Uranium from Russia

Investigation No. 731-TA-539-C (Fifth Review)

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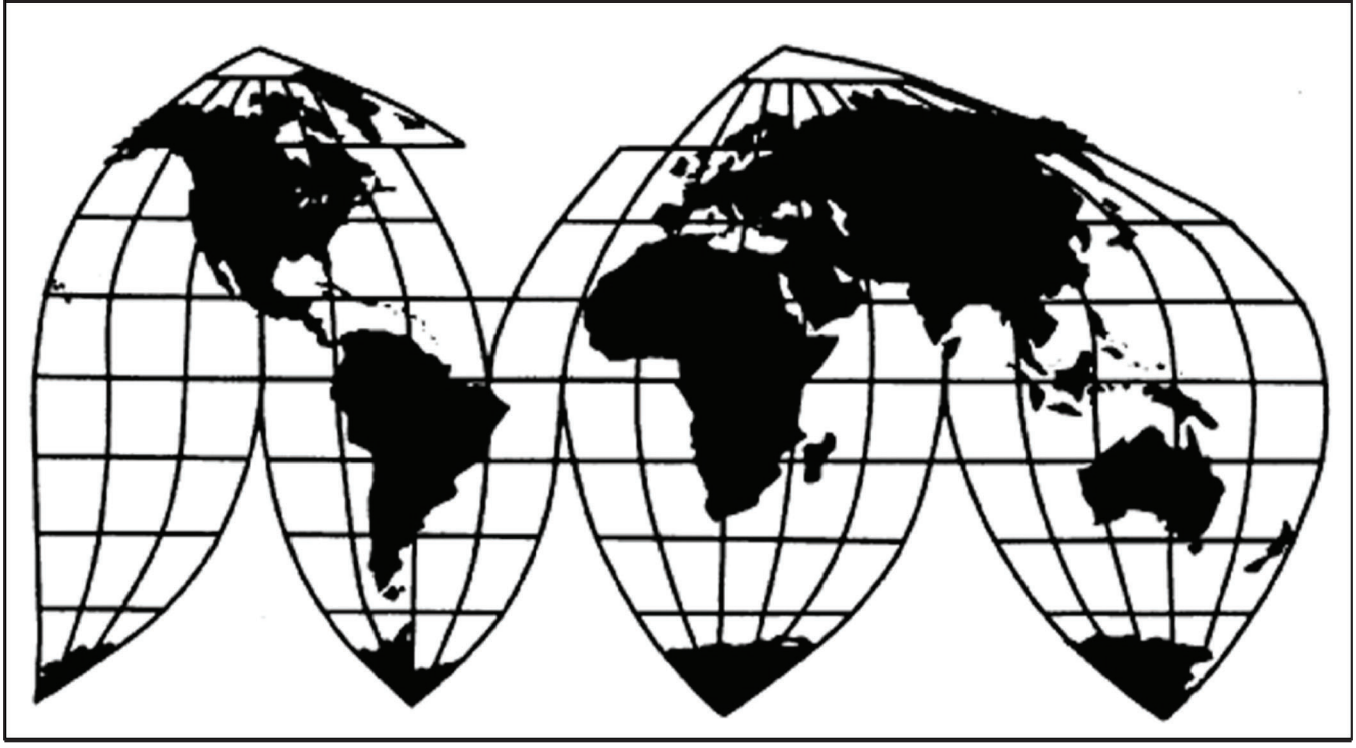
U.S. International Trade Commission



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U.S. International Trade Commission

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UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 731-TA-539-C (Fifth Review)

Uranium from Russia

DETERMINATION

On the basis of the record[1] developed in the subject five-year review, the United States International Trade Commission ("Commission") determines, pursuant to the Tariff Act of 1930 ("the Act"), that termination of the suspended investigation on uranium from Russia would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.

BACKGROUND

The Commission instituted this review on September 1, 2022 (87 FR 53774) and determined on December 5, 2022 that it would conduct an expedited review (88 FR 11476, February 23, 2023).

[1] The record is defined in § 207.2(f) of the Commission's Rules of Practice and Procedure (19 CFR 207.2(f)).

Views of the Commission

Based on the record in this five-year review, we determine under section 751(c) of the Tariff Act of 1930, as amended ("the Tariff Act"), that termination of the suspended investigation covering uranium from Russia would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.

I. Background

Original Investigation: On December 23, 1991, the Commission issued a preliminary determination that there was a reasonable indication that an industry in the United States was materially injured by reason of imports of uranium from the Union of Soviet Socialist Republics ("U.S.S.R.") that allegedly were being sold at less than fair value ("LTFV").[1] Two days later, the U.S.S.R. dissolved into twelve separate republics.[2] Commerce and the Commission continued their respective investigations, with Commerce conducting 12 separate investigations, each concerning one of the former U.S.S.R. republics.[3] Commerce issued affirmative preliminary determinations in the investigations concerning six of the newly independent countries in June 1992.[4] On October 16, 1992, Commerce entered into suspension agreements with these six countries (Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Ukraine, and Uzbekistan).[5] The

[1] *Uranium from the U.S.S.R.*, Inv. No. 731-TA-539 (Preliminary), USITC Pub. 2471 (Dec. 1991) ("*Original Preliminary Determination*").

[2] The twelve separate republics were comprised of: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

[3] *Postponement of Preliminary Antidumping Duty Determination: Uranium from the Former Union of Soviet Socialist Republics (USSR)*, 57 Fed. Reg. 11064 (Apr. 1, 1992).

[4] *Preliminary Determination of Sales at Less Than Fair Value: Uranium from Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Ukraine and Uzbekistan: and Preliminary Determination of Sales at Not Less Than Fair Value: Uranium from Armenia, Azerbaijan, Byelarus, Georgia, Moldova and Turkmenistan*, 57 Fed. Reg. 23380 (June 3, 1992).

[5] *See Antidumping Uranium from Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Ukraine, and Uzbekistan; Suspension of Investigation and Amendment of Preliminary Determinations*, 57 Fed. Reg. 49220 (Oct. 30, 1992). Commerce subsequently terminated the investigations against the remaining countries that did not produce uranium on the grounds that there were no LTFV sales from those countries. *Final Determination of Sales at Not Less Than Fair Value: Uranium from Armenia, Azerbaijan, Belarus, Georgia, Moldova, and Turkmenistan,* 57 Fed. Reg. 48505 (Oct. 26, 1992).

suspension agreements, in general, established quotas on volume of imports of uranium from the subject countries.[6]

In early 1993, Tajikistan and Ukraine requested the termination of their suspension agreements. Accordingly, Commerce continued the investigations of uranium from those countries in April 1993, and issued final affirmative determinations regarding both Tajikistan and Ukraine.[7] The Commission issued a negative determination with respect to uranium from Tajikistan and an affirmative determination with respect to uranium from Ukraine in August 1993.[8] Commerce subsequently terminated the investigation on Tajikistan and issued an antidumping duty order on imports of uranium from Ukraine.[9]

The suspension agreements concerning uranium from Kazakhstan, Kyrgyzstan, Russia, and Uzbekistan remained in effect, and were subject to a series of amendments that broadened the range of products subject to the agreements, gave the subject countries a larger quota for

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[6] *See, e.g., Agreement Suspending the Antidumping Investigation on Uranium from the Russian Federation Russia*, 57 Fed. Reg. 49235 (Oct. 30, 1992). Under the original agreement to suspend the antidumping duty investigation on uranium from the Russian Federation, the Russian Federation Ministry for Atomic Energy ("ROSATOM") agreed to restrict the volume of direct or indirect exports to the United States of uranium products from all producers and exporters of such products in Russia subject to the agreement's terms. The agreement's basic provision for controlling imports was an export quota expressed in pounds U_3O_8 equivalent and kilograms uranium (kg U). It was enforced through export licensing and certification. There have been several amendments to the agreement, in 1994, 1996, 1997, and 2008. Also in 2008, Congress enacted legislation (the "Domenici Amendment"), which codified many provisions in the amended suspension agreement and instituted import quotas through 2020 that in large part mirror the quotas in the 2008 Amendment. The Domenici Amendment allowed Russia to export to the United States an additional 5 percent of enriched uranium as separative work units ("SWU") provided that Russia down-blended proscribed amounts of highly enriched uranium ("HEU"). The suspension agreement was most recently amended in 2020 which, *inter alia*, extended the agreement until 2040 and established a cap on exports pursuant to enriched uranium product sales equivalent to 15 percent of U.S. enrichment demand in 2021, 9.8 percent in 2022, 10.2 percent in 2023, 5.7 percent in 2024, 5.3 percent in 2025, and 5 percent per year from 2026 to 2040. *See generally* CR/PR at I-12-13.

See also Agreement Suspending the Antidumping Investigation on Uranium from Kazakhstan, 57 Fed. Reg. 49222 (Oct. 30, 1992); *Agreement Suspending the Antidumping Investigation on Uranium from Kyrgyzstan*, 57 Fed. Reg. 49228 (Oct. 30, 1992); *Agreement Suspending the Antidumping Investigation on Uranium from Tajikistan*, 57 Fed. Reg. 49242 (Oct. 30, 1992); *Agreement Suspending the Antidumping Investigation on Uranium from Ukraine*, 57 Fed. Reg. 49248 (Oct. 30, 1992); *Agreement Suspending the Antidumping Investigation on Uranium from Uzbekistan*, 57 Fed. Reg. 492455 (Oct. 30, 1992).

[7] *Uranium from Ukraine and Tajikistan*, 58 Fed. Reg. 36640 (July 8, 1993) (Final).

[8] *Uranium from Tajikistan and Ukraine*, Inv. Nos. 731-TA-539D-539E (Final), USITC Pub. 2669 (Aug. 1993) ("*Uranium from Tajikistan and Ukraine*").

[9] *Antidumping Duty Order: Uranium From Ukraine; termination of Investigation: Uranium from Tajikistan*, 58 Fed. Reg. 45483 (Aug. 30, 1993).

U.S. imports, and, in the case of Russia, made changes to correspond with the Russian Highly Enriched Uranium ("HEU") Agreement and the USEC Privatization Act.[10]

In early 1999, Kazakhstan requested the termination of its suspension agreement. Consequently, Commerce and the Commission resumed their investigations, and the Commission reached a negative final determination on July 23, 1999.[11]

First Review: The Commission conducted its first review of the suspended investigation on uranium from Russia as part of its grouped reviews of uranium from Russia, Ukraine, and Uzbekistan. No review of the order on imports from Kyrgyzstan was conducted by the Commission because Commerce revoked that order due to a lack of a response to the notice of institution by domestic interested parties.[12] The Commission conducted full reviews that resulted in an affirmative determination with respect to uranium from Russia, but negative determinations with respect to uranium from Ukraine and Uzbekistan.[13] Commerce issued a notice continuing the Russian suspension agreement ("RSA") on August 22, 2000.[14]

Second Review: The Commission conducted a full review notwithstanding an inadequate respondent interested party response, "{I}n light of a desire to further examine conditions of competition for this industry, including changes to the U.S.-Russia HEU

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[10] *See, e.g., Amendment to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation*, 59 Fed. Reg. 15373 (Apr. 1, 1994); *Agreement Suspending the Antidumping Investigation on Uranium From Uzbekistan*, 60 Fed. Reg. 55004 (Oct. 27, 1995); *Amendments to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation*, 61 Fed. Reg. 56665 (Nov. 4, 1996). As further discussed in section III.B below, the HEU Agreement required United States Enrichment Corporation ("USEC"), a domestic producer of natural uranium and low-enriched uranium ("LEU"), to import large quantities of Russian LEU downblended from Russian HEU that was part of the Soviet military stockpile and sell it directly to utilities. Uranium from Russia, Ukraine, and Uzbekistan, Inv. Nos. 731-TA-539C, E, and F (Review), USITC Pub. 3344 (Aug. 2000) ("*First Review Determination*") at 29; Uranium from Russia, Inv. No. 731-TA-539C (Second Review), USITC Pub. 3872 (Aug. 2006) ("*Second Review Determination*") at 22.

[11] *Uranium from Kazakhstan*, 64 Fed. Reg. 10317 (Mar. 3, 1999) (notice of continuation of review); *Uranium from the Republic of Kazakhstan*, 64 Fed. Reg. 31179 (June 10, 1999); *Uranium from Kazakhstan*, Inv. No. 731-TA-539A (Final), USITC Pub. 3213 (July 1999) ("*Uranium from Kazakhstan*").

[12] *Uranium From Kyrgyzstan*, 64 Fed. Reg. 61939 (Nov. 15, 1999).

[13] *First Review Determination*, USITC Pub. 3344. The Commission's negative determination with respect to uranium from Uzbekistan was appealed to the U.S. Court of International Trade ("CIT"), which affirmed the Commission. *Ad Hoc Committee of Domestic Uranium Producers v. United States*, 162 F. Supp. 2d 649 (Ct. Int'l Trade 2001). The Commission's affirmative determination with respect to subject imports from Russia was not challenged.

[14] *Continuation of Suspended Antidumping Duty Investigation: Uranium From Russia*, 65 Fed. Reg. 50958 (Aug. 22, 2000).

Agreement."[15] In that review, the Commission determined that termination of the suspended investigation would be likely to lead to continuation or recurrence of material injury to the domestic industry within a reasonably foreseeable time.[16] Commerce issued a notice continuing the RSA on August 11, 2006.[17]

Third Review: The Commission conducted an expedited review and determined that termination of the suspended investigation on uranium from Russia would likely lead to continuation or recurrence of material injury to the domestic industry within a reasonably foreseeable time.[18] Commerce issued a notice continuing the RSA on March 8, 2012.[19]

Fourth Review: In September 2017, the Commission again conducted an expedited review and determined that termination of the suspended investigation on uranium from Russia would likely lead to continuation or recurrence of material injury to the domestic industry within a reasonably foreseeable time.[20] On October 2, 2017, Commerce published its notice continuing the RSA.[21]

Current Review. The Commission instituted the current review on September 1, 2022.[22] It received eight responses to its notice of institution from eight firms that are current domestic producers, former domestic producers, or potential future domestic producers of uranium, as well as one U.S. trade association consisting of domestic producers of uranium. The responses included: a joint response from Power Resources, Inc. ("PRI") and Crow Butte Resources, Inc. ("CBR"), domestic producers (miners/concentrators) of natural uranium concentrate; Energy

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[15] *Second Review Determination*, USITC Pub. 3872 at Appdx. A, Explanation of Commission Determination on Adequacy.

[16] *Second Review Determination*, USITC Pub. 3872 at 3. Both RWE Nukem, Inc. ("Nukem"), an importer, and the Ad Hoc Utilities Group ("AHUG"), a coalition of U.S. industrial users of uranium, appealed the Commission's affirmative determination to the CIT. The CIT judge dismissed both Nukem's and AHUG's appeals (Nukem reached a settlement with USEC on undisclosed terms, after the CIT judge hearing the case urged them to do so, and the judge dismissed AHUG's appeal for lack of standing). *Ad Hoc Utilities Group v. United States*, 625 F. Supp. 2d 1330 (June 15, 2009).

[17] *Continuation of Suspended Antidumping Duty Investigation: Uranium From the Russian Federation*, 71 Fed. Reg. 46191 (Aug. 11, 2006).

[18] Uranium from Russia, Inv. No. 731-TA-539C (Third Review), USITC Pub. 4307 (Feb. 2012) at 3 ("*Third Review Determination")*.

[19] *Continuation of Suspended Antidumping Duty Investigation: Uranium From the Russian Federation*, 77 Fed. Reg. 14001 (Mar. 8, 2012).

[20] *Uranium from Russia*, Inv. No. 731-TA-539C (Fourth Review), USITC Pub. 4727 (Sep. 2017) at 5 ("*Fourth Review Determination*") at 3.

[21] *Uranium From the Russian Federation: Continuation of Suspension of Antidumping Investigation*, 82 Fed. Reg. 45810 (Oct. 2, 2017).

[22] *Uranium from Russia; Institution of a Five-Year Review*, 87 Fed. Reg. 53774 (Sep. 1, 2022).

Fuels Resources (USA) Inc. ("Energy Fuels"), a domestic producer (miner/concentrator) of natural uranium concentrate; Ur-Energy USA Inc. ("Ur-Energy"), a domestic producer (miner/concentrator) of natural uranium concentrate; ConverDyn, a domestic producer (converter) of natural uranium hexafluoride (its production has been idled since 2017, but is expected to restart in 2023); Centrus Energy Corp. and its wholly-owned subsidiary, United States Enrichment Corporation ("USEC") (collectively, "Centrus"), a previous domestic producer (enricher) and current wholesaler of low-enriched uranium ("LEU") and also a U.S. importer of LEU from Russia; [23] Global Laser Enrichment, LLC ("GLE"), a potential future domestic producer of LEU; Louisiana Energy Services, LLC ("LES"), as the operator of the URENCO USA facility, a domestic producer (enricher) of LEU; and, Uranium Producers of America ("UPA"), a trade association consisting of producers (concentrators, converters, and enrichers) of uranium (collectively "domestic interested parties").[24] It did not receive a response to the notice of institution from any respondent foreign producer or exporter of uranium from Russia.[25]

On December 5, 2022, the Commission determined that the domestic interested party group response to the notice of institution was adequate and that the respondent interested party group response was inadequate.[26] In the absence of any other circumstances that would warrant a full review, the Commission determined that it would conduct an expedited review of the suspended investigation.[27] [28] Multiple parties submitted individual final comments

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[23] Centrus supports continuation of the suspended investigation covering imports of uranium from Russia and argues for an expedited review. CR/PR at n.7 and I-4. In its supplemental response to the notice of institution, Centrus provided information on its subject imports. According to Centrus, in 2021, it was allocated approximately *** percent of the quota under the RSA and Centrus estimates that its imports accounted for approximately that percentage of LEU imports. Centrus Supplemental Response, EDIS Doc. 783873 (Nov. 4, 2022) at 4.

[24] Confidential Report, Memorandum INV-UU-117, Nov. 23, 2022 ("CR"); *Uranium from Russia*, Inv. No. 731-TA-539C (Fifth Review), USITC Pub. (Mar. 2023) ("PR") at I-2-3.

[25] CR/PR at Table I-2.

[26] Explanation of Commission Determination on Adequacy, EDIS Doc. 793338 (Mar. 29, 2023).

[27] *Uranium From Russia; Scheduling of an Expedited Five-Year Review*, 88 Fed. Reg. 11476 (Feb. 23, 2023).

[28] In their respective comments on the adequacy of responses to the Commission's notice of institution, PRI and CBR, GLE, LES and Centrus each noted that the Russian uranium industry agreed in the most recent October 2020 amendment to the RSA that all sunset reviews of the suspended investigation should be expedited up through and including 2034: "All parties agree that these sunset reviews shall be expedited … at both the Department of Commerce and the International Trade Commission." *See 2020 Amendment to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation* at Section XII.A, 85 Fed. Reg. 64112, 64119 (Oct. 9, 2020). However, we note that this is an agreement between the U.S. Department of Commerce and (Continued…)

pursuant to Commission rule 207.62(d)(1) regarding the determination that the Commission should reach.[29]

U.S. industry data for this review are based on the information that the domestic interested parties, which include the sole U.S. enricher of LEU in 2021 and domestic producers responsible for *** percent of domestic production of uranium concentrate in 2021, furnished in their respective responses to the notice of institution.[30] U.S. import data and related information are based on official Commerce import statistics.[31] Foreign industry data and related information are based on information furnished by domestic interested parties in their responses to the notice of institution, information from the original investigation and prior five-year reviews, and publicly available information gathered by the Commission.[32] Four U.S. purchasers responded to the Commission's adequacy phase questionnaire.[33]

II. Domestic Like Product and Industry

A. Domestic Like Product

In making its determination under section 751(c) of the Tariff Act, the Commission defines the "domestic like product" and the "industry."[34] The Tariff Act defines "domestic like product" as "a product which is like, or in the absence of like, most similar in characteristics and uses with, the article subject to an investigation under this subtitle."[35] The Commission's practice in five-year reviews is to examine the domestic like product definition from the original

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ROSATOM (the Russian Federation's State Atomic Energy Corporation); the Commission is not a party to the agreement and is therefore not bound by it. Indeed, in their comments parties also acknowledge the Commission has the discretion to conduct a full review if it determined that the circumstances so require, notwithstanding the suspension agreement. PRI and CBR's Joint Adequacy Comments, EDIS Doc. 784422 (Nov. 14, 2022) at 5; GLE's Adequacy Comments, EDIS Doc. 784426 (Nov. 14, 2022) at 5.

[29] 19 C.F.R. § 207.62(d)(1); PRI and CBR Final Comments, EDIS Doc. 792138 (Mar. 9, 2023); GLE Final Comments, EDIS Doc. 792133 (Mar. 9, 2023); Centrus Final Comments, EDIS Doc. 791217 (Mar. 9, 2023); LES Final Comments, EDIS Doc. 792123 (Mar. 9, 2023); UPA Final Comments, EDIS Doc. 792169 (Mar. 10, 2023).

[30] CR/PR at Table I-2 n.1.

[31] *See* CR/PR at Tables I-9 & I-10.

[32] *See* CR/PR at I-38-46, Tables I-11-14.

[33] CR/PR at D-3-9. *** provided questionnaire responses. *Id.*

[34] 19 U.S.C. § 1677(4)(A).

[35] 19 U.S.C. § 1677(10); *see, e.g., Cleo Inc. v. United States*, 501 F.3d 1291, 1299 (Fed. Cir. 2007); *NEC Corp. v. Dep't of Commerce*, 36 F. Supp. 2d 380, 383 (Ct. Int'l Trade 1998); *Nippon Steel Corp. v. United States*, 19 CIT 450, 455 (1995); *Timken Co. v. United States*, 913 F. Supp. 580, 584 (Ct. Int'l Trade 1996); *Torrington Co. v. United States*, 747 F. Supp. 744, 748-49 (Ct. Int'l Trade 1990), *aff'd*, 938 F.2d 1278 (Fed. Cir. 1991); *see also* S. Rep. No. 249, 96th Cong., 1st Sess. 90-91 (1979).

investigation and consider whether the record indicates any reason to revisit the prior findings.[36]

> Commerce has defined the subject merchandise as follows:
> Natural uranium in the form of uranium ores and concentrates; natural uranium metal and natural uranium compounds; alloys, dispersions (including cermets), ceramic products, and mixtures containing natural uranium or natural uranium compounds; uranium enriched in U^{235} and its compounds; alloys, dispersions (including cermets), ceramic products, and mixtures containing uranium enriched in U^{235} or compounds of uranium enriched in U^{235}; and any other forms of uranium within the same class or kind.
>
> Uranium ore from Russia that is milled into U_3O_8 and/or converted into UF_6 in another country prior to direct and/or indirect importation into the United States is considered uranium from Russia and is subject to the terms of this Suspension Agreement.
>
> For purposes of this Suspension Agreement, uranium enriched in U^{235} or compounds of uranium enriched in U^{235} in Russia are covered by this Suspension Agreement, regardless of their subsequent modification or blending. Uranium enriched in U^{235} in another country prior to direct and/or indirect importation into the United States is not considered uranium from Russia and is not subject to the terms of this Suspension Agreement.
>
> HEU is within the scope of the underlying investigation, and HEU is covered by this Suspension Agreement. HEU means uranium enriched to 20 percent or greater in the isotope uranium-235.
>
> Imports of uranium ores and concentrates, natural uranium compounds, and all forms of enriched uranium are currently classifiable under the Harmonized Tariff Schedule of the United States (HTSUS) subheadings 2612.10.00, 2844.10.20,

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[36] *See*, *e.g.*, *Internal Combustion Industrial Forklift Trucks from Japan*, Inv. No. 731-TA-377 (Second Review), USITC Pub. 3831 at 8-9 (Dec. 2005); *Crawfish Tail Meat from China*, Inv. No. 731-TA-752 (Review), USITC Pub. 3614 at 4 (July 2003); *Steel Concrete Reinforcing Bar from Turkey*, Inv. No. 731-TA-745 (Review), USITC Pub. 3577 at 4 (Feb. 2003).

2844.20.00, respectively. Imports of natural uranium other than compounds are currently classifiable under HTSUS subheadings: 2844.10.10 and 2844.10.50. Although the HTSUS subheading is provided for convenience and customs purposes, the written description of the scope of the order is dispositive.[37]

Uranium is a heavy, naturally and slightly radioactive, metallic element.[38] Uranium has three principal isotopes—U^{238}, U^{235}, and U^{234}—which constitute 99.285 percent, 0.71 percent, and 0.005 percent, respectively, of the element's weight in its natural elemental state. U^{235} is the only naturally occurring fissionable nuclide, *i.e.*, when bombarded by thermal neutrons, the U^{235} atom disintegrates, creating a self-perpetuating chain reaction with the release of energy. It is the fissionable property of the U^{235} isotope that is important for uranium's principal uses – primarily as a fuel to generate electricity in nuclear power plants and secondarily as a fuel to propel naval vessels and as an active element in nuclear weaponry. The half-lives of U^{235} and U^{238} are 7.13×10^8 and 4.51×10^9 years, respectively. Because of these slow rates of radioactive decay, natural uranium is only mildly radioactive. By contrast, elemental uranium (uranium metal) is highly reactive chemically.[39]

Processing uranium ore into a product usable as fuel in a nuclear reactor involves four successive stages of preparation, in which uranium takes on four different forms. In the first stage, concentrators mine uranium ore and extract the uranium content of the ore in a concentrated form of U_3O_8, resulting in a product known as "uranium concentrate." In the second stage, converters purify the U_3O_8 and then react it with hydrofluoric acid and fluorine to produce UF_6 (uranium hexafluoride). In the third stage, enrichers process the UF_6 to increase its proportion of U^{235} from its natural level of 0.71 percent to about 3-5 percent by weight, to create LEU. The two traditional methods of enrichment are gaseous diffusion enrichment and gas centrifuge enrichment. In the fourth stage, fabricators react LEU with water and hydrogen to obtain uranium dioxide (UO_2), which is used to make fuel rods and assemblies.[40]

Uranium is enriched by gas-centrifuge technology. In order to use this process, the

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[37] *Uranium From the Russian Federation; Final Results of the Expedited Fifth Sunset Review of the Suspension Agreement*, 88 Fed. Reg. 61 (Jan. 3, 2023). *See also*, Issues and Decision Memorandum for the Final Results of the Expedited Fifth Sunset Review of the Agreement Suspending the Antidumping Duty Investigation on Uranium from the Russian Federation (Dec. 27, 2022) ("Issues & Decision Memo") at 2.

