Water Stewardship

Strategies	2030 Goals	2026 Targets	2025 Achievements
Sustainable Water Stewardship[Note1] Enforce climate risk mitigation policies, implement daily water conservation and water shortage adaptation, develop diversified water sources, and advance restoration initiatives to lower environmental risks	Global Water Positive achievement rate of > 65%	Global Water Positive achievement rate of 18%	Global Water Positive achievement rate of 21% ↑ Target: 17% Increased unit water consumption by 8.8% (L/12-inch equivalent wafer mask layer) (Base year: 2010) — Note 2 Target: Reduce unit water consumption by 2.7% (Base year: 2010) 18% Replacement of water resources with reclaimed water ↑ Target: 15%
Innovative Water Pollution Prevention Technology Improve the efficiency of water pollution control and removal of water pollutants	Reduce water pollution composite indicator[Note 3] by >60%	Reduce water pollution composite indicator reduction rate by 60%	Water pollution composite indicator reduction rate of 61.9% ↑ Target: 60%

Applicable to all TSMC fabs around the world | Applicable to TSMC fabs in Taiwan and other specific fabs | Only applicable to TSMC fabs in Taiwan | Applicable to TSMC overseas fabs | ↑ Exceeded | ✓ Achieved | — Missed Target

Note 1: TSMC is committed to optimizing water use efficiency. To drive a more comprehensive and systematic approach to water stewardship and effectively address climate change challenges as well as ensure water resilience, the Company integrated its "Water Resource Risk Management" and "Diverse Water Resource Development" strategies into "Sustainable Water Stewardship" in 2025. The Company also adopted global Water Positive impact as a key indicator to evaluate the overall effectiveness of its strategy and its positive contribution to the ecological environment.

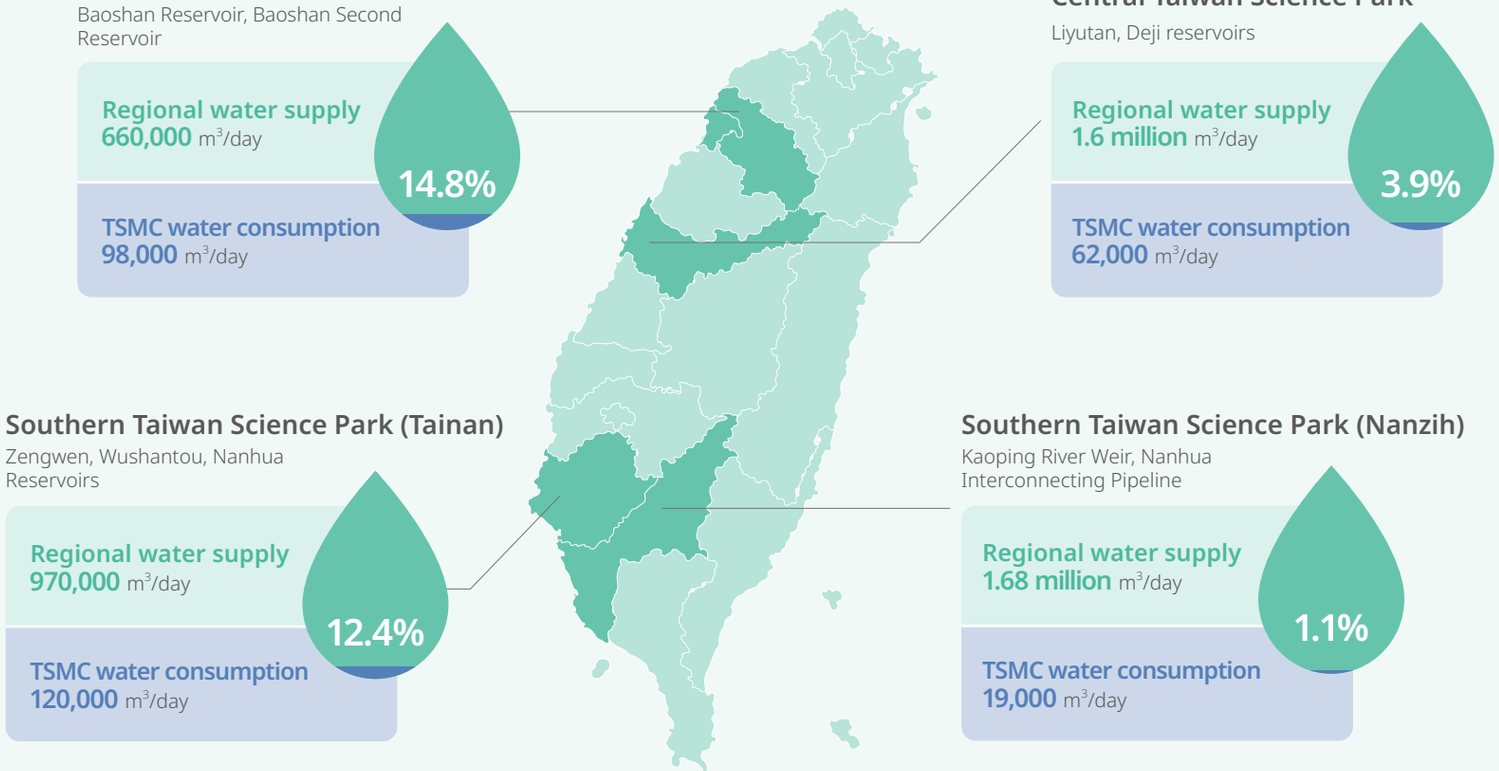
Note 2: For factors contributing to unmet targets, please refer to "Strengthen In-house Water Reclamation and Water Use Efficiency."

