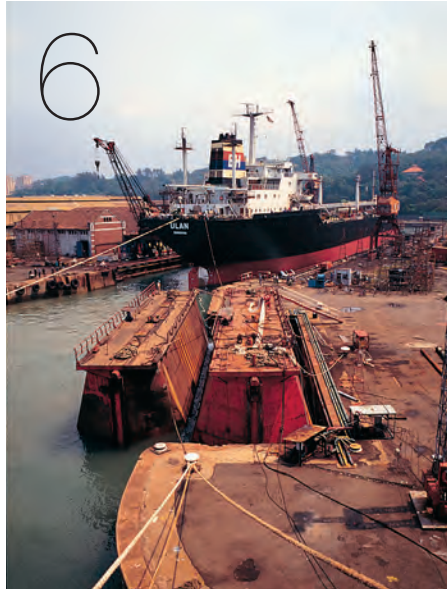


# KEPPEL BAY

A world above and below our waters



# CONTENTS



22



**2**  
**FOREWORD**  
From the Chairman  
of Keppel Land

**3**  
**MESSAGE**  
From the CEO of  
Keppel Land

## **HARMONY**

**6**  
**WAVES OF  
TRANSFORMATION**  
From a historic harbour  
to a world-class  
waterfront precinct

**16**  
**LAND MEETS WATER**  
A vision to transform  
Singapore's southern  
coast into a new major  
gateway and location  
for urban living

## **HABITAT**

**22**  
**MEET THE RESIDENTS**  
Keppel Bay's wildest  
residents are also some  
of its finest

**34**  
**SHAPING THE  
LANDSCAPE**  
Contributing to the fight  
against climate change

## **HUMAN**

**40**  
**TAKE THE PLUNGE**  
The epitome of true  
waterfront lifestyle at  
Keppel Bay

**44**  
**PLUG AND PLAY**  
Building homes in  
the sea

**50**  
**MEET CAROL  
THE CORAL**  
Reaching out to young  
minds on marine  
conservation

**52**  
**SUSTAINABLE  
FOOTSTEPS**  
Building a sustainable  
future together with  
stakeholders

**60**  
**ACKNOWLEDGEMENTS**

Commissioned by:  
**KEPPEL LAND LIMITED**  
1 HarbourFront Avenue  
Level 2 Keppel Bay Tower  
Singapore 098632  
**T** (65) 6338 8111  
[www.keppelland.com](http://www.keppelland.com)

Published by:  
**TATLER ASIA  
(SINGAPORE) PTE LTD**  
34 Bukit Pasoh Road  
Singapore 089848  
**T** (65) 6323 1606  
**F** (65) 6323 1692  
**E** [sginfo@tatlerasia.com](mailto:sginfo@tatlerasia.com)

Images sources:  
Keppel, National Archives of  
Singapore, Straits Times Press,  
M&G Contracts (S) Pte Ltd,  
Wikipedia, Alamy.com,  
Unsplash.com and 123rf.com.

©2021 Keppel

All rights reserved. No part of this  
publication may be reproduced, stored  
in a retrieval system, or transmitted, in  
any form or by any means, electronic,  
mechanical, photocopying, recording  
or otherwise, without the prior written  
permission of the copyright owner.

Printed in Singapore  
First printed in October 2021



# FOREWORD

Keppel Bay, the site of the original Keppel Harbour, played an important role in the history of modern Singapore. It was the site of the original Keppel Harbour where Singapore's first ship repair dry dock was built in 1859. King's Dock, which was built a few decades later, was the second largest dock in the world when it opened in 1913.

Keppel Bay is also the birthplace of Keppel Corporation, which was established initially as a small ship repair yard in 1968, shortly after Singapore's independence. Over the years, Keppel grew and diversified into different businesses. By 1999, as Singapore's city centre expanded, Keppel's yard was relocated to the western end of Singapore, and we started the process of transforming the former shipyard into the beautiful and vibrant Keppel Bay waterfront precinct that it is today.

The metamorphosis of Keppel Bay reflects Keppel's business transformation

over the years, starting from the offshore and marine business, and growing to be a provider of sustainable urbanisation solutions. It also highlights Keppel's commitment to sustainability, including environmental conservation as well as the promotion of harmonious communities and sustainable lifestyles.

Through the story of Keppel Bay's development, we hope to share with you how Keppel has made sustainability our business. As part of Keppel's Vision 2030, we have put sustainability at the core of our strategy and will be doing even more in the years to come to contribute to environmental sustainability and fighting climate change, as we work with all stakeholders to build a sustainable future together.

**Loh Chin Hua**  
**Chairman, Keppel Land**

# MESSAGE

Keppel Land provides innovative and multi-faceted urban space solutions that enrich people and communities. Over the years, we have created highly liveable, vibrant and sustainable communities across key cities in Asia, shaping skylines and enriching lives through developing quality homes, offices, commercial properties and integrated developments.

One of our most iconic projects is the transformation of Keppel Bay over more than two decades from a historic shipyard to a world-class waterfront precinct, juxtaposed with thriving coral reefs and lush coastal forests. This was in line with the Singapore Government's vision to shape our southern shores into a major gateway and high-quality location for urban living. The latest plans by the Singapore Government to develop the Greater Southern Waterfront has brought even greater focus to Keppel Bay, as an iconic jewel on Singapore's southern shores.

This booklet captures succinctly the transformation of Keppel Bay, and showcases how urban development can take place alongside environmental conservation. Today, the iconic architecture of Keppel Bay blends seamlessly with a well-preserved natural habitat, on land and underwater. Active engagement efforts with stakeholders have further contributed to making Keppel Bay a highly popular live-work-play environment of enduring value.

In our journey towards Vision 2030, Keppel Land will continue to push the envelope of digitalisation and sustainability to further improve customer experience and realise Keppel Land's vision to be a leader in redefining urban spaces for a sustainable future. We look forward to collaborating with our partners to build a cleaner, greener and better world.

