

**SPOTLIGHT REPORT**

May 6, 2023

**DC Goes Nuclear**

**What's Happening:** Legislation from both the House and Senate that would ban Russian imports of uranium and support domestic manufacturing have passed through relevant respective committees and are ready for consideration on the floor by both chambers, [pushing stock](#) prices of uranium companies up in the process.

**Why It Matters:** The US banned imports of oil, natural gas, and coal from Russia only a few weeks following Russian President Vladimir Putin's invasion of Ukraine. A year and some change later and despite much deliberation, America has still not pulled the trigger on banning imports of another Russian fuel: uranium for the nation's ~90 nuclear reactors that provide [one-fifth](#) of the country's electricity.

**[Twenty-eight percent of enrichment services and 14 percent of uranium overall purchased by US utilities in 2021 came from Russia](#)** (as opposed to just eight percent of US petroleum imports). And unlike oil and natural gas, which have alternative competitors and infrastructure, Russia holds a dominant position for certain necessary bottlenecks of uranium processing: **[forty percent of global capacity for conversion and almost 50 percent for enrichment lie in Russia](#)**. US domestic production has declined to a trickle due to a long period of depressed uranium prices, caused in part by a flood of Russian product from decommissioned warheads. The Inflation Reduction Act got the ball rolling with [\\$30 billion](#) in nuclear production tax credits, investment tax credits, and billions for the Department of Energy (DOE) to prop up failing plants, among other miscellaneous goodies. American uranium manufacturing has recently [found a pulse](#) but will require significant government support to fully replace potentially sanctioned services.

**What's Next:** Nuclear energy is having a mini-renaissance. DOE credits from the Infrastructure Investment and Jobs Act will help keep existing plants online. Over [20 states](#) are considering bills to encourage nuclear power. The legislative support for nuclear energy is bicameral and bipartisan. **Trade groups and public utilities which lobbied against sanctions last year seem to now be [on board](#)**. In the end, sanctions will likely only have a [slight impact](#) on nuclear energy prices. Most of the costs of nuclear energy [are capital](#) and the secretary of Energy can set waivers up to around the levels that the US typically imports in a year. **A compromise version of these bills has a realistic shot of being passed as part of the annual National Defense Authorization Act**. Future-facing steps in these bills like encouraging at-scale domestic uranium processing and advanced nuclear reactors

are slow-burns that would only become operational around 2030. [A hearing](#) by the House Committee on Energy and Commerce on Nuclear Regulatory Commission reform will be held on June 14th.

## The New Legislation

### Banning Russian Imports

Three separate bills that have cleared committee would impose sanctions on Russia for some step of the nuclear fuel cycle.

**Bills in the House** (the [Prohibiting Russian Uranium Imports Act](#)) and **Senate** (the [Nuclear Fuel Security Act](#)) each contain identical language that would ban imports of low-enrichment uranium produced in Russia 90 days after enactment. This type of uranium is the fuel used for the current generation of commercial reactors. **The secretary of Energy would have the ability to waive this restriction if no alternative viable source is available to sustain the continued operation of a nuclear reactor or if importation is “in the national interest.”** Even so, the secretary may only waive up to a certain amount of total uranium. This amount declines every year until 2028, when waivers end. The limit for the first year is ~580,000 kilograms. For scale, a [Washington Post](#) analysis estimated the US imported ~550,000 kilograms from Russia in 2021, ~450,000 kilograms in 2020, and ~570,000 kilograms in 2016. This means the secretary could effectively negate the effect of sanctions, though with decreasing success each passing year. Another bill in the Senate would target a further step in the long uranium refinement process. **The [Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy \(ADVANCE\) Act of 2023](#) would prohibit ownership of enriched uranium fabricated into fuel assemblies in Russia or China.**

**How much would a Russian ban change the landscape of American energy? Likely not that much.** Russia provides 14 percent of uranium and [28 percent](#) of enrichment for American customers. Much of the world's capacity for necessary steps (conversion, enrichment) in processing occurs there. However, companies have already priced in a [2020 agreement](#) between the US and Russia to reduce Russia's share of enrichment services to 15 percent by 2028. This, in combination with the [highest](#) uranium spot prices in over a decade, has already led nuclear plants to begin finding alternatives and uranium companies to [expand](#) operations. That being said, building or reopening these facilities is a [multiple-year](#) process. The owner of one of the two processing facilities in America wants government [guarantees](#) of purchases before swelling operations.

