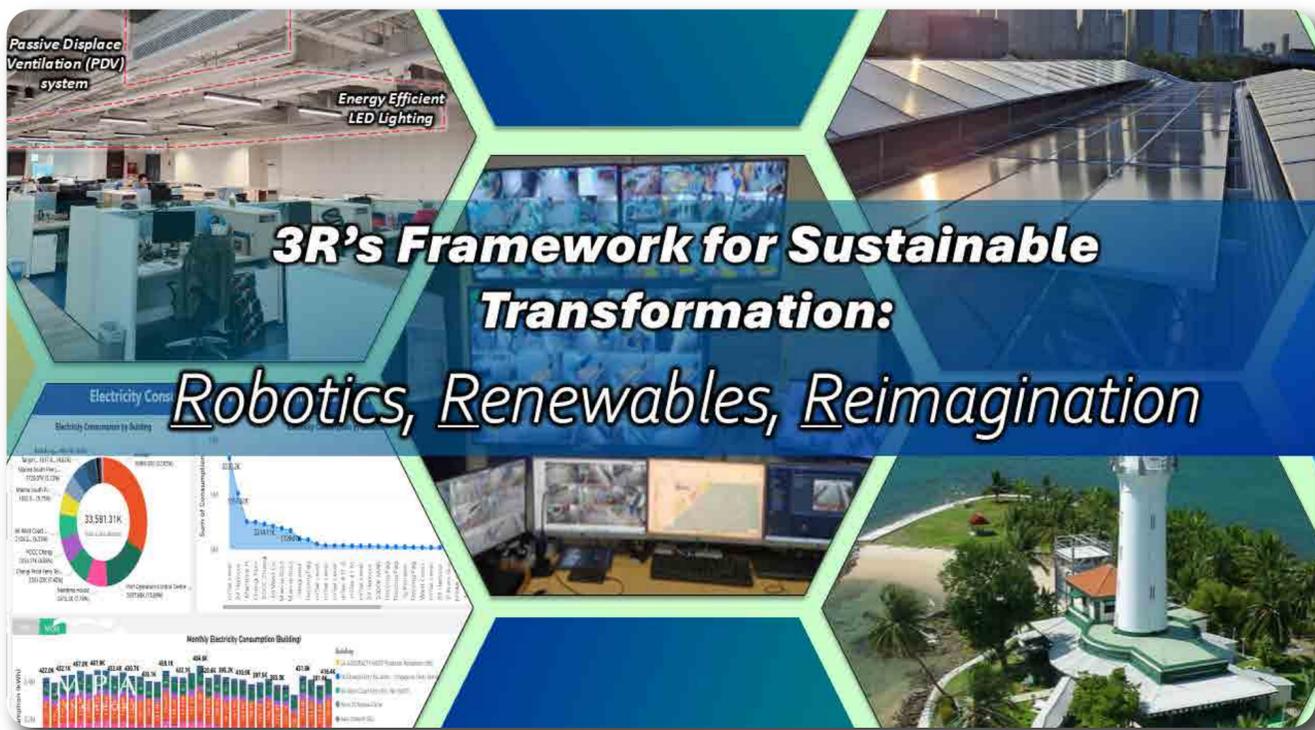


MINISTER'S VALUE-FOR-MONEY ACHIEVEMENT AWARD



MERIT AWARD

3R'S FRAMEWORK FOR SUSTAINABLE TRANSFORMATION: ROBOTICS, RENEWABLES, RE-IMAGINE



PROJECT TEAM



Er. Tham Wai Wah	Advisor
Er. Albert Cheng	Facilitator
Chua Wee Liang	Co-Team Leader
Er. Ray Tan	Co-Team Leader
Chris Ong	Member
Philip Tang	Member
Jeremy Kwok	Member
Lily Tan	Member
Chiok Hwee Kian	Member
Audrey Huang	Member
Tan Qin Xiang	Member
Desmond Leong	Member

OVERVIEW

NEED FOR
PROJECT

SOLUTION

IMPACT

MINISTER'S VALUE-FOR-MONEY ACHIEVEMENT AWARD



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3R'S FRAMEWORK FOR SUSTAINABLE TRANSFORMATION: ROBOTICS, RENEWABLES, RE-IMAGINE

NEED FOR PROJECT



- Singapore's facilities management sector was challenged by escalating operating costs under the combined pressures of manpower crunch, high energy prices, and accelerating imperative to decarbonise by 2050.
- Security services had become a major cost driver due to the manpower crunch and significant wage increases. To manage these escalating costs, MPA should adopt innovative, technology-driven solutions to reduce reliance on manpower.
- Energy prices had surged due to global conflicts, tight supply, and strong demand, driving Singapore's electricity tariffs up by about 40% since 2020 and keeping them elevated.
- Carbon tax raised progressively from \$25 per tonne in 2024 to around \$50 to \$80 per tonne by 2030, to support Singapore's target of achieving net-zero emissions by 2050.

