



U.S. Nuclear Waste Technical Review Board

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NUWASTE Results

Scenario 2.4

Steady State Reprocessing & Fabrication of PWR MOX and Recycled UOX Fuel

**Presented to: NWTRB Workshop on Evaluation of Waste Streams
Associated with LWR Fuel Cycle Options**

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Steady State Reprocessing & Fabrication of PWR MOX and Recycled UOX Fuel

- Mass of fission products and minor actinides separated by reprocessing, either total or by isotope, Output Measure 2.4.2.1).

Reprocessing Capacity (MT/year)	Actual Reprocessing Mass (MT)	Actual Fabrication Mass (MT)	Reprocessed Fuel Age	Mass FP & MA (MT)
1500 (year 2050)	1,500	1,275	5	89
	1,500	1,275	25	89
	1,500	1,275	30	89
3,000 (year 2050)	3,000	1,275	5	178
	3,000	1,275	25	179
	3,000	1,275	30	179
3,000 (year 2070)	1,110	1,235	5	56
	1,062	1,235	25	54
	1,029	1,235	30	52

1500 5
 1500 25
 1500 50
 3000 5
 3000 25
 3000 50



NUWASTE Results - Scenario 2.4

Steady State Reprocessing & Fabrication of PWR MOX and Recycled UOX Fuel

- Percent reduction in total natural uranium demand, Output Measure 2.4.2.2).

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Reprocessing Capacity (MT/year)	Actual Reprocessing Mass	Actual Fabrication Mass	Reprocessed Fuel Age	% Uranium Reduction	Total PWR	Total Recycled PWR	% Recycled
1500 (year 2050)	1,500	1,275	5	18.4%	2,966	815	27.5%
	1,500	1,275	25	16.6%	2,966	735	24.8%
	1,500	1,275	50	15.8%	2,966	700	23.6%
3,000 (year 2050)	3,000	1,275	5	36.8%	2,966	1,631	55.0%
	3,000	1,275	25	33.1%	2,966	1,470	49.6%
	3,000	1,275	30	31.6%	2,966	1,400	47.2%
3,000 (year 2070)	1,110	1,235	5	9.7%	2,871	421	14.7%
	1,062	1,235	25	6.8%	2,871	296	10.3%
	1,029	1,235	50	6.8%	2,871	295	10.3%



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Steady State Reprocessing & Fabrication of PWR MOX and Recycled UOX Fuel

- Either total number or mass, and isotopic composition, of assemblies fabricated, Output Measure 2.4.2.3).

Reprocessing Capacity (MT/year)	Actual Reprocessing Mass (MT)	Actual Fabrication Mass (MT)	Reprocessed Fuel Age	Natural Uranium				Separated Mass				
				PWR UOX		BWR UOX		PWR UOX		PWR MOX		
				Number	Enrichment	Number	Enrichment	Number	Enrichment	Number	% Pu	Pu Quality
1500 (year 2050)	1,500	1,275	5	2,151	4.40%	3,551	4.35%	399	5.0%	416	10.03%	61.85%
	1,500	1,275	25	2,231	4.40%	3,551	4.35%	399	5.0%	336	11.50%	59.50%
	1,500	1,275	50	2,266	4.40%	3,551	4.35%	399	5.0%	301	12.36%	58.37%
3,000 (year 2050)	3,000	1,275	5	1,335	4.40%	3,551	4.35%	798	5.0%	833	10.03%	61.85%
	3,000	1,275	25	1,496	4.40%	3,551	4.35%	798	5.0%	672	11.50%	59.50%
	3,000	1,275	50	1,566	4.40%	3,551	4.35%	798	5.0%	602	12.36%	58.37%
3,000 (year 2070)	1,110	1,235	5	2,450	4.40%	3,551	4.35%	206	5.0%	215	10.03%	61.85%
	1,062	1,235	25	2,575	4.40%	3,551	4.35%	161	5.0%	135	11.50%	59.50%
	1,029	1,235	50	2,576	4.40%	3,551	4.35%	168	5.0%	127	12.81%	59.16%



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Steady State Reprocessing & Fabrication of PWR MOX and Recycled UOX Fuel

- Mass of uranium tails generated, Scenario 2.4.2.4).