[38] CR/PR at I-16.

[39] CR/PR at I-16.

[40] CR/PR at I-19-23.

uranium must be present in a compound that can be readily converted to a gas. After enrichment in U^{235}, the uranium hexafluoride is converted to a fuel form for use in

the manufacture of nuclear fuel assemblies. These forms include the oxides (usually enriched

UO_2), or metals, alloys, carbides, nitrides, and salt solutions of enriched uranium. Enriched uranium is then encapsulated in protective metal sheaths to produce a "fuel rod." Fuel rods are then assembled into the required configuration for use in a power plant's nuclear reactor.[41]

Nuclear fuel for commercial power reactors for the generation of electricity is the

predominant commercial application for uranium. Relatively small quantities of uranium depleted in U^{235} are used in specialized nonenergy applications, principally for military ordnance. Depleted uranium readily forms alloys with other metals, has a very high density, and is easy to fabricate, which makes it useful for some applications.[42]

In the 1991 preliminary determination in *Uranium from the U.S.S.R.* and the 1993 final determination in *Uranium from Tajikistan and Ukraine*, the Commission found a single domestic like product coextensive with the scope. It concluded that the five-factor semifinished product analysis supported finding a single like product encompassing all four forms of uranium.[43]

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[41] CR/PR at I-18.

[42] CR/PR at I-18-19.

[43] *Original Preliminary Determination*, USITC Pub. 2471 at 8-9. The Commission concluded that "the lack of significant independent uses for unenriched forms of uranium other than for nuclear fuel and the presence of the "essential U^{235} isotype in all pertinent forms of uranium outweigh the countervailing criteria and support designation of a single like product coextensive with the articles under investigation." *Id.* at 8.

In *Uranium from Tajikistan and Ukraine*, the Commission evaluated whether there were two like products: enriched uranium and unenriched uranium. It found that three of the five factors favored a single like product: (1) that all forms of uranium were dedicated for use in the production of nuclear fuel; (2) that all forms shared the same essential characteristic, the presence of fissionable U^{235}; and (3) that there were no independent markets for the various forms of uranium. The Commission found that these three factors outweighed the two that militated for separate like products, namely: (1) that the enrichment step involved a more than nominal cost and added substantial value to UF_6, and (2) that the various forms of uranium were not interchangeable. *See Uranium from Tajikistan and Ukraine*, USITC Pub. 2669 at 10-12. Because some Commissioners defining a single domestic like product made negative determinations, and some Commissioners who made affirmative determinations defined the like product differently, the final affirmative determination applied only to uranium other than HEU. In *Uranium from Kazakhstan*, the Commission found a single like product encompassing all four forms of uranium. The Commission decided that fuel assemblies should be explicitly excluded from the like product. *Uranium from Kazakhstan*, USITC Pub. 3213 at 6-8.

In the first review, the Commission found that the product had remained essentially unchanged since the 1991 preliminary determination, and that the parties had not presented any arguments for revisiting the 1991 definition. Accordingly, it defined a single domestic like product consisting of all forms of uranium coextensive with the scope of the review.[44]

In the second review, the Commission again defined a single domestic like product consisting of all forms of uranium coextensive with the scope of the review. The Commission considered and rejected several arguments that the domestic like product should be defined differently.[45]

In the third review, the Commission determined that there was no new information in the record that suggested any reason to revisit the domestic like product definition from its second review. The Commission therefore defined the domestic like product as consisting of all four forms of uranium coextensive with the scope of the review.[46]

In the fourth review, the Commission again defined a single domestic like product coextensive with the scope definition.[47] In that review, the participating domestic producers indicated that they agreed with the definition of the domestic like product the Commission adopted in its prior proceedings, and there was no new information on the record indicating

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[44] The Commission addressed the Russian respondents' contention that Commerce's inclusion of HEU in the scope was invalid, and the domestic interested parties' argument that uranium tails were within the scope of the review. The Commission explained that both of these arguments involved the scope of the review, that such issues were properly directed to Commerce and not the Commission, and that the Commission was precluded from changing Commerce's scope determination. With respect to the question of whether tails were within the scope of the review, the Commission observed that Commerce's scope language neither explicitly included, nor excluded, depleted uranium; and that the scope included language regarding uranium compounds without reference to the concentration level. *First Review Determination*, USITC Pub. 3334 at 10-13.

[45] First, the Commission rejected the argument that it should exclude from its domestic like product definition uranium purchased pursuant to SWU transactions, because the scope of the review did not exclude LEU purchased through SWU contracts. Second, the Commission rejected the argument that it should exclude fuel rods and assemblies from the domestic like product, explaining that it was following its past practice of including the uranium content of fuel assemblies in the domestic like product, but excluding the casings. Third, the Commission rejected the argument that it should exclude tails and spent fuel from the domestic like product, because, in the United States, depleted uranium is treated as waste and not commercially exploited. Fourth, the Commission applied its semifinished product analysis in order to determine that the domestic like product consisted of all four forms of uranium, and rejected the argument that it should find four separate domestic like products. *Second Review Determination*, USITC Pub. 3872 at 9-14.

[46] *Third Review Determination*, USITC Pub. 4307 at 9.

[47] *Fourth Review Determination*, USITC Pub. 4727 at 9.

that the pertinent product characteristics of uranium had changed since the prior proceedings.[48]

In this review, the record contains no new information suggesting that the characteristics and uses of domestically produced uranium have changed so as to warrant revisiting the Commission's domestic like product definition from the prior investigations and reviews. The domestic interested parties indicate that they agree with the domestic like product definition the Commission adopted in the original investigation and prior reviews, as set out in the notice of institution.[49] Accordingly, we again define a single domestic like product consisting of all uranium, coextensive with Commerce's scope.

B. Domestic Industry

Section 771(4)(A) of the Tariff Act defines the relevant industry as the domestic "producers as a whole of a domestic like product, or those producers whose collective output of a domestic like product constitutes a major proportion of the total domestic production of the product."[50] In defining the domestic industry, the Commission's general practice has been to include in the industry producers of all domestic production of the like product, whether toll-produced, captively consumed, or sold in the domestic merchant market.

We must determine whether any producer of the domestic like product should be excluded from the domestic industry pursuant to section 771(4)(B) of the Tariff Act. This provision allows the Commission, if appropriate circumstances exist, to exclude from the domestic industry producers that are related to an exporter or importer of subject merchandise

[48] *Fourth Review Determination*, USITC Pub. 4727 at 9.

[49] PRI and CBR Response to the Notice of Institution, EDIS Doc. 784538 (Oct. 3, 2022) at 53 ("PRI and CBR Response"); PRI and CBR Final Comments at 6-7; Centrus Response at 15; GLE Response to the Notice of Institution, EDIS Doc. 781534 (Oct. 3, 2022) at 19 ("GLE Response"); UPA Response to the Notice of Institution, EDIS Doc. 781503 (Oct. 3, 2022) at 13 ("UPA Response"); LES Response to the Notice of Institution, EDIS Doc. 781480 (Oct. 3, 2022) at 42 ("LES Response").

[50] 19 U.S.C. § 1677(4)(A). The definitions in 19 U.S.C. § 1677 are applicable to the entire subtitle containing the antidumping and countervailing duty laws, including 19 U.S.C. §§ 1675 and 1675a. *See* 19 U.S.C. § 1677.

or which are themselves importers.[51] Exclusion of such a producer is within the Commission's discretion based upon the facts presented in each investigation.[52]

Prior Proceedings. In the original investigation, the Commission included the U.S. Department of Energy ("DOE") as part of the domestic industry, because at the time it was engaged in enrichment services. The Commission rejected respondents' argument that an enricher was not the same as a producer, observing that enrichment services were an integral part of the production process for enriched uranium. It also rejected respondents' argument that a government entity could not be part of the domestic industry, because the statutory language encompasses all producers and does not exclude government entities. The Commission also found that appropriate circumstances did not exist to exclude Energy Fuels as a related party.[53]

In the first review, the Commission found that U.S. fabricators engaged in sufficient production-related activity to be included in the domestic industry. The Commission found that appropriate circumstances did not exist to exclude Cogema (a domestic concentrator at the time) or USEC from the domestic industry as related parties.[54]

In the second five-year review, the Commission defined a single domestic industry, consisting of all domestic producers of uranium, including concentrators, the converter, enrichers, and fabricators. It found that appropriate circumstances did not exist to exclude

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[51] *See Torrington Co v. United States*, 790 F. Supp. 1161, 1168 (Ct. Int'l Trade 1992), *aff'd without opinion*, 991 F.2d 809 (Fed. Cir. 1993); *Sandvik AB v. United States*, 721 F. Supp. 1322, 1331-32 (Ct. Int'l Trade 1989), *aff'd mem.,* 904 F.2d 46 (Fed. Cir. 1990); *Empire Plow Co. v. United States*, 675 F. Supp. 1348, 1352 (Ct. Int'l Trade 1987).

[52] The primary factors the Commission has examined in deciding whether appropriate circumstances exist to exclude a related party include the following:

(1) the percentage of domestic production attributable to the importing producer;

(2) the reason the U.S. producer has decided to import the product subject to investigation (whether the firm benefits from the LTFV sales or subsidies or whether the firm must import in order to enable it to continue production and compete in the U.S. market);

(3) whether inclusion or exclusion of the related party will skew the data for the rest of the industry;

(4) the ratio of import shipments to U.S. production for the imported product; and

(5) whether the primary interest of the importing producer lies in domestic production or importation. *Changzhou Trina Solar Energy Co. v. USITC*, 100 F. Supp.3d 1314, 1326-31 (Ct. Int'l. Trade 2015), *aff'd*, 839 F.3d 1377 (Fed. Cir. 2018); *see also Torrington Co. v. United States*, 790 F. Supp. at 1168.

[53] *Original Preliminary Determination*, USITC Pub. 2471 at 10-16.

[54] *First Review Determination*, USITC Pub. 3344 at 14-18.

concentrators PRI/CBR, enricher USEC, or Westinghouse, a fabricator of fuel rods, as related parties.[55]

In the third review, the Commission again defined a single domestic industry, consisting of all domestic producers of uranium, including concentrators, the converter, enrichers, and fabricators. It determined that appropriate circumstances did not exist to exclude either enricher USEC or Uranium One USA, Inc., a domestic producer of mined uranium, from the domestic industry as related parties.[56]

In the fourth review, the Commission found that two domestic producers, USEC and Uranium One, qualified for possible exclusion under the related parties provision. The Commission found that appropriate circumstances did not exist to exclude USEC under the related parties provision since it also found that although USEC imported subject LEU, it was legally obligated to do so pursuant to long-term contracts and the HEU Agreement.[57] It also observed that USEC supported the continuation of the suspended investigation.[58] The Commission further found that appropriate circumstances did not exist to exclude Uranium One under the related parties provision, given the limited information on the record.[59] It therefore again defined a single domestic industry consisting of all domestic producers of uranium, including concentrators, the converter, enrichers, and fabricators.[60]

Current Review. In the current review, Centrus qualifies for possible exclusion under the related parties provision because Centrus imported LEU from Russia during the period of review.[61] Pursuant to its long-term contracts, Centrus estimates that it imported LEU from Russia with a separative work unit ("SWU") component of *** valued at $*** in 2021, accounting for *** percent of subject imports of LEU that year.[62] Centrus argues that it qualifies as a domestic producer and wholesaler of the domestic like product, despite having ceased domestic production of LEU in 2013, because it supplies LEU to utilities in the United States and abroad *** from existing inventories of LEU that were domestically produced by Centrus in the past.[63] Of Centrus' U.S. shipments of LEU in 2021, *** percent were made from

[55] *Second Review Determination*, USITC Pub. 3872 at 15-18.
[56] *Third Review Determination*, USITC Pub. 4307 at 11-12.
[57] *Fourth Review Determination*, USITC Pub. 4727 at 11.
[58] *Fourth Review Determination*, USITC Pub. 4727 at 11.
[59] *Fourth Review Determination*, USITC Pub. 4727 at 12.
[60] *Fourth Review Determination*, USITC Pub. 4727 at 12.
[61] Centrus Response at 2 & 13; Centrus Supplemental Response at 2-5.
[62] Centrus Response at 13; Centrus Supplemental Response at 4-5.
[63] Centrus Response at 2, 9, 12.

its own inventory.[64] It also contends that it is working on U.S. production of high-assay, low-enriched uranium ("HALEU") and signed a contract with the DOE in October 2019, recently extended through November 2022, to deploy a cascade of centrifuges to demonstrate production of HALEU for advanced reactors at its facility in Piketon, Ohio, due to commence production in 2023.[65] Centrus asserts that its goal is to begin production as demand increases for HALEU.[66] Centrus supports the continuation of the RSA and the suspended investigation covering imports of uranium from Russia.[67]

For purposes of our analysis in this expedited review, we agree that Centrus is a domestic producer.[68] Based on Centrus's support for the continuation of the suspended investigation and the RSA, the fact that in 2021 *** percent of its U.S. shipments in 2021 were from its own inventories of domestically produced LEU, and Centrus's substantial efforts to deploy an enrichment facility demonstrating production of HALEU in Piketon, Ohio, due to commence production in 2023, we find that Centrus has a continuing interest as a domestic producer, and that appropriate circumstances do not exist to exclude Centrus from the domestic industry pursuant to the related parties provision.

In sum, consistent with our definition of the domestic like product, we define the domestic industry as all domestic producers of uranium, including concentrators, the converter, enrichers, and fabricators.

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[64] CR/PR at Table I-8 Note. Centrus ceased domestic production of LEU in 2013 but maintains inventories of its domestically produced LEU. Centrus Response at 9. As noted above, for 2021, Centrus reported its quantity of subject imports as *** SWUs with a value of ***. CR/PR at Table B-6. Also in 2021, Centrus reported, as a domestic producer, commercial U.S. shipments of enriched uranium hexafluoride totalling *** SWU with a value of ***. CR/PR at Table B-4.

[65] Centrus Response at 2 & 9-11; CR/PR at I-18.

[66] Centrus Response at 11.

[67] Centrus Response at 3-4 (asserting that the RSA is necessary to provide stability in the market, which helps create conditions that support investments in new technologies and domestic production).

[68] The Commission has found that a firm need not engage in current production of the domestic like product to be deemed a domestic producer, if the firm otherwise engages in sufficient production-related activities. *See Sebacic Acid from China*, Inv. No. 731-TA-653 (Second Review), USITC Pub. 3775 (May 2005) at 14; *Brake Rotors from China*, Inv. No. 731-TA-744 (Second Review), USITC Pub. 4009 (June 2008) at 8 & n.39. Centrus asserts that it has continued to engage in substantial LEU production-related activities during the period of review, despite having ceased production of LEU in 2013, based on its contract with the DOE and efforts to demonstrate production of HALEU for advanced reactors at its facility in Piketon, Ohio. Centrus Response at 2.

III. Termination of the Suspended Investigation Would Likely Lead to Continuation or Recurrence of Material Injury Within a Reasonably Foreseeable Time

A. Legal Standards

In a five-year review conducted under section 751(c) of the Tariff Act, Commerce will revoke an antidumping or countervailing duty order unless: (1) it makes a determination that dumping or subsidization is likely to continue or recur and (2) the Commission makes a determination that revocation of the antidumping or countervailing duty order "would be likely to lead to continuation or recurrence of material injury within a reasonably foreseeable time."[69] The SAA states that "under the likelihood standard, the Commission will engage in a counterfactual analysis; it must decide the likely impact in the reasonably foreseeable future of an important change in the status quo – the revocation or termination of a proceeding and the elimination of its restraining effects on volumes and prices of imports."[70] Thus, the likelihood standard is prospective in nature.[71] The U.S. Court of International Trade ("CIT") has found that "likely," as used in the five-year review provisions of the Act, means "probable," and the Commission applies that standard in five-year reviews.[72]

The statute states that "the Commission shall consider that the effects of revocation or termination may not be imminent, but may manifest themselves only over a longer period of

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[69] 19 U.S.C. § 1675a(a).

[70] SAA at 883-84. The SAA states that "{t}he likelihood of injury standard applies regardless of the nature of the Commission's original determination (material injury, threat of material injury, or material retardation of an industry). Likewise, the standard applies to suspended investigations that were never completed." *Id*. at 883.

[71] While the SAA states that "a separate determination regarding current material injury is not necessary," it indicates that "the Commission may consider relevant factors such as current and likely continued depressed shipment levels and current and likely continued {sic} prices for the domestic like product in the U.S. market in making its determination of the likelihood of continuation or recurrence of material injury if the order is revoked." SAA at 884.

[72] *See NMB Singapore Ltd. v. United States*, 288 F. Supp. 2d 1306, 1352 (Ct. Int'l Trade 2003) ("'likely' means probable within the context of 19 U.S.C. § 1675(c) and 19 U.S.C. § 1675a(a)"), *aff'd mem.*, 140 Fed. Appx. 268 (Fed. Cir. 2005); *Nippon Steel Corp. v. United States*, 26 CIT 1416, 1419 (2002) (same); *Usinor Industeel, S.A. v. United States*, 26 CIT 1402, 1404 nn.3, 6 (2002) ("more likely than not" standard is "consistent with the court's opinion;" "the court has not interpreted 'likely' to imply any particular degree of 'certainty'"); *Indorama Chemicals (Thailand) Ltd. v. United States*, 26 CIT 1059, 1070 (2002) ("standard is based on a likelihood of continuation or recurrence of injury, not a certainty"); *Usinor v. United States*, 26 CIT 767, 794 (2002) ("'likely' is tantamount to 'probable,' not merely 'possible'").

time."[73] According to the SAA, a "'reasonably foreseeable time' will vary from case-to-case, but normally will exceed the 'imminent' timeframe applicable in a threat of injury analysis in original investigations."[74]

Although the standard in a five-year review is not the same as the standard applied in an original investigation, it contains some of the same fundamental elements. The statute provides that the Commission is to "consider the likely volume, price effect, and impact of imports of the subject merchandise on the industry if the orders are revoked or the suspended investigation is terminated."[75] It directs the Commission to take into account its prior injury determination, whether any improvement in the state of the industry is related to the order or the suspension agreement under review, whether the industry is vulnerable to material injury if an order is revoked or a suspension agreement is terminated, and any findings by Commerce regarding duty absorption pursuant to 19 U.S.C. § 1675(a)(4).[76] The statute further provides that the presence or absence of any factor that the Commission is required to consider shall not necessarily give decisive guidance with respect to the Commission's determination.[77]

In evaluating the likely volume of imports of subject merchandise if an order under review is revoked and/or a suspended investigation is terminated, the Commission is directed to consider whether the likely volume of imports would be significant either in absolute terms or relative to production or consumption in the United States.[78] In doing so, the Commission must consider "all relevant economic factors," including four enumerated factors: (1) any likely increase in production capacity or existing unused production capacity in the exporting country; (2) existing inventories of the subject merchandise, or likely increases in inventories; (3) the existence of barriers to the importation of the subject merchandise into countries other than the United States; and (4) the potential for product shifting if production facilities in the foreign

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[73] 19 U.S.C. § 1675a(a)(5).

[74] SAA at 887. Among the factors that the Commission should consider in this regard are "the fungibility or differentiation within the product in question, the level of substitutability between the imported and domestic products, the channels of distribution used, the methods of contracting (such as spot sales or long-term contracts), and lead times for delivery of goods, as well as other factors that may only manifest themselves in the longer term, such as planned investment and the shifting of production facilities." *Id*.

[75] 19 U.S.C. § 1675a(a)(1).

[76] 19 U.S.C. § 1675a(a)(1). Commerce has not made any duty absorption findings with respect to the order under review. *Commerce I&D Memorandum* at 7

[77] 19 U.S.C. § 1675a(a)(5). Although the Commission must consider all factors, no one factor is necessarily dispositive. SAA at 886.

[78] 19 U.S.C. § 1675a(a)(2).

country, which can be used to produce the subject merchandise, are currently being used to produce other products.[79]

In evaluating the likely price effects of subject imports if an order under review is revoked and/or a suspended investigation is terminated, the Commission is directed to consider whether there is likely to be significant underselling by the subject imports as compared to the domestic like product and whether the subject imports are likely to enter the United States at prices that otherwise would have a significant depressing or suppressing effect on the price of the domestic like product.[80]

In evaluating the likely impact of imports of subject merchandise if an order under review is revoked and/or a suspended investigation is terminated, the Commission is directed to consider all relevant economic factors that are likely to have a bearing on the state of the industry in the United States, including but not limited to the following: (1) likely declines in output, sales, market share, profits, productivity, return on investments, and utilization of capacity; (2) likely negative effects on cash flow, inventories, employment, wages, growth, ability to raise capital, and investment; and (3) likely negative effects on the existing development and production efforts of the industry, including efforts to develop a derivative or more advanced version of the domestic like product.[81] All relevant economic factors are to be considered within the context of the business cycle and the conditions of competition that are distinctive to the industry. As instructed by the statute, we have considered the extent to which any improvement in the state of the domestic industry is related to the suspension agreement under review and whether the industry is vulnerable to material injury upon termination of that agreement.[82]

No respondent interested party participated in this expedited review. The record, therefore, contains limited new information with respect to the uranium industry in Russia. There also is limited information about the market for uranium in the United States during the

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[79] 19 U.S.C. § 1675a(a)(2)(A-D).

[80] *See* 19 U.S.C. § 1675a(a)(3). The SAA states that "{c}onsistent with its practice in investigations, in considering the likely price effects of imports in the event of revocation and termination, the Commission may rely on circumstantial, as well as direct, evidence of the adverse effects of unfairly traded imports on domestic prices." SAA at 886.

[81] 19 U.S.C. § 1675a(a)(4).

[82] The SAA states that in assessing whether the domestic industry is vulnerable to injury if the order is revoked, the Commission "considers, in addition to imports, other factors that may be contributing to overall injury. While these factors, in some cases, may account for the injury to the domestic industry, they may also demonstrate that an industry is facing difficulties from a variety of sources and is vulnerable to dumped or subsidized imports." SAA at 885.

period of review. Accordingly, for our determination, we rely as appropriate on the facts available from the original investigation and prior reviews and the limited new information in the record of this review.

B. Conditions of Competition and the Business Cycle[83]

In evaluating the likely impact of the subject imports on the domestic industry if an order is revoked or a suspension agreement is terminated, the statute directs the Commission to consider all relevant economic factors "within the context of the business cycle and conditions of competition that are distinctive to the affected industry."[84] The following conditions of competition inform our determination.

Demand Conditions

Prior Proceedings. In the first review, the Commission observed that U.S. utilities' demand for uranium, as measured by reactor requirements, had been constant during the period of review and was projected to remain relatively flat for the next decade. The Commission observed that, since 1978, at least 11 nuclear power plants in the United States had been closed and no new plants had been constructed.[85]

In the second review, the Commission determined that U.S. utilities' demand for uranium had grown slowly in the previous several years, and was projected to continue to do so during the reasonably foreseeable future. It explained that demand for uranium depended on a number of factors, including the level of U.S. demand for electricity, the number of operating U.S. nuclear power plants, the capacity utilization (also known as the "load factor") of these plants, the enrichment level of the fuel used, the plants' cycle length and burnup/fuel design, and contracted tails assays. Deregulation of electric utilities also affected demand for uranium, by putting nuclear power plants in competition with other sources of electricity. The Commission further explained that the nature of U.S. demand may have changed as U.S. electric utilities became able partially to bypass the fuel cycle by purchasing processed uranium products directly, especially natural UF_6 and enriched uranium. Enriched uranium obtained from downblended HEU under the HEU Agreement had become a significant source of nuclear

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[83] At the time of the original investigations, the Commission's practice did not include discussing conditions of competition in its opinions.

[84] 19 U.S.C. § 1675a(a)(4).

