



Alliance for Water Stewardship (AWS) Report

TSMC has unveiled its Environmental Policy “to promote environment sustainability and to be a world-class company in environmental protection management as well as conservation of energy and other resources conservation” as its vision. In terms of water management, TSMC has introduced the *Alliance for Water Stewardship (AWS)* standard to enhance its strategies in water resource risk management, expanding diverse water resources, and developing prevention and control technologies to achieve sustainable water cycle action.

The *Alliance for Water Stewardship* sets the global standard for sustainable water management. TSMC has adopted the AWS sustainable water management standard since 2019 and has become the world’s first semiconductor company to achieve platinum-level verification. The company has also expanded its efforts to other sites, covering the water catchments of the Hsinchu Science Park, the Central Taiwan Science Park, and the Southern Taiwan Science Park, and collaborating with stakeholders to maintain regional water resources sustainably.

Organizations for Sustainable Water Management

Responsible Personnel / Unit	Roles and Responsibilities
Corporate ESH Division and Director	<ul style="list-style-type: none"> • Corporate management representative for environment, safety and health (ESH), and is responsible for corporate level water related management review • Water-related regulatory identification and communication • Water-related internal audit • Stakeholder communication for water-related topics
Fab Director	Fab management representative for environment, safety and health (ESH), and is responsible for fab water related management review
Facility Department	<p>The functional unit for AWS water management, and is responsible water-related tasks in fabs, including:</p> <ul style="list-style-type: none"> • Water risk identification and response • Operation and maintenance of water-related systems • Emergency response for water-related management • Water quality monitoring • Setting and implementing water-related goals and plans
Fab Industrial Safety and Environmental Protection Department	<ul style="list-style-type: none"> • Application and reporting for water-related permits • Water-related quality measurement • Water-related internal audit

Five Main Outcomes for Implementation of the AWS Standard

Category	Measures and Achievements
Good water governance	TSMC has incorporated water scarcity and flooding into its enterprise risk management, implemented climate risk mitigation programs, and continued to implement daily water conservation and water scarcity adaptation. At the same time, we continue to monitor the water storage capacity of local reservoirs, the water consumption status of our facilities, and national disaster information, and establish effective water management indicators and response procedures.
Sustainable water balance	The four major water conservation measures at TSMC are to "Reduce Facility System Water Consumption, Increase Wastewater Recycling of Facilities, Improve Water Production Rate of the System, and Decrease Water Discharge Loss from the System". In 2022, TSMC has been able to maintain a stable supply of process water through water-saving measures. The overall recycling system has increased water saving by 3.35 million metric tons, and the total recycled water consumption has reached 215 million metric tons.
Good water quality status	TSMC strives to uncover more opportunities to conserve water and has developed 38 distribution systems based on the composition and concentration of wastewater from fabrication for wastewater classification and resource management. With subsequent treatment equipment, each wastewater system can effectively degrade pollutants and be concentrated and reused through the recycling system, reducing the concentration of pollutants again, achieving the dual goals of pollutant reduction and recycling.
Important water-related areas	TSMC is striving to recover ecosystems surrounding TSMC fabs and make sure that the ecosystem is conducive to biodiversity. It opened the green ecological parks at Fab 12B, Fab 15, and Fab 14 to student tours. Students are able to experience cleanroom suits, engage in DIY activities, and conduct scientific experiments to strengthen their understanding and participation in environmental protection. In addition, eco-volunteers from TSMC serve regularly at the Shuihu Ecological Education Park to share the environment and the beauty of nature with the public.
Safe water, sanitation and hygiene	Relevant measures include establishing and maintaining a cleanliness system in the workplace, setting up a healthy and safe drinking water system and maintaining it regularly, improving the convenience of hand-washing facilities in the office, and strengthening epidemic prevention measures for infectious diseases (such as the novel coronavirus (COVID-19)).

Annual Water Management Goals and Performance

Performance Indicator	Unit	Goal	Base Year	Target Year	2022 Performance									
					Company-wide	Fab 5	Fab 6	Fab 12A	Fab 12B	Fab 14B	Fab 14P7	Fab 15A	Fab 15B	AP03
Unit Product Water Use	Liter/12-inch wafer-e-mask layer	Reduce 30%	Y2010	Y2030	-2.6%	31.8%	-42.0%	-8.8% Note 2	27.7% Note 2	-33.3% Note 3	11.3% Note 4	-15.8% Note 5	-50.4% Note 6	-7.6% Note 7
Water pollution composite indicator	%	Water pollution composite indicator 50% above effluent standards Note 1	-	Y2030	-54.3%	-10.8%	-41.2%	-54.5%	-34.1%	-51.1%	-61.2%	-59.0%	-44.7%	-83.0%

Note 1 The water pollution composite indicator is an integration of TSMC's pollutants as compared to the average reduction rate of effluent standards: Including chemical oxygen demand (COD), fluoride, suspended solids, ammonia nitrogen, nitrate nitrogen, arsenic, boron, copper and cobalt

Note 2 Base year is 2013, first year of mass production for Fab 12A/B

Note 3 Base year is 2015, first year of mass production for Fab 14B

Note 4 Base year is 2016, first year of mass production for Fab 14P7

Note 5 Base year is 2016, first year of mass production for Fab 15A

Note 6 Base year is 2018, first year of mass production for Fab 15B

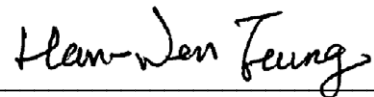
Note 7 Base year is 2016, first year of mass production for AP03 (Advanced Backend Fab 3); AP03's water consumption indicator unit is liter/12-inch wafer-e

AWS Demonstration Facilities Common Water-related Challenges and Responses with Stakeholders

Risk	Impact	Responding Action
Flooding	Production is affected, causing financial losses and a decrease in revenue	<ul style="list-style-type: none"> • Raise 2 meters of the building base of the fabs in Sothern Taiwan Science Park constructed after 2014 • Evaluate external public facilities and major suppliers for potential flooding risks and supervise them to mitigate risks • For factories with potential flooding risk, complete contingency drills as planned • Install water-proof gates for existing fabs and buildings in areas with high flooding risks
Drought	Production is affected, causing financial losses and a decrease in revenue	<ul style="list-style-type: none"> • Promote green factory and green building certifications • Promote fab water conservation and recycling • Collaborate with stakeholders on water-saving measures • Enhance preparedness of back-up water sources and water lorries
Unstable Water Supply	Impact on production, increase in operating costs	<ul style="list-style-type: none"> • Adopt and develop regenerated water • Establish a comprehensive water monitoring system

Water-related noncompliance records, and corrective and preventive actions

No violation records for water-related incident in last 5 years for TSMC AWS demonstration facilities.



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