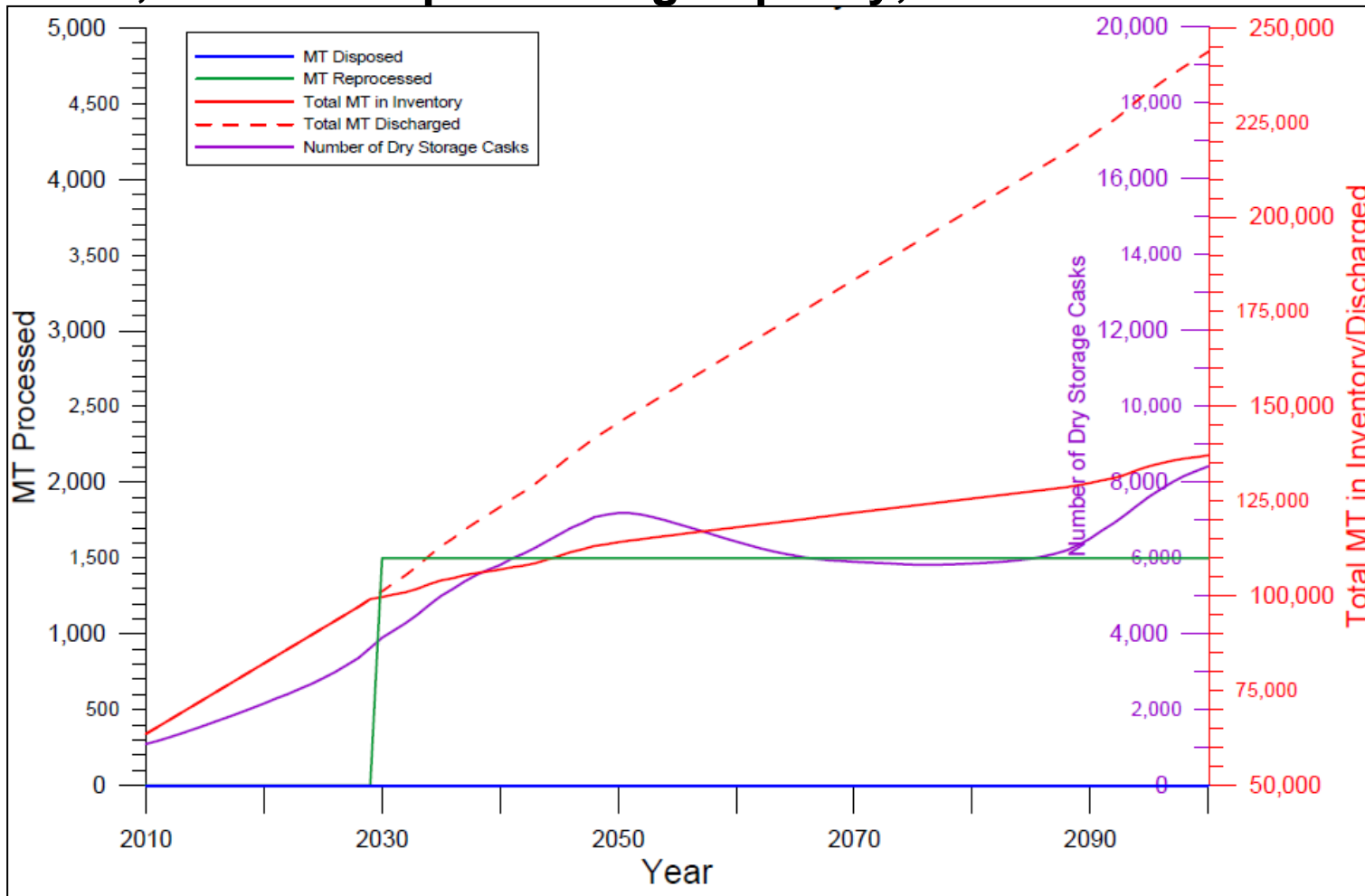
Reprocessing Capacity (MT/year)	Actual Reprocessing Mass	Actual Fabrication Mass	Reprocessed Fuel Age	Mass Tails (MT)	
				Fresh	Separated
1500 (year 2050)	1,500	1,275	5	10,996	1,221
	1,500	1,275	25	10,950	1,221
	1,500	1,275	50	11,345	1,221
3,000 (year 2050)	3,000	1,275	5	8,515	2,441
	3,000	1,275	25	9,005	2,441
	3,000	1,275	50	9,217	2,441
3,000 (year 2070)	1,110	1,235	5	11,583	630
	1,062	1,235	25	12,284	493
	1,029	1,235	50	12,284	499



