



The effects of climate change weaves through our daily lives, affecting everyone regardless of their socioeconomic status or nationality.

Countries across the globe are racing to slow down, if not revert, the effects of climate change. Singapore is no exception, setting ambitious yet concrete targets to combat climate change.

## The Client

The National Environment Agency (NEA) of Singapore drives the nation-wide initiatives to ensure a clean and sustainable environment of Singapore. The recently launched Green Plan 2030 is a whole-of-nation sustainable development agenda that focuses on sustainability, waste minimisation and co-creating environmental solutions with citizens. Some of the targets include reducing waste sent to our landfills by 30% and using 15% less energy in our Housing Development Board (HDB) towns.

## The System

### Digitally Transforming Singapore's Waste and Resources Ecosystem

As part of the green initiative, a new system, the new Waste and Resources Management System (WRMS), is commissioned to facilitate waste minimisation and resource sustainability by integrating all waste-related systems into an ecosystem. WRMS enables NEA to drive public sector environment sustainability initiatives, ensure waste minimisation and co-create with citizens for a cleaner and more sustainable environment.

## The Solution

### ➤ Utilising Technology to Track Public Sector Energy Consumption

GreenGov.SG initiative, formally known as the Public Sector Taking the Lead in Environmental Sustainability (PSTLES), has recently been launched. This change comes with ambitious targets of the public sector peaking carbon emissions in 2025.

Having visibility of the resource consumption is essential for NEA to make informed decisions and policies to lead Singapore's environmental sustainability efforts. WRMS enables NEA to collect and analyse energy consumption across various industries with the NEA Survey System (NSS).

The NEA Survey System (NSS) supports the NEA in data collection across various industries. It provides an analysis of Singapore's waste management, resource consumption and public sector environment sustainability initiatives. NSS automates the entire survey process, from planning, design and creation, tracking of survey submissions to analysis and reporting.

### ➤ Ensuring Waste Minimisation and Proper Waste Disposal

Singapore's first and only offshore landfill, Semakau Island, is built to achieve land use optimisation and efficient waste management. However, with Singapore producing about 7 million tonnes of waste each year, the island is expected to run out of space by 2035.

As part of Singapore's towards zero waste journey and the country's bid to extend the Semakau Landfill lifespan beyond 2030, the Environmental Public Health Act (EPHA) was enacted to enable the mandatory reporting of waste data and submission of waste reduction plans.

WRMS brings together all stakeholders of the waste management ecosystem into a single platform, enabling the easy management of waste minimisation initiatives and reporting. Industrial premises, hotels and shopping malls can easily submit their waste report and waste reduction plan via WRMS. Waste collection and disposal data from the Public Waste Collectors (PWC) is also captured by the system. This provides NEA with comprehensive data to predict the space left in the landfill and planning of waste management initiatives.

### ➤ Cloud-Native System to Co-Create with Stakeholders and Scale with Green Initiatives

Climate change is an ever evolving issue. As Singapore steps up efforts for a more resilient future, more green initiatives are expected. To enable NEA to respond quickly to policy changes and scale to meet ever-changing needs, WRMS leverages the Ecquaria Government Platform Enterprise Edition (EGP EE) and new technologies, such as microservices and containers, to enable business agility and uninterrupted operations.

By decomposing WRMS into smaller microservices, it gives a level of modularity as each microservice can be deployed, updated and scaled independently. Instead of updating the entire application, the loosely-coupled microservices can be easily updated and deployed. This allows NEA to respond promptly to the new initiatives and co-create with stakeholders and citizens for a cleaner and more sustainable environment.