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Advancing a Circular Value Chain

CEM continues to enhance resource efficiency and reduce waste generation.
Through full lifecycle asset management and technological upgrades,
the Company is progressively building a more resilient and sustainable value chain

8.1 Waste Management

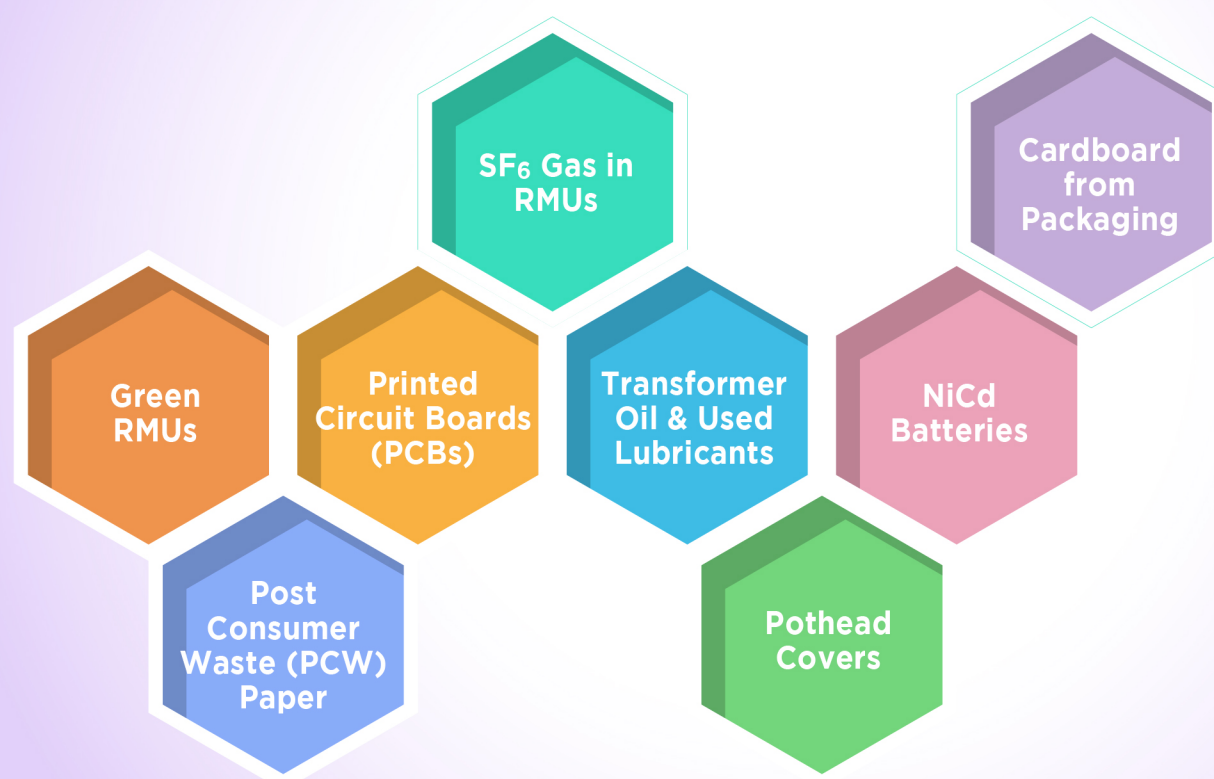
CEM has established clear corporate standards that provide comprehensive guidelines for the generation, handling, storage, transportation and final disposal of waste, ensuring that all waste management activities comply with regulatory requirements and standards. In addressing unique geographical challenges and stringent environmental regulations⁶, the Company has turned these challenges into opportunities to drive comprehensive sustainable operations.

We have developed the Requirement Guideline for EOL Plan & Waste Management, shifting from a passive waste disposal approach to proactive lifecycle planning. This extends responsibility for waste management upstream into the supply chain, while continuously enhancing the waste management system to ensure compliant, transparent and responsible end-to-end management in both local and cross-boundary contexts.

8.1.1 Hazardous Waste Control: Full Lifecycle Management

For hazardous waste involving environmental risks, CEM implements stringent classification and compliant transfer systems. Hazardous waste must be properly collected and stored in designated chemical and oil containment vessels, and transported to specified areas for centralised management. During transfer, waste quantities are recorded in the “Waste Transfer Note” and properly retained to ensure full traceability.

