

SUSTAINABILITY

SSMC ECO GARDEN WINS GOLD AWARD 2018

SSMC is honoured by National Parks Board Singapore who presented SSMC the CIB Gold Award in Jun 2018. The awards aim to motivate and encourage community gardeners to cultivate a sustainable environment and be part of national efforts in making Singapore a garden city. SSMC Eco Garden is up-keep by SSMC's Gardening interest Group, the interest group members. The team shows their passion and talents in using environmental friendly approach to maintain the garden which demonstrates outstanding quality in the following area:

- Garden Quality - landscaping creativity, layout and garden maintenance
- Gardening volunteers' involvement - fostering community bonding and promote a love for gardening
- Biodiversity & Environmental Friendliness - friendly practices are used to minimise the impact on the environment

SSMC IS FEATURED IN THE STRAITS TIMES ON 21 MAR

SSMC is featured in The Straits Times newspaper on 21 Mar: Mr. Jagadish and his colleagues ensure that the equipment is working at optimal energy-efficient level. Using energy efficient pumps is the one of the many ways of SSMC in caring for the environment and fighting the climate change. Besides, we also introduced the use of non-hazardous chemicals to reduce greenhouse gas emission. He commented "We should all strive to demonstrate a strong commitment to social responsibility by transforming the world into a better place, improving the lives we touch and preserving a clean, green and sustainable environment."



Caring for the environment together

We can start with small steps to contribute to a clean, green and sustainable Singapore

By Nur Syahiidah Zainal
SPH Content Lab

Leading by example

**Mr Jagadish CV walks the talk
when it comes to saving energy**

Guided by the strong vision of its Chief Executive Officer, Mr Jagadish CV, 61, Systems on Silicon Manufacturing Company (SSMC) is making strong headway in environmental sustainability in the semiconductor industry.

In an industry where there is high consumption of water and energy, SSMC has put in place measures to ensure it is as energy-efficient and sustainable as possible.

In 2006, Mr Jagadish set up a committee to promote awareness of environmental issues among the company's more than 1,600 staff, and ensured that they adhered to the set of sustainability practices put in place to reduce the company's environmental footprint.

Over the next decade, a slew of measures helped the company save more than 20 gigawatt-hours of electricity — enough to power approximately 4,200 four-room HDB flats for a year. Equipment such as pumps and chillers were upgraded to optimise energy usage.

To promote sustainability, the company introduced the use of non-hazardous chemicals in its manufacturing process — which also helps to reduce greenhouse gas emissions, and fluoride-related waste through its wastewater treatment.

Not satisfied with just fixing processes and machines, Mr Jagadish actively persuades colleagues to join him in his quest for energy savings beyond the workplace.

He encourages them to adopt energy-efficient practices such as using LED light bulbs at home, switching off appliances



Mr Jagadish and his colleagues ensuring that the equipment is working at optimal energy-efficient levels. PHOTOS: RAY CHUA KAR TZENG

at the power socket when not in use, and setting the air-conditioner temperature at 25°C or higher. He also encourages his colleagues to purchase energy-efficient home appliances and electronics that have more ticks on the Energy Label.

Mr Jagadish is heartened by his colleagues' commitment to care for the environment. Their actions, as well as the company's initiatives, play a role in Singapore's efforts to fight climate change.

"We should all strive to demonstrate a strong commitment to social responsibility by transforming the world into a better place, improving the lives we touch and preserving a clean, green and sustainable environment for our future generations," he says.

To that end, Mr Jagadish has become the driving force behind the company's corporate social responsibility efforts.

For example, since 2011, SSMC has been engaging schools in environment-

related activities.

These include educational visits to Semakau Landfill to document the flora and fauna, learning about mangroves in the Pasir Ris area, and beach clean-ups at Pasir Ris Beach.

Mr Jagadish says: "We are always seeking opportunities to inspire the next generation. Our outreach programmes give us a platform to work with the youth for a cleaner and more sustainable future."

Take climate action today for a sustainable future

By the end of this century,
Singapore may face the
following effects of
climate change:



Daily temperatures could
rise by 1.4° C to 4.6° C



Wet months are likely to be
wetter and dry months drier.
More intense and frequent
heavy rainfall are projected.



Mean sea levels could
rise by up to 1 metre

Here are some steps we can take to reduce our carbon footprint:



Switch off after use



Set air conditioner
at 25°C

SSMC'S WATER RECYCLING EFFORT IS FEATURED IN CHANNEL NEWS ASIA'S "BLUEPRINT FOR SURVIVAL"

On 17 Jan 2018, SSMC was featured in the documentary of ChannelNewsAsia, "Blueprint for Survival". Supporting PUB's industrial water recycling initiative, SSMC made history in being the first for using NEWater in the semiconductor industry. As a result, 100% of semiconductor wafer fabs together with over 600 companies in Singapore reap the benefits of NEWater. Together, we made a difference in water conservation; paving the path for tomorrow.

