

# Singapore's Journey: *Embracing Sustainable Development in a High Density City State*



# Singapore: Sustainability Driven by Necessity

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Land Area: 720 km<sup>2</sup>

Population: 5.61 million

# #1: Long Term Strategic Planning Waste Management Infrastructure

## How the waste system works

### 1 Chutes

- Rubbish is thrown into household chutes.
- No modification to the chutes is needed during the transition to the new system.

### 2 Discharge valves

- The rubbish ends up in bins at the bottom of blocks.
- When the bins are full, sensors will instruct valves to open and drop the trash into underground pipes.

### 3 Pneumatic pipes

- Waste is then transported by air suction to a centralised bin centre in the precinct, at a speed of 50kmh to 80kmh.
- It takes less than a minute for the waste to travel from the blocks to the centralised bin centre.

### 4 Recycling

- Outdoor disposal inlets where the public can throw recyclable waste will also be linked to the system.

### 5 Air inlets

- 18 air inlets in the neighbourhood allow air into the underground pipe network, enabling smooth airflow along the pipes.

### 6 Cyclone separators

- Waste at the centralised bin centre is sucked through a cyclone, where it is separated from the transport air.
- The waste then falls into a compactor below while the air flows into another pipe.

### 7 Exhausters

- These are centrifugal fans that drive the airflow in the pipe network.

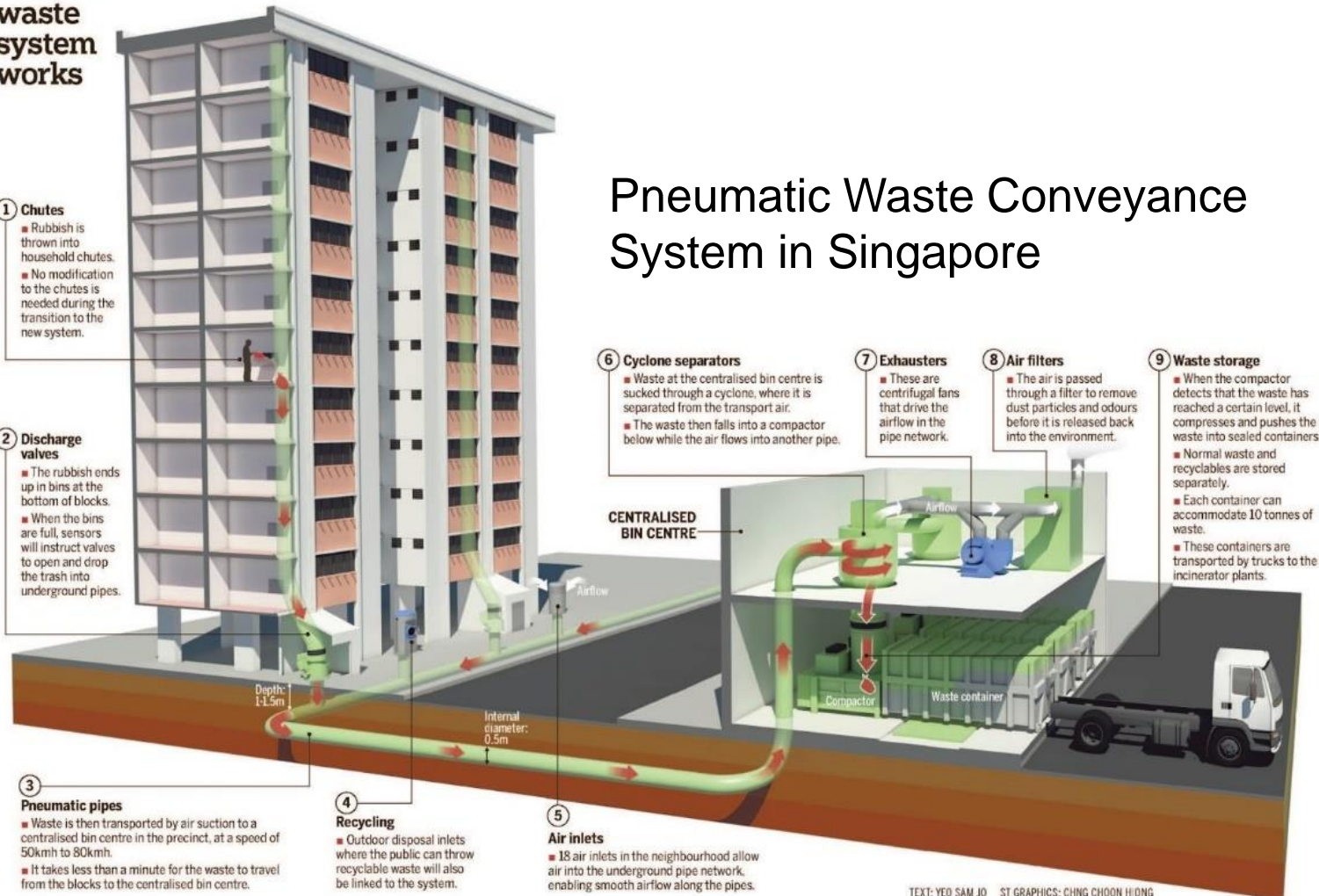
### 8 Air filters

- The air is passed through a filter to remove dust particles and odours before it is released back into the environment.