**Louis Lim**  
**CEO, Keppel Land**



Image: Straits Times Press





# HARMONY

The transformation of Keppel Bay into a world-class waterfront precinct was in harmony with the government's vision to shape Singapore's southern shores into a vibrant hub for urban living.



HARMONY

# Waves of Transformation

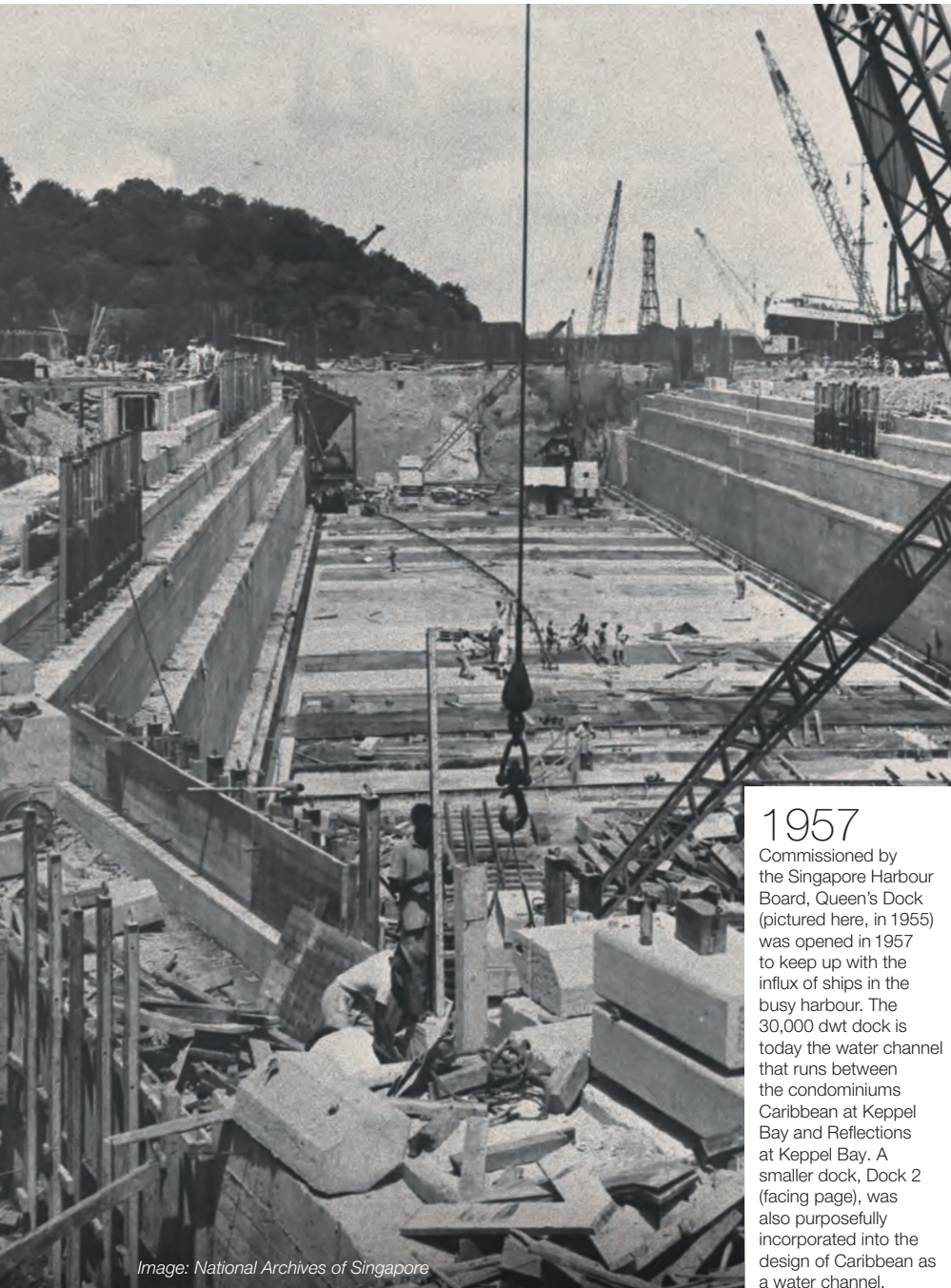
From a historic harbour to one of Singapore's most iconic developments today, Keppel Bay's metamorphosis was envisioned with the idea of environmental conservation.

1913

Since the early 19<sup>th</sup> century, Keppel Harbour has been pivotal to Singapore's growth as a global shipping hub. A key feature of Keppel Harbour was King's Dock (pictured here, in the 1930s), which was opened in 1913. King's Dock, a 40,000 deadweight tonnage (dwt) dry dock, was then the largest dock east of the Suez Canal and the second largest in the world.

*Image: National Archives of Singapore*





1957

Commissioned by the Singapore Harbour Board, Queen's Dock (pictured here, in 1955) was opened in 1957 to keep up with the influx of ships in the busy harbour. The 30,000 dwt dock is today the water channel that runs between the condominiums Caribbean at Keppel Bay and Reflections at Keppel Bay. A smaller dock, Dock 2 (facing page), was also purposefully incorporated into the design of Caribbean as a water channel.

Image: National Archives of Singapore



The former Keppel Harbour yard, photographed in the 1990s.

When Keppel Land embarked on the Keppel Bay project, innovation and environmental conservation were key considerations.

In the 1990s, when the Urban Redevelopment Authority announced its long-term redevelopment plan for the Southern Waterfront—to relocate the shipyard to Tuas and transform the 32 hectares of dockland into an urban escape—Keppel took to the drawing board. It was the vision of then-Executive Chairman of Keppel Corporation, Sim Kee Boon, who reimagined a premier waterfront precinct completely different from its tough industrial past as the site of the original Keppel Harbour yard. Right in front of the residential developments



are the very waters that once bustled with ships and workers. Today, pleasure boats are berthed serenely at Marina at Keppel Bay.

