Uranium from Russia

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

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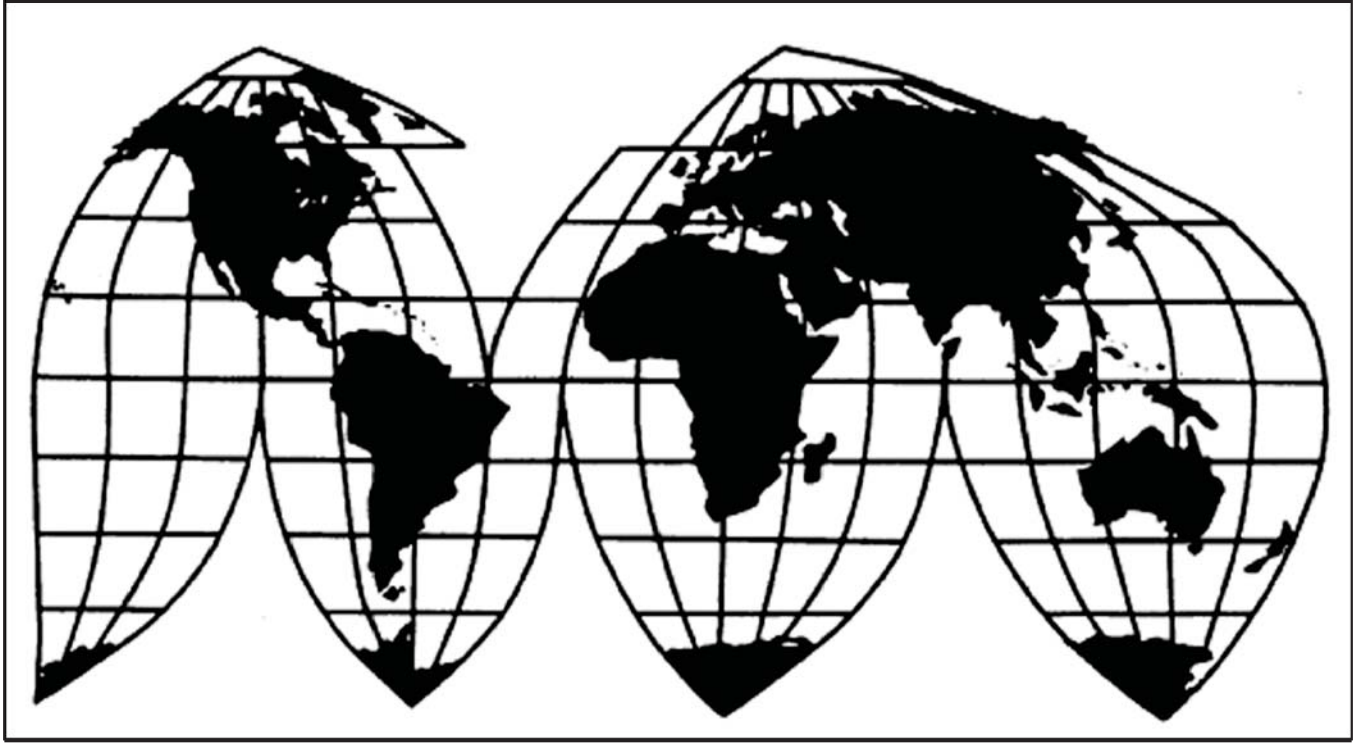
U.S. International Trade Commission



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UNITED STATES INTERNATIONAL TRADE COMMISSION

Investigation No. 731-TA-539-C (Fourth 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 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.

BACKGROUND

The Commission, pursuant to section 751(c) of the Act (19 U.S.C. 1675(c)), instituted this review on February 1, 2017 (82 F.R. 8951) and determined on May 8, 2017 that it would conduct an expedited review (82 F.R. 27287, June 14, 2017).

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

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 in both of them.[5] 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.[6] Commerce subsequently issued an antidumping duty order on imports of uranium from Ukraine.[7]

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

[2] 57 Fed. Reg. 11064 (Apr. 1, 1992).

[3] 57 Fed. Reg. 23380 (June 3, 1992).

[4] *See, e.g.*, *Agreement Suspending the Antidumping Investigation on Uranium from Russia* (Oct. 16, 1992), 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. 57 Fed. Reg. 48505 (Oct. 26, 1992).

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

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

[7] 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.[8]

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 13, 1999.[9]

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. 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.[10] Commerce issued a notice continuing the Russian suspension agreement (RSA) on August 22, 2000.[11]

Second Review: In its second five-year 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 Agreement."[12] 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.[13] Commerce issued a notice continuing the RSA on August 11, 2006.[14]

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[8] *See, e.g.*, 59 Fed. Reg. 15373 (Apr. 1, 1994) (Russia); 60 Fed. Reg. 55004 (Oct. 27, 1995) (Uzbekistan); 61 Fed. Reg. 56665 (Nov. 4, 1996) (Russia). As further discussed in section III.B below, the HEU Agreement required 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. *First Review Determination*, USITC Pub. 3344 at 29; *Second Review Determination*, USITC Pub. 3872 at 22.

[9] *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*").

[10] *Uranium from Russia, Ukraine, and Uzbekistan*, Inv. Nos. 731-TA-539C, E, and F (Review), USITC Pub. 3344 (August 2000) ("*First Review Determination*"). The Commission's negative determination with respect to uranium from Uzbekistan was appealed to the U.S. Court of International Trade, 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. 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.

[11] 65 Fed. Reg. 50958 (Aug. 22, 2000).

[12] *Uranium from Russia*, Inv. No. 731-TA-539C (Second Review), USITC Pub. 3872 (Aug. 2006) at Appdx. A, Explanation of Commission Determination on Adequacy ("*Second Review Determination*").

[13] *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 (Continued…)

Third Review: In its third five-year review, the Commission conducted an expedited review because of an inadequate respondent interested party response, and did not find that other circumstances warranted a full review.[15] The Commission 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.[16] Commerce issued a notice continuing the suspension agreement on uranium from Russia on March 8, 2012.[17]

The Current Review: The Commission instituted this fourth review on February 1, 2017.[18] The Commission received responses to its notice of institution from: (i) Centrus Energy Corp. and its wholly owned subsidiary United States Enrichment Corporation (collectively "USEC"), a domestic producer of natural uranium and low enriched uranium ("LEU"); (ii) Power Resources, Inc., Crow Butte Resources, Inc., Ur-Energy USA Inc., and Energy Fuels Inc. (collectively "PRI/CB"), domestic producers of natural uranium; and (iii) Louisiana Energy Services LLC ("LES"), a domestic producer of uranium products. No respondent party responded to the notice of institution.

On May 8, 2017, the Commission determined that the domestic responses described above were individually adequate. The Commission also determined that the domestic interested party group response was adequate, and that the respondent party group response was inadequate. The Commission did not find any circumstances that would warrant conducting a full review.[19] It determined that it would conduct an expedited review pursuant to section 751(c)(3) of the Tariff Act of 1930, as amended.[20] USEC, LES, and PRI/CB each filed final comments pursuant to Commission rule 207.62(d).

U.S. industry data are based on the information provided in the responses to the notice of institution by the domestic producers, which include the sole U.S. enricher of LEU in 2016 and uranium concentrate producers responsible for 94 percent of U.S. production of that product in 2016.[21] U.S. import data and related information are based on Commerce's official import statistics.[22] Foreign industry data and related information are based on information from public sources, the responses to the notice of institution, and the facts available from the prior proceedings.

(…Continued)
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).

[14] 71 Fed. Reg. 46191 (Aug. 11, 2006).

[15] *Uranium from Russia*, Inv. No. 731-TA-539C (Third Review), USITC Pub. 4307 (Feb. 2012) at 5-6 ("*Third Review Determination*").

[16] *Third Review Determination*, USITC Pub. 4307 at 3.

[17] 77 Fed. Reg. 14001 (Mar. 8, 2012).

[18] 82 Fed. Reg. 8951 (Feb. 1, 2017).

[19] Commissioner Broadbent voted to conduct a full review.

[20] Explanation of Commission Determination on Adequacy, EDIS Doc. 611254 (May 10, 2017).

[21] Confidential Report ("CR")/Public Report ("PR") at Table I-1.

[22] CR at I-46, PR at I-35.

II. Domestic Like Product and Industry

A. Domestic Like Product

1. Background

In making its determination under section 751(c) of the Tariff Act, the Commission defines the "domestic like product" and the "industry."[23] 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."[24] The Commission's practice in five-year reviews is to examine the domestic like product definition from the original investigation and consider whether the record indicates any reason to revisit the prior findings.[25]

Commerce has defined the subject merchandise 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 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

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[23] 19 U.S.C. § 1677(4)(A).

[24] 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. Department 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).

[25] *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).

> 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, 2844.20.00, respectively. Imports of natural uranium other than compounds are currently classifiable under HTSUS subheadings: 2844.10.10 and 2844.10.50.[26]

Uranium is a radioactive substance used principally as 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. 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.[27]

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 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.[28]

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[26] *Uranium from the Russian Federation; Final Results of the Expedited Fourth Sunset Review of the Suspension Agreement*, 82 Fed. Reg. 26776, 26776-26777 (June 9, 2017) ("*Commerce Fourth Review Determination*") (footnote omitted).

[27] CR at I-19-30, PR at I-14-22.

[28] *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.
(Continued…)

In its first five-year 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.[29]

In its second five-year 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.[30]

(…Continued)

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.

[29] 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.

[30] 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.

In its 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.[31]

2. Current Review

The participating domestic producers indicate that they agree with the definition of the domestic like product the Commission adopted in its prior proceedings.[32] The available data in the record indicate that the pertinent product characteristics of uranium have not changed since the prior proceedings.[33] Consequently, for the reasons stated in the prior determinations, we find that there is a single domestic like product coextensive with the scope definition.

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."[34] 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, provided that they conduct adequate production-related activity in the United States.[35]

1. The Prior Proceedings

In the original investigation, the Commission decided to treat the Department of Energy 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. The Commission 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.[36]

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

[32] LES Response at 36; PRI/CB Response at 62; USEC Response at 12.

[33] *See generally* CR at I-19-30, PR at I-14-22.

[34] 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.

[35] *See, e.g.*, *United States Steel Group v. United States*, 873 F. Supp. 673, 682-83 (Ct. Int'l Trade 1994), *aff'd*, 96 F.3d 1352 (Fed. Cir. 1996).

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

In its first five-year 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.[37]

In its 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 concentrators PRI/CB, enricher USEC, or Westinghouse, a fabricator of fuel rods, as related parties.[38]

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.[39]

2. Current Review

These reviews raise the issue whether appropriate circumstances exist to exclude any producer from the domestic industry as a related party pursuant to 19 U.S.C. § 1677(4)(B). 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, or are themselves importers.[40] Exclusion of such a producer is within the Commission's discretion based upon the facts presented in each investigation.[41]

As explained further below, two domestic producers, USEC and Uranium One, are potentially subject to exclusion from the domestic industry pursuant to the related parties

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

[38] *Second Review Determination*, USITC Pub. 3872 at 15-18.

[39] *Third Review Determination*, USITC Pub. 4307 at 11-12.

[40] 19 U.S.C. § 1677(4)(B).

[41] 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 ration 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); *see also Torrington Co. v. United States*, 790 F. Supp. 1161, 1168 (Ct. Int'l Trade 1992).

provision. Domestic producers contend that the Commission should define the domestic industry as it did in the prior proceedings to include within the domestic like product all domestic producers of uranium in all forms.[42]

USEC. USEC, which ceased enrichment operations in 2013, claims that it is a still a domestic producer because it continues to sell LEU to utilities, including LEU from its domestically produced inventory. USEC also conducts research and development regarding centrifuge enrichment technology, and has the objective of re-entering the domestic enrichment market. USEC continues to import subject LEU pursuant to a long-term contract that it signed in 2011, making it a related party.[43]

For purposes of our analysis in this expedited review, we agree that USEC is a domestic producer.[44] At the time that USEC signed the agreement pursuant to which it now imports LEU, the HEU Agreement remained in effect, and legally obligated USEC to import subject LEU.[45] USEC currently imports LEU in order to fulfill its obligations under long-term supply contracts with electric utilities.[46] Additionally, USEC supports the continuation of the suspended investigation.[47] In light of these considerations and the absence of any contrary argument, we find that appropriate circumstances do not exist to exclude USEC as a related party.

Uranium One. Uranium One has been producing uranium concentrates at Willow Creek, Wyoming since 2010 and is wholly owned by the Russian Atomic Energy Agency (ROSATOM).[48] Because ROSATOM controls TENEX, the firm that exports enriched uranium from Russia, as well as Uranium One,[49] Uranium One is a related party.[50] Given that PRI/CB collectively account for

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[42] LES Response at 36; PRI/CB Response at 62; USEC Response at 12.

[43] USEC Response at 2-3; CR at I-39-40, PR at I-28-29.

[44] The Commission generally does not exclude a firm that produced the domestic like product during the period of review from its definition of the domestic industry because the firm ceased domestic production during the period. *See Sebacic Acid from China*, Inv. No. 731-TA-653 (Second Review), USITC Pub. 3775 (May 2005) at 13-14 ("*Sebacic Acid*"); *Saccharin from China*, Inv. No. 731-TA-1013 (Review), USITC Pub. 4077 (May 2009) at 5-6; *Brake Rotors from China*, Inv. No. 731-TA-744 (Second Review), USITC Pub. 4009 (June 2008) at 8 & n.39 ("*Brake Rotors*"). Furthermore, 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. *Sebacic Acid*, USITC Pub. 3775 at 14; *Brake Rotors*, USITC Pub. 4009 at 8 & n.39. The 2011-2016 period for which import data were collected for this review encompasses the time during which USEC was still engaging in domestic enrichment operations. *See* CR/PR at Tables I-7-8.

USEC asserts that it has continued to engage in substantial LEU production-related activities after ceasing LEU production in 2013. It has invested $2.5 billion in enrichment technology to prepare for deployment of a future commercial enrichment facility; has a license from the Nuclear Regulatory Commission for deployment of the technology at a plant in Piketon, Ohio; and successfully completed a three-year demonstration of its centrifuge technology in early 2016. USEC Response at 2, 8-10.

[45] CR at I-39-40, PR at I-28-29.

[46] USEC Response at Exhibit 1.

[47] USEC Response at 12.

[48] PRI/CB Response at 54.

[49] *See* CR at I-51, PR at I-38; USEC Response at 4-5.

94.1 percent of domestic U_3O_8 production, Uranium One can be responsible for no more than 5.9 percent of domestic U_3O_8 production.[51] Uranium One did not respond to the notice of institution, and the record contains no further information about its operations and status as a domestic producer. Consequently, the limited information on the record does not establish that appropriate circumstances exist to warrant Uranium One's exclusion from the domestic industry, and the existence of such circumstances would make no difference to the record of this investigation because Uranium One reported no data that the Commission could exclude. Therefore, we find that appropriate circumstances do not exist to exclude Uranium One as a related party.

Conclusion. In light of our definition of the domestic like product, we find that there is a single domestic industry consisting of all domestic producers of uranium, including concentrators, the converter, enrichers, and fabricators.

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 order or terminate a suspended investigation 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 suspended investigation "would be likely to lead to continuation or recurrence of material injury within a reasonably foreseeable time."[52] The Uruguay Round Agreements Act Statement of Administrative Action (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."[53] Thus, the likelihood standard is prospective in nature.[54] The U.S. Court of International Trade has found that "likely," as used in

(…Continued)

[50] *See* 19 U.S.C. § 1677(4)(B)(III).

[51] PRI/CB Response at Exhibit 4.

[52] 19 U.S.C. § 1675a(a).

[53] SAA, H.R. Rep. 103-316, vol. I at 883-84 (1994). 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.

[54] 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.

the five-year review provisions of the Act, means "probable," and the Commission applies that standard in five-year reviews.[55]

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 time."[56] 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."[57]

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."[58] 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).[59] 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.[60]

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

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[55] *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'").

[56] 19 U.S.C. § 1675a(a)(5).

[57] 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*.

[58] 19 U.S.C. § 1675a(a)(1).

[59] 19 U.S.C. § 1675a(a)(1). Because this review involves a suspension agreement, Commerce has not made any duty absorption findings.

[60] 19 U.S.C. § 1675a(a)(5). Although the Commission must consider all factors, no one factor is necessarily dispositive. SAA at 886.

or relative to production or consumption in the United States.[61] 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 country, which can be used to produce the subject merchandise, are currently being used to produce other products.[62]

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.[63]

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.[64] 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 the suspended investigation.[65]

No respondent interested party participated in this expedited review. The record, therefore, contains limited new information with respect to the uranium industry in Russia.

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[61] 19 U.S.C. § 1675a(a)(2).

[62] 19 U.S.C. § 1675a(a)(2)(A-D).

[63] *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.

[64] 19 U.S.C. § 1675a(a)(4).

[65] 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.

There also is limited information on the uranium market in the United States during the period of review. Accordingly, for our determinations, we rely as appropriate on the facts available from the original investigations and prior reviews, and the limited new information on the record in this fourth review.