Note 3: Covers ten key pollutants — chemical oxygen demand (COD), fluoride, suspended solids (SS), ammonia nitrogen, nitrate nitrogen, arsenic, boron, copper, cobalt, and total phosphorus — serving as indicators to assess overall pollutant concentration reduction and control performance.

TSMC upholds the commitments made in its Water Statement and advances four key water conservation measures to enhance in-fab water reclamation and overall water use efficiency. The Company also set achieving Water Positive impact as a core sustainability objective, while expanding the adoption of alternative water sources such as reclaimed water and desalinated seawater to deliver tangible results. In 2025, cumulative reclaimed water use at Taiwan fabs reached 23.53 million cubic meters, with the substitution rate rising to 18%. In 2026, reclaimed water from the Kaohsiung Qiaotou facility will be introduced, and the TSMC S.T.S.P. Reclaimed Water Plant will be further expanded, with daily supply capacity expected to reach 30,000 cubic meters by 2028. At the same time, TSMC Arizona began construction of a reclaimed water facility, incorporating industry-leading near-zero liquid discharge (NLD) technology and setting a new benchmark for water stewardship in the semiconductor industry.

Furthermore, TSMC actively develops diversified water sources and restoration initiatives. In 2025, in addition to JASM's achieved of groundwater replenishment, TSMC Arizona is also planning river restoration efforts for the Verde River in its operating watershed. These initiatives aim to optimize regional water efficiency and improve aquatic ecosystems, with completion anticipated in 2026, thereby fostering environmental sustainability.

TSMC Water Consumption Share Across Four Science Parks



Resource: Water Resources Agency, Ministry of Economic Affairs

Sustainable Water Stewardship

TSMC applies the World Resources Institute (WRI) water risk assessment tool each year to evaluate water-related risks across its global operations. Based on the 2025 assessment results, TSMC (China) and TSMC Arizona are classified as high-risk locations, while all other sites fall within medium-low or low-risk categories.

Although TSMC (China) is located in a water-abundant region, significant fluctuations in raw water quality place it in the high-risk category. The site ensures a stable and high-quality process water supply through a municipal water purification plant and in-fab water treatment systems. TSMC Arizona, located in a desert climate region, initiated a local reclaimed water plant project in 2024, with construction commencing in 2025. The facility plans to adopt NLD technology to maximize water reclamation, minimize wastewater discharge, and optimize concentrated waste treatment, while advancing water resource restoration initiatives.

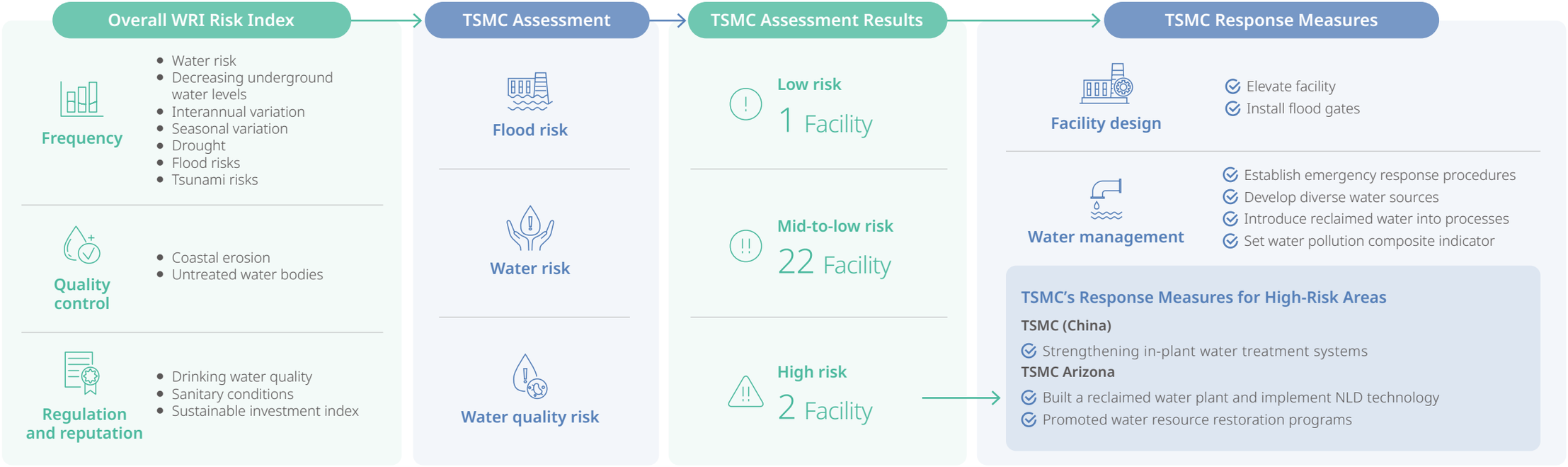
For sites in medium-low or low water risk regions, TSMC applies established preventive measures — such as elevating site ground levels and installing flood barriers — while incorporating proven water reclamation, reuse, and wastewater treatment systems from existing fabs into the planning and design of new facilities. At the same time, regional operations teams regularly review local water use profiles and water availability conditions and take timely response actions as needed to ensure operational resilience. In addition, TSMC continues to advance the use of diversified alternative water sources, including reclaimed water and desalinated seawater, to ease pressure on local water resources.