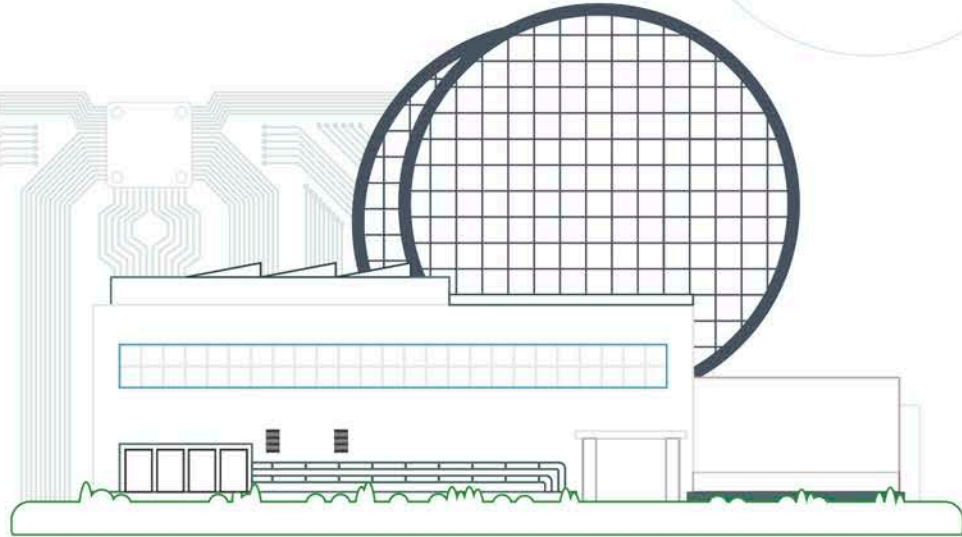


SSMC IS CITED IN WAFER FAB INDUSTRY BEST PRACTICE WATER EFFICIENCY GUIDE

The Wafer Fabrication and Semiconductor sector is one of the largest water consuming industries in Singapore. PUB published a guide on July 2018 that seeks to share the best practice in efficient water management in our industry and SSMC is showcased as a living example in the case study.

Our 3Rs initiatives include reusing wet bench discharge waste, optimizing wet bench flow rates and commissioning new water recycling plants to recycle different sources of wastewater such as CMP waste water, organic waste water and acid rinse waste water etc. Together with our recent implementation of local scrubber reuse system, filtration and reverse osmosis system and Hydrofluoric treatment plant, today, SSMC achieved the highest recycling rate (~70%) in the industry in Singapore.

BEST PRACTICE GUIDE IN WATER EFFICIENCY WAFER FABRICATION AND SEMICONDUCTOR SECTOR VERSION 1



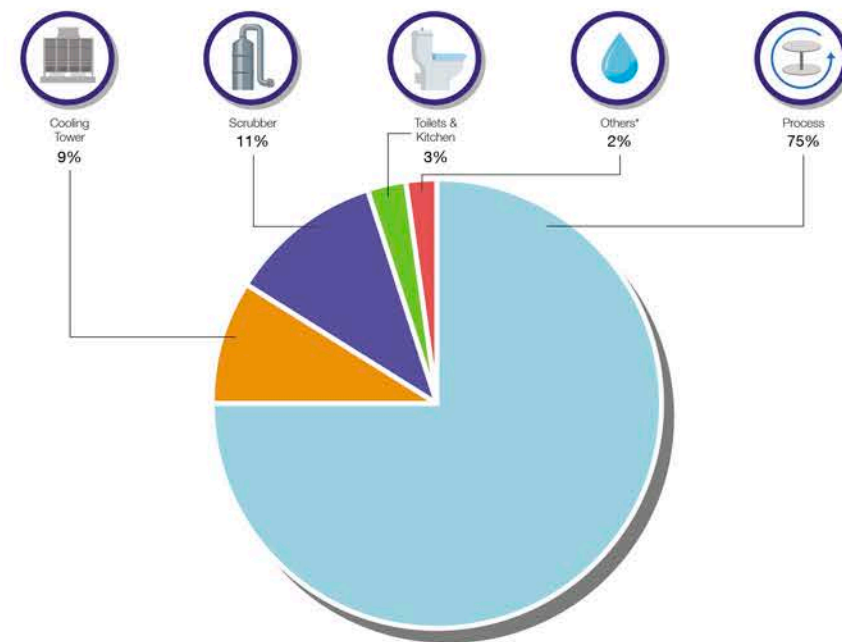
BEST PRACTICE GUIDE IN WATER EFFICIENCY

WAFA FABRICATION AND SEMICONDUCTOR SECTOR

VERSION 1

1 INTRODUCTION

The Wafer Fabrication and Semiconductor sector is one of the largest water consuming industries in Singapore. The water usage breakdown of the sector is as shown in Fig. 1.



* Others include fire protection, irrigation etc

▲ Fig. 1 Water usage breakdown for Wafer Fabrication and Semiconductor sector

Given the limited water resource that Singapore possesses, PUB encourages industries to improve their water efficiency through the following: (a) Reduce, (b) Reuse/Recycle, and (c) Replace (i.e. use of alternative sources of water such as seawater cooling, rainwater reuse).