[85] *First Review Determination*, USITC Pub. 3344 at 29. In the 1991 preliminary phase of the investigation of uranium from the U.S.S.R, the Commission cited domestic-industry-compiled data on U.S. consumption in lieu of its typical approach. *See Original Preliminary Determination* at 19 n.62 & A-11 (explaining difficulties calculating apparent consumption).

fuel for U.S. nuclear utilities. The Commission also found that a majority of U.S. electric utilities' purchases of uranium and uranium processing were based on long-term contracts.[86]

In the third review, the Commission found that the conditions of competition that it had relied on in past reviews had generally continued during the period of review. Specifically, the Commission determined that consumption of uranium products was projected to remain generally flat in the foreseeable future, that most uranium sales were made pursuant to long-term contracts, and that the United States continued to be the largest single-country importing market in the world. It observed that the 2011 Fukushima nuclear power plant accident created uncertainties in the nuclear fuel industries and led to a decline in demand in several third country markets.[87]

In the fourth review, the Commission found that demand had declined during the period of review. The Commission also observed that six nuclear plants had closed in the United States during the period of review and that several other nuclear plants were slated for retirement in the near future.[88] Apparent U.S. consumption of uranium products, as measured by value, had declined from $*** in 2010 to $*** in 2016.[89]

Current Review. In this review, the information available indicates that demand declined during the current period of review. In 2021, apparent U.S. consumption of uranium was $***, which is lower than apparent U.S. consumption in 2005, 2010, or 2016.[90]

The domestic interested parties contend that demand for uranium declined markedly during the current review period, while noting that there are signs that demand for nuclear power may increase.[91] They assert that the nuclear accident in Fukushima, Japan, in March 2011 led to a prolonged market weakness that became entrenched and continued well

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[86] *Second Review Determination*, USITC Pub. 3872 at 23. The Commission also observed the prevalence of long-term contracts in its original preliminary determination. *Original Preliminary Determination*, USITC Pub. 2471 at 17.

[87] *Third Review Determination*, USITC Pub. 4307 at 18.

[88] *Fourth Review Determination*, USITC Pub. 4727 at 16.

[89] *Fourth Review Determination*, USITC Pub. 4727 at 16. *Confidential Fourth Review*, EDIS Doc. 623573 at 23.

[90] CR/PR at Table I-10.

[91] Centrus Response at 11 & 14; GLE Response at 11, & 18-19; LES Response at 1, 4, 16, & 20; UPA Response at 7, 8, 10 & 12-13; ConverDyn Response to the Notice of Institution, EDIS Doc. 781479 (Oct. 3, 2022) at 4 ("ConverDyn Response"); PRI and CBR Response at 5-6, 10-11, & 49-51; Energy Fuels Response to the Notice of Institution, EDIS Doc. 781553 (Oct. 3, 2022) at 6 ("Energy Fuels Response") at 6.

into the current period of review.[92] Furthermore, the domestic interested parties claim that declining demand for uranium has resulted in continuous oversupply, inventory overhang, substantial price-insensitive secondary supplies in the market, and excess capacity, along with declining production and prices.[93] The domestic interested parties also state that the United States is by far the largest importing country for uranium in the world.[94]

The domestic interested parties further argue that the United States and other countries showed renewed interest in nuclear power in 2021, due to concerns over reducing greenhouse gas emissions, energy security, and the "domestication" of the U.S. nuclear fuel supply chain away from Russian supply.[95] However, they argue that this renewed interested in nuclear power has yet to translate into additional long-term contracts for uranium supply that would warrant the reopening of closed uranium mines in the United States.[96]

The domestic interested parties also assert that demand has increased for uranium from hedge funds.[97] Responding purchasers *** also reported ***.[98] *** reported ***.[99] Responding purchaser *** reported that ***.[100]

1. Supply Conditions

Prior Proceedings. In the first review, the Commission observed that there had been an overall increase in the supply of uranium, particularly uranium in processed forms, with uranium imports under the Russian HEU Agreement providing a large and increasing supply of LEU to the U.S. market. The development of relatively high-grade, low-cost uranium ore reserves in Canada and Australia further added to the worldwide abundance of uranium, and

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[92] ConverDyn Response at 2, PRI and CBR Response at 2, 8-10, 18, 31-32, 49-50; PRI and CBR Final Comments at 4, 10; UPA Response at 4; LES Response at 16; LES Final Comments at 2; Centrus Response at 4; GLE Response at 11 & 19; GLE Final Comments at 4.

[93] PRI and CBR Response at 49-50; GLE Response at 19; UPA Response at 12.

[94] PRI and CBR Response at 49-50; PRI and CBR Final Comments, at 6; GLE Response at 7; Centrus Response at 14; ConverDyn Response at 4. *See also*, CR/PR at I-4.

[95] GLE Response at 17-19; LES Response at 28 & Exhibit 4; UPA Response at 4; ConverDyn Response at 4; PRI and CBR Response at 5-6, 10. The domestic interested parties assert that Russia's invasion of Ukraine has further increased interest in reducing reliance on Russian supply, as well as on preserving nuclear power plants in the United States and Europe. Energy Fuels Response at 6; Centrus Response at 14; ConverDyn Response at 4; UPA Response at 13; PRI and CBR Response at 51-53; GLE Response at 16-18.

[96] PRI and CBR Response at 51-53; *see* Centrus Response at 14; ConverDyn Response at 4.

[97] GLE Response at 19; LES Response at 5, 17.

[98] CR/PR at D-3, D-5, and D-6.

[99] CR/PR at D-3-4. *** further asserts that ***. *Id.*

[100] CR/PR at D-5.

an overhang of natural and enriched UF_6 inventories in the United States and throughout the world represented another source of uranium supply.[101]

In the second review, the Commission determined that inventories of natural and enriched UF_6 in the United States and throughout the world continued to represent a significant source of uranium supply. Inventories were held most notably by owners and operators of U.S. civilian nuclear plants, brokers and traders, members of the U.S. uranium industry, members of the Russian industry, and the DOE (which had a separate large stockpile of natural UF_6, which was to be held off the market until at least 2009). In addition to these large global inventories, an upswing in exploration and mining of uranium ore in the United States further affected the supply of uranium concentrate. The large domestic inventories of uranium allowed producers and utilities to engage in a variety of non-cash transactions. These alternative transactions resulted in the disaggregation of an advanced stage of uranium (such as natural or enriched UF_6) into the raw material (uranium concentrate or natural UF_6) and processing (conversion or enrichment) used to make it, creating separate, but interrelated, markets for the uranium and enrichment components of enriched UF_6.[102]

The Commission also observed in the second review that Canada and Australia were major nonsubject suppliers of uranium concentrate to the United States, and that there were also significant nonsubject imports of LEU, principally from Western European suppliers. Additionally, the Commission determined that the planned deployment of two new enrichment facilities in the United States (USEC's "American Centrifuge" facility at Portsmouth, Ohio, and LES's "National Enrichment Facility" in Eunice, New Mexico) would significantly affect the future supply of LEU.[103]

Finally, the Commission explained that trade restrictions in addition to the RSA had affected exports of uranium from Russia. The European Atomic Energy Community ("EURATOM") countries limited imports of uranium from Russia to about 15 percent of the EURATOM market. RSA and EURATOM restrictions resulted in a two-tiered pricing structure in the global market for uranium. Uranium eligible for sale in the United States and EURATOM countries (known as "restricted market uranium") bore a higher price than uranium that could

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[101] *First Review Determination*, USITC Pub. 3344 at 29-31. In the 1991 preliminary phase investigation of uranium from the U.S.S.R., the Commission noted that it did not have reliable production data on all sectors of the U.S. uranium industry. *See Original Preliminary Determination* at 18 & 20-21.

[102] *Second Review Determination*, USITC Pub. 3872 at 24.

[103] *Second Review Determination*, USITC Pub. 3872 at 24-25.

only be sold in countries without import restrictions (known as "unrestricted market uranium").[104]

In the third review, the Commission found that there had been several relevant developments during the period of review. The 2008 RSA Amendment increased the amount of subject imports allowed into the United States through 2020, with the Russian industry eventually permitted to supply roughly 20 percent of the U.S. enrichment market's demand. Additionally, the 2008 amendment provided that, after 2013, enriched uranium imported from Russia could be LEU produced directly through the nuclear fuel cycle (rather than downblended from HEU), and that the Russian industry no longer had to sell to USEC as its Executive Agent. The Commission observed that the 2008 Domenici Amendment to the USEC Privatization Act included quotas that mirrored those in the RSA, but acknowledged that the RSA was a more comprehensive agreement. The Commission also observed that Kazakhstan had become by far the world's largest uranium producer and one of the largest suppliers of nonsubject imports in the U.S. market.[105]

In the fourth review, the Commission found that there had been several changes to the supply of uranium to the U.S. market since the last review. Specifically, the Commission observed that USEC had ceased enrichment operations in 2013; AREVA, a French enricher, had cancelled plans to build an enrichment facility in Idaho; and GLE had slowed its efforts to commercialize laser enrichment technology in the United States and in other markets due to market conditions.[106]

The Commission also found that because Russia had fulfilled its commitment under the HEU Agreement to downblend 500 metric tons of HEU in 2013, the Russian industry was permitted to export LEU that was produced directly through the fuel cycle, rather than only LEU downblended from HEU, to the United States.[107] The Commission also observed that in May 2017, in accordance with the RSA and the Domenici Amendment, Commerce calculated adjustments to the quotas on subject imports in order to reflect projected nuclear reactor demand in future years.[108] Additionally, the Commission found that both the domestic industry

[104] *Second Review Determination*, USITC Pub. 3872 at 25.
[105] *Third Review Determination*, USITC Pub. 4307 at 18.
[106] *Fourth Review Determination*, USITC Pub. 4727 at 17.
[107] *Fourth Review Determination*, USITC Pub. 4727 at 17-18.
[108] *Fourth Review Determination*, USITC Pub. 4727 at 18.

and subject imports had gained market share since the third five-year review.[109] Nevertheless, nonsubject imports remained the *** source of supply of uranium products to the U.S. market.[110]

Current Review. The domestic industry was the *** source of supply to the U.S. market in 2021, accounting for *** percent of apparent U.S. consumption by value that year.[111] This was lower than the domestic industry's share of apparent U.S. consumption in the prior reviews.[112]

According to Centrus, the number of operable U.S. nuclear reactors has become smaller since the last review, but U.S. net electricity generation has remained largely unchanged since 2017.[113] Available information from the U.S. Energy Information Administration ("EIA") shows that U.S. uranium mine production fell from 2.9 million pounds of U_3O_8 concentrate in 2016 to only 21,000 pounds in 2021.[114] Consistent with these data, Uranium One and Peninsula Energy idled their production facilities in 2018 and 2019, respectively, and ConverDyn reported that it idled its Metropolis Works uranium conversion plant in 2018.[115]

More recently, the domestic industry plans to increase uranium production in the United States, consistent with anticipated demand trends. In 2021, ConverDyn announced that it planned to restart its uranium conversion plant in early 2023.[116] Western Uranium & Vanadium Corp. announced that it was preparing to resume mining activities in Colorado in 2023.[117] Additional production increases and expansion were planned by Ur-Energy, Westinghouse, and enCore Energy.[118] Lastly, as mentioned previously, Centrus has signed a contract with the DOE to demonstrate production of HALEU in Piketon, Ohio, having received a

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[109] *Fourth Review Determination*, USITC Pub. 4727 at 18. Domestic producers accounted for *** percent of apparent U.S. consumption in 2016, compared with *** percent in 2010, and subject imports accounted for *** percent of apparent U.S. consumption in 2016, compared with *** percent in 2010. *Id*. *Confidential Fourth Review* at 26-27.

[110] *Fourth Review Determination*, USITC Pub. 4727 at 18. Nonsubject imports accounted for *** percent of apparent U.S. consumption in 2016, compared with *** percent in 2010. *Id*. *Confidential Fourth Review* at 27.

[111] CR/PR at Table I-10. Because of the complexities of the nature in which uranium is marketed, produced, and sold, the Commission is relying on the value data of all uranium types. CR/PR at I-37.

[112] CR/PR at Table I-10.

[113] Centrus Response at 14.

[114] PRI and CBR Response at 49-50 & Exhibit 14.

[115] CR/PR at Table I-5.

[116] ConverDyn Response at 4.

[117] CR/PR at Table I-5.

[118] CR/PR at Table I-5.

license to produce HALEU from the U.S. Nuclear Regulatory Commission in 2021 ("NRC").[119] Production is scheduled to commence in 2023.[120]

Subject imports were the *** largest source of supply in the U.S. market in 2021, accounting for *** percent of apparent U.S. consumption by value that year.[121] According to Ur-Energy, global uranium supply continues to be dominated by state-owned enterprises ("SOEs"), particularly in Russia and Kazakhstan, and Western non-SOEs have struggled to compete with SOEs.[122] PRI and CBR also assert that Russia is the largest supplier of enriched uranium in the world and that it has taken steps to modernize and increase plant capacity, despite Russia's domestic demand accounting for only *** percent of its current enrichment capacity.[123]

On October 5, 2020, Commerce and the government of Russia's State Atomic Energy Corporation ("ROSATOM") signed another amendment to the RSA.[124] This amendment extended the duration of the RSA through 2040; established new export limits corresponding to a lower percentage of U.S. enrichment demand, ***; revised the 'returned feed' provisions from the prior RSA to require foreign-origin returned feed that is enriched or sold in third countries to be subject to the RSA's export limits if exported back to the United States; and established a cap on exports pursuant to enriched uranium product sales equivalent to 15.0 percent of U.S. enrichment demand in 2021, 9.8 percent in 2022, 10.2 percent 2023, 5.7 percent in 2024, 5.3 percent in 2025, and 5.0 percent per year from 2026 to 2040. The cap for additional exports pursuant to sales of SWU plus conversion is equivalent to 1.0 percent of U.S. enrichment demand in 2021, approximately 3.0 percent from 2022 to 2025, and zero percent from 2026 to 2040.[125]

[119] Centrus Response at 2 & 9-11.
[120] CR/PR at Table I-5.
[121] CR/PR at Table I-10.
[122] Ur-Energy Response to the Notice of Institution, EDIS Doc. 781506 (Oct. 3, 2022) at 6.
[123] PRI and CBR Response at 28-29.
[124] CR/PR at I-13; 2020 Amendment to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation, 85 Fed. Reg. 64112 (Oct. 5, 2020).
[125] CR/PR at I-13; 2020 Amendment to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation, 85 Fed. Reg. 64112 (Oct. 5, 2020).

Nonsubject imports were the *** source of supply in the U.S. market in 2021 by value, accounting for *** percent of apparent U.S. consumption.[126] The largest sources of nonsubject imports during the review period were the Netherlands, Germany, and the United Kingdom.[127]

Responding purchaser *** reported a *** resulting from ***.[128] Responding purchasers *** also reported that ***.[129] *** contends that ***.[130] *** also reported that ***.[131]

2. Substitutability and Other Conditions

Prior Proceedings. In its prior reviews, the Commission characterized the various forms of uranium—U_3O_8, natural UF_6, enriched UF_6 (LEU), and UO_2—to be fungible, commodity products. The four basic forms are not physically interchangeable with each other because they are all intermediate products, each successively contained in the next. Significant volumes of natural UF_6 and LEU act as substitutes for the domestic provision of uranium concentrates, conversion of concentrates to UF_6, and enrichment services. In other words, utilities are able to skip purchases at the early stages of the nuclear fuel cycle either by purchasing UF_6 from existing inventories, or by purchasing LEU that has been obtained by blending down HEU.[132]

In the first review, the Commission described substantial structural changes to the domestic industry since the original investigation. These included consolidations and closings affecting concentrate producers and converters, and the privatization of USEC.[133] In the second review, the Commission found that there had been no further significant structural changes to the domestic uranium industry since the first five-year reviews.[134]

In both the first and second reviews, the Commission also described USEC's role as the U.S. Government's Executive Agent under the Russian HEU Agreement. In this role, USEC was required to import large quantities of Russian LEU downblended from Russian HEU that was

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[126] CR/PR at Table I-10.

[127] CR/PR at Table I-9. In March 2019, Commerce revoked, due to the absence of a response to its notice of institution from any domestic interested party, an antidumping duty order on imports of LEU from France that had been in place since 2002. CR/PR at I-14, Table I-3; *Final Results of Sunset Review and Revocation of Antidumping Duty Order*, 84 Fed. Reg. 9493 (Mar. 15, 2019).

[128] CR/PR at D-4.

[129] CR/PR at D-4-6.

[130] CR/PR at D-7.

[131] CR/PR at D-7-8.

[132] *First Review Determination*, USITC Pub. 3344 at 28; *Second Review Determination*, USITC Pub. 3872 at 21-22; *Third Review Determination*, USITC Pub. 4307 at 18; *Fourth Review determination*, USITC Pub. 4727 at 18.

[133] *First Review Determination*, USITC Pub. 3344 at 28.

[134] *Second Review Determination*, USITC Pub. 3872 at 22.

part of the U.S.S.R.'s military stockpile, and sell it directly to utilities. USEC was committed to purchasing 5.5 million SWUs per year from Russia through 2013. In 2002, the pricing terms under which USEC acquired LEU downblended from Russian HEU were amended to implement a market-based pricing structure. In addition, under this Agreement, USEC paid Russian producers in kind for the natural uranium contained in the enriched UF_6 (by crediting Russian producers an equivalent quantity of natural UF_6) and paid in cash for the value of enrichment. This natural UF_6, which was owned by Russian producers and was stored at USEC facilities, could be imported and sold in the U.S. market under increasing annual limits.[135]

In the third review, the Commission found that the approaching expiration of the HEU Agreement would likely have a significant impact on the U.S. uranium market by increasing the supply of uranium from Russia. Otherwise, the Commission did not find that there had been significant changes to the structure of the domestic industry during the period of review.[136]

In the fourth review, the Commission highlighted changes in the structure of the domestic industry. Specifically, it observed that USEC had ceased enrichment operations in 2013 and that LES had continued to operate UUSA, the only operational domestic enrichment facility, which satisfied approximately one-third of domestic demand for uranium enrichment services.[137] The Commission also found no evidence on the record that the Commission's past findings concerning the nature of the product were no longer applicable, noting the domestic producers' argument that uranium products continued to be highly fungible and price-sensitive.[138]

Current Review. The record in this review contains no new information to indicate that the fungibility between the domestic like product and subject imports or the importance of price in purchasing decisions has changed since the last review.[139] The domestic interested parties state that uranium products remain fungible and price-sensitive.[140]

On January 18, 2018, the Secretary of Commerce initiated an investigation into the effect of imports of uranium on national security pursuant to Section 232 of the Trade

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[135] *First Review Determination*, USITC Pub. 3344 at 29; *Second Review Determination*, USITC Pub. 3872 at 22.

[136] *Third Review Determination*, USITC Pub. 4307 at 18.

[137] *Fourth Review Determination*, USITC Pub. 4727 at 19.

[138] *See* PRI and CBR Response at 40, 49; PRI and CBR Final Comments at 4; GLE Final Comments at 4; UPA Response at 6.

[139] *See* PRI and CBR Response at 40, 49; PRI and CBR Final Comments at 4; GLE Final Comments at 4; UPA Response at 6.

[140] LES Response at 38; UPA Response at 6.

Expansion Act of 1962, as amended ("Section 232").[141] In April 2019, Commerce determined that uranium imports threaten to impair the national security of the United States pursuant to Section 232.[142] To address these concerns, the President directed the establishment of the United States Nuclear Fuel Working Group ("Working Group") to develop recommendations for reviving and expanding domestic nuclear fuel production.[143] On April 23, 2020, the Working Group released a report outlining a strategy for restoring U.S. competitiveness in the nuclear energy sector, including the recommendation to establish a uranium reserve.[144]

Since Russia's invasion of Ukraine on February 24, 2022, Russian nuclear fuel and services have not been directly targeted by sanctions. The invasion reportedly has had a chilling effect on demand for uranium from Russia, however, due to the added logistical, freight, and insurance challenges and complications for environmental, social and governance principles.[145] In particular, the EU has called for member states to diversify away from Russian nuclear fuel and services, a Swedish utility has ceased purchasing and accepting deliveries of Russian nuclear fuel, and Ukraine and the Czech Republic shifted their sourcing of nuclear fuel from Russia to Westinghouse and Framatome.[146]

C. Likely Volume of Subject Imports

1. The Original Investigations and Prior Reviews

In its original preliminary determination, the Commission found that the volume of uranium imports (both enriched and natural uranium) from the U.S.S.R. increased substantially in both absolute and relative terms during the period of investigation.[147]

In the first review, the Commission found that the volume of subject imports from Russia, which was already substantial, would likely increase significantly if the suspended investigation were terminated based on Russia's significant reserves of unmined uranium, its extensive capacity to produce all forms of uranium, its substantial inventories of various forms

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[141] *Notice of Request for Public Comments on Section 232 National Security Investigation of Imports of Uranium*, 83 Fed. Reg. 35204 (Jul. 24, 2018).

[142] White House, "Memorandum on the Effect of Uranium Imports," July 12, 2019.

[143] White House, "Memorandum on the Effect of Uranium Imports," July 12, 2019.

[144] Publication of a Report on the Effect of Imports of Uranium on the National Security: An Investigation Conducted Under Section 232 of the Trade Expansion Act of 1962, as Amended, 86 Fed. Reg. 41540 (Aug. 2, 2021); USDOC, BIS, OTE, "The Effect of Imports of Uranium on the National Security," April 14, 2019.

[145] CR/PR at I-38-39.

[146] CR/PR at I-39.

[147] *Original Preliminary Determination*, USITC Pub. 2471 at 24.

of uranium, its relatively small home market, and barriers to imports of Russian uranium in third-country markets.[148]

In the second review, the Commission found that the volume of subject imports had been significant, even with the discipline of the RSA. In light of Russia's substantial uranium inventories and production capacity, its stated intention to expand exports to the United States, and its extensive contingent contracts and ongoing contract negotiations with U.S. purchasers during the period of review, the Commission concluded that the already substantial volume of subject imports likely would increase significantly within a reasonably foreseeable time if the suspended investigation were terminated.[149]

In the third review, the Commission again found that the volume of subject imports was substantial, and that Russian producers would likely significantly increase shipments of subject uranium to the United States within the reasonably foreseeable future if the suspended investigation were terminated. The Commission found that the volume of subject imports had been significant, even with the discipline of the RSA; that Russia continued to have substantial inventories of and production capacity for subject uranium; that the U.S. market was relatively attractive for the Russian uranium industry; and that there was evidence that the Russian industry intended to increase its exports to the U.S. market if the RSA were terminated. The Commission also acknowledged that the Domenici Amendment to the USEC Privatization Act contained import quotas mirroring those contained in the RSA. However, the Commission determined that the RSA imposed restrictions and procedures not included in the Domenici Amendment.[150]

In the fourth review, the Commission found that under the provisions of the RSA, subject imports had maintained a substantial presence in the U.S. market during the period of review, accounting for *** percent of the value of apparent U.S. consumption in 2016.[151] The Commission also stated that Russia was one of the four largest suppliers to U.S. nuclear utilities in each year from 2011 through 2015, accounting for roughly 16 percent of U.S. utilities' purchases in 2015.[152]

The Commission also found that the Russian industry had substantial inventories of uranium products and controlled over roughly 900 tons of government-surplus HEU, which

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[148] *First Review Determination*, USITC Pub. 3344 at 32-37.
[149] *Second Review Determination*, USITC Pub. 3872 at 25-30.
[150] *Third Review Determination*, USITC Pub. 4307 at 19-21.
[151] *Fourth Review Determination*, USITC Pub. 4727 at 20-21. *Confidential Fourth Review* at 31.
[152] *Fourth Review Determination*, USITC Pub. 4727 at 21.

could be downblended into LEU and exported to the United States.[153] It found that the Russian industry had large and underutilized production capacity, with roughly 9 percent of the world's reasonably assured resources and access to U_3O_8 from Kazakhstan, ***.[154] Additionally, the Commission found that the United States remained a relatively attractive export destination for the Russian uranium industry, in part because of barriers to entry and/or declining demand in other export markets.[155] The Commission observed that the United States was the largest market for uranium, representing about 30 percent of worldwide demand, with the highest levels of uncovered uranium demand through 2020.[156] Lastly, the Commission observed that Russian producers had acknowledged their desire to increase exports to the United States.[157]

Consequently, the Commission concluded that the volume of subject imports would likely be significant if the suspended investigation were terminated.[158]

2. The Current Review

Under the provisions of the RSA, subject imports from Russia maintained a significant presence in the U.S. market during the period of review. The value of subject imports increased from $639.9 million in 2017 to $666.3 million in 2018, decreased to $584.8 million in 2019 and $568.2 million in 2020, and then increased to $645.8 million in 2021.[159] Subject imports from Russia accounted for *** percent of apparent U.S. consumption, by value, in 2021, which was lower than in 2005, 2010, or 2016.[160] While the value of subject imports from Russia was lower in 2021 than in the prior reviews, Russia remains the largest country supplier of uranium to the U.S. market.[161] [162]

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[153] *Fourth Review Determination*, USITC Pub. 4727 at 21.
[154] *Fourth Review Determination*, USITC Pub. 4727 at 21. *Confidential Fourth Review* at 32.
[155] *Fourth Review Determination*, USITC Pub. 4727 at 21-22.
[156] *Fourth Review Determination*, USITC Pub. 4727 at 22.
[157] *Fourth Review Determination*, USITC Pub. 4727 at 22.
[158] *Fourth Review Determination*, USITC Pub. 4727 at 22.
[159] CR/PR at Table I-9.
[160] CR/PR at Table I-10.
[161] CR/PR at Table I-9.
[162] In their response to the Commission's notice of institution, PRI and CBR assert that Russia has made substantial use of its quotas under the Agreement, though there is no publicly available information about the degree to which the quotas have been used. In addition, they provide that "the volume of contract approvals, contract amendment approvals, and shipment requests which has been submitted suggests significant activity and usage of the RSA quotas," along with U.S. import statistics showing high levels of Russian imports of enriched uranium. As further evidence, they contend that TENEX's negotiations around the extension of the Agreement, including the "push for ongoing access (Continued…)

The record of this expedited review contains limited information on the uranium industry in Russia. The available information indicates that subject producers in Russia have the means and incentive to increase exports of the subject merchandise to the U.S. market within a reasonably foreseeable time if the suspended investigation were terminated. The domestic interested parties identified two producers of uranium in Russia.[163] According to the World Nuclear Association ("WNA"), Russian producers accounted for 14 percent of global natural uranium production in 2021, 40 percent of global uranium conversion infrastructure; and, as of 2018, 46 percent of the global uranium enrichment capacity.[164] Additionally, as of 2020, Russia was utilizing only 58 percent of its production capacity for natural uranium.[165] Moreover, Russia has implemented a modernization program for its enrichment plants that increased their enrichment capacity by *** percent in 2020.[166] WNA reported that annual uranium enrichment capacity in Russia was nearly *** million SWU in 2020 and that the subject industry's capacity utilization rate was around *** percent in 2022, which would have yielded excess capacity of *** million SWU, equivalent to *** percent of estimated U.S. requirements for SWU, that year.[167] Thus, the subject industry in Russia remains large.