B. Conditions of Competition and the Business Cycle

In evaluating the likely impact of the subject imports on the domestic industry if a suspended investigation 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."[66] The following conditions of competition inform our determination.

Demand. In its first reviews, 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.[67]

In its 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 fuel for U.S. nuclear utilities. The Commission also determined that a majority of U.S. electric utilities' purchases of uranium and uranium processing were based on long-term contracts.[68]

In its 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

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[66] 19 U.S.C. § 1675a(a)(4).

[67] *First Review Determination*, USITC Pub. 3344 at 29.

[68] *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.

market in the world. It observed that the 2011 Fukushima accident created uncertainties in the nuclear fuel industries and led to a decline in demand in several countries.[69]

In this fourth review, the available data in the record indicate that demand declined during the current period of review. Apparent U.S. consumption of uranium products, as measured by value, declined from $*** in 2010 to $*** in 2016.[70] The record indicates that six nuclear plant closures in the United States have occurred during the period of review, and several other nuclear plants are slated for retirement in the near future.[71] Furthermore, there is *** uncovered enrichment demand for the foreseeable future.[72]

Supply. In its first reviews, 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 an overhang of natural and enriched UF_6 inventories in the United States and throughout the world represented another source of uranium supply.[73]

In its 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 U.S. Department of Energy (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.[74]

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

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

[70] CR/PR at Table I-9. Because of the complexity of marketing natural and enriched uranium, the Commission's usual approach of computing apparent consumption from shipment data is difficult to apply here given the limitations of the record in this five-year review. Consequently, apparent consumption has been calculated only on the basis of value. CR at I-50, PR at I-37.

[71] LES Response at 14-15.

[72] LES Response at 15.

[73] *First Review Determination*, USITC Pub. 3344 at 29-31.

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

LES's "National Enrichment Facility" in Eunice, New Mexico) would significantly affect the future supply of LEU.[75]

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 only be sold in countries without import restrictions (known as "unrestricted market uranium").[76]

In its third review, the Commission determined 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.[77]

During the current period of review, there were several pertinent developments concerning supply. As discussed above, USEC ceased enrichment operations in 2013.[78] LES has continued to operate URENCO USA ("UUSA") during the period of review, which supplies approximately one-third of domestic demand for uranium enrichment services.[79] AREVA, a French enricher, had planned to build an enrichment facility in Idaho, but has since cancelled those plans.[80] Additionally, Global Laser Enrichment (GLE), which is a partnership between General Electric, Hitachi, and Cameco to commercialize laser enrichment technology in the United States and in other markets, has slowed development of that technology because of market conditions.[81]

The Russian industry is composed of more than 80 enterprises operating across the nuclear fuel cycle (including exporter TENEX), consolidated in a single entity held entirely by

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[75] *Second Review Determination*, USITC Pub. 3872 at 24-25.
[76] *Second Review Determination*, USITC Pub. 3872 at 25.
[77] *Third Review Determination*, USITC Pub. 4307 at 18.
[78] CR at I-29, PR at I-21.
[79] LES Response at 11.
[80] CR at I-6, PR at I-4.
[81] CR at I-29, PR at I-21; PRI/CB Response at 8.

ROSATOM.[82] In 2013, Russia fulfilled its commitment under the HEU Agreement to downblend 500 metric tons of HEU.[83] Since the completion of the HEU Agreement in 2013, the Russian industry has been permitted to ship LEU that has been produced directly through the fuel cycle, rather than only LEU downblended from HEU.[84]

Since the third five-year review, both the domestic industry and subject imports have gained market share. 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. [85] Meanwhile, nonsubject imports accounted for *** percent of apparent U.S. consumption in 2016, compared with *** percent in 2010.[86] Nonsubject imports nevertheless remain the *** source of supply of uranium products to the U.S. market.[87] The largest sources of nonsubject uranium products are Kazakhstan, Canada, and Australia.[88]

In May 2017, in accordance with the RSA and the Domenici Amendment, Commerce calculated adjustments to quotas for subject imports in order to reflect projected nuclear reactor demand in future years.[89] Domestic producers maintain that, notwithstanding the Domenici Amendment, the RSA continues to be of critical importance to the domestic industry, because it contains procedures and requirements not included in the Domenici Amendment.[90]

Other Conditions. 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 uranium concentrates, natural conversion, 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.[91]

Domestic producers argue that these conditions remain applicable and that uranium products continue to be highly fungible and price-sensitive.[92] There is no evidence in the record

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[82] CR at I-51, PR at I-38.

[83] CR at I-16, PR at I-12.

[84] CR at I-15, PR at I-11.

[85] CR/PR at Table I-9.

[86] CR/PR at Table I-9.

[87] CR/PR at Table I-9.

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

[89] *See* Decision Memorandum for the Final 2016 Export Limit Adjustments Under the Agreement Suspending the Antidumping Investigation on Uranium from the Russian Federation (May 19, 2017) at Attachment 1.

[90] LES Response at 11-12; PRI/CB Response at 6-7; USEC Response at 3-4.

[91] *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.

[92] LES Response at 9-10; PRI/CB Response at 14-19.

indicating that the Commission's past findings concerning the nature of the product are no longer applicable.

In its first five-year reviews, 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.[93] 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.[94]

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 part of the Soviet military stockpile, and sell it directly to utilities. USEC was committed to purchasing 5.5 million separative work units ("SWU") 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 (SWU). 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.[95]

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.[96]

There have been changes to the structure of the domestic industry during the current period of review. Specifically, in 2013, USEC ceased enrichment operations.[97] Additionally, LES has continued to operate UUSA, the only operational domestic enrichment facility, which satisfies approximately one-third of domestic demand for uranium enrichment services.[98]

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

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

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

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

[97] CR at I-29, PR at I-21.

[98] LES Response at 11.

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.[99]

In its 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. It based this decision on Russia's significant reserves of unmined uranium, its extensive capacity to produce all forms of uranium, its substantial inventories of various forms of uranium, its relatively small home market, and barriers to imports of Russian uranium in third-country markets.[100]

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.[101]

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.[102]

2. The Current Review

Under the provisions of the RSA, subject imports maintained a substantial presence in the U.S. market during the period of review. The value of subject imports ranged from a period

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[99] *Original Preliminary Determination*, USITC Pub. 2471 at 24.
[100] *First Review Determination*, USITC Pub. 3344 at 32-37.
[101] *Second Review Determination*, USITC Pub. 3872 at 25-30.
[102] *Third Review Determination*, USITC Pub. 4307 at 19-21.

low of $854.4 million in 2013 to a period high of $1.0 billion in 2016.[103] Imports of uranium into the United States from Russia amounted to *** percent of the total value of apparent U.S. consumption in 2016.[104] Russia was one of the four largest suppliers to U.S. nuclear utilities in each year from 2011 through 2015, and accounted for roughly 16 percent of U.S. utilities' purchases in 2015.[105] The value and market penetration of subject imports even with the RSA in place indicates the importance of the U.S. market to the subject producers.

In the second and third reviews, the Commission concluded that the Russian industry had substantial inventories of all forms of uranium and significant production capacity to produce all forms of uranium.[106] In this review, there is uncontradicted evidence in the record that the Russian industry continues to have substantial inventories of uranium products. According to a TENEX annual report, the company held inventory valued at approximately $579 million at the end of 2014. Russian enrichers also control roughly 900 tons of government-surplus HEU, which can be downblended into LEU and exported to the United States.[107] There is also evidence that the Russian industry has large and underutilized production capacity, with roughly 9 percent of the world's reasonably assured resources and substantial access to U_3O_8 from Kazakhstan, ***.[108] LES also claims that Russia's excess enrichment capacity is ***.[109] Furthermore, an industry analyst estimated that only 14 percent of Russia's supply of enriched uranium went towards satisfying domestic demand in 2015, underscoring the Russian industry's dependence on exports.[110]

The U.S. market remains 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. Russian access to European markets is limited. EURATOM, which governs the market for nuclear energy production in Europe, has taken steps to discourage European Union (EU) member states from entering into supply contracts for uranium from Russia, in order to promote supply diversity.[111] China, which is largely responsible for projected growth in world nuclear generation capacity, intends to be self-sufficient in its nuclear power generation activities, and to become an exporter itself.[112] Other countries, such as the United Kingdom, Switzerland, Germany, Japan, and Taiwan, are phasing out nuclear capacity, in some cases rapidly, partly in response to the 2011 Fukushima accident.[113] In particular, Japan, which was

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[103] CR/PR at Table I-7.

[104] CR/PR at Table I-9.

[105] CR/PR at Table I-8.

[106] *Second Review Determination*, USITC Pub. 3872 at 27-28; *Third Review Determination*, USITC Pub. 4307 at 20.

[107] CR at I-53-54, PR at I-39.

[108] CR at I-53; PR at I-39; LES Response at 17.

[109] CR at I-53, PR at I-39; LES Response at 18.

[110] PRI/CB Response at 35.

[111] CR at I-54-55, PR at I-40.

[112] CR at I-56, PR at I-41.

[113] CR at I-55-56, PR at I-41.

the third largest market for uranium products before the 2011 Fukushima accident, is currently operating only three of its 54 nuclear reactors.[114]

By contrast, the U.S. market has not experienced significant contraction; U.S. utilities' demand remained roughly stable from 2011 through 2015.[115] The United States is also the largest market for uranium, representing about 30 percent of worldwide demand, and has the highest levels of uncovered uranium demand through 2020.[116] Russian producers have acknowledged their desire to increase exports to the United States. For example, after TENEX signed a contract with several U.S. utilities, the head of ROSATOM stated that the deal was "only the beginning" of the Russian industry's efforts to enter into LEU contracts with U.S. utilities.[117] Furthermore, TENAM, a North American subsidiary of the Russian industry, maintains an office outside of Washington, DC, to contract directly with American utilities, and domestic utilities have indicated their willingness to purchase subject imports.[118]

In light of Russia's substantial uranium inventories and production capacity, the relative attractiveness of the U.S. market, and evidence of the Russian industry's intention to increase exports to the United States, we find that the volume of subject imports, which is already substantial, would likely be significant, both in absolute terms and relative to U.S. consumption, should the suspended investigation be terminated.[119]

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 Soviet Union.[120]

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[114] CR at I-56, PR at I-41.

[115] CR/PR at Table I-8

[116] CR at I-56, PR at I-41.

[117] LES Response at 27.

[118] CR at I-51, PR at I-38; PRI/CB Response at 42; LES Response at 27-28.

[119] The record lacks 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 its third five-year review, 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; LES Response at 11-12; PRI/CB Response at 6-7; USEC 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.

[120] *Original Preliminary Determination*, USITC Pub. 2471 at 25-26.

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 part of the fuel cycle; and declining uranium prices.[121]

In the second 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 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.[122]

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.[123] 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 was 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.[124]

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[121] *First Review Determination*, USITC Pub. 3344 at 37-38.
[122] *Second Review Determination*, USITC Pub. 3872 at 30-32.
[123] *Third Review Determination*, USITC Pub. 4307 at 22-23.
[124] *Third Review Determination*, USITC Pub. 4307 at 22.

2. The Current Review

The record in this expedited review contains no specific price comparison data, although prices have declined since the 2011 Fukushima accident.[125] On the basis of the available evidence, however, we find that if the suspended investigation were terminated, subject imports from Russia would likely undersell U.S. uranium in order to gain market share, thereby depressing or suppressing prices of the domestic like product. We have found that termination of the suspended investigation would likely result in a significant increase in subject imports volume. Because the subject imports and the domestic like product are fungible, and the uranium market is price sensitive, subject producers are likely to offer low prices in the U.S. market as a means of increasing their market penetration. Indeed, the Russian industry has touted its ability to undersell the U.S. industry: ROSATOM has claimed that it is able to undercut global nuclear fuel and service prices, including U.S. prices, by 30 percent.[126] Faced with likely underselling, domestic producers will be forced to choose between cutting prices or losing sales.

For the foregoing reasons, we find that termination of the suspended investigation would likely lead to significant underselling of the domestic like product by subject imports, as well as likely significant price depression or suppression, within a reasonably foreseeable time.

E. Likely Impact of Subject Imports

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. Other indicators, however, were unknown or positive. The industry overall had a very 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. The Department of Energy's enrichment enterprise showed generally positive results on 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.[127]

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

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[125] For example, the spot price for LEU before the Fukushima accident was $***/SWU, but only $***/SWU in November 2016. CR at I-43, PR at I-32.

[126] LES Response at 30-31.

[127] *Original Preliminary Determination*, USITC Pub. 2471 at 16-23.

termination would have a significant impact on all of the domestic industry's performance indicators.[128]

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.[129]

In the third review, the Commission again found that the likely significant volume of 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 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 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.[130]

2. The Current Review

As in previous reviews, we analyze the likely impact of subject imports on the domestic industry as a whole, while also considering the impact of subject imports on domestic producers at different stages of the uranium fuel cycle. In this expedited review, information in the record is based on data provided in response to the notice of institution by four concentrators (Power Resources, Crow Butte, Ur-Energy USA, and Energy Fuels) and two enrichers (LES and USEC). The Commission did not receive information from other U.S. concentrators, the lone U.S. converter, or fabricators.[131] The limited record in this review is

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[128] *First Review Determination*, USITC Pub. 3344 at 39-40.

[129] *Second Review Determination*, USITC Pub. 3872 at 32-34.

[130] *Third Review Determination*, USITC Pub. 4307 at 23-24.

[131] We note that, in terms of the share of total processing costs, concentrating and enrichment are by far the largest components of the U.S. industry producing nuclear fuel, together accounting for 70 (Continued…)

insufficient for us to make a finding on whether the domestic injury is vulnerable to the continuation or recurrence of material injury if the suspended investigation were terminated.

Because this is an expedited review, we have only limited information concerning the domestic industry's performance.[132] The information on the record indicates that in 2016, the domestic industry's natural uranium concentrate production capacity was 20.0 million pounds, its production was 2.7 million pounds, and its capacity utilization was 13.7 percent.[133] In 2016, domestic concentrators had net sales of $ 121.2 million, an operating loss of $102.1 million, and an operating income margin of negative 84.2 percent, significantly worse than in the original investigation or in any prior review.[134] In 2016, the only operating domestic enricher, LES, had production capacity of *** SWU, production of *** SWU, and a capacity utilization rate of *** percent. In 2016, LES had net sales of $***, operating income of $***, and an operating income margin of *** percent.[135]

On the basis of the information available in these reviews, we find that, if the suspended investigation were terminated, the likely significant volume and price effects of the subject imports would likely have a significant impact on the production, shipments, sales, market share, and revenues of the domestic industry. Declines in those indicators of industry performance would likely have a direct adverse effect on the industry's profitability and employment, as well as its ability to raise capital, make and maintain capital investments, and fund research and development.

We have also considered the role of factors other than subject imports, including the presence of nonsubject imports, so as not to attribute the likely impact of other factors to the subject imports. Nonsubject imports as a share of the U.S. market were *** percent in 2016, down from *** percent in 2010.[136] 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. Consequently, the likely effects of subject imports in the event of termination of the suspended investigation are distinct from those of nonsubject imports.

Accordingly, on the basis of the evidence in the record, we conclude that, if the suspended investigation were terminated, subject imports would likely have a significant impact on the domestic industry within a reasonably foreseeable time.

(…Continued)
percent of total processing costs in 2017. CR/PR at Table I-4. We also note that, in March 2017, Westinghouse, a fabricator, filed for bankruptcy protection. CR at I-5, PR at I-4.

[132] Uranium concentrators' trade and financial data for 2016, provided for this review, are not comparable to data for 2010, provided for the third review. The Commission received financial data from concentrators responsible for only approximately *** percent of domestic production in 2010, whereas, in this review, it has received financial data from concentrators responsible for more than 94 percent of U.S. production in 2016. CR/PR at Table I-5.

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

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

[135] CR/PR at Table I-6.

[136] CR/PR at Table I-9.

IV. Conclusion

For the foregoing reasons, we determine that termination of the suspended investigation covering 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.

INFORMATION OBTAINED IN THIS REVIEW

BACKGROUND

On February 1, 2017, 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 revocation of the suspended antidumping duty investigation on uranium from Russia would likely lead to the continuation or recurrence of material injury to a domestic industry.[2] All interested parties were requested to respond to this notice by submitting certain information requested by the Commission.[3] [4] The following tabulation presents information relating to the background and schedule of this proceeding:

Effective or statutory date	Action
February 1, 2017	Notice of initiation and institution by Commerce and Commission
May 8, 2017	Commission vote on adequacy
June 9, 2017	Commerce results of its expedited review
September 29, 2017	Commission statutory deadline to complete expedited review

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

[2] *Uranium from Russia; Institution of a Five-Year Review*, 82 FR 8951, February 1, 2017. 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 antidumping duty order concurrently with the Commission's notice of institution. *Initiation of Five-Year ("Sunset") Reviews*, 82 FR 9193, February 3, 2017. 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 prior proceedings is 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 subject merchandise. Presented in app. D are the responses received from purchaser surveys transmitted to the purchasers identified in the adequacy phase of this review.