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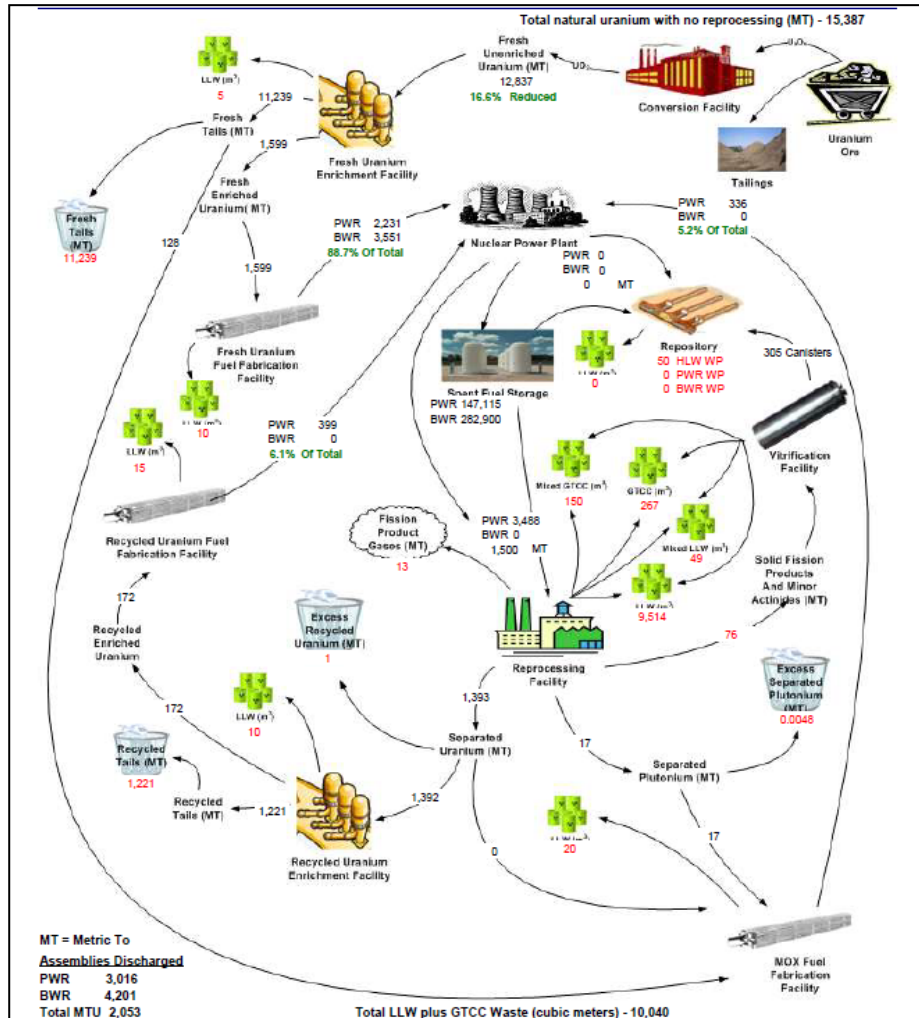
1,500 MTU Reprocessing Capacity; 25-Year Old Fuel



