. Those prices can be volatile because the market for enrichment services is relatively small; therefore, predicting the effect the bill would have on those prices is difficult.
- The way suppliers and buyers would respond to higher prices. Because LEU enrichment services generally are procured through long-term contracts that are not made public, predicting when reactors will need to contract for new enrichment services is difficult.
- The price of electricity over the 2024-2033 period. Electricity prices can vary nationally and regionally because of changes in natural gas prices, competition from other generators, electricity demand, weather, and other factors.
- Reactor-specific operating costs and revenues. Those cashflows can change for reasons that are unrelated to electricity prices, and CBO cannot predict what other factors might affect nuclear reactors.

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. H.R 1042 would increase direct spending from budget authority originally designated as an emergency requirement under the Infrastructure Investment and Jobs Act. In keeping with section 4(g) of the Statutory Pay-As-You-Go Act of 2010, such amounts are excluded from estimates of that law's direct spending effects. Thus, there would be no pay-as-you-go effect from enacting the bill.

Increase in Long-Term Net Direct Spending and Deficits

CBO estimates that enacting H.R. 1042 would not increase net direct spending by more than $2.5 billion in any of the four consecutive 10-year periods beginning in 2034.

CBO estimates that enacting H.R. 1042 would not increase on-budget deficits by more than $5 billion in any of the four consecutive 10-year periods beginning in 2034.

Mandates

The bill contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act.

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