

# 2017 Uranium Marketing Annual Report

May 2018















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### **Contents**

Contacts	i
Tables	i\
Figures	
Introduction	
Uranium purchases and prices	
New and future uranium contracts	
Uranium feed, enrichment services, uranium loaded	2
Uranium foreign purchases/sales and inventories	

## **Tables**

Table S1a. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors, 1994–2017	4
Table S1b. Weighted-average price of uranium purchased by owners and operators of U.S. civilian	
nuclear power reactors, 1994–2017	
Table S2. Uranium feed deliveries, enrichment services, and uranium loaded by owners and	. 0
operators of U.S. civilian nuclear power reactors, 1994–2017	0
operators of 0.5. civilian nuclear power reactors, 1994–2017	. 0
Table S3a. Foreign purchases, foreign sales, and uranium inventories owned by U.S. suppliers and	
owners and operators of U.S. civilian nuclear power reactors, 1994–2017	11
Table S3b. Weighted-average price of foreign purchases and foreign sales by U.S. suppliers and	
owners and operators of U.S. civilian nuclear power reactors, 1994–2017	13
Table 1. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by	
supplier and delivery year, 2012–2017	15
Table 2. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by	
origin and delivery year, 2012–2017	18
Table 3. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by	
origin country and delivery year, 2012–2017	21
Table 4. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by	
origin and material type, 2017 deliveries	23
Table 5. Average price and quantity for uranium purchased by owners and operators of U.S. civiliar	n
nuclear power reactors by pricing mechanisms and delivery year, 2016–2017	25
Table 6a. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors	
ranked by price and distributed by quantity, 2015–2017 deliveries	27
Table 6b. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors	
ranked by price and distributed by purchaser, 2015–2017 deliveries	28
Table 7. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by	
contract type and material type, 2017 deliveries	29
Table 8. Contracts signed in 2017 by owners and operators of U.S. civilian nuclear power reactors b	Эγ
contract type	30
Table 9. Contracted purchases of uranium by owners and operators of U.S. civilian nuclear power	
reactors, signed in 2017, by delivery year, 2018–2027	31
Table 10. Contracted purchases of uranium from suppliers by owners and operators of U.S. civilian	1
nuclear power reactors, in effect at the end of 2017, by delivery year, 2018–2027	33
Table 11. Unfilled uranium market requirements of owners and operators of U.S. civilian nuclear	
power reactors, 2017–2027	35
Table 12. Maximum anticipated uranium market requirements of owners and operators of U.S.	
civilian nuclear power reactors, 2018–2027, at end of 2017	37
Table 13. Deliveries of uranium feed by owners and operators of U.S. civilian nuclear power reacto	
by enrichment country and delivery year, 2015–2017	39

Table 14. Deliveries of uranium feed for enrichment by owners and operators of U.S. civilian nuclear
power reactors by origin country and delivery year, 2015–201741
Table 15. Shipments of uranium feed by owners and operators of U.S. civilian nuclear power
reactors to domestic and foreign enrichment suppliers, 2018–202643
Table 16. Purchases of enrichment services by owners and operators of U.S. civilian nuclear power
reactors by origin country and year, 2013–202745
Table 17. Purchases of enrichment services by owners and operators of U.S. civilian nuclear power
reactors by contract type in delivery year, 201747
Table 18. Uranium in fuel assemblies loaded into U.S. civilian nuclear power reactors by year, 2013–
2017 48
Table 19. Foreign purchases of uranium by U.S. suppliers and owners and operators of U.S. civilian
nuclear power reactors by delivery year, 2013–201750
Table 20. U.S. broker and trader purchases of uranium by origin, supplier, and delivery year, 2013–
2017 52
Table 21. Foreign sales of uranium from U.S. suppliers and owners and operators of U.S. civilian
nuclear power reactors by origin and delivery year, 2013–201754
Table 22. Inventories of natural and enriched uranium by material type as of end of year, 2013–2017
Table 23. Inventories of uranium by owner as of end of year, 2013–201759
Table 24. Uranium sellers to owners and operators of U.S. civilian nuclear power reactors, 2015–
2017 61
Table 25. Enrichment service sellers to owners and operators of U.S. civilian nuclear power reactors,
2015–2017 62

## **Figures**

Figure S1. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors,
1994–2017 deliveries 5
Figure S2. Weighted-average price of uranium purchased by owners and operators of U.S. civilian
nuclear power reactors, 1994–2017 deliveries
Figure S3. Uranium loaded into U.S. civilian nuclear power reactors, 1994–2017
Figure S4. Uranium enrichment services purchased by owners and operators of U.S. civilian nuclear
power reactors, 1994–2017
Figure S5. Total commercial uranium inventories of U.S. suppliers and owners and operators of U.S.
civilian nuclear power reactors, 1994–201712
Figure S6. Weighted-average price of foreign purchases and foreign sales of uranium, 1994–2017. 14
Figure 1. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by
supplier and delivery year, 2012–2017
Figure 2. Weighted-average price of uranium purchased by owners and operators of U.S. civilian
nuclear power reactors by supplier and delivery year, 2012–2017 17
Figure 3. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by
origin and delivery year, 2012–2017 19
Figure 4. Weighted-average price of uranium purchased by owners and operators of U.S. civilian
nuclear power reactors by origin and delivery year, 2012–2017
Figure 5. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by
selected origin country and delivery year, 2012–201722
Figure 6. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by
material type, 2017 deliveries
Figure 7. Average price for uranium purchased by owners and operators of U.S. civilian nuclear
power reactors by pricing mechanisms and delivery year, 2016–201726
Figure 8. Contracted purchases of uranium by owners and operators of U.S. civilian nuclear power
reactors, signed in 2017, by delivery year, 2018–23
Figure 9. Maximum contracted purchases of uranium from suppliers by owners and operators of
U.S. civilian nuclear power reactors, in effect at the end of 2017, by delivery year, 2018–2025 34
Figure 10. Annual unfilled uranium market requirements of owners and operators of U.S. civilian
nuclear power reactors, at the end of 2016 and at the end of 2017
Figure 11. Maximum anticipated uranium market requirements of owners and operators of U.S.
civilian nuclear power reactors, 2017–2026, as of December 31, 2017 38
Figure 12. Deliveries of uranium feed for U.S. and foreign enrichment by owners and operators of
U.S. civilian nuclear power reactors by delivery year, 2015–2017
Figure 13. Deliveries of uranium feed for enrichment by owners and operators of U.S. civilian
nuclear power reactors by selected origin country of feed and delivery year, 2015–2017 42
Figure 14. Shipments of uranium feed by owners and operators of U.S. civilian nuclear power
reactors to domestic and foreign enrichment suppliers, 2018–2026
Figure 15. Purchases of enrichment services by owners and operators of U.S. civilian nuclear power
reactors by selected origin country and year, 2013–2027

Figure 16. Uranium in fuel assemblies loaded into U.S. civilian nuclear power reactors by year, 2	013–
2017	49
Figure 17. Foreign purchases of uranium by U.S. suppliers and owners and operators of U.S. civil	lian
nuclear power reactors by delivery year, 2013–2017	51
Figure 18. U.S. broker and trader purchases of uranium by delivery year, 2013–2017	53
Figure 19. Foreign sales of uranium from U.S. suppliers and owners and operators of U.S. civiliar	า
nuclear power reactors by origin and delivery year, 2013–2017	55
Figure 20. Commercial inventories of natural and enriched uranium as of end of year, 2013–201	7. 57
Figure 21. Owners and operators of U.S. civilian nuclear power reactors inventories by material	type
as of end of year, 2013–2017	58
Figure 22. Commercial inventories of uranium by owner as of end of year, 2013–2017	60

May 2018

#### Introduction

In this report, the U.S. Energy Information Administration (EIA) provides detailed data on uranium marketing activities in the United States from 2012 through 2017 and summary data back to 1994.

Data in this report are based on information reported on Form EIA-858, *Uranium Marketing Annual Survey*. Form EIA-858 survey collects data on contracts, deliveries (during the report year and projected for the next 10 years), enrichment services purchased, inventories, use in fuel assemblies, feed deliveries to enrichers (during the report year and projected for the next 10 years), and unfilled market requirements for the next 10 years.

Previous editions of this report are available on EIA's website.

Definitions for terms in this report are available in EIA's Energy Glossary.

#### **Uranium purchases and prices**

Owners and operators of U.S. civilian nuclear power reactors (civilian owner/operators, or COOs) purchased a total of 43 million pounds  $U_3O_8e$  (equivalent<sup>1</sup>) of deliveries from U.S. suppliers and foreign suppliers during 2017, at a weighted-average price of \$38.80 per pound  $U_3O_8e$ . The 2017 total of 43 million pounds  $U_3O_8e$  was 15% lower than the 2016 total of 50.6 million pounds  $U_3O_8e$ . The 2017 weighted-average price of \$38.80 per pound  $U_3O_8e$  was 9% lower than the 2016 weighted-average price of \$42.43 per pound  $U_3O_8e$  (Table 1).

Seven percent of the 43 million pounds  $U_3O_8e$  delivered in 2017 was U.S.-origin uranium at a weighted-average price of \$35.55 per pound. Foreign-origin uranium accounted for the remaining 93% of deliveries at a weighted-average price of \$39.04 per pound (Table 2). Australian-origin and Canadian-origin uranium together accounted for 52% of the 43 million pounds. Uranium originating in Kazakhstan, Russia, and Uzbekistan accounted for 32%. The remaining 9% originated from Hungary, Malawi, Namibia, Niger, South Africa, and Ukraine (Table 3).

COOs purchased three material types of uranium for 2017 deliveries from 36 sellers, the same number of sellers as in 2016 (Table 4, Table 24). Uranium concentrate was 55% of the 43 million pounds  $U_3O_8e$  delivered in 2017. Natural UF<sub>6</sub> was 27%, and enriched UF<sub>6</sub> was 18% (Table 4). During 2017, 14% of the uranium delivered was purchased under spot contracts at a weighted-average price of \$22.36 per pound. The remaining 86% was purchased under long-term contracts at a weighted-average price of \$41.58 per pound (Table 7). Spot contracts are contracts with a one-time uranium delivery (usually) for the entire contract, and the delivery typically occurs within one year of contract execution (signed date). Long-term contracts are contracts with one or more uranium deliveries to occur after a year following the contract execution (signed date) and as such may reflect some agreements of short and medium terms as well as longer term.

<sup>&</sup>lt;sup>1</sup>Uranium quantities are expressed in the unit of measure  $U_3O_8e$  (equivalent).  $U_3O_8e$  is triuranium octoxide (or uranium concentrate) and the equivalent uranium-component of uranium hexafluoride (UF<sub>6</sub>) and enriched uranium.

May 2018

#### New and future uranium contracts

In 2017, COOs signed 34 new purchase contracts with deliveries in 2017 of 4.7 million pounds  $U_3O_8e$  at a weighted-average price of \$20.82 per pound. Five of these contracts were long-term and received deliveries of 1.5 million pounds  $U_3O_8e$  at a weighted-average price of \$21.03 in 2017. The other 29 contracts were spot contracts with 3.2 million pounds  $U_3O_8e$  delivered at a weighted-average price of \$20.72 in 2017 (Table 8).

COOs report minimum and maximum quantities of future deliveries under contract to allow for the option of either decreasing or increasing quantities. At the end of 2017, the maximum uranium deliveries for 2018 through 2027 under existing purchase contracts for COOs totaled 176 million pounds  $U_3O_8e$  (Table 10). Also at the end of 2017, unfilled uranium market requirements for 2018 through 2027 totaled 209 million pounds  $U_3O_8e$  (Table 11). These contracted deliveries and unfilled market requirements combined represent the maximum anticipated market requirements of 385 million pounds  $U_3O_8e$  over the 10-year period for COOs.

#### Uranium feed, enrichment services, uranium loaded

In 2017, COOs delivered 34 million pounds  $U_3O_8e$  of natural uranium feed to U.S. and foreign enrichers. Fifty-three percent of the feed was delivered to U.S. enrichment suppliers, and the remaining 47% was delivered to foreign enrichment suppliers (Table 13). Thirteen million separative work units (SWU)<sup>2</sup> were purchased under enrichment services contracts from 12 sellers in 2017, the same number of sellers as in 2016 (Table 16, Table 25). The average price paid by the COOs for the 13 million SWU was \$125.43 per SWU in 2017, compared with the 2016 average price of \$131 per SWU. In 2017, the U.S.-origin SWU share was 43%, and the foreign-origin SWU accounted for the remaining 57%. Foreign-origin SWU included 23% from Russia, 12% from the United Kingdom, 9% from the Netherlands, and 3% from Germany (Table 16).

