4.6 Waste Management

PharmaEssentia primarily produces general business waste from operations, including a small amount of chemicals used in R&D and laboratory experiments. The company strictly adheres to legal regulations for waste management to avoid any potential legal issues or risks of environmental pollution. Additionally, PharmaEssentia actively keeps abreast of environmental regulations, promoting waste reduction from the research phase, adjusting process designs, and improving material usage efficiency to achieve environmentally friendly practices.

Waste Output and Disposal GRI 306-1~2

PharmaEssentia examines waste output, elimination, treatment, and recycling from a lifecycle perspective, meticulously recording input materials and waste output. Waste disposal is outsourced to qualified third-party waste treatment firms.

Input & Output

Input Characteristics

Waste Originating from Manufacturing, Quality Control (QC) Analysis, and Laboratory R&D Work: This includes a small amount of hazardous waste comprising toxic substances used in experiments and infectious waste. Initially, these wastes undergo high-temperature sterilization within the factory and laboratories, after which they are considered as general waste. However, to ensure compliance with regulatory control measures, they are subsequently treated as infectious waste for disposal.

Activity Records

Detailed Recording of Toxic Chemicals: Usage and inventory of toxic chemicals are meticulously recorded, along with the statistics on waste output. In 2023, the total waste generated was 33.8 metric tons, an increase from the previous year due to the rise in production batches.

Impact Assessment

Production and QC Inspection in Accordance with Pharmacopeial Standards: Operations in the manufacturing area and QC inspections adhere to pharmacopeial standards and Good Manufacturing Practices (GMP). The materials used, including those containing toxic substances, cannot be substituted arbitrarily, and practices are in place to prevent reuse within the processes that could contaminate and affect the quality of subsequent pharmaceutical products. Efforts are made to manage waste from the back end of the process to minimize environmental impact.

Disposal & Monitoring

Categorized Disposal

Disposal Categorized by Waste Type: Disposal processes are categorized according to the type of waste, including hazardous waste, infectious hazardous waste related to biological medical activities, solid/liquid hazardous waste, and non-hazardous waste, ensuring each type is handled appropriately to mitigate environmental impact.

Multifaceted Monitoring

- Waste Management Contractors: The waste disposal contractors engaged by our company are legally registered as Class A or B waste removal/treatment providers. Operations are conducted using a "three-party check and balance operation," which involves completing stamps from PharmaEssentia, the waste transporter, and the final treatment facility before final reporting on the Environmental Protection Administration's official website. This process is essential to manage and control the final direction of waste disposal.
- Annual Vendor Audits and Inspections: We conduct annual audits of our contractors (during the removal/treatment processes) and accompany them on visits to ensure that waste management is carried out flawlessly. Throughout these audits, there have been no instances of contractors violating legal regulations.

Waste Output Volume GRI 306-3, 306-4. 306-5

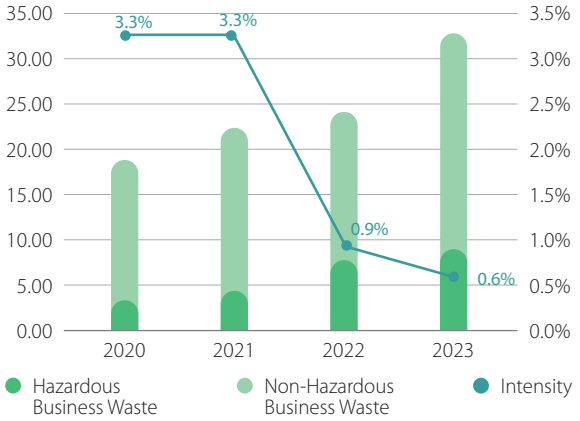
As PharmaEssentia's global footprint expands, our capacity and efficiency continue to improve. We persistently focus on reducing waste volume and enhancing the efficiency per unit of output to decrease the intensity of waste generated. Following short-term, medium-term, and long-term goals and action paths, we refine our management policies and implement concrete actions. The intensity of total waste generation has decreased year over year, with a reduction of 33.3% in 2023 compared to the previous year.