### 9 Waste storage

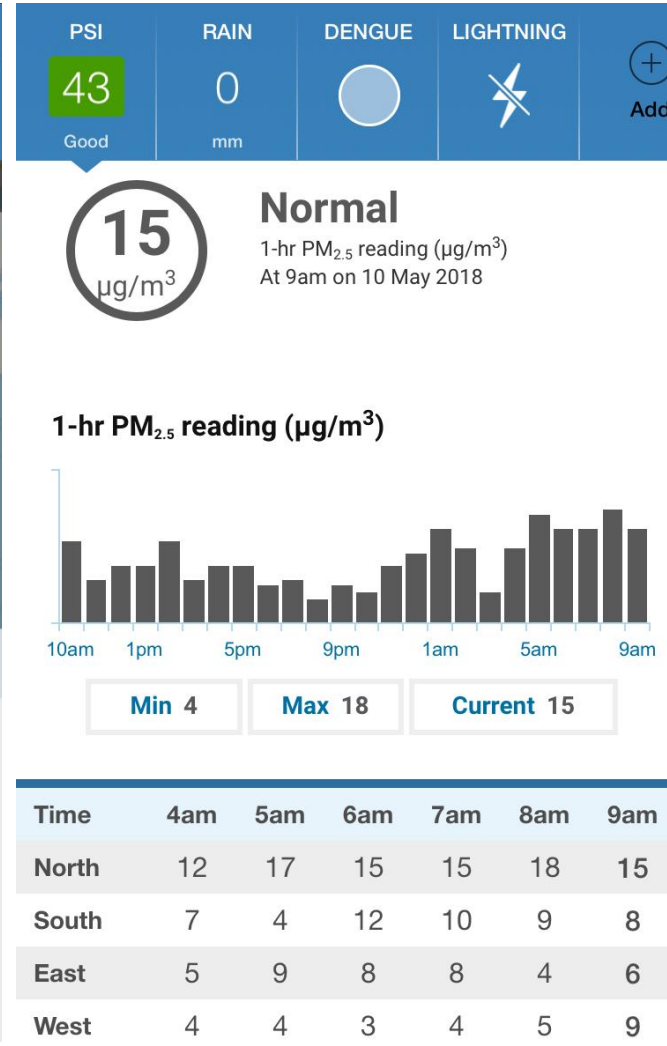
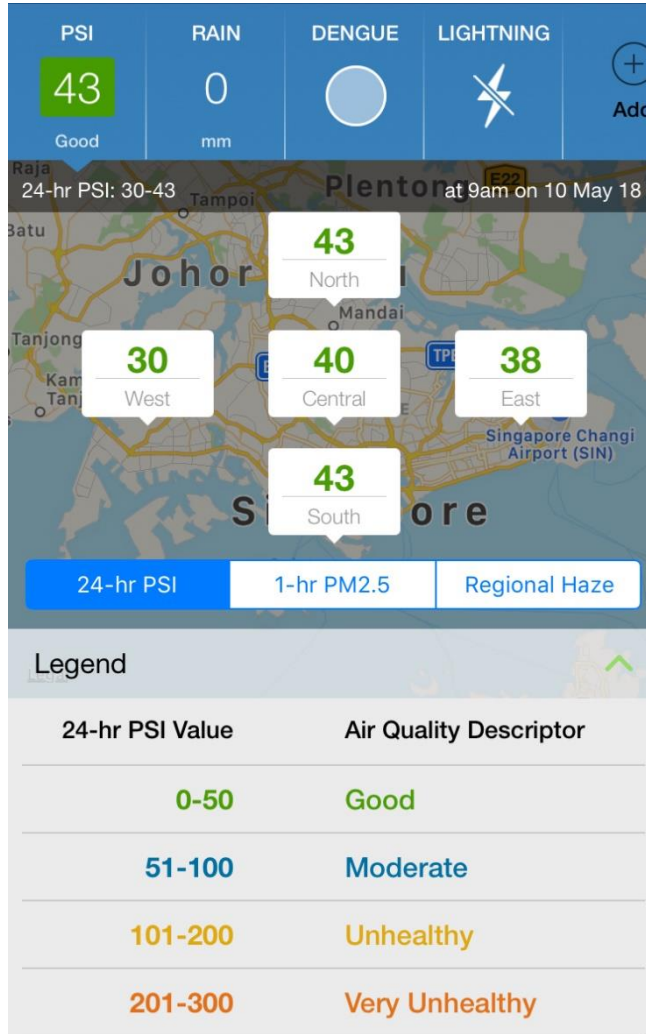
- When the compactor detects that the waste has reached a certain level, it compresses and pushes the waste into sealed containers.
- Normal waste and recyclables are stored separately.
- Each container can accommodate 10 tonnes of waste.
- These containers are transported by trucks to the incinerator plants.