Uranium in fuel assemblies loaded into U.S. civilian nuclear power reactors during 2017 contained 45.5 million pounds  $U_3O_8e$ , compared with 41.7 million pounds  $U_3O_8e$  loaded during 2016. Thirteen percent of the uranium loaded during 2017 was U.S.-origin uranium, and 87% was foreign-origin uranium (Table 18).

#### **Uranium foreign purchases/sales and inventories**

U.S. suppliers (brokers, converters, enrichers, fabricators, producers, and traders) and COOs purchase uranium each year from foreign suppliers. Together, foreign purchases totaled 42 million pounds  $U_3O_8e$  in 2017, and the weighted-average price was \$37.09 per pound  $U_3O_8e$  (Table 19). Also, U.S. suppliers and COOs sold uranium to foreign suppliers. Together, foreign sales totaled 14 million pounds  $U_3O_8e$  in 2017, and the weighted-average price was \$25.19 per pound  $U_3O_8e$  (Table 21).

<sup>&</sup>lt;sup>2</sup> Separative work unit (SWU): The standard measure of enrichment services. The effort expended in separating a mass F of feed of assay  $x_f$  into a mass P of product assay  $x_p$  and waste of mass W and assay  $x_w$  is expressed in terms of the number of separative work units needed, given by the expression SWU = WV( $x_w$ ) + PV( $x_p$ ) - FV( $x_f$ ), where V(x) is the *value function*, defined as V(x) = (1 - 2x) 1n((1 - x)/x).

Year-end commercial uranium inventories represent ownership of uranium in different stages of the nuclear fuel cycle (in-process for conversion, enrichment, or fabrication) at domestic or foreign nuclear fuel facilities. Total U.S. commercial inventories (including inventories owned by COOs, U.S. brokers, converter, enrichers, fabricators, producers, and traders) were 142.7 million pounds  $U_3O_8e$  at the end of 2017. Commercial uranium inventories owned at the end of 2017 by COOs totaled 123.7 million pounds  $U_3O_8e$ , a 3% decrease in inventories from the year-end 2016 level. Uranium inventories owned by U.S. suppliers (converters, enrichers, fabricators, producers, brokers and traders) totaled 19 million pounds  $U_3O_8e$  at the end of 2017 (Table 22).

Table S1a. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors, 1994–2017

million pounds U<sub>3</sub>O<sub>8</sub> equivalent

Purchased from other owners and operators of U.S. civilian nuclear power reactors, other Short, medium, Purchased from U.S. suppliers, (and U.S. Purchased from and long-term Delivery Purchased from U.S. brokers and U.S.-origin Foreign-origin year government for 2007) 1 foreign suppliers uranium Spot contracts 2 contracts 3 Total purchased U.S. producers traders uranium 1994 38.3 5.4 15.3 1.1 7.7 30.6 8.5 29.8 43.4 5.3 0.6 1995 16.2 21.4 5.2 38.2 13.6 29.8 1996 47.3 5.8 13.3 1.9 26.4 8.3 39.0 9.1 38.3 1997 42.0 5.7 9.9 3.0 23.4 8.1 33.9 5.5 36.5 4.5 21.3 7.2 35.6 34.9 1998 42.7 6.5 10.5 7.8 1999 47.9 5.2 10.4 5.6 26.8 11.4 36.5 8.0 40.0 2000 51.8 8.8 30.4 13.3 38.6 10.4 39.1 3.6 9.1 11.7 30.0 13.2 42.2 40.0 2001 55.4 2.3 11.4 14.4 2002 52.7 1.5 13.4 5.7 32.2 6.2 46.5 41.4 8.6 37.2 2003 56.6 0.6 10.5 8.3 10.2 46.4 8.2 46.7 2004 64.1 0 13.2 12.2 38.7 12.3 51.8 9.2 53.3 2005 65.7 W 10.4 W 39.4 11.0 54.7 6.9 58.8 2006 66.5 0 13.9 12.6 40.0 10.8 55.7 6.3 59.4 2007 51.0 0 9.8 7.6 33.5 4.0 47.0 6.6 43.7 2008 53.4 0.6 9.4 6.3 37.2 7.7 45.6 8.7 42.8 W W 36.8 42.8 41.0 2009 49.8 11.1 7.1 8.1 2010 46.6 3.7 42.9 37.9 0.4 11.7 1.9 32.6 8.2 38.4 42.3 2011 54.8 0.6 14.8 1.1 5.2 49.6 12.0 2012 57.5 11.5 W 37.6 9.8 47.7 48.9 W 8.1 2013 57.4 W 12.8 W 37.4 9.5 47.9 11.3 46.1 2014 53.3 W 17.1 W 34.4 3.3 50.0 14.5 38.8 2015 56.5 W 13.9 W 38.2 3.4 53.1 11.3 43.2 2016 50.6 W 7.9 W 39.5 5.4 45.2 10.6 37.0 2017 43.0 W 4.5 34.4 2.9 40.1 6.2 36.6

Notes: Other U.S. Suppliers are U.S. converters, enrichers, and fabricators. Totals may not equal sum of components because of independent rounding.

Sources: U.S. Energy Information Administration: 1994–2002 Uranium Industry Annual , Tables 10, 11 and 16. 2003–2017 Form EIA-858 Uranium Marketing Annual Survey .

<sup>-- =</sup> Not applicable. W = Data withheld to avoid disclosure of individual company data. NA = Not available.

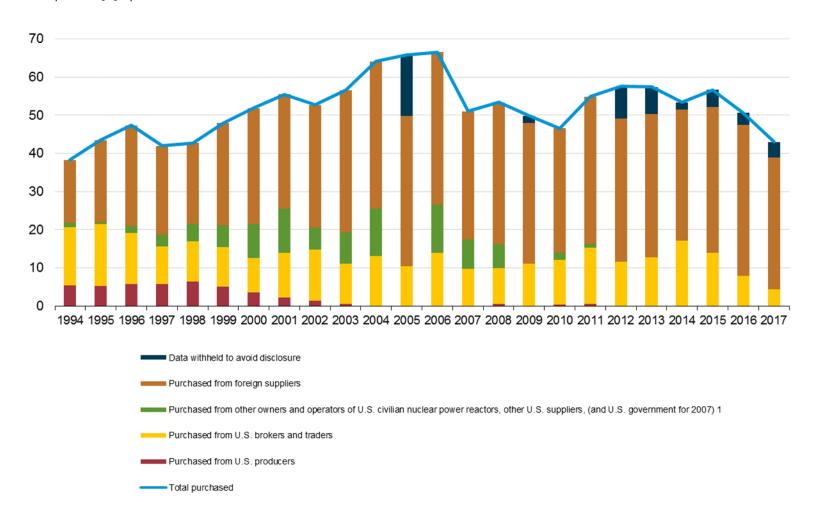
<sup>&</sup>lt;sup>1</sup> Includes purchases between owners and operators of U.S. civilian nuclear power reactors along with purchases from other U.S. suppliers which are U.S. converters, enrichers, and fabricators.

<sup>&</sup>lt;sup>2</sup> Spot Contract: A one-time delivery (usually) of the entire contract to occur within one year of contract execution (signed date).

<sup>&</sup>lt;sup>3</sup> Short, Medium, and Long-Term Contracts: One or more deliveries to occur after a year following contract execution (signed date).

Figure S1. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors, 1994–2017

million pounds U<sub>3</sub>O<sub>8</sub> equivalent



<sup>&</sup>lt;sup>1</sup> Includes purchases between owners and operators of U.S. civilian nuclear power reactors along with purchases from other U.S. suppliers which are U.S. converters, enrichers, and fabricators. Sources: U.S. Energy Information Administration: 1994–2002 *Uranium Industry Annual* reports. 2003–2017 Form EIA-858 *Uranium Marketing Annual Survey*.

Table S1b. Weighted-average price of uranium purchased by owners and operators of U.S. civilian nuclear power reactors, 1994–2017

dollars per pound U<sub>3</sub>O<sub>8</sub> equivalent

Delivery year	Total purchased (weighted- average price)	Purchased from U.S. producers	Purchased from U.S. brokers and traders	Purchased from other owners and operators of U.S. civilian nuclear power reactors, other U.S. suppliers, (and U.S. government for 2007) <sup>1</sup>		U.Sorigin uranium (weighted- average price)	Foreign-origin uranium (weighted- average price)	Spot contracts <sup>2</sup> (weighted- average price)	Short, medium, and long-term contracts <sup>3</sup> (weighted- average price)
1994	10.40	13.72	9.34	8.04	10.43	12.08	9.97	9.01	NA
1995	11.25	14.84	9.83	12.52	11.40	14.20	10.84	10.30	NA
1996	14.12	14.20	13.36	14.98	14.45	14.62	14.02	14.22	NA
1997	12.88	13.60	12.31	W	12.91	13.36	12.78	11.61	NA
1998	12.14	13.61	11.95	W	11.97	13.37	11.90	10.56	NA
1999	11.63	13.93	11.54	W	11.47	12.24	11.47	9.52	NA
2000	11.04	14.81	11.28	10.45	10.65	11.52	10.88	8.54	11.70
2001	10.15	13.26	10.44	9.98	9.86	10.50	10.05	7.92	10.96
2002	10.36	13.03	10.21	W	10.37	10.89	10.29	9.29	10.58
2003	10.81	14.17	11.05	10.16	10.82	10.81	10.81	10.10	10.94
2004	12.61		12.08	11.30	13.15	11.87	12.76	14.77	12.24
2005	14.36	W	13.76	W	14.70	15.11	14.21	20.04	13.70
2006	18.61		20.49	W	18.62	17.85	18.75	39.48	16.38
2007	32.78		34.10	W	32.36	28.89	33.05	88.25	24.45
2008	45.88	75.16	39.62	W	48.49	59.55	43.47	66.95	41.59
2009	45.86	W	41.88	W	46.68	48.92	45.35	46.45	45.74
2010	49.29	47.13	44.98	42.24	51.30	45.25	49.64	43.99	50.43
2011	55.64	58.12	53.29	52.50	56.60	52.12	55.98	54.69	55.90
2012	54.99	W	54.44	W	54.40	59.44	54.07	51.04	55.65
2013	51.99	W	50.44	W	51.93	56.37	51.13	43.83	54.00
2014	46.16	W	42.90	W	47.62	48.11	46.03	36.64	49.73
2015	44.13	52.35	44.67	W	44.66	43.86	44.14	36.80	46.04
2016	42.43	48.86	50.56	W	44.85	43.92	42.26	29.62	46.11
2017	38.80	48.77	41.80	20.02	41.16	35.55	39.04	22.36	41.58

<sup>-- =</sup> Not applicable. W = Data withheld to avoid disclosure of individual company data. NA = Not available.

Notes: Other U.S. Suppliers are U.S. converters, enrichers, and fabricators. Totals may not equal sum of components because of independent rounding. Weighted-average prices are not adjusted for inflation.

Sources: U.S. Energy Information Administration: 1994–2002 Uranium Industry Annual, Tables 10, 11 and 16. 2003–2017 Form EIA-858 Uranium Marketing Annual Survey.

<sup>&</sup>lt;sup>1</sup> Includes purchases between owners and operators of U.S. civilian nuclear power reactors along with purchases from other U.S. suppliers which are U.S. converters, enrichers, and fabricators.

<sup>&</sup>lt;sup>2</sup> Spot Contract: A one-time delivery (usually) of the entire contract to occur within one year of contract execution (signed date).

<sup>&</sup>lt;sup>3</sup> Short, Medium, and Long-Term Contracts: One or more deliveries to occur after a year following contract execution (signed date).