PharmaEssentia (Taipei + Taichung) Waste Statistics for 2023

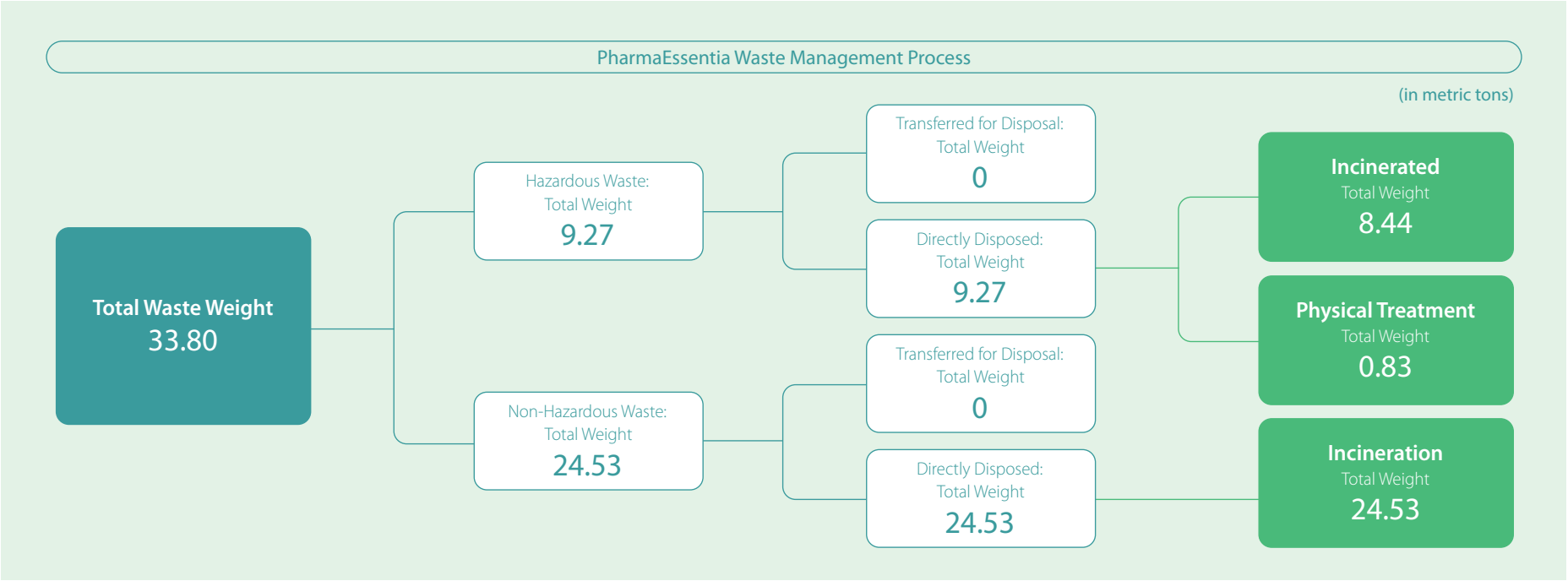
(in metric tons)

Category	Subcategory	Total	Rate	Recycled	Recycling Rate	Landfilled	Landfill Rate	Incinerated	Rate	Total
Non-Hazardous Business Waste	None	24.53	72.57%	0.00	0.00%	0.00	0.00%	24.53	72.57%	100%
Hazardous Business Waste Total Waste Output Category	Biomedical	1.97	5.82%	0.00	0.00%	0.00	0.00%	1.97	5.82%	100%
	Organic Effluents	6.47	19.15%	0.00	0.00%	0.00	0.00%	6.47	19.15%	100%
	Non-Organic Effluents	0.83	2.46%	0.00	0.00%	0.83	2.46%	0.00	0.00%	100%
Total Business Waste		33.80	100.00%	0.00	0.00%	0.83	2.46%	32.97	97.54%	100%

Historical Total Waste Volume and Intensity



Note: The above data includes both Taipei and Taichung facilities. The calculation method for intensity is total waste volume divided by the annual revenue (in million NTD).



Material Management in Production and Packaging

The Taichung facility operates as a GMP (Good Manufacturing Practice) compliant plant. To meet regulatory requirements, many materials used in various operational processes are disposable, especially in the packaging of semi-finished or finished products, to prevent cross-contamination and protect the products. The packaging materials used are not reused. In 2023, the main non-renewable materials used during production were disposable process bags, accounting for approximately 87.7% of all materials. Renewable materials primarily consisted of paper boxes and inserts used for packaging.

	2021	2022	2023
Renewable Materials (Metric Tons)			
Packaging Materials (Paper Boxes/Inserts) (FP)	0.05	0.08	0.1
Non-Renewable Materials (Metric Tons)			
Disposable Consumables for Processes (FP)	0.04	0.09	0.09
Packaging Materials (Blister Packs/Syringe Labels/Plungers/Safety Needles) (FP)	0.05	0.09	0.1
Disposable Process Bags	0.54	1.26	1.35
Total	0.63	1.44	1.54