“Such a project was unprecedented. The redevelopment of Keppel Harbour was the first project in Singapore where





*The Keppel Harbour redevelopment was the first project in Singapore where land originally meant for heavy industries was rezoned into an area for waterfront developments.*

The 250m-long cable-stayed Keppel Bay Bridge links Keppel Island to the mainland of Singapore. It is an architectural gem and also contributes to the free flow of currents through the marina basin, thus stimulating marine life and coral growth.

land originally meant for heavy industries was rezoned into an area for waterfront developments,” says Paul Lau, General Manager, Projects, at Keppel Land, adding that this was why Keppel Land had to consult and collaborate closely with various government agencies.

Being situated close to a water body and surrounded by an ecosystem of flourishing flora and fauna also provided an existing resource, which helped to achieve Keppel Land’s high standards of sustainability and eco-conservation goals. The ingenuity of the project is evident in how little the design interfered with the natural environment—thereby allowing nature to thrive.

### DID YOU KNOW?

The waterways that run through Keppel Bay have been vital to Singapore’s maritime history since the 13<sup>th</sup> century as a passageway for ships sailing from the Straits of Malacca to the South China Sea. But it was the discovery of its sheltered deep harbour in 1848 that led to Singapore’s rise as a regional and international port for the passage of goods and cargo. By the 1950s, Keppel Harbour’s four docks were hosting vessels from around the world for repairs and refuelling.



## HARMONY



### CONSERVATION IS KEY

Protecting the marina's environment was paramount right from the beginning. To this end, breakwaters and floating booms were erected to prevent debris from flowing into its basin, and a box culvert under Keppel Bay Bridge allowed water exchanges across the basin.

Extensive studies were conducted to preserve and maintain good water quality within Keppel Bay during and after the redevelopment. A new seawall was also necessary, as the existing dock's timber piles were rotting.



(From top) The waters beneath Corals at Keppel Bay (pictured) is an underwater sanctuary for King's Dock's thriving marine life. Precast granite slabs were installed onto the seawalls during the development of Keppel Bay to prevent erosion and seawater pollution.



## Today

Keppel Bay, part of the Greater Southern Waterfront, combines the best of city life and waterfront living. Keppel's efforts in environmental conservation have resulted in the thriving marine life in Keppel Bay's waters and verdant greenery on Keppel Island.

*Keppel Bay, the crown jewel of Singapore's southern shores, is not only our pride and joy, but also a showcase that puts us on the world map for premium waterfront homes. As a leading green developer, sustainability is at the heart of Keppel Land's strategy and operations. It was no different when we embarked to build this world-class precinct—one that would harmonise with the environment. We will continue to uphold high standards of environmental stewardship and care for the inhabitants of Keppel Bay—above and below our waters.*

—Tan Swee Yiow, Senior Managing Director of Urban Development, Keppel Corporation, and former CEO of Keppel Land





Dr Lee Boon Yang, then-Chairman of Keppel Corporation (centre), and Loh Chin Hua, CEO of Keppel Corporation and Chairman of Keppel Land, with President Halimah Yacob at the unveiling of the restored King's Dock plaque.

## RESTORING HISTORY

On 7 July 2018, Keppel Corporation commemorated its 50<sup>th</sup> anniversary with a 50km charity run that ended at Keppel Bay. The Keppel 50 Charity Run kicked off early that morning with more than 200 participating staff gathered at the opposite ends of Singapore. During the event, Dr Lee Boon Yang, then-Chairman of Keppel Corporation, presented a cheque of S\$1 million to President Halimah Yacob, who received the donation on behalf of the President's Challenge.

Adding to the celebrations was the unveiling of the restored King's Dock plaque. Originally laid in 1913 by Sir Arthur Henderson Young, then-Governor and Commander-in-Chief of the Straits Settlements, the historic plaque was removed during the redevelopment of Keppel Bay.



The pontoons at Marina at Keppel Bay are breeding grounds for a rich variety of marine life. Brightly coloured sea anemone and clownfish (top) are among the thriving marine life found in Keppel Bay's waters.



## SUSTAINABLE AESTHETICS

The iconic cable-stayed Keppel Bay Bridge allows for the free flow of currents through the entire marina basin during the change of tides—bringing in nutrients and plankton, and also helping to remove sediments that would otherwise settle on marine organisms and smother them. This thus helps stimulate marine life and coral growth.

Studies by the National University of Singapore and the National Parks Board have shown that the abundance and diversity of fish and soft-bottom macrobenthos—organisms that live at the bottom of a water body and are visible to the naked eye—were higher within the marina compared to the adjacent open water areas. The pass-on effect to all this is a healthy marine ecosystem.

Today, many species of wildlife are residents in and around this area, allowing the human residents the opportunity to experience living amidst nature every day.

Co-existing with nature is like a gift that keeps on giving—respecting and protecting it is key for Keppel Land, which applies such concepts of eco-conservation and sustainable urbanisation in the development of all properties in its portfolio. ☻





# Land Meets Water

A vision to transform the southern coast of Singapore into a new major gateway and location for urban living.

The Greater Southern Waterfront initiative will transform the southern coast of Singapore into a new major gateway linking seamless expanses of green space with urban hotspots, including landmarks such as Henderson Waves (below).

Singapore has always had a close affinity with water, being that it has written its history. The island state's water boundaries offer enormous freedom to develop trade, commerce and tourism. Its shores have welcomed people and goods from lands far away, which have helped shape Singapore into a thriving global city.

Just as its past is tied to the seas and the straits, so, too, is Singapore's present —albeit differently, with water and its environs playing a part beyond being a mode of transport to that of a means of rest and recreation as well. Water bodies are go-to places for the community to exercise, relax and socialise, or just to absorb their calming presence.

And Singapore's future is in pushing those boundaries further—it is not one positioned where land ends and water begins, but a vision for a future where the two meet, unlocking endless possibilities.

The Singapore Government's plans for the Greater Southern Waterfront proposes this new world with Keppel Bay being a key node in this grand blueprint for water to meet land. A world where different species can flourish in harmony—humans, flora and fauna, as well as marine life.