RESPONSES TO THE COMMISSION'S NOTICE OF INSTITUTION

Individual responses

The Commission received three 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. Centrus Energy Corp. and its wholly-owned subsidiary, United States Enrichment Corporation ("USEC") (collectively, "Centrus"), wholesaler and importer of low-enriched uranium ("LEU") and domestic producer (enricher) of LEU through 2013.

2. Louisiana Energy Services, LLC ("LES"), a producer and enricher of LEU as the operator of the URENCO USA ("UUSA") facility in New Mexico.

3. Power Resources, Inc. ("PRI"), Crow Butte Resources, Inc. ("Crow Butte"), Ur-Energy USA Inc. ("Ur-Energy"), and Energy Fuels Inc. ("Energy Fuels"), domestic producers of natural uranium concentrate (collectively, "uranium concentrate producers").

The Commission received no submissions in response to its notice of institution in the subject review from entities in the subject country.

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 responses. A summary of the number of responses and estimates of coverage for each is shown in table I-1.

Table I-1
Uranium from Russia: Summary of responses to the Commission's notice of institution

Type of interested party	Completed responses	
	Number	Coverage
Domestic:		
U.S. producer	3	([1])

[1] 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. LES was the only enricher of LEU in the U.S. in 2016. Centrus enriched and produced LEU up until 2013. The uranium concentrate producers account for about 94 percent of concentrate production in the United States in 2016.

Party comments on adequacy

The Commission received three submissions from parties commenting on the adequacy of responses to the notice of institution and whether the Commission should conduct expedited or full reviews. These submissions were filed on behalf of the following entities: Centrus; LES; and the uranium concentrate producers.

Domestic interested parties argued that the Commission should find the respondent interested party group response to be inadequate since there was no complete submission by any respondent interested party. Therefore, because of the inadequate response by the respondent interested parties and the fact that there have been no major changes in the conditions of competition in the market since the Commission's last five-year review, they request that the Commission conduct an expedited review of the suspension agreement on uranium from Russia. Further, domestic interested parties note language in the most recently amended 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. [5]

RECENT DEVELOPMENTS IN THE INDUSTRY

Since the Commission's last five-year review, the following developments have occurred in the uranium industry.

- In the aftermath of tsunami-caused Fukushima accident in Japan on March 11, 2011, global demand for nuclear power has declined, leading to a glut of inventory and declining prices. The accident also led several countries to engage in policies to reduce or eliminate their dependence on nuclear power.[6]
- USEC, the only U.S. enricher in the first and second reviews (and one of two enrichers in the third review), underwent a financial restructuring in 2014, becoming Centrus Energy Corp.[7] The company also ceased enrichment at its

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[5] LES *Comments on Adequacy*, April 17, 2017, pp. 1-5; Centrus *Comments on Adequacy*, April 17, 2017, p. 2; uranium concentrate producers, *Comments on Adequacy*, April 17, 2017, pp. 1-3. However, uranium concentrate producers also note that, "Neither the parties' collective desire for an expedited review in this proceeding nor the RSA language concerning expedited reviews limits the Commission's discretion to conduct a full review if it determines that circumstances require." Uranium concentrate producers, Comments on Adequacy, April 17, 2017, pp. 1-5.

[6] *Centrus' Response to the Notice of Institution,* March 3, 2017, p. 12; *LES' Response to the Notice of Institution,* March 3, 2017, pp. 10, 22-24,; and uranium concentrate producers' *Response to the Notice of Instituation*, March 3, 2017, pp. 37-39, 59-61.

[7] *Centrus' webpage "History",* http://www.centrusenergy.com/who-we-are/history/, retrieved April 17, 2017. In the original preliminary investigation, the only enricher reported was the U.S. Department of Energy ("DOE"). *Uranium from U.S.S.R., Inv. No. 731-TA-539 (Preliminary),* USITC Pub. 2471, December 1991. p. A-28. USEC originated as a government corporation created out of the DOE's

(*continued*...)

Paducah, KY gaseous diffusion plant in 2013.[8] While it is no longer an enricher of uranium, it still distributes uranium domestically from existing inventories, and is and has been an importer of uranium during the period of review.[9] It currently is working with UT-Battelle, LLC, the operator of the DOE's Oak Ridge National Laboratory, to develop and test centrifuge technology.[10] The company has stated it has an objective of resuming commercial enrichment production.[11]

- 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"), described in more detail below, concluded in December 2013. The agreement, also known as the "Megatons to Megawatts" program, allowed for the downblending and transfer of highly enriched uranium ("HEU") from Russian nuclear warheads for commercial energy producing purposes in the United States. Under the program 500 metric tons of bomb-grade HEU was recycled into more than 14,000 metric tons of low enriched uranium.[12]
- On March 29, 2017, Westinghouse Electric Company, LLC ("Westinghouse"), one of the fabricators historically involved in the uranium industry, filed for bankruptcy protection. The bankruptcy leaves in doubt the future of two reactor construction projects Westinghouse had been developing in Georgia and South Carolina.[13]
- Areva Nuclear Materials LLC had been planning an enrichment facility to be located in Idaho Falls, ID. However, on March 10, 2017, the firm sent a letter to the U.S. Nuclear Regulatory Commission requesting termination of a license to construct and operate the facility stating, "Since the facility will not be constructed, maintaining the License is no longer required and it can now be terminated."[14]

(…*continued*)
Uranium Enrichment Enterprise after passage of the Energy Policy Act of 1992. *Centrus' webpage "History",* http://www.centrusenergy.com/who-we-are/history/, retrieved April 17, 2017.

[8] Centrus' *Response to the Notice of Institution*, March 3, 2017, p. 8.

[9] Centrus' *Response to the Notice of Institution*, March 3, 2017, pp. 2-3, 11.

[10] Centrus' *Response to the Notice of Institution*, March 3, 2017, p. 8.

[11] Centrus' *Response to the Notice of Institution*, March 3, 2017, p. 2.

[12] *Centrus' webpage "Megatons to Megawatts",* http://www.centrusenergy.com/who-we-are/history/megatons-to-megawatts/, retrieved April 24, 2017.

[13] Diane Cardwell and Jonathan Soble, "Westinghouse Files for Bankruptcy, in Blow to Nuclear Power", March 29, 2017, https://www.nytimes.com/2017/03/29/business/westinghouse-toshiba-nuclear-bankruptcy.html?_r=0, accessed April 17, 2017.

[14] Letter from Sam Shakir, President and CEO, AREVA Nuclear Materials LLC, to U.S. Nuclear Regulatory Commission, March 10, 2017.

THE ORIGINAL INVESTIGATION AND SUBSEQUENT REVIEWS[15]

The original investigation

On November 8, 1991, a petition was filed with Commerce and the Commission alleging that an industry in the United States was materially injured by reason of dumped imports of uranium from the U.S.S.R. and each Republic that was a member of the U.S.S.R. on the filing date of the petition.[16] On December 25, 1991, the U.S.S.R. dissolved, and shortly thereafter the United States recognized the former Soviet republics as independent countries. Commerce investigated each of the former Soviet republics in turn 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 less than fair value ("LTFV").[17] 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.[18] The Commission suspended its final investigations immediately thereafter.

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[15] Unless otherwise indicated, the discussion in this section is based on information contained in *Uranium from Russia: Investigation No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012,pp. I-4—I-6.

[16] The petition was filed by counsel on behalf of the Ad Hoc Committee of Domestic Uranium Producers ("Ad Hoc Committee") and the Oil, Chemical and Atomic Workers International Union. The names and locations of the petitioners are as follows: Ferret Exploration Co., Inc., Denver CO; First Holding Co., Denver, CO; Geomex Minerals, Inc., Denver, CO; Homestake Mining Co., SanFrancisco, CA; IMC Fertilizer, Inc., Northbrook, IL; Malapai Resources Co., Houston, TX; Pathfinder Mines Corp., Bethesda, MD; Power Resources, Inc., Denver CO; Rio Algom Mining Corp., Oklahoma City, OK; Solution Mining Corp., Laramie, WY; Total Minerals, Corp., Houston, TX; Umetco Minerals Corp., Danbury, CT; Uranium Resources, Inc., Dallas, TX; and Oil, Chemical and Atomic Workers International Union, Denver, CO.

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. See *Uranium from Russia: Investigation No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, p. 3, citing from *Uranium from U.S.S.R., Inv. No. 731-TA-539 (Preliminary),* USITC Pub. 2471, December 1991.

[17] 57 FR 2330, June 3, 1992.

[18] *Antidumping; Uranium from Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Ukraine, and Uzbekistan; Suspension of Investigations and Amendment of Preliminary Determinations*, 57 FR 49220, 49235, October 30, 1992. Commerce also amended its preliminary determinations to include HEU in the scope of the investigations.

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.[19] The Commission thereupon continued investigation Nos. 731-TA-539-D (Tajikistan) and 539-E (Ukraine), and on August 6, 1993, determined negatively with respect to Tajikistan and affirmatively with respect to Ukraine.[20] Commerce's final antidumping margin for Ukraine was 129.29 percent.

Commission activity on 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.[21] The Commission reached a negative determination with respect to the antidumping investigation concerning imports of uranium from Kazakhstan on July 13, 1999.[22]

The first five-year review

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.[23] 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[24] and the Commission thereafter terminated its corresponding five-year review.[25] 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.[26] 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 at a weighted-average margin of 129.29 percent. On June 27, 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 at a weighted-average margin of 115.82 percent. In July 2000, the Commission determined that termination of the suspended investigation concerning Uzbekistan and revocation of the

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

[20] *Uranium From Tajikistan and Ukraine, Investigations Nos. 731-TA-539-D and 539-E (Final)*, USITC Pub. 2669, August 1993.

[21] 64 FR 2877, January 19, 1999.

[22] *Uranium from Kazakhstan, Investigation No. 731-TA-539-A (Final)*, USITC Pub. 3213, July 1999.

[23] 64 FR 41965, August 2, 1999.

[24] 64 FR 59737, November 3, 1999.

[25] 64 FR 61939, November 15, 1999.

[26] 64 FR 62691, November 17, 1999.

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.[27] Commerce published notice of the continuation of the suspended antidumping duty investigation concerning uranium from Russia on August 20, 2000.[28]

The second five-year review

The Commission instituted the second five-year review of the suspended investigation on July 1, 2005,[29] and determined on October 4, 2005, that it would conduct a full review.[30] 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 at a weighted-average margin of 115.82 percent.[31] On August 1, 2006, the Commission notified Commerce of its determination that material injury would be likely to continue or recur within a reasonably foreseeable time[32] and, on August 11, 2006, Commerce issued the second continuation of the suspended investigation.[33]

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[27] 65 FR 48734, August 9, 2000.

[28] *Notice of Continuation of Suspended Antidumping Duty Investigation: Uranium from Russia*, 65 FR 50958, August 22, 2000; and *Uranium from Russia; Corrected Continuation of Suspended Antidumping Duty Investigation*, 65 FR 52407, August 29, 2000.

[29] 70 FR 38212, July 1, 2005.

[30] 70 FR 60368, October 17, 2005. The Commission determined that all of the domestic interested party responses were individually adequate, the domestic interested party group response was adequate, and the respondent interested party group response was inadequate. In light of a desire to further examine conditions of competition for this industry, including changes to the U.S.-Russia HEU Agreement, the Commission found that circumstances warranted conducting a full review.

[31] 71FR 32517, June 6, 2006.

[32] 71 FR 44707, August 7, 2006.

[33] *Continuation of Suspended Antidumping Duty Investigation: Uranium From the Russian Federation*, 71 FR 46191, August 11, 2006.

The third five-year review

The Commission instituted the third five-year review of the suspended investigation on July 1, 2011, [34] and determined it would conduct an expedited review on October 4, 2011.[35] 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 at a weighted-average margin of 115.82 percent.[36] On February 27, 2012, the Commission notified Commerce of its determination that material injury would be likely to continue or recur within a reasonably foreseeable time[37] and, on March 8, 2012, Commerce issued the third continuation of the suspended investigation.[38]

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

[34] 76 FR 38694.

[35] 76 FR 64107, October 17, 2011.

[36] 76 FR 68404.

[37] 77 FR 12880, March 2, 2012.

[38] *Continuation of Suspended Antidumping Duty Investigation: Uranium From the Russian Federation*, 77 FR 14001.

[39] Unless otherwise indicated, the discussion in this section is based on information contained in *Uranium from Russia: Investigation No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, pp. I-7—I-13.

[40] *Antidumping; Uranium from Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Ukraine, and Uzbekistan; Suspension of Investigations and Amendment of Preliminary Determinations*, 57 FR 49221, October 30, 1992. Commerce also amended its preliminary determination to include HEU in the scope of the investigations.

spot market and long-term contract prices.[41] The agreement permitted importation of uranium from Russia for processing in the United States 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, 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.[43] 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.[44] 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).[45]

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[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] *Amendment to the Agreement Suspending the Antidumping Investigation on. Uranium From the Russian Federation*, 59 FR 15373, April, 1994. The amendment also extended the duration of the Suspension Agreement to March 31, 2004. A separative work unit 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.

[43] *Uranium From Russia, Ukraine, and Uzbekistan, Investigations Nos. 731-TA-539 C, E, and F (Review)*, USITC Publication 3334, August 2000, p. I-9.

[44] *Amendment to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation*, 59 FR 15376, April 1, 1994.

[45] *Amendment Suspending the Antidumping Investigation on Uranium From the Russian Federation, 63 FR 40879*, July 31, 1998.

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.[46] 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.[47]

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.[48]

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.[49]

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

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

[47] *Amendments to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation*, 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.

[48] *Amendments to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation*, 61 FR 56665, November 4, 1996.

[49] *Amendment to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation*, 62 FR 37879, July 15, 1997.

2020 for commercial Russian uranium exports sold directly or indirectly to U.S. utilities or otherwise.[50] The 2008 Amendment included the following provisions:

• Small amounts of commercial LEU from Russia were allowed into the United States between 2008 through 2013.

• During 2014-20, following the expiration of the HEU Agreement, the import quota will be raised to approximate 20 percent of the U.S. enrichment market.

• After 2020, the RSA will expire.

• In contrast to the HEU Agreement, the enriched uranium allowed into the United States from Russia after 2013 but before 2021 can 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 can be sold directly to U.S. utilities without requiring the services of an executive agent.

Commerce noted that the following from Section XII of the 2008 Amendment is of particular relevance in this third five-year review:

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.[51]

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.[52] The Domenici Amendment allowed Russia to export to the United

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[50] *Amendment to the Agreement Suspending the Antidumping Investigation on Uranium From the Russian Federation*, 73 FR 7705, February 11, 2008. The Department issued its memorandum regarding the 2008 Amendment's prevention of price suppression or undercutting on May 14, 2008. *Memorandum to David M. Spooner, Assistant Secretary for Import Administration, from Ronald K. Lorentzen, Deputy Assistant Secretary for Policy and Negotiations, regarding "Prevention of Price Suppression or Undercutting of Price Levels of Domestic Products by the Amended Agreement Suspending the Antidumping Investigation on Uranium from the Russian Federation,"* May 14, 2008.

[51] *Issues and Decision Memorandum for the Third Sunset Review of the Agreement Suspending the Antidumping Investigation on Uranium from the Russian Federation; Final Results*, October 28, 2011, p. 3.

[52] *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

(*continued*...)

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.

PRIOR RELATED INVESTIGATIONS[53]

On December 7, 2000, USEC filed a petition alleging that an industry in the United States was materially injured and threatened with material injury by reason of subsidized and LTFV imports of low enriched uranium ("LEU") from France, Germany, the Netherlands, and the United Kingdom. Commerce determined that LEU from Germany, the Netherlands, and the United Kingdom was not being sold at LTFV.[54] The Commission found material injury to the domestic industry by reason of imports of LEU from France, Germany, the Netherlands, and the United Kingdom that were found by Commerce to be subsidized. The Commission also found injury to the domestic industry by reason of imports of LEU from France that found by

(…*continued*)
consideration the requirements of the Domenici Amendment. *Statement of Administrative Intent*, February 2, 2010.

[53] Unless otherwise indicated, the discussion in this section is based on information contained in *Uranium from Russia: Investigation No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, p. I-14.

[54] *Notice of Final Determinations of Sales at Not Less Than Fair Value: Low Enriched Uranium from the United Kingdom, Germany, and the Netherlands*, 66 FR 65886, December 21, 2001.

Commerce to be sold at LTFV.[55] Accordingly, on February 12, 2002, Commerce issued one antidumping and four countervailing duty orders.[56] On July 7, 2006, Commerce determined that all programs found to have provided countervailable subsidies on LEU from Germany, the Netherlands, and the United Kingdom had been abolished for at least three consecutive years. Commerce found that continued application of these CVD orders was no longer warranted, and revoked the CVD orders on imports of LEU from Germany, the Netherlands, and the United Kingdom.[57]

THE PRODUCT

Commerce's scope

Commerce has defined the subject merchandise as follows:

> The merchandise covered by this Suspension Agreement (Section III, "Product Coverage") includes the following products from Russia:[58] 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

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[55] *Low Enriched Uranium From France, Germany, the Netherlands, and the United Kingdom-Determinations*, 67 FR 6050, February 8, 2002.