CEM continues to strengthen full lifecycle material management. In 2025, the Company proactively engaged with the recycling market, conducting multiple rounds of solution assessments and professional consultations with nine recycling enterprises. Based on these findings, CEM successfully optimised and upgraded disposal processes covering eight categories of key materials, systematically enhancing the management efficiency of industrial asset decommissioning. This ensures efficient recovery and reuse of resources, further demonstrating the practical implementation of a circular economy.



⁶ Including compliance with the relevant international requirements of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal.

8.1.2 General Waste Management: Green Office and Resource Recycling

For general waste management, CEM adopts a dual approach of “waste reduction at source” and “segregation and recycling”, fully integrating waste reduction principles into daily operations. Waste is sorted based on its recyclability, and recyclable materials are placed into standardised “three-colour collection bins” to enhance sorting accuracy and recycling efficiency. Designated cleaning contractors are responsible for recording the quantities of different types of waste and submitting monthly reports, which serve as a key basis for ongoing monitoring and evaluation of waste reduction performance.

In terms of green office practices and sustainable procurement, CEM also promotes resource reduction at source by implementing practical environmentally friendly alternatives. The Company has fully upgraded office paper to environmentally preferable options, replacing paper certified by the Forest Stewardship Council (FSC) with post-consumer waste (PCW) paper, thereby reducing reliance on virgin pulp resources and further lowering its environmental footprint. To improve the convenience and overall efficiency of waste paper recycling, CEM is also actively exploring the introduction of smart recycling bins, leveraging digital and intelligent solutions to encourage employee participation in recycling and progressively advancing towards a “zero waste” office environment.

8.1.3 “Eco Fun” Programme

In 2025, CEM actively supported the resource recycling initiatives promoted by the DSPA. Through standardised recycling channels, the Company properly handled more than 450 used batteries and 817 waste fluorescent tubes. CEM also actively participated in the Environmental Protection Bureau’s “Eco Fun” Programme, recycling over 450 metal cans, 2,149 kg of waste paper and 16 kg of plastics through proper waste segregation, thereby effectively promoting resource circularity.

Waste and food waste collected under the “Eco Fun” Programme



Since joining the food waste recycling programme launched by DSPA in 2023, CEM has continuously promoted food waste recycling and reduction. In 2025, a total of 2,449 kg of food waste was collected from two staff canteens located at the CEM Headquarters Building and the Coloane Power Plant. At the same time, an online meal ordering system has been introduced at the Coloane Power Plant to further reduce food waste.

8.2 Water Resource Management

CEM recognises the value of water resources and the potential impacts of industrial operations on the aquatic environment. To address this, the Company adopts a full lifecycle water management approach, covering source assessment, operational control, and discharge monitoring. This ensures comprehensive management of water use and wastewater discharge, with every discharge meeting relevant legal and regulatory requirements and, where feasible, exceeding applicable standards.

In accordance with current environmental laws and regulations in Macao, CEM implements stringent treatment and monitoring of industrial wastewater, focusing on six key water quality parameters: total suspended solids (TSS), detergents, chemical oxygen demand (COD), potential of hydrogen (pH), biochemical oxygen demand (BOD), and oil and grease. To further reduce the impact of operations on the water environment, the Company continues to upgrade its water and wastewater management systems, including optimising cooling water circulation design and promoting wastewater reuse initiatives. CEM is also exploring the development of measurable water management targets to continuously enhance water use efficiency and environmental performance.

Wastewater Management and Monitoring Procedures



Management Approach and Source Control

- CEM follows the principle of pollution prevention by implementing preventive and control measures across its operations, products and services. Through environmental impact assessments, the Company identifies risks at an early stage and develops mitigation measures to reduce impacts on the surrounding environment.



Wastewater Classification and Treatment Systems

- CEM classifies and segregates wastewater from power generation, with drainage systems divided into industrial wastewater, domestic sewage and stormwater to prevent cross-contamination. Oil-contaminated wastewater is treated through oil interception and physical separation systems to ensure compliance with discharge requirements.



