Plutonium (Pu) Modernization Spending, Actual, Proposed, and Estimated, by Site and Fiscal Year, $M, from FY24 Congressional Budget Request (CBR) and other sources, 5/11/23, Los Alamos Study Group

	Prior years	2019	2020	2021	2022 enacte	2023 enacte	through 2023	2024 requested	FYNSP 2025	FYNSP 2026	FYNSP 2027	FYNSP 2028	Total 2024-2028	Total through 2028	2029-2031	Total 2024-2031	Total through 2031	Total through 2033	Total 2024-2033	Total through 2035	Total 2024-2035	Total through 2036	Total 2024-2036	Total through 2039	Total 2024-2039	Notes
Los Alamos National Laboratory (LANL) Pu Operations; $3.0 B in pre-2019 costs omitted (GAO 2023: $3.6 B through 2020)		271.6	287.0	610.6	660.4	767.4	2,597.0	833.1	845.9	898.4	927.5	1,004.1	4,509.0	7,106.0	3,300.0	7,809.0	10,406.0	12,856.0	10,259.0	15,506.0	12,909.0	16,906.0	14,309.0	20,006.0	17,409.0	Assumes cost growth $50 M/year from 1,000 (~5%/yr initially, declining to 3.3%/yr by 2039)
LANL Plutonium Pit Production Project (LAP4), 21-D-512		1.9	58.1	226.0	350.0	588.2	1,224.2	670.0	680.1	710.0	715.5	730.0	3,505.6	4,729.8	-	3,505.7	4,729.9	6,148.9	4,924.7	6,621.9	5,397.7	6,621.9	5,397.7	6,621.9	5,397.7	Expenses continue through 2031 per PDS. NNSA: 30-40% cost increase expected, to $6.148.9 (Scenario LANL 1, "SL1") to $6.621.9 (SL2) for LAP4, with 2-4 yr schedule extension. We used SL2 for the LANL outyears.
Chemistry Metallurgy Research Replacement (CMRR) Project, 04-D-125)	1,713.0	237.0	168.4	169.4	138.1	138.1	2,564.0	227.1	77.0	21.2	-	-	325.3	2,889.3	-	325.3	2,889.3	2,889.3	325.3	2,889.3	325.3	2,889.3	325.3	2,889.3	325.3	FY24 CBR, TPC: $2,886.2; why the minor difference?
LANL Transuranic (TRU) Liquid Waste Facility, 07-D-220-04	93.3	1.0	1.7	37.7	30.0	24.8	188.5	-	-	-	-	-	-	188.5	-	-	188.5	188.5	-	188.5	-	188.5	-	188.5	-	
LANL TA-55 Reinvestment Phase III (TRP-III), 15-D-302	43.7	1.8	-	32.0	27.0	30.0	134.5	30.0	34.5	2.0	-	-	66.5	201.0	-	66.5	235.1	235.1	100.6	235.1	100.6	235.1	100.6	235.1	100.6	
Subtotal LANL Pu Modernization, incl. line item construction listed	1,850.0	513.3	515.2	1,075.7	1,205.5	1,548.5	6,708.2	1,760.2	1,637.5	1,631.6	1,643.0	1,734.1	8,406.4	15,114.6	3,300.0	11,706.5	18,448.8	22,317.7	15,609.6	25,440.7	18,732.6	26,840.7	20,132.6	29,940.7	23,232.6	
Pu-supporting small capital construction projects and equipment not included above							-						-	-	-		-									Will increase LANL costs when included
Pu-supporting pro-rata site-wide infrastructure (not included)							-						-	-	-		-									Will increase LANL costs when included
Pu-supporting, non-Pu project and program costs (not included)							-						-	-	-		-									Will increase LANL costs when included
Pu-supporting line item construction (see below and right). Includes 27-D-XXX, Protective Forces Support Facility (FY24 funding requested) and first-year funding only for 28-D-XXX, Radiography/Assembly Complex Replacement (RACR)						48.5	48.5	98.5	48.5	48.7	48.7	36.9	281.3	329.8	150.0	431.3	479.8	579.8	531.3	679.8	631.3	729.8	681.3	879.8	831.3	2029 on: assume $50M/year; omits possible Pit Disassembly and Processing ($1.0-$3.4 B). For RACR see FY23 SSMP p. 118; total cost will be greater than shown.
Sigma Replacement (FY23 SSMP, pp. 117-118), not included																										Will increase LANL costs when included
PF-4 replacement/augmentation (FY21 Campus Master Plan p. 54), not included																										Will increase LANL costs when included
Total LANL Pu Modernization	1,850.0	513.3	515.2	1,075.7	1,205.5	1,597.0	6,756.7	1,858.7	1,686.0	1,680.3	1,691.7	1,771.0	8,687.7	15,444.4	3,450.0	12,137.8	18,928.6	22,897.6	16,140.92	26,120.6	19,368.91	27,570.6	20,813.9	30,820.6	24,063.9	Minimum current values
Savannah River Site (SRS) Pu Operations		76.4	410.5	200.0	128.0	58.3	873.2	62.8	74.3	112.4	144.7	164.3	558.5	1,431.7	612.9	1,171.4	2,044.6	2,493.2	1,620.0	3,421.8	2,548.6	3,986.1	3,112.9	5,679.0	4,805.8	Assumes increasing $20M/yr through 2031, then $40M/yr through 2036 to $524.3M, then +$20M/yr
Savannah River Plutonium Processing Facility (SRPPF) Design & Construction, 21-D-511		91.3	219.9	351.9	475.0	1,200.0	2,338.1	858.2	1,100.0	1,200.0	1,200.0	1,230.0	5,588.2	7,926.3	3,800.5	9,388.7	11,726.8	12,100.0	9,761.9	13,000.0	10,661.9	13,320.0	10,981.9	15,540.0	13,201.9	">$1 B" per PDS added in 2029-2030; SRPPF appropriations continue here through 2036 or 2039. Assumes full production in 2036 (Scenario SRS 1, "SS1") or 2039 (SS2). NNSA: 20-40% cost increase over CD-0 expected, to $13.21 - $15.41 B total for SRPPF, with 1-3 yr schedule extension
Total SRS Pu Modernization		167.7	630.4	551.9	603.0	1,258.3	3,211.3	921.0	1,174.3	1,312.4	1,344.7	1,394.3	6,146.7	9,358.0	4,413.4	10,560.1	13,771.4	14,593.2	11,381.9	16,421.8	13,210.5	17,306.1	14,094.79	21,219.0	18,007.65	Unsure if administration building is included
Enterprise plutonium support, multiple sites, (pp.); 2029 and after, $115 M/year for 3 years, then $150M/yr,		53.7	79.2	90.8	107.1	89.0	419.8	87.8	94.7	95.3	95.3	104.3	477.4	897.2	340.0	817.4	1,237.2	1,482.2	1,062.4	1,747.2	1,327.4	1,887.2	1,467.40	2,337.2	1,917.40	Increases $5M/yr past 2031
Total Complex-wide Pu Modernization	1,850.0	734.7	1,224.8	1,718.4	1,915.6	2,944.3	10,387.8	2,867.5	2,955.0	3,088.0	3,131.7	3,269.6	15,311.8	25,699.6	8,203.4	23,515.3	33,937.2	38,972.9	28,585.2	44,289.6	33,901.8	46,763.9	36,376.10	54,376.8	43,989.00	Totals do not include pre-2019 LANL program (sunk) or omitted current and anticipated costs at LANL