[56] *Notice of Amended Final Determination of Sales at Less Than Fair Value and Antidumping Duty Order: Low Enriched Uranium From France*, with antidumping margins of 19.95 percent ad valorem for CogemaEurodif and all others (67 FR 6680, February 13, 2002); and *Notice of Amended Final Determinations and Notice of Countervailing Duty Orders: Low Enriched Uranium From Germany, the Netherlands and the United Kingdom*, with subsidy rates in all three countries of 2.23 percent ad valorem for Urenco and all others (67 FR 6689, February 13, 2002), and France, with subsidy rates of 12.15 percent ad valorem for Eurodif/Cogema and all others (67 FR 6691, February 13, 2002).

[57] *Low Enriched Uranium from Germany, the Netherlands, and the United Kingdom: Final Results of Countervailing Duty Administrative Reviews and Revocation of Countervailing Duty Orders*, 71 FR 38626, July 7, 2006.

[58] *See 1992 Suspension Agreements*, at 49235.

Russia and is not subject to the terms of this Suspension Agreement.[59] 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.[60] 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, 2844.20.00, respectively. Imports of natural uranium metal and forms of natural uranium other than compounds are currently classifiable under HTSUS subheadings: 2844.10.10 and 2844.10.50. HTSUS subheadings are provided for convenience and Customs purposes. The written description of the scope of this proceeding is dispositive. The Department has not received any scope requests or made any scope determinations in this proceeding since the Second Sunset Review.[61]

Description and uses[62]

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. Natural 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

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[59] As noted above, the second amendment of two amendments to the Suspension Agreement effective on November 4, 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 *Amendments to the Agreement Suspending the Antidumping Investigation on Uranium from the Russian Federation*, 61 FR 56665, November 4, 1996.

[60] Section IV .M of the Suspension Agreement in no way prevents Russia from selling directly or indirectly any or all of the HEU in existence at the time of the signing of the Suspension Agreement and/or LEU produced in Russia from HEU to the U.S. Department of Energy ("DOE"), its governmental successor, its contractors, assigns, or U.S. private parties acting in association with DOE or the United States Enrichment Corporation and in a manner not inconsistent with the agreement between the United States and Russia concerning the disposition of HEU resulting from the dismantlement of nuclear weapons in Russia. See *1992 Suspension Agreements*, at 49237.

[61] *Uranium From the Russian Federation; Final Results of Expedited Sunset Review of the Suspension Agreement*, 76 FR 68404, November 4, 2011.

[62] Unless otherwise noted, this information is based on *Uranium from Russia: Investigation No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, pp. I-17—I-19.

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. 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.

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 to 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 "SWU". As is intuitively obvious, 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 gaseous-diffusion or gas-centrifuge technology. In order to use these processes, 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, in a few reactor designs, e.g., CANDU reactors deployed in Canada, Argentina, China, India, Pakistan, Romania, and South Korea, electricity can be generated from reactors containing natural uranium.[63] Other uses for uranium include Government-sponsored nuclear programs, including weapons, 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 U.S. currently produces much greater quantities of depleted uranium than it uses.

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[63] WNA, "Uranium Enrichment", November 2016, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx; Canadian Nuclear Association, "CANDU Technology", https://cna.ca/technology/energy/candu-technology/ (accessed April 14, 2017).

Depleted uranium with no commercial use is either disposed of as low-level radioactive waste or transferred to DOE, which currently has about 750,000 metric tons in storage.[64]

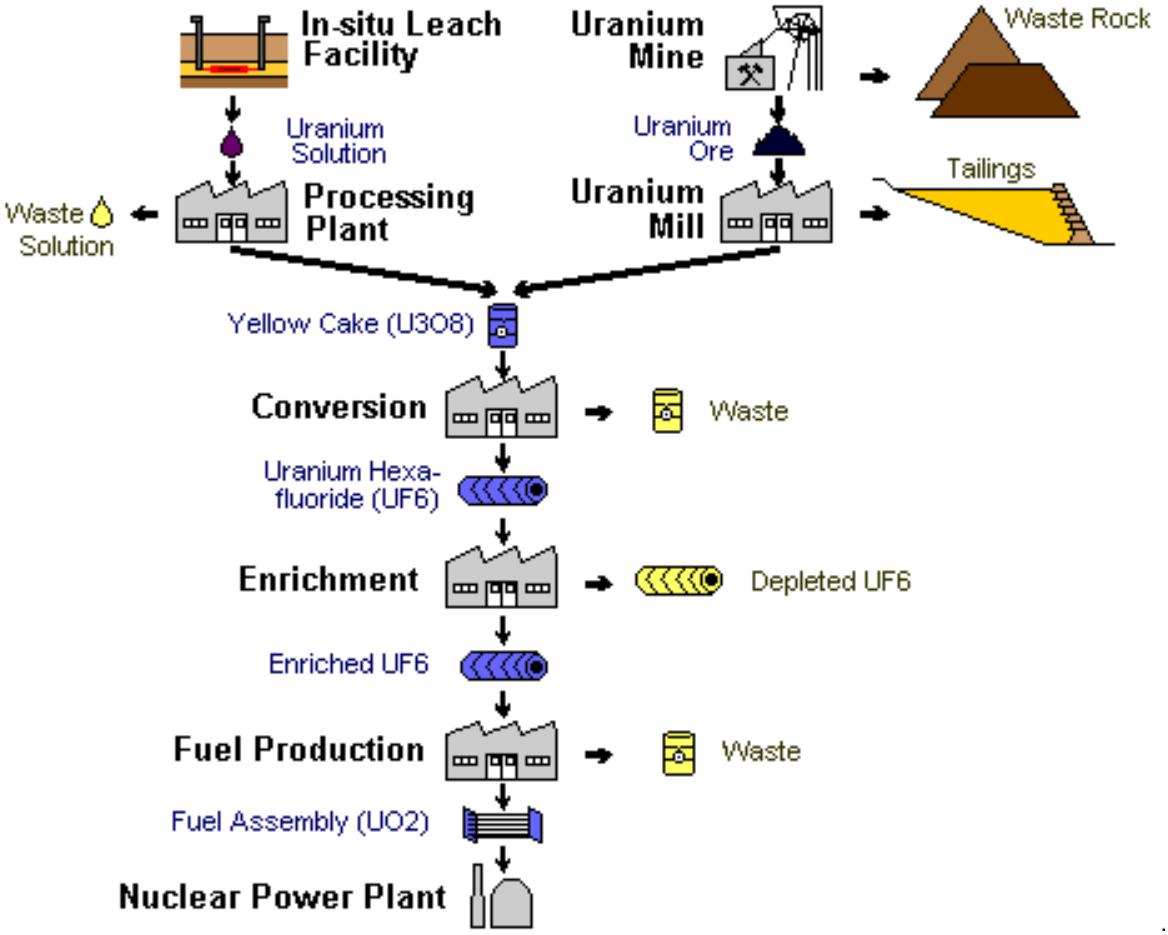
Manufacturing process[65]

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.

[64] U.S. Nuclear Regulatory Commission, "Background Information on Depleted Uranium," February 24, 2017, https://www.nrc.gov/waste/llw-disposal/llw-pa/uw-streams/bg-info-du.html

[65] Unless otherwise noted, this information is based on *Uranium from Russia: Investigation No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, pp. I-19—I-23.

Figure I-1
Nuclear Fuel Production Chain for Light Water Reactors



Source: WISE, *Nuclear Fuel Production Chain*, retrieved at http://www.wise-uranium.org/nfp.html (as cited in *Uranium From Russia: Investigation No. 731-TA-539-C (Second Review)*, USITC Publication 3872, August 2006, p. I-19.)

Table I-2 below identifies the producers and products for the four main steps involved in manufacturing uranium-based nuclear fuel.

Table I-2
Stages of Nuclear Fuel Production

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

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 dramatically, especially in the United States. 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 at two of DOE's national laboratories,

Pacific Northwest (PNNL) and Oak Ridge (ORNL), have made recent advances on developing seawater extraction as a renewable alternative to uranium mining.[66]

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 convert uranium concentrate to UF_6. Converdyn's facility in the U.S. 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.[67] 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.[68] 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.[69]

There are two traditional methods of uranium enrichment: gaseous diffusion enrichment and gas centrifuge enrichment.[70] Gaseous diffusion involves the passage of UF_6 in a gaseous form through thousands of barriers or cascades, containing millions of microscopic holes, until the desired assay is reached. Because U^{235} is lighter than U^{238}, the U^{235} passes

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[66] Jennifer Hackett, "Uranium Extraction from Seawater Takes a Major Step Forward," *Scientific American,* July 1, 2016, https://www.scientificamerican.com/article/uranium-extraction-from-seawater-takes-a-major-step-forward/

[67] WNA, "Conversion and Deconversion," January 2017, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/conversion-and-deconversion.aspx

[68] 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.

[69] As indicated previously, the industry uses a standard of measure of effort or service employed in the uranium enrichment industry known 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.

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

through the barriers more readily than the U^{238}. At the end of the gaseous diffusion process, there are two UF_6 streams, both of which contain primarily U^{238}, but one stream contains a higher concentration of U^{235} suitable for use in a nuclear reactor for the generation of electricity. The stream with the higher concentration of U^{235} is LEU which will be transformed into nuclear fuel; the other is the depleted UF_6 (also known as tails) often considered to be a waste product.

Enrichment by gas centrifuges 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 effected 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 heaver 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}. The gas centrifuge plants traditionally had higher capital costs than gaseous diffusion plants, but used substantially less electricity. Centrifuge technology also enjoys other advantages, including a modular design which allows for incremental expansion of capacity and production as well as a higher effective operating capacity that approaches the nameplate capacity. Both processes result in an enriched UF_6 that is chemically and functionally identical, but the industry increasingly has favored centrifuge technology. USEC's plant in Paducah, Kentucky was the last remaining gaseous diffusion facility in the world and shut down in 2013.[71]

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 U.S. has focused on advancing SILEX, also referred to as global laser enrichment (GLE). A consortium consisting of GE, Hitachi, and Cameco Corp. ("Cameco") received a license from the U.S. Nuclear Regulatory Commission to develop a GLE plant at an existing fuel fabrication facility in Wilmington, North Carolina. The consortium also has proposed developing a GLE 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. If these plans go forward, a GLE plant would likely be constructed in the United States in the early 2020s.[72]

[71] World Nuclear News, "Paducah enrichment plant to be closed," May 28, 2013, http://www.world-nuclear-news.org/ENF_Paducah_enrichment_plant_to_be_closed_2805132.html

[72] WNA, "Uranium Enrichment," November 2016, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx

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.[73] 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 consider to be a customized part of the production process.

Value added by segment

The estimated cost of processing uranium ore through the various stages of the nuclear fuel cycle to produce 1 kg of uranium as $U0_2$ reactor fuel at March 2017 uranium prices is presented in table I-3. Information regarding the relative cost of processing for the various stages of the front end of the nuclear fuel cycle for 2017 and for time periods examined in the Commission's three prior reviews of this order are presented in table 1-4.

[73] 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.

Table I-3

Uranium: Front-end fuel cycle costs of 1 kg of uranium as UO2 fuel, by stage (as of March 2017)

Process	Amount required x price	Cost (in U.S. Dollars)	Proportion of total (in percent)
Uranium (concentrate)	8.9 kg U_3O_8 x $68	605	43.0
Conversion	7.5 kg U x $14	105	8.0
Enrichment	7.3 SWU x $52	380	27.0
Fuel fabrication	per kg	300	22.0
Total		1390	100

Source: World Nuclear Association ("WNA"), "The Economics of Nuclear Power", http://www.world-nuclear.org/information-library/economic-aspects/economics-of-nuclear-power.aspx Accessed April 18, 2017.

Table I-4

Uranium: Processing cost, by stage, 2000, 2004, 2006, 2011, 2017

Processing Stage	Share of total processing cost (in percent)					
	2000[1]	2004[1]	2006[2]	2006[3]	2011[4]	2017[5]
Uranium concentrate	31.0	47.1	***	32.0	46.9	43.0
Conversion	3.0	5.4	***	6.0	3.5	8.0
Enrichment	59.0	31.6	***	44.0	40.9	27.0
Fuel fabrication	7.0	15.8	***	18.0	8.7	22.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

[1] Based on published market prices for the individual line items (default values) as used in the Wise Nuclear Fuel Cost Calculator (found at http://www.wise-uranium.org/nfcc.html).

[2] Revised valuations provided by USEC to reflect commercial considerations (e.g., long-term contract values) in the U.S.market.

[3] Presentation in Urenco's Eurobond offering of November 2005 (http://www.urenco.con/investors/index.aspx).

[4] Because the Wise Nuclear Fuel Cost Calculator has not been updated since 2009, the data presented for 2011 are from the World Nuclear Association, "The Economics of Nuclear Power," http://www.world-nuclear.org/info/inf02.html, March 9, 2011.

[5] Derived from table I-3.

Note.–Figures may not add to totals shown because of rounding.

Source: *Investigation No. 731-TA-539C (Third Review): Uranium from Russia--Staff Report*, INV-JJ-129, December 19, 2011, pp. I-31; *Uranium From Russia: Investigation No. 731-TA-539-C (Second Review)*, USITC Publication 3872, August 2006, p. I-25 (for data presented for 2000, 2004, and 2006); World Nuclear Association, "The Economics of Nuclear Power," http://www.world-nuclear.org/info/inf02.html, March 9, 2011 (for data presented for 2011); and World Nuclear Association, "The Economics of Nuclear Power", http://www.world-nuclear.org/information-library/economic-aspects/economics-of-nuclear-power.aspx April 18, 2017 (for data presented for 2017)

U.S. tariff treatment

Uranium is currently imported under HTS 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 most of these statistical reporting numbers, uranium imported from Russia enters the U.S. market at a column 1-general duty rate of "free"; uranium imported under HTS statistical reporting numbers 2844.10.1000 and 2844.10.5000 imported from Russia enters the U.S. market at a column 1-general duty rate of 5 percent.

The definition of the domestic like product

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.

In the 1991 preliminary determination for the original investigation of uranium from the U.S.S.R., the majority of the Commission found that the five-factor semifinished product analysis dictated a single like product encompassing all four forms of uranium.[74] In its first[75] and second[76] full five-year review determination concerning Russia, and in its third expedited five-year review determination concerning Russia, the Commission defined the domestic like product consisting of all four forms of uranium coextensive with Commerce's scope.[77]

In its notice of institution for this review, the Commission solicited comments from interested parties regarding what they deemed to be the appropriate definition of the domestic like product. According to their response to the notice of institution, the domestic interested

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[74] *Uranium from Russia: Investigation No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, p. 8.

[75] In the first review, the Commission addressed two domestic like product issues: a contention by Russian respondents that Commerce's inclusion of HEU in the scope was invalid, and the other by a domestic interested party that uranium tails are within the scope. The Commission explained that both of these arguments involve the scope, not the domestic like product. *Uranium from Russia: Investigation No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, p. 8.

[76] In the second review, the Commission analyzed four different arguments concerning domestic like product, including that it find that each of the four segments of the uranium fuel cycle is a separate like product. The Commission rejected these arguments and settled on its finding that there was a single domestic like product consisting of all forms of uranium coextensive with the scope of the review. *Uranium from Russia: Investigation No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, pp. 8-9.

[77] This paragraph uses information from *Uranium from Russia: Investigation No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, pp. 5-9, which cites *Soviet Uranium* (i.e. *Uranium from U.S.S.R., Inv. No. 731-TA-539 (Preliminary),* USITC Pub. 2471, December 1991); *First Review Determinations*; and *Second Review Determination*.

parties agreed with the Commission's definition of the domestic like product consisting of all forms of uranium as stated in the last five-year review.[78]

ACTIONS AT COMMERCE

There have been no completed administrative reviews of the suspension agreement. There have also been no changed circumstances reviews or duty absorption findings concerning the suspension agreement. The suspension agreement remains in effect for all manufacturers, producers, and exporters of uranium from Russia.[79]

Current five-year review

Commerce is conducting an expedited review with respect to uranium from Russia and intends to issue the final results of this review based on the facts available not later than June 1, 2017.[80]

THE INDUSTRY IN THE UNITED STATES

U.S. producers

U.S. Concentrate Producers

Based on the amount of producers involved, the segment of the industry producing uranium concentrate has seen the most volatility since the original investigation.

At least 15 firms were cited as concentrate producers in the United States during the 1989-91 period of investigation.[81] During the first five-year review, the Commission identified seven U.S. concentrate producers, only five of which were producing at the end of the period examined.[82]

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[78] *Centrus' Response to the Notice of Institution,* March 3, 2017, p. 12; *LES' Response to the Notice of Institution,* March 3, 2017, p. 36; and uranium concentrate producers' *Response to the Notice of Instituation*, March 3, 2017, p. 62.