**Most of the price of a nuclear plant is in fixed capital costs:** the permitting, licensing, and building of the facility. Fuel is only [28 percent](#) of the remaining operating costs (which is primarily maintenance and the hundreds of often specialist salaries). This leaves fuel around [four percent](#) of all costs; the amount to refuel a common reactor design is [\\$40 million](#). **A recent estimate from the [Bulletin of the Atomic Scientists](#) predicts that if uranium prices rose by 50 percent, retail nuclear electricity prices would rise by 2**

**percent.** Another factor to consider is that reactors only have to be refueled every 18-24 months. Because of this, many utilities have long-term contracts or existing product on hand: the industry collectively has [~140 million](#) pounds of yellowcake uranium in inventory for a ~40 million pound per year burn rate. The CEO of the largest American nuclear provider, **Constellation (CEG)**, [testified](#) before Congress on March 9th that the company had fuel and contracts to last through 2028, though he acknowledged that other operators may not have such a stockpile.

**A ban on Russian uranium is unlikely to drive plants into an early retirement. That doesn't mean plants won't be inconvenienced or that prices won't rise. Supply chains will have to be adjusted and uranium companies will reap higher demand if there is no Russian competition.** Some advanced nuclear projects may slow. These experiments require highly enriched uranium and the only current source is Russia (though the Department of Energy (DOE) has some on hand).

The two Senate bills are markedly bipartisan and the House bill technically so (two Democrats joined all Republicans in committee), all passing through their relevant committees and subcommittees last month. There is a consensus that the US is over-reliant on Russian imports to support its nuclear power. **Rosatom, a Russian state-owned corporation and arms component [manufacturer](#), earns approximately [\\$1 billion](#) in revenue from American customers annually.** During an appearance on [BNN Bloomberg](#), former Energy Secretary Ernest Moniz stated the question of banning Russian imports is "[when](#)," not "if." However, while Republicans and Democrats agree on the problem, they're not so sure on the solution. Democrats believe that an import ban is an admirable goal but additional support for domestic industry is required to fill the gap. House Republicans disagree, believing spending billions on a nascent industry is premature and unnecessary.

## **Contracting Domestic Uranium**

**The same Senate bill that would ban Russian imports of low-enriched uranium would also pursue several avenues to spur domestic operations.** The Nuclear Fuel Security Act would create a government secured supply for uranium, contracting 100 metric tons of low-enriched uranium (LEU) and 20 metric tons of high-assay low-enriched uranium (HALEU) by 2026. LEU is uranium enriched up to the five percent utilized by commercial reactors; HALEU is enriched between five and 20 percent. The only currently commercially available source of HALEU is [Russia](#). Many proposed designs for the next generation of reactors require this type of more enriched uranium. This procured uranium would have to be domestically produced, or if impracticable, provided by allies. Further, HALEU from the government stockpile would be awarded to qualifying advanced reactor designs to aid research and development; with 3 metric tons awarded by September 30th, 2024, and 10 metric tons by June 30th, 2026. **To fund this, the DOE would be given [\\$3.5 billion](#) (to expire in 2032), of which [\\$1 billion](#) could be used for HALEU activity.**

The Nuclear Fuel Security Act would also make advanced nuclear reactor research eligible for supply chain funding found in the CHIPS and Science Act and workforce development

funds in the Energy Policy Act of 2005.

## **Streamlining Industry**

**The ADVANCE Act, which would ban importation of fabricated uranium, includes other provisions to incentivize building new reactors.** The law would push the Nuclear Regulatory Commission (NRC) into the business of promoting reactor exports, create a fee structure for NRC reviews, and clarify regulatory requirements. It would also extend the Price-Anderson Act from its impending sunset at the end of 2025 all the way to 2045. This law creates a government fund to insure nuclear plants in case of disaster, something private insurance is unwilling to do.