According to the Urban Redevelopment Authority, the development of the Greater Southern Waterfront will respond sensitively to the





## HARMONY

*The development of the Greater Southern Waterfront will respond sensitively to the site's existing context and topography.*

site's existing context and topography. It will also be guided by a comprehensive green and blue plan that will complement the nearby Berlayer Creek and Labrador Nature Reserve. The neighbourhood will be walkable, and well connected to public transport nodes and amenities.

The plans are sprawling in scale and scope for the Greater Southern Waterfront. It will spread over 30km of the southern coastline, from Gardens by the Bay all the way to Pasir Panjang. It includes an area of

2,000 hectares—six times the size of Marina Bay and twice that of Punggol, when taken as reference—freed up by the relocation of the Tanjong Pagar, Keppel and Brani terminals.

More than 9,000 private and public residential units are being planned. The new neighbourhoods will be interlaced with waterfront promenades, shops and green open spaces—residents will enjoy elevated living standards as well as a green and sustainable environment. The new enhancements to the area



will blend seamlessly with the Keppel Bay precinct, with its premium waterfront residences such as Caribbean, Reflections and Corals at Keppel Bay, as well as The Reef at King's Dock, Keppel Land's latest residential project that is jointly developed with Mapletree.

Even the two former power station buildings in the area have been earmarked for creative repurposing in the model of London's Bankside Power Station, which now houses Tate Modern.

As Singapore continues on its growth trajectory, it means that transforming and enhancing quality living will be a continuous process. The Greater Southern Waterfront presents a brave new world. 🌐



The Greater Southern Waterfront will enhance waterfront living concepts at Keppel Bay.





# HABITAT

The enthralling biodiversity of Keppel Bay—more than 50 species of plants, 70 species of birds and 30 species of butterflies native to Singapore, as well as a thriving marine reef.





# Meet the Residents

The wildlife of Keppel Bay are residents you will be proud to call neighbours.

A common sight in forest edges and secondary growth areas, the **Blue-crowned Hanging Parrot** can often be found on Keppel Island.



It is said that aside from the topography of a place, the life it supports gives it character and vibrancy. This is true of Keppel Bay, where some of nature's finest congregate. The vegetation, some of which have been on Keppel Island for decades, the birds that swoop up in the air resplendently, and the dazzling marine life.

Dedicated conservation efforts and high standards of environmental protection have rehabilitated this once-polluted area, and allowed the return of terrestrial and marine life,

*Singapore is an important stopover for many migratory birds, including seabirds, as it lies on the East Asian-Australasian Flyway.*

leading to a biodiverse urban environment.

Imagine watching a White-bellied Sea Eagle diving in to pick up its meal and a Bee-eater feeding in mid-flight, its wings a blur

of intensity, or being a part of an environment that nourishes a wide range of plant and tree species.

Let us meet some of the beautiful residents of Keppel Bay.



## SUNBIRDS AND KINGFISHERS



Crimson Sunbird



White-throated Kingfisher



Blue-winged Pitta



Common Flameback

The male **Crimson Sunbird** is a sight to behold with its red head, mantle and upper breast, as well as iridescent dark blue crown and tail. The nectarivore (feeds mainly on nectar) is Singapore's unofficial national bird.

Kingfishers, contrary to what their name suggests, do not strictly feed on fish or only occur near a body of water. Many kingfisher species are woodland birds and feed on insects, amphibians, reptiles, and other smaller birds during the nesting season. Three main species are commonly found in the Keppel Bay area. The Collared Kingfisher and **White-throated Kingfisher** are resident species, and can be spotted in forested and landscaped garden areas around Keppel Bay.

The smaller Common Kingfisher, however, is a migratory species, found in Singapore during the year-end monsoon season till March or April.

Other migratory bird species, such as the Hooded Pitta and **Blue-winged Pitta**, can often be heard foraging through the leaf litter under hedges and shrubs, as well as in the forest undergrowth, in search of earthworms and snails.

Graceful birds with a predominantly green plumage, Blue-throated Bee-eaters often perch on exposed branches, occasionally flying off to feed on dragonflies, only to return to the same branch in a figure-of-eight motion. Also a regular sight is the **Common Flameback**. Its distinctive colouration, especially the males with their red crowns, makes it hard to miss.



Brahminy Kite



White-bellied Sea Eagle

## KITES AND EAGLES

Amongst the birds, there are a few that you can spot regularly. **Brahminy Kites** and **White-bellied Sea Eagles** can be seen through the day as they look for food. One of the largest common birds of prey in Singapore, the White-bellied Sea Eagle, usually seen near water, is a resident species that is present all year round in Singapore.



The **Little Egret** is a wading bird that feeds in shallow water and on land. Usually seen in flocks, the Little Egret is often spotted on the docks and pontoons of Marina at Keppel Bay.



**MORE THAN JUST TREES**

The vegetation at Keppel Bay is diverse, with evergreens forming the bulk of the greenery. Most are native to the land and have practical uses, as well as medicinal properties. While most of the fauna around Keppel Bay are common and widespread, some of the plant species are vulnerable and critically endangered, such as the *Syzygium palembanicum* and *Gordonia penangensis* respectively.



Native to Southeast Asia, the *Oncosperma tigillarum*, also known as Nibong Palm, is commonly found on Keppel Island. Growing in thick clumps, the leaflets of this tall, straight and spiny trunk palm curve downward, giving the palm a graceful appearance.



The *Calophyllum pulcherrimum*, where pulcherrimum means "most beautiful" in Latin, occurs mainly in lowland forests.



The leaves of the *Cinnamomum iners* are used in traditional medicine. Oil extracts from this evergreen plant also have aromatherapeutic applications.



*Melastoma malabathricum*, also known as Singapore Rhododendron, thrives in wastelands and secondary forests. Its bark and leaves are used in treating a variety of ailments, while its roots may be used as a mouthwash for toothache.



The *Syzygium palembanicum* tree, a native of Singapore, is a source of tannins, dyestuff, caulk, and wood.