[79] *Memorandum to Paul Piquado, Assistant Secretary for Import Administration, from Carole Showers, Acting Deputy Assistant Secretary for Policy and Negotiations, " Issues and Decision Memorandum for the Third Sunset Review of the Agreement Suspending the Antidumping Investigation on Uranium from the Russian Federation; Final Results,"* October 28, 2011, p. 4.

[80] *Letter from Jim Doyle, Director, AD/CVD Operations, Enforcement and Compliance, U.S. Department of Commerce to Michael G. Anderson*, March 27, 2017.

[81] *Uranium From Russia, Inv. No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, p. I-32.

[82] These firms were COGEMA, Inc., a subsidiary of COGEMA; PRI; Rio Algom (one of the original petitioners); International Uranium; Cotter; as well as Uranium Resources and IMC Global, both of which ceased production in 1999. The decline in the number of producers was caused by

(*continued*...)

During the second five-year review, the Commission received U.S. producer questionnaires from five concentrate producers, including current domestic interested parties PRI and Crow Butte (who filed a questionnaire together in that review).[83]

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 Crow Butte. These two firms accounted for *** percent of total U.S. production of natural uranium concentrates during 2010.[84]

PRI and Crow Butte filed a response to the Commission's notice of institution in this review and provided a list of nine known U.S. producers of uranium concentrate.[85]

U.S. Converter

In the original investigation and during the first, second, and third reviews, the sole converter in the United States has been ConverDyn, a joint venture between Honeywell International and General Atomics. The firm owns and operates a single conversion facility in Metropolis, IL, and functions essentially as a toll producer, converting concentrate into natural uranium hexafluoride (i.e. UF_6).[86] In their responses to the notice of institution, the domestic interested parties affirmed that this is the only known U.S. fabricator.

U.S. Enrichers

In the original investigation and first and second reviews, USEC was the only identified enricher of uranium. In the third review, two enrichers were identified: USEC and LES, which commenced operations in New Mexico in June 2010.[87]

In response to the Commission's notice of institution in this current review, USEC (now Centrus) and LES both filed responses. Centrus closed down its last enrichment facility in 2013, leaving LES as the sole U.S. enricher of uranium in 2016.

(…*continued*)
"consolidations and closings". *Uranium From Russia, Inv. No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, p. I-32.

[83] The other firms were Areva NC Inc., Cotter Corp., and Uranium Resources Inc. (which, as mentioned in the previous footnote, ceased production in 1999). *Uranium From Russia, Inv. No. 731-TA-539-C (Second Review)*, USITC Publication 3872, August 2006, 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--Staff Report*, INV-DD-101,June 30, 2006, p. III-14.

[84] *Investigation No. 731-TA-539C (Third Review): Uranium from Russia--Staff Report*, INV-JJ-129, December 19, 2011, pp. I-3.

[85] Two of these firms did not produce uranium in 2016, but are indicated by the EIA to be on standby. *Uranium concentrate producers' Response to the Notice of Institution*, March 3, 2017, exh. 8.

[86] *Uranium From Russia, Inv. No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, p. I-33.

[87] *Investigation No. 731-TA-539C (Third Review): Uranium from Russia--Staff Report*, INV-JJ-129, December 19, 2011, pp. I-3 and I-43. USEC ***.

U.S. Fabricators

The number of U.S. fabricators has slowly declined since the first review. In the first review, five fabricators were identified in the U.S.,[88] and in the second review four fabricators were identified in the U.S.[89]

In their responses to the Commission's notice of institution for this review, the domestic interested parties identified the same three firms as nuclear fuel fabricators.[90]

Definition of the domestic industry and related party issues

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 related party for purposes of its injury determination if "appropriate circumstances" exist.[91]

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 concerning Russia, and in its expedited third five-year review determination, the Commission defined the domestic industry as all domestic producers of uranium, including concentrators, the converter, the enricher (or enrichers, in the case of the third review), and fabricators.[92]

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[88] These firms included ABB (whose operations were purchased by Westinghouse in 2000); GE; Siemens; and Westinghouse. *Uranium From Russia, Ukraine, and Uzbekistan, Inv. Nos. 731-TA-539-C, E and F (Review)*, USITC Publication 3334, August 2000, p. I-9.

[89] These firms were Areva NP Inc.; Global Nuclear Fuel; Westinghouse; and ***. *Investigation No. 731-TA-539C (Third Review): Uranium from Russia--Staff Report*, INV-JJ-129, December 19, 2011, p. I-43.

[90] These firms are Areva Inc.; Global Nuclear Fuel Services LLC; and Westinghouse. *Centrus' Response to the Notice of Institution,* March 3, 2017, p. 5; *LES' Response to the Notice of Institution,* March 3, 2017, p. 34; and uranium concentrate producers' *Response to the Notice of Instituation*, March 3, 2017, exh. 8.

These are also the three firms identified in the expedited third review as U.S. fabricators, along with B&W Nuclear Operations Group, which was listed on the Nuclear Regulatory Commission's website as a fabricator of uranium fuel. *Uranium From Russia, Inv. No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, p. I-34.

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

[92] *Uranium From Russia, Inv. No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, pp. 12, I-17.

In the original preliminary investigation regarding the U.S.S.R., the Commission considered whether domestic producers which imported subject product should be excluded from the domestic industry, and found that appropriate circumstances to do so did not exist.[93]

In the first review, the Commission considered whether Cogema and USEC, domestic producers, should be excluded from the domestic industry because they had imported subject merchandise from Russia. The Commission also considered whether PRI was a related party as a member of a consortium contracted to sell Russian feed component UF_6 resulting from the Russian HEU Agreement. The Commission found that appropriate circumstances did not exist to exclude Cogema and USEC from the domestic industry and that PRI was not a related party.[94]

In the second review, the Commission found that appropriate circumstances did not exist to exclude PRI/Crow Butte, USEC, and Westinghouse from the domestic industry. [95]

In the third review, the Commission found that appropriate circumstances did not exist to exclude USEC, Uranium One USA, Inc., or Uranium Resources, Inc. from the domestic industry.[96]

In its notice of institution for this review, the Commission solicited comments from interested parties regarding the appropriate definition of the domestic industry and inquired as

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[93] *Uranium From Russia, Ukraine, and Uzbekistan, Inv. Nos. 731-TA-539-C, E and F (Review)*, USITC Publication 3334, August 2000, pp. 15-16.

[94] *Uranium From Russia, Ukraine, and Uzbekistan, Inv. Nos. 731-TA-539-C, E and F (Review)*, USITC Publication 3334, August 2000, p. 18.

[95] A party responding to the notice of institution argued that PRI/Crow Butte should be excluded as they are "…owned by a foreign exporter of the subject merchandise, Cameco." However, the Commission noted, "There is no evidence that PRI *** were shielded from any injury that might have been caused by subject imports on account of their corporate parent's importing activity. Because AHUG *** has not shown otherwise, we accept at face value PRI/CBR's statement that '***he financial health of PRI and Crow Butte is solely a function of the companies' production costs and the market for uranium concentrate.'"

The same party argued that USEC not be included as it imported LEU from Russia pursuant to the HEU agreement, but as the Commission noted, "It imports Russian LEU to support a nuclear non-proliferation agreement, not as a result of a commercial decision to buy the subject merchandise rather than make the domestic like product."

Lastly, Westinghouse was discussed as it imported LEU from Russia during the review period. However, the Commission noted, "Because the quantity of Westinghouse's production of uranium dioxide for fuel rods is much larger than the quantity of its imports of LEU, it seems unlikely that – on account of these imports – it is shielded from any injury that might be caused by subject imports." *Uranium From Russia, Inv. No. 731-TA-539-C (Second Review)*, USITC Publication 3872, August 2006, pp. 15-18.

[96] The Commission reiterated their reasoning from previous reviews in finding that appropriate circumstances did not exist for excluding USEC as a related party.

The Commission found that the "Uranium One entities"—concentrate producers that were 51-percent owned by ARMZ Uranium Holding Co. ("ARMZ"), a firm in the subject country—accounted for only a small share of domestic production *Uranium From Russia, Inv. No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, p. 12.

to whether any related parties issues existed. The domestic interested parties agreed with the Commission's prior definition of the domestic industry, while LES and uranium concentrate producers noted that one U.S. producer, Uranium One USA, Inc. (a producer of uranium concentrate) is wholly owned by the Russian firm Rosatom.[97] [98] [99] Additionally, USEC imported subject merchandise from Russia as Executive Agent under the HEU agreement, which ended in 2013. The company, now a wholly owned subsidiary of Centrus, signed a multi-year contract with Tenex to import subject merchandise in 2011, beginning in 2013.[100]

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 of the current five-year review.[101] The following tables present a compilation of the data submitted from all responding U.S. producers as well as trade and financial data submitted by U.S. producers in the original investigation and prior five-year reviews. Domestic interested parties presented in their response to the notice of institution data regarding capacity, production, U.S. commercial shipments and U.S. internal consumption/transfers, and financial performance of U.S. producers.

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[97] *Centrus' Response to the Notice of Institution,* March 3, 2017, p. 4; *LES' Response to the Notice of Institution,* March 3, 2017, p. 34; and uranium concentrate producers' Response to the Notice of Instituation, March 3, 2017, p. 54.

[98] Uranium concentrate producers also note, "PRI and Crow Butte are wholly-owned subsidiaries of Cameco Corporation, a Canadian-based company that owns uranium mining and conversion facilities in Canada, the United States, and Kazakhstan. Cameco owns Nukem, Inc…[which] along with Cameco and Cogema (now AREVA), were purchasers of the HEU feed (natural uranium) component made available under the U.S.-Russia HEU Agreement. PRI and Crow Butte should not be excluded from the domestic industry, as during the period of review and at present, they are not related to any foreign producer, exporter, or importer of the subject merchandise." Uranium domestic producers' Response to Notice of Institution, March 3, 2017, p. 54.

LES operates the UUSA facility under Urenco USA Inc., a division of Urenco Ltd., a UK-registered company whose shares are held (in thirds) by the UK government; the Dutch government; and two German utilities. LES' Response to Notice of Institution, March 3, 2017, p. 1; and Urenco Ltd. webpages, "Urenco Limited" https://urenco.com/about-us/company-structure/urenco-ltd/ and "Company Structure" https://urenco.com/about-us/company-structure/, accessed April 24, 2017.

[99] Rosatom (or State Atomic Energy Corporation Rosatom) is a major organization in Russia's nuclear industry. It is a non-profit company set up in 2007 and which holds all nuclear assets on behalf of the state. It is described in more detail in "The Industry in Russia" section below.

[100] *LES' Response to the Notice of Institution,* March 3, 2017, exh. 32. Accordingly, Centrus has reported certain data related to its import operations, as indicated in app. B.

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

U.S. Concentrate Producers

Table I-5 presents data provided in response to the Commission's notice of institution in this fourth five-year review concerning 2016 U.S. concentrate producers' operations. For comparison purposes, also presented are selected data collected in the original investigation (1992) and the first, second, and third five-year reviews (1999, 2005, and 2010). During the original investigation there were at least 15 separate firms producing uranium concentrate.

In terms of the share of total processing costs, concentration is the largest component, accounting for 43 percent of the total processing cost of producing nuclear fuel, as of March 2017 (see table I-3.) In recent years, according to the response of uranium concentrate producers, significant oversupply and inventory buildup resulting from falling demand in the wake of the Fukushima accident and attendant reduction in global nuclear generating capacity have led to U.S. producers reducing production.[102]

[102] Uranium concentrate producers' *Response to Notice of Institution*, March 3, 2017, pp. 58-61.

Table I-5

Natural uranium concentrate (concentrated U_3O_8): U.S. producers' trade and financial data, 1992, 1999, 2005, 2010, 2016[1]

Item	1992 Original Investigation	1999 First Review	2005 Second Review	2010 Third Review	2016 Fourth Review
Capacity (1,000 pounds of U_3O_8)	25,551	13,472	***	***	20,000
Production (1,000 pounds of U_3O_8)	5,917	4,936	***	***	2,744
Capacity utilization (percent)	23.2	36.6	***	***	13.7
Total commercial shipments:[2]					
Quantity (1,000 pounds of U_3O_8)	3,305	3,775	***	***	3,109
Value ($1,000)	62,220	55,791	***	***	116,915
Unit value (per $1,000)	18.83	14.78	***	***	37.61
Net sales ($1,000)	139,362	59,939	***	***	121,201
COGS ($1,000)	102,036	59,034	***	***	153,429
COGS/net sales (percent)	73.2	98.5	***	***	126.6
Gross profit or (loss) ($1,000)	37,326	905	***	***	(36,690)
SG&A expenses (loss) ($1,000)	12,579	27,811	***	***	32,148
Operating income/(loss) ($1,000)	24,747	(26,906)	***	***	(102,102)
Operating income (loss)/net sales (percent)	17.8	-44.9	***	***	-84.2

[1] Firms believed to have represented all U.S. production of uranium concentrates during 1992 provided data in response to the Commission's questionnaire. Data presented for the final annual period examined in the first five-year review (1999) were provided by five producers (COGEMA, Everest, IMC Global, Rio Algom, and Uranium Resources) that were believed to have represented all U.S. production of uranium concentrates during that year. Data presented for the final annual period examined in the second five-year review (2005) were provided by four producers (Areva NC Inc.; Cotter Corp.; Power Resources Inc./Crow Butte Resources Inc.; and Uranium Resources Inc.) that were believed to have accounted for all U.S. production of uranium concentrates during 2005. Data presented in response to the Commission's notice of institution in this third five-year review for 2010 were provided by two uranium concentrate producers (Crow Butte and Power Resources, Inc.) that were believed to have represented *** percent of U.S. production of uranium concentrates during 2010. Data presented in response to the Commission's notice of institution in this fourth five-year review for 2016 were provided by four uranium concentrate producers (Crow Butte, PRI, Ur-Energy (USA) Inc., and Energy Fuels, Inc.) that were believed to have represented more than 94 percent of U.S. production of uranium concentrates during 2010.

[2] Total commercial shipments includes reported U.S commercial shipments and internal consumption and transfers.

Source: *Investigation No. 731-TA-539-C (Second Review): Uranium from Russia-Staff Report*, INV-DD-101, June 30, 2006, tables I-3 and III-8; *Uranium from Russia: Investigation No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, p. I-45; and uranium concentrate producers' *Response to Notice of Institution*, March 3, 2017, exhs. 1, 2, and 3.

U.S. Enrichers

Table I-6 presents data provided in response to the Commission's notice of institution in this third five-year review concerning 2016 operations. For comparison purposes, also presented are selected data provided in the original investigation (1992) and the first, second, and third five-year reviews (1999, 2005, and 2010).

In terms of the share of total processing costs, enrichment is the second largest component, accounting for 27 percent of the total processing cost of producing nuclear fuel, as of March 2011(see table I-3). Industry responses discussing the enrichment sector note that the nuclear fuel and power sector have been affected by the post-Fukushima decline in demand as well as the increased ability of lower-priced alternatives (i.e. natural gas) and renewable sources to compete.[103] Further, demand for LEU (that is, the market for enrichment services) that is not yet already satisfied by existing contracts is ***. In other words, ***.[104] Industry responses provide further data indicating that prices for SWUs have fallen dramatically since the last review. The spot price for LEU in November 2016 stood at $***/ SWU, while the long-term price was $***/SWU. However, prices for SWU during the last review (and before Fukushima) were $***/SWU.[105]

[103] *LES' Response to the Notice of Institution,* March 3, 2017, p. 14.
[104] *LES' Response to the Notice of Institution,* March 3, 2017, p. 15.
[105] *LES' Response to the Notice of Institution,* March 3, 2017, p. 13.

Table I-6

Enriched uranium hexaflouride (enriched UF6 (LEU-HF)): U.S. producers' trade and financial data, 1992, 1999, 2005, 2010, and 2016[1]

* * * * * * *

U.S. IMPORTS AND APPARENT CONSUMPTION

U.S. importers

During the period of the original investigation (1989-91), reported imports of the subject uranium from Russia were accounted for by ***. During the first five-year review (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 "by pass" provisions instituted in 1996.

The following five subject importers provided responses to the Commission's questionnaires during the second five-year review: Cameco; GNSS; RWE Nukem Inc.; USEC; and Westinghouse. Of the importers' responses received by the Commission in the second five-year review, ***, reported imports of uranium concentrate; ***, reported imports of natural uranium hexafluoride; ***, reported imports of enriched uranium hexafluoride; and *** reported imports of enriched uranium oxides, nitrates, or metals from Russia during the period of review.