## **Why These Bills Have A Chance**

**These bills have some serious backing now.** The Nuclear Fuel Security Act was introduced by Senate Energy Committee Chair Joe Manchin (D-WV); Senator John Barrasso (R-WY), ranking member of the committee and number-three Senate Republican; and Senator James Risch (R-ID). The House bill is sponsored by House Energy and Commerce Committee Chair Cathy McMorris Rodgers (R-WA). The ADVANCE ACT was introduced by five Republican and five Democratic senators in March. Barrasso tried to get legislation banning Russian uranium imports passed [last year](#) but was not able to attract widespread attention.

**Further, these bills are widely bipartisan. All three bills saw major progress in the last month.** The Nuclear Fuel Security Act passed unanimously through the Senate Energy Committee. The ADVANCE Act was approved by the Senate Environment and Public Works Committee. The final vote was 16 in favor and three opposed. The House bill was slightly bipartisan; it was approved in the subcommittee with all Republicans and a single Democratic vote and in the committee with all Republicans and two Democratic votes.

Last year, the White House considered adding uranium to its oil, natural gas, and coal sanctions shortly after the invasion of Ukraine but was [pressured](#) by the nuclear power industry to drop it. **Crucially, trade groups and public utilities who [previously](#) lobbied [against](#) a sanction last year also seem to now be [on board](#).**

**That doesn't mean this is a slam dunk. There are two significant issues to resolve.**

**First, House Republicans are skeptical that a Russian import ban should entail assisting domestic industry.** Energy Secretary Jennifer Granholm testified in April before the House Energy and Commerce Committee Subcommittee on Energy, Climate, and Grid Security, "[I'm worried about the gap](#). We need to build up the supply here." House Republicans removed the cross-authorization of \$1.5 billion of funds already appropriated in subcommittee and have voted down subsequent amendments aiding the industry without a given price tag. They are of the opinion that creating market certainty is likely sufficient to bridge the gap. They did, however, include that the secretary of Energy should

provide a market evaluation report and provide recommendations. Senate Republicans seem to have no such qualms. The bill with \$3.5 billion in support passed through committee unanimously.

**Second, progressive Democrats are reluctant to expand nuclear energy.** The modern environmentalist faction has historic roots in anti-proliferation and anti-nuclear movements. Uranium mining is messy and spreads radioactive material to the surrounding community. Local interests, which often include tribal governments, frequently [oppose](#) such development. The three objections to the ADVANCE Act were progressive senators concerned by nuclear waste, nuclear decommissioning, and the change of the NRC from safety regulator to industry promoter.

**Nevertheless, all of this smoke belies bicameral, bipartisan interest. This legislative push has a reasonable chance of passage this year. If so, the compromise provisions might be passed as an amendment added to the annual National Defense Authorization Act (NDAA).** While the nuclear-specific legislation on its own is unlikely to garner valuable floor time, particularly in the Senate, on a standalone basis, the NDAA is considered a must-pass legislative vehicle on which other non-controversial measures can catch a ride.

## A Mini-Renaissance (and Mini-Reactors)

Nuclear is the slumbering giant of American energy. After a furious spate of activity in the 1970s and 1980s, interest in nuclear power cooled off in the wake of nuclear accidents and low fossil fuel prices. Only one nuclear power plant has been licensed [since 1975](#). In addition to being politically controversial, nuclear also struggles to compete with cheap natural gas and the declining cost of renewables. Prior to recent legislation, between [22 and 38 percent](#) of the country's nuclear fleet was at risk of retiring in the 2030s. While renewables began to receive tax breaks during the Obama administration, nuclear plants (which produce no greenhouse gasses) received [nothing](#). **The last two years have seen a significant step toward turning the situation around and re-energizing the moribund industry.**