## HABITAT



The shrub ***Scaevola taccada*** grows abundantly on Keppel Island and can also be found along the coast of Singapore. It is used medicinally to treat a variety of conditions.

*The grounds of Keppel Bay have some of the most diverse habitats in Singapore—including parkland and woodland.*



### ***Buchanania arborescens***

is native to Singapore. Its leaves are stalked, spirally arranged, and are oval or drop-shaped. Its bark, which has a small amount of tannin, is used to strengthen fishing nets.



*Calophyllum inophyllum*

## ENDANGERED PLANT SPECIES

***Calophyllum inophyllum***, also known as Tamanu or Mastwood, was especially renowned in traditional shipbuilding. Tamanu oil offers a wide range of medicinal—it has pain-relieving properties—and skincare benefits, including the removal of scars and blemishes. ***Memecylon edule*** also has a variety of uses. Its wood is often used for rafts, fuelwood and charcoal, while yellow dye and mordant can be extracted from its leaves. Its leaves, bark and root also have medicinal purposes. The ***Gordonia penangensis*** is a species of the Theaceae (or tea) family. A small evergreen tree, it thrives in acidic soils and requires high rainfall. Although threatened by habitat loss in Singapore and parts of Malaysia, this species is the pride of Keppel Island, where the rarely flowering tree sometimes blooms.



*Memecylon edule*



*Gordonia penangensis*





The **Hawksbill Turtle** is one of four species of marine turtles recorded in Singapore. It feeds mainly on sponges and crustaceans, and has been recorded nesting on the sandy beaches of the Southern Islands. These sea turtles are also sighted at Marina at Keppel Bay from time to time.

DID YOU KNOW?

**CORALS ARE ACTUALLY ANIMALS, NOT PLANTS.**

Coral reefs are the most diverse marine ecosystems on earth. Zooxanthellae, an algae that lives inside the corals, provides them with food as well as gives them their colour.

**CORAL REEFS ARE LIKE HOMES FOR FISH.**

They are home to about 4,000 species of fish. Corals also protect the shoreline by acting as nature's buffer against waves, storms and floods.

**CORAL REEFS CAN PRODUCE MEDICINE.**

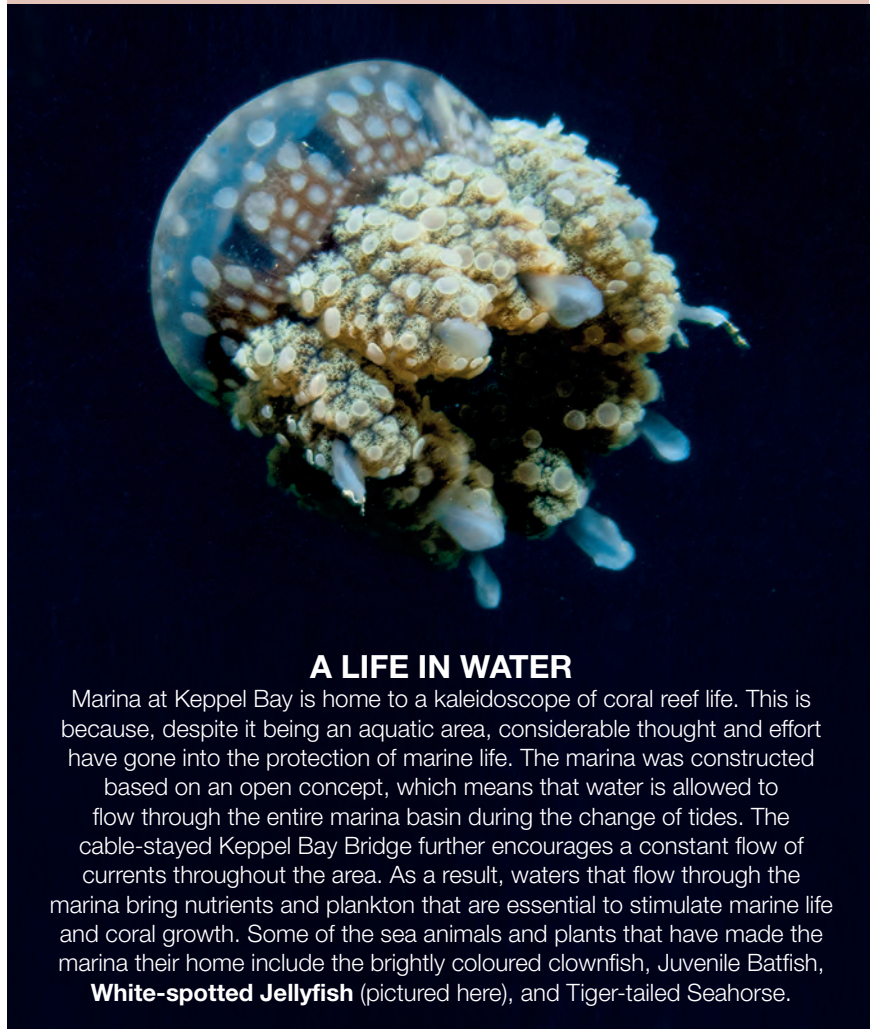
The plants and animals that coral reefs house are important sources of new medicines being developed in the 21<sup>st</sup> century to treat cancers, arthritis, human bacterial infections, Alzheimer's disease, heart diseases, and more.



**CORALS**

**Mushroom** and **Brain Corals** are hard corals with a calcareous skeleton. Hard corals are vital to reef building, forming the backbone and foundation of the reef. These corals rely heavily on algae for nutrition—up to 95 per cent of which comes from the photosynthesis of these unicellular algae. They feed on plankton with their tiny stinging tentacles.