Although the Commission did not receive responses from any respondent interested parties in its third five-year review, the domestic interested parties indicated in their responses to the Commission's notice of institution that, since 2005, the following have likely imported uranium from the Russian Federation for consumption in the United States: GNSS; USEC (as Executive Agent under the Russian HEU Agreement); TENAM (Tenex's U.S. subsidiary); Nukem Inc. ("Nukem"); and Transport Logistics International.[106]

Although the Commission did not receive responses from any respondent interested parties in this current review, in its response to the Commission's notice of institution, the domestic interested parties provided a list of six potential U.S. importers of uranium: Tenex and TENAM; Nukem; Kazatomprom; Cameco; Transport Logistics International (DAHER-TLI); and Traxys North America LLC.[107]

As described previously, USEC imported subject merchandise from Russia as Executive Agent under the HEU agreement, which ended in 2013. The company (now called Centrus) signed a multi-year contract with Tenex to import subject merchandise in 2011, beginning in 2013.[108] The firm reported it imported SWUs from Russia in 2016 worth roughly $***, including transportation costs.

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[106] The preceding paragraphs derived from *Investigation No. 731-TA-539C (Third Review): Uranium from Russia--Staff Report*, INV-JJ-129, December 19, 2011, pp. I-61—I-62.

[107] *Centrus' Response to the Notice of Institution,* March 3, 2017, p. 5; *LES' Response to the Notice of Institution,* March 3, 2017, p. 35; and uranium concentrate producers' *Response to the Notice of Institution*, March 3, 2017, p. 55.

[108] *LES' Response to the Notice of Institution,* March 3, 2017, exh. 32. Accordingly, Centrus has reported certain data related to its import operations, as indicated in app. B.

U.S. imports

Table I-7 presents the value of U.S. imports of uranium from 2011 to 2016 compiled from official U.S. import statistics (specifically 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). As in the third review, data do not include HTS statistical reporting numbers 2844.10.1000 (uranium metal), 2844.10.2055 (other), and 2844.10.5000 (other), as the products imported under these reporting numbers is unclear. Further, as utilized in the third review and explained in the "Apparent U.S. Consumption and Market Shares" section below, trade in natural uranium cannot be simply added to trade in enriched uranium to obtain a meaningful statistic, except possibly by value. Therefore, only value data is reported in table I-7.

During 2011-16, the vast majority of all U.S. imports from Russia entered the United States under HTS statistical reporting number 2844.20.0020 (uranium flouride enriched in U235). According to official import statistics, the only other HTS statistical reporting numbers under which Russian uranium entered the United States during the period examined in this fourth five-year review was HTS statistical reporting number 2612.10.0025 ($99,000) in 2014 and 2844.20.0030 ($490,000) in 2015.

Table I-7
Uranium: U.S. imports, 2011-16

Item	Calendar year					
	2011	2012	2013	2014	2015	2016
	Landed, duty-paid value (1,000 dollars)					
U.S. imports from.—						
Russia	949,837	854,372	960,438	888,238	862,644	1,033,669
Other Sources	4,338,748	3,456,293	2,900,120	2,247,741	1,817,945	2,143,785
Total U.S. imports	**5,288,585**	**4,310,665**	**3,860,558**	**3,135,979**	**2,680,589**	**3,177,454**

Source: Compiled from official Commerce statistics.

Additional information regarding imports are prepared by the EIA in its Uranium Marketing Annual Report, which tracks natural uranium purchases of U.S. utilities by country of origin (including the United States). Shown in table I-8 are data for delivery years 2011-15. Relative to 2011, the volume of 2015 uranium deliveries increased by 3.1 percent and the percentage of deliveries attributable to foreign sources grew from 90.5 percent to 94.0 percent. In 2015, Canada was the largest source of natural uranium purchases, with U.S. utilities taking delivery of over 16.8 million pounds of Canadian U_30_8. Purchases of Russian natural uranium accounted for approximately 17.1 percent of U.S. utilities' total deliveries of foreign U_30_8 and nearly 16.0 percent of U.S. utilities' total deliveries of U_30_8. Relative to 2011, purchases from Russia during 2015 fell by 11.1 percent.

Table I-8
Uranium: Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by origin country and delivery year, 2011-15

(1,000 pounds U_3O_8 equivalent; dollars per pound U_3O_8 equivalent)

Source	2011	2012	2013	2014	2015
Purchases (1,000 pounds U_3O_8 equivalent)					
Australia	6,001	6,724	10,741	10,511	9,678
Canada	10,832	13,584	7,808	9,789	16,876
Kazakhstan	9,728	6,234	6,454	12,032	10,723
Malawi	780	W	1,277	1,514	W
Namibia	6,199	5,986	5,677	4,603	3,456
Niger	1,744	2,133	1,666	1,316	922
Russia	10,199	7,643	10,580	6,859	9,063
South Africa	1,524	1,243	186	938	826
Uzbekistan	1,808	2,576	3,064	1,779	1,040
Foreign Total	**49,626**	**47,713**	**47,919**	**50,033**	**53,106**
United States	5,205	9,807	9,484	3,316	3,419
Total Purchases	**54,831**	**57,520**	**57,403**	**53,349**	**56,524**
Weighted Average Price (dollars per pound U_3O_8 equivalent)					
Australia	57.47	51.17	49.92	48.03	44.16
Canada	56.08	56.75	52.61	45.87	45.84
Kazakhstan	53.71	51.69	46.73	44.47	42.82
Malawi	65.44	W	59.89	44.94	W
Namibia	56.74	54.56	49.78	45.54	48.57
Niger	54.38	50.45	51.26	42.86	39.74
Russia	56.57	54.40	53.73	45.65	40.87
South Africa	53.62	56.45	46.72	43.71	37.64
Uzbekistan	55.99	52.80	50.02	46.84	47.90
Foreign Total	**55.98**	**54.07**	**51.13**	**46.03**	**44.14**
United States	52.12	59.44	56.37	48.11	43.86
Total Purchases	**55.64**	**54.99**	**51.99**	**46.16**	**44.13**

Note.-- W = Data withheld to avoid disclosure of individual company data.
Note.-- Totals may not add due to rounding. Weighted-average prices are not adjusted for inflation.
Source: U.S. Energy Information Administration: Form EIA-858 "Uranium Marketing Annual Survey" (2011-15).

Apparent U.S. consumption and market shares

As was the case in prior reviews concerning uranium, because of the complexity of marketing natural and enriched uranium, the Commission's usual approach for computing apparent consumption from shipment data is difficult to apply in this five-year review. Further, trade in natural uranium cannot be simply added to trade in enriched uranium to obtain a meaningful statistic, except possibly by value. Nonetheless, U.S. consumption data on a value basis compiled from official import statistics and responses to the Commission's notice of institution for this current five-year review are presented in table I-9, with comparisons to data from the third five-year review for 2010.

Table I-9
Uranium: U.S. market data on a valuation basis, 2010 and 2016

Item	2010		2016	
	Value (1,000 dollars)	Share (percent)	Value (1,000 dollars)	Share (percent)
U.S. producers' U.S. shipments	***	***	***	***
U.S. imports from—				
Russia	1,049,038	***	1,033,669	***
All other	4,208,021	***	2,143,785	***
Total imports	5,257,059	***	3,177,454	***
Apparent U.S. consumption	***	100.0	***	100.0

Source: For 2010, data compiled from official Commerce statistics; Response of PRI and Crow Butte, August 1, 2011, exh. 1; and Response of USEC, August 1, 2011, exh. 24.

For 2016, data compiled from official Commerce statistics; Uranium concentrate producers, Response to the Notice of Institution, March 3, 2017, exh. 1-3; data provided by LES (LES' Response to the Notice of Institution, March 3, 2017, exh. 22; email from Jared Wessel to USITC staff); and data provided by Centrus (Centrus' Response to the Notice of Institution, March 3, 2017, p. 10 and exh. 2; Response to Commission Request for Information, p. 3).

THE INDUSTRY IN RUSSIA

Organization

The main organization in the Russian nuclear industry is Rosatom. As described by the WNA, "The State Corporation (SC) Rosatom is a vertically-integrated holding company which took over Russia's nuclear industry in 2007, from the Federal Atomic Energy Agency (FAEA, also known as Rosatom). This had been formed from the Ministry for Atomic Energy (Minatom) in 2004, which had succeeded a Soviet ministry in 1992. The civil parts of the industry, with a history of over 60 years, are consolidated under JSC AtomEnergoProm (AEP)."

Rosatom holds all of the shares of AEP, which is a single vertically-integrated state holding company for the country's nuclear power sector (separately from the military complex). It incorporates more than 80 enterprises operating across the nuclear fuel cycle. Among its entities include ARMZ (a uranium mining firm); Tenex (exporting arm of Rosatom and executive agent for the Russian government for the HEU agreement, and which also has a North American subsidiary called TENAM); Uranium One Group (based in Canada and focused on uranium mining in non-Russian markets); and TVEL (conversion, enrichment, and nuclear fuel fabrication). Many of these firms operate as joint stock companies.[109]

Responses in original investigation and reviews

For the first five-year review[110], 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.[111]

During the second full 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 the volume of Russian exports to the United States, the country's expected export trends, and market share in nonsubject countries, amongst other information.[112]

The Commission did not receive responses to its notice of institution from any respondent interested parties in its expedited third five-year review, however the domestic

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[109] WNA, "Russia's Nuclear Fuel Cycle," Accessed April 13, 2017, http://www.world-nuclear.org/information-library/country-profiles/countries-o-s/russia-nuclear-fuel-cycle.aspx.

[110] 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. *Uranium from U.S.S.R., Inv. No. 731-TA-539 (Preliminary),* USITC Pub. 2471, December 1991. p. A-39.

[111] *Uranium From Russia, Ukraine, and Uzbekistan, Investigations Nos. 731-TA-539 C, E, and F (Review)*, USITC Publication 3334, August 2000, p. 5.

[112] *Uranium From Russia: Investigation No. 731-TA-539-C (Second Review)*, USITC Publication 3872, August 2006, pp. IV-18—IV-22.

interested parties provided a list of four firms that they believed produced uranium in Russia during the five-year review period: Rosatom; ARMZ; Tenex (as seller of Russian uranium products from the enrichment and conversion plants of Rosatom); and Joint Stock Company TVEL.[113] These same firms were also cited by the domestic interested parties in their responses to the notice of institution of this current five-year review.[114]

Russian Production Capacity and Inventory

Both LES and the uranium concentrate producers assert that Russian production capacity and inventories are enormous. In their response, the uranium concentrate producers note that in 2015, Russia produced nearly 7.6 million pounds U_3O_8, which is still short of its capacity to produce nearly 12.5 million pounds U_3O_8. Further, they cite World Nuclear Association reports that Russia possesses about 9% of "world reasonably assured resources".[115] LES notes that Russia has a "massive" amount of unused enrichment capacity, and in fact that excess capacity is ***.[116] Further, uranium concentrate producers note that this large underutilized enrichment capacity makes it more viable for Russian producers to re-enrich uranium 'tails' (that is, the depleted UF_6 that is normally the wasteproduct of the enrichment process), a normally inefficient use of enrichment capacity. These re-enriched tails, of which Russia is believed to possess substantial inventories, are thus a potentially considerable source of commercial uranium.[117]

Both responses assert that Russian inventories of uranium products are enormous. LES cites an annual report from Tenex stating that the company held inventory valued at approximately $579 million at the end of 2014.[118] Uranium concentrate producers note that Russia possesses the predominant share of the over 1400 tons of HEU which was produced in the former Soviet states. The uranium concentrate producers assert that as 500 tons of this figure were blended down to LEU and exported to the United States as part of the HEU Agreement, that still leaves 900 tons of HEU which could potentially be processed and exported to the United States by Russia.[119]

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[113] Response of USEC, August 1, 2011, p. 66; Response of PRI and Crow Butte, August 1, 2011, p. 44.

[114] *Centrus' Response to the Notice of Institution,* March 3, 2017, p. 5; *LES' Response to the Notice of Institution,* March 3, 2017, p. 35; and uranium concentrate producers' *Response to the Notice of Instituation*, March 3, 2017, p. 55.

[115] Uranium concentrate producers' *Response to the Notice of Institution*, March 3, 2017, p. 29.

[116] LES *Response to the Notice of Institution,* March 3, 2017, p. 18.

[117] Uranium concentrate producers' *Response to the Notice of Institution*, March 3, 2017, p. 31-33.

[118] LES *Response to the Notice of Institution,* March 3, 2017, p. 20.

[119] They further add, "Nine hundred tonnes of HEU may contain as much as 700 million pounds of U_3O_8." Uranium concentrate producers' *Response to the Notice of Institution*, March 3, 2017, p. 30.

ANTIDUMPING OR COUNTERVAILING DUTY ORDERS IN THIRD-COUNTRY MARKETS

The Commission has previously reported examples of European barriers to imports of Russian uranium, in the form of sales quota restrictions applied by the EURATOM Supply Agency ("EURATOM"). For example, respondents to the second and third five-year reviews indicated that EURATOM was maintaining a quota limiting uranium imports from Russia to between 15 and 20 percent of the EURATOM market.[120] While these sales quotas restrictions are not believed currently in effect, EURATOM has continued to deter member countries from becoming dependent on Russian uranium supplies and to encourage sourcing from other countries.

In particular, the European Commission ("EC") introduced a greater emphasis on fuel supply diversity as part of its broader 2014 Energy Security Strategy. In a memo publicly issued on May 28, 2014, the EC mentioned Russia's tendency to offer integrated packages for investments in the whole nuclear chain, providing financing for Russian-designed nuclear power plants that are primarily compatible with Russian fabricated fuel. The memo specifically warned against dependence on Russia for the supply of nuclear fuel, instructing that "the possibility of fuel supply diversification needs to be a condition for any new investment, to be ensured by the EURATOM Supply Agency".[121] EURATOM in March 2015 blocked Hungary from entering into a fuel supply contract with Rosatom for a proposed nuclear generation project until the terms were adjusted to better enable long-term opportunities for fuel supply diversification.[122] In June 2015, the EURATOM Research and Training Programme also provided €2 million in funding to support Westinghouse's fabrication of nuclear fuel that is compatible with Russian-designed reactors.[123]

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[120] *Uranium from Russia: Investigation No. 731-TA-539-C (Third Review)*, USITC Publication 4307, February 2012, p. I-63.

[121] European Commission, "Questions and answers on security of energy supply in the EU," May 28, 2014, http://europa.eu/rapid/press-release_MEMO-14-379_en.htm.

[122] *LES' Response to the Notice of Institution*, March 3, 2017, p. 23.

[123] World Nuclear Association, "Nuclear Fuel Fabrication", April 2017, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/fuel-fabrication.aspx.

THE GLOBAL MARKET

There are approximately 450 commercial nuclear reactors globally, producing about 10 percent of the world's electricity.[124] Both Centrus and LES reported in their responses to the Commission's notice of institution in this fourth five-year review that the 2011 Fukushima reactor meltdown significantly weakened global demand for uranium, as reactor shutdowns in Japan and Germany created a buildup in inventories of enriched uranium product.[125] LES further notes that nuclear power capacity has either stalled or is declining in Japan, Germany, Switzerland, the United Kingdom, and Taiwan as a result of reactor shutdowns, prompted in many of these countries by government plans to phase out nuclear power. China is one of the few countries identified as having a growing nuclear generation portfolio, but the Chinese government's emphasis on developing domestic enrichment capabilities and overall supply chain self-sufficiency suggest that the Chinese market will remain relatively closed to foreign producers. The United States remains the largest market in terms of uranium demand—about 30 percent of the global market—and has a larger share of uncovered demand in the near term than other markets.[126] The European Union is the second largest market, with France alone accounting for nearly 15 percent of total global uranium requirements. Japan was historically the third largest market, but is now only operating 3 of its 54 nuclear reactors, or about 2.5 GW of the 49 GW of operational capacity it had prior to the Fukushima accident.[127]

Uranium mining and milling

This critical stage of the nuclear fuel process is dependent on the availability in the ground of uranium, which typically needs to be present in a concentration of about 0.1 percent or more to be retrievable commercially. Although uranium is generally considered a finite resource, its level of known recoverable resources is higher than that of most other minerals. In 2015, global known recoverable resources of uranium were estimated at 5.7 million metric tons of uranium, assuming prices of $130 per kilogram. Uranium can also be recovered (typically at higher prices) as a byproduct of phosphate or coal ash. With technology improvements or significant increases to uranium prices, it could also be extracted from the Earth's seawater. In addition to these primary sources of uranium, global supplies can be expanded or extended by drawing down civil stockpiles held by utilities and governments, recycling uranium and plutonium (known as MOX fuel), re-enriching depleted uranium (tails), underfeeding enrichment plants, and downblending excess stockpiles of high-enriched uranium.[128]

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[124] *Centrus' Response to the Notice of Institution*, March 3, 2017, p. 12

[125] *Centrus' Response to the Notice of Institution*, March 3, 2017, p. 12; *LES' Response to the Notice of Institution*, March 3, 2017, pp. 21-24.

[126] *LES' Response to the Notice of Institution*, p. 27.

[127] *LES' Response to the Notice of Institution*, pp. 21-22.

[128] WNA, "Supply of Uranium," December 2016, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/uranium-resources/supply-of-uranium.aspx

As of 2015, Kazakhstan, Canada, and Australia were the world's largest producers of uranium, accounting for more than two-thirds of global uranium production from mines. Other substantial producers included Niger, Russia, Namibia, Uzbekistan, China, the United States, and Ukraine.[129] Table I-10 presents world uranium production data during 2011-15.