Figure S2. Weighted-average price of uranium purchased by owners and operators of U.S. civilian nuclear power reactors, 1994–2017 dollars per pound U<sub>3</sub>O<sub>8</sub> equivalent

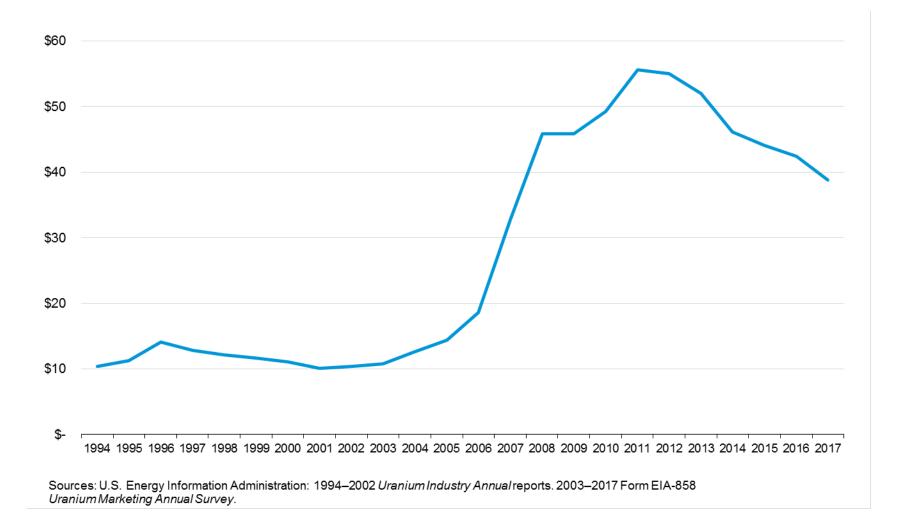


Table S2. Uranium feed deliveries, enrichment services, and uranium loaded by owners and operators of U.S. civilian nuclear power reactors, 1994–2017

	Million pounds U	₃O <sub>8</sub> equivalent	Million			
Year	Feed deliveries by owners and operators of U.S. civilian nuclear power reactors	Uranium in fuel assemblies loaded into U.S. civilian nuclear power reactors	U.Sorigin enrichment services purchased	Foreign-origin enrichment services purchased	Total purchased enrichment services	Average price (US\$ per SWU)
1994	37.6	40.4	7.5	1.7	9.2	-
1995	44.3	51.1	6.7	2.8	9.5	-
1996	49.1	46.2	8.0	3.2	11.2	-
1997	40.3	48.2	6.0	2.9	8.9	-
1998	40.6	38.2	5.7	4.4	10.1	-
1999	43.9	58.8	4.6	5.4	10.0	-
2000	47.8	51.5	5.2	6.6	11.8	-
2001	47.3	52.7	1.3	9.1	10.4	-
2002	54.7	57.2	1.7	9.8	11.5	-
2003	49.3	62.3	1.7	10.3	12.0	-
2004	53.4	50.1	1.4	10.4	11.8	-
2005	52.9	58.3	1.1	10.3	11.4	-
2006	56.6	51.7	1.6	11.8	13.4	106.57
2007	49.0	45.5	1.5	12.7	14.2	114.58
2008	43.4	51.3	1.9	10.7	12.6	121.33
2009	51.9	49.4	4.1	13.1	17.2	130.78
2010	45.5	44.3	2.3	11.5	13.8	136.14
2011	51.3	50.9	2.4	12.4	14.8	136.12
2012	52.1	49.5	3.3	12.3	15.6	141.36
2013	47.4	42.6	3.9	8.5	12.3	142.22
2014	41.9	50.5	3.8	9.2	12.9	140.75
2015	41.4	47.4	4.1	8.8	12.9	136.88
2016	43.1	42.5	4.8	9.5	14.3	131.00
2017	33.8	45.5	5.6	7.3	12.9	125.43

<sup>- =</sup> No data reported.

Notes: Totals may not equal sum of components because of independent rounding. Average prices are not adjusted for inflation. Sources: U.S. Energy Information Administration: 1994–2002 *Uranium Industry Annual*, Tables 22, 23, 25, and 27. 2003–2017 Form EIA-858 *Uranium Marketing Annual Survey*.

Figure S3. Uranium loaded into U.S. civilian nuclear power reactors, 1994–2017

million pounds U<sub>3</sub>O<sub>8</sub> equivalent

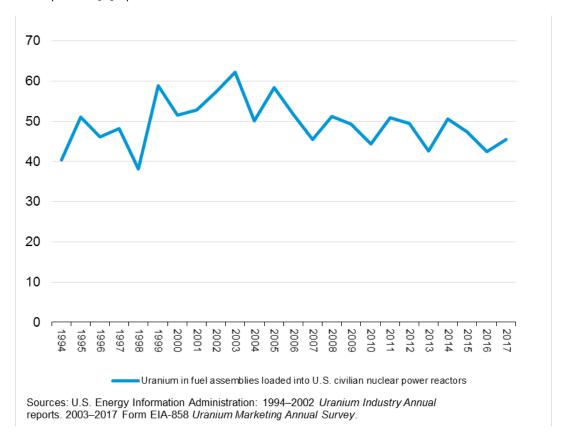
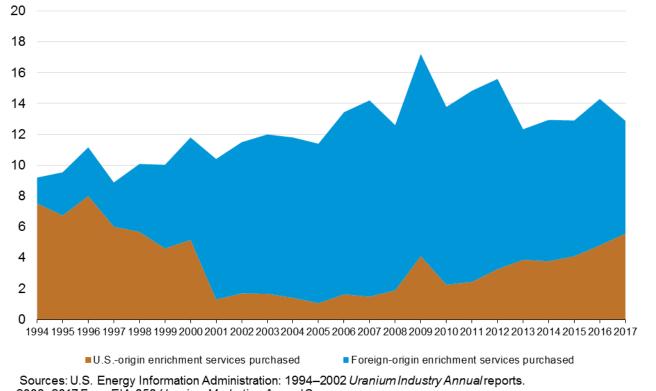


Figure S4. Uranium enrichment services purchased by owners and operators of U.S. civilian nuclear power reactors, 1994–2017

million separative work units (SWU)



2003–2017 Form EIA-858 Uranium Marketing Annual Survey.

Table S3a. Foreign purchases, foreign sales, and uranium inventories owned by U.S. suppliers and owners and operators of U.S. civilian nuclear power reactors, 1994–2017

million pounds U<sub>3</sub>O<sub>8</sub> equivalent

Delivery year	Foreign purchases by U.S. suppliers	Foreign purchases by owners and operators of U.S. civilian nuclear power reactors	Total foreign purchases	U.S. broker and trader purchases from foreign suppliers	Foreign sales	U.S. supplier owned uranium inventories	Owners and operators of U.S. civilian nuclear power reactors owned uranium inventories	Total commercial uranium inventories
1994	21.1	15.5	36.6	22.3	17.7	21.5	65.4	86.9
1995	20.2	21.1	41.3	18.3	9.8	13.7	58.7	72.5
1996	21.7	23.7	45.4	17.8	11.5	13.9	66.1	80.0
1997	20.4	22.5	43.0	15.7	17.0	40.4	65.9	106.2
1998	22.6	21.1	43.7	21.7	15.1	70.7	65.8	136.5
1999	21.0	26.6	47.6	19.2	8.5	68.8	58.3	127.1
2000	17.4	27.5	44.9	15.8	13.6	56.5	54.8	111.3
2001	18.7	28.0	46.7	18.3	11.7	48.1	55.6	103.8
2002	22.7	30.0	52.7	18.6	15.4	48.7	53.5	102.1
2003	18.2	34.9	53.0	15.8	13.2	39.9	45.6	85.5
2004	30.2	35.9	66.1	26.4	13.2	37.5	57.7	95.2
2005	27.0	38.5	65.5	24.0	20.5	29.1	64.7	93.8
2006	26.1	38.7	64.8	24.0	18.7	29.1	77.5	106.6
2007	21.6	32.5	54.1	18.9	14.8	31.2	81.2	112.4
2008	24.1	32.9	57.1	21.3	17.2	27.0	83.0	110.0
2009	26.7	32.2	58.9	26.8	23.5	26.8	84.8	111.5
2010	25.0	30.4	55.3	24.7	23.1	24.7	86.5	111.3
2011	19.3	35.1	54.4	19.6	16.7	22.3	89.8	112.1
2012	20.2	36.0	56.2	20.2	18.0	23.3	97.6	120.9
2013	23.2	34.1	57.3	w	18.9	21.3	113.1	134.4
2014	24.2	34.4	58.6	w	20.0	18.7	114.0	132.7
2015	27.2	36.9	64.1	26.1	25.7	14.3	121.1	135.5
2016	22.1	28.5	50.7	22.1	17.2	16.7	128.0	144.6
2017	16.9	25.2	42.1	14.1	14.0	19.0	123.7	142.7

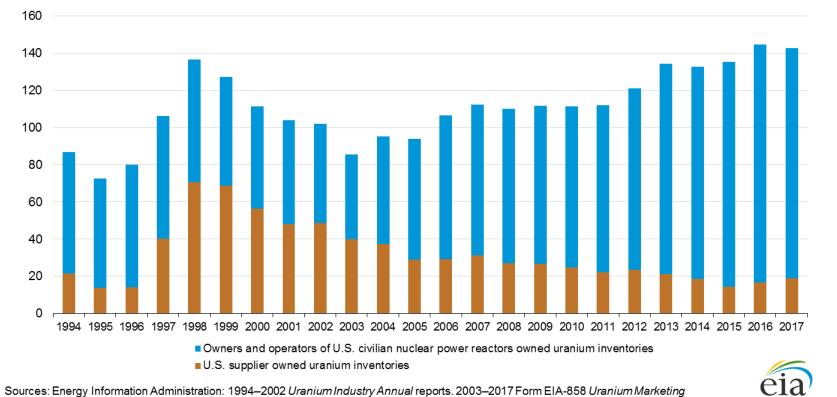
W = Data withheld to avoid disclosure of individual company data.

Notes: Totals may not equal sum of components because of independent rounding. Foreign purchase: A uranium purchase of foreign-origin uranium from a firm located outside the United States. Foreign sale: A uranium sale to a firm located outside the United States.

Sources: U.S. Energy Information Administration: 1994–2002 Uranium Industry Annual, Tables 28, 29, 30 and 31. 2003–2017 Form EIA-858 Uranium Marketing Annual Survey.

Figure S5. Total commercial uranium inventories of U.S. suppliers and owners and operators of U.S. civilian nuclear power reactors, 1994–2017

million pounds U<sub>3</sub>O<sub>8</sub> equivalent



Sources: Energy Information Administration: 1994–2002 *Uranium Industry Annual* reports. 2003–2017 Form EIA-858 *Uranium Marketing Annual Survey*.

Table S3b. Weighted-average price of foreign purchases and foreign sales by U.S. suppliers and owners and operators of U.S. civilian nuclear power reactors, 1994–2017

dollars per pound U<sub>3</sub>O<sub>8</sub> equivalent

Delivery year	Foreign purchases by U.S. suppliers	Foreign purchases by owners and operators of U.S. civilian nuclear power reactors	Total foreign purchases (weighted-average price)		
1994	7.78	10.53	8.95	7.87	11.34
1995	8.96	11.39	10.20	9.02	13.48
1996	11.78	14.41	13.15	11.78	14.20
1997	10.61	12.89	11.81	10.71	12.39
1998	10.50	11.96	11.19	10.77	12.05
1999	9.42	11.45	10.55	9.60	11.97
2000	8.45	10.68	9.84	8.61	8.48
2001	8.98	9.87	9.51	8.87	8.79
2002	9.65	10.37	10.05	9.59	10.04
2003	10.19	10.79	10.59	10.19	10.39
2004	11.21	13.13	12.25	11.15	12.63
2005	15.11	14.63	14.83	15.68	20.70
2006	20.28	18.66	19.31	21.61	32.87
2007	36.59	32.58	34.18	39.88	55.47
2008	33.30	47.46	41.30	35.39	45.62
2009	34.80	46.55	41.23	34.88	41.48
2010	41.30	51.69	47.01	41.23	42.78
2011	48.80	56.87	54.00	49.27	49.05
2012	46.80	54.08	51.44	47.08	47.57
2013	43.25	51.64	48.24	w	42.75
2014	39.13	47.62	44.11	W	35.69
2015	40.68	44.70	42.96	40.77	39.29
2016	36.03	44.08	40.45	36.09	33.66
2017	31.11	41.12	37.09	29.93	25.19

W = Data withheld to avoid disclosure of individual company data.

Notes: Totals may not equal sum of components because of independent rounding. Foreign purchase: A uranium purchase of foreign-origin uranium from a firm located outside the United States. Foreign sale: A uranium sale to a firm located outside the United States. Weighted-average prices are not adjusted for inflation.

Sources: U.S. Energy Information Administration: 1994–2002 *Uranium Industry Annual,* Tables 28, 29, 30 and 31. 2003–2017 Form EIA-858 *Uranium Marketing Annual Survey*.