*Singapore's waters, including Keppel Bay, support a rich marine biodiversity, including 250 species of hard corals, 120 species of sponges and 120 species of reef fish.*



**A LIFE IN WATER**

Marina at Keppel Bay is home to a kaleidoscope of coral reef life. This is because, despite it being an aquatic area, considerable thought and effort have gone into the protection of marine life. The marina was constructed based on an open concept, which means that water is allowed to flow through the entire marina basin during the change of tides. The cable-stayed Keppel Bay Bridge further encourages a constant flow of currents throughout the area. As a result, waters that flow through the marina bring nutrients and plankton that are essential to stimulate marine life and coral growth. Some of the sea animals and plants that have made the marina their home include the brightly coloured clownfish, Juvenile Batfish, **White-spotted Jellyfish** (pictured here), and Tiger-tailed Seahorse.



# HABITAT

## THE CORALLIVORES

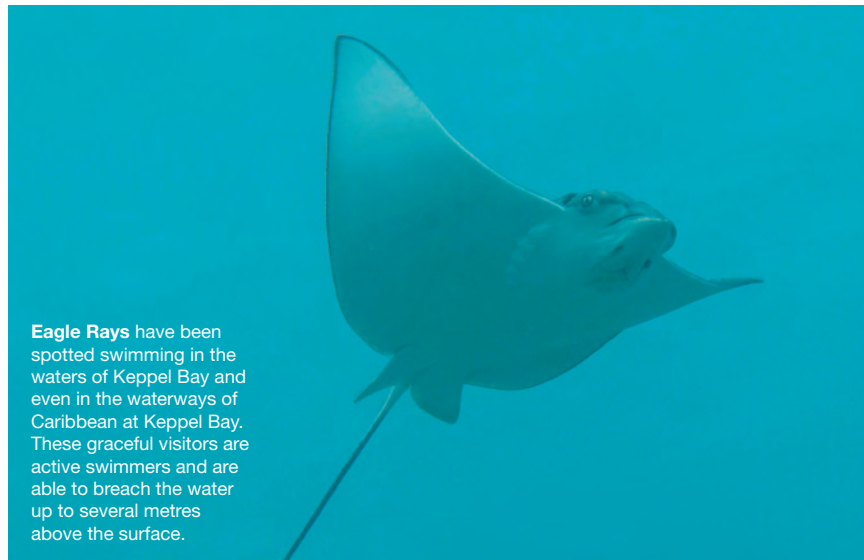
Two fishes that rely on coral reefs for their livelihood are the **Eight-banded Butterflyfish** and **Filefish**. A boldly marked marine fish with a deep, laterally compressed body and a small tubular mouth, the Eight-banded Butterflyfish mainly inhabits coral reefs and occurs singly or in pairs. Commonly found along the coast of coral reefs, the Filefish has leathery skin and a file-like dorsal spine, and is commercially available as food in markets.



Eight-banded Butterflyfish



Filefish



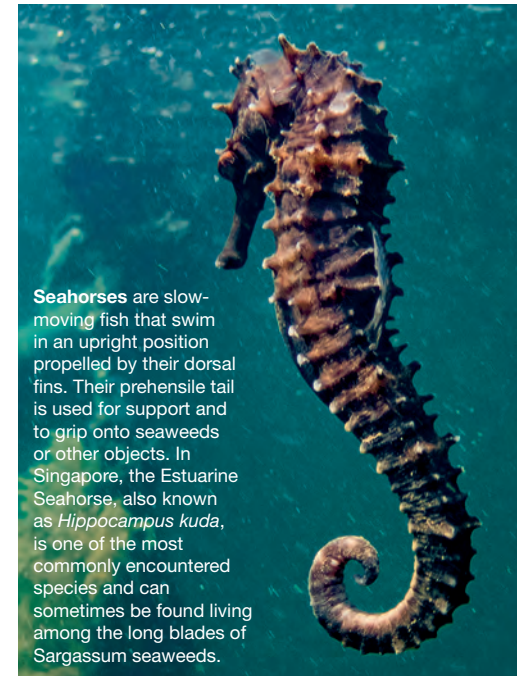
**Eagle Rays** have been spotted swimming in the waters of Keppel Bay and even in the waterways of Caribbean at Keppel Bay. These graceful visitors are active swimmers and are able to breach the water up to several metres above the surface.



***Hypselodoris whitei***, a nudibranch species, is a bilaterally symmetrical sea slug. Many such nudibranch species can be found at Keppel Bay, but they tend to hide in rock and coral crevices, only emerging at night to feed.



**Sea cucumbers** are soft-bodied echinoderms and live on or near the seabed. They have leathery skin and an elongated body, and feed on tiny particles such as algae, minute aquatic animals, and waste materials.



**Seahorses** are slow-moving fish that swim in an upright position propelled by their dorsal fins. Their prehensile tail is used for support and to grip onto seaweeds or other objects. In Singapore, the Estuarine Seahorse, also known as *Hippocampus kuda*, is one of the most commonly encountered species and can sometimes be found living among the long blades of Sargassum seaweeds.





## SAVE THE FORESTS

In November 2019, 150 volunteers from across the Keppel Group, led by Dr Lee Boon Yang, then-Chairman of Keppel Corporation, and Loh Chin Hua, CEO of Keppel Corporation and Chairman of Keppel Land, together with Garden City Fund Chairman Professor Leo Tan and National Parks Board (NParks) CEO Kenneth Er, planted 150 coastal trees at Labrador Nature Reserve, which are expected to sequester 21.3 tonnes of carbon dioxide over the next decade. This initiative by Keppel supports NParks' Forest Restoration Action Plan, which seeks to strengthen the resilience of Singapore's forests to climate change and enhance biodiversity through a science-based approach that involves the sustained planting of native forest species.

It is a well-known fact that trees are vital to reducing carbon emissions, as trees possess the ability to absorb carbon dioxide emissions, which are driving global warming. Tree-planting is an increasingly embraced initiative undertaken by organisations worldwide today.

Environmental conservation and landscape rejuvenation have always been a priority for Keppel. But rejuvenating the environment on a large scale requires the collective effort of multiple parties—Keppel was astutely aware of this right from the very beginning. Over the years, Keppel has been joining hands with some

# Shaping the Landscape

Keppel contributes to the fight against the climate crisis with its environmental protection efforts.