Water Resource Management and Technological Development

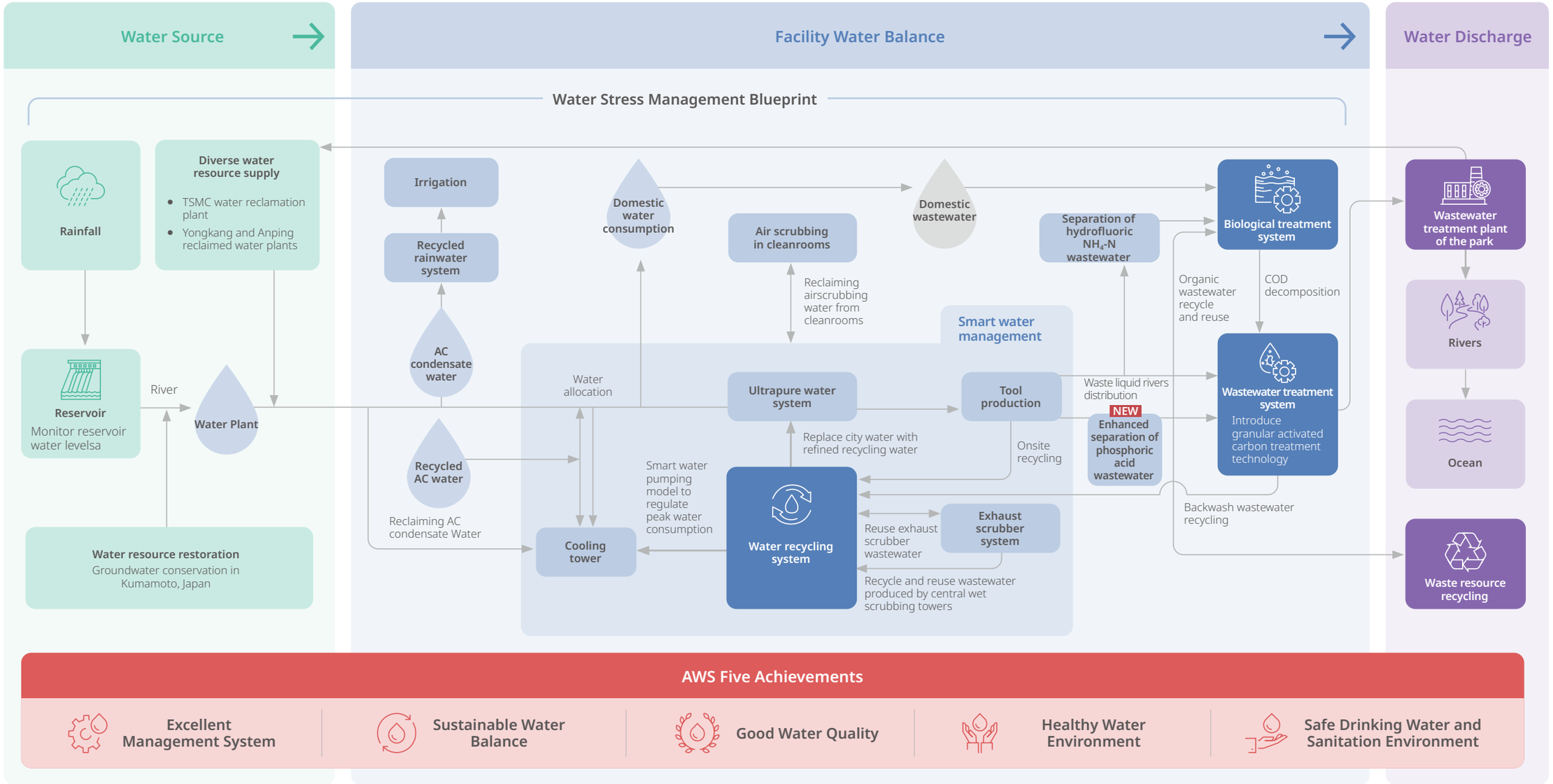
TSMC manages site water according to the Alliance for Water Stewardship (AWS) standard. In 2025, the Hsinchu and Taichung sites underwent annual certification, while the Tainan sites completed their triennial recertification, with all sites maintaining Platinum-level performance. For an overview of TSMC's overall water management framework, please refer to the Water Flow and Upstream/Downstream Environmental Relationship Diagram .