Figure S6. Weighted-average price of foreign purchases and foreign sales of uranium, 1994–2017

dollars per pound U<sub>3</sub>O<sub>8</sub> equivalent

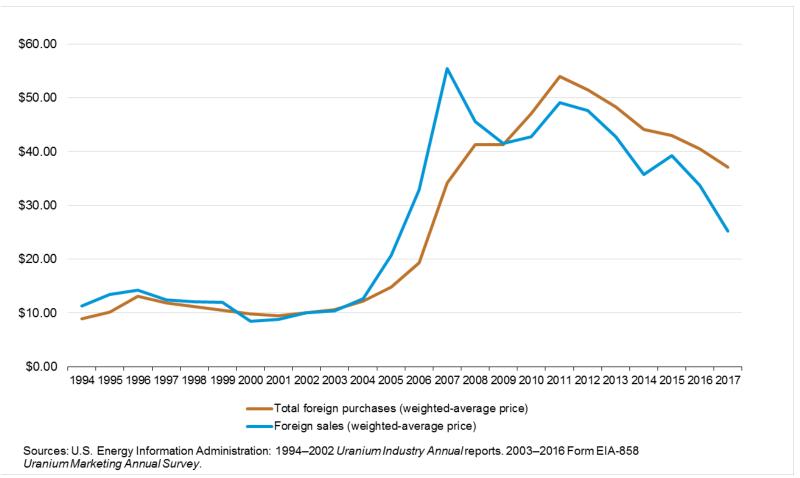


Table 1. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by supplier and delivery year, 2012–2017

thousand pounds U<sub>3</sub>O<sub>8</sub> equivalent; dollars per pound U<sub>3</sub>O<sub>8</sub> equivalent

Deliveries	2012	2013	2014	2015	2016	2017
Purchased from U.S. producers						
Purchases of U.Sorigin and foreign- origin uranium	W	W	W	1,455	2,169	1,762
Weighted-average price	W	W	W	52.35	48.86	48.77
Purchased from U.S. brokers and traders						
Purchases of U.Sorigin and foreign- origin uranium	11,545	12,835	17,111	13,852	7,862	4,548
Weighted-average price	54.44	50.44	42.90	44.67	50.56	41.80
Purchased from other owners and operator	s of U.S. civilian nucle	ar power reactors				
Purchases	0	0	0	W	W	W
Weighted-average price				W	W	W
Purchased from other U.S. suppliers						
Purchases of U.Sorigin and foreign- origin uranium	W	W	W	W	W	W
Weighted-average price	W	W	W	W	W	W
Purchased from foreign suppliers						
Purchases of U.Sorigin and foreign- origin uranium	37,624	37,405	34,404	38,184	39,469	34,384
Weighted-average price	54.40	51.93	47.62	44.66	44.85	41.16
Total purchased by owners and operators o	f U.S. civilian nuclear	power reactors				
Purchases of U.Sorigin and foreign- origin uranium	57,520	57,403	53,349	56,524	50,595	43,033
Weighted-average price	54.99	51.99	46.16	44.13	42.43	38.80

W = Data withheld to avoid disclosure of individual company data.

Notes: Other U.S. Suppliers are U.S. converters, enrichers, and fabricators. Totals may not equal sum of components because of independent rounding. Weighted-average prices are not adjusted for inflation.

Source: U.S. Energy Information Administration: Form EIA-858 Uranium Marketing Annual Survey (2012–2017).

<sup>-- =</sup> Not applicable.

Figure 1. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by supplier and delivery year, 2012–2017

thousand pounds U<sub>3</sub>O<sub>8</sub> equivalent

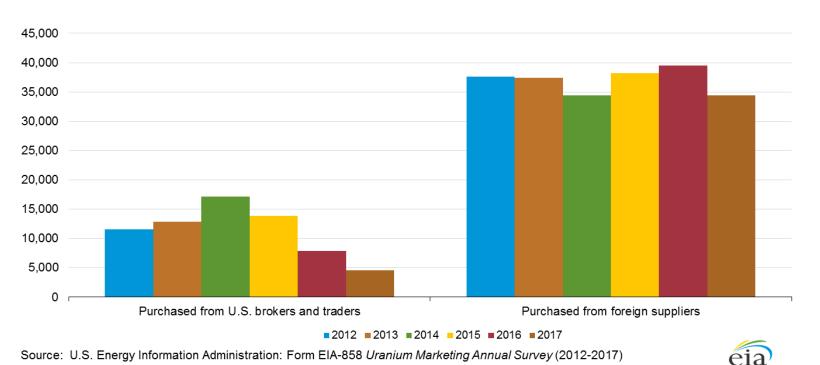


Figure 2. Weighted-average price of uranium purchased by owners and operators of U.S. civilian nuclear power reactors by supplier and delivery year, 2012–2017

dollars per pound U<sub>3</sub>O<sub>8</sub> equivalent

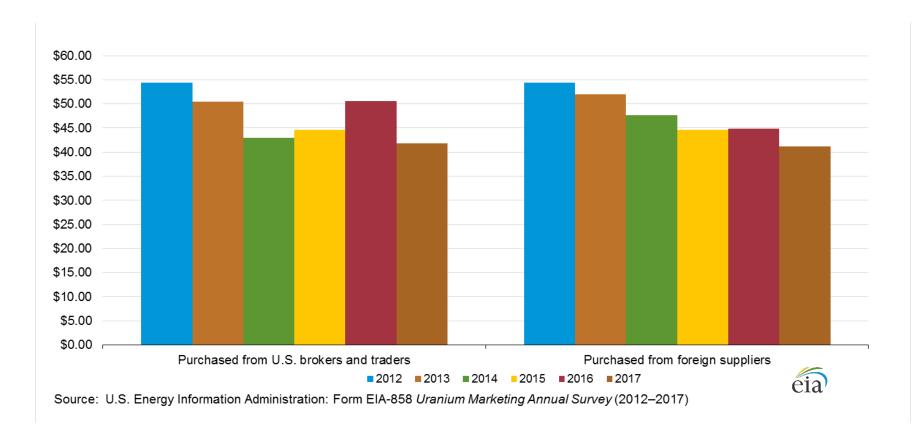


Table 2. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by origin and delivery year, 2012–2017

thousand pounds U3O8 equivalent; dollars per pound U3O8 equivalent

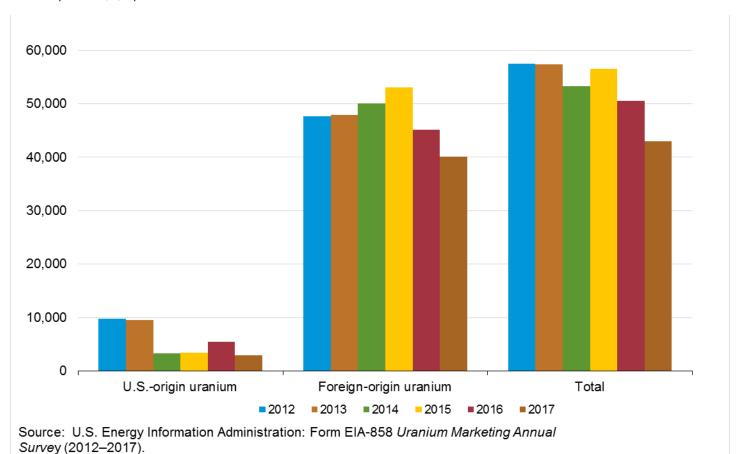
Deliveries	2012	2013	2014	2015	2016	2017
U.Sorigin uranium						
Purchases	9,807	9,484	3,316	3,419	5,424	2,916
Weighted-average price	59.44	56.37	48.11	43.86	43.92	35.55
Foreign-origin uranium						
Purchases	47,713	47,919	50,033	53,106	45,171	40,117
Weighted-average price	54.07	51.13	46.03	44.14	42.26	39.04
Total						
Purchases	57,520	57,403	53,349	56,524	50,595	43,033
Weighted-average price	54.99	51.99	46.16	44.13	42.43	38.80

Notes: Totals may not equal sum of components because of independent rounding. Weighted-average prices are not adjusted for inflation.

Source: U.S. Energy Information Administration: Form EIA-858 Uranium Marketing Annual Survey (2012–2017).

Figure 3. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by origin and delivery year, 2012–2017

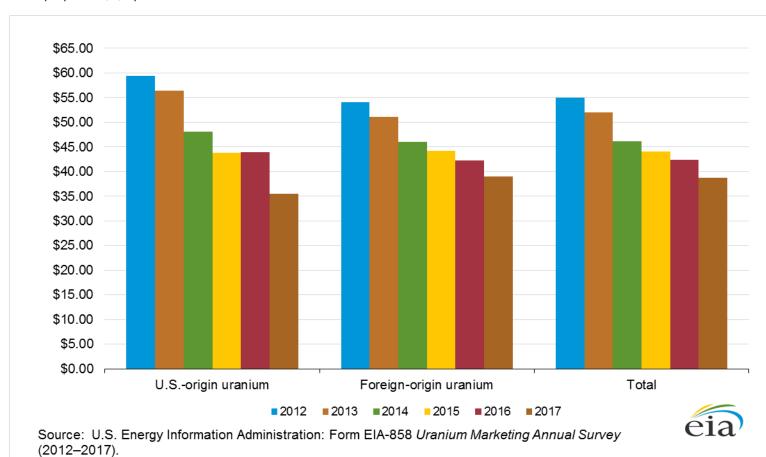
thousand pounds U<sub>3</sub>O<sub>8</sub> equivalent



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Figure 4. Weighted-average price of uranium purchased by owners and operators of U.S. civilian nuclear power reactors by origin and delivery year, 2012–2017

dollars per pound U<sub>3</sub>O<sub>8</sub> equivalent



U.S. Energy Information Administration | 2017 Uranium Marketing Annual Report

Table 3. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by origin country and delivery year, 2012–2017

thousand pounds U3O8 equivalent; dollars per pound U3O8 equivalent

	Deliveries in 2013		Deliveries in 2014		Deliveries in 2015		Deliveries in 2016		Deliveries in 2017	
		Weighted-								
		average								
Origin country	Purchases	price								
Australia	10,741	49.92	10,511	48.03	9,678	44.16	8,963	43.05	8,129	42.44
Brazil	W	W	W	W	0		W	W	0	
Bulgaria	0		0		W	W	W	W	0	
Canada	7,808	52.61	9,789	45.87	16,876	45.84	11,119	43.22	14,048	40.63
China	W	W	W	W	0		W	W	0	
Czech Republic	W	W	W	W	W	W	W	W	0	
Germany	W	W	0		0		W	W	0	
Hungary	W	W	0		0		0		W	W
Kazakhstan	6,454	46.73	12,032	44.47	10,723	42.82	10,806	39.91	4,638	38.30
Malawi	1,277	59.89	1,514	44.94	W	W	519	41.38	W	W
Namibia	5,677	49.78	4,603	45.54	3,456	48.57	1,993	44.30	W	W
Niger	1,666	51.26	1,316	42.86	922	39.74	1,032	44.12	W	W
Portugal	W	W	0		0		0		0	
Russia	10,580	53.73	6,859	45.65	9,063	40.87	6,539	43.85	7,068	31.54
South Africa	186	46.72	938	43.71	826	37.64	1,169	43.75	W	W
Ukraine	0		W	W	0		W	W	W	W
United Kingdom	0		W	W	0		0		0	
Uzbekistan	3,064	50.02	1,779	46.84	1,040	47.90	2,030	39.18	2,148	37.17
unknown	W	W	W	W	W	W	W	W	W	W
Foreign Total	47,919	51.13	50,033	46.03	53,106	44.14	45,171	42.26	40,117	39.04
United States	9,484	56.37	3,316	48.11	3,419	43.86	5,424	43.92	2,916	35.55
Total Purchases	57,403	51.99	53,349	46.16	56,524	44.13	50,595	42.43	43,033	38.80

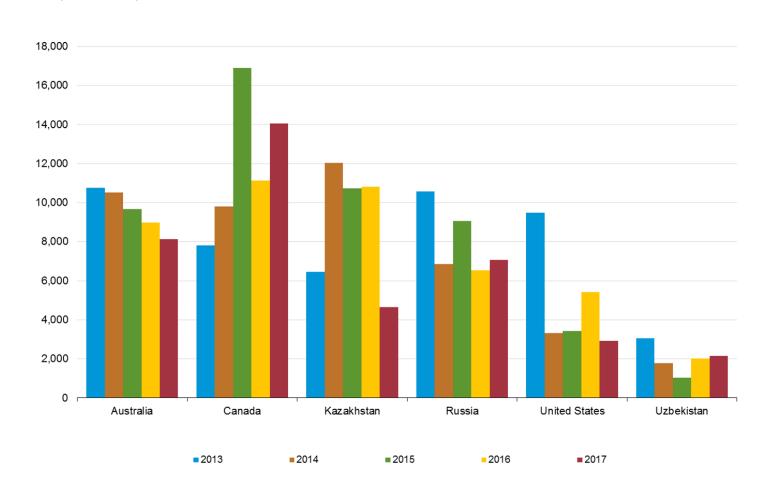
W = Data withheld to avoid disclosure of individual company data. -- = Not applicable.

 $Notes: Totals\ may \ not\ equal\ sum\ of\ components\ because\ of\ independent\ rounding.\ Weighted-average\ prices\ are\ not\ adjusted\ for\ inflation.$ 

Source: U.S. Energy Information Administration: Form EIA-858 Uranium Marketing Annual Survey (2013–2017).