The available information also indicates that the four nuclear fuel suppliers in Russia (TENEX, TVEL, ARMZ, and Uranium One) hold large inventories of uranium products, including LEU, that could be used to increase exports to the United States after termination of the suspended investigation. According to ***, and the Russian government ***.[168]

In addition, Russia possesses substantial stockpiles of HEU that could be processed into LEU for export to the United States. Based on Russia's original stockpile of *** tons of HEU and downblending of *** tons into LEU for export to the United States under the completed HEU Agreement, Russia could possess up to *** tons of HEU containing up to *** SWU.[169] These

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through the RSA, and a portfolio of U.S. utility contracts requiring quotas to exceed 20 percent in certain initial years of the extended RSA period demonstrates that Russia continues to find the U.S. to be an extremely attractive market and that it seeks to increase uranium exports to the United States." PRI and CBR Response at 36, 37.

[163] CR/PR at I-38. *See also,* Centrus Response at 6; Energy Fuels Response at 5; GLE Response at 14; LES Response at 40; CBR and PRI Response at 47; Ur-Energy Response at 5.

[164] LES Response at 23 & Exhibits 29, 30, & 31.

[165] LES Response at 23 & Exhibits 23.

[166] CR/PR at I-39.

[167] GLE Response at 7, Exhibit 4.

[168] LES Response at 25, Exhibit 34.

[169] GLE Response at 8, Exhibit 4; PRI and CBR Response at 26.

stockpiles of HEU held in Russia would further enhance the ability of subject producers to increase their exports of LEU to the United States in the event of termination.

Subject producers in Russia remain export oriented. According to WNA, subject producers in Russia possessed an enrichment capacity of nearly *** million SWU in 2020, of which only *** million SWU was needed to satisfy demand in Russia.[170] Thus, the vast majority of Russian enrichment capacity is available to serve export markets.

Furthermore, subject producers in Russia are likely to direct additional exports to the United States after termination, given the attractiveness of the U.S. market. The United States remains the world's largest importer of uranium,[171] representing 28 percent of the world's reactor requirements in 2021,[172] *** percent of global uncommitted SWU demand for the 2022-2024 period,[173] and around *** of uncommitted demand for natural uranium for the 2022-2025 period.[174] Subject imports maintained a significant presence in the U.S. market during the period of review, accounting for *** percent of the value of apparent U.S. consumption in 2021, thereby maintaining customers and ready distribution networks in the United States through long-standing contracts. Through offices in the United States, Russian producers have sought to contract directly with American utilities and generate business opportunities in the United States.[175] Indeed, statements by officials from ROSATOM and Fuelco, an entity that negotiates with TENEX on behalf of several U.S. utilities, indicate that subject producers are actively seeking to increase their exports to the United States.[176]

As noted above, Russian nuclear fuel and services have not been directly targeted by U.S. sanctions following Russia's invasion of Ukraine in February 2022. Furthermore, although "normal trade relations" with Russia were suspended in March 2022, the column 2 duty rate applicable to imports from Russia is "free" for several of the HTSUS subheadings/statistical

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[170] GLE Response at 7, Exhibit 4; PRI and CBR Response at 29.

[171] CR/PR at I-40. *See also* PRI and CBR Response at 35 & 50.

[172] CR/PR at I-42 and Table I-12. *See also* PRI and CBR Response at 29-30.

[173] PRI and CBR Response at 30.

[174] CR/PR at I-40; PRI and CBR Response at 50.

[175] PRI and CBR Response at 35-36 & Exhibit 30.

[176] LES Response at 30, 31-32, Exhibits 48-49. Following a contract signing between Tenex and several U.S. utilities for the delivery of LEU, Sergei Kiriyneko, the head of ROSATOM, stated that the company had "broken through the wall forbidding {Tenex} to sell Russian fuel to the American market. After the contracts signed today, we will start new contracts…this is only the beginning." LES Response at 31-32 & Exhibit 48. Similar comments were echoed by Bruce Hamilton, President of Fuelco, who stated "The Russians do it all...{a}nd after 2020, it's just wide open {for Russia}." LES Response at 32 & Exhibit 48.

reporting numbers under which the product is classified, and 45 percent for the remaining classifications.[177]

Moreover, barriers to uranium from Russia in the EU and China and declining demand in Japan would further increase the relative appeal of the U.S. market to subject producers after termination. While the EU is the second largest market for uranium, EURATROM has reportedly limited imports of natural uranium from Russia to 15-25 percent of total EU demand.[178] As discussed in section III.B.3 above, Russia's invasion of Ukraine in February 2022 has caused the EU to further reduce Russia's access to the EU market. Japan, historically the third largest market for uranium, is only running 10 of the 54 nuclear reactors that were operational prior to the Fukushima accident, which has greatly reduced Japanese demand for uranium products.[179] Finally, China is unlikely to be a receptive market for uranium from Russia, despite growing demand there for nuclear fuels, due to its commitment to become self-sufficient in its nuclear power generation capacity and supply chain.[180]

In light of the significant and increasing volume of subject imports during the original investigation, the significant presence of subject imports in the U.S. market during the period of review, the subject industry's substantial capacity and excess capacity, and the attractiveness of the U.S. market to subject producers, we find that the volume of subject imports would likely be significant, both in absolute terms and relative to consumption in the United States, if the suspended investigation were terminated.[181]

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[177] CR/PR at I-16.

[178] CR/PR at I-39.

[179] CR/PR at I-19 & I-40. *See also* PRI and CBR Response at 31 & Exhibit 21.

[180] LES Response at 28-29, Exhibits 44-45.

[181] The record does not contain data addressing the potential for product shifting. Furthermore, we recognize that the Domenici Amendment to the USEC Privatization Act contains import quotas for Russian uranium that mirror the export quotas for subject merchandize currently in the amended RSA. However, as the Commission determined in the third and fourth five-year reviews, we find that the RSA imposes restrictions and procedures that are critical to the enforceability of the quotas, but are not included in the Domenici Amendment. *See Third Review Determination*, USITC Pub. 4307 at 19-21; *Fourth Review* Determination, USITC Pub. at 22; LES Response at 14; PRI and CBR Response at 8 & 26; Centrus Response at 3-4. Thus, the existence of the Domenici Amendment does not affect our determination that the volume of subject imports would likely increase were the suspended investigation terminated. Given this, the substantial capacity and excess capacity of subject producers, and the attractiveness of the U.S. market to subject producers, the information available indicates that the Domenici Amendment would not prevent subject imports from increasing significantly if the suspended investigation were terminated.

D. Likely Price Effects of Subject Imports

1. The Original Investigations and Prior Reviews

In its original preliminary determination, the Commission found that there was a reasonable indication that subject imports were having significant price effects on the domestic like product, in light of the decline of many indices of domestic prices, at a time of rising imports from the U.S.S.R.[182]

In the first review, the Commission found that termination of the suspended investigation on uranium from Russia would likely lead to significant underselling by the subject imports, and to significant price depression and suppression, within a reasonably foreseeable time. It based this decision on factors that included the price-sensitive nature of the uranium market; an increase in worldwide supplies of uranium, including the growing availability of natural UF_6 and LEU as finished products that bypass parts of the fuel cycle; and declining uranium prices.[183]

In the second full review, the Commission found that without the discipline of the RSA, there was a substantial likelihood that the subject imports would be priced aggressively in the U.S. market in order to gain market share. The likelihood that subject imports from Russia would undersell the domestic product was, in the Commission's view, accentuated by the tendency of Russian enrichers to operate at high rates of capacity utilization, using low prices to spur sales and fill capacity. The Commission reasoned that, because the price that USEC paid under the HEU Agreement included a discount from an index of retrospective U.S. and international prices, Russia could sell additional uranium outside the terms of the HEU Agreement for a higher price than it obtained under that agreement, yet still undersell the domestic like product. It also observed that evidence in the record indicated that the Russian industry's LEU prices in North America and the EU were lower than prices offered by other suppliers. The Commission found that likely underselling by subject imports would likely lead to

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[182] *Original Preliminary Determination*, USITC Pub. 2471 at 25-26 ("Uranium is a fungible product produced to standard industry specifications, increasing the likelihood that Soviet imports can affect domestic prices. Many indices of domestic prices declined during the period of investigation, at a time of rising Soviet imports. Spot market price levels for uranium concentrate have generally declined since 1989. Tolling fees charged by U.S. uranium converters have fallen sharply since 1990. Enrichment fees charged by DOE declined during 1991. We cannot dismiss a causal connection between these price declines and the simultaneous entry of large quantities of Soviet imports into the U.S. market on the basis of this record.") *Id*. at 26 (internal citations omitted).

[183] *First Review Determination*, USITC Pub. 3344 at 37-38.

the significant depression or suppression of prices for the domestic like product, as the Russian industry competed with the domestic industry for contracts, and as the presence of subject imports at aggressive prices drove down spot market prices, which, in turn, were a factor in the negotiation of contract prices.[184]

In the third review, the Commission found that the increased volume of subject imports from Russia that would likely result if the suspended investigation were terminated would likely have significant effects on prices for the domestic like product.[185] Absent price comparison data on the record, the Commission found that, without the discipline of the RSA, the Russian industry would likely price its exports to the U.S. market aggressively in order to gain market share. The Commission also relied on its finding from the second review that the likelihood of underselling was accentuated by the tendency of Russian enrichers to operate at high rates of capacity utilization and to sell LEU at whatever price necessary to move the product and keep their facilities fully utilized. Because uranium is a commodity product, the Commission reasoned that additional supplies of low-priced subject imports would be likely to drive down market prices, influence contract prices, and depress or suppress prices for the domestic like product to a significant degree.[186]

In the fourth review, the Commission observed that, while the record contained no specific price comparison data, prices had declined since the 2011 Fukushima accident.[187] Based on the fungibility between subject imports and the domestic like product, and the price sensitivity of the uranium market, the Commission found that the likely significant volume of subject imports after termination would likely undersell U.S. uranium in order to gain market share, noting ROSATOM's claim that it could undercut global nuclear fuel and services prices, including U.S. prices, by 30 percent.[188] The Commission also found that subject import underselling would likely depress or suppress prices for the domestic like product to a

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[184] *Second Review Determination*, USITC Pub. 3872 at 30-32. As additional evidence suggesting that subject imports would likely undersell the domestic product, the Commission noted that the pricing terms of many of the contingent contracts that Russia had negotiated with U.S. utilities were lower than prevailing spot prices. Specifically, the Commission observed that "{g}enerally, one would expect prices under long-term contracts (such as these contingent contracts), which give security of supply (the leading concern of purchasers), to be somewhat higher than spot prices, particularly at a time when both prices and global demand are rising." *Id.* at 31 n.212.

[185] *Third Review Determination*, USITC Pub. 4307 at 22-23.

[186] *Third Review Determination*, USITC Pub. 4307 at 22.

[187] *Fourth Review Determination*, USITC Pub. 4727 at 24.

[188] *Fourth Review Determination*, USITC Pub. 4727 at 24.

significant degree, by forcing domestic producers to choose between cutting prices or losing sales.[189]

2. The Current Review

As discussed in section III.B.3, we continue to find that the domestic like product and subject imports are fungible and that price is an important factor in purchasing decisions.

The record in this expedited review does not contain new product-specific pricing information. Based on the available information, including the fungibility between subject imports and the domestic like product, the importance of price in purchasing decisions, and the attractiveness of the U.S. market to subject producers, we find that if the suspended investigation were terminated, significant volumes of subject imports would likely undersell the domestic like product to a significant degree, as a means of gaining market share. Absent the discipline of the RSA, the significant volumes of low-priced subject imports would likely force domestic producers to reduce their prices, forego needed price increases, or risk losing sales and market share to subject imports.[190] Accordingly, we find that if the suspended investigation were terminated, significant volumes of subject imports would likely undersell the domestic like product and cause significant price effects.

E. Likely Impact of Subject Imports[191]

1. The Original Investigations and Prior Reviews

In the original preliminary determination, the Commission found that many indicators pertaining to the condition of the domestic uranium industry were negative. The industry overall had a low and declining market share. The performance of uranium concentrate producers was dismal, and the Commission had no data concerning the condition of uranium converters. However, the DOE's enrichment enterprise showed generally positive results on

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[189] *Fourth Review Determination*, USITC Pub. 4727 at 24.

[190] Domestic interested parties assert that none of the conditions cited by the Commission in its pricing analysis in prior reviews remain changed and that absent the discipline of the suspended investigation, Russian uranium would be priced aggressively in the U.S. market, depressing U.S. prices and expanding Russia's already significant market share. *See* PRI and CBR Response at 40; LES Response at 34-35.

[191] In the final results of its expedited review of the suspended antidumping investigation, the Commerce Department determined that termination of the Agreement and suspended investigation on uranium from Russian would likely lead to continuation or recurrence of dumping at a margin of up to 115.82 percent. *Uranium From the Russian Federation; Final Results of the Expedited Fifth Sunset Review of the Suspension Agreement*, 88 Fed. Reg. 61, 62 (January 3, 2023).

production, employment, and operating performance. On balance, and considering the condition of the industry as a whole, the Commission found a reasonable indication that the domestic industry was materially injured by reason of subject imports.[192]

In the first review, the Commission found that subject imports from Russia would likely have a significant impact on the domestic industry within a reasonably foreseeable time if the suspended investigation were terminated. It based this decision on the weakened state of the domestic industry and declines in the overall financial performance of all domestic producers. It concluded that the likely increase in subject imports at aggressive prices in the event of termination would have a significant impact on all of the domestic industry's performance indicators.[193]

In the second review, the Commission again found that subject imports from Russia would likely have a significant impact on the domestic industry within a reasonably foreseeable time if the suspended investigation were terminated. It observed that, overall, the domestic industry performed poorly during the review period. Given this and the substantial investments required to build two new U.S. enrichment facilities, the Commission concluded that the domestic industry was vulnerable to material injury by the likely significant volume of subject imports and subsequent negative price effects that would occur if the suspended investigation were terminated. The Commission found that USEC was in a particularly vulnerable position, as it sought to make the critical shift from reliance solely on the power-intensive gaseous diffusion technology used in its remaining enrichment facility, to the more energy-efficient centrifuge technology to be used by its planned American Centrifuge facility. While recognizing that a majority of USEC's shipments of its U.S. production were exported, the Commission found that USEC was sufficiently dependent on the U.S. market that subject imports would likely have a significant negative impact on the company's U.S. production operations in the event of termination.[194]

In the third review, the Commission again found that the likely significant volume of subject imports if the RSA were terminated would likely adversely impact the domestic industry. Though unable to ascertain whether the domestic industry was vulnerable due to the limited record, the Commission found that the information available, from two responding concentrators and the enricher USEC, indicated that the domestic industry had performed poorly during the period of review according to most, but not all, indicators. If the suspended

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[192] *Original Preliminary Determination*, USITC Pub. 2471 at 16-23.
[193] *First Review Determination*, USITC Pub. 3344 at 39-40.
[194] *Second Review Determination*, USITC Pub. 3872 at 32-34.

investigation were terminated, the Commission concluded, the likely volume and price effects of the subject imports would likely have a significant adverse impact on the production, shipments, sales, market share, and revenues of the domestic industry.[195]

In the fourth review, the Commission again found that it was unable to determine whether the domestic industry was vulnerable to the continuation or recurrence of material injury based on the limited information available.[196] Based on the available information in the record, the Commission found that, if the suspended investigation were terminated, the likely significant volume of subject imports, coupled with their price effects, would likely have a significant impact on the domestic industry.[197]

The Commission also considered the role of factors other than subject imports, including nonsubject imports, so as not to attribute injury from other factors to the subject imports. Noting that nonsubject imports as a share of the U.S. market had decreased, the Commission found that, given the fungible nature of uranium products, any increase in subject imports would likely come at the expense of both the domestic industry and nonsubject imports.[198]

2. The Current Review

The record of this expedited review contains limited new information on the domestic industry's condition, consisting of data provided by the domestic interested parties in their responses to the notice of institution.

The domestic industry's performance with respect to domestic producers of natural uranium concentrate was weaker in 2021 relative to the industry's performance in the prior proceedings according to most measures. In 2021, the industry's capacity was *** pounds, while its production was *** pounds.[199] While the domestic industry's production capacity of concentrated natural uranium was higher in 2021 than in the prior reviews, the industry's production was *** lower and, unlike in the prior review periods, the industry ***.[200]

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[195] *Third Review Determination*, USITC Pub. 4307 at 23-24.
[196] *Fourth Review Determination*, USITC Pub. 4727 at 25-26.
[197] *Fourth Review Determination*, USITC Pub. 4727 at 26.
[198] *Fourth Review Determination*, USITC Pub. 4727 at 26.
[199] CR/PR at Table I-6.
[200] CR/PR at Table I-6. ***. CR/PR at I-31.

The domestic industry's performance with respect to enriched uranium hexafluoride in 2021 was mixed compared to the industry's performance in prior proceedings.[201] The domestic industry's production capacity of enriched UF_6 was *** SWUs, its production was *** SWUs, and its capacity utilization rate was *** percent.[202] The industry's U.S. shipments were *** SWUs, with a value of $***.[203] In 2021, the domestic industry's had net sales revenues of $***, gross profit of $***, operating income of $***, and a ratio of operating income to net sales of *** percent.[204] This limited information is insufficient for us to make a finding as to whether the domestic industry is vulnerable to the continuation or recurrence of material injury if the suspended investigation were terminated.[205]

Based on the information available in this review, we find that termination of the suspended investigation would likely lead to a significant volume of subject imports that would likely significantly undersell the domestic like product. Given the fungibility between domestically produced uranium and subject imports and the importance of price to purchasers, the likely significant volume of low-priced subject imports would likely capture sales and market share from the domestic industry and/or force domestic producers to lower their prices to defend their sales, thereby depressing or suppressing prices for the domestic like product to a significant degree. Consequently, subject imports would likely have a significant impact on the production, shipments, sales, market share, and revenue of the domestic industry. These declines would likely impact the domestic industry's profitability and employment, and its ability to raise capital and to make and maintain capital investments.

We have also considered the role of factors other than subject imports, including the presence of nonsubject imports, so as not to attribute injury from other factors to subject

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[201] Because LES was the sole U.S. enricher in 2021, the domestic industry's capacity and production data consists entirely of data reported by LES. Domestic industry shipment and financial performance data include data reported by both LES and Centrus, however, because Centrus reported U.S. shipments of LEU in 2021. CR/PR at I-33.

[202] CR/PR at Table I-8. Reported capacity utilization in 2021 was higher than in the last years examined in the prior proceedings. *Id. See also* CR/PR at Appendix C.

[203] CR/PR at Table I-8. The reported quantity and value of U.S. shipments was lower than in the last years examined in the prior proceedings. *Id.*

[204] CR/PR at Table I-8. The industry's net sales were lower than in the last years of the prior proceedings, and its operating income was *** as a share of net sales than in 1992 but *** than the last year of any of the prior reviews. *Id*. The industry's COGS were lower than the last years of the prior proceedings. *Id.* Gross profits were lower during the current period of review than the last year in all prior proceedings except for 2010. *Id.*

[205] There was no activity reported by domestic uranium converters or fuel fabricators over the period of review. CR/PR at I-25, I-26 & I-43 (Table I-13).

imports. Although nonsubject imports have increased their presence in the U.S. market since the prior review, accounting for *** percent of apparent U.S. consumption by value in 2021,[206] the record provides no indication that the presence of nonsubject imports would prevent subject imports from entering the U.S. market in significant volumes through significant underselling after termination of the suspended investigation. Given the fungibility between subject imports and the domestic like product and the importance of price in purchasing decisions, we find that the likely significant volume of low-priced subject imports would take market share at least in part from the domestic industry, as well as from nonsubject imports, and/or depress or suppress domestic prices to a significant degree. Consequently, we find that any effects of nonsubject imports would be distinct from the likely effects attributable to the subject imports.

We recognize that apparent U.S. consumption, by value, was *** percent lower in 2021 than in 2016.[207] Despite declining demand for uranium during the period of review, the available information indicates that U.S. net generation has remained largely unchanged, declining only 2 GWe since 2017 to 98 GWe,[208] and that U.S. SWU demand is expected to remain flat or possibly recover in the future.[209] Even if demand were to decline, the likely significant volume of low-priced subject imports after termination of the suspended investigation would likely exacerbate the effects of declining demand on the domestic industry. We therefore find that any effects related to demand trends would be distinct from the likely effects attributable to the subject imports.

In sum, we conclude that if the suspended investigation were terminated, subject imports from Russia would likely have a significant impact on the domestic industry within a reasonably foreseeable time.

IV. Conclusion

For the foregoing reasons, we determine that termination of the suspended investigation covering uranium from Russia would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.

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[206] CR/PR at Table I-10.
[207] Calculated from CR/PR at Table I-10.
[208] Centrus Response at 14.
[209] LES Response at 37; PRI and CBR Response at 52-53.

Information obtained in this review

Background

On September 1, 2022, the U.S. International Trade Commission ("Commission") gave notice, pursuant to section 751(c) of the Tariff Act of 1930, as amended ("the Act"),[1] that it had instituted a review to determine whether termination of the suspended antidumping duty investigation on uranium from Russia would be likely to lead to continuation or recurrence of material injury.[2] All interested parties were requested to respond to this notice by submitting certain information requested by the Commission.[3] [4] Table I-1 presents information relating to the background and schedule of this proceeding:

Table I-1
Uranium: Information relating to the background and schedule of this proceeding

Effective date	Action
September 1, 2022	Notice of initiation by Commerce (87 FR 53727, September 1, 2022)
September 1, 2022	Notice of institution by Commission (87 FR 53774, September 1, 2022)
December 5, 2022	Commission's vote on adequacy
January 3, 2023	Commerce's results of its expedited review (88 FR 61)
March 31, 2023	Commission's determination and views

Responses to the Commission's notice of institution

Individual responses

The Commission received eight submissions in response to its notice of institution in the subject review. They were filed on behalf of the following entities (collectively referred to herein as "domestic interested parties"):

[1] 19 U.S.C. 1675(c).

[2] 87 FR 53774, September 1, 2022. In accordance with section 751(c) of the Act, the U.S. Department of Commerce ("Commerce") published a notice of initiation of a five-year review of the subject suspension agreement. 87 FR 53727, September 1, 2022. Pertinent Federal Register notices are referenced in app. A, and may be found at the Commission's website (www.usitc.gov).

[3] As part of their response to the notice of institution, interested parties were requested to provide company-specific information. That information is presented in app. B. Summary data compiled in the original investigation and subsequent full reviews are presented in app. C.

[4] Interested parties were also requested to provide a list of three to five leading purchasers in the U.S. market for the domestic like product and the subject merchandise. Presented in app. D are the responses received from purchaser surveys transmitted to the purchasers identified in this proceeding.

1. Crow Butte Resources, Inc. ("CBR") and Power Resources, Inc. ("PRI"), domestic producers (miners/concentrators) of U_3O_8 ("natural uranium concentrate").
2. Energy Fuels Resources (USA) Inc. ("Energy Fuels"), a domestic producer (miner/concentrator) of natural uranium concentrate.
3. Ur-Energy USA Inc. ("Ur-Energy"), a domestic producer (miner/concentrator) of natural uranium concentrate.
4. ConverDyn, a domestic producer (converter) of UF_6 ("natural uranium hexafluoride").[5]
5. Centrus Energy Corp. and its wholly-owned subsidiary, United States Enrichment Corporation ("USEC") (collectively, "Centrus"), a previous domestic producer (enricher) and current wholesaler of low-enriched uranium ("LEU")[6] and a U.S. importer of LEU from Russia.[7]
6. Global Laser Enrichment, LLC ("GLE"), a potential future domestic producer (enricher) of LEU.[8]
7. Louisiana Energy Services, LLC ("LES") as the operator of the URENCO USA facility, a domestic producer (enricher) of LEU.
8. Uranium Producers of America ("UPA"), a trade association comprising producers (concentrators, converters, and enrichers) of uranium.[9]

A complete response to the Commission's notice of institution requires that the responding interested party submit to the Commission all the information listed in the notice. Responding firms are given an opportunity to remedy and explain any deficiencies in their

[5] The nature of ConverDyn's operations can be found in the "U.S. producers" section of this report.

