

The Plutonium Utilization Plan

February 16, 2024

The Federation of Electric Power Companies of Japan

The 9 major utilities (excluding the Okinawa Electric Power), the Japan Atomic Power Company, and Electric Power Development Co., Ltd. (J-Power) have updated the Plutonium Utilization Plan based on the Rokkasho Reprocessing Plant and MOX Fuel Fabrication Plant operation plan and changes in the business environment in the past year.

This new plan describes the amount of plutonium projected to be used by each operator in the three years from FY2024 to FY2026, and the outlook for the use of plutonium in after FY2027.

The 11 power companies in the new Pluthermal Program published on December 2020 have indicated their intent to quickly introduce pluthermal power generation in as many plants as possible and to have at least 12 reactors running on pluthermal by FY2030.

Based on the Action Plan for Promoting the Pluthermal Program published in December 2022 as part of a press release titled “Strengthening Initiatives to Promote the Pluthermal Plan”, we are focusing on our efforts to introduce pluthermal in our power plants by advancing initiatives to gain local understanding and strengthening cooperative ties between operators. Specifically, operators are strategically sharing knowledge and information on gaining local understanding, and moving plutonium among operators with the premise that each company will be responsible for using up the plutonium they own.

In resource-poor Japan, establishing a nuclear fuel cycle domestically is a critical part of securing a stable supply of energy in the long-term. The importance of pluthermal power generation remains unchanged even as circumstances surrounding nuclear power generation continue to change after the accident at TEPCO’s Fukushima Daiichi Nuclear Power Station.

Under the Japanese government's policy of not possessing plutonium without a specific purpose, we will do our utmost to promote the pluthermal program to steadily use up all plutonium including that which is stored abroad and plutonium collected by the Rokkasho Reprocessing Plant through these initiatives, while also explaining to the local community to gain their understanding.

END

Plutonium Utilization Plan

Owner	Amount stockpiled (ton(s) of Pu)*1 (forecast as of the end of FY2023)	Purpose (to use as light water reactor fuel)					(Reference) Amount of spent fuel currently stored (ton U) (As of the end of FY2022)
		Reactors running on pluthermal and reactors that will be running on pluthermal conditional on the understanding of the local community*2	Amount used (ton Pu)*1,*3,*4			Estimated amount of annual usage*5 (ton Pu/year)	
			FY2024	FY2025	FY2026		
Hokkaido EPCO	0.3	Tomari Nuclear Power Station Unit 3	—	—	—	approx. 0.5	510
Tohoku EPCO	0.7	Onagawa Nuclear Power Station Unit 3	—	—	—	approx. 0.4	680
TEPCO HD	13.6	One of TEPCO HD's reactors assuming that TEPCO will work to regain the trust of the siting region for restart, and also steadily use up plutonium	—	—	—	—	7,040
Chubu EPCO	3.9	Hamaoka Nuclear Power Station Unit 4	—	—	—	approx. 0.6	1,380
Hokuriku EPCO	0.3	Shika Nuclear Power Station Unit 1	—	—	—	approx. 0.1	170
Kansai EPCO	11.3	Takahama Nuclear Power Station Units 3, 4	0.0	0.0	0.7	approx. 1.1	4,390
		One or two units at Ohi Nuclear Power Station	—	—	—	approx. 0.5~ 1.1	
Chugoku EPCO	1.4	Shimane Nuclear Power Station Unit 2 *7	—	—	—	approx. 0.4	590
Shikoku EPCO	1.3	Ikata Nuclear Power Station Unit 3	0.0	0.0	0.0	approx. 0.5	920
Kyushu EPCO	2.2	Genkai Nuclear Power Station Unit 3	0.0	0.0	0.0	approx. 0.5	2,620
Japan Atomic Power Company	5.0	Tsuruga Nuclear Power Station Unit 2	—	—	—	approx. 0.5	1,180
		Tokai Daini Nuclear Power Station	—	—	—	approx. 0.3	
Electric Power Development Company (J- Power)	Necessary amounts to be provided by other utilities*6	Ohma Nuclear Power Station	—	—	—	approx. 1.7	
Total	40.1		0.0	0.0	0.7		19,480
Amount of plutonium to be recovered through reprocessing (ton Pu)*8			0	0.6	1.4		
Total amount stockpiled (ton Pu)*11			40.1	40.7	41.4		

This plan will become more detailed as plants restart and the pluthermal program progress, and as the MOX Fuel Fabrication Plant starts its operation.