Figure 5. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by selected origin country and delivery year, 2012–2017

thousand pounds U<sub>3</sub>O<sub>8</sub> equivalent



Source: U.S. Energy Information Administration: Form EIA-858 Uranium Marketing Annual Survey (2012–2017).

Table 4. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by origin and material type, 2017 deliveries

thousand pounds U3O8 equivalent; dollars per pound U3O8 equivalent

	Uranium	Natural UF <sub>6</sub> and					
Deliveries	concentrate	Natural UF <sub>6</sub>	Enriched UF <sub>6</sub>	Enriched UF <sub>6</sub>	Total		
U.Sorigin uranium							
Purchases	1,394	W	W	1,522	2,916		
Weighted-average price	43.36	W	w	28.40	35.55		
Foreign-origin uranium							
Purchases	22,336	W	W	17,781	40,117		
Weighted-average price	37.82	W	W	40.66	39.04		
Total							
Purchases	23,730	11,412	7,891	19,303	43,033		
Weighted-average price	38.14	43.75	33.78	39.67	38.80		

W = Data withheld to avoid disclosure of individual company data.

Notes: Totals may not equal sum of components because of independent rounding. Weighted-average prices are not adjusted for inflation. Natural UF<sub>6</sub> is uranium hexafluoride. The natural UF<sub>6</sub> and enriched UF<sub>6</sub> quantity represents only the U<sub>3</sub>O<sub>8</sub> equivalent uranium-component quantity specified in the contract for each delivery of natural UF<sub>6</sub> and enriched UF<sub>6</sub>. The natural UF<sub>6</sub> and enriched UF<sub>6</sub> weighted-average prices represent only the U<sub>3</sub>O<sub>8</sub> equivalent uranium-component price specified in the contract for each delivery of natural UF<sub>6</sub> and enriched UF<sub>6</sub>, it does not include the conversion service and enrichment service components. Source: U.S. Energy Information Administration, Form EIA-858 *Uranium Marketing Annual Survey* (2017).

Figure 6. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by material type, 2017 deliveries

thousand pounds U<sub>3</sub>O<sub>8</sub> equivalent

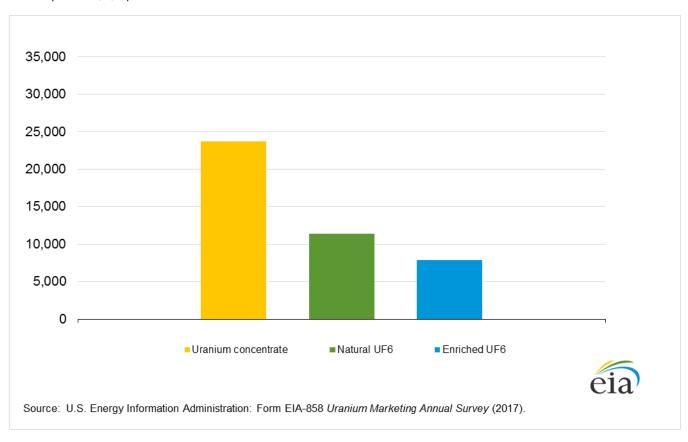


Table 5. Average price and quantity for uranium purchased by owners and operators of U.S. civilian nuclear power reactors by pricing mechanisms and delivery year, 2016–2017

dollars per pound U3O8 equivalent; thousand pounds U3O8 equivalent

	Domestic p	ourchases 1	Foreign p	urchases <sup>2</sup>	Total purchases	
Pricing mechanisms	2016	2017	2016	2017	2016	2017
Contract-specified (fixed and base-e	scalated) pricing					
Weighted-average price	39.82	33.58	47.09	45.27	42.78	38.81
Quantity with reported price	13,917	9,794	14,439	15,707	30,344	28,997
Spot-market pricing						
Weighted-average price	26.08	W	34.61	W	31.73	21.94
Quantity with reported price	871	W	3,064	W	4,448	3,669
Other pricing						
Weighted-average price	52.67	W	42.52	W	45.30	44.90
Quantity with reported price	3,524	W	9,335	W	12,858	10,081
All pricing mechanisms						
Weighted-average price	41.64	38.57	44.08	41.12	42.43	38.80
Quantity with reported price	18,312	13,933	26,837	25,056	47,650	42,747
Total quantity	18,797	13,958	28,512	25,187	50,595	43,033

<sup>&</sup>lt;sup>1</sup> A uranium purchase of both U.S.-origin uranium from a firm located in the United States.

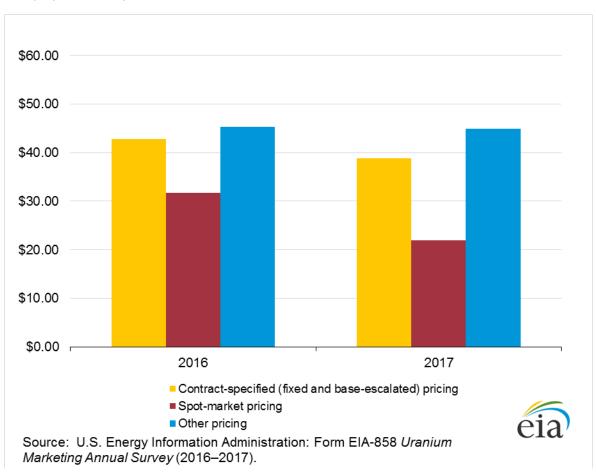
Notes: Totals may not equal sum of components because of independent rounding. Weighted-average prices are not adjusted for inflation.

Source: U.S. Energy Information Administration: Form EIA-858 Uranium Marketing Annual Survey (2016–2017).

<sup>&</sup>lt;sup>2</sup> A uranium purchase of foreign-origin uranium from a firm located outside of the United States.

Figure 7. Average price for uranium purchased by owners and operators of U.S. civilian nuclear power reactors by pricing mechanisms and delivery year, 2016–2017

dollars per pound U<sub>3</sub>O<sub>8</sub> equivalent



# Table 6a. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors ranked by price and distributed by quantity, 2015–2017 deliveries

thousand pounds U3O8 equivalent; dollars per pound U3O8 equivalent

	Deliveries	in 2015	D	eliveries in 2016	Deliveries in 2017		
Quantity distribution <sup>1</sup>	Quantity with reported price	Weighted- average price	Quantity with reported price	Weighted- average price	Quantity with reported price	Weighted- average price	
First	6,807	29.68	5,956	21.64	5,343	18.66	
Second	6,807	36.03	5,956	28.18	5,343	23.10	
Third	6,807	38.63	5,956	34.60	5,343	28.39	
Fourth	6,807	41.80	5,956	39.41	5,343	33.67	
Fifth	6,807	44.63	5,956	42.82	5,343	38.53	
Sixth	6,807	47.84	5,956	47.59	5,343	43.65	
Seventh	6,807	52.69	5,956	54.68	5,343	51.17	
Eighth	6,807	61.70	5,956	70.52	5,343	73.22	
Total	54,457	44.13	47,650	42.43	42,747	38.80	

<sup>&</sup>lt;sup>1</sup> Distribution divides total quantity of uranium delivered (with a price) into eight distributions by price (sorted from lowest to highest) and provides the quantity-weighted average price for each distribution.

Notes: Totals may not equal sum of components because of independent rounding. Weighted-average prices are not adjusted for inflation.

Source: U.S. Energy Information Administration: Form EIA-858 Uranium Marketing Annual Survey (2015–2017).

# Table 6b. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors ranked by price and distributed by purchaser, 2015–2017 deliveries

thousand pounds U3O8 equivalent; dollars per pound U3O8 equivalent

		D	eliveries in 2015		D		Deliveries in 2017		
Distribution of purchasers	Number of purchasers	Quantity with reported price	Weighted- average price	Number of purchasers	Quantity with reported price	Weighted- average price	Number of purchasers	Quantity with reported price	Weighted- average price
First	8	11,864	39.35	7	9,736	34.43	7	17,802	31.75
Second	7	22,481	43.16	7	7,195	39.70	7	8,596	37.07
Third	7	10,889	46.47	7	20,508	42.87	7	10,669	40.18
Fourth	7	9,222	49.86	6	10,212	51.10	6	5,680	60.91
Total	29	54,457	44.13	27	47,650	42.43	27	42,747	38.80

Notes: Totals may not equal sum of components because of independent rounding. Weighted-average prices are not adjusted for inflation.

Source: U.S. Energy Information Administration: Form EIA-858 Uranium Marketing Annual Survey (2015–2017).

Table 7. Uranium purchased by owners and operators of U.S. civilian nuclear power reactors by contract type and material type, 2017 deliveries

thousand pounds U<sub>3</sub>O<sub>8</sub> equivalent; dollars per pound U<sub>3</sub>O<sub>8</sub> equivalent

	Spot Contracts <sup>1</sup> Long-Term Contracts <sup>2</sup>			Total		
Material Type	Quantity with reported price	Weighted- average price	Quantity with reported price	Weighted- average price	Quantity with reported price	Weighted- average price
U <sub>3</sub> O <sub>8</sub>	4,198	23.11	19,508	41.38	23,705	38.14
Natural UF <sub>6</sub>	W	W	W	W	11,151	43.75
Enriched UF <sub>6</sub>	W	W	W	W	7,891	33.78
Total	6,181	22.36	36,566	41.58	42,747	38.80

<sup>&</sup>lt;sup>1</sup> A one-time delivery (usually) of the entire contract to occur within one year of contract execution (signed date).

Notes: Totals may not equal sum of components because of independent rounding. Weighted-average prices are not adjusted for inflation.

 $UF_6$  is uranium hexafluoride. The natural  $UF_6$  and enriched  $UF_6$  quantity represents only the  $U_3O_8$  equivalent uranium-component quantity specified in the contract for each delivery of natural  $UF_6$  and enriched  $UF_6$ . The natural  $UF_6$  and enriched  $UF_6$  weighted-average price represent only the  $U_3O_8$  equivalent uranium-component price specified in the contract for each delivery of natural  $UF_6$  and enriched  $UF_6$ , it does not include the conversion service and enrichment service components.

<sup>&</sup>lt;sup>2</sup> One or more deliveries to occur after a year following contract execution (signed date).

## Table 8. Contracts signed in 2017 by owners and operators of U.S. civilian nuclear power reactors by contract type

thousand pounds U3O8 equivalent; dollars per pound U3O8 equivalent

Purchase contract type (Signed in 2017)	Quantity of deliveries received in 2017	Weighted-average price	Number of purchase contracts for deliveries in 2017
Spot	3,189	20.72	29
Long-term	1,482	21.03	5
Total	4,671	20.82	34

Notes: Totals may not equal sum of components because of independent rounding. Weighted-average prices are not adjusted for inflation.

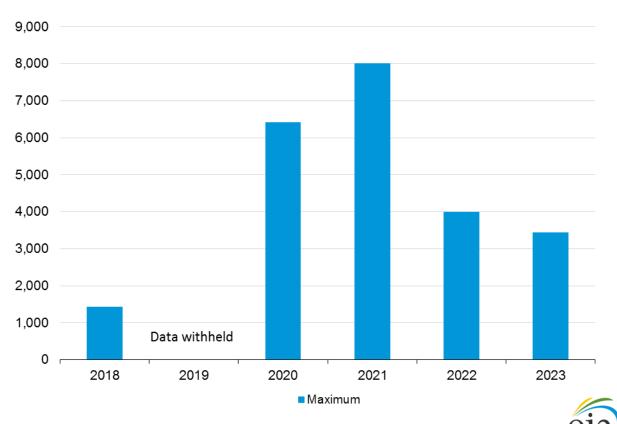
Table 9. Contracted purchases of uranium by owners and operators of U.S. civilian nuclear power reactors, signed in 2017, by delivery year, 2018–2027

Year of delivery	Minimum	Maximum
2018	1,386	1,432
2019	W	W
2020	6,212	6,415
2021	7,639	8,019
2022	3,158	3,990
2023	2,516	3,447
2024	2,752	3,820
2025	2,399	3,365
2026	1,814	2,517
2027	w	W
Total	34,904	40,940

W = Data withheld to avoid disclosure of individual company data.

Note: Totals may not equal sum of components because of independent rounding.

Figure 8. Contracted purchases of uranium by owners and operators of U.S. civilian nuclear power reactors, signed in 2017, by delivery year, 2018–2023



Source: U.S. Energy Information Administration: Form EIA-858 *Uranium Marketing Annual Survey* (2017).