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Steady State Reprocessing & Fabrication of PWR MOX and Recycled UOX Fuel

1,500 MTU Reprocessing Capacity; 25-Year Old Fuel



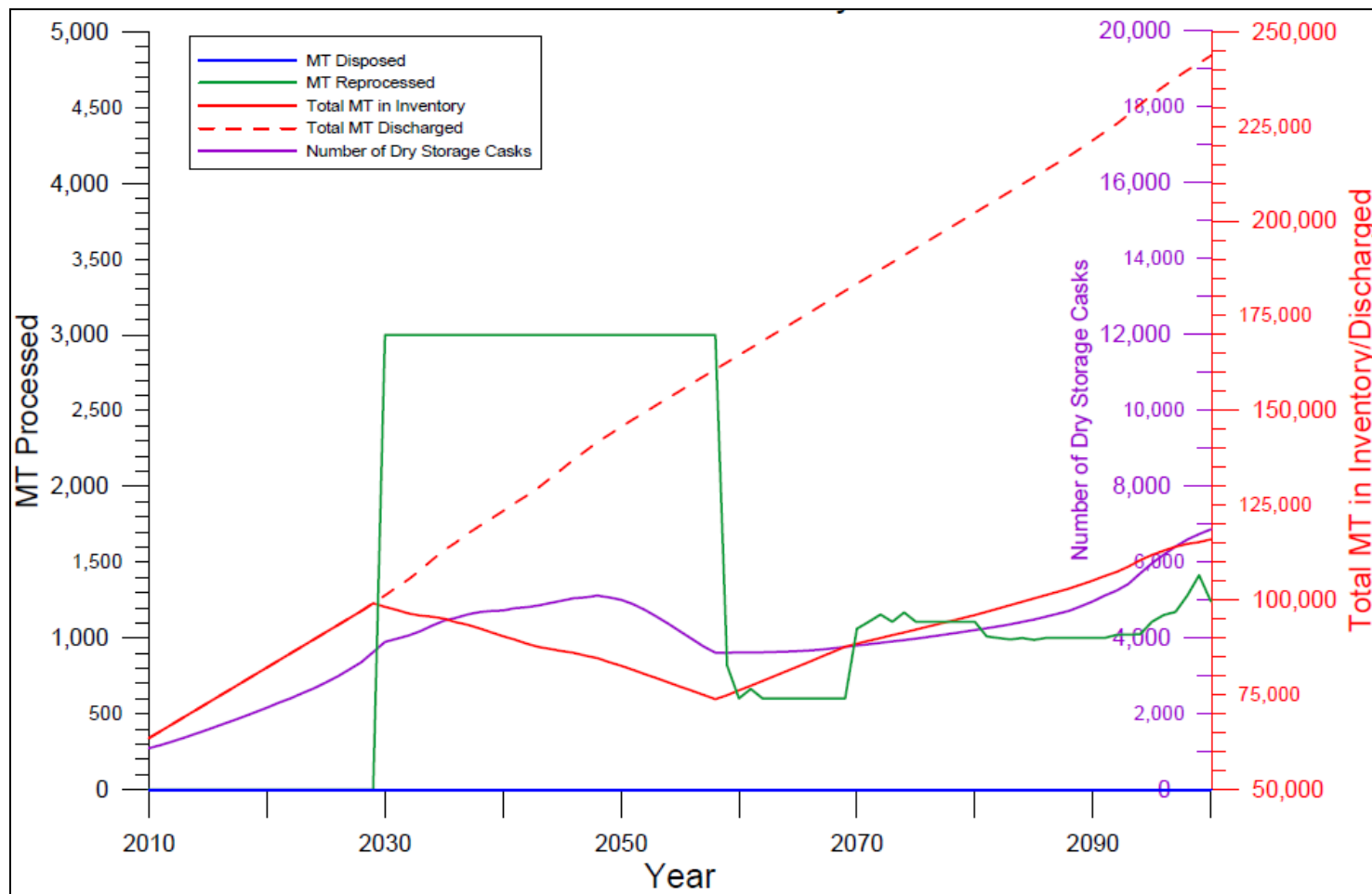
Mas Balance



