



# Gardens by the Bay

A Green Marvel For Sustainability

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# A nation's garden in the heart of Singapore's downtown

## 101 ha National Garden and Premier Horticultural Attraction

- A Distinctive Global City
- A Source of National Pride for Singaporeans
- A Compelling Leisure Destination for Locals and Tourists



Bay South's main attractions, **designed to inspire people to care for plants and planet** through tropical horticulture and garden artistry, include 2 glass biomes (Flower Dome & Cloud Forest), 18 Supertrees, and a series of lakes and outdoor gardens

**54** hectares

Living collection of over

**1,500,000** plants including locally and globally endangered species throughout the Gardens





The **Flower Dome** is a cool-dry conservatory of plants from Mediterranean-type and semi-arid climatic regions of the world

**1.2** hectares of column-free space

**45** metres tall

Over **28,000** plants consisting of at least 950 taxa have been planted in the Flower Dome

Nine different gardens in Flower Dome feature exotic plants from five continents, such as thousand-year-old olive trees and unusual Baobabs, as well as a changing display of flowers.



The **Cloud Forest** is a cool-moist conservatory of plants from Tropical Montane regions between 1,000 – 3,500 metres above sea level

**0.8** hectares

**65** metres tall

**Over 64,000** plants consisting of at least 2,400 taxa have been planted in the Cloud Forest

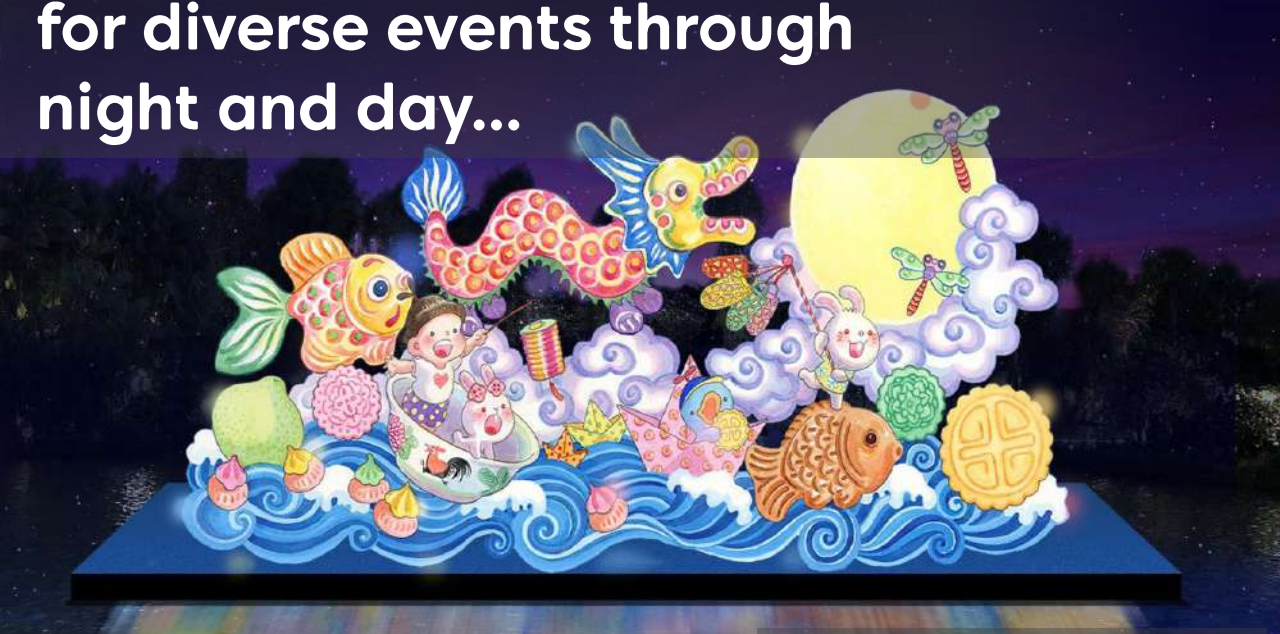
The 35m tall mountain wall in Cloud Forest has been densely planted with bromeliads, orchids, pitcher plants, begonias, and ferns.