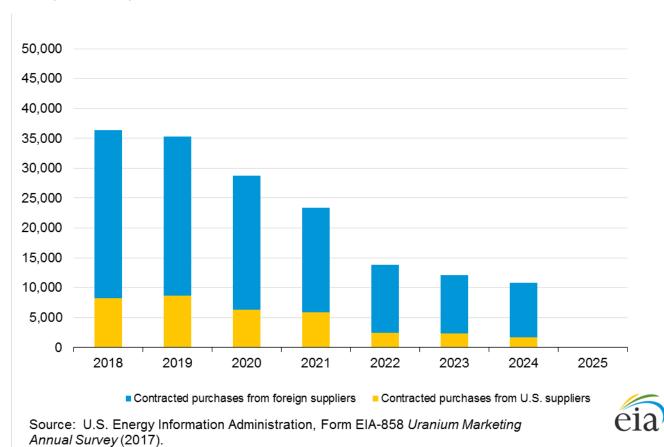
Table 10. Contracted purchases of uranium from suppliers by owners and operators of U.S. civilian nuclear power reactors, in effect at the end of 2017, by delivery year, 2018–2027

	•	ntracted purchases from U.S. suppliers		Contracted purchases from foreign suppliers		ses from all s
Year of delivery	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
2018	7,678	8,216	25,672	28,151	33,349	36,367
2019	7,882	8,684	24,394	26,597	32,277	35,281
2020	4,469	6,274	20,339	22,437	24,808	28,711
2021	4,044	5,831	16,376	17,586	20,420	23,417
2022	1,918	2,438	10,128	11,429	12,046	13,867
2023	1,830	2,367	7,807	9,765	9,638	12,132
2024	1,227	1,652	7,226	9,143	8,453	10,794
2025	W	W	W	W	7,021	8,779
2026	W	W	W	W	2,312	3,599
2027	0	0	2,004	3,412	2,004	3,412
Total	30,815	37,638	121,512	138,719	152,327	176,357

W = Data withheld to avoid disclosure of individual company data.

Note: Totals may not equal sum of components because of independent rounding.

Figure 9. Maximum contracted purchases of uranium from suppliers by owners and operators of U.S. civilian nuclear power reactors, in effect at the end of 2017, by delivery year, 2018–2025



U.S. Energy Information Administration | 2017 Uranium Marketing Annual Report

Table 11. Unfilled uranium market requirements of owners and operators of U.S. civilian nuclear power reactors, 2017–2027

	As of Dece	ember 31, 2016	As of Dece	ember 31, 2017
Year	Annual	Cumulative	Annual	Cumulative
2017	3,290	3,290	_	
2018	6,255	9,544	3,449	3,449
2019	8,330	17,874	4,945	8,394
2020	10,662	28,536	9,630	18,024
2021	18,895	47,430	10,961	28,985
2022	32,171	79,601	21,043	50,028
2023	33,634	113,235	23,699	73,727
2024	38,125	151,360	25,993	99,720
2025	41,243	192,603	33,742	133,462
2026	40,691	233,294	39,519	172,981
2027	-		36,139	209,120

<sup>- =</sup> No data reported. -- = Not applicable.

Note: Totals may not equal sum of components because of independent rounding.

Figure 10. Annual unfilled uranium market requirements of owners and operators of U.S. civilian nuclear power reactors, at the end of 2016 and at the end of 2017

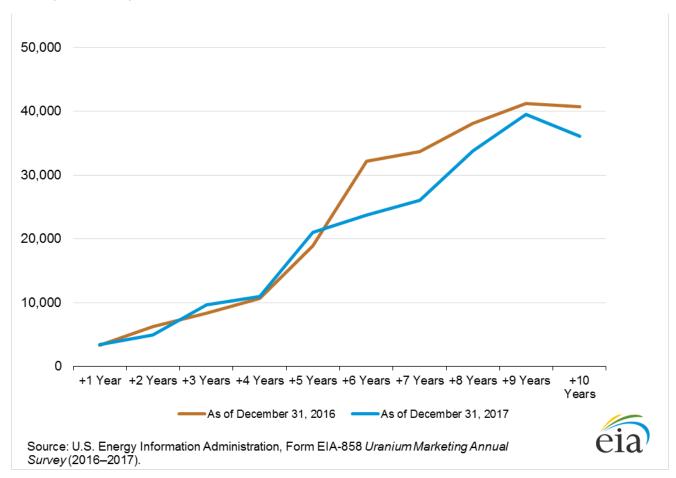


Table 12. Maximum anticipated uranium market requirements of owners and operators of U.S. civilian nuclear power reactors, 2018–2027, at end of 2017

	Maximum under purchase	Unfilled market	Maximum anticipated	
Year	contracts	requirements	market requirements	Enrichment feed deliveries
2018	36,367	3,449	39,816	45,246
2019	35,281	4,945	40,225	44,798
2020	28,711	9,630	38,341	45,907
2021	23,417	10,961	34,378	41,589
2022	13,867	21,043	34,910	45,424
2023	12,132	23,699	35,831	42,988
2024	10,794	25,993	36,787	43,073
2025	8,779	33,742	42,520	43,369
2026	3,599	39,519	43,118	44,506
2027	3,412	36,139	39,551	40,772
Total	176,357	209,120	385,477	437,671

Note: Totals may not equal sum of components because of independent rounding.

Figure 11. Maximum anticipated uranium market requirements of owners and operators of U.S. civilian nuclear power reactors, 2017–2026, at end of 2017

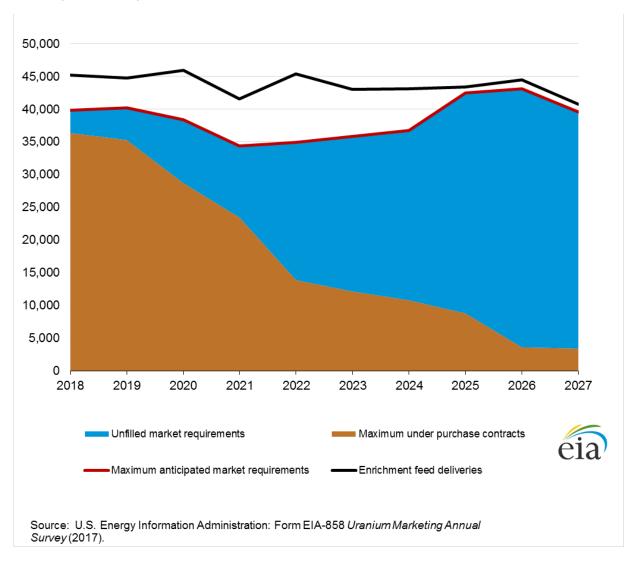


Table 13. Deliveries of uranium feed by owners and operators of U.S. civilian nuclear power reactors by enrichment country and delivery year, 2015–2017

		Feed deliveri	es in 2015		Feed deliveri	es in 2016		Feed deliveri	es in 2017
		Foreign-			Foreign-			Foreign-	
Enrichment country	U.Sorigin	origin	Total	U.Sorigin	origin	Total	U.Sorigin	origin	Total
China	-	W	W	-	-	-	-	-	-
France	W	W	3,299	W	W	2,555	-	W	W
Germany	W	W	W	W	W	W	-	453	453
Netherlands	W	W	4,180	666	2,832	3,498	W	W	1,228
Russia	<u>-</u>	2,089	2,089	W	W	3,974	W	W	4,845
United Kingdom	W	W	3,460	-	W	W	W	W	W
Europe <sup>1</sup>	-	8,297	8,297	721	7,773	8,494	W	W	W
unknown <sup>2</sup>	-	W	W	-	-	-	-	-	-
Foreign total	1,056	22,437	23,493	2,334	18,106	20,440	1,994	13,961	15,954
United States	1,485	16,407	17,892	2,463	20,207	22,670	5,155	12,698	17,853
Total	2,541	38,844	41,385	4,798	38,313	43,110	7,149	26,659	33,808

W = Data withheld to avoid disclosure of individual company data.

Note: Totals may not equal sum of components because of independent rounding.

<sup>&</sup>lt;sup>1</sup> Specific country in Europe was not reported.

<sup>&</sup>lt;sup>2</sup> Specific country was not reported.

Figure 12. Deliveries of uranium feed for U.S. and foreign enrichment by owners and operators of U.S. civilian nuclear power reactors by delivery year, 2015–2017

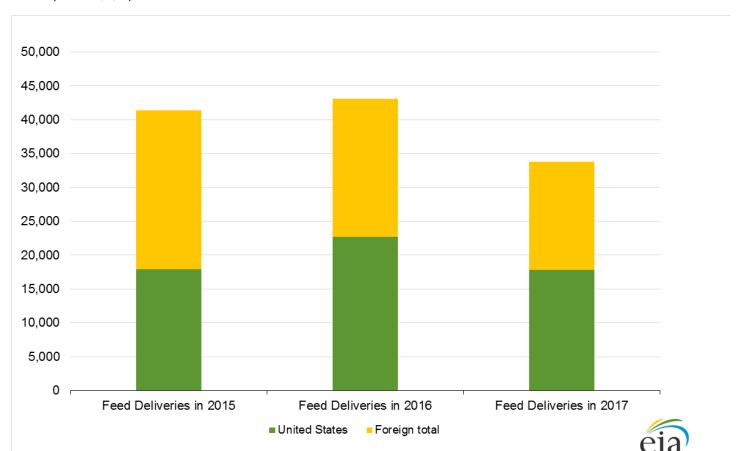


Table 14. Deliveries of uranium feed for enrichment by owners and operators of U.S. civilian nuclear power reactors by origin country and delivery year, 2015–2017

		Delive	eries in 2015		Delive	ries in 2016		Deliver	ies in 2017
Origin country of		Foreign			Foreign			Foreign	
feed	U.S. enrichment	enrichment	Total	U.S. enrichment	enrichment	Total	U.S. enrichment	enrichment	Total
Australia	1,673	3,797	5,470	6,524	3,098	9,622	1,035	3,128	4,162
Brazil	0	W	W	W	W	w	0	0	0
Canada	6,212	9,698	15,910	6,635	6,912	13,546	7,327	4,611	11,938
China	0	W	W	0	0	0	0	0	0
Czech Republic	0	W	W	W	W	W	0	0	0
Kazakhstan	3,490	4,173	7,662	2,658	5,027	7,685	1,742	3,018	4,760
Malawi	W	W	347	W	W	w	0	W	W
Namibia	963	1,588	2,551	1,033	698	1,731	W	W	W
Niger	0	W	W	W	W	w	W	W	W
Portugal	0	0	0	0	0	0	0	0	0
Russia	4,019	1,490	5,509	W	W	4,163	960	1,089	2,049
South Africa	W	W	445	W	W	296	W	W	W
Ukraine	0	0	0	0	0	0	0	0	0
United Kingdom	0	0	0	0	0	0	0	0	0
Uzbekistan	W	W	108	W	W	581	W	W	W
unknown/other	0	W	W	W	W	w	W	W	W
Foreign total	16,407	22,437	38,844	20,207	18,106	38,313	12,698	13,961	26,659
United States	1,485	1,056	2,541	2,463	2,334	4,798	5,155	1,994	7,149
Total	17,892	23,493	41,385	22,670	20,440	43,110	17,853	15,954	33,808

W = Data withheld to avoid disclosure of individual company data.

Note: Totals may not equal sum of components because of independent rounding.

Figure 13. Deliveries of uranium feed for enrichment by owners and operators of U.S. civilian nuclear power reactors by selected origin country of feed and delivery year, 2015–2017

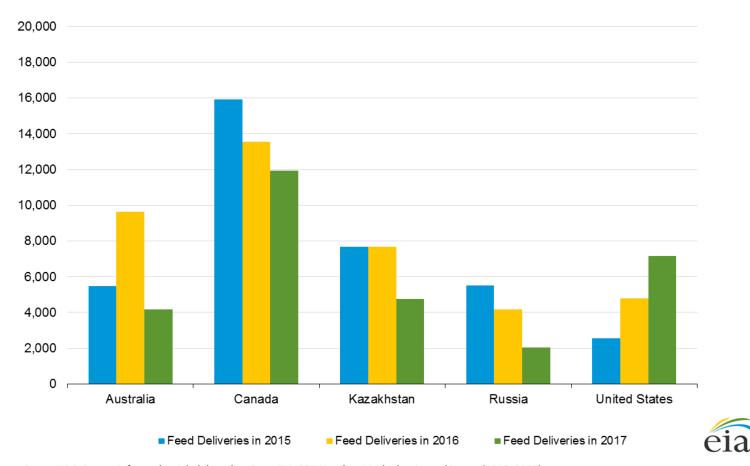


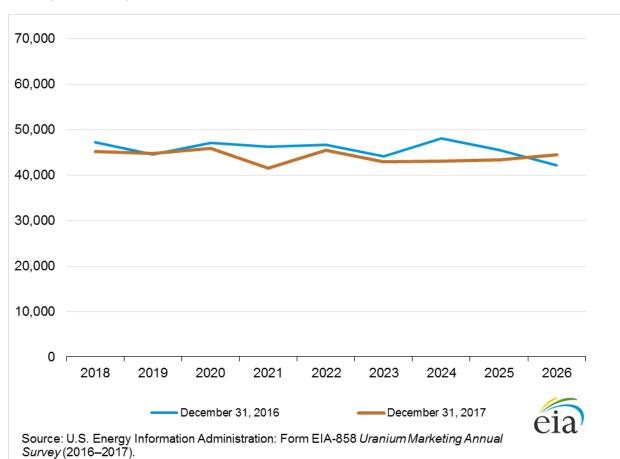
Table 15. Shipments of uranium feed by owners and operators of U.S. civilian nuclear power reactors to domestic and foreign enrichment suppliers, 2018–2026

	Amount	t of feed to be shipped	Change	from 2016 to 2017
Year of shipment	As of December 31, 2016	As of December 31, 2017	Annual	Cumulative
2018	47,193	45,246	-1,947	-1,947
2019	44,489	44,798	309	-1,638
2020	47,127	45,907	-1,220	-2,858
2021	46,208	41,589	-4,619	-7,477
2022	46,690	45,424	-1,266	-8,743
2023	44,110	42,988	-1,122	-9,865
2024	48,108	43,073	-5,035	-14,900
2025	45,514	43,369	-2,145	-17,045
2026	42,228	44,506	2,278	-14,767
2027	-	40,772		

<sup>- =</sup> No data reported. -- = Not applicable.