Projections as of now for the amounts of plutonium to be used from FY2027 and onwards are described below to provide plutonium use projections for after the Rokkasho Reprocessing Plant starts operation.

Projections for the amount of plutonium to be used in FY2027 and beyond (total of all the utilities)

- FY2027: 2.1 ton Pu *9
- FY2028: 1.4 ton Pu *9
- FY2029 to FY2030: up to 6.6 ton Pu/year *10

- *1 Total amount of plutonium (Put). (The total may not match the sum of the amount stored by each utility as figures were rounded off at the second decimal place.)
- *2 Locations according to the existing plan. This may change following future study.
- *3 Use of domestic MOX fuel are projected to start in FY2027 or later.
- *4 0.0: When MOX fuel can be used
—: When MOX fuel cannot be used
- *5 "Estimated amount of annual usage" is the annualized amount of plutonium contained in MOX fuel that will be loaded onto plants specified in the pluthermal plans formulated by each utility.
- *6 It was agreed that the 0.1 tons initially planned to be handed over from Kyushu EPCO to Electric Power Development will be used by Kyushu EPCO to fabricate their own MOX fuel to advance the use of plutonium, and for TEPCO HD and Chubu EPCO to provide the 0.1 tons instead. As a result, utilities will be providing the following amounts to Electric Power Development (0.1 tons from Tohoku EPCO, 0.7 tons from TEPCO HD, 0.1 tons from Chubu EPCO, 0.1 tons from Hokuriku EPCO, 0.2 tons from Chugoku EPCO, 0.0 tons from Shikoku EPCO, for a total of 1.3 tons in fissile plutonium.) *No change in the total amount.
- *7 Shimane Unit 2 plans to run pluthermal generation with the understanding of the local community after restart (approx. 0.3 tons Put).
The start date of pluthermal generation is yet to be determined as the operation plan after restart has not been finalized. However, the plant aims to start pluthermal at the earliest date in FY2025 onwards.
- *8 The amount of plutonium to be collected in the Provisional Operation Plan for Rokkasho Reprocessing Plant and MOX Fuel Fabrication Plant (February 9, 2024; JNFL).
The amount of plutonium to be collected will be finally written in the Medium-Term Implementation Plan for Spent Nuclear Fuel Reprocessing created by the Nuclear Reprocessing Organization of Japan and approved by the Minister of Economy, Trade and Industry.
- *9 The plan is to exchange part of the plutonium collected by France (0.1 tons from Tohoku EPCO, 1.0 tons from TEPCO HD, 0.4 tons from Chubu EPCO, 0.0 tons from Hokuriku EPCO, 0.2 tons from JAPC for a total of 1.7 tons of fissile plutonium) and part of the plutonium collected by the UK (0.7 tons from Shikoku EPCO, 1.0 tons from Kyushu EPCO for a total of 1.7 tons of fissile plutonium), and for Kyushu EPCO and Shikoku EPCO to turn this plutonium into MOX fuel in France which has an operating MOX fuel fabrication plant, which will then be used in domestic plants.
- *10 Will be gradually raising the annual usage amount starting in FY2029 to FY2030 to use up the approx. 6.6 ton Put collected in reprocessing 800 ton U can be used.
- *11 Calculated based on the amount of plutonium stockpiled (predictions as of the end of FY2023) and using the amount of plutonium to be used beyond and to be collected as indicated in the Provisional Operation Plan for Rokkasho Reprocessing Plant and MOX Fuel Fabrication Plant (February 9, 2024; JNFL).