Ever-changing myriad of colours through seasonal floral showcases...

Children's Festival 2024



And transformation of spaces for diverse events through night and day...



Mid-Autumn Festival 2024

Flower Dome Floral Display  
'Sakura Matsuri'

Flower Dome Floral Display  
'Poinsettia Wishes'

# Greenhouse Engineering

## Façade elements and active cooling elements

Spectrally-selective double-glazed glass with low emissivity coating

Allows 65% light to pass through with only 35% of solar heat



External shades

Retractable, cable-tensioned, triangular blinds for use on sunny days



Displacement Ventilation

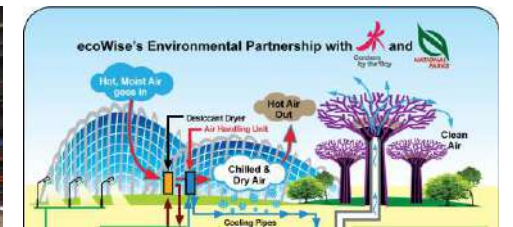
Conditioned air supply at low level within occupied zones

Active ground cooling  
Chilled water pipes embedded in concrete screeds of paths and circulation areas



Absorption Chillers

Heat dump for biomass boiler and provide base cooling load



Dehumidification and fog system

Strong liquid desiccant for demudification, regeneration of desiccant through heat from biomass

# Use of Supertree structures for servicing requirements and additional energy output

House **flue gas exhaust** from biomass system

**Eliminate hot exhaust air** from desiccant system

**Solar PV** to harness additional energy





# Water: Masterplanning with Water-Sensitive Urban Design

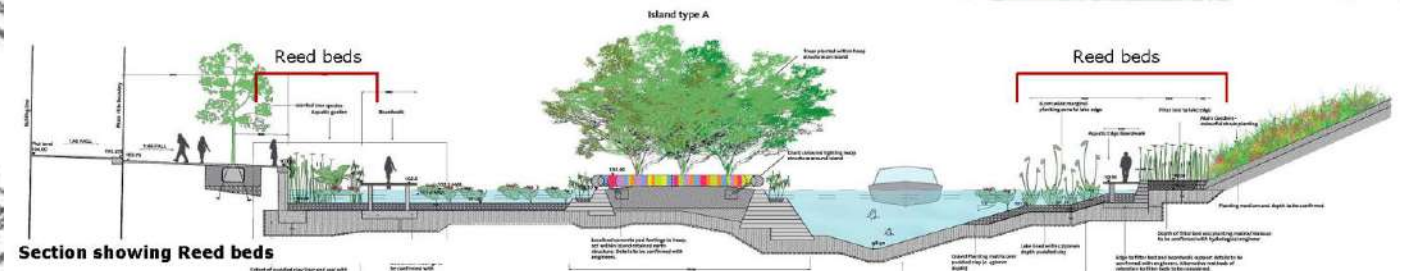
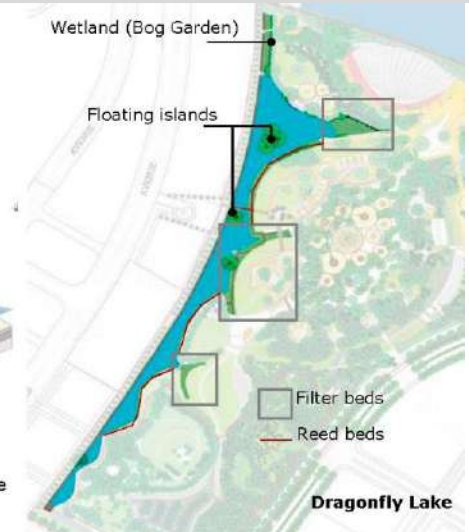
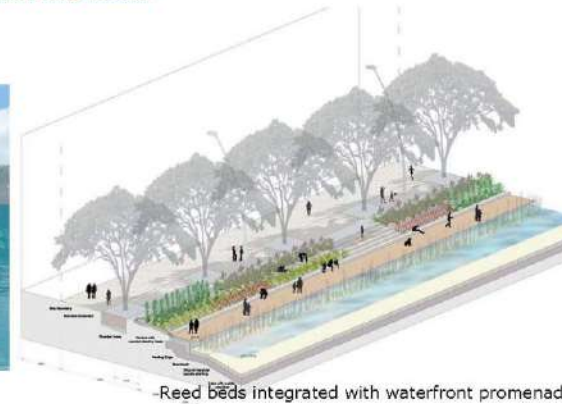
Sustainable water cycles using water retention, conservation and purification