To advance environmental sustainability, TSMC channels resources through its Water Stewardship Cooperation Model and continues investing in new technology development through a Joint Development Project (JDP) with academic institutions. In 2025, the Company collaborated with universities in Taiwan on research covering phosphoric acid wastewater treatment and recycling, three-dimensional groundwater monitoring technologies, and analysis of trace unknown substances in ultrapure water, with the aim of strengthening water quality monitoring and treatment capabilities. TSMC also partnered with institutions in the United States, Japan, and China to study per- and polyfluoroalkyl substances (PFASs) treatment and their potential environmental impacts, addressing shared global environmental challenges. Given JASM's reliance on groundwater resources, TSMC additionally collaborated with local universities in Kumamoto on groundwater quality assessment, volume simulation, and monitoring in response to regional hydrogeological conditions.

WRI Risk Identification



Water Flow and Upstream/Downstream Environmental Relationship Diagram



Note: In 2025, the AWS annual certification covered the Hsinchu sites (Fab 5, Fab 12A, Fab 12B, and Advanced Backend Fab 3) and the Taichung sites (Fab 15A and Fab 15B), while the triennial recertification covered the Tainan sites (Fab 6, Fab 14A Phase 7, and Fab 14B Phase 5 and Phase 6).

Water Positive

In response to its global expansion and increasing water demand from advanced manufacturing processes, TSMC upholds sustainable co-prosperity as its guiding principle and adopts Water Positive impact as a key performance indicator, integrating water stewardship efforts across multiple dimensions. The core concept of water positivity is to ensure that the volume of water returned to local ecosystems through diversified water sourcing and external water restoration initiatives is equal to or greater than the volume of water withdrawn for operations. Diverse water resources include tap water replacement such as reclaimed water, as well as supplementary tap water sources such as desalinated seawater and brackish water. Water restoration initiatives encompass groundwater recharge, wetland restoration, reservoir dredging, and watershed rehabilitation, all aimed at mitigating environmental impacts and achieving sustainable water use.

• Reclaimed Water

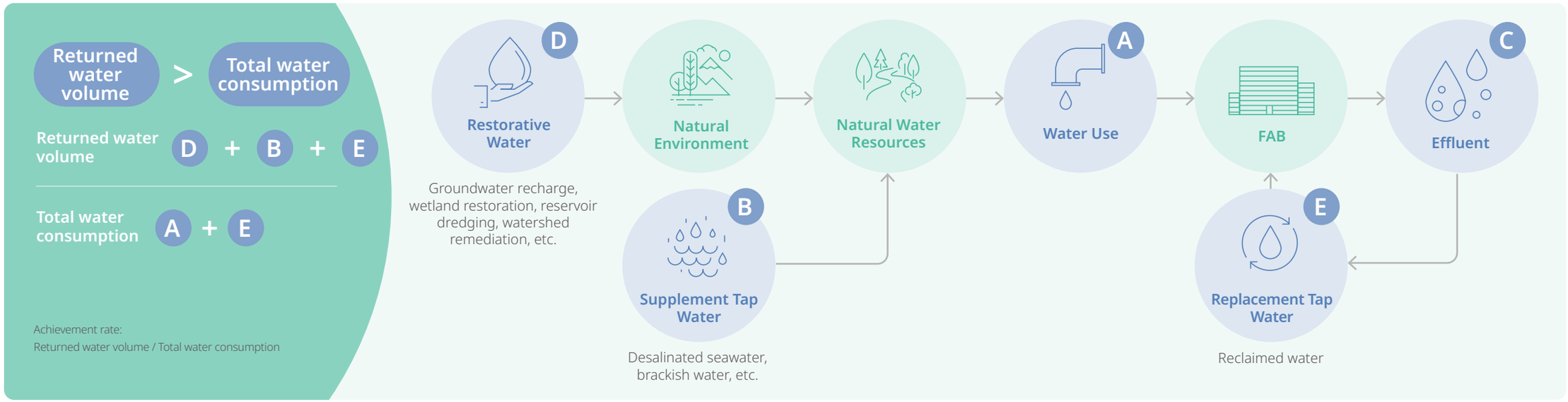
TSMC expanded its use of reclaimed water, with cumulative consumption reaching 23.53 million cubic meters in 2025 (including 22.73 million cubic meters of reclaimed water intake and 0.80 million cubic meters of water exchange), achieving a substitution rate of 18% at Taiwan fabs. In addition, the Company completed the expansion of the Kaohsiung Nanzi and Qiaotou reclaimed water plants and signed agreements for the Hsinchu Science Park reclaimed water plant. The Qiaotou reclaimed water plant is expected to supply 25,500 cubic meters of reclaimed water per day to Fab 22 starting in 2026.

For reclaimed water that cannot be directly supplied to fabs due to distance or volume constraints, TSMC pursued innovative collaboration models. In 2025, through coordination by the Tainan City Government Water Resources Bureau, TSMC partnered with industrial users near the Rende Reclaimed Water Plant to establish Taiwan's first cross-regional reclaimed water exchange mechanism based on a carbon trading–inspired concept, with official water supply commencing in September. This tripartite collaboration enhanced the cost efficiency of reclaimed water delivery and regional water resource utilization, while reducing reliance on local natural water resources and creating shared benefits among stakeholders.