Many wafer fabrication and semiconductor plants do incorporate some form of water reuse and recycling in the plant, albeit to different degrees. For process use, each facility has its own UPW (Ultra-Pure Water) production plant and the UPW system configuration varies depending on final water quality requirements. Most of the facilities have various degrees of internal

re-circulation/recycling within the UPW plant to maximize the recycling rate.

This guide seeks to share with companies the water efficiency opportunities that companies within the sector have implemented and to provide practical guidance for efficient water management in the wafer fabrication and semiconductor sector. It is not intended to be prescriptive nor does it set an industry standard.

Companies may wish to read this guide in conjunction with the SS577:2012 Water Efficiency Management Systems and Technical Reference for Water Conservation in Cooling Towers.

5 CASE STUDIES

Systems on Silicon Manufacturing Company Pte Ltd



An advanced wafer fabrication manufacturer, Systems on Silicon Manufacturing Company Pte Ltd (SSMC) obtained the Water Efficient Building (Gold) Certification in 2013, Watermark Award in 2013 and President's Award for the Environment in 2015. Their commitment to making a positive impact to the environment and community is supported by integrating the water conservation component as part of their ECOvision Journey, where they monitor their consumption in the areas of energy, water, generation of waste and use of substances, in the planning process and sustaining their efforts through daily operations and external outreach to all stakeholders (employees, suppliers, customers and the community).

The first wafer fabrication company in Singapore to use NEWater for wafer processing in 2003, SSMC remains fully committed to water conservation and has seen a reduction in their annual water consumption, even as their operations expand to more than double in capacity over the years. Their initiatives include reusing wet bench discharge waste, optimizing wet bench flow rates and commissioning new water recycling plants to recycle different sources of wastewater such as CMP waste water, organic waste water and acid rinse waste water etc.



▲ Fig. 3 Aerial view of SSMC



▲ Fig. 4 Wafer fabrication process

In 2012, SSMC tapped onto PUB's Water Efficiency Fund to install a local scrubber reuse system to recycle the wastewater used by their local scrubber systems, resulting in annual savings of more than 300,000 m³. The key technologies include filtration and reverse osmosis with appropriate dosing and ion exchange system. These efforts have yielded a yearly reduction

of more than 2 million m³ of water. SSMC's latest Best Known Method is to segregate ultrapure Hydrofluoric Acid (~1%) from production tools and reclaim the water for UPW inlet, resulting in annual NEWater savings of 88,000m³. Through various water efficiency initiatives, SSMC achieved a recycling rate of 68% in 2016, which is the highest in the industry.

EXTENDING SUPPORT TO GREATER COMMUNITY

2018 was a year Sports, Recreation and Community (SRC) accomplished new milestones. Community activities were not restricted to just local support. This year, fund raising went a step further to aid global mishaps and less fortunate nationalities around the world. Staffs played their part in different ways and showing compassion with a BIG HEART to the community.



SWIM MARATHON FUND RAISING

The first SSMC swim for charity event was held on 29th April at Sports Lifestyle Centre, 3500A Bukit Merah Central. Staffs and their families made their contribution for a good cause to the End Polio Now campaign and Footballplus Champions Program organized by the Rotary Global Club. The swimmers started their swim at 8.30am and they swam a total of 10.3km or 103 laps of 100m each within an hour! A total of \$1,436 was raised to support this cause.

GIVING BACK TO OUR SOCIETY



HAIR FOR HOPE

Hair for Hope is Children's Cancer Foundation's signature fundraising event. This event was held on 29th July at Vivo City where heads are shaved to reflect the outlook of a cancer patient who undergoes chemotherapy. Chemotherapy treatment attacks rapidly growing cells in body that includes hair roots. Staffs went down to Vivo City and they made their pledge to support a "Bald" Statement to help needy families to aid the cost of treatment.





BLOOD DONATION

The annual blood donation on 28th August in SSMC was run by Singapore Red Cross. Blood is needed to save lives in times of emergencies and to sustain lives of those with medical conditions, like leukemia, thalassaemia and bleeding disorder, as well as patients who are undergoing major surgeries. This year, a record collection of 60 bags of blood were donated in a single day-drive. Staffs would go through a medical review with the doctor prior to the administration of blood collection. In about an hour, a full bag of blood is collected and each bag can save 3 lives.



INDIA – KERALA FLOOD DONATION DRIVE

This donation drive was initiated by a Photo colleague to support the mishap of a massive flood that hit the Southern state of India, Kerala in July 2018. During that period, lives were lost and 353,000 people had to take shelter in 3,026 relief camps. Together with his fellow colleagues and the support from SRC committee, a donation drive was held in the canteen on 10th and 11th September to aid this cause. During the 2 day donation drive, 162 employees together with company's distribution, a heart-warming total collection of \$6,072 was raised. This drive depicts 2 core values of our company. "Taking Initiative" and "Working Together"