PROBLEM STATEMENT

Need to find a solution that reduced facility management costs while improving environmental sustainability and maintaining performance standards.

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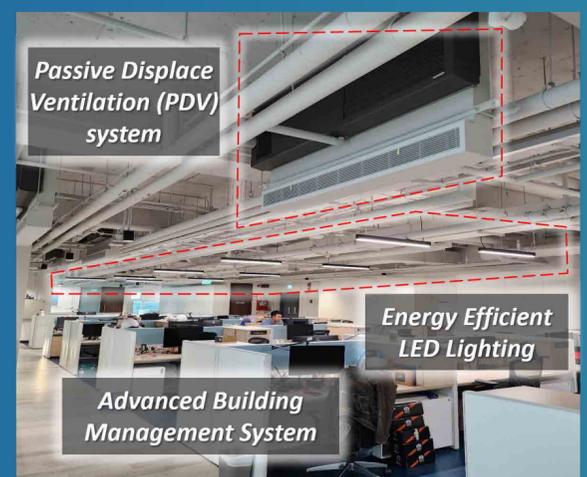
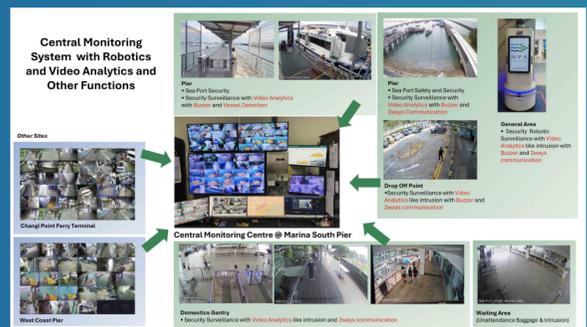


MERIT AWARD

3R'S FRAMEWORK FOR SUSTAINABLE TRANSFORMATION: ROBOTICS, RENEWABLES, RE-IMAGINE

SOLUTION

- Implemented the 3R's Framework: synergistic integration of Robotics & Automation with existing facility operations, development of highly-efficient Renewable Energy infrastructures and bold Re-imagination of facility design and energy management processes to enhance energy efficiency and mitigate rising energy prices.
- Centralised and upgraded the surveillance systems with AI to *automate* threat detection and improved response across its facilities. This reduced manpower needs while enabling security officers to focus on higher-value tasks.
- Rejuvenated office spaces from blank slate to complete **Re-imagination** of office space design.
 - Integrated energy saving features into refreshed office space, with MPA as first Government Agency to pioneer deployment of Passive Displacement Ventilation (PDV) system within existing commercial building.
 - Secured a competitive bulk electricity rate of 16.5 cents/kWh.
- Installed Best-in-class Solar Panels and Building-Integrated PV Panels (BIPV) at Marina South Pier to maximise on-site generation of **Renewable Energy** so as to offset energy consumption and support power requirements for future expansion of electric harbour craft charging infrastructures.



MINISTER'S VALUE-FOR-MONEY ACHIEVEMENT AWARD



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3R'S FRAMEWORK FOR SUSTAINABLE TRANSFORMATION: ROBOTICS, RENEWABLES, RE-IMAGINE

SOLUTION STATEMENT

Implemented the 3R's Framework to address key facility management cost drivers while promoting operational efficiency and environmental sustainability.

MINISTER'S VALUE-FOR-MONEY ACHIEVEMENT AWARD



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3R'S FRAMEWORK FOR SUSTAINABLE TRANSFORMATION: ROBOTICS, RENEWABLES, RE-IMAGINE

IMPACT



- The AI-enabled and Central Monitoring Systems (**Robotics & Automation**) cut 35,040 manhours annually and let officers focused on higher-value tasks. They provided 24/7 coverage with real-time alerts, improving threat detection and response.
- The best-in-class Solar PV system at MSP used high-efficiency PV panels and with optimisation of usage space, increased **Renewable Energy** by 210%.
 - MSP achieved self-sufficiency for daytime peak electricity demand and abated 329.6 tonnes of CO₂-equivalent annually.
 - This was in line with Public Service's target to attain net-zero emissions by 2045.
- **Re-imagination** of refreshed office spaces achieved a 14% reduction in energy consumption through PDV air-conditioning, smart lighting, and building management systems, meeting GreenGov.SG 2030 target.
- **Cost savings: \$1.30mil annually** in security, electricity and renewable energy.

MINISTER'S VALUE-FOR-MONEY ACHIEVEMENT AWARD



MERIT AWARD

3R'S FRAMEWORK FOR SUSTAINABLE TRANSFORMATION: ROBOTICS, RENEWABLES, RE-IMAGINE

OUTCOME STATEMENT

MPA's 3R's Framework cut operating costs while enhancing environmental sustainability and maintaining high performance standards.