[6] Centrus ceased enrichment at its Paducah, Kentucky gaseous diffusion plant in 2013. The LEU currently supplied by Centrus comes from various sources, including existing inventories of U.S. LEU produced in the past by Centrus. Centrus also is working to pioneer U.S. production of high-assay, low-enriched uranium ("HALEU"). Centrus response to the notice of institution, October 3, 2022, pp. 9-12.

[7] Centrus supports continuation of the suspended investigation covering imports of uranium from Russia. Centrus response to the notice of institution, October 3, 2022, p. 4.

[8] GLE plans to complete its commercial demonstration pilot at its Wilmington facility in the mid-2020s, and to start commercial operations at the Paducah facility as soon as 2027. Additional information on GLE's operations is available in later sections of this report. GLE response to the notice of institution, October 3, 2022, p. 3.

[9] The members of the trade association are as follows: ConverDyn, enCore Energy Corp, Energy Fuels Resources (USA) Inc., Laramide Resources Ltd., Power Resources, Inc., dba Cameco Resources, Rio Grande Resources, Strata Energy, Inc., Uranium Energy Corporation, UR-Energy USA, Inc., Western Uranium & Vanadium Corp., and Okapi Resources. Some UPA members have produced uranium in the past and are moving to meet anticipated domestic nuclear power requirements in the near future by readying operational sites from standby status. UPA response to the notice of institution, October 3, 2022, pp. 1-2.

responses. A summary of the number of responses and estimates of coverage for each is shown in table I-2.

Table I-2
Uranium: Summary of completed responses to the Commission's notice of institution

Interested party	Type	Number of firms	Coverage
U.S. producer	Domestic	8	See note
U.S. trade association	Domestic	1	See note
U.S. importer	Domestic	1	***%

Note: Multiple forms of uranium are included in the domestic like product, coextensive with Commerce's scope. These forms are associated with different parts of the production process in which mined uranium ore is converted into nuclear fuel (the "nuclear fuel cycle"). The responding U.S. producers operate at different points of the nuclear fuel cycle, thus accounting for differing production methods and levels of coverage. The four responding uranium concentrators estimated based on EIA data that they accounted for about *** percent of natural uranium concentrate production in the United States in 2021. Responding firm ConverDyn described itself as the sole converter of natural uranium hexafluoride in the United States; however, its production of natural uranium hexaflouride has been idled since 2017. ConverDyn's facility is scheduled to restart in 2023. Responding firm LES is the only currently operating enricher of LEU in the United States. Centrus enriched and produced LEU until 2013 and both Centrus and GLE expect to enrich uranium in the future. As the members of UPA (the trade association identified above) operate at different points of the nuclear fuel cycle, calculation of coverage cannot be straightforwardly applied. CBR/PRI response to the notice of institution, October 3, 2022, exh. 1; Energy Fuels response to the notice of institution, October 3, 2022, exh. 1; Ur-Energy response to the notice of institution, October 3, 2022, exh. 1; ConverDyn response to the notice of institution, October 3, 2022, pp. 2-4; LES response to the notice of institution, October 3, 2022, exh. 1; Centrus response to the notice of institution, October 3, 2022, pp. 9-10; GLE response to the notice of institution, October 3, 2022, pp. 2-4.

Note: The U.S. importer coverage figure presented, as provided by domestic producer and importer Centrus in its response, represents the firm's allocation of subject imports as determined by the quota pursuant to the terms of the suspension agreement. Centrus supplemental response to the notice of institution, November 4, 2022, p. 4.

Party comments on adequacy

The Commission received party comments on the adequacy of responses to the notice of institution and whether the Commission should conduct an expedited or full review from Centrus, CBR and PRI, GLE, and LES, all of which request that the Commission conduct an expedited review of the suspended investigation.[10]

The original investigation

The original investigation resulted from an antidumping duty petition filed on November 8, 1991, with Commerce and the Commission by the Ad Hoc Committee of Domestic Uranium Producers ("Ad Hoc Committee") and the Oil, Chemical and Atomic Workers International Union.[11] On December 23, 1991, the Commission determined that there was a reasonable indication that an industry in the United States was being materially injured by reason of imports of uranium from the U.S.S.R. that allegedly were being sold at less than fair value.[12] On December 25, 1991, the U.S.S.R. dissolved, and shortly thereafter the United States recognized the twelve newly independent countries which emerged: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, the Russian Federation (Russia), Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. Commerce investigated imports from each of these countries and determined that imports of uranium from Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Ukraine, and Uzbekistan were being, or were likely to be, sold in the United States at

[10] Centrus comments on adequacy, November 14, 2022, pp. 2-3; CBR/PRI comments on adequacy, November 14, 2022, pp. 2-3; GLE comments on adequacy, November 14, 2022, pp. 2-3; LES comments on adequacy, November 14, 2022, pp. 1-3. Parties also noted language in the 2008 and 2020 amendments to the suspension agreement (discussed in "The Russian Suspension Agreement ("RSA")" subsection below) indicating that the parties to the agreement agreed that these reviews shall be expedited at both Commerce and the Commission.

[11] Uranium from U.S.S.R., Inv. No. 731-TA-539 (Preliminary), USITC Publication 2471, December 1991 ("Original preliminary publication"), p. A-3. The members of the Ad Hoc Committee were Ferret Exploration Co., Inc., Denver, Colorado; First Holding Co., Denver, Colorado; Geomex Minerals, Inc., Denver, Colorado; Homestake Mining Co., San Francisco, California; IMC Fertilizer, Inc., Northbrook, Illinois; Malapai Resources Co., Houston, Texas; Pathfinder Mines Corp., Bethesda, MD; Power Resources, Inc., Denver, Colorado; Rio Algom Mining Corp., Oklahoma City, Oklahoma; Solution Mining Corp., Laramie, Wyoming; Total Minerals, Corp., Houston, Texas; Umetco Minerals Corp., Danbury, Connecticut; Uranium Resources, Inc., Dallas, Texas; and Oil, Chemical and Atomic Workers International Union, Denver, Colorado.

[12] Original preliminary publication, pp. 1 and A-3.

less than fair value ("LTFV").[13] Accordingly, the Commission instituted final investigations Nos. 731-TA-539-A through F under section 735(b) of the Act (19 U.S.C. 1673d (b)).

In a letter dated September 16, 1992, Commerce notified the Commission of its intent to suspend the antidumping duty investigation on uranium from Russia. Accordingly, the Commission suspended its investigation. On October 20, 1992, before the Commission reached determinations on the subject countries, Commerce notified the Commission that it was entering into suspension agreements with all of the subject countries to restrict the volume of direct or indirect exports to the United States of uranium and was therefore suspending its investigations.[14] The Commission suspended its final investigations immediately thereafter.

The suspensions remained in effect for all six subject countries until April 1993, when Commerce notified the Commission that its agreements with Tajikistan and Ukraine were terminated and its corresponding investigations were resumed.[15] The Commission thereupon continued investigation Nos. 731-TA-539-D (Tajikistan) and 539-E (Ukraine), and on August 6, 1993, reached a negative determination with respect to Tajikistan and an affirmative determination with respect to Ukraine.[16]

The remaining investigations remained suspended until January of 1999 when Commerce notified the Commission that it was resuming its antidumping investigation on Kazakhstan as a result of the Government of Kazakhstan's termination of its suspension agreement on uranium.[17] The Commission reached a negative determination with respect to the antidumping investigation concerning imports of uranium from Kazakhstan on July 23, 1999.[18]

[13] 57 FR 2330, June 3, 1992.

[14] 57 FR 49220, 49235, October 30, 1992. Commerce also amended its preliminary determinations to include HEU in the scope of the investigations.

[15] 58 FR 21144, April 19, 1993; and 58 FR 29197, May 19, 1993.

[16] Uranium From Tajikistan and Ukraine, Investigations Nos. 731-TA-539-D and 539-E (Final), USITC Publication 2669, August 1993, p. 1.

[17] 64 FR 2877, January 19, 1999.

[18] Uranium from Kazakhstan, Investigation No. 731-TA-539-A (Final), USITC Publication 3213, July 1999, p. I-2; 64 FR 40897, July 28, 1999.

The first five-year reviews

The Commission instituted its first reviews of the suspension agreements on Kyrgyzstan, Russia, and Uzbekistan and the antidumping duty order on Ukraine on August 2, 1999.[19] Commerce terminated its suspended investigation on Kyrgyzstan on November 3, 1999, because no domestic party responded to its notice of initiation of the five-year review [20] and the Commission thereafter terminated its corresponding five-year review.[21] Therefore, the countries that remained under suspension agreements (Russia and Uzbekistan) and under an antidumping duty order (Ukraine) were those subject to the Commission's full first five-year reviews.

On November 4, 1999, the Commission determined that full sunset reviews of the suspension agreements on uranium from Russia and Uzbekistan and the antidumping duty order on Ukraine should proceed.[22] On March 3, 2000, Commerce found that revocation of the antidumping duty order on uranium from Ukraine would likely lead to continuation or recurrence of dumping.[23] On July 5, 2000, Commerce found that revocation of the antidumping duty suspension agreements on uranium from Russia and Uzbekistan would likely lead to continuation or recurrence of dumping.[24] On August 7, 2000, the Commission determined that termination of the suspended investigation concerning Uzbekistan and revocation of the antidumping duty order regarding the Ukraine would not be likely to lead to continuation or recurrence of material injury. The Commission further determined that termination of the suspended investigation concerning uranium from Russia would be likely to lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time.[25] Following these determinations, Commerce published notice of the continuation of the suspended antidumping duty investigation concerning uranium from Russia on August 22, 2000.[26]

[19] 64 FR 41965, August 2, 1999.
[20] 64 FR 59737, November 3, 1999.
[21] 64 FR 61939, November 15, 1999.
[22] 64 FR 62691, November 17, 1999.
[23] 65 FR 11552, March 3, 2000.
[24] 65 FR 41439 and 41441, July 5, 2000.
[25] 65 FR 48734, August 9, 2000.
[26] 65 FR 50958, August 22, 2000; 65 FR 52407, August 29, 2000.

The second five-year review

On October 4, 2005, the Commission determined that it would conduct a full review of the suspended investigation on uranium from Russia.[27] On June 6, 2006, Commerce published its determination that termination of the suspension agreement on uranium from Russia would likely lead to continuation or recurrence of dumping.[28] On August 1, 2006, the Commission notified Commerce of its determination that termination of the suspended investigation on uranium from Russia would likely lead to continuation or recurrence of material injury to an industry in the United States within a reasonably foreseeable time[29] and, on August 11, 2006, Commerce issued the second continuation of the suspended investigation.[30]

The third five-year review

On October 4, 2011, the Commission determined it would conduct an expedited review of the suspended investigation on uranium from Russia.[31] On November 4, 2011, Commerce published its determination that termination of the suspension agreement on uranium from Russia would likely lead to continuation or recurrence of dumping.[32] On February 27, 2012, the Commission determined that material injury would be likely to continue or recur within a reasonably foreseeable time[33] and, on March 8, 2012, Commerce issued the third continuation of the suspended investigation.[34]

[27] 70 FR 60368, October 17, 2005.
[28] 71 FR 32517, June 6, 2006.
[29] 71 FR 44707, August 7, 2006.
[30] 71 FR 46191, August 11, 2006.
[31] 76 FR 64107, October 17, 2011.
[32] 76 FR 68404, November 4, 2011.
[33] 77 FR 12880, March 2, 2012.
[34] 77 FR 14001, March 8, 2012.

The fourth five-year review

On May 8, 2017, the Commission determined that it would conduct an expedited review of the suspended investigation on uranium from Russia.[35] On June 9, 2017, Commerce determined that termination of the suspension agreement on uranium from Russia would be likely to lead to continuation or recurrence of dumping and subsidization.[36] On September 20, 2017, the Commission determined that material injury would be likely to continue or recur within a reasonably foreseeable time.[37] Following affirmative determinations in the five-year review by Commerce and the Commission, effective October 2, 2017, Commerce issued the fourth continuation of the suspended investigation.[38]

[35] 82 FR 27287, June 14, 2017.
[36] 82 FR 26776, June 9, 2017.
[37] 82 FR 44842, September 26, 2017.
[38] 82 FR 45810, October 2, 2017.

Agreements regarding imports of uranium from Russia[39]

The Russian Suspension Agreement ("RSA")

1992 Original Suspension Agreement

The original agreement to suspend the antidumping duty investigation on uranium from the Russian Federation was signed on October 16, 1992.[40] Under that agreement, the Russian Federation Ministry for Atomic Energy agreed to restrict the volume of direct or indirect exports to the United States of uranium products from all producers and exporters of such products in Russia subject to the agreement's terms. The agreement's basic provision for controlling imports was an export quota expressed in pounds U_3O_8 equivalent and kilograms uranium (kg U). It was enforced through export licensing and certification. On a semi-annual basis, Commerce was to determine the market price for subject uranium in the United States and the corresponding quota level. The market price was based on the weighted average of the spot market and long-term contract prices.[41] The agreement permitted importation of uranium from Russia for processing in the United States for re-export where such imports were not for sale or consumption in the United States and where re-exports took place within 12 months of entry.

1994 Amendment

Since the original 1992 agreement suspending the antidumping duty investigation on Russian uranium, there have been a number of amendments. The first amendment, effective March 11, 1994, was made "to restore the competitive position of the U.S. industry" by introducing the concept of "matched sales" in the United States of Russian-origin and U.S.-origin natural uranium and separative work units ("SWU").[42] The matched imports, through which quota amounts of uranium from Russia could be imported into the United States,

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[39] This section is based on information contained in Uranium from Russia, Inv. No. 731-TA-539-C (Fourth Review), USITC Publication 4727, September 2017 ("Fourth review publication"), pp. I-8—I-12, and updated to include information on the 2020 Amendment.

[40] 57 FR 49221, October 30, 1992. Commerce also amended its preliminary determination to include HEU in the scope of the investigations.

[41] The market price determinations and quota calculations were to be made semi-annually on October 1 and April 1 of each year with the exception of the first period which began on October 16, 1992.

[42] 59 FR 15373, April 1, 1994. The amendment also extended the duration of the Suspension Agreement to March 31, 2004. A SWU is a unit of measurement of the effort needed to separate the U^{235} and U^{238} atoms in natural uranium in order to create a final product that is richer in U^{235} atoms.

provided that a U.S. partner with an equivalent form and quantity of domestically produced uranium was also party to the sale or contractual arrangement and that the Russian material was priced such that the price of the U.S. component could be greater than the average price to the customer. The amendment also provided for matched import ratios, 50-50 in the first year to be adjusted thereafter based on the level of U.S. production.[43] On July 31, 1998, Commerce announced a change to the administration of matched sales. Previously, Commerce used a delivery year quota of April 1 through March 31. At the request of Nuclear Energy Institute members, Commerce switched to a calendar year of January 1 through December 31 to conform with the members' other internal tracking systems (i.e. budgeting, requests for quotes, deliveries).[44]

1996 Amendments

In April 1996, Congress passed the United States Enrichment Corporation Privatization Act (42 U.S.C. § 2297h, et seq.), transferring the ownership interests of the United States in USEC to the private sector.[45] To make the RSA consistent with the USEC Privatization Act, an amendment to the Suspension Agreement, effective October 3, 1996, provided for the sale in the United States of feed associated with imports of Russian low enriched uranium ("LEU") derived from HEU.[46]

Substantial quantities of uranium products produced from Russian ore and not subject to the RSA began to undermine the agreement's effectiveness. To address this situation, another amendment, also effective on October 3, 1996, covered Russian uranium which had been enriched in a third country within the terms of the RSA. This amendment also restored previously unused quotas for SWU. These modifications were to remain in effect until October 3, 1998.[47]

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[43] 59 FR 15376, April 1, 1994.

[44] 63 FR 40879, July 31, 1998.

[45] H 3931, §3103, Title III Rescissions and Offsets, Chapter 1, Energy and Water Development, Subchapter A-United States Enrichment Corporation Privatization, April 25, 1996.

[46] 61 FR 56665, November 4, 1996. HEU feed refers to the natural uranium feed associated with the LEU (derived from HEU), which is imported pursuant to the Agreement Between the Government of the United States of America and the Government of the Russian Federation Concerning the Disposition of Highly Enriched Uranium Extracted from Nuclear Weapons (The HEU Agreement), signed February 18, 1993.

[47] 61 FR 56665, November 4, 1996.

1997 Amendment

Another amendment to the RSA was signed, effective on May 7, 1997, to encourage processing in the United States of uranium products from Russia. The amendment doubled the amount of Russian-origin uranium which was allowed to be imported into the United States for further processing prior to re-exportation. In addition, the amendment lengthened the period of time uranium could remain in the United States for such processing from 12 months to up to three years.[48]

2008 Amendment

On February 1, 2008, mindful of the approaching expiration of the HEU agreement (see subsequent section in this report entitled "The HEU Agreement"), Commerce and the Government of Russia signed another amendment to the RSA instituting new quotas through 2020 for commercial Russian uranium exports sold directly or indirectly to U.S. utilities or otherwise.[49]

Commerce noted the following from Section XII of the 2008 Amendment:

> In addition, {Commerce} shall conduct sunset reviews under 19 U.S.C. 1675(c) in the years 2011 and 2016. All parties agree that the sunset reviews shall be expedited, pursuant to 19 U.S.C. 1675(C)(4) and (C)(3)(B), respectively, at both {Commerce} and the International Trade Commission.

[48] 62 FR 37879, July 15, 1997.

[49] 73 FR 7705, February 11, 2008. The 2008 Amendment included the following provisions: (1) Small amounts of commercial LEU from Russia were allowed into the United States between 2008 through 2013; (2) During 2014-20, following the expiration of the HEU Agreement, the import quota would be raised to approximate 20 percent of the U.S. enrichment market; (3) After 2020, the RSA would expire; and (4) In contrast to the HEU Agreement, the enriched uranium allowed into the United States from Russia after 2013 but before 2021 could be from LEU produced directly through the nuclear fuel cycle, i.e., the LEU does not have to be produced from downblended HEU. Additionally, also in contrast to the terms of the HEU Agreement, the LEU could be sold directly to U.S. utilities without requiring the services of an executive agent.

The Domenici Amendment

In September 2008, Congress enacted legislation which codified many provisions in the amended RSA and instituted import quotas through 2020 that in large part mirror the quotas in the 2008 Amendment.[50] The Domenici Amendment allowed Russia to export to the United States an additional 5 percent of enriched uranium as SWU provided that Russia downblended proscribed amounts of HEU. The RSA and the Domenici Amendment applied to all LEU purchases including LEU pursuant to SWU contracts.

The HEU Agreement

The Agreement Between the Government of the United States and the Government of the Russian Federation Concerning the Disposition of Highly Enriched Uranium Extracted from Nuclear Weapons ("HEU Agreement") was signed on February 19, 1993. The Russian HEU Agreement facilitated the conversion of HEU extracted from Russia's nuclear weapons, into LEU for use as fuel in commercial nuclear reactors. This Agreement was reached to further the objectives of broader arms control agreements, in particular the Treaty on the Non-Proliferation on Nuclear Weapons of July 1, 1968. The HEU Agreement provided that the United States would purchase from Russia 500 metric tons of HEU converted to LEU over 20 years (1994-2013). These purchases were made by USEC as the executive agent of the U.S. Government under a 1994 HEU contract with the Russian state-owned corporation, Techsnabexport ("Tenex"). In each purchase, USEC traded natural uranium for Tenex's downblended HEU. Tenex then sold the natural uranium to three western uranium suppliers and retained a portion for itself. The USEC Privatization Act imposed a quota on the total quantity of natural uranium delivered to Tenex that could be sold each year for consumption in the United States, either directly by Tenex or through one of its customers.

The HEU Agreement ended in December 2013, and there has been no new agreement since to extend or re-new the arrangement.

[50] Consolidated Security, Disaster Assistance, and Continuing Appropriations Act, 2009, HR. 2638, 110th Cong. Section 8118 ("Domenici Amendment"), pp. 110-123, September 2008. On February 2, 2010, Commerce issued a Statement of Administrative Intent, which contained guidelines clarifying Commerce's intent with regard to the implementation of the amended RSA and to take into consideration the requirements of the Domenici Amendment. Statement of Administrative Intent, February 2, 2010.

2020 Amendment

On October 5, 2020, Commerce and the government of Russia's State Atomic Energy Corporation Rosatom signed another amendment to the RSA. This amendment:

- Extended the duration of the RSA through 2040;
- Established new export limits to an (on average) lower percent of U.S. enrichment demand;
- Revised the "returned feed" provisions from the prior RSA to require foreign-origin returned feed that is enriched or sold in third countries to be subject to the RSA's export limits if exported back to the United States, and;
- Established a cap on exports pursuant to enriched uranium product sales equivalent to 15 percent of U.S. enrichment demand in 2021, 9.8 percent in 2022, 10.2 percent in 2023, 5.7 percent in 2024, 5.3 percent in 2025, and 5 percent per year from 2026 to 2040. The cap for additional exports pursuant to sales of SWU plus conversion is equivalent to 1 percent of U.S. enrichment demand in 2021, approximately 3 percent from 2022 to 2025, and zero percent from 2026 to 2040.[51]

[51] 85 FR 64112, October 5, 2020. The draft text of the amendment was issued on September 16, 2020 for public comment. 85 FR 57824, September 16, 2020. The signed amendment was virtually identical to the draft amendment.

Previous and related investigations

The Commission has conducted one previous grouped import relief investigation on low enriched uranium, as outlined below in table I-3.

Table I-3
Uranium: Previous and related Commission proceedings and status of orders

Date	Number	Countries	ITC original determination	Current status of order
2000	701-TA-409-412 and 731-TA-909	France, Germany, the Netherlands, and the United Kingdom	Affirmative	CVD orders on Germany, the Netherlands, and the United Kingdom revoked before first review (2006); CVD order on France revoked after institution of first review (2007); AD order on France revoked after institution of third review (2018).

Source: U.S. International Trade Commission publications and Federal Register notices.

Note: "Date" refers to the year in which the investigation or review was instituted by the Commission.

Commerce's five-year review

Commerce announced that it would conduct an expedited review with respect to the suspended investigation on uranium from Russia with the intent of issuing the final results of this review based on the facts available not later than December 30, 2022.[52] Commerce publishes its Issues and Decision Memoranda and its final results concurrently, accessible upon publication at http://enforcement.trade.gov/frn/. Issues and Decision Memoranda contain complete and up-to-date information regarding the background and history of the order, including scope rulings, duty absorption, changed circumstances reviews, and anticircumvention, as well as any decisions that may have been pending at the issuance of this report.

[52] Letter from Alex Villanueva, Senior Director, Office I, Enforcement and Compliance, U.S. Department of Commerce to Nannette Christ, Director of Investigations, October 25, 2022.

The product

Commerce's scope

Commerce has defined the scope as follows:

> The product covered by the Suspension Agreement is natural uranium in the form of uranium ores and concentrates; natural uranium metal and natural uranium compounds; alloys, dispersions (including cermets), ceramic products, and mixtures containing natural uranium or natural uranium compounds; uranium enriched in U^{235} and its compounds; alloys, dispersions (including cermets), ceramic products, and mixtures containing uranium enriched in U^{235} or compounds of uranium enriched in U^{235}; and any other forms of uranium within the same class or kind.
>
> Uranium ore from Russia that is milled into $U_3 O_8$ and/or converted into UF_6 in another country prior to direct and/or indirect importation into the United States is considered uranium from Russia and is subject to the terms of this Suspension Agreement.
>
> For purposes of this Suspension Agreement, uranium enriched in U^{235} or compounds of uranium enriched in U^{235} in Russia are covered by this Suspension Agreement, regardless of their subsequent modification or blending. Uranium enriched in U^{235} in another country prior to direct and/or indirect importation into the United States is not considered uranium from Russia and is not subject to the terms of this Suspension Agreement.[53]
>
> HEU is within the scope of the underlying investigation, and HEU is covered by this Suspension Agreement. For the purpose of this Suspension Agreement, HEU means uranium enriched to 20 percent or greater in the isotope uranium-235. [54]

[53] The second amendment of two amendments to the Suspension Agreement effective on October 3, 1996, in part included within the scope of the Suspension Agreement Russian uranium which had been enriched in a third country prior to importation into the United States. According to the amendment, this modification remained in effect until October 3, 1998. See 61 FR 5665, 56667, November 4, 1996.

[54] 82 FR 45810, October 2, 2017.

U.S. tariff treatment

Uranium covered by this review is currently imported under Harmonized Tariff Schedule of the United States ("HTS") subheadings/statistical reporting numbers 2612.10.0000, 2844.10.1000, 2844.10.2010, 2844.10.2025, 2844.10.2055, 2844.10.5000, 2844.20.0010, 2844.20.0020, 2844.20.0030, and 2844.20.0050. For these statistical reporting numbers, uranium produced in Russia comes into the U.S. market at a column 2 duty rate of "free" (subheading 2612.10.00, 2844.10.20, or 2844.20.00) or 45 percent ad valorem (2844.10.10 or 2844.10.50). Decisions on the tariff classification and treatment of imported goods are within the authority of U.S. Customs and Border Protection.