**The Infrastructure Investment and Jobs Act of 2021 (IIJA) included provisions intended to keep currently operating nuclear facilities from shutting down.** The DOE received [\\$6 billion](#) (split over four years) for reactors planning to shut down or at risk of doing so (the Civil Nuclear Credit Program). **The IIJA also gave the DOE [\\$3.2 billion](#) for its Advanced Reactor Demonstration Program to partner with industry to develop next-generation reactors.**

The Inflation Reduction Act (IRA) took things one step further. **The law contains a \$15 per megawatt-hour tax credit for electricity sourced from existing nuclear plants. The Congressional Budget Office projected the provision to provide \$30 billion over the eligibility period (2024-2032).**

The IRA also incentivized the construction of new plants. **The Clean Electricity Production Tax Credit (Section 45Y) provides \$25 (inflation-adjusted) dollars per megawatt-hour for any generation constructed after 2025. The Investment Tax Credit (Section 48E) separately provides a credit equivalent to 30 percent of investment costs.** This is significant for nuclear power, given that capital costs represent [over 60 percent](#) of total costs. The IRS has not released final guidance for these credits as of [yet](#). Both of these credits receive a 10 percent bonus for new electricity generated where a coal plant used to live. The DOE has found that [hundreds](#) of coal power plant sites could be converted to nuclear sites.

Like the Investment Tax Credit, the IRA also has other technology-agnostic benefits that apply to any clean energy, of which nuclear power is eligible. The DOE received up to \$250 billion through its Loan Program Office to provide loans to energy projects across the country, which could include nuclear. The Advanced Energy Project Credit is authorized to dispense \$10 billion. Nuclear power can also be used to produce [hydrogen](#), which grants \$3 per kilogram produced. The same logic applies to a credit for [manufacturing](#) component parts.

The IRA laid the groundwork for the strategy of the current legislative agenda, albeit at a smaller scale than some current proposals. **\$700 million went towards HALEU R&D and another \$150 million towards nuclear innovation.** Much of the focus for the next generation are [small, transportable](#) reactors that can be built en masse in a factory, lowering the massive production costs of new facilities. These units aspire to be modular — able to be connected to each other to increase total power when needed. More than [20](#) companies are developing these projects, which are not scaleable yet and only in the early stages. The first next-generation reactor requiring high-enrichment uranium plans to come online [in 2029](#). The first research reactors will need HALEU [by 2024](#), though the DOE has some on hand.

**It's true that the opening Republican offer in debt ceiling negotiations [cut the entire nuclear production tax credit in the IRA](#).** This is a \$30 billion boon for the industry and supports many active plants that might otherwise close. **Don't take this job too seriously though.** This idea was stripped out of dealmaking fairly quickly and did not end up in the final deal. Democrats will continue to fight tooth and nail to defend one of their major legislative accomplishments. The Limit, Save, Grow Act was a symbolic move signaling GOP displeasure with the IRA as a whole. Republicans are also more supportive of nuclear power than Democrats by a [16 point](#) margin. Congresspeople will ultimately fight to keep the nuclear plant providing jobs and electricity in their respective districts open.

Support for the nuclear sector has also come directly from the [DOE](#) and from the [states](#). Red states have recently been a bit more willing to [reduce](#) restrictions while blue states have been [increasing](#) them, but the pro-nuclear movement is widespread. Michigan is considering [reopening](#) a closed plant. Virginia passed bills establishing an Innovation Fund and a grant program for education. A bill to lift a 30-year moratorium on the construction of new plants is [on the desk](#) of Governor Pritzker (D-IL) in Illinois. In all, [24 state](#) legislatures have introduced over 60 pieces of legislation in the hopes of [spurring](#) nuclear

development.

The DOE is taking flyers on [fusion](#) in addition to small, modular fission reactors. Fusion recently attracted worldwide attention for achieving long-pursued “[ignition](#)” but has since been beset by [obstacles](#). The DOE’s approach to supporting this larval field so far has been giving [grants](#) to laboratories researching the topic.



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1701 Pennsylvania Avenue, NW, Suite 200 Washington, DC 20006 | (202) 729-6335

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