Water Quality Monitoring and Compliance Performance

- CEM's power plants regularly monitor discharged water quality and comply with relevant environmental protection regulations of the Macao SAR Government to ensure stable compliance. Emergency response and spill prevention mechanisms are in place to prevent chemical or oil leaks from contaminating water bodies, with related materials properly handled as chemical waste.

2025 Average Levels of the Wastewater Parameters of CCA

Parameter	Result	Emission Limit	Qualified
TSS (mg/L)	35.24	60	✓
Detergent (mg/L)	0.9	2	✓
COD (mg/L)	33.11	150	✓
pH	7.11	6-9	✓
BOD (mg/L)	13.33	40	✓
Oils and Greases (mg/L)	5	15	✓

2025 Average Levels of the Wastewater Parameters of CCB

Parameter	Result	Emission Limit	Qualified
TSS (mg/L)	12.67	60	✓
Detergent (mg/L)	1	2	✓
COD (mg/L)	20	150	✓
pH	7.3	6-9	✓
BOD (mg/L)	10.83	40	✓
Oils and Greases (mg/L)	5	15	✓

8.3 Biodiversity Conservation

Electricity supply is closely linked to the natural environment. CEM is committed to achieving a balance between its operations and ecological protection, and continues to promote biodiversity conservation. During project planning and implementation, the Company adopts a context-specific approach, taking into account surrounding ecological characteristics, population density and land use, and carefully assessing the potential environmental impacts of its operations.

8.3.1 Protection of Marine Mammals during Construction

CEM has implemented a Marine Mammal Exclusion Zone Monitoring Programme to protect dolphins and other marine species. A 250-metre exclusion zone is established around dredging works, with monitoring conducted by trained marine mammal observers. Prior to each dredging operation, observers carry out a 30-minute visual survey. If any marine mammals enter the exclusion zone, works are suspended until the area is fully cleared before resuming operations. Detailed observation records, regular drills and clear communication mechanisms further strengthen the effectiveness of these protective measures.

In support of green and environmentally responsible principles, CEM has introduced greening systems on the rooftops and external façades of substations, integrating more natural elements into its infrastructure. This not only enhances the overall environmental performance of substations, but also further strengthens their positive impact on surrounding communities and ecosystems.

8.3.2 Substation Greening Landscape



New Incinerator Substation — Vertical Greening System Transforming Industrial Landscape

Traditional substations are typically characterised by enclosed concrete structures with limited ecological value. At the New Incinerator Substation, CEM has introduced a vertical greening system integrated with automated smart drip irrigation technology, ensuring stable plant growth on building façades while improving water use efficiency.

The extensive vertical planting contributes to microclimate regulation by capturing airborne particulate matter and improving local air quality. It also provides thermal insulation for building façades, helping to reduce the substation's operational energy consumption. From a biodiversity perspective, the vertical greening system creates suitable habitats for local pollinators and microorganisms, enhancing the ecological value of industrial infrastructure.

Oriental Pearl Substation — Rooftop Greening Enhancing Urban Micro-ecosystems

Located in a high-density urban area, the Oriental Pearl Substation has implemented large-scale rooftop greening tailored to local conditions. Through specialised load-bearing and waterproofing design, the previously enclosed concrete roof has been transformed into a functional green roof with ecological benefits.

The green roof exhibits a “sponge” effect, effectively retaining rainwater and alleviating pressure on urban drainage systems. At the same time, plant evapotranspiration helps reduce rooftop temperatures, mitigating local heat island effects. In addition, the rooftop greenery provides habitat and foraging spaces for birds and insects, forming a micro biodiversity hotspot within a dense urban environment and demonstrating the potential for integration between energy infrastructure and urban ecology.



8.3.3 Environmentally Preferable Grid Equipment

Vegetable Oil Distribution Transformers

To reduce the environmental impact of power equipment, CEM continues to adopt more environmentally preferable technologies in its grid infrastructure. The Company plans to progressively increase the use of vegetable oil distribution transformers. Compared with conventional mineral oil transformers, vegetable oil offers higher biodegradability and lower environmental risk, enabling improved equipment safety while reducing potential environmental impacts.