Description and uses[55]

Uranium (U) is a heavy, naturally and slightly radioactive, metallic element (atomic number 92). Uranium is one of over 100 basic chemical elements, or types of atoms, known to occur in nature. Each element is defined by the number of its atoms' protons, one of the atom's three building blocks along with electrons and neutrons. The uranium atom has 92 protons and thus ranks 92nd among the elements. Although the number of protons and electrons in the element's atoms (assumed to be neutral) is equal and consistent, the number of neutrons can vary, resulting in different "isotopes" of the same element, each with slightly different properties. Uranium has three principal isotopes—U^{238}, U^{235}, and U^{234}—which constitute 99.285 percent, 0.71 percent, and 0.005 percent, respectively, of the element's weight in its natural elemental state. U^{235} is the only naturally occurring fissionable nuclide, i.e., when bombarded by thermal neutrons, the U^{235} atom disintegrates, creating a self-perpetuating chain reaction with the release of energy. It is the fissionable property of the U^{235} isotope that is important for uranium's principal uses – primarily as a fuel to generate electricity in nuclear power plants and secondarily as a fuel to propel naval vessels and as an active ingredient in atomic weaponry.

The half-lives of U^{235} and U^{238} are 7.13×10^8 and 4.51×10^9 years, respectively. Because of these slow rates of radioactive decay, natural uranium is only mildly radioactive. By contrast, elemental uranium (uranium metal) is highly reactive chemically. A fresh surface of elemental uranium is silvery gray in color, but rapidly oxidizes to black oxide in air at room temperature. Chips and powder of uranium are highly pyrophoric (igniting spontaneously when exposed to air), and the metal is a strong reducing agent.

[55] Unless otherwise noted, this information is based on the Fourth review publication, pp. I-14-I-17.

Uranium is one of the less common elements but its compounds are readily soluble and widely distributed in many mineral and rock types throughout the world. Most of the large economic deposits have a uranium content greater than 0.10 percent triuranium octoxide (U_3O_8). Uranium does not occur in nature in the elemental state but only in chemical combinations with other elements. It is an important constituent in 155 minerals and a measurable constituent in nearly 500 minerals. Therefore, as a first step, natural uranium is mined or recovered from naturally occurring mineral deposits.

"Yellowcake" is the term often applied to the concentrate produced at uranium mills. The exact chemical composition of uranium concentrate is variable and the industry generally includes purified natural uranium oxides in its definition of uranium concentrate. In the United States, the terms uranium concentrate, yellowcake, and natural uranium oxides are used interchangeably in the industry. The uranium industry has adopted the practice of expressing the natural uranium content of uranium concentrates in terms of U_3O_8 equivalent. Most uranium concentrates contain a minimum of 75 percent U_3O_8, and average 80 to 85 percent U_3O_8.

"Enriched uranium" is uranium in which the concentration of isotope U^{235} has been increased (i.e., the product has been "enriched in U^{235}") relative to the natural state. Uranium enrichment is essentially taking a feedstock consisting of a mixture of U^{235} and U^{238} and increasing the relative amount of U^{235} in one batch while necessarily reducing the relative amount of U^{235} in a second batch. The first batch is the product (the enriched uranium) whereas the second batch which contains less U^{235} than in the feedstock is referred to as depleted uranium or tails and is often considered a waste product.

U^{235} is indispensable to the nuclear energy industry because it is the only isotope existing in nature, to any appreciable extent, that is fissionable by thermal neutrons, i.e., at about room temperature. Enrichment of uranium fuel lowers the size of the "critical mass" assemblies of "light-water" nuclear reactors and, therefore, lowers capital cost requirements for the reactors. Enriched uranium for use by commercial power plants in the United States generally has 3 to 5 percent U^{235} by weight. Depleted uranium usually contains between about 0.2 percent and 0.35 percent U^{235} but there are exceptions to this rule, particularly in relationship to Russia's nuclear industry.

The industry has accepted a basic unit of quantity derived from thermodynamics to measure the effort needed to enrich a given amount of uranium from the initial enrichment level to a higher enrichment level. This unit of measurement is referred to as separative work unit ("SWU"). The amount of SWU required is proportional to the amount of uranium to be enriched and increases (but not linearly) the greater the level of enrichment. In other words, it

requires more SWU to enrich a given amount of natural uranium (containing about 0.7 percent U^{235}) to 5 percent U^{235} than to enrich the same amount of natural uranium to 3 percent U^{235}.

Uranium is enriched by gas-centrifuge technology. In order to use this process, the uranium must be present in a compound that can be readily converted to a gas. For a number of technical reasons, such as a relatively low boiling point, uranium hexafluoride is well suited for this purpose. Uranium hexafluoride (UF_6) is a white solid at ambient temperature and pressure and is obtained by the chemical treatment of uranium concentrate or oxides. UF_6 forms a vapor at temperatures above 56 degrees Centigrade and is the form of uranium used for the enrichment process. Consequently, two types of UF_6 are of commercial significance (i.e., "natural" and "enriched").

After enrichment in U^{235}, the uranium hexafluoride is converted to a fuel form for use in the manufacture of nuclear fuel assemblies. These forms include the oxides (usually enriched UO_2), or metals, alloys, carbides, nitrides, and salt solutions of enriched uranium. Pelletized ceramic UO_2 is the most common fuel form used in light-water reactors, which are the type of reactors used by utilities in the United States. Enriched uranium is then encapsulated in protective metal sheaths to produce a "fuel rod." Fuel rods are then assembled into the required configuration for use in a power plant's nuclear reactor.

Nuclear fuel for commercial power reactors for the generation of electricity is the predominant commercial application for uranium. In the United States and most other countries, natural uranium must first be converted into enriched uranium, i.e., the U^{235} component must be increased. However, a few reactor designs, e.g., CANDU reactors deployed in Canada, Argentina, China, India, Pakistan, Romania, and South Korea, directly use natural uranium as the fuel.[56] On the other hand, many of the advanced small modular reactor designs currently under development with funding from the DOE use a high-assay low-enriched uranium (HALEU) fuel enriched to between 5 percent and 20 percent uranium-235. Russia is the only commercial source of HALEU, although Centrus has a contract with DOE to complete an enrichment facility demonstrating production of HALEU (due to start producing in 2023).[57] Other uses for uranium include Government-sponsored nuclear programs, including weapons,

[56] WNA, "Uranium Enrichment," http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx (updated October 2022); WNA, "Nuclear Power in Canada," https://world-nuclear.org/information-library/country-profiles/countries-a-f/canada-nuclear-power.aspx (updated August 2022).

[57] Mcfarlane, Gardner, and Twidale, "America's New Nuclear Power Industry Has a Russian Problem," October 20, 2022, https://www.reuters.com/business/energy/americas-new-nuclear-power-industry-has-russian-problem-2022-10-20/.

propulsion (particularly nuclear powered submarines and aircraft carriers), underground tests, isotope production, research and development, and space applications.

Relatively small quantities of uranium, depleted in U^{235}, are used in specialized non-energy applications, principally for military ordnance. Depleted uranium readily forms alloys with other metals, has a very high density, and is easy to fabricate, which makes it useful for some applications. However, there are also some concerns over the short- and long-term health effects from exposure to depleted uranium, even though it is less radioactive than natural uranium. The United States currently produces much greater quantities of depleted uranium than it uses. Depleted uranium with no commercial use is either disposed of as low-level radioactive waste or transferred to the U.S. Department of Energy, which has an ongoing project converting about 800,000 metric tons of depleted UF_6 into more stable depleted uranium oxide.[58]

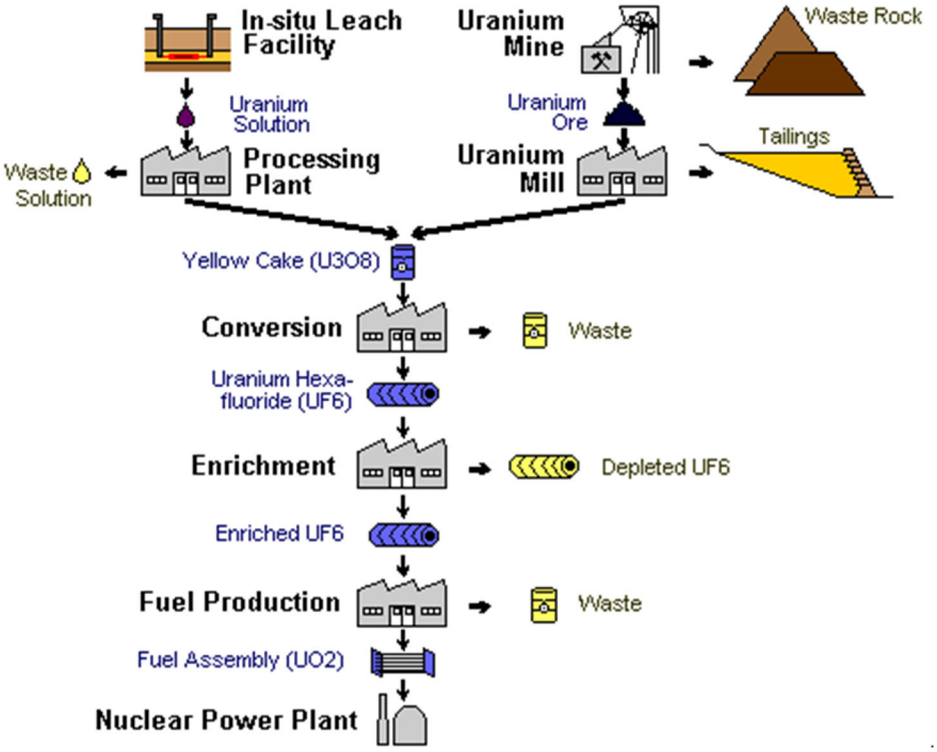
Manufacturing process[59]

Uranium is generally found in molecular combination with oxygen, embedded in various concentrations in rock formations, known as uranium ores, throughout the world. Unlike the production of other mineral or metallic products, the process by which uranium is transformed into a nuclear fuel for the generation of electricity involves four successive processes administered by four types of generally independent producers. The various steps in converting uranium ore to nuclear fuel suitable for use in light water reactors is shown in figure I-1.

[58] DOE, "DUF6 Conversion Project," https://www.energy.gov/pppo/pppo-services/pppo-cleanup-projects-portsmouth-paducah-duf6/duf6-conversion-project (accessed October 27, 2022); DOE, "EM Restarts DUF6 Conversion at Improved Portsmouth, Paducah Facilities," October 25, 2022, https://www.energy.gov/em/articles/em-restarts-duf6-conversion-improved-portsmouth-paducah-facilities.

[59] Unless otherwise noted, this information is based on the Fourth review publication, pp. I-17-I-22.

Figure I-1
Uranium: Nuclear fuel production chain for light water reactors



Source: Fourth review publication, p. I-18, figure I-1.

Table I-4 below identifies the producers and products for the four main steps involved in manufacturing uranium-based nuclear fuel.

Table I-4
Uranium: Producers and manufacturing process overview

Producer	Product	Process
Miners/ concentrators	Natural uranium concentrate, also known as “yellowcake”	Mining uranium-containing ores and concentrating the uranium into the molecular form U_3O_8
Converters	Natural uranium hexafluoride	Converting the U_3O_8 into UF_6
Enrichers	Enriched uranium hexafluoride	Enriching the UF_6 by increasing the proportion of U^{235}
Fabricators	Enriched uranium oxides, nitrates, and metals	Fabricating the enriched uranium in a final form suitable for positioning and use in a nuclear reactor

Source: Fourth review publication, p. I-19.

Further details on the production process for each of the key forms of uranium in the nuclear fuel cycle are provided in the descriptions below.

Miners/concentrators (natural uranium concentrate—U_3O_8)

In the uranium industry, the milling operation comprises the entire mechanical and chemical processing from the crushing and grinding of the ore to the precipitation of a marketable uranium concentrate. Mine-run ores are crushed before going to the grinding circuit. Jaw or impact-type crushers are commonly used for the primary crush. Impact, cone, or gyratory crushers are used for the secondary crushing stage.

"Unconventional uranium mining" includes various leaching methods and byproduct operations. For example, uranium is leached from the ore slime by either alkaline treatment (sodium carbonate or sodium bicarbonate) or acid treatment (usually sulfuric acid). In both techniques, oxidation is necessary to convert uranium to the soluble form. Uranium in leach solutions is recovered and purified by solvent extraction or ion exchange. Uranium is precipitated as uranium concentrate that is then filtered, dried, and packaged for shipment. Uranium concentrate is chemically stable and is usually stored and shipped in 55-gallon steel drums.

In-situ and heap leaching are employed to recover uranium from deposits that may not be economically recoverable by conventional mining methods. The in-situ method involves leaching uranium from mineralized ground in place and is also referred to as "solution mining." The leaching solution is generally a carbonate, and an oxidant, such as oxygen, is added to improve leaching. In-situ leaching ("ISL") is a very cost-effective method of production because of the low capital and labor costs compared with the costs of a conventional mine. The use of in-situ leaching has grown over time and is the most common method for mining uranium in the United States.[60] However, not all uranium deposits are geologically suitable for in-situ mining. Uranium concentrates are also produced as a byproduct of phosphoric acid production; from gold, copper, and other minerals mining; and from mine water. Extracting uranium from seawater is not yet cost competitive with these other recovery techniques, but researchers globally have continued to develop techniques improving the rate of uranium absorption from seawater.[61]

Converters (natural uranium hexafluoride—UF_6)

Conversion of uranium concentrate to natural uranium hexafluoride (UF_6) is not done in the United States at the mills but is done by "converters." Several processes have been used to

[60] WNA, "In Situ Leach Mining of Uranium," https://world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/in-situ-leach-mining-of-uranium.aspx (updated September 2020).

[61] B. David Zarley, "Researchers Discover a Way to Extract More Than 95% of Uranium from Seawater," September 4, 2022, https://bigthink.com/hard-science/extract-uranium-seawater/.

convert uranium concentrate to UF_6. ConverDyn's facility in the United States uses what is known as the "dry process," strongly heating uranium oxide concentrate to remove some of the impurities and then agglomerating and crushing the U_3O_8. Other facilities more commonly use the "wet process," dissolving the uranium concentrate in nitric acid, purifying the solution by solvent extraction, removing the uranium with a dilute nitric acid solution, and then subjecting the resulting uranium nitrate solution to heat and decomposing it to an oxide. For both processes, the resulting crushed U_3O_8 or purified uranium oxide is then typically reacted with hydrofluoric acid and fluorine to produce UF_6. The natural UF_6 is then held in inventory until instructions are issued for shipment to an enrichment plant. UF_6 is a highly reactive chemical and is stored and transported in heavy-wall steel cylinders.

Enrichers (enriched uranium hexafluoride)

Before uranium can be used as a fuel in most nuclear power plants, the proportion of its U^{235} isotope must be increased relative to that of its other isotopes.[62] In the enrichment process, the proportion of U^{235} of the uranium in natural UF_6 is increased from 0.71 percent to about 3-5 percent by weight of UF_6 in LEU.

The industry uses a standard of measure of effort or service employed in the uranium enrichment industry known as separative work units, which is commonly abbreviated as SWUs. It is a measure of the effort that is required to transform a given amount of natural uranium feed stock (UF_6) into two streams of uranium, one enriched in the U^{235} isotope and the other depleted in the U^{235} isotope.

Gas centrifuge is the principal method for uranium enrichment.[63] It is based on the principle that a partial separation of the components of a gaseous mixture results when the gas is subjected to a pressure gradient. The isotopic separation of UF_6 is affected by the high-speed rotation in centrifuges in which the lighter U^{235} isotope moves at a greater velocity in the pressure gradient in the centrifuges. The UF_6 gas is spun in a series of centrifuges; the heavier U^{238} tends to move toward the outer walls of the centrifuge whereas the lighter U^{235} tends to remain near the center. After the uranium is subjected to repeated spins, appreciable separation is achieved between the lighter U^{235} and the heavier U^{238}. Gas centrifuge plants have fully displaced gaseous diffusion plants, another method for enrichment that is no longer in use. Centrifuge technology benefited from lower electricity costs, a modular design which

[62] Most of the world's and all of the U.S. nuclear power plants are so-called "light-water" reactors and require enriched uranium for fuel; however, there are a small number of others, known as "heavy-water" reactors, that are capable of using natural uranium.

[63] Extensive research and development on enrichment technologies employing lasers has been conducted and is discussed later in this section.

allows for incremental expansion of capacity and production, as well as a higher effective operating capacity that approaches the nameplate capacity. USEC's plant in Paducah, Kentucky was the last remaining gaseous diffusion facility in the world and shut down in 2013.

Various country governments and companies have been involved in developing laser enrichment processes as a possible more efficient third-generation technology for enriching uranium. There are two categories of laser enrichment technologies, atomic (e.g., atomic vapor laser isotope separation or AVLIS) and molecular (separation of isotopes by laser excitation or SILEX). The United States has focused on advancing SILEX, also referred to as global laser enrichment. Global Laser Enrichment, LLC ("GLE") received a license from the U.S. Nuclear Regulatory Commission to develop a global laser enrichment plant at an existing fuel fabrication facility in Wilmington, North Carolina. GLE also has proposed developing a plant at the location of the shutdown gaseous diffusion plant in Paducah, Kentucky, reaching an agreement with DOE in 2016 to enrich about 300,000 metric tons of high-assay tails in storage to natural uranium levels over a 40-year period. GLE plans to complete its commercial demonstration pilot at the Wilmington facility in the mid-2020s, and to start commercial operations at the Paducah facility as soon as 2027.[64]

Fabricators (fabricated fuel)

Generally considered the final step in the production of nuclear fuel, enriched uranium hexafluoride from an enrichment plant must be converted to other uranium compounds or uranium metal for use in reactor applications.[65] LEU conversion is generally done by fuel fabricators as one step in the production of fuel rods and fuel assemblies to be used in commercial nuclear reactors. Fuel fabricators react uranium hexafluoride with water and hydrogen to obtain uranium dioxide (UO_2) that is used to make fuel rods and assemblies. Specifically, this involves converting the enriched UF_6 to enriched uranium oxides (primarily UO_2), nitrates, and metals, pelletizing this material, encapsulating the pellets into protective metal sheaths, called "fuel rods," and then assembling the rods into "fuel rod assemblies" in the specific configuration the nuclear power facility requires. In contrast to other steps in the fuel cycle, the production of fabricated fuel and fuel assembles is largely considered to be a customized part of the production process.

[64] WNN, "Testing Complete for Laser Enrichment Module," September 5, 2022, https://www.world-nuclear-news.org/Articles/Testing-complete-for-laser-enrichment-module; GLE response to the notice of institution, October 3, 2022, p. 3.

[65] LEU is most often converted from uranium hexafluoride to uranium oxide for use in commercial nuclear reactors, whereas HEU is generally reduced from uranium hexafluoride to uranium metal for use in nuclear weapons or small nuclear reactors.

The industry in the United States

U.S. producers

U.S. concentrate producers

Nineteen firms were cited as concentrate producers in the United States during the Commission's original investigation, all of which provided questionnaire responses in the preliminary phase investigation, although some of the firms had no production during January 1988-September 1991.[66] During the full first five-year reviews, the Commission identified seven U.S. concentrate producers, only five of which were producing at the end of the period examined and provided data in response to the Commission questionnaire.[67] During the full second five-year review, the Commission received U.S. producer questionnaires from five concentrate producers, including current domestic interested parties PRI and CBR (who filed a questionnaire together in that review).[68] In the expedited third five-year review, the Commission received one submission in response to its notice of institution from uranium concentrate producers: a joint response from PRI and CBR.[69] In the expedited fourth five-year review, PRI and CBR filed a response to the Commission's notice of institution and provided a list of nine known U.S. producers of uranium concentrate.[70]

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[66] Original preliminary publication, p. A-14.

[67] The five producers that provided data in the first five-year reviews (COGEMA, Everest, IMC Global, Rio Algom, and Uranium Resources) were believed to have represented all U.S. production of uranium concentrates at that time. Fourth review publication, table I-5; Uranium from Russia, Ukraine, and Uzbekistan, Investigation Nos. 731-TA-539-C, E, and F (Review), USITC Publication 3334, August 2000 ("First review publication"), p. III-1.

[68] The five producers that provided data in the second five-year review (Areva NC Inc.; Cotter Corp.; PRI; CBR; and Uranium Resources Inc.) were believed to have accounted for all U.S. production of uranium concentrates during 2005. Fourth review publication, table I-5; Uranium From Russia, Investigation No. 731-TA-539-C (Second Review), USITC Publication 3872, August 2006 ("Second review publication"), p. I-35. PRI and Crow Butte accounted for *** percent of reported 2005 domestic production of uranium concentrate. Investigation No. 731-TA-539-C (Second Review): Uranium from Russia, Confidential Report, INV-DD-101, June 30, 2006 ("Second review confidential report"), p. III-14.

[69] Uranium From Russia, Investigation No. 731-TA-539-C (Third Review), USITC Publication 4307, February 2012 ("Third review publication"), p. I-32. PRI and CBR accounted for *** percent of total U.S. production of natural uranium concentrates during 2010. Investigation No. 731-TA-539C (Third Review): Uranium from Russia, Confidential Report, INV-JJ-129, December 19, 2011 ("Third review confidential report"), p. I-3.

[70] Data provided in PRI's and CBR's response to the Commission's notice of institution in the fourth five-year review for 2016 were provided by four uranium concentrate producers (CBR, PRI, Ur-Energy, and Energy Fuels) that were believed to have represented more than 94 percent of U.S. production of uranium concentrates at that time. Fourth review publication, p. I-35 and table I-5.

In response to the Commission's notice of institution in the current fifth five-year review, four firms (CBR, PRI, Energy Fuels, and Ur-Energy) filed responses to the Commission's notice of institution and provided a list of 10 known U.S. producers of uranium concentrate.[71]

U.S. converter

In previous Commission proceedings on uranium, the sole converter in the United States has been ConverDyn, a joint venture between Honeywell International and General Atomics.[72] The firm owns and operates a single conversion facility in Metropolis, Illinois, and functions essentially as a toll producer, converting concentrate into natural uranium hexafluoride (UF_6).[73] In its response to the notice of institution in the current five-year review, ConverDyn confirmed that it is the only known U.S. converter, which was affirmed by other domestic interested parties.[74]

U.S. enrichers

In the original investigation and full first and second reviews, USEC (now Centrus) was the only identified enricher of uranium.[75] In the expedited third and fourth five-year reviews, two enrichers were identified: USEC/Centrus and LES, which commenced operations in New Mexico in June 2010.[76]

In response to the Commission's notice of institution in this current fifth five-year review, Centrus and LES both filed responses. In 2021 LES was the sole U.S. enricher of uranium; Centrus closed down its last enrichment facility in 2013, however in 2019 it signed a contract with the Department of Energy to begin demonstration of HALEU production, which

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[71] The four responding uranium concentrators estimated based on EIA data that they accounted for about *** percent of natural uranium concentrate production in the United States in 2021. CBR/PRI response to the notice of institution, October 3, 2022, exhs. 1 and 28; Energy Fuels response to the notice of institution, October 3, 2022, exh. 1; Ur-Energy response to the notice of institution, October 3, 2022, exh. 1.

[72] First review publication, p. III-1; Second review publication, p. III-9; Third review publication, p. I-33; Fourth review publication, p. I-26. In the Commission's original investigations two firms were identified as U.S. converters: Allied-Signal, Inc. (Morristown, New Jersey) and Sequoyah Fuels Corp. (Oklahoma City, Oklahoma). Original preliminary publication, p. A-15.

[73] Fourth review publication, p. I-26.

[74] ConverDyn's facility, which was placed in idle standby in November 2017, is scheduled to restart in 2023. ConverDyn response to the notice of institution, October 3, 2022, pp. 2-3.

[75] Original preliminary publication, p. A-15; First review publication, p. III-2; Second review publication, p. III-9.

[76] USEC, which accounted for almost all domestic production of LEU at the time, filed a response to the Commission's notice of institution in the third review. Both USEC and LES filed responses to the Commission's notice of institution in the fourth review. Third review publication, p. I-33; Fourth review publication, p. I-26.

has been extended through November 2022.[77] Additionally, GLE submitted a response to the Commission's notice of institution in this fifth five-year review. GLE plans to complete its commercial demonstration pilot at its Wilmington facility in the mid-2020s, and to start commercial operations at the Paducah facility as soon as 2027.[78]

U.S. fabricators

The number of U.S. fabricators has declined somewhat since the original investigations. In the original investigations and full first five-year review, five fabricators were identified,[79] and in the full second five-year review, three fabricators (Areva NP, Global Nuclear Fuel, and Westinghouse) were identified and responded to the Commission's questionnaires.[80] In their responses to the Commission's notice of institution for the third, fourth, and current fifth reviews, the domestic interested parties identified the same three firms as nuclear fuel fabricators.[81] No U.S. fabricators responded to the Commission's notice of institution in this fifth five-year review or in the previous third and fourth five-year reviews.[82]

[77] Centrus response to the notice of institution, October 3, 2022, p. 2.

[78] GLE response to the notice of institution, October 3, 2022, p. 3.

[79] Original preliminary publication, p. A-15; First review publication, p. I-9.

[80] Second review publication, p. 18.

[81] Fourth review publication, p. I-27; Centrus response to the notice of institution, October 3, 2022, p. 5; Energy Fuels response to the notice of institution, October 3, 2022, p. 5; GLE response to the notice of institution, October 3, 2022, p. 13; LES response to the notice of institution, October 3, 2022, p. 40; CBI/PRI response to the notice of institution, October 3, 2022, exh. 28; Ur-Energy response to the notice of institution, October 3, 2022, p. 5.

[82] Third review publication, p. I-44; Fourth review publication, p. 25.