• Desalinated Seawater and Brackish Water

Beyond reclaimed water, TSMC supports national policies on diversified water resource development. In 2025, the Company signed additional desalinated seawater subscription contracts for 136,000 cubic meters per day. To reinforce a resilient foundation for water supply, TSMC also collaborated with industry, government, and academic partners to explore emerging water sources, including brackish water in tidal river reaches and atmospheric water harvesting technologies, with the aim of converting these sources into industrial-grade water through advanced treatment technologies, further enhancing water supply stability and resilience.

Water Positive Calculation Method



• Restorative Water

In terms of water resource restoration, TSMC not only conducts research on river restoration and water-saving initiatives for agricultural irrigation at its Taiwan fabs, but also actively advances conservation across its global operations. At JASM in Kumamoto, Japan, the Company carried out groundwater recharge programs, achieving a restoration volume of eight million cubic meters in 2025, with continued expansion of the program scope, demonstrating solid progress in sustainable water stewardship.

The Salt River is one of the primary water sources in the watershed where TSMC Arizona operates. To address long-standing seepage and evaporation losses along the upstream Verde River conveyance system, TSMC plans to convert the existing open earthen canal into a closed pipeline system, thus improving regional water use efficiency, restoring flows in the Salt River, and enhancing aquatic habitats. The project was formally contracted at the end of 2025, with completion scheduled for 2026, and is expected to deliver positive outcomes for local ecosystems and biodiversity conservation.

Strengthening In-house Water Reclamation and Water Use Efficiency

TSMC manages in-fab water usage through its diversified water supply integration platform and implements four water conservation measures: Decreasing Water Discharge Loss from the System, Reducing Facility System Water Consumption, Increasing Wastewater Recycling by Facilities, and Improving Water Production Rate of the System. In 2025, newly achieved water savings reached 6.73 million cubic meters, while total reclaimed water volume from the overall recovery system stood at 318.94 million cubic meters, representing a 12% increase compared with 2024.

In 2025, TSMC's unit water consumption was 153.3 liters per 12-inch equivalent wafer mask layer, down 4.8% from 161.0 liters in 2024, but still above the 2010 baseline of 140.9 liters per 12-inch equivalent wafer mask layer. This was primarily driven by strong global wafer demand in recent years and the accelerated expansion of TSMC's global footprint, with multiple newly built fabs in pre-production qualification stages, including Fab 20 Phases 1 and 2, Fab 22 Phases 1 and 2, TSMC Arizona Fab Phase 1, JASM Fab Phase 1, and Advanced Backend Fab 8. These sites accounted for approximately 20% of total global tap water consumption, thus affecting the reduction trend in unit water consumption. Excluding these new fabs, unit water consumption in 2025 would have been 122.3 liters per 12-inch equivalent wafer mask layer, a 13.2% decrease compared with the 2010 baseline, reflecting continued improvements in water efficiency at existing fabs.

As TSMC continues to scale up its operations, the impact of new fab ramp-ups on water consumption per unit of product will remain an ongoing factor. To tackle this challenge, the Company focuses on its global Water Positive achievement rate as the key indicator for guiding and evaluating water resource management performance, furthering its commitment to sustainable water stewardship.

Water-saving Measures and Achievements in 2025

Increased Wastewater Recycling by Facilities

- Other Recycled wastewater **3,253,000 m³** (48.31%)
- Recycled water refined into industrial water **849,000 m³** (12.60%)

Improved Water Production Rate of the System

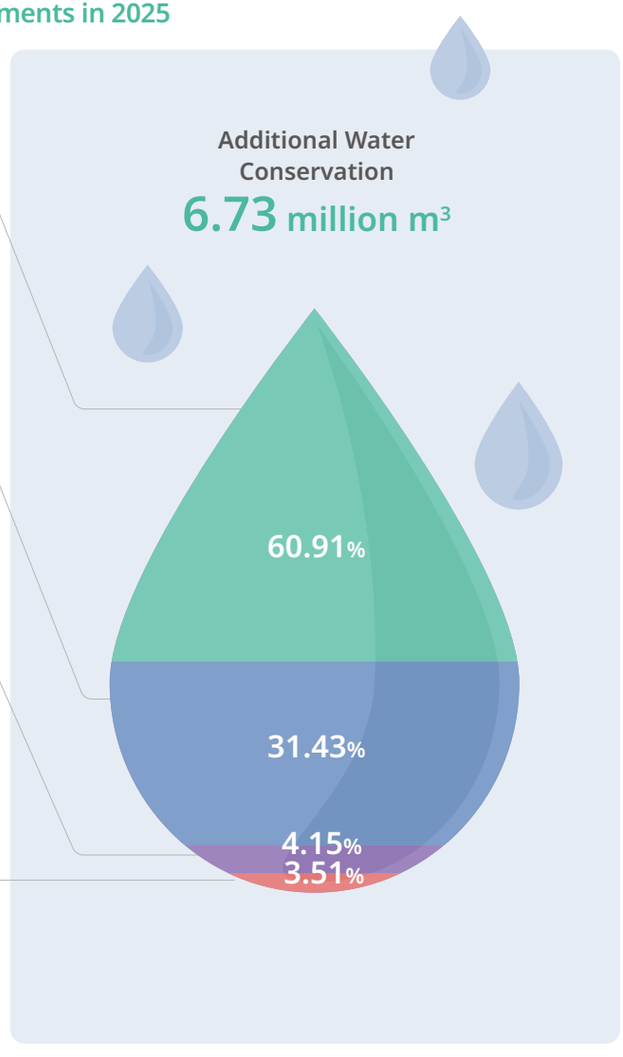
- Increased the water production rate of RO recycling systems **1,289,000 m³** (19.14%)
- Improved usage efficiency of recycled water **827,000 m³** (12.29%)