Standing together for a greener future—Keppel Volunteers during a tree-planting exercise at Labrador Nature Reserve in November 2019.





(From left to right) Desmond Lee, Minister for National Development and Minister-in-charge of Social Services Integration, joined Keppel Volunteers led by Dr Lee Boon Yang, Chairman of Keppel Care Foundation, and Danny Teoh, Chairman of Keppel Corporation, to plant trees at Labrador Nature Reserve in May 2021. The tree-planting event marked the start of Keppel's pledge to plant 10,000 trees in support of Singapore's OneMillionTrees movement.

*Keppel is committed to sustainability—both as an urbanisation solutions provider and a responsible corporate citizen. We are glad to contribute by planting trees, a nature-based solution to fight climate change. We look forward to working with all stakeholders to build a sustainable future.*

—Loh Chin Hua, CEO, Keppel Corporation; Chairman, Keppel Land

of Singapore's statutory boards and non-governmental bodies to support Singapore's vision of being a City in a Garden, and will continue to do so as Singapore moves towards becoming a City in Nature.

Keppel embarked on a collaboration with the National Parks Board (NParks) and the Garden City Fund in 2016 to restore the freshwater forest wetlands as well as enhance the biodiversity of the Singapore Botanic Gardens' Learning Forest.

The freshwater wetlands was named Keppel Discovery Wetlands in recognition of the company's S\$2.08 million commitment towards this restoration project, and was officially opened on 31 March 2017.

A 1.8-hectare green lung, Keppel Discovery Wetlands is divided into three distinct spaces: Orchid Islands, Pulau Marsh and Botanists' Boardwalk.

Walking trails along the entire wetland area make for an immersive outdoor learning experience for visitors.

**GREEN FUTURE**

In 2020, Keppel pledged to donate S\$3 million to support NParks' OneMillionTrees movement. The contribution will go towards the planting of 10,000 trees in Singapore's parks and nature reserves over the next five years. About 5,000 of these trees will be planted at Labrador Nature Reserve to help restore and enhance its coastal habitats.

In addition, Keppel is collaborating with NParks and other stakeholders on several initiatives at Keppel Bay and Labrador Nature Reserve, which will contribute to environmental conservation,

and also create more vibrant and green spaces for the community to enjoy. For example, Keppel and Mapletree will be jointly developing a public park in front of The Reef at King's Dock. Keppel Land is also working on an initiative with the authorities, which will allow for natural vegetation on the hillock on Keppel Island to be conserved.

These initiatives demonstrate Keppel's unwavering commitment to combating climate change, fostering exemplary environmental stewardship and creating a better environment for everyone. 🌱





# HUMAN

As a steward of precious natural resources, Keppel is committed to working with all its stakeholders to care for and conserve the environment.



# Take the Plunge

A blend of modern urban living amenities and a tranquil, natural environment makes Keppel Bay the epitome of true waterfront lifestyle.



Consider this: you, taking a leisurely stroll on the boardwalk along Singapore's picturesque southern coastline—the bracing sea breeze ruffling your hair, as you watch the yachts lining the horizon. Or, you could be taking in this scene from the other side—while sailing with family and friends on the shimmering waves.

Perhaps you are spending time in one of the restaurants or quayside bars along the expansive boardwalk before heading back to your well-appointed waterfront home just a few steps away. You are surrounded by the happy chatter of friends catching up after work, and couples and families out for some quality time.

Complementing all of this are the people on the jogging, walking and bicycle paths, as well as the walking trails winding through the lush greenery surrounding Keppel Bay, endorsing a different kind of outdoor experience.

This amalgamation is a reality at Keppel Bay—it's where the buzz of modern life melds seamlessly with calm nature for a well-balanced lifestyle.

## MAKING WAVES

The crown jewel of Singapore's southern shores, Keppel Bay is the quintessential waterfront playground for not just discerning homeowners, but also nature enthusiasts. It is the berthing spot of choice for yachts from around the world, and conveniently located near entertainment hotspots such as Resorts World Sentosa and VivoCity, Singapore's largest entertainment and retail hub.

For those who love to sail the high seas, Marina at Keppel Bay is where you can choose from a fleet of yachts and have a professional skipper take you on a customised cruise around Singapore and the Southern Islands.

## OCEANIC ADVENTURE

One of the longest endurance races on the high seas, the Clipper Round The World Yacht Race is a 40,000-nautical-mile circumnavigation on a 70ft ocean-racing yacht, visiting over eight ports in a year. During the years of 2006 to 2012, the race saw the international Clipper fleet sail into Keppel Bay, which was the official host port for the Singapore stopover before the fleet continued on the race to Qingdao, China.





The marina has earned numerous certifications that have cemented its position as a top global yachting centre. These include being accredited with the 5 Gold Anchor rating for the fourth consecutive time in 2021 and re-accredited, also in 2021, as a Clean Marina and Fish Friendly Marina by the Marina Industries Association.

More recently, in August 2021, M1 and Keppel Land unveiled a new suite of intelligent solutions powered by M1's 5G Standalone connectivity that aims to enhance live, work and play experiences at the marina. The fast speed and highly responsive enhanced network will not only improve safety and security, but further automate and streamline processes to boost productivity and efficiency at the marina.

## THE GOOD LIFE

Small wonder that this world-class precinct has lured many looking for a waterfront lifestyle.

Its residences include Caribbean at Keppel Bay and Reflections at Keppel Bay—winners of the FIABCI Prix d'Excellence Award for the years 2006 and 2013 respectively—as well as Corals at Keppel Bay. The iconic Reflections and Corals at Keppel Bay developments were designed by world-renowned architect Daniel Libeskind.

The Reef at King's Dock, the latest residential development to be launched at Keppel Bay, will be located adjacent to the historic King's Dock. When completed, residential blocks will rise from the land and sea like urban sculptures, providing a spectacular seaside experience that will let residents be one with the water.