Recent developments

Table I-5 presents events in the U.S. industry since the Commission's last five-year review.[83]

Table I-5
Uranium: Recent developments in the U.S. industry

Item	Firm	Event
Idling	ConverDyn/ Honeywell	In a January 11, 2018 letter, Honeywell (ConverDyn's owner) notified the U.S. Nuclear Regulatory Commission that it was idling its Metropolis Works uranium conversion plant in Metropolis, IL until business conditions improve.
Section 232 petition	Energy Fuel Resources, Ur-Energy USA	On January 16, 2018, uranium concentrate producers Energy Fuel Resources and Ur-Energy USA successfully petitioned the Secretary of Commerce to conduct an investigation under Section 232 of the Trade Expansion Act of 1962 to determine the effect of imports of uranium on national security.
Idling	Uranium One	On July 9, 2018, Uranium One idled production at the Willow Creek mine in Wyoming.
Presidential memorandum		On July 12, 2019, the President issued a memorandum on the section 232 investigation. Instead of applying import restrictions, the memorandum established a Nuclear Fuel Working Group to develop recommendations for reviving and expanding domestic nuclear fuel production.
Idling	Strata Energy	In July 2019, Peninsula Energy (parent company of Strata Energy) idled in-situ recovery operations in Crook, Wyoming.
Planned production	Centrus	On October 31, 2019, Centrus signed a contract with DOE to demonstrate production of high-assay low-enriched uranium (HALEU) in Piketon, Ohio. The contract has been extended through November 30, 2022; a separate contract for beginning HALEU production at the site is pending with the DOE as of October 2022.
Restructuring	GLE	In December 2019, GLE stakeholders Silex and Cameco agreed to jointly purchase GE-Hitachi's 76 percent stake, restructuring GLE into a joint venture.
License renewal	ConverDyn/ Honeywell	On March 25, 2020, the NRC renewed Honeywell's operating license for the Metropolis Works conversion plant for another 40 years.
NFWG report		On April 23, 2020, the Nuclear Fuel Working Group released a report outlining a strategy for restoring U.S. competitiveness in the nuclear energy sector, including a recommendation to establish a uranium reserve.

[83] For recent developments, if any, in tariff treatment, please see "U.S. tariff treatment" section.

Item	Firm	Event
Suspension agreement	ROSATOM	On October 5, 2020, Commerce and ROSATOM signed a finalized amendment extending the Suspension Agreement through 2040.
Planned restart	ConverDyn/ Honeywell	In February 2021, Honeywell announced that it planned to restart the Metropolis conversion plant in early 2023.
License approval	Centrus	In June 2021, Centrus received a license to produce HALEU from the U.S. Nuclear Regulatory Commission.
Planned restart	Western Uranium & Vanadium	On July 6, 2021, Western Uranium & Vanadium Corp announced that it was preparing to resume mining activities at the Sunday mine complex in Colorado, "in anticipation of the uranium price rising substantially over the next year or two." As of November 2022, mining operations are targeted to restart in January 2023.
Planned production increase	Ur-Energy	On November 1, 2021, Ur-Energy announced the start of a program to shift from reduced operations to "full production-ready status" at the Lost Creek mining site in Wyoming.
Planned expansion	Westinghouse	On December 15, 2021, Westinghouse announced plans to expand operations at the Columbia Fuel Fabrication Facility in South Carolina through $131 million in investments over the next five years.
Acquisition	Uranium Energy Corp	On December 20, 2021, Texas-based UEC announced it had completed its acquisition of Uranium One Americas from Uranium One (a Rosatom company). The acquisition included the Willow Creek project (Christensen Ranch and Irigaray) and some other nearby in-situ recovery mines.
Acquisition	enCore Energy	In January 2022, enCore Energy completed its acquisition of Azarga Uranium, consolidating assets including two in-situ recovery facilities in South Texas.
Strategic uranium reserve		On June 30, 2022, DOE's National Nuclear Security Administration issued a solicitation to purchase up to 1 million pounds of domestically produced uranium concentrate to support the creation of a strategic uranium reserve.
Acquisition	Cameco	On October 11, 2022, Cameco announced it was forming a partnership with Brookfield Renewable Partners to acquire Westinghouse for $7.9 billion.
Planned restart	enCore Energy	On November 1, 2022, enCore Energy announced it had completed refurbishment of the Rosita in-situ recovery uranium plant in Texas for a scheduled production startup in 2023.

Source: Letter from Honeywell to NRC, ADAMS ML 18023A384, January 11, 2018, https://www.nrc.gov/reading-rm/adams.html; BIS, The Effect of Imports of Uranium on the National Security, April 14, 2019, p. 38; NEI, "Uranium One Mothballs US Mine," August 21, 2018, https://www.neimagazine.com/news/newsuranium-one-mothballs-us-mine-6715119; Presidential Memorandum on the Effect of Uranium Imports, July 12, 2019, https://trumpwhitehouse.archives.gov/presidential-actions/memorandum-effect-uranium-imports-national-security-establishment-united-states-nuclear-fuel-working-group/; Peninsula Energy, "Lance Projects,"

https://www.pel.net.au/projects/lance-projects-wyoming/ (accessed November 1, 2022); Centrus response to the notice of institution, October 3, 2022, pp. 10-11; WNN, "US Government Approves GLE Restructure, January 19, 2021, https://www.world-nuclear-news.org/Articles/US-government-approves-GLE-restructure; NRC, "NRC Approves License Renewal for Honeywell Uranium Conversion Facility, March 25, 2020, https://www.nrc.gov/reading-rm/doc-collections/news/2020/20-018.pdf; CBR/PRI response to the notice of institution, October 3, 2022, p. 3 and exh. 5; Terra Temple, "Honeywell to Reopen in Early 2023," February 11, 2021, https://www.metropolisplanet.com/news/honeywell-to-reopen-in-early-2023/article_ac755dba-d560-5bf4-9795-ed8c9a05d582.html; Centrus, "NRC Approves Centrus Energy's License Amendment for HALEU Production," June 14, 2021, https://www.centrusenergy.com/news/nrc-approves-centrus-energys-license-amendment-for-haleu-production/; Western Uranium & Vanadium, "Western Uranium & Vanadium Announces Mining Restart at the Sunday Mine Complex," July 6, 2021, https://www.western-uranium.com/news/WUC_News_Release_July_6_2021_updated.pdf; Western Uranium & Vanadium, "Western Uranium & Vanadium Provides Company Updates," November 2, 2022, https://www.western-uranium.com/news/WUC_News_Release_Nov_2_2022.pdf; Ur-Energy, "Ur-Energy Releases 2021 Q3 Results," November 1, 2021, https://www.ur-energy.com/news-media/press-releases/detail/323/ur-energy-releases-2021-q3-results-and-announces-lost-creek; ANS, "Westinghouse to Invest $131 Million in S.C. Fuel Fabrication Facility," December 20, 2021, https://www.ans.org/news/article-3527/westinghouse-to-invest-131-million-in-sc-fuel-fabrication-facility/; UEC, "Uranium Energy Corp Completes Acquisition," December 20, 2021, https://www.uraniumenergy.com/news/releases/index.php?content_id=879; WNN, "US Uranium Acquisition Completed," January 5, 2022, https://www.world-nuclear-news.org/Articles/US-uranium-acquisition-completed; WNN, "US NNSA Initiates Process to Purchase Strategic Uranium, July 1, 2022, https://www.world-nuclear-news.org/Articles/US-NNSA-initiates-process-to-purchase-strategic-ur; Cameco, "Cameco and Brookfield Renewable Form Strategic Partnership," October 11, 2022, https://www.cameco.com/media/news/cameco-and-brookfield-renewable-form-strategic-partnership-to-acquire-westi; Cision, "EnCore Energy Completes Rosita Central Processing Plant Refurbishment," November 1, 2022, https://www.newswire.ca/news-releases/encore-energy-completes-rosita-central-processing-plant-refurbishment-855408446.html.

U.S. producers' trade and financial data

The Commission asked domestic interested parties to provide trade and financial data in their response to the notice of institution in the current five-year review.[84] Tables I-6, I-7, and I-8 present compilations of the trade and financial data submitted from all responding U.S. producers of natural uranium concentrate (table I-6), converters (table I-7), and enrichers (I-8) in the original investigation and subsequent five-year reviews.

[84] Individual company trade and financial data are presented in app. B.

Table I-6
Natural uranium concentrate (concentrated U_3O_8): Trade and financial data submitted by U.S. producers, by period

Quantity in 1,000 pounds of U_3O_8; value in 1,000 dollars; unit value in dollars per pound; ratio is in percent

Item	Measure	1992	1999	2005	2010	2016	2021
Capacity	Quantity	25,551	13,472	***	***	20,000	***
Production	Quantity	5,917	4,936	***	***	2,744	***
Capacity utilization	Ratio	23.2	36.6	***	***	13.7	***
U.S. shipments	Quantity	3,305	3,775	***	***	3,109	***
U.S. shipments	Value	62,220	55,791	***	***	116,915	***
U.S. shipments	Unit value	18.83	14.78	***	***	37.61	***
Net sales	Value	139,362	59,939	***	***	121,201	***
COGS	Value	102,036	59,034	***	***	153,429	***
COGS to net sales	Ratio	73.2	98.5	***	***	126.6	***
Gross profit or (loss)	Value	37,326	905	***	***	(36,690)	***
SG&A expenses	Value	12,579	27,811	***	***	32,148	***
Operating income or (loss)	Value	24,747	(26,906)	***	***	(102,102)	***
Operating income or (loss) to net sales	Ratio	17.8	(44.9)	***	***	(84.2)	***

Source: For the years 1992, 1999, 2005, 2010, and 2016, data are compiled using information submitted in the Commission's original investigation and subsequent reviews, as presented in the fourth review staff report, table I-5. For the year 2021, data are compiled using data submitted by CBR, PRI, Energy Fuels, and Ur-Energy.

Note: ***.

Table I-7
Natural uranium hexaflouride (UF_6): Trade and financial data submitted by U.S. producers, by period

Quantity in 1,000 kilograms U; value in 1,000 dollars; unit value in dollars per kilogram; ratio is in percent

Item	Measure	1992	1999	2005	2010	2016	2021
Capacity	Quantity	***	***	***	***	***	***
Production	Quantity	***	***	***	***	***	***
Capacity utilization	Ratio	***	***	***	***	***	***
U.S. shipments	Quantity	***	***	***	***	***	***
U.S. shipments	Value	***	***	***	***	***	***
U.S. shipments	Unit value	***	***	***	***	***	***
Net sales	Value	***	***	***	***	***	***
COGS	Value	***	***	***	***	***	***
COGS to net sales	Ratio	***	***	***	***	***	***
Gross profit or (loss)	Value	***	***	***	***	***	***
SG&A expenses	Value	***	***	***	***	***	***
Operating income or (loss)	Value	***	***	***	***	***	***
Operating income or (loss) to net sales	Ratio	***	***	***	***	***	***

Source: For the years 1992, 1999, and 2005, data are compiled using information submitted in the Commission's original investigation and subsequent reviews, as presented in the second review staff report, table I-4. Data are not available for 2010 and 2016. For the year 2021, data are compiled using data submitted by ConverDyn. ConverDyn reduced capacity of its plant in 2016 and then idled it in 2017. In 2021, it announced plans to restart the plant after refurbishment in 2023, bringing approximately 7,000 tU per year of domestic conversion supply back online following being idle for nearly six years. ConverDyn response to the notice of institution, October 3, 2022, p. 4 and exh. 1.

Table I-8
Enriched uranium hexaflouride (enriched UF_6 (LEU-HF)): Trade and financial data submitted by U.S. producers, by period

Quantity in 1,000 SWUs; value in 1,000 dollars; unit value in dollars per SWU; ratio is in percent

Item	Measure	1992	1999	2005	2010	2016	2021
Capacity	Quantity	***	***	***	***	***	***
Production	Quantity	***	***	***	***	***	***
Capacity utilization	Ratio	***	***	***	***	***	***
U.S. shipments	Quantity	***	***	***	***	***	***
U.S. shipments	Value	***	***	***	***	***	***
U.S. shipments	Unit value	***	***	***	***	***	***
Net sales	Value	***	***	***	***	***	***
COGS	Value	***	***	***	***	***	***
COGS to net sales	Ratio	***	***	***	***	***	***
Gross profit or (loss)	Value	***	***	***	***	***	***
SG&A expenses	Value	***	***	***	***	***	***
Operating income or (loss)	Value	***	***	***	***	***	***
Operating income or (loss) to net sales	Ratio	***	***	***	***	***	***

Source: For the years 1992, 1999, 2005, 2010, and 2016, data are compiled using information submitted in the Commission's original investigation and subsequent reviews, as presented in the fourth review staff report, table I-6. For the year 2021, data are compiled using data submitted by LES and Centrus. LES response to the notice of institution, October 3, 2022, exh. 1; Centrus response to the notice of institution, October 3, 2022, p. 12 and exh. 2; Centrus supplemental response to the notice of institution, November 4, 2022, pp. 3-4 and exh. 2.

Note: LES was the sole enricher in 2021 and thus the only provider of capacity and production data. Centrus recorded shipments of LEU in 2021, *** percent of which came from its own inventory, and so it is included in shipment and financial performance data. LES response to the notice of institution, October 3, 2022, exh. 1; Centrus response to the notice of institution, October 3, 2022, p. 12 and exh. 2; Centrus supplemental response to the notice of institution, November 4, 2022, pp. 3-4 and exh. 2.

Note: LES noted that its production is ***. LES response to the notice of institution, October 3, 2022, pp. 41-42.

Definitions of the domestic like product and domestic industry

The domestic like product is defined as the domestically produced product or products which are like, or in the absence of like, most similar in characteristics and uses with, the subject merchandise. The domestic industry is defined as the U.S. producers as a whole of the domestic like product, or those producers whose collective output of the domestic like product constitutes a major proportion of the total domestic production of the product. Under the related parties provision, the Commission may exclude a U.S. producer from the domestic industry for purposes of its injury determination if "appropriate circumstances" exist.[85]

In its original preliminary determination concerning the U.S.S.R., its full first and second five-year review determinations concerning Russia, and its expedited third and fourth five-year review determinations concerning Russia, the Commission defined the domestic like product as all forms of uranium coextensive with Commerce's scope. In its original preliminary determination concerning the U.S.S.R., the Commission defined the domestic industry as domestic producers of the product coextensive with Commerce's scope of the investigation, including the U.S. Department of Energy's uranium enrichment operations. In its full first and second five-year review determinations and its expedited third and fourth five-year review determinations concerning Russia, the Commission defined the domestic industry as all domestic producers of uranium, including concentrators, the converter, enrichers, and fabricators.[86]

In 2021, U.S. producer (enricher) Centrus's imports accounted for an estimated *** percent of total subject imports of LEU from Russia. As previously indicated, Centrus ceased enrichment at its Paducah, Kentucky gaseous diffusion plant in 2013 but is working to pioneer U.S. production of high-assay, low-enriched uranium ("HALEU").[87]

[85] Section 771(4)(B) of the Tariff Act of 1930, 19 U.S.C. § 1677(4)(B).

[86] 87 FR 53774, September 1, 2022.

[87] Centrus response to the notice of institution, October 3, 2022, pp. 9-10; Centrus' supplemental response to the notice of institution, November 4, 2022, p. 4.

U.S. importers

During the period of the original investigation (1989-91), reported imports of the subject uranium from Russia were accounted for by ***. Import data presented in the original investigations for the U.S.S.R are based on *** questionnaire response. Imports from all other sources were calculated from apparent consumption minus imports from the U.S.S.R. minus U.S. producers' domestic shipments of uranium concentrates.[88]

During the full first five-year reviews (1997-99) *** reported imports of the subject uranium from Russia. In addition to these reported imports from Russia, *** reported imports of enriched uranium from *** in *** that was made from Russian uranium. Even though this uranium was a product of *** for Customs purposes, its natural component was subject to the quota limitations of the Russian Suspension Agreement, as per the Agreement's "bypass" provisions instituted in 1996. Import data presented in the full first five-year review for Russia, Ukraine, and Uzbekistan are based on questionnaire responses and import data for all other countries are based on official Commerce statistics.[89]

During the full second five-year review, the Commission received responses from five importers: Cameco, GNSS, RWE Nukem Inc., USEC, and Westinghouse. The firms reported imports of uranium concentrate, natural uranium hexafluoride, and enriched uranium hexafluoride. Import data presented for Russia are based on questionnaire responses and import data for all other countries are based on official Commerce statistics.[90]

The Commission did not receive responses from any respondent interested parties in its third or fourth five-year reviews. In its response to the Commission's notice of institution in the third five-year review, the domestic interested parties identified four potential U.S. importers of uranium,[91] and provided a list of six potential U.S. importers of uranium in its response to the notice of institution in the fourth five-year review.[92] Import data presented in the Commission's reports in the expedited third and fourth five-year reviews are based on official Commerce statistics.[93]

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[88] Original preliminary publication, p. A-16 and table 21.

[89] Firms that responded to the importer questionnaire were believed to have accounted for 100 percent of imports from Russia during the period for which data were collected (1997-99). First review publication, pp. I-14 and IV-1 and tables I-2—I-6.

[90] Second review publication, p. IV-1.

[91] Third review publication, pp. I-61—I-62.

[92] Fourth review publication, p. I-46.

[93] Third review publication, tables I-9 and I-11; Fourth review publication, tables I-7 and I-9.

In its response to the notice of institution for this current fifth five-year review, Centrus provided data regarding its U.S. imports of LEU. In their responses to the Commission's notice of institution, the domestic interested parties identified a total of ten potential U.S. importers of uranium.[94] Import data presented for 2021 are based on official Commerce statistics.

U.S. imports

Table I-9 presents the value of U.S. imports from Russia as well as the other top sources of U.S. imports (shown in descending order of 2021 imports). As in prior reviews, due to the differences in units of measure between natural and enriched uranium, table I-9 presents value data only.

Table I-9
Uranium: U.S. imports, by source and period

Value in 1,000 dollars

U.S. imports from	Measure	2017	2018	2019	2020	2021
Russia	Value	639,864	666,326	584,774	568,190	645,728
Netherlands	Value	194,078	449,594	521,660	392,131	535,015
Germany	Value	218,452	287,449	252,655	394,544	403,613
United Kingdom	Value	224,751	252,363	212,637	122,289	393,290
All other sources	Value	949,229	557,258	603,942	309,503	455,030
Nonsubject sources	Value	1,586,510	1,546,665	1,590,894	1,218,467	1,786,947
All import sources	Value	2,226,375	2,212,990	2,175,668	1,786,657	2,432,675

Source: Compiled from official Commerce statistics for HTS statistical reporting numbers 2612.10.0000, 2844.10.2010, 2844.10.2025, 2844.20.0010, 2844.20.0020, 2844.20.0030, and 2844.20.0050, accessed November 4, 2022.

Note: Because of rounding, data may not add to totals shown.

[94] Centrus response to the notice of institution, October 3, 2022, p. 6; LES response to the notice of institution, October 3, 2022, pp. 40-41; CBR/PRI response to the notice of institution, October 3, 2022, p. 47.

Apparent U.S. consumption and market shares

Table I-10 presents data on U.S. producers' U.S. shipments, U.S. imports, apparent U.S. consumption, and market shares. Because of the unique complexities of the nature in which uranium is marketed, produced, and sold, table I-10 presents only value data of all uranium types. Additionally, due to data availability, the data shown below begin with the second five-year review.[95]

Table I-10
Uranium: Apparent U.S. consumption and market shares, by source and period

Value in 1,000 dollars; shares in percent

Source	Measure	2005	2010	2016	2021
U.S. producers	Value	***	***	***	***
Russia	Value	***	1,049,038	1,033,669	645,728
Nonsubject sources	Value	***	4,208,021	2,143,785	1,786,947
All import sources	Value	***	5,257,059	3,177,454	2,432,675
Apparent U.S. consumption	Value	***	***	***	***
U.S. producers	Share of value	***	***	***	***
Russia	Share of value	***	***	***	***
Nonsubject sources	Share of value	***	***	***	***
All import sources	Share of value	***	***	***	***

Source: For the years 2005, 2010, and 2016, data are compiled using data submitted in the Commission's second and subsequent five-year reviews. For the year 2021, U.S. producers' U.S. shipments are compiled from LES's and Centrus's responses to the Commission's notice of institution and U.S. imports are compiled using official Commerce statistics under HTS statistical reporting numbers 2612.10.0000, 2844.10.2010, 2844.10.2025, 2844.20.0010, 2844.20.0020, 2844.20.0030, and 2844.20.0050, accessed November 4, 2022.

[95] In addition to the challenges presented with analyzing uranium itself, official import statistics were generally not usable until after the first review. Although the independence of the individual countries of the former U.S.S.R was officially recognized in 1992, official data on their individual exports to the United States were not available until 1994, and were limited in their reliability thereafter for some time due to many anomalies and misclassifications for the individual subject countries. First review publication, p. I-21. Summary data collected in the original investigations and full first and second five-year reviews are available in Appendix C.

The industry in Russia

Producers in Russia

Information contained in the petition was used as the basis for collecting information about the uranium industry in the U.S.S.R. in the original preliminary investigation, after a request for information was transmitted through diplomatic channels but not returned.[96] For the full first five-year reviews, the Commission received a joint response to the notice of institution from three firms: the Ministry of the Russian Federation for Atomic Energy (at the time the sole producer of uranium in Russia and also called "Minatom"); Tenex (at the time the sole exporter of uranium from Russia); and GNSS.[97] During the full second five-year review, the Commission did not receive foreign producer/exporter questionnaires from any producers in Russia. However, it did receive written correspondence from Rosatom with information concerning, inter alia, the volume of Russian exports to the United States, the country's expected export trends, and market share in nonsubject countries.[98] The Commission did not receive responses to its notice of institution from any respondent interested parties in its expedited third or fourth five-year reviews; however the domestic interested parties provided a list of four firms that they believed produced uranium in Russia: Rosatom, ARMZ, Tenex (as seller of Russian uranium products from the enrichment and conversion plants of Rosatom), and Joint Stock Company TVEL.[99]

Although the Commission did not receive responses from any respondent interested parties in this current fifth five-year review, the domestic interested parties identified two possible producers of uranium in Russia.[100]

Recent developments

Since the Commission's last five-year review, Russia's invasion of Ukraine on February 24, 2022 has disrupted global demand for Russian uranium. Russian nuclear fuel and services have not been directly targeted by sanctions, but the added logistical, freight, and insurance

[96] Original preliminary publication, p. A-39.

[97] First review publication, p. 5.

[98] Second review publication, pp. IV-18—IV-22.

[99] Fourth review publication, p. I-53.

[100] Centrus response to the notice of institution, October 3, 2022, p. 6; Energy Fuels response to the notice of institution, October 3, 2022, p. 5; GLE response to the notice of institution, October 3, 2022, p. 14; LES response to the notice of institution, October 3, 2022, p. 40; CBR/PRI response to the notice of institution, October 3, 2022, p. 47; Ur-Energy response to the notice of institution, October 3, 2022, p. 5.

challenges and complications for environmental, social, and governance (ESG) principles have reportedly had a chilling effect on demand for uranium from Russia.[101] The EU has called for member states to diversify from Russian nuclear fuel and services.[102] Swedish nuclear utility Vattenfall announced it would no longer place orders or accept deliveries of Russian nuclear fuel.[103] Ukraine and the Czech Republic announced supply agreements with Westinghouse and Framatome, after traditionally sourcing most of their fuel fabrication from Russia.[104]

Russia has also implemented a modernization program for its enrichment plants, replacing older centrifuges with newer and higher output centrifuges. These upgrades reportedly increased Russia's total enrichment capacity by *** percent in 2020.[105]

Third-country trade actions

Based on available information, uranium from Russia has not been subject to other antidumping or countervailing duty investigations outside the United States. However, PRI and CBR indicate that Euratom is believed to limit Russian imports to 15 to 25 percent of total EU demand. This limit is not a transparent figure and is higher than the 15 to 20 percent quotas that have been reported in earlier reviews of this investigation.[106] EU utility purchases of uranium from Russia totaled about 19.7 percent of the market in 2021.[107]

The global market

There are approximately 440 commercial nuclear reactors globally as of November 2022, producing about 10 percent of the world's electricity.[108] GLE and LES report that the

[101] William Freebarin, "Disentangling the Global Nuclear Fuel Supply Chain After Russia's Invasion of Ukraine," July 7, 2022, https://www.spglobal.com/commodityinsights/en/market-insights/blogs/electric-power/070722-global-nuclear-fuel-supply-chain-uranium-russia-ukraine-war; CBR/PRI response to the notice of institution, October 3, 2022, p. 11; ESA, Euratom Supply Agency Annual Report 2021, p. 29.

[102] ESA, Euratom Supply Agency Annual Report 2021, pp. 28-29.

[103] CBR/PRI response to the notice of institution, October 3, 2022, p. 32.

[104] CBR/PRI response to the notice of institution, October 3, 2022, p. 34.

[105] CBR/PRI response to the notice of institution, October 3, 2022, p. 29.

[106] CBR/PRI response to the notice of institution, October 3, 2022, p. 31; Fourth review publication, p. I-40.

[107] ESA, Euratom Supply Agency Annual Report 2021, p. 72; CBR/PRI response to the notice of institution, October 3, 2022, p. 31.