Reduced Water Discharge Loss from the System

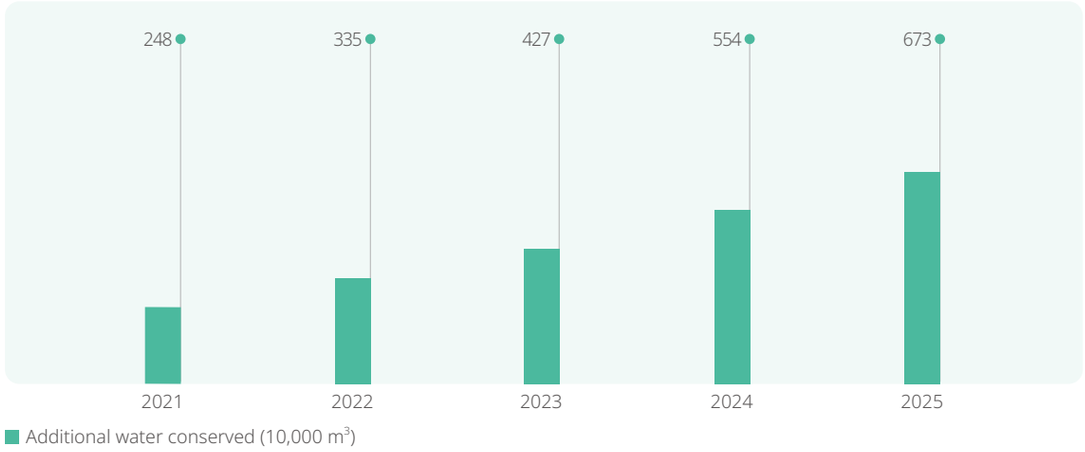
- Recycled from MAU drain **279,000 m³** (4.15%)

Reduced Facility System Water Consumption

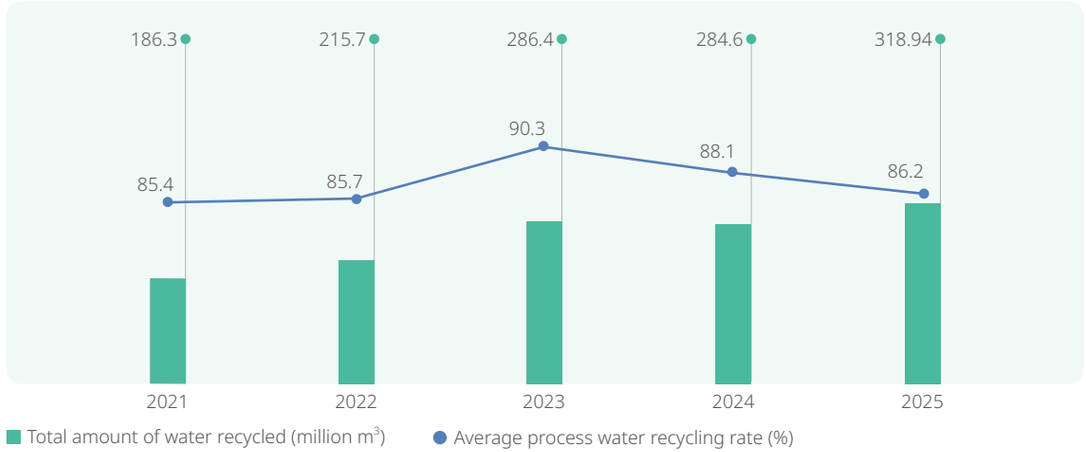
- Reduce backwashing water of cooling towers and sand filters by **236,000 m³** (3.51%)