Note: Totals may not equal sum of components because of independent rounding.

Figure 14. Shipments of uranium feed by owners and operators of U.S. civilian nuclear power reactors to domestic and foreign enrichment suppliers, 2018–2026



U.S. Energy Information Administration | 2017 Uranium Marketing Annual Report

Table 16. Purchases of enrichment services by owners and operators of U.S. civilian nuclear power reactors by origin country and year, 2013–2027

thousand separative work units (SWU)

Country of enrichment service (SWU-

origin)	2013	2014	2015	2016	2017
China	W	636	318	W	W
France	0	0	0	0	W
Germany	753	1,005	1,281	1,636	437
Netherlands	2,112	1,801	2,385	2,546	1,183
Russia	2,491	3,083	2,234	3,188	2,912
United Kingdom	2,674	2,435	2,522	1,003	1,525
Europe <sup>1</sup>	0	W	W	W	W
Other <sup>2</sup>	W	W	W	W	W
Foreign total	8,464	9,165	8,769	9,524	7,305
United States	3,867	3,773	4,146	4,756	5,572
Total	12,331	12,939	12,914	14,280	12,877
Average price (US\$ per SWU)	142.22	140.75	136.88	131.00	125.43

W = Data withheld to avoid disclosure of individual company data.

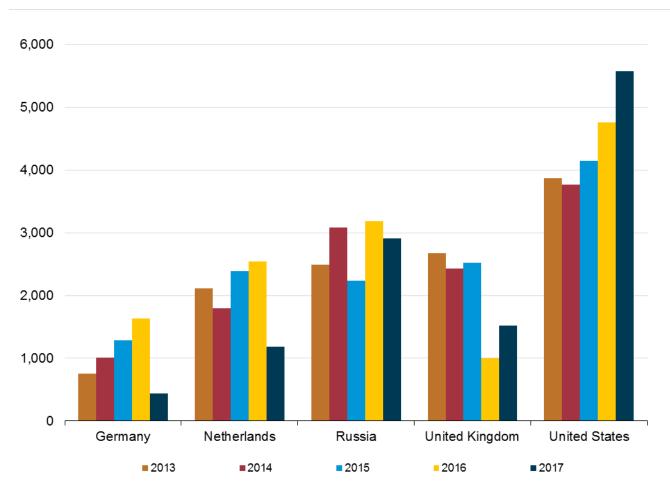
Notes: Totals may not equal sum of components because of independent rounding. Average prices are not adjusted for inflation.

<sup>&</sup>lt;sup>1</sup> Specific country in Europe was not reported.

<sup>&</sup>lt;sup>2</sup> Specific country was not reported.

Figure 15. Purchases of enrichment services by owners and operators of U.S. civilian nuclear power reactors by selected origin country and year, 2013–2027

thousand separative work units (SWU)



# Table 17. Purchases of enrichment services by owners and operators of U.S. civilian nuclear power reactors by contract type in delivery year, 2017

thousand separative work units (SWU)

### **Enrichment service**

contract type	U.S. enrichment	Foreign enrichment	Total
Spot	W	W	337
Long-term	W	W	12,540
Total	5,572	7,305	12,877

W = Data withheld to avoid disclosure of individual company data.

Note: Totals may not equal sum of components because of independent rounding.

Source: U.S. Energy Information Administration, Form EIA-858  $\it Uranium$ 

Marketing Annual Survey (2017).

Table 18. Uranium in fuel assemblies loaded into U.S. civilian nuclear power reactors by year, 2013–2017

Origin of uranium	2013	2014	2015	2016	P2017
Domestic-origin uranium	3,643	3,251	4,050	3,204	5,734
Foreign-origin uranium	39,000	47,281	43,381	38,455	39,807
Total	42,642	50,532	47,431	41,659	45,541

P = Preliminary data. Final 2016 fuel assembly data reported in the 2017 survey.

Notes: Includes only unirradiated uranium in new fuel assemblies loaded into reactors during the year. Does not include uranium removed from reactors that subsequently will be reloaded. Totals may not equal sum of components because of independent rounding.

Figure 16. Uranium in fuel assemblies loaded into U.S. civilian nuclear power reactors by year, 2013–2017

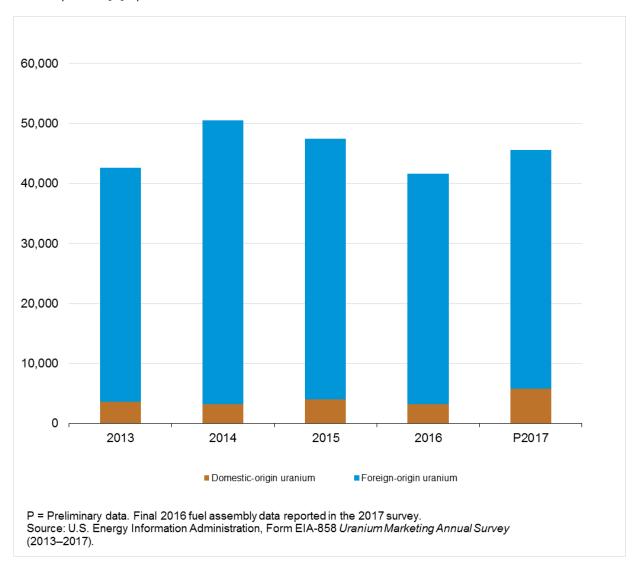


Table 19. Foreign purchases of uranium by U.S. suppliers and owners and operators of U.S. civilian nuclear power reactors by delivery year, 2013–2017

thousand pounds U308 equivalent; dollars per pound U308 equivalent

Deliveries	2013	2014	2015	2016	2017
U.S. suppliers					
Foreign purchases	23,233	23,684	27,233	22,138	16,891
Weighted-average price	43.25	39.22	40.68	36.03	31.11
Owners and operators of U.S. civilian nu	clear power reactors				
Foreign purchases	34,195	32,863	37,001	28,512	25,187
Weighted-average price	51.67	47.51	44.67	44.08	41.12
Total					
Foreign purchases	57,428	56,547	64,234	50,650	42,078
Weighted-average price	48.27	44.03	42.95	40.45	37.09

Notes: Totals may not equal sum of components because of independent rounding. Foreign Purchase: A uranium purchase of foreign-origin uranium from a firm located outside of the United States. Weighted-average prices are not adjusted for inflation.

Figure 17. Foreign purchases of uranium by U.S. suppliers and owners and operators of U.S. civilian nuclear power reactors by delivery year, 2013–2017

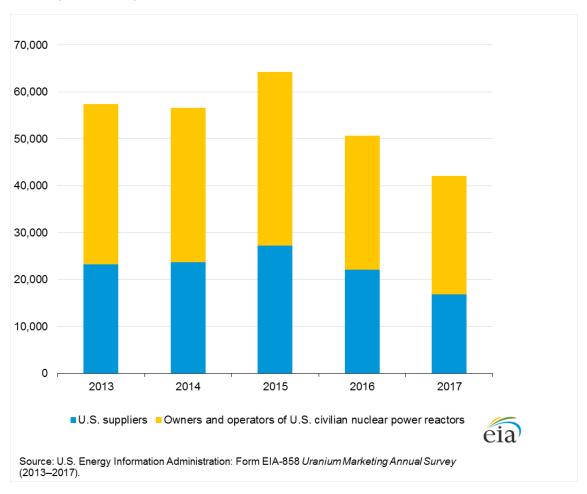


Table 20. U.S. broker and trader purchases of uranium by origin, supplier, and delivery year, 2013–2017

thousand pounds U<sub>3</sub>O<sub>8</sub> equivalent; dollars per pound U<sub>3</sub>O<sub>8</sub> equivalent

Deliveries	2013	2014	2015	2016	2017
Received U.Sorigin uranium					
Purchases	W	410	2,702	3,266	3,501
Weighted-average price	W	33.55	35.04	26.31	19.88
Received foreign-origin uranium					
Purchases	W	28,743	33,014	34,046	35,156
Weighted-average price	W	38.42	39.58	32.71	24.83
Total received by U.S. brokers and traders					
Purchases	30,191	29,153	35,716	37,312	38,657
Weighted-average price	42.95	38.35	39.24	32.11	24.38
Received from foreign suppliers					
Purchases	W	W	26,069	22,088	14,060
Weighted-average price	W	W	40.77	36.09	29.93

W = Data withheld to avoid disclosure of individual company data.

Notes: Totals may not equal sum of components because of independent rounding. Weighted-average prices are not adjusted for inflation.

Figure 18. U.S. broker and trader purchases of uranium by delivery year, 2013–2017

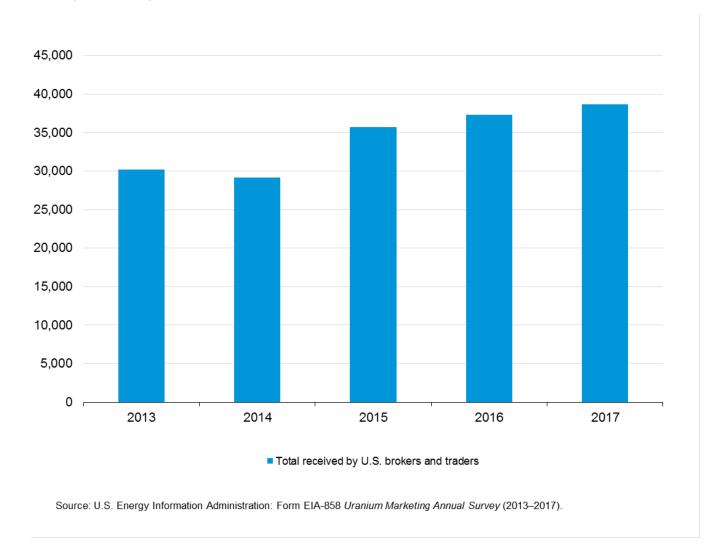


Table 21. Foreign sales of uranium from U.S. suppliers and owners and operators of U.S. civilian nuclear power reactors by origin and delivery year, 2013–2017

thousand pounds U3O8 equivalent; dollars per pound U3O8 equivalent

Deliveries to foreign suppliers and utilities	2013	2014	2015	2016	2017
U.Sorigin uranium					
Foreign sales	4,148	4,210	4,258	3,142	1,617
Weighted-average price	43.10	32.91	37.85	25.99	27.61
Foreign-origin uranium					
Foreign sales	14,717	15,794	21,465	14,034	12,408
Weighted-average price	42.66	36.43	39.58	35.38	24.88
Total sent:					
Foreign sales	18,864	20,004	25,723	17,176	14,025
Weighted-average price	42.75	35.69	39.29	33.66	25.19
From owners and operators of U.S. civilian nuc	clear power reacto	ors, U.S. produc	cers, and othe	r U.S. supplier	S
Foreign sales	4,177	4,493	6,022	3,153	3,505
Weighted-average price	44.61	36.45	38.77	30.26	29.55
From U.S. brokers and traders					
Foreign sales	14,687	15,511	19,700	14,023	10,520
Weighted-average price	42.26	35.47	39.45	34.43	23.74

Notes: Other U.S. Suppliers are U.S. converters, enrichers, and fabricators. Totals may not equal sum of components because of independent rounding. Foreign sale: A uranium sale to a firm located outside the United States. Weighted-average prices are not adjusted for inflation.

