



TTSH Earth Day - Projects Showcase and Sharing

By Goh Mia Siang, FMO

What is This About

- Tan Tock Seng Hospital (TTSH) is committed to environmental sustainability by reducing energy and water consumption through the adoption of innovative technologies, best practices, and active staff engagement.
- The Earth Day Project Showcase highlights key initiatives that demonstrate how sustainability and financial responsibility can go hand in hand, delivering both ecological benefits and operational savings.
- The facilities team believes that everyone has a part to play in conserving resources to preserve the earth's environment.



Why Should I Care

- Hospitals are major consumers of energy and water, leading to high operational costs and environmental impact.
- TTSH recognizes the importance of sustainability in ensuring long-term resilience. Rising energy and water demands, coupled with increasing costs and environmental concerns, underscore the need for proactive solutions.
- Ongoing resource conservation initiatives drive meaningful change, leading to substantial cost savings and a reduced environmental footprint.
- By integrating sustainability into daily operations, TTSH not only enhances efficiency and reduces consumption, but aims to meet GreenGov.SG targets to lead the way in sustainable development, contributing to a greener future.



Achievements:

**2006
Building & Construction
Authority (BCA) Green Mark
Certification
Platinum Award
(Retrofitted Building)**



**2006
ASEAN Energy Efficient
Building Competition
1st Position
(Retrofitted Building)**



**2023
SS ISO 46001:2019
Water Efficiency
Management
Certification**



**2024
Building & Construction
Authority (BCA) Green
Mark Certification
Platinum Super Low
Energy (SLE)**



Achievements:

TTSH started its Energy & Water Conservation Program since 1998. The effort earned TTSH BCA Green Mark (GM) Platinum Award in 2006 - the **first acute general hospital** to achieve. Same year, TTSH won ASEAN Energy Efficient Building Competition 1st position. Today, most of the initiatives had been adopted by others.

On 10th May 2024 mTTSH became the **first acute general hospital** to attained the GM Platinum Super Low Energy (SLE) certification.

Dedication to environmental sustainability aside, TTSH also show responsible financial stewardship of public fund in:

- ❖ Attaining the GM Platinum SLE without spending the budget granted by MOH for engagement of consultant to achieve study and help NHG PHIs achieve the certification, **saving \$779,041**.
- ❖ Implementing mTTSH Chiller EOL Replacement Project with **4R (Review, Reduce, Recycle & Reuse)**. Not only this **saved ~\$2.5 millions**; it also reduced the Embodied Carbon of the project, with no compromise in resiliency, operational readiness, or plant efficiency. The **4R** approach along with the laborious process of working on the many GM Platinum SLE requirements earned certification.

Achieving the certification not only signifies compliance with high energy and water management standards but also highlights the institution efforts to reduce operational costs through efficient energy/water usage, while maintaining exceptional healthcare services.

1. Energy Conservation Initiatives:

A. Chiller Plant Optimization:

- Implemented the Chiller End-of-Life (EOL) replacement project, reducing energy consumption saving approximately \$700,000 annually.
- Integrated adaptive control systems to optimize chiller performance.
- Achieved annual energy savings of over 3,300,000 kWh, equivalent to the yearly energy consumption of 700 units of 4-room HDB flats.

B. LED Lighting Conversion:

- Upgraded about 80% of lighting to energy-efficient LED systems.
- Adopted an Energy Performance Contracting (EPC) model, resulting in \$212,491 annual cost savings and an energy reduction of 2,458,425 kWh (equivalent to 983 tons of CO₂ reduction).



Integration of adaptive control in chiller system automation to optimize performance and reducing energy consumption

Chiller End-of-Life (EOL) replacement

Conservation Initiatives (Energy)

C. Solar Energy Initiatives:

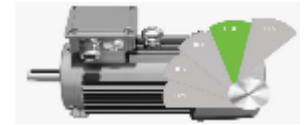
- Proposed to install photovoltaic solar panels at the Medical Centre and Atrium Blocks.
- Generate energy savings of approx. 400,000 kWh, equivalent to the annual energy consumption of 93 units of 4-room HDB flats.



Photovoltaic Solar Panels

D. Air Handling Unit (AHU) and Fan Coil Unit (FCU) End-of-Life Replacement :

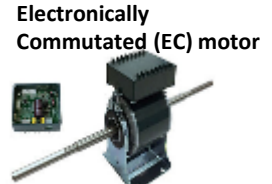
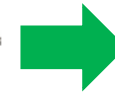
- Implemented AHU and FCU End-of-Life replacement projects, resulting in:
- 212,474 kWh savings for AHU, equivalent to the annual consumption of 47 units of 4-room HDB flats.
- 67,550 kWh savings for FCU, equivalent to the annual consumption of 15 units of 4-room HDB flats.



Air Handling Unit (AHU) End of Life Replacement



Induction motor



Fan Coil Unit (FCU) End of Life Replacement

Conservation Initiatives (Water)

A. Efficient Fixtures

- Replaced manual faucets with sensor-based taps (3-tick Mandatory Water Efficiency Labelling (WELS) rating).
- Upgraded manual flush valves to automated toilet flush systems for greater efficiency.

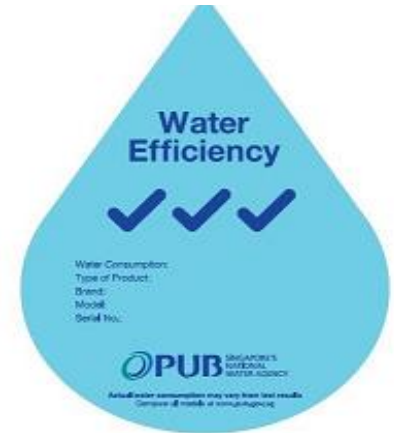


B. Rainwater Harvesting:

- Installed a rainwater collection system at Carpark A to support irrigation needs.