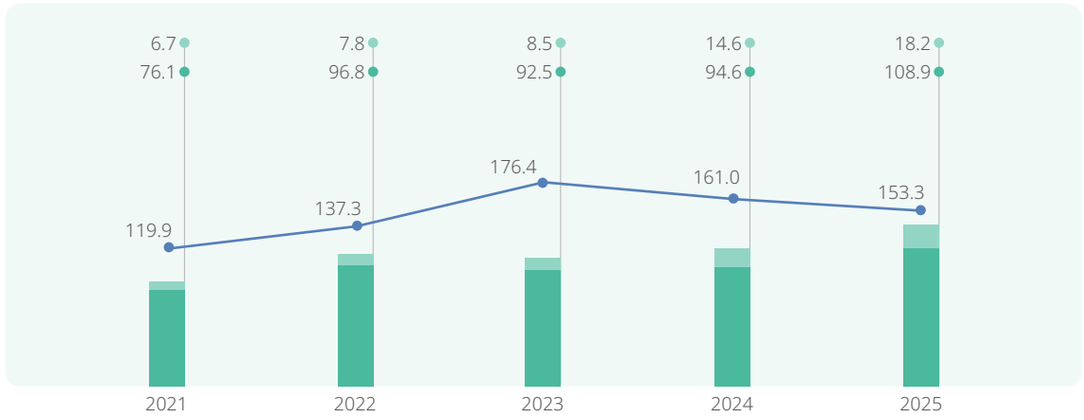
Annual Incremental Water Conservation



Water Recycling and Process Usage Efficiency

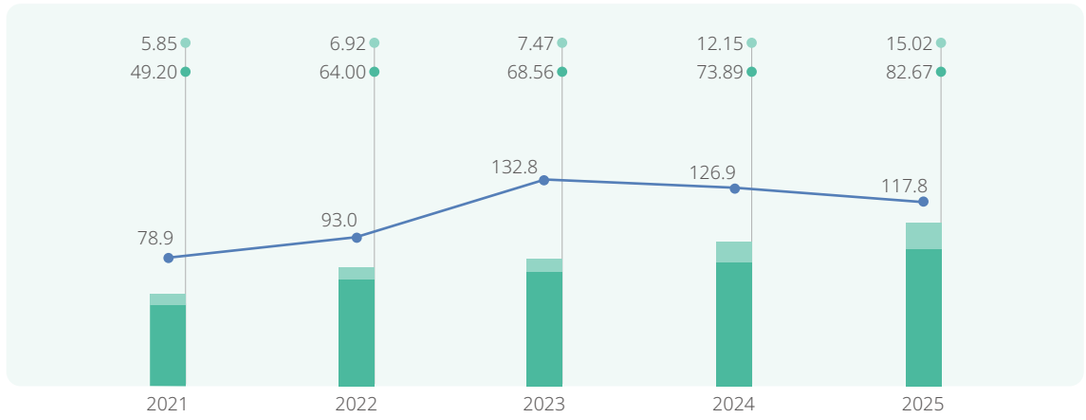


Tap Water Consumption and Water Consumption per Wafer-layer



Note: The scope of subsidiaries include TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, JASM, and VisEra.

Wastewater Discharge per Unit



Note: The scope of subsidiaries include TSMC (China), TSMC (Nanjing), TSMC Washington, LLC, TSMC Arizona, JASM, and VisEra.

Product Water Footprint

To effectively manage and reduce product water footprint, TSMC conducts a product water footprint assessment every three years, with third-party verification in accordance with ISO 14046. The 2024 assessment results indicate that, due to fab expansion and associated increases in water demand, the share of water footprint attributed to the wafer manufacturing stage increased. In response, TSMC strengthened water-saving measures in manufacturing processes to cut water consumption. At the same time, the Company monitors pollution prevention performance through the water pollution composite indicator reduction rate and actively develops advanced wastewater treatment technologies to improve pollutant removal efficiency and reach its environmental sustainability objectives.

Water Resources Education

Guided by the principle of shared prosperity between business and the environment, TSMC leverages environmental education to raise awareness of sustainable water use among both internal and external stakeholders. Externally, TSMC launched its environmental education website in 2025, providing the public with environmental education courses, activities, and outreach information. Among these initiatives, the TSMC S.T.S.P. Reclaimed Water Plant Environmental Education Center offers diversified water resource programs designed for different age groups, using interactive formats to enhance public awareness and engagement. In 2025, TSMC held a total of 71 events, attracting 2,971 participants and fostering greater public attention to water resource conservation.

Internally, TSMC continues to reinforce employees' water resource awareness. In addition to ongoing "Understanding Reclaimed Water Plant Tours," the Company launched two online courses in 2025, "Water Stewardship" and "TSMC Environmental Education: A Comprehensive Analysis of Water Stewardship." These courses provide knowledge on water resources and the Company's strategies, while encouraging employees to practice water conservation in daily operations. As of December, 1,550 employees completed both on-site activities and online courses.



TSMC promotes water resource education programs.

Case Study

Innovative Application of Reclaimed Water Cuts Chemical Usage by 20%

In 2024, TSMC successfully introduced reclaimed water into advanced manufacturing processes. Compared with tap water, reclaimed water contains significantly lower levels of total organic carbon (TOC) and conductivity, as well as sodium bromide originating from the treatment process. In 2025, TSMC further leveraged these characteristics by conducting precise analysis and adjustment of operating parameters of the ultrapure water system. As a result, consumption of chemicals including hydrochloric acid, sodium hydroxide, and sodium bromide in processes such as urea treatment, activated carbon, and ion exchange resin units was reduced by more than 20%. In addition, reduced TOC and turbidity extended the replacement cycle of activated carbon consumables by 30%, leading to additional cost and resource savings. This innovation demonstrates multiple benefits in process optimization, resource conservation, and environmental performance, underscoring TSMC's commitment to sustainable water stewardship.



TSMC uses reclaimed water to reduce energy and resource consumption.

Innovative Water Pollution Prevention Technology

TSMC continues to advance pollution prevention technologies through the development of an Ammonia Nitrogen Wastewater Diversion and Processing Inspection System , which reduces effluent conductivity by 40% and chemical usage by 30%. In 2025, the system was implemented at Fab 20 Phase 1, and was then validated at Fab 20 Phase 2 and Fab 22 Phase 1, demonstrating its scalability. The system is being adopted as a standard design for new fabs and further extended to existing facilities. In addition, for PFASs-containing process wastewater, TSMC introduced drinking-water-grade bituminous coal granular activated carbon (GAC) adsorption and filtration technology, achieving an average removal efficiency of 95%. The system was fully deployed at all existing fabs in 2025 and incorporated as the standard wastewater treatment design for new fabs, further enhancing overall treatment performance.