Figure 19. Foreign sales of uranium from U.S. suppliers and owners and operators of U.S. civilian nuclear power reactors by origin and delivery year, 2013–2017

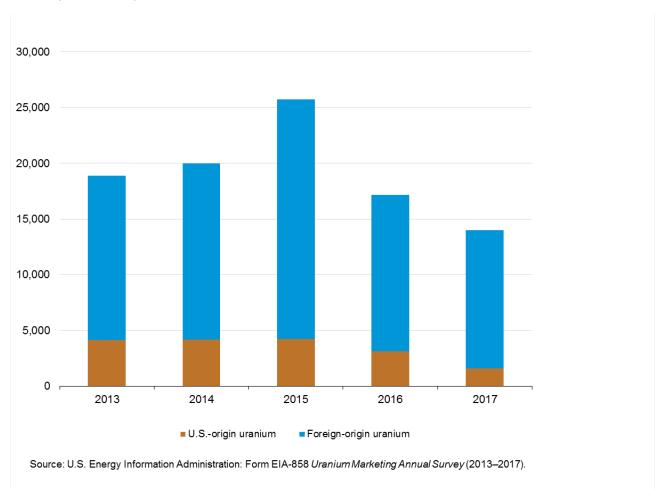


Table 22. Inventories of natural and enriched uranium by material type as of end of year, 2013–2017

	Inventories at the end of the year					
Type of Uranium Inventory Owned by	2013	2014	2015	2016	P2017	
Owners and operators of U.S. civilian nuclear power						
reactors inventories	113,077	114,046	121,131	127,964	123,695	
Uranium concentrate (U₃O <sub>8</sub> )	18,131	19,060	20,635	20,790	20,613	
Natural UF <sub>6</sub>	38,332	40,803	48,136	53,602	53,358	
Enriched UF <sub>6</sub>	40,841	43,382	41,557	43,743	41,428	
Fabricated fuel (not inserted into a reactor)	15,773	10,802	10,803	9,829	8,296	
U.S. supplier inventories	21,342	18,682	14,340	16,667	19,018	
Uranium concentrate (U₃O <sub>8</sub> )	7,658	6,170	6,289	7,185	8,374	
Natural UF <sub>6</sub>	W	W	W	W	W	
Enriched UF <sub>6</sub>	W	W	W	W	W	
Fabricated fuel (not inserted into a reactor)	0	0	0	0	0	
Total Commercial Inventories	134,419	132,728	135,471	144,631	142,713	

P = Preliminary data. Final 2016 inventory data reported in the 2017 survey.

W = Data withheld to avoid disclosure of individual company data.

Note: Totals may not equal sum of components because of independent rounding.

Figure 20. Commercial inventories of natural and enriched uranium as of end of year, 2013–2017

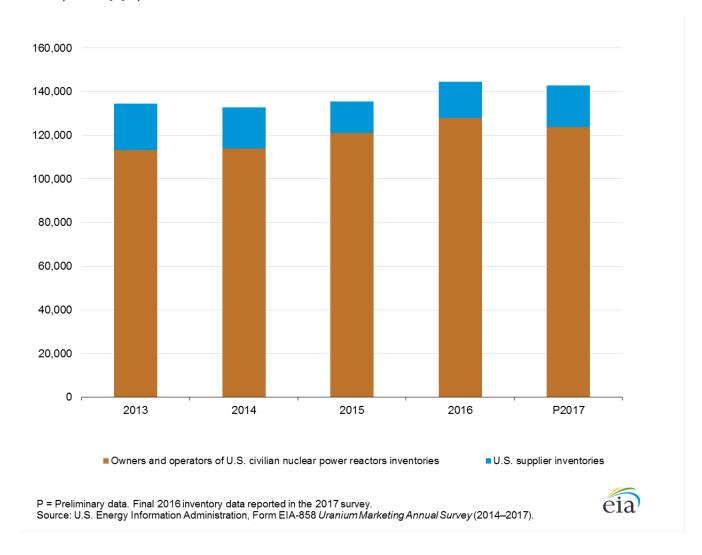
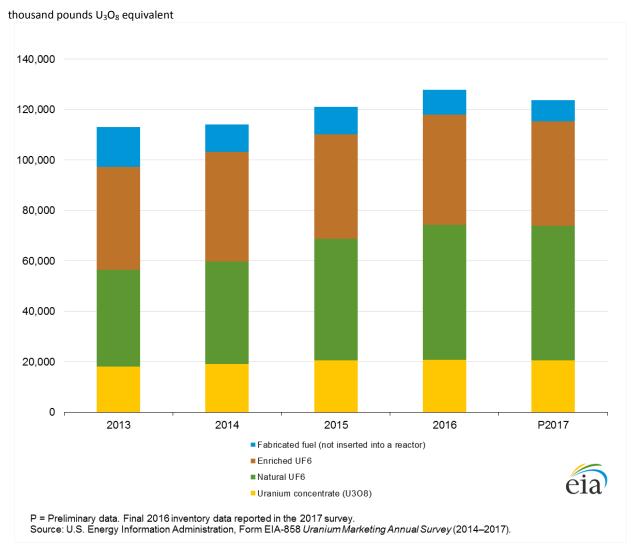


Figure 21. Owners and operators of U.S. civilian nuclear power reactors inventories by material type as of end of year, 2013–2017



## Table 23. Inventories of uranium by owner as of end of year, 2013–2017

thousand pounds U<sub>3</sub>O<sub>8</sub> equivalent

#### Inventories at the End of Year

Owner of uranium inventory	2013	2014	2015	2016	P2017
Owners and operators of U.S. civilian nuclear power reactors	113,077	114,046	121,131	127,964	123,695
U.S. brokers and traders	7,926	5,916	5,678	7,772	9,719
U.S. converter, enrichers, fabricators, and producers	13,416	12,766	8,662	8,895	9,299
Total commercial inventories	134,418	132,728	135,471	144,631	142,713

P = Preliminary data. Final 2016 inventory data reported in the 2017 survey.

Note: Totals may not equal sum of components because of independent rounding.

Figure 22. Commercial inventories of uranium by owner as of end of year, 2013–2017

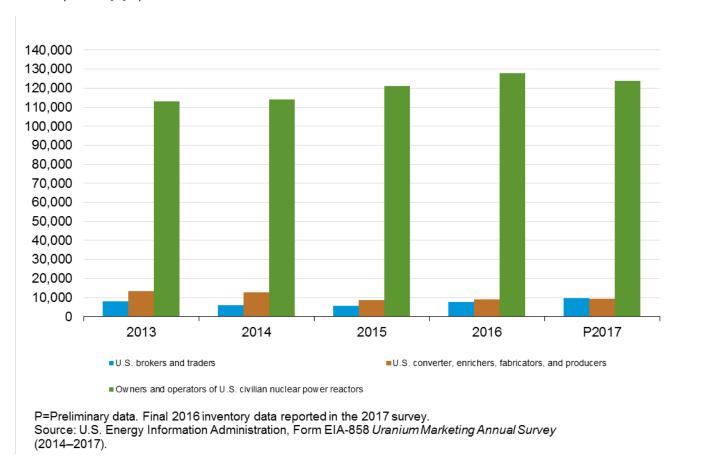


Table 24. Uranium sellers to owners and operators of U.S. civilian nuclear power reactors, 2015–2017

2015	2016	2017
AREVA / AREVA NC, Inc.	AREVA / AREVA NC, Inc.	AREVA / AREVA NC, Inc.
ARMZ (AtomRedMetZoloto)	ARMZ (AtomRedMetZoloto)	ARMZ (AtomRedMetZoloto)
BHP Billiton Olympic Dam Corporation Pty Ltd	BHP Billiton Olympic Dam Corporation Pty Ltd	BHP Billiton Olympic Dam Corporation Pty Ltd
CAMECO	CAMECO	CAMECO
CGN Global Uranium Limited	CGN Global Uranium Limited	CGN Global Uranium Limited
ConverDyn	ConverDyn	ConverDyn
Deutsche Bank	Deutsche Bank	Deutsche Bank
Duke Energy Florida, Inc.	Duke Energy Florida, Inc.	Duke Energy Florida, Inc.
Energy Fuels Resources	Energy Fuels Resources	Energy Fuels Resources
Energy Resources of Australia Ltd.	Energy Resources of Australia Ltd.	Energy Resources of Australia Ltd.
Energy USA, Inc.	Energy USA, Inc.	Energy USA, Inc.
Itochu Corporation / Itochu International	Itochu Corporation / Itochu International	Itochu Corporation / Itochu International
Kazatomprom	Kazatomprom	Kazatomprom
Langer Heinrich Uranium Ltd (Paladin Energy)	Langer Heinrich Uranium Ltd (Paladin Energy)	Langer Heinrich Uranium Ltd (Paladin Energy)
Macquarie Bank	Macquarie Bank	Macquarie Bank
Mitsui & Co.	Mitsui & Co.	Mitsui & Co.
MTM Trading, LLC	MTM Trading, LLC	MTM Trading, LLC
Nufcor International Limited	Nufcor International Limited	Nufcor International Limited
NUKEM, Inc.	NUKEM, Inc. / RWE Nukem	NUKEM, Inc. / RWE Nukem
NYNCO Trading, Ltd.	NYNCO Trading, Ltd.	NYNCO Trading, Ltd.
Paladin Resources Limited / Paladin Energy	Paladin Resources Limited / Paladin Energy	Paladin Resources Limited / Paladin Energy
Rio Tinto Uranium Limited	Rio Tinto Uranium Limited	Rio Tinto Uranium Limited
Rossing Uranium Limited	Rossing Uranium Limited	Rossing Uranium Limited
SOPAMIN (Société de Patrimoine des Mines du Niger "Heritage Society of Mines in Niger")	SOPAMIN (Société de Patrimoine des Mines du Niger "Heritage Society of Mines in Niger")	SOPAMIN (Société de Patrimoine des Mines du Niger "Heritage Society of Mines in Niger")
Southern Cross Resources Australia Pty. Ltd.	Southern Cross Resources Australia Pty. Ltd.	Southern Cross Resources Australia Pty. Ltd.
TENAM Corporation	TENAM Corporation	TENAM Corporation
TENEX (Techsnabexport)	TENEX (Techsnabexport)	TENEX (Techsnabexport)
Traxys North America, LLC	Traxys North America, LLC	Traxys North America, LLC
UG U.S.A., Inc.	UG U.S.A., Inc.	UG U.S.A., Inc.
Uranerz Energy Corporation	Uranerz Energy Corporation	Uranerz Energy Corporation
Uranium One	Uranium One	Uranium One
UrAsia Energy Ltd.	UrAsia Energy Ltd.	UrAsia Energy Ltd.
URENCO, Inc.	URENCO, Inc.	URENCO, Inc.
Ur-Energy / Ur-Energy USA Inc	Ur-Energy / Ur-Energy USA Inc	Ur-Energy / Ur-Energy USA Inc
USEC, Inc. (United States Enrichment Corporation)	USEC, Inc. (United States Enrichment Corporation)	USEC, Inc. (United States Enrichment Corporation)
Westinghouse Electric Company, LLC	Westinghouse Electric Company, LLC	Westinghouse Electric Company, LLC

Table 25. Enrichment service sellers to owners and operators of U.S. civilian nuclear power reactors, 2015–2017

2015	2016	2017
AREVA Enrichment Services, LLC / AREVA NC, Inc.	AREVA Enrichment Services, LLC / AREVA NC, Inc.	AREVA Enrichment Services, LLC / AREVA NC, Inc.
CAMECO	CAMECO	CAMECO
CNEIC (China Nuclear Energy Industry Corporation)	CNEIC (China Nuclear Energy Industry Corporation)	CNEIC (China Nuclear Energy Industry Corporation)
Energy Northwest	Energy Northwest	Energy Northwest
LES, LLC (Louisiana Energy Services)	LES, LLC (Louisiana Energy Services)	LES, LLC (Louisiana Energy Services)
TENAM Corporation	TENAM Corporation	TENAM Corporation
TENEX (Techsnabexport Joint Stock Company)	TENEX (Techsnabexport Joint Stock Company)	TENEX (Techsnabexport Joint Stock Company)
UG U.S.A., Inc.	UG U.S.A., Inc.	UG U.S.A., Inc.
URENCO, Inc. (Deutschland GmbH, Nederland B.V., UK Limited)	URENCO, Inc. (Deutschland GmbH, Nederland B.V., UK Limited)	URENCO, Inc. (Deutschland GmbH, Nederland B.V., UK Limited)
URENCO USA, Inc.	URENCO USA, Inc.	URENCO USA, Inc.
USEC, Inc. (United States Enrichment Corporation)	USEC, Inc. (United States Enrichment Corporation)	USEC, Inc. (United States Enrichment Corporation)
Westinghouse Electric Company, LLC	Westinghouse Electric Company, LLC	Westinghouse Electric Company, LLC