## Pneumatic Waste Conveyance System in Singapore



# #1: Long Term Strategic Planning

## Air Quality Monitoring



# #2: Whole-Of-Government Approach Singapore's Climate Action Plan



## PROTECTING SINGAPORE FROM THE IMPACTS OF CLIMATE CHANGE

### 01 Safeguarding Key Infrastructure

- Safeguard MRT stations, airports, sea ports, power stations, cellular towers and other key infrastructure against floods.
- Protect MRT tracks from elevated temperatures.

### 02 Protecting our Coasts

- Safeguard against coastal erosion and rising sea levels by building seawalls or using geo-bags along our coasts.
- Raise selected roads near the coast.

### 03 Protecting Biodiversity and Greenery

- Replace storm-vulnerable trees.
- Restore and protect mangroves.
- Establish States' Islands Marine Park.
- Increase connectivity between green areas.

### 04 Managing Stormwater

- Adopt holistic Source-Pathway-Receiver approach to cope with higher-intensity storms.

### 05 Protecting Public Health

- Manage vector-borne diseases like dengue.

### 06 Building up Climate Science

- Advance scientific understanding of climate change and its effects on Singapore.

### 07 Strengthening Food Security

- Promote innovative local farming solutions such as indoor farming.

### 08 Ensuring Water Sustainability

- Improve energy efficiency in desalination and used water treatment.
- Manage water demand from homes, businesses, and industries.
- Diversify our water sources and expand capacity.

### 09 Enhancing our Built Environment

- Green 80 per cent of our buildings by 2030.
- Improve energy efficiency of buildings.
- Inspect buildings regularly to ensure structural integrity.

### 10 Encouraging Collective Climate Action

- Build knowledge and awareness.
- Promote action on climate change.
- Support international cooperation.

## REDUCING GREENHOUSE GAS EMISSIONS AND USING ENERGY MORE EFFICIENTLY

### 11 Increasing Industrial Energy and Carbon Efficiency

- Develop and enforce schemes to drive energy efficiency improvements.
- Reduce non-CO<sub>2</sub> GHGs from industrial processes.
- Adopt cleaner fuels.

### 12 Generating Cleaner Power

- Adopt more efficient power generation technologies.
- Increase deployment of solar photovoltaic systems.
- Increase efficiency of waste-to-energy plants.

### 13 Reducing Waste

- Achieve a national recycling rate of 7.0 per cent.
- Reduce incineration of plastic waste.

### 14 Encouraging Smart and Resource-Efficient Households

- Raise energy performance standards of appliances.
- Introduce smart home technology.
- Encourage use of energy-efficient appliances.

### 15 Moving to Clean, Car-lite Transport

- Achieve 75 per cent public transport use by 2030.
- Encourage cycling and walking.
- Improve vehicle fuel efficiency.
- Test electric vehicles.

### 16 Developing and Deploying Low-Carbon Technology

- Develop R&D capabilities.
- Scale and deploy technology in test-beds and "living labs".

# #2: Whole-Of-Government Approach

## Promoting Solar Energy in Singapore

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Solar Panels on Residential Buildings