## Lake system as a water catchment

- Aquatic plants for filtration and treatment of water
- Optimal hydrologic flow and capacity that balances between drainage requirements and constant water level
- Minimisation of surface runoff through permeable paving and tanks



Nutrient absorption via reed beds and floating islands



# Increasing Renewables – Solar Panel Upgrade



- Installation is being carried out in three phases
- Close to 1,800 solar panels will be progressively installed



# A living laboratory to testbed the potential of urban wetlands as nature-based solutions

One- year pilot study on carbon stored and biodiversity supported in Kingfisher Wetlands, a freshwater wetland in the city centre

## Habitat Enhancement and Water Circulation



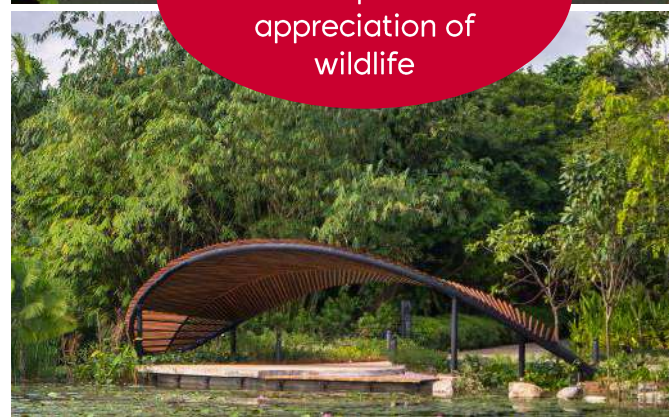
Cascades to improve water aeration to encourage formation of microhabitats and native species planted to promote biodiversity to thrive



## Nature-based Recreation



Interpretive signages and bird hide to promote appreciation of wildlife



## Testbed Nature-based Solutions



200 native mangroves planted and carbon stock measured



# Community Outreach and Impact

Over the past two years, Sustainability Office has been partnering with like-minded parties to curate a line-up of Sustainability related offerings



**2022**

**Tiger Trail**

**Tigers on the prowl in Singapore**

The AR-mazing Tiger Trail interactive exhibition features 33 life-size tiger sculptures in places such as Gardens by the Bay.

**2022/23**

**Wonderful Wetlands Series**

**Gardens by the Bay launches Wonderful Wetlands series to mark 10th anniversary**

05 Jun 2022 06:55PM (Updated: 05 Jun 2022 09:52PM)

THE STRAITS TIMES SINGAPORE

Wong Zhen Yu

**2023/25**

**Nature and Sustainability Tours**

**Free nature tours at Gardens by the Bay from next month**

These will cover typically complex scientific topics such as carbon capture, biodiversity

SINGAPORE \$182,000

**唤醒保育野生老虎意识 33座老虎雕塑全岛展出**

WWF

WWF logo and text about tiger conservation.

**Research at Gardens by the Bay may guide development of more urban mangrove wetlands**

TEMASEK

**展示植物魅力强化可持续理念 滨海湾花园推出多个主题免费导览**

Keppel

Keppel logo and text about nature tours.





Gardens  
by the Bay