Table I-10
Uranium: World production from mines, by country, 2011-15

Country	2011	2012	2013	2014	2015
Quantity (metric tons of uranium)					
Kazakhstan	19,451	21,317	22,451	23,127	23,800
Canada	9,145	8,999	9,331	9,134	13,325
Australia	5,983	6,991	6,350	5,001	5,654
Niger	4,351	4,667	4,518	4,057	4,116
Russia	2,993	2,872	3,135	2,990	3,055
Namibia	3,258	4,495	4,323	3,255	2,993
Uzbekistan (est.)	2,500	2,400	2,400	2,400	2,385
China (est.)	885	1,500	1,500	1,500	1,616
United States	1,537	1,596	1,792	1,919	1,256
World	53,493	58,489	59,331	56,041	60,496

Note: Totals of individual country data presented do not add to "World" data presented.
Source: WNA, "World Uranium Mining Production," July 2016.

Companies involved in uranium mining and milling range from companies that specialize in mining only to companies that are involved in all stages of the nuclear fuel cycle. The uranium mining and milling industry has historically seen increased consolidation; however, Kazakhstan has emerged as a major producer since the Commission's second five-year review. The percentage of global uranium production accounted for by the top eight mining companies rose from 70 percent in 1995 to 82 percent in 2004. In 2015, the top eight companies marketed about 86.7 percent of the world's uranium mine production.[130]

Uranium producers have increasingly switched from underground mining to in-situ leach ("ISL") mining. The share of global uranium production attributed to ISL has increased from about 15 percent in 2000 to 21 percent in 2004, 41 percent in 2010, and 48 percent in 2015. ISL allows for the extraction of uranium from ore deposits that may not be rich enough to be mined by other methods. Six of the top 15 largest-producing uranium mines in 2015 were ISL mines in Kazakhstan.[131] About six percent of uranium produced in 2015 was not directly mined,

[129] WNA, "World Uranium Mining Production," July 2016, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx

[130] WNA, "World Uranium Mining Production," July 2016, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx

[131] WNA, "World Uranium Mining Production," July 2016, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx

but rather produced as a by-product (including uranium from the Olympic Dam, which recovers it as a by-product with copper).[132]

Commercially, uranium or nuclear fuel is associated with essentially one end use, the generation of electricity in nuclear power plants. This association strengthened further during the 1990s, with the winding down of the cold war, when the two major producers of nuclear fuel for weapons applications, the United States and the former Soviet Union with a surplus of weapons grade nuclear fuel, sharply curtailed their production of nuclear fuel for weapons applications. Nevertheless, the use of nuclear fuel for weapons applications remains a major consideration not only for national security but also in the commercial sector as evidenced by the former HEU agreement.

The potential of uranium in the generation of electricity for civil applications was widely recognized as a consequence of Einstein's famous equation $E=mc^2$. It took, however, the successful development of nuclear weapons to convince government and industry officials that uranium could indeed be used in civilian applications as well. Following the installation of the first nuclear power plants in the 1950s in Russia and the United States, nuclear power plants were installed in Canada, Western Europe, and Japan, followed by countries throughout the world but primarily concentrated in the developed world. Currently, expansions of nuclear power generation capacity in the developed world have slowed down. In some developed countries nuclear power plants have started to shut down as a result of limited political support or even opposition, especially following the Fukushima accident.

In terms of uranium requirements, the United States is the largest consumer of uranium, accounting for about 29 percent of the world's reactor requirements in 2016 (table I-11).[133]

[132] WNA, "World Uranium Mining Production," July 2016, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx

[133] WNA, "World Nuclear Power Reactors & Uranium Requirements," March 2017, http://www.world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-and-uranium-requireme.aspx

Table I-11
Uranium: Reactor requirements, by location

Country	2016 Requirements (metric tons of uranium)
United States	18,161
France	9,211
Japan	680
Korea	5,013
China	5,338
Russia	6,264
Germany	1,689
Canada	1,630
World	63,404
Note: Totals of individual country data presented do not add to "World" data presented. Source: WNA, "World Nuclear Power Reactors & Uranium Requirements," March 2017	

Uranium conversion

Uranium conversion, the conversion of uranium yellowcake to UF_6, is required for the subsequent step of enrichment. Enriched uranium is required in the preparation of nuclear fuel to be used in light water reactors, the predominant kind of reactor used globally with the exception of a few countries including Canada. Shown in table I-12 is a listing of 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-12
Natural uranium hexafluoride (UF_6): Converters, locations and nameplate capacity

Converter	Country	Location	Nameplate capacity (metric tons uranium metal)
Cameco	Canada	Port Hope, ON	12,500
CNCC	China	Lanzhou	5,000
COMURHEX	France	Pierrelatte	15,000
ConverDyn	United States	Metropolis, IL	7,000
IPEN	Brazil	Sao Paulo	100
Rosatom	Russia	Irkutsk, Seversk	12,500
World Total			52,100
Note: The Springfield Fuels conversion facility in the United Kingdom closed in August 2014, and ConverDyn's nameplate capacity decreased from 15,000 to 7,000 starting in 2017. Source: WNA, "Conversion and Deconversion," January 2017.			

Uranium enrichment

Four enrichment enterprises dominate 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. USEC had significant capacity at its gaseous diffusion facility in Paducah, Kentucky before the plant shut down, but is not currently involved in commercial enrichment production. 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. Enrichment nameplate effective capacities for the primary suppliers of uranium enrichment are presented in table I-13.

Table I-13
Enriched uranium hexafluoride (UF_6): Enrichers, locations, and nameplate capacity, 2015

Enricher	Location(s)	Capacity (1,000 SWU/year)
Areva	France	7,000
CNNC	China	5,760
JNFL	Japan	75
Rosatom	Russia	26,578
Urenco	United States (New Mexico) Germany/Netherlands/UK	4,700 14,400
Other	Argentina, Brazil, India, Pakistan, Iran	100
Global (est.)		58,600
SWU demand (WNA ref.)		47,285

Note: Areva shut down its gaseous diffusion plant in 2012, replacing it with a new facility using centrifuge technology. 100 percent of enrichment capacity in 2015 came from centrifuges.
Source: WNA, "Uranium Enrichment," November 2016.

As shown in the table above, there is a significant surplus of global enrichment capacity. Since the last remaining gaseous diffusion plants in the United States and France have shut down, the only enrichment technology currently in commercial use are centrifuge plants. However, centrifuges are expensive to shut down and restart. Consequently, enrichers are increasingly "underfeeding" 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 WNA nevertheless projects an increase in global enrichment capacity to about 66.7 million SWU per year by 2020, primarily from expansions in China (designed to serve its growing domestic market) and Russia.[134] In addition, SWU obtained from secondary sources is still significant and may include downblended SWU from both Russia and the United States as well as mixed oxide (MOX) fuel fabricated from plutonium oxide.

Fuel fabricators for light water reactors

The WNA lists 19 fuel fabrication facilities worldwide for lightwater reactors, five of which are in Western Europe, three are in the United States, two are in Russia, and four are in Japan. Fuel fabricators are engaged in the final step in what has been designated as the front

[134] WNA, "Uranium Enrichment," November 2016, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx

end of the nuclear fuel cycle. These steps include the conversion of uranium to uranium dioxide, pelletizing, and finally encasing these pellets in a fuel rod/fuel rod assembly system. Not all fabricators, however, are involved in all steps of this process. In contrast to the other stages of the nuclear fuel cycle, the manufacture of fuel assemblies is a highly customized process. In the past, this has resulted in limiting the competitiveness of the various vendors to a limited number of reactors for which they have the design expertise, since many of the fuel fabricators are also reactor vendors. In recent years, in order to increase market share, fuel fabricators have begun to offer fuel fabrication services to customers using reactors manufactured by their competitors. The European Union has also encouraged this trend, providing €2 billion to Westinghouse in 2015 to manufacture nuclear fuel for Russian-designed reactors in the EU. At the same time as Westinghouse has developed and expanded capacity to supply Russian-designed reactors, Russian fuel manufacturer TVEL has also developed capabilities to supply fuel to nuclear reactors in the United States. The fuel fabrication industry has become increasingly competitive as the firms increase product diversity. At the same time, fuel fabricators are becoming increasingly competitive by offering products with improved performance capabilities, such as higher burnup.

According to the WNA, there is significant global overcapacity for fuel fabrication services. Companies have sought to consolidate through acquisitions, joint ventures, and other partnerships. However, countries like China, India, and South Korea have prioritized maintaining their own domestic capacity to ensure self-sufficiency for their nuclear supply chain.[135]

Reprocessing industry and the recycling of military warheads

Effective nuclear fuel capability can be increased by employing technologies that recycle or reprocess spent fuel. The uranium and plutonium in the spent fuel can be separated; the latter is formed as a byproduct of the nuclear fission process. The reprocessed uranium can then be re-enriched to LEU that is suitable to be used in nuclear reactors. The separated plutonium can also be used when mixed with uranium to form a mixed oxide (MOX) fuel. According to the WNA, a reduction of 30 percent of natural uranium can be achieved. The other advantage of reprocessing is that it reduces the volume of high-level waste as well as the level of radioactivity in the long-term.

The major commercial reprocessing facilities are in Western Europe and Russia. These facilities are located in La Hague, France; Sellafield, the United Kingdom, and Ozersk (Mayak) in Russia. Smaller reprocessing facilities are located in India, Japan, and other countries. MOX fuel fabrication facilities are currently located in France, India, Japan, and the United States. MOX is no longer being used in Belgium, Germany, or Switzerland, significantly weakening the market for the fuel.[136]

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[135] WNA, "Nuclear Fuel Fabrication," April 2017, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/fuel-fabrication.aspx

[136] WNA, "Nuclear Fuel Fabrication," April 2017, http://www.world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/fuel-fabrication.aspx

Plutonium (military grade) and uranium can also be extracted from military warheads. Both the United States and the Russian Federation have done extensive work in this regard. The U.S. DOE downblends HEU it has produced from weapons at facilities in Erwin, TN, and Lynchburg, VA.

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
82 FR 8951 February 1, 2017	*Uranium From Russia; Institution of a Five-Year Review*	https://www.gpo.gov/fdsys/pkg/FR-2017-02-01/pdf/2017-01995.pdf
82 FR 9193 February 3, 2017	*Initiation of Five-Year (''Sunset'') Reviews*	https://www.gpo.gov/fdsys/pkg/FR-2017-02-03/pdf/2017-02343.pdf

APPENDIX B

COMPANY-SPECIFIC DATA

RESPONSE CHECKLIST FOR U.S. PRODUCERS

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APPENDIX C

SUMMARY DATA COMPILED IN PRIOR INVESTIGATIONS

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

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

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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. A response was received from domestic interested parties and they named and provided email contacts for the following six firms as the top purchasers of uranium: ***. Purchaser questionnaires were sent to these six firms and four firms (***) provided responses which are presented below.

1. a.) Have any changes occurred in technology; production methods; or development efforts to produce uranium that affected the availability of uranium in the U.S. market or in the market for uranium in Russia since 2012?

   b.) Do you anticipate any changes in technology; production methods; or development efforts to produce uranium that will affect the availability of uranium in the U.S. market or in the market for uranium in Russia within a reasonably foreseeable time?

Purchaser	Changes that have occurred	Anticipated changes
***	While no changes in technology or production methods appear to have occurred, exploration and development expenditures have changed since 2012 as depicted on Figure 1.4 of the 2016 Nuclear Energy Agency (NEA) Uranium 2016: Resources, Production and Demand ("Red Book") (see https://www.oecd-nea.org/ndd/pubs/2016/7301-uranium-2016.pdf). There does not appear to be an impact on the availability of uranium in the U.S. market.	A laser enrichment process being developed by GE-Hitachi Global Laser Enrichment LLC (GLE) might produce uranium feed by enriching depleted uranium ("tails") stored at the Paducah gaseous diffusion plant over a 40-year period starting in the mid-2020s. For more information see the US Department of Energy (DOE) announcement available at: https://energy.gov/ppo/articles/energy-department-announces-agreement-sell-depleted-uranium-be-enriched-civil-nuclear. This may support the availability of uranium in the U.S. market. It is anticipated that due to the current low uranium prices, budgets for the exploration and development of uranium supply will be reduced until more favorable pricing develops. This may negatively impact the availability of uranium in the U.S. market in the future.
***	With centrifuge enrichment technology replacing gaseous diffusion enrichment, a domestic gaseous diffusion enrichment facility (USEC's Paducah plant) was closed in 2013 without replacing the capacity of that facility (see item 2b for discussion on the replacement facility).	Potential for a future laser enrichment facility (more efficient than centrifuge, lower tails assays achievable at lower cost).

***	First, it is important to understand that there is not a single market for "uranium" as the like product is here defined. In essence there are three related but not identical markets – for natural uranium concentrates, conversion and enrichment. These markets are linked but the linkage is neither direct nor linear. Changes in one market will affect the others, but the effects may be delayed, muted or simply not quite what one might expect. There is a meaningful example of this effect discussed below. The impact of the Fukushima event in Japan has driven down demand and pricing across all segments of the global uranium markets. There were immediate price reductions in 2011, but there have been further price reductions during the inquiry time period as restart of Japanese reactors and thus recovery of Japanese demand has taken much longer than anticipated. Further, in hindsight it has become clear that no one in the industry fully grasped the impact of the accident on the fuel markets. Early assessments correctly identified that there would be reduction in uranium and enrichment demand. What was not promptly understood was the interaction between excess enrichment capacity and the natural uranium supply. In essence, that surplus enrichment capacity was used in a substantial way to reduce uranium requirements and the impact on the market for natural uranium was more severe than anticipated. As a consequence of the demand reductions discussed above, within the last two or three years there has been a series of deferrals or abandonment of new uranium, conversion and enrichment supply projects, reduction in output from existing projects and an ongoing search for a new supply-demand balance. Spot market material (available for immediate delivery) continues to be relatively abundant. In turn, a lively carry trade has developed wherein intermediary actors (traders and other investors) will secure material on the spot market and sell it forward, attempting to capture the difference between their own internal finance rates and the implied rates of the forward price curve. In the natural uranium sector, low cost production in Kazakhstan has substantially increased. Kazakhstan is now clearly the most important uranium source and Kazakh marketing and production decisions have enormous influence over the direction of the market. Two very large conventional projects, Cigar Lake in Canada and Husab in Namibia have added to production capacity during the time period. In the enrichment market there have been several important developments subsequent to Fukushima. Both existing gaseous diffusion plants (in the US at Paducah Kentucky and in Pierrelatte France) have been permanently closed. All enrichment capacity worldwide is now based on centrifuge technology. A second major development has been the abandonment or deferral of three US enrichment projects – USEC's American Centrifuge Project, Areva's Eagle Rock and GLE's laser enrichment facility. All of these were perceived by their owners as unnecessary in the current oversupplied market. This leaves the Urenco National Enrichment Facility in New Mexico as the sole US enrichment capacity. NEF has capability to supply approximately one third of US needs and plans for expansion have been put on hold at this time. In 2013 the US-Russian HEU agreement ended, and enriched uranium sourced from demilitarized Soviet era warheads ceased to be available. Restrictions on Russian imports effectively limit them to 20% of the US market, approximately half of the level that prevailed under the HEU agreement. The Russian supplier has had to work diligently to sell out their available quota – to the best of our knowledge substantial quota space remains prior to the expected end of the quota regime in 2020.	Until market supply/ demand fundamentals are better aligned there is no reason to anticipate a change in development efforts. No technological or production method change appears likely within the foreseeable future.