# #2: Whole-Of-Government Approach

## Energy Conservation Act

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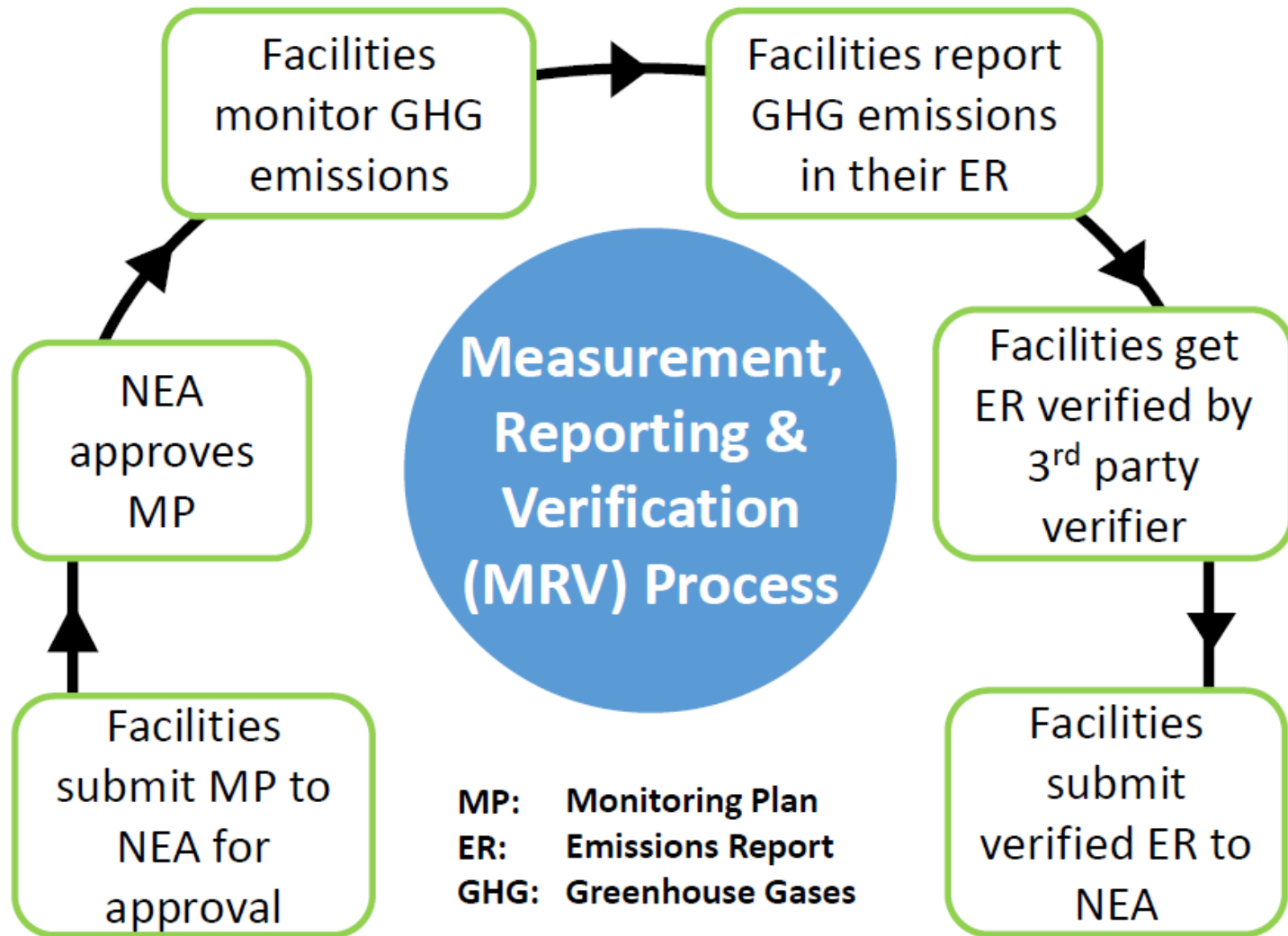


Jurong Island, Singapore

# #2: Whole-Of-Government Approach

## Carbon Tax in Singapore

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# #3: 3P (People-Private-Public Sector) Singapore Packaging Agreement

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3R Packaging Awards Ceremony and Gala Dinner

# #3: 3P (People-Private-Public Sector)

## Food Waste Minimization

**LOVE YOUR FOOD** WASTE LESS. SAVE MORE.

**Order only what you can finish.**  
Pesan apa yang anda boleh habiskan sahaja.

**Ask for less carbohydrates if you can't finish them.**  
Minta kurang karbohidrat jika anda tidak dapat menghabiskannya.

**Take away food that you can't finish.**  
Bungkus makanan yang anda tidak dapat habiskan.

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For more tips, download the handy guide at [cgs.sg](http://cgs.sg)  
Untuk tip tambahan, harap muat turun panduan berguna ini di [cgs.sg](http://cgs.sg)

Campaign to reduce Food Waste in Singapore (2016)

# #3: 3P (People-Private-Public Sector)

## Promoting 3Rs in Schools

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# Singapore: 2018 Year of Climate Action

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**MAKE YOUR PLEDGE FOR  
CLIMATE ACTION • 2018**

Take Action Today For A  
Sustainable Future.





# Singapore's Journey in Embracing Sustainable Development