[108] WNA, "Plans for New Reactors Worldwide," https://world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide.aspx (updated November 2022).

global market is starting to recover from a prolonged period of weak demand in the aftermath of the 2011 Fukushima reactor meltdown.[109] Increased focus on greenhouse gas emissions, tight global natural gas supplies, and efforts to diversify from Russian energy supply have all contributed to renewed interest in nuclear energy and a tighter uranium market.[110] However, nuclear fleets in Europe, Japan, and the United States continue to be diminished in the aftermath of Fukushima.[111] Current plans for new nuclear reactors are largely concentrated in Asia; as of November 2022, countries building new reactors include China, India, Russia, and the United Arab Emirates.[112] The United States has two nuclear reactors under construction, both expansions to a plant in Georgia: Vogtle Unit 3 is projected to be in service the first quarter of 2023 and Vogtle Unit 4 in the fourth quarter of 2023.[113] However, these U.S. capacity additions will be more than offset by planned retirements in 2024 and 2025.[114]

Global markets for uranium have also been affected by increased demand from hedge funds. In July 2021, the Sprott Physical Uranium Trust (SPUT) was formed and started buying physical volumes of uranium concentrate to hold indefinitely. Buying sprees over the next few months helped drive substantial price increases, pushing uranium concentrate prices to a nine-year high of $50 per pound in September 2021. SPUT and other financial entities have continued to make sizable spot market purchases in 2022.[115]

The United States continues to be the largest importer of uranium and accounted for about half of uncommitted demand for natural uranium in 2022.[116] The European Union (including the United Kingdom) is the second largest market. Japan was historically the third

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[109] GLE response to the notice of institution, October 3, 2022, p. 19; LES response to the notice of institution, October 3, 2022, pp. 5, 17.

[110] GLE response to the notice of institution, October 3, 2022, p. 19; Centrus response to the notice of institution, October 3, 2022, p. 14.

[111] CBR/PRI response to the notice of institution, October 3, 2022, pp. 31-34; Centrus response to the notice of institution, October 3, 2022, p. 14.

[112] WNA, "Plans for New Reactors Worldwide," https://world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide.aspx (updated November 2022).

[113] Reuters, "Southern Co Trims Cost Estimate for Georgia Vogtle Reactors," October 27, 2022, https://www.reuters.com/business/energy/southern-co-trims-cost-estimate-georgia-vogtle-reactors-sees-them-2023-2022-10-27/.

[114] Mark Morey, "U.S. Nuclear Electricity Generation Continues to Decline as More Reactors Retire," April 8, 2022, https://www.eia.gov/todayinenergy/detail.php?id=51978.

[115] CBR/PRI response to the notice of institution, October 3, 2022, p. 10 and 11; J. Holzman, "Sprott Fund Transforms Uranium Spot Market," October 19, 2021, https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/sprott-fund-transforms-uranium-spot-market-67100457.

[116] CBR/PRI response to the notice of institution, October 3, 2022, p. 50

largest market but is only running 10 of the 54 nuclear reactors that were operational prior to the Fukushima accident.[117]

Uranium mining and milling

As of 2021, Kazakhstan, Namibia, and Canada were the world's largest producers of mined uranium, accounting for about two-thirds of global uranium production from mines. Other substantial producers included Australia, Uzbekistan, Russia, Niger, and China. At a company level, uranium suppliers are relatively consolidated: about half of uranium mine production is controlled by state-owned mining companies, and the top 10 companies by production supplied about 90 percent of the world's uranium production in 2021.[118]

Table I-11 presents world uranium production data during 2017-21.

Table I-11
Uranium: World production from mines, by country and period, in metric tons of uranium metal

Country	2017	2018	2019	2020	2021
Kazakhstan	23,321	21,705	22,808	19,477	21,819
Namibia	4,224	5,525	5,476	5,413	5,753
Canada	13,116	7,001	6,938	3,885	4,693
Australia	5,882	6,517	6,613	6,203	4,192
Uzbekistan (est.)	3,400	3,450	3,500	3,500	3,500
Russia	2,917	2,904	2,911	2,846	2,635
Niger	3,449	2,911	2,983	2,991	2,248
China (est.)	1,692	1,885	1,885	1,885	1,885
United States	940	582	58	6	8
World	60,514	54,154	54,742	47,731	48,332

Source: WNA, "World Uranium Mining Production," http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx (updated July 2022).

Note: Totals of individual country data presented do not add to "World" data presented.

[117] CBR/PRI response to the notice of institution, October 3, 2022, pp. 33-34.

[118] WNA, "World Uranium Mining Production," http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx (updated July 2022).

In terms of uranium requirements, the United States is the largest consumer of uranium, accounting for about 28 percent of the world's reactor requirements in 2021 (table I-12).[119]

Table I-12
Uranium: Reactor requirements, by location, in metric tons of uranium metal

Country	2021 requirements
United States	17,587
China	9,563
France	8,233
Russia	5,925
Korea	4,270
Canada	1,492
Japan	1,396
Germany	521
World	62,946

Source: WNA, "World Nuclear Power Reactors & Uranium Requirements," https://world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-and-uranium-requireme.aspx (updated October 2022).

Note: Totals of individual country data presented do not add to "World" data presented.

[119] WNA, "World Nuclear Power Reactors & Uranium Requirements," https://world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-and-uranium-requireme.aspx (updated October 2022).

Uranium conversion

Uranium conversion, the conversion of uranium yellowcake to UF_6, is required for the subsequent step of enrichment. Table I-13 lists companies involved in uranium conversion to produce natural uranium hexafluoride (UF_6), along with their conversion facility locations and their estimated nameplate capacities.

Table I-13
Natural uranium hexafluoride (UF_6): Converters, locations, and nameplate capacity in 2020

Converter	Country	Location	Nameplate capacity (metric tons uranium metal)
Cameco	Canada	Port Hope, ON	12,500
CNCC	China	Lanzhou & Hengyang	15,000
Orano	France	Pierrelatte & Malvesi	15,000
ConverDyn	United States	Metropolis, IL	7,000
Rosatom	Russia	Seversk	12,500
World Total			62,000

Source: WNA, "Conversion and Deconversion," https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/conversion-and-deconversion.aspx (updated January 2022).

Note: ConverDyn reduced capacity of its plant in 2016 and then idled it in 2017. In 2021, it announced plans to restart the plant after refurbishment in 2023. Orano's new conversion facility is in the process of production ramp-up, which is expected to be finalized by 2023. China's capacity is estimated, and assumes China will develop its conversion capacity to supply the needs of its domestic reactor fleet.

Uranium enrichment

Four enrichment enterprises provide nearly all of the world's enrichment capacity: Rosatom in Russia, Areva in France, the China National Nuclear Corporation (CNNC) in China, and Urenco with facilities in the United States, Germany, the Netherlands, and the United Kingdom. Enrichment is often considered the most sensitive step in the nuclear fuel cycle from both an economic and nonproliferation point of view, as the production of highly enriched uranium is often viewed as the most critical step in the production of nuclear weapons.[120] Enrichment nameplate effective capacities for the primary suppliers of uranium enrichment are presented in table I-14.

Table I-14
Enriched uranium hexafluoride (UF_6): Enrichers, locations, and nameplate capacity, 2020

Enricher	Location(s)	Capacity (1,000 SWU/year)
Areva	France	7,500
CNNC	China	6,300
Rosatom	Russia	27,700
Urenco	United States (New Mexico) Germany/Netherlands/UK	4,900 13,700
Other	Argentina, Brazil, India, Pakistan, Iran	66
Global (est.)		60,166
SWU demand (WNA ref.)		50,205

Source: WNA, "Uranium Enrichment," https://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx (updated October 2022).

As shown in the table above, there is a significant surplus of global enrichment capacity. The centrifuges used for enrichment are expensive to shut down and restart. Consequently, enrichers sometime "underfeed" their plants, using less uranium than contractually supplied and instead subjecting the tails assay to additional SWU—effectively replacing excess SWU capacity with surplus natural uranium and/or enriched uranium product that the enricher can sell back on the market. Because of this dynamic, excess enrichment capacity after the Fukushima reactor meltdown exacerbated over-supply in uranium markets at all stages of the production process and prolonged weak market conditions for uranium producers. The World Nuclear Association (WNA) nevertheless projects an increase in global enrichment capacity to

[120] WNA, "Uranium Enrichment," https://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx (updated October 2022).

about 62.4 million SWU per year by 2025, primarily from expansions in China (designed to serve its growing domestic market).[121]

Fuel fabricators for light water reactors

The WNA lists 21 fuel fabrication facilities worldwide for light water reactors, five of which are in Western Europe, three are in the United States, two are in Russia, and four are in Japan. In contrast to the other stages of the nuclear fuel cycle, the manufacture of fuel assemblies is a highly customized process: many fuel fabricators are also reactor vendors who supply fuel customized for their specific reactor designs. However, fuel fabricators are increasingly developing capabilities to supply other reactor designs. Russian fabricator TVEL manufactures fuel for Western pressurized water reactors (PWRs—one type of light water reactor), and Western fabricators such as Westinghouse can manufacture fuel for Russian-designed PWRs, which are known as VVER.[122]

Reprocessing industry

Effective nuclear fuel production capability can be increased by employing technologies that recycle or reprocess spent fuel. Depleted uranium tails left over from the enrichment process can be blended with plutonium oxide to form a mixed uranium oxide and plutonium oxide (MOX) fuel used in some light water reactors in Europe and Asia. France, Russia, Japan, and India each have MOX fuel fabrication capacity. However, Belgium, Germany, and Switzerland have stopped using MOX fuel, weakening demand for it. Russia has also developed a product called REMIX fuel that uses a combination of reprocessed used fuel and LEU.[123]

[121] WNA, "Uranium Enrichment," https://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx (updated October 2022).

[122] WNA, "Nuclear Fuel and Its Fabrication," https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/fuel-fabrication.aspx (updated October 2021).

[123] WNA, "Nuclear Fuel and Its Fabrication," https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/fuel-fabrication.aspx (updated October 2021).

APPENDIX A

FEDERAL REGISTER NOTICES

The Commission makes available notices relevant to its investigations and reviews on its website, www.usitc.gov. In addition, the following tabulation presents, in chronological order, Federal Register notices issued by the Commission and Commerce during the current proceeding.

Citation	Title	Link
87 FR 53727, September 1, 2022	*Initiation of Five-Year (Sunset) Reviews*	https://www.govinfo.gov/content/pkg/FR-2022-09-01/pdf/2022-18925.pdf
87 FR 53774, September 1, 2022	*Uranium from Russia; Institution of a Five-Year Review*	https://www.govinfo.gov/content/pkg/FR-2022-09-01/pdf/2022-18912.pdf

APPENDIX B

COMPANY-SPECIFIC DATA

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APPENDIX C

SUMMARY DATA COMPILED IN PRIOR PROCEEDINGS

Table I-1
Uranium: Summary data from the original investigations, first reviews, and current review, 1990-92 and 1997-2005

(Value=*1,000 dollars*)

Item	1990	1991	1992	1997	1998	1999	2000	2001	2002	2003	2004	2005
Value of imports and sales from U.S. production:												
Amount	2,538,506	2,844,282	2,833,989	2,642,242	2,749,775	2,633,740	***	***	***	***	***	***
Producers' share[1]	65.0	65.2	68.1	59.9	55.3	44.7	***	***	***	***	***	***
Importer's share:												
Russia[1]	0.0	0.0	0.0	***	***	***	***	***	***	***	***	***
All other countries[1]	0.0	0.0	0.0	***	***	***	***	***	***	***	***	***
Total imports[1]	35.0	34.8	31.9	40.1	44.7	55.3	***	***	***	***	***	***
Value of U.S. imports from--												
Russia	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
All other sources	(2)	(2)	(2)	***	***	***	873,023	964,753	1,202,524	1,761,188	1,459,736	1,945,063
Total imports	889,520	989,844	904,856	1,059,150	1,229,376	1,455,725	***	***	***	***	***	***
Sales from U.S. production:												
U.S. sales	1,149,494	1,259,555	1,192,721	842,699	876,694	546,833	***	***	***	***	***	***
Exports	499,492	594,883	736,412	740,393	643,705	631,182	***	***	***	***	***	***
Total sales	1,648,986	1,854,438	1,929,133	1,583,092	1,520,399	1,178,015	1,110,163	735,070	816,100	693,912	663,076	682,654
Production workers	3,462	3,471	3,361	5,952	5,806	5,347	4,838	3,737	2,999	2,780	2,743	2,865
Hours worked	8,264	8,114	7,329	12,469	12,153	11,221	10,723	8,192	6,558	5,868	6,052	6,247
Wages paid	126,278	132,792	128,259	314,822	323,692	307,580	312,382	259,900	220,038	204,554	216,949	223,398
Hourly wages	$15.28	$16.37	$17.50	$25.25	$26.64	$27.41	$29.13	$31.73	$33.55	$34.86	$35.85	$35.76

[1] In *percent*.
[2] Not available.

Source: Data for 1990-92 and 1997-99 compiled from confidential staff report INV-XX-154, July 7, 2000, table I-2; and data for 2000-05 compiled from responses to Commission questionnaires and from official Commerce statistics. Import data for Russia compiled from responses to Commission questionnaires, and data for total for all sources compiled from official Commerce statistics (HTS statistical reporting numbers 2612.10.0000, 2844.10.2010, 2844.10.2025, 2844.20.0010, 2844.20.0020, 2844.20.0030, and 2844.20.0050). Data for all other import sources do not include HTS statistical reporting numbers 2844.10.1000 (uranium metal), 2844.10.2055 (other), and 2844.10.5000 (other) as the contents of these reporting numbers are unclear.

Table I-2
Uranium: U.S. imports from the original investigations, first reviews, and current review, by sources, 1990-92 and 1997-2005

(Quantity=*1,000 pounds U_3O_8 or 1,000 kilograms U*; value=*1,000 dollars*; unit values are *per pound or kilogram*)

Item	1990	1991	1992	1997	1998	1999	2000	2001	2002	2003	2004	2005
Natural uranium concentrate: (Quantity=*1,000 pounds U_3O_8*)												
U.S. imports from-- Russia: Quantity	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Value	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Unit value	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
All other countries:												
Quantity	(2)	(2)	(2)	***	***	***	13,289	21,298	14,429	21,312	12,624	16,916
Value	(2)	(2)	(2)	***	***	***	159,968	233,346	157,124	247,383	169,797	332,302
Unit value	(2)	(2)	(2)	***	***	***	$12.04	$10.96	$10.89	$11.61	$13.45	$19.64
All countries:												
Quantity	15,387	22,972	19,419	16,838	12,022	6,914	***	***	***	***	***	***
Value	236,165	354,848	298,075	265,843	177,332	97,753	***	***	***	***	***	***
Unit value	$15.35	$15.45	$15.35	$15.79	$14.75	$14.14	***	***	***	***	***	***
Natural uranium hexafluoride: (Quantity=*1,000 kilograms U*)												
U.S. imports from-- Russia: Quantity	(2)	(2)	(2)	(2)	(2)	(2)	***	***	***	***	***	***
Value	(2)	(2)	(2)	(2)	(2)	(2)	***	***	***	***	***	***
Unit value	(2)	(2)	(2)	(2)	(2)	(2)	***	***	***	***	***	***
All other countries:												
Quantity	(2)	(2)	(2)	(2)	(2)	(2)	6,503	7,476	6,126	2,420	2,733	3,099
Value	(2)	(2)	(2)	(2)	(2)	(2)	265,567	302,683	184,728	64,786	142,893	264,796
Unit value	(2)	(2)	(2)	(2)	(2)	(2)	$40.84	$40.49	$30.16	$26.77	$52.28	$85.45
All countries:												
Quantity	6,378	5,483	3,964	8,256	8,767	7,353	***	***	***	***	***	***
Value	230,344	229,258	148,886	325,745	333,530	211,701	***	***	***	***	***	***
Unit value	$36.12	$41.81	$37.57	$39.46	$38.04	$28.79	***	***	***	***	***	***

Table continued on next page.

Table I-2--*Continued*
Uranium: U.S. imports from the original investigations, first reviews, and current review, by sources, 1990-92 and 1997-2005

(Quantity=*1,000 SWUs or 1,000 kilograms U*; value=*1,000 dollars*; unit values are *per SWU or kilogram*)

Item	1990	1991	1992	1997	1998	1999	2000	2001	2002	2003	2004	2005
Enriched uranium hexafluoride: (Quantity=*1,000 SWUs*)												
U.S. imports from--												
Russia:												
Quantity	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Value	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Unit value	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
All other countries:												
Quantity	(2)	(2)	(2)	***	***	***	2,578	3,194	4,915	9,622	7,617	5,903
Value	(2)	(2)	(2)	***	***	***	305,497	386,416	847,194	1,426,991	1,143,712	1,299,661
Unit value	(2)	(2)	(2)	***	***	***	$118.52	$120.99	$172.36	$148.31	$150.15	$220.18
All countries:												
Quantity	405	583	583	3,486	5,082	12,378	***	***	***	***	***	***
Value	253,019	346,317	427,224	367,025	647,325	1,100,384	***	***	***	***	***	***
Unit value	$624.74	$594.03	$732.80	$105.29	$127.38	$88.90	***	***	***	***	***	***
Enriched uranium oxides, nitrates, and metals: (Quantity=*1,000 kgs U*)												
U.S. imports from--												
Russia:												
Quantity	(2)	(2)	(2)	(2)	(2)	(2)	***	***	***	***	***	***
Value	(2)	(2)	(2)	(2)	(2)	(2)	***	***	***	***	***	***
Unit value	(2)	(2)	(2)	(2)	(2)	(2)	***	***	***	***	***	***
All other countries:												
Quantity	(2)	(2)	(2)	(2)	(2)	(2)	529	28	180	509	36	642
Value	(2)	(2)	(2)	(2)	(2)	(2)	141,991	42,307	13,477	22,028	3,334	48,305
Unit value	(2)	(2)	(2)	(2)	(2)	(2)	$268.21	$1,530.22	$74.92	$43.31	$93.17	$75.25
All countries:												
Quantity	321	239	56	166	53	325	***	***	***	***	***	***
Value	165,774	54,679	24,749	90,121	64,934	21,578	***	***	***	***	***	***
Unit value	$516.43	$228.78	$441.95	$542.90	$1,225	$66.39	***	***	***	***	***	***

[1] In *percent*.
[2] Not available.
[3] Not applicable.

Source: Data for 1990-92 and 1997-99 compiled from confidential staff report INV-XX-154, July 7, 2000, tables I-3-I-6; and data for 2000-05 compiled from responses to Commission questionnaires and from official Commerce statistics.

Table I-3
Natural uranium concentrate: Summary data from the original investigations, first reviews, and current review, 1990-92 and 1997-2005

(Quantity=*1,000 pounds U_3O_8*; value=*1,000 dollars*; unit values, unit labor costs, and unit financial data are *per pound*)

Item	1990	1991	1992	1997	1998	1999	2000	2001	2002	2003	2004	2005
U.S. producers'-- Capacity quantity	26,095	27,145	25,551	12,722	14,072	13,472	***	***	***	***	***	***
Production quantity	8,379	7,995	5,917	4,989	4,389	4,936	***	***	***	***	***	***
Capacity utilization[1]	32.1	29.5	23.2	39.2	31.2	36.6	***	***	***	***	***	***
U.S. shipments: Quantity	7,956	6,891	3,305	3,796	3,707	3,775	***	***	***	***	***	***
Value	166,196	150,609	62,220	51,290	53,507	55,791	***	***	***	***	***	***
Unit value	$24.60	$21.86	$18.83	$13.51	$14.43	$14.78	***	***	***	***	***	***
Ending inventory quantity	11,057	8,143	7,128	3,097	2,663	3,624	***	***	***	***	***	***
Inventories/total shipments[1]	108.3	74.6	104.8	61.3	55.2	91.2	***	***	***	***	***	***
Production workers	696	603	387	423	475	494	***	***	***	***	***	***
Hours worked (*1,000 hours*)	1,302	1,125	786	862	1,019	1,045	***	***	***	***	***	***
Wages paid (*1,000 dollars*)	16,968	15,624	11,692	13,038	15,512	15,938	***	***	***	***	***	***
Hourly wages	$13.03	$13.89	$14.88	$15.13	$15.23	$15.25	***	***	***	***	***	***
Productivity (*pounds per hour*)	6.5	7.2	7.5	6.7	5.0	4.6	***	***	***	***	***	***
Net sales: Quantity	9,008	10,277	5,909	4,196	4,341	3,748	***	***	***	***	***	***
Value	218,413	224,985	139,362	65,036	69,645	59,939	***	***	***	***	***	***
Unit value	$24.25	$21.89	$23.58	$15.50	$16.04	$15.99	***	***	***	***	***	***
Cost of goods sold	155,310	165,471	102,036	76,776	64,113	59,034	***	***	***	***	***	***
Gross profit/(loss)	63,103	59,514	37,326	(11,740)	5,532	905	***	***	***	***	***	***
Operating income/(loss)	43,530	41,608	24,747	(26,541)	(8,983)	(26,906)	***	***	***	***	***	***
Capital expenditures	22,777	28,943	11,364	34,331	15,383	3,581	***	***	***	***	***	***
Unit cost of goods sold	$17.24	$16.10	$17.25	$18.30	$14.77	$15.75	***	***	***	***	***	***
Unit operating income/(loss)	$4.83	$4.05	$4.34	($6.33)	($2.07)	($7.18)	***	***	***	***	***	***
Cost of goods sold/sales[1]	71.1	73.5	73.2	118.1	92.1	98.5	***	***	***	***	***	***
Operating income or (loss)/sales[1]	19.9	18.5	17.8	(40.8)	(12.9)	(44.9)	***	***	***	***	***	***

[1] In *percent*.

Source: Data for 1990-92 and 1997-99 compiled from confidential staff report INV-XX-154, July 7, 2000, table I-3; and data for 2000-05 compiled from responses to Commission questionnaires and from official Commerce statistics.

Table I-4
Natural uranium hexafluoride: Summary data from the original investigations, first reviews, and current review, 1990-92 and 1997-2005

* * * * * * *

Table I-5
Enriched uranium hexafluoride: Summary data from the original investigations, first reviews, and current review, 1990-92 and 1997-2005

* * * * * * *

Table I-6
Enriched uranium oxides, nitrates, and metals: Summary data from the original investigations, first reviews, and current review, 1990-92 and 1997-2005

(Quantity=*1,000 kilograms U*; value=*1,000 dollars*; unit values, unit labor costs, and unit financial data are *per kilogram*)

Item	1990	1991	1992	1997	1998	1999	2000	2001	2002	2003	2004	2005
U.S. producers'--												
Capacity quantity	3,800	3,800	3,800	4,050	4,050	4,050	***	***	***	***	***	***
Production quantity	2,503	2,622	2,593	2,583	2,571	2,479	***	***	***	***	***	***
Capacity utilization[1]	65.9	69.0	68.2	63.8	63.5	61.2	***	***	***	***	***	***
U.S. shipments:												
Quantity	1,943	2,058	2,325	1,790	1,887	1,869	***	***	***	***	***	***
Value	(2)	(2)	(2)	217,010	240,246	222,660	***	***	***	***	***	***
Unit value	(2)	(2)	(2)	$121.21	$127.28	$119.14	***	***	***	***	***	***
Ending inventory quantity	1,028	1,121	997	595	543	549	***	***	***	***	***	***
Inventories/total shipments[1]	40.6	45.3	34.5	23.1	20.6	22.5	***	***	***	***	***	***
Production workers	678	693	741	722	732	670	***	***	***	***	***	***
Hours worked (*1,000 hours*)	1,833	1,899	1,990	1,557	1,584	1,433	***	***	***	***	***	***
Wages paid (*1,000 dollars*)	23,858	25,786	28,669	37,747	39,075	38,759	***	***	***	***	***	***
Hourly wages	13.01	13.58	14.40	$24.24	$24.67	$27.05	***	***	***	***	***	***
Productivity (*pounds per hour*)	1.3	1.4	1.3	1.7	1.6	1.7	***	***	***	***	***	***
Net sales:												
Quantity	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Value	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Unit value	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Cost of goods sold	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Gross profit or (loss)	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Operating income or (loss)	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Capital expenditures	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Unit cost of goods sold	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Unit operating income or (loss)	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Cost of goods sold/sales[1]	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***
Operating income or (loss)/sales[1]	(2)	(2)	(2)	***	***	***	***	***	***	***	***	***

[1] In *percent*.
[2] Not available.

Source: Data for 1990-92 and 1997-99 compiled from confidential staff report INV-XX-154, July 7, 2000, table I-6; and data for 2000-05 compiled from responses to Commission questionnaires and from official Commerce statistics.

APPENDIX D

PURCHASER QUESTIONNAIRE RESPONSES

As part of their response to the notice of institution, interested parties were asked to provide a list of three to five leading purchasers in the U.S. market for the domestic like product. Responses were received from domestic interested parties and named the following seven firms as top purchasers of uranium: ***. Purchaser questionnaires were sent to these seven firms and four firms (***) provided responses, which are presented below.

1. Have there been any significant changes in the supply and demand conditions for uranium that have occurred in the United States or in the market for uranium in Russia since January 1, 2017?

Purchaser	Yes / No	Changes that have occurred
***	***	***
***	***	***
***	***	***
***	***	***

2. Do you anticipate any significant changes in the supply and demand conditions for uranium in the United States or in the market for uranium in Russia within a reasonably foreseeable time?

Purchaser	Yes / No	Anticipated changes
***	***	***
***	***	***
***	***	***
***	***	***