Enterprise Plutonium Modernization Support in FY21, from FY21 CBR	Prior	2019	2020	2021
KCNSC	unknown	3.4	7.4	8.0
LLNL	unknown	31.2	36.8	51.4
National Energy Technology Lab	unknown	0.6	2.3	2.0
NNSS	unknown	5.1	8.9	13.6
NNSA Albuquerque Complex	unknown	7.5	7.2	0.4
Total	unknown	47.8	62.6	75.4

From NNSA FY24 CBR and earlier CBRs
Sum of sunk costs to date, with some omissions as noted
LANL capital expenses outside Pu modernization program budget line; also pre-2019 LANL program and construction costs
Totals less sunk costs
From NNSA CD-1 estimates and as modified by FY24 PDS texts
Start-up costs, LANL and SRS scenarios 1 and 2, and 80 reliable WR ppy
LASG estimates; see notes and formulas

Pu-supporting LANL line item construction outside the Pu Modernization Program, costs as shown above:
23-D-518. Plutonium Modernization Operations & Waste Management Office Building
24-D-511, Plutonium Production Building
25-D-XXX, Plutonium Mission Safety & Quality Building
26-D-XXX, Plutonium Program Accounting Building
27-D-XXX, Plutonium Engineering Support Building
27-D-XXX, Protective Forces Support Facility
28-D-XXX, Radiography/Assembly Complex Replacement (RACR)

	Minimum	Minimum post-2023	Maximum	Maximum post-2023	Notes
LANL "30 R", startup only through 2033 (min) and 2035 (max)	22,898	16,141	26,121	19,364	From main table
LANL "30 R" startup and production through 2036 (min) and 2039 (max)	27,571	**20,814**	30,821	**24,064**	From main table
SRS "50+ R" (or possibly "80+ R") startup only	17,306	14,095	21,219	18,008	From main table
Enterprise "80+ R" startup	1,887	1,467	2,337	1,917	From main table
All sites "80+ R" through startup	46,764	36,376	54,377	43,989	From main table
All sites "80+ R" in 2036 and 2039 less all future LAP4 and 50% of future LANL program	n/a	**23,824**	n/a	**37,752**	**Cancelling LAP4 and retaining 25%-50% of LANL program would save enough to pay for much or possibly all of entire remaining pit program startup**
All sites "80+ R" in 2036 and 2039 less all future LAP4 and 75% of future LANL program	n/a	**20,247**	n/a	**32,750**	

For reference, total Manhattan Project costs through December 31, 1945 were $31.34 billion in 2023 dollars.
(See *Atomic Audit* , p. 60). Minimum estimated remaining pit production startup costs ($36.4 billion) exceed this.