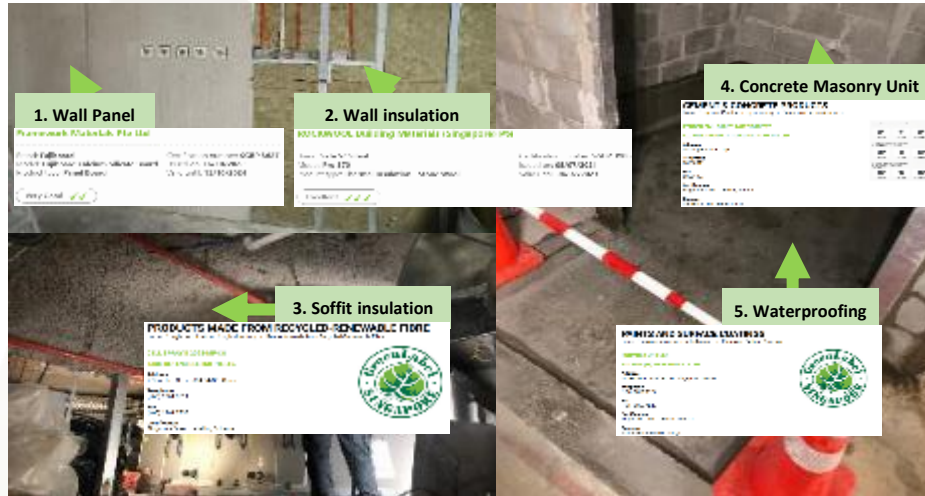
C. Water-Efficient Equipment:

- Upgraded the central kitchen dishwasher to a water-saving model.



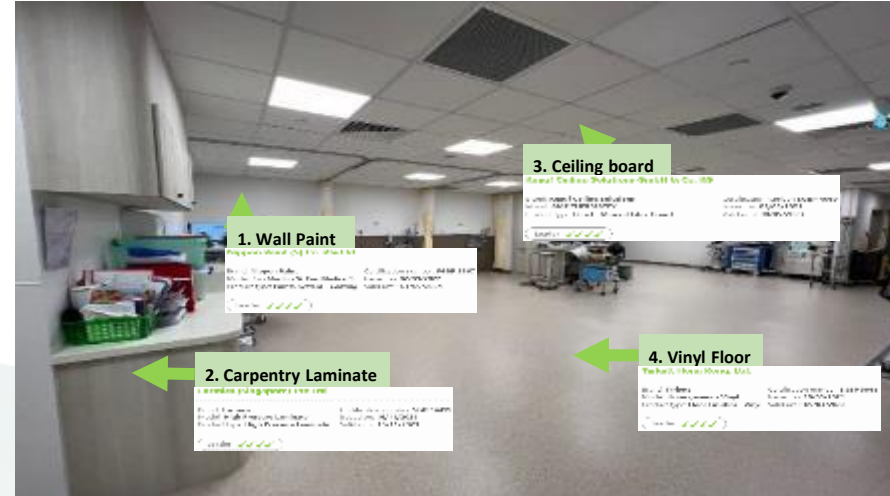
Using “Green Products” for Construction

TTSH incorporates environmentally preferred materials through the Singapore Green Labelling Scheme (SGLS) and Singapore Green Building Product (SGBP) certification to reduce environmental impact.



Singapore Green Building Product (SGBP)

- Assesses products based on their sustainability performance.
- Environmental and health impacts can occur across a product's lifecycle, from raw material extraction or cultivation, through manufacturing, use and end-of-use management.
- The SGBP certification scheme looks at the whole lifecycle of products to account for the full impact.



Singapore Green Labelling Scheme (SGLS)

- Help public identify environmentally preferred products that meet certain eco-standards.
- A type 1 Ecolabel independently verified by 3rd party based on the life cycle considerations.
- Addresses the main environmental impacts of a given product and place limits for compliancy to reduce these impacts.



How Can You Help?

Simple Actions for Everyone:

- Turn off lights, air conditioning, and equipment when not in use.
- Keep doors and windows closed in air-conditioned areas.
- Set thermostats to 25°C for optimal cooling efficiency.

Water-Saving Habits:

- Turn off the tap while soaping hands or washing cups or dishes.
- Take shorter showers and turn off the water while lathering.
- Report leaks and faulty fixtures immediately.

Sustainable Work Practices:

- Print only when necessary, use double-sided printing.
- Secure digital documents instead of making photocopies.
- Reduce unnecessary printing by using cloud storage and electronic documentation.



PLEASE TURN OFF THE LIGHTS WHEN NOT IN USE



5. Future : A Leader in Green Healthcare

Charting TTSH's Journey to Net-Zero CO2 Emissions

2030

- Achieve a 10% reduction in both the Energy Utilisation Index¹ (EUI) and the Water Efficiency Index² (WEI) by **2030**, in line with GreenGov.SG targets.

2050

- Achieve **Net-Zero CO2 Emissions** by **2050** through energy conservation, smart technologies, and the construction of environmentally sustainable facilities. In collaboration with patients and partners, we are creating a healthcare environment that supports both people and the planet.

¹Energy Utilisation Index is energy consumption divided by the total Gross Floor Area of the premises.

²Water Efficiency Index is the water consumption per day divided by the total number of public officer headcount, including visitors to the premises.



Thank You 

 Tan Tock Seng
HOSPITAL