***	Significant changes have occurred that affect uranium availability in the U.S since 2012 due to the extended impact from the Japanese Fukushima accident in 2011 driving a large number of immediate and planned early reactor shutdowns in and outside the U.S. that serve to decrease demand for uranium products and increase uranium product inventories worldwide. Since 2012, the following plants in the U.S. have closed: Crystal River, Kewaunee, San Onofre, Vermont Yankee and Fort Calhoun. In addition, retirement announcements have been made regarding the following plants: Clinton, Quad Cities, Pilgrim, Indian Point and Diablo Canyon, with Clinton and Quad Cities only recently receiving support from local government to operate for another 10 years. In addition, the vast majority of new reactor build plans in the U.S. (30 reactor count in 2009) were abandoned by the end of 2013. Outside the U.S., announcements have been made for programmatic reductions in nuclear generation capacities in Japan, Germany, Switzerland and France. The resultant significant inventory buildup of uranium products in and outside the U.S. have served to crash nuclear fuel prices for all uranium products in this scope. A portion of these inventories have reentered the market to further reduce uranium product requirements of operating reactors in the U.S. The natural uranium and enrichment services producers have also responded with cutbacks in capacity at currently operating production centers while halting prior plans for any new production centers. The USEC (now Centrus) gaseous diffusion plant in Paducah, KY with an enrichment capacity of 5-6 million SWU was permanently closed in May 2013, removing a large amount of SWU from the market. Also in May 2013, AREVA communicated definitively to halt plans to build a new enrichment facility in Idaho any time in the foreseeable future. LES, the only U.S. enrichment facility in operation today located in New Mexico, announced initiatives to delay the final capacity build out of its enrichment plant. LES is currently producing ~ *** SWU but its final target capacity of *** SWU was delayed 4-5 years until 2022 or later. With total annual U.S. utility enrichment demand at ~ *** SWU, LES is capable of supplying only ***% of U.S. utility enrichment requirements; therefore, U.S. utilities must rely on foreign enrichment suppliers for ***% of their enrichment needs. The U.S. antidumping tariff of 14.6% imposed on all LEU (low enriched uranium) from France in 2009 continues and has significantly reduced U.S. utility access to LEU made in France. Outside the U.S., Russia has begun to significantly cut back on its enrichment capacity, planning to close one of its four SWU plants over the next few years. Russia also has taken its smallest SWU plant at Angarsk and dedicated it entirely to tails re-enrichment for indigenous use, thus taking 2.9 million of enrichment capacity out of the global market. Likewise, URENCO in Europe has mothballed a number of cascades at its Capenhurst facility in the U.K., ultimately removing about 0.5 million enrichment capacity from the global market. These actions by international enrichment suppliers also reduce enrichment supplies available for U.S. utility requirements. In early 2017, Honeywell's ConverDyn plant, the only U.S. natural uranium conversion facility located in Metropolis, Illinois, announced a reduction in capacity. After the change at ConverDyn, U.S. conversion capacity will only meet ~ 14% of U.S. utility requirements thereby increasing U.S. utility reliance on foreign conversion suppliers to 86% of U.S. utility requirements. Total licensed natural uranium mining capacity in the U.S. is ~17M lbs U3O8 (~33% of U.S. requirements); however, the most the U.S. has produced annually in the last 20 years is ~6.3M lbs in 1996 but in 2016 U.S. natural uranium production only amounted to ~2.9M lbs. These totals equate to only 12.6% of U.S. utility requirements at maximum production in 1996 but only 6% of 2016 U.S. utility requirements, respectively.	We expect the production capacity reductions and inventory buildup of uranium products outlined in 1a above to continue into the foreseeable future with the possibility of additional premature reactor shutdowns. With the resulting sustained low prices, it is also expected that producers will continue to defer any new production plans.

2. a.) Have any changes occurred in the ability to increase production of uranium (including the shift of production facilities used for other products and the use, cost, or availability of major inputs into production) that affected the availability of uranium in the U.S. market or in the market for uranium in Russia since 2012?

   b.) Do you anticipate any changes in the ability to increase production (including the shift of production facilities used for other products and the use, cost, or availability of major inputs into production) that will affect the availability of uranium in the U.S. market or in the market for uranium in Russia within a reasonably foreseeable time?

Purchaser	Changes that have occurred	Anticipated changes
***	No	No.
***	New enrichment facilities e.g. GBII have come online since 2012.	Various uranium mines, conversion facilities, and enrichment facilities have scaled back production in response to the depressed market. Some may or may not have the capability to quickly respond if demand increases. Enriched uranium supply (EUP) has potential of increasing if Centrus (USEC) opens an enrichment plant with American Centrifuge technology.
***	Global uranium production (and domestic uranium production as well) is now most commonly performed using in-situ recovery techniques, since these are relatively low cost and can make do with lower grade ore deposits. ISR techniques are flexible compared to conventional mining techniques, with production increased or reduced based on development of new wellfields and adjustment to process flowrates through existing ones. Enrichment technology is now entirely centrifuge based. Older gaseous diffusion plants are now all retired and laser enrichment techniques have not been able to make headway in the current oversupplied market. This has important market consequences. Centrifuge enrichment techniques have high upfront capital costs and low incremental cost of operation. It is economically advantageous for centrifuge enrichment operators to operate at or near full capacity if possible and as far as we can tell all of them do so. This makes this form of supply relatively inelastic. In the wake of the demand reductions post Fukushima one might have anticipated reductions in enrichment operations, but this largely did not occur. Instead, that surplus capacity was redirected to other uses (lowering the tails assay used in production in order to reduce required uranium inputs, enriching previously depleted tails material and enriching on hand supplies of UF_6 to create inventories in advance of need).	No
***	Enrichment producers worldwide converted some of their primary enrichment capacity to the alternate production of natural uranium, whether from underfeeding or from re-enriching tails. As a result, the capacity devoted to primary enrichment production has been reduced, further reducing enrichment supplies to the U.S. and worldwide.	We anticipate the conversion of primary enrichment supply to the production of natural uranium outlined in 2a above to continue into the foreseeable future.

3. a.) Have any changes occurred in factors related to the ability to shift supply of uranium among different national markets (including barriers to importation in foreign markets or changes in market demand abroad) that affected the availability of uranium in the U.S. market or in the market for uranium in Russia since 2012?

   b.) Do you anticipate any changes in factors related to the ability to shift supply among different national markets (including barriers to importation in foreign markets or changes in market demand abroad) that will affect the availability of uranium in the U.S. market or in the market for uranium in Russia within a reasonably foreseeable time?

Purchaser	Changes that have occurred	Anticipated changes
***	No.	Potential US sanctions or duties on Russia or others might impact the availability or cost of imported uranium to the U.S. market.
***	Uranium future demand has been negatively impacted by the reactor shutdowns in Japan due to the Fukushima accident, with only three nuclear reactors in Japan currently online. Nuclear plant closures in the US and Germany have negatively impacted the demand with some of the uranium inventories flowing back into the market. China's current and future new nuclear plants will positively impact the uranium demand as some of their uranium demand is expected to come from the spot market.	The restart of more nuclear plants in Japan would increase future uranium demand (after built up inventories are depleted). The closure of more nuclear plants in the US would decrease future uranium demand.
***	Post Fukushima, large inventories of material have accumulated at multiple locations around the globe. Stocks of material at every stage of the processing chain have strained the ability of the industry to store and manage it. While Japanese utilities have largely held on to their stockpiled materials other entities in Germany, Sweden and the United States have made their inventories available for sale, often at discount to then-current market. These available inventories (often with motivated sellers in ownership) have in some cases pushed aside material from primary suppliers. The only substantial counterbalance to this has been the increasing demand and ongoing buildup of strategic inventories in China. Chinese inventories of uranium are now estimated by industry sources to exceed 250 million pounds – more than a year's global demand and approximately 5 years' worth of US demand. This discretionary purchasing has been crucial in providing some level of price support for natural uranium but has been insufficient to clear the market.	Certain tax proposals now being considered by the administration would apparently favor domestic production by imposing additional tax burden on imported goods and services. Given the lack of detail any assessment of impact would be highly speculative but we are watching to see if there will be meaningful changes.

***	The inventory of uranium products as a result of permanent shutdowns outlined in 1a above have supplied a portion of U.S. and global reactor requirements as these materials have found a path back into the market to decrease overall demand since 2012. Conversely, China, India, and certain Middle Eastern countries have continued plans to build a large number of new reactors in the foreseeable future that stand to increase global demand for uranium products. Asian countries are significantly growing their nuclear reactor population and are consuming evermore of the world's available uranium product supply. In July 2014, the new Prime Minister of India urged a tripling of India's nuclear capacity by 2024. India currently uses natural uranium as fuel for the majority of its reactors that utilize the heavy water technology; however, enriched uranium requirements will develop as India builds new pressurized water reactor designs. U.S. utilities will have to compete with the demand coming from these new reactors outside the U.S. for natural uranium and enrichment services requirements. China has plans to build indigenous enrichment services capacity to meet the majority of internal enrichment services needs but the enriched uranium product (EUP) required for all of China's new reactor initial cores and some subsequent reloads have and will continue to be provided from sources outside China. In addition, Urenco (Europe) supplies 30% of the enrichment requirements for the two Daya Bay reactors and has announced a direct focus on additional sales of enrichment services to Asia (https://www.bloomberg.com/news/articles/2017-03-23/europe-s-nuclear-monopoly-pivots-to-china-as-u-s-power-stalls).Tenex (Russia) supplies 6 million SWU as EUP from 2010 to 2021 for the first four AP1000 reactors. If China's plans for an ultimate indigenous enrichment capacity build is unsuccessful or lags behind new reactor requirements, China may find itself in a position to seek additional non-Chinese sources of enrichment capacity, which has not been considered in current global demand for the foreseeable future. China has also been increasingly acquiring stakes in operating and planned natural uranium mines abroad with the intent of sending mined uranium to China. These acquisitions reduce the amount of natural uranium available to U.S. utilities. As mentioned in 1a above, Russia has begun to significantly cut back on its enrichment capacity and also released plans to close one of its four enrichment plants in the foreseeable future. Russia also has dedicated its smallest enrichment plant at Angarsk entirely to tails re-enrichment for indigenous natural uranium supply, thus taking 2.9 million of enrichment capacity out of the global market and becoming an equivalent mine source for natural uranium.	As outlined in 3a above, China, India, and certain Middle Eastern countries plan to build a large number of new reactors in the foreseeable future. U.S. utilities will have to compete with the demand coming from these new reactors for natural uranium and enrichment services supplies. China plans to ultimately have indigenous enrichment services capacity to meet internal enrichment requirements but if their efforts to build enrichment capacity fall behind the reactor build forward demand, China would be forced to seek additional non-Chinese sources of enrichment capacity in the future. This demand is not factored in current projections of global enrichment services demand and would further increase competition for enrichment services supplies while global enrichment production capacity plans continue to decrease. China has made public statements regarding its desire to source two thirds of its uranium requirements from mines outside of China either via market purchases or ownership stakes in mines. As uranium requirements grow in China, there will be continual increases in market competition and purchases of mining assets, which serves to reduce the amount of uranium available to U.S. utilities.

4. a.) Have there been any changes in the end uses and applications of uranium in the U.S. market or in the market for uranium in Russia since 2012?

   b.) Do you anticipate any changes in the end uses and applications of uranium in the U.S. market or in the market for uranium in Russia within a reasonably foreseeable time?

Purchaser	Changes that have occurred	Anticipated changes
***	No.	No.
***	No.	No.
***	No.	No.
***	No.	Uncertain of the foreseeable timing but a possible new end use for worldwide enrichment capacity will be the need for higher enriched uranium fuel for Small Modular Reactors and Advanced Nuclear Reactors, if developed. These new reactors will require enrichments in the vicinity of 10% or higher, putting stresses on then-existing SWU capacity.

5. a.) Have there been any changes in the existence and availability of substitute products for uranium in the U.S. market or in the market for uranium in Russia since 2012?

   b.) Do you anticipate any changes in the existence and availability of substitute products for uranium in the U.S. market or in the market for uranium in Russia within a reasonably foreseeable time?

Purchaser	Changes that have occurred	Anticipated changes
***	No	No.
***	The low cost of natural gas and the dropping cost of power generation from renewables (wind and solar) has led to a competitive energy market challenging the profitability of merchant nuclear plants. This in turn has led to nuclear plant closures and future plant closure announcements in the U.S., thus reducing previously expected demand in the uranium market.	The cost of power generation from renewables (wind and solar) may further decrease, especially when combined with battery storage. This could lead to even faster pace development of wind and solar power generation facilities.
***	Competition from low-cost natural gas and subsidized renewables has driven power prices in the US to historic lows. A number of nuclear plant closures have taken place or been narrowly averted by state intervention, reducing domestic demand for uranium based fuel. Essentially demand for uranium fuel has been replaced by demand for natural gas, wind or solar generation. Another recent development has seen uranium products which do not meet standard commercial specifications made available to the US market. These off-spec materials are typically sold at a discount to market price and have varying levels of deficit from standard product. Typically, this material is a byproduct of fuel reprocessing. Globally there are a number of potential sources, and many of these have been offered to us in recent years. Exelon has purchased a quantity of this material in recent years, substituting for standard commercial grade product.	Given that there has been some commercial success in placing off-spec material as noted above we expect that additional material of this type will be made available in the future.
***	The increasing availability of alternative, lower cost generation sources such as natural gas and renewables have added to the reduction in demand for uranium in the U.S. since 2012 by forcing premature permanent shutdown of nuclear plants.	The availability of substitute products outlined in 5a above may increase in the foreseeable future.

6. a.) Have there been any changes in the level of competition between uranium produced in the United States, uranium produced in Russia, and such merchandise from other countries in the U.S. market or in the market for uranium in Russia since 2012?

   b.) Do you anticipate any changes in the level of competition between uranium produced in the United States, uranium produced in Russia, and such merchandise from other countries in the U.S. market or in the market for uranium in Russia within a reasonably foreseeable time?

Purchaser	Changes that have occurred	Anticipated changes
***	No.	If weak uranium prices persist, many of the uranium mining firms will not be able to survive and will leave the market thus potentially reducing competition.
***	The expiration of the HEU agreement in 2013 has reduced competition from Russia; with Russia now supplying less of the enrichment demand (Russian SWU quota that can enter the US market is currently restricted on a yearly basis). US plant closures and future plant closure announcements have resulted in reduced market competition.	No.
***	Domestic US uranium production had increased slightly until very recently, and there are a handful of new domestic entrants to the industry as well. New entrants have been able to utilize lower cost ISR techniques to allow them to compete on the global market. Uranium production in Kazakhstan has continued to ramp up and is now the single largest global source by a considerable margin. On the enrichment side the LES facility in New Mexico has scaled up to full target production levels. This has partially offset the closure of the Paducah gaseous diffusion plant.	No.
***	The level of competition in the enriched uranium market has been reduced since 2012 for the reasons mentioned in Question 1a and 1b above. Not only did USEC close it gaseous diffusion enrichment plant but AREVA also closed their 10 million enrichment services nominal capacity gaseous diffusion plant in France in 2012, taking another large amount of enrichment capacity out of the global market. Also, all but one of the new enrichment plants that were being planned for commercial production by the 2015 timeframe never materialized due primarily to the March, 2011 accident at the Fukushima plant in Japan. These three plants, AREVA's Eagle Rock plant in Idaho, USEC's American Centrifuge Plant in Piketon, Ohio, and GLE's laser enrichment plant in Wilmington, NC, totaling a minimum of ~ 9.5 million SWU, never materialized. The evaporation of this large amount of planned enrichment capacity continues to limit enrichment market competition available to U.S. utilities to that of LES, Urenco, AREVA and TENEX. In addition, the expiration of HEU Megatons to Megawatts agreement between the U.S. and Russia in 2013 resulted in a reduction of Russian supply to U.S. utility requirements from 40% of enrichment services to ~ 20%.	The level of competition in the enriched uranium market should continue to be reduced in the foreseeable future for the reasons mentioned in Question 1a, 1b and 6a above.

7. a.) Have there been any changes in the business cycle for uranium in the U.S. market or in the market for uranium in Russia since 2012?

   b.) Do you anticipate any changes in the business cycle for uranium in the U.S. market or in the market for uranium in Russia within a reasonably foreseeable time?

Purchaser	Changes that have occurred	Anticipated changes
***	The Fukushima accident and related issues (such as a very slow return of Japanese reactors to the market) has created excess inventories, bolstered a significant over-supply, and resulted in a downward business cycle since 2012. In the US market, this negative business cycle was magnified by concerns that utilities such as First Energy (see https://www.thestreet.com/story/14015917/1/firstenergy-is-not-long-for-nuclear-power.html) and PSEG (see http://www.njspotlight.com/stories/17/03/06/pseg-warns-that-without-subsidies-nuclear-plants-could-go-dark/) might reduce their nuclear fleets. In a negative indication for potential new nuclear power plant builds and further negative business cycle pressure, nuclear vendors like AREVA and Toshiba are in difficult financial conditions. At the beginning of 2017, Toshiba, the owner of Westinghouse, announced that it will no longer build new nuclear plants (see http://www.cnbc.com/2017/01/31/toshiba-to-put-a-halt-to-nuclear-power-plant-business-ambitions.html). AREVA is restructuring their business (see http://www.reuters.com/article/us-areva-restructuring-newco-idUSKCN1152Q5).	Financial weakness and over-supply will probably continue and might result in firms leaving the uranium market. Pressure on utilities to close nuclear power plants will probably persist into the future and keep potential demand increases for uranium low. Construction of new nuclear plants is not anticipated to be significant at least in the US market. Overall, the negative business cycle is anticipated to continue into the foreseeable future.
***	With lower uranium prices, potential exists for utilities have either started carrying uranium inventories or have increased uranium inventories.	No.
***	No.	No.
***	The production cutbacks outlined in 1a above have impacted the availability of natural uranium in the form of U_3O_8, conversion services, and enrichment services in the U.S. Inventory sales in the U.S. have served to displace traditional primary production sales. Inventory sales can be offered at shortened lead times to traditional required timing of downstream conversion, enrichment, or fabrication.	Changes in the business cycle for uranium in the U.S. market should continue in the foreseeable future for the reasons mentioned in Question 7a above. As these excess inventories ultimately roll off the market, producers will likely return to longer lead times for delivery of feed material to converters and enrichers that serves to increase holding costs for U.S. utilities.