TSMC (Nanjing) completed a "Wastewater Phosphorus Reduction Project" in 2025 to comply with stringent local total phosphorus discharge regulations (3 ppm). Through optimization of the defluorination system, adoption of phosphorus-free corrosion inhibitors in cooling towers, and tighter control of phosphorus-containing chemicals, the site reduced total phosphorus discharge by more than 45%. The phosphorus-free cooling tower corrosion inhibitor not only addresses local discharge requirements but also demonstrates potential for company-wide application, demonstrating TSMC's green technology innovation capability.

Wastewater Classification and Resource System

TSMC establishes 39 wastewater diversion systems for recycling and reuse based on process wastewater composition and concentration characteristics. For wastewater that cannot be reclaimed, the Company applies membrane bioreactor systems, hypochlorous acid (HOCl) conversion systems, and high-gravity rotating beds before discharging treated effluent to science park wastewater treatment facilities. In 2025, the global Water Pollution Composite Indicator reduction rate reached 61.9%, exceeding the annual target of 60%. To ensure stable system operation and achieve zero failure in pollution control, wastewater treatment systems are equipped with redundancy and early warning mechanisms, enabling continuous operation in the event of system malfunctions. No abnormal wastewater discharge incidents occurred in 2025.

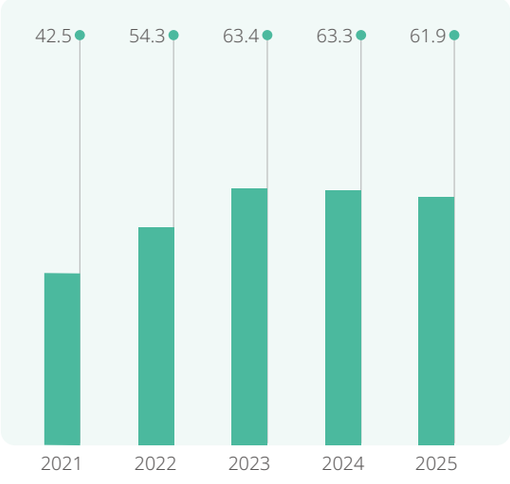
TSMC continuously enhances wastewater resource management.



In anticipation of Taiwan's total phosphorus effluent discharge standards taking effect in 2027, TSMC acted ahead of schedule by officially incorporating total phosphorus into its Water Pollution Composite Indicator management framework in 2025. The Company segregates and recovers phosphoric acid–containing wastewater at the source, then concentrates it using evaporation technology and transfers it to qualified recyclers for conversion into secondary industrial-grade phosphoric acid. This approach not only effectively manages total phosphorus levels in wastewater but also advances circular economy principles.

Water Pollution Composite Indicator Reduction Rates

Unit: %



Wastewater Classification and Resource System

Tap Water → Processing Equipment → Wastewater Classification and Resource System → Discharge to Onsite Wastewater Treatment Facilities → Rivers and the Environment

Reused by Other Industries

	39 Different Types of Liquid Classified	9 Recycling Systems	13 Types of Wastewater Treatment	8 Products Recycled
Hydrofluoric (HF) Acid Wastewater	• HF acid wastewater (two types) • Ozone-containing HF acid wastewater • Manufacturing process scrubbing water (two types)	• Hydrofluoric (HF) acid wastewater • Local scrubber wastewater recycling	• Chemical coagulation treatment of HF acid • HF (including ammonia) treatment • Biological treatment of HF acid wastewater	• Calcium fluoride • Fluorite Cryolit
Acidic, Caustic, and Organic Wastewater	• Deionized water • Acidic wastewater (three types) NEW • Ozone-containing acidic wastewater • Caustic wastewater • Ozone-containing Caustic wastewater • TMAH wastewater • Organic wastewater (two types)	• Acidic wastewater recycling • Ozone-containing acidic wastewater recycling • Caustic wastewater recycling • Caustic wastewater upcycling • Organic wastewater recycling	• Acidic and Caustic wastewater treatment • NH_4-N wastewater treatment and recycling • TMAH liquid waste recycling • Biological treatment system for organic wastewater	• Ammonium sulfate • TMAH
CMP Wastewater	• Electroplating wastewater • CMP wastewater (two types) • Copper-containing CMP wastewater • Cobalt-containing CMP wastewate	• Chemical coagulation recycling of CMP wastewater • Copper-containing CMP wastewater upcycling	• CMP wastewater treatment • Copper-containing CMP wastewater treatment • Cobalt-containing CMP wastewater treatment	• Silicon aluminum oxide
High concentration Liquid Waste	• Other wastewater (16 types) • Waste sulfuric acid • Waste copper sulfate • Cobalt-containing liquid		• Waste-H_2SO_4 reclamation • Copper-containing electroplating wastewater recycling • Cobalt-containing electroplating wastewater recycling	• Sulfuric acid • Copper bar • Cobalt bar