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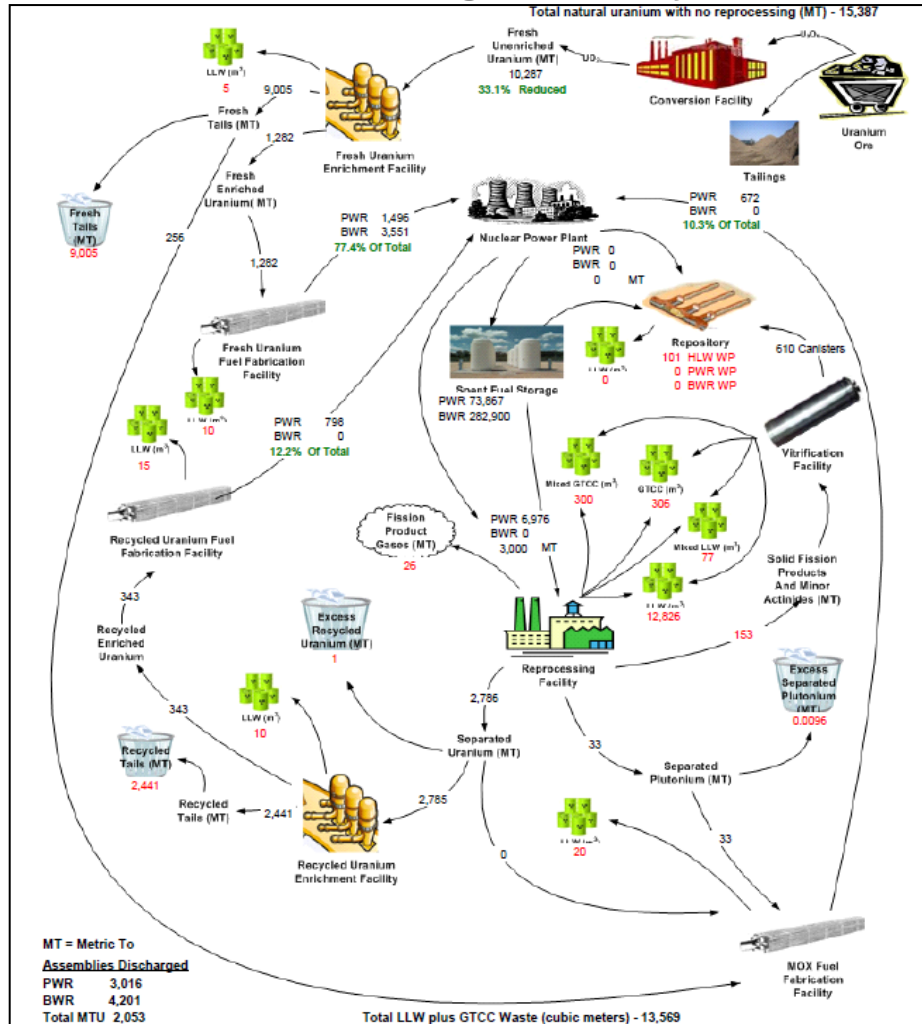
3,000 MTU Reprocessing Capacity; 25-Year Old Fuel



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3,000 MTU Reprocessing Capacity; 25-Year Old Fuel



[Material Balance](#)

