

# Sustainable Water Management (Alliance for Water Stewardship, AWS) Report

The Alliance for Water Stewardship (AWS) sets the global standard for sustainable water management. TSMC became the first semiconductor company in the world to receive Platinum Certification when Fab 6 and Fab 14B were certified. Other TSMC fabs are using the “smart copy” technique to earn AWS certifications as well. In 2020, Fab 15A and Fab 15B broke records again by obtaining Platinum Certifications from AWS. In 2021, TSMC will be focusing on certifications for Hsinchu facilities including Fab 12A, Fab 12B, Fab 5, and Advanced Backend Fab 3.

## Organizations for Sustainable Water Management

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

## 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 to 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 2020, TSMC launched a backwash wastewater recycling system and was able to conserve 297,000 metric tons of water, further increasing water conservation levels in 2020 to 1.927 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	In response to the COVID-19 pandemic, TSMC established the Disease Prevention Guidelines to define responsible divisions for disease prevention, investigation approaches, health declarations, communication with external parties, inspecting disease prevention measures, disinfection, and other processes.

## Annual Water Management Goals and Performance

Performance Indicator	Unit	Goal	Base Year	Target Year	Y2020 Performance								
					Company-wide	Fab 5	Fab 6	Fab 12A	Fab 12B	Fab 14B	Fab 15A	Fab 15B	AP03
Unit Product Water Use	Liter/12-inch wafer-e-mask layer	Reduce 30%	Y2010	Y2030	-8.9%	-3.8%	-31.1%	7.3% Note 2	-10.5% Note 2	-39.3% Note 3	-10.5% Note 4	-46.1% Note 5	-47.4% Note 6
Water pollution composite indicator	%	Water pollution composite indicator 50% above effluent standards Note 1	-	Y2030	-42.4%	-52.4%	-50.8%	-53.5%	-22.0%	-45.6%	-59.3%	-34.1%	-91.8%

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, and copper

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

Note 3 Base year is 2016, first year of mass production for Fab 14B

Note 4 Base year is 2016, first year of mass production for Fab 15A

Note 5 Base year is 2018, first year of mass production for Fab 15B

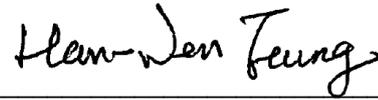
Note 6 Base year is 2016, first year of mass production for AP03 (Advanced Backend Fab 3); AP03's water consumption indicator unit is liter/12-inch wafer-e

## 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"><li>• Raise the building base of newly- construction fabs</li><li>• Install water-proof gates</li></ul>
Drought	Production is affected, causing financial losses and a decrease in revenue	<ul style="list-style-type: none"><li>• Promote green factory and green building certifications</li><li>• Promote fab water conservation and recycling</li><li>• Collaborate with stakeholders on water-saving measures</li><li>• Enhance preparedness of back-up water sources and water lorries</li></ul>
Unstable Water Supply	Impact on production, increase in operating costs	<ul style="list-style-type: none"><li>• Adopt and develop regenerated water</li><li>• Establish a comprehensive water monitoring system</li></ul>

### 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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