When fully developed, Keppel Bay will house around 3,000 of such waterfront residences for discerning homeowners who want to be close to the comforts of the city, yet nestled in one of Singapore's most desirable nature and recreational enclaves.



The rollout of M1's 5G Standalone powered solutions at Marina at Keppel Bay is among Keppel Land's ongoing initiatives that seek to push the envelope of digitalisation, and sharpen its focus on customer centricity and engagement.



## BACK TO NATURE

Embracing a healthy lifestyle is easy for residents at Keppel Bay, thanks to the many green, open spaces in the vicinity. Take your family for a walk along the 330m-long Bukit Chermin Boardwalk, or for a heartier hike, try the 10km Southern Ridges trail that weaves through the green belts of Mount Faber Park, Telok Blangah Hill Park, HortPark, Kent Ridge Park and Labrador Nature Reserve.

The stunning gardens at the 10-hectare HortPark are not only an eye-opener for those with a green thumb, they link Telok Blangah Hill Park and Kent Ridge Park, providing a delightful path for joggers and walkers.

For lovers of nature, the Labrador Nature Reserve is home to more than 70 species of birds and 30 species of butterflies. It became designated as a nature reserve in 2002 owing to its rich biodiversity.



(From top) The Keppel Bay lifestyle strikes that perfect balance between life in the city and nature—the strategic location of the condominium properties offers easy access to nature spots such as Berlayer Creek via the Bukit Chermin Boardwalk. Labrador Nature Reserve is also home to historical relics, including a machine gun post used by the military in World War II.

History buffs will appreciate the fact that this site houses relics from World War II, including a disused fort, Fort Pasir Panjang—one of the 11 artillery forts built along the coast of Singapore by the British to defend its waters. The many fitness stations, walking trails as well as a jogging track make it a haven for fitness buffs as well. 📍





# Plug and Play

Keppel Land's drive to building homes of a different kind.

In 1992, when Keppel Land was tasked to undertake the redevelopment of Keppel Bay, one factor was high on the company's agenda: that whatever was taken away from nature must be restored. What followed, among others, was an ambitious coral cultivation and restoration project.

Corals are often underrated in terms of the impact they can have on our ecosystem and, by extension, our lives. The level of biodiversity in a healthy coral reef is not just astounding, but also critical to the existence of the myriad marine plant and animal species that call it home. Coral reefs also absorb up to 97 per cent of a wave's energy, acting as a buffer for currents, waves and storms, helping to prevent the loss of lives and property damage. Coastlines protected by coral reefs are more stable as well in terms of erosion than those without.

Despite their useful existence, we often do not think of corals unless we go snorkelling or diving, or peer at them through the glass walls of aquariums.



## CREATING A BALANCE

Research has shown that rapid urbanisation and expanding coastlines are detrimental to corals—at least 60 per cent of Singapore’s original reefs have been lost over time due to urban development, and there is no time better than the present to take all measures necessary to maintain our marine biodiversity.

Long-term research findings show that the thoughtful installation of man-made structures such as pontoons, pilings and seawalls help stimulate the marine environment and support marine organisms. “They have the potential to function as new habitats; as a refuge to provide food for marine animals,” explains Sam Shu Qin of the Tropical Marine Science Institute at the National University of Singapore. Such considerations are key to Keppel Land’s conservation efforts.

As marine organisms can naturally be found in the area along Keppel Bay, providing more substrate adds complexity to the reef and encourages growth, adds Brian Cabrera, a marine biologist from DHI, a research-based environmental consulting firm appointed by Keppel Land for its coral conservation and cultivation projects. “These reef enhancement structures increase the space available for natural coral recruitment and also serve as fish-aggregating devices.”

Corals need hard substrate to grow on, so it is helpful that the sides of King’s Dock are stepped. This increases the surface area available for coral recruitment. Furthermore, its proximity to natural reefs from where coral larvae originate proves to be an added bonus.



The soft coral *Lobophytum spp* can be commonly found in Singapore waters.



Desmond Lee (centre), then-Minister for Social and Family Development and Second Minister for National Development, at Keppel Bay in March 2019.

## UNDERWATER HOMES

The first project was kick-started in 2014, when marine biologists sourced for fragments of coral measuring roughly 10cm from the waters around Keppel Island. These were then nurtured for a period of 16 months in a coral nursery at Keppel Island, during which they grew to about five times their original size. The matured corals were attached to fibreglass structures using marine epoxy cement. Naturally occurring hard corals that were unattached or overturned due to natural processes from around Keppel Island were also used. These were subsequently transplanted onto reef enhancement structures at King’s Dock.



There are hard corals and soft corals; hard corals have calcium carbonate skeletons while soft corals do not. A common misconception is that corals are plants, due to the symbiotic algae that they host in their tissues. Now we know that they are actually animals. Picture depicts a Fan Coral.



# HUMAN

(From top left) Cave Corals are small hard corals that are usually found in shady places in shallow water—picture depicts a Cave Coral, *Tubastrea sp.* The presence of Butterflyfish is an indication of healthy reef environments. The undersides of pontoons create a conducive environment for the growth of soft corals and macroalgae.



“The success of the project was ascertained by how well the transplanted corals could perform functions mimicking a coral reef,” says Dr Siti Maryam Yaakub, Head of Department, Ecological Habitats & Processes, at DHI. This included, among other factors, the number of other flora and fauna such as fish and invertebrates attracted by the reefs.

“Which is why it was encouraging to see Monocle Bream, Orange-spotted Rabbitfish, Pipefish, and Butterflyfish flitting around the arms of the transplanted branching coral,” says Cabrera. “Butterflyfish, in particular, are a good sign as they are usually found in healthy reef environments.”

DHI has again been engaged to cultivate corals at and transplant corals to The Reef at King’s Dock, the latest residential development to be launched at Keppel Bay, to further enrich the biodiversity of King’s Dock.

Keppel Bay today supports a rich marine ecosystem. There are at least 47 species of hard corals, eight species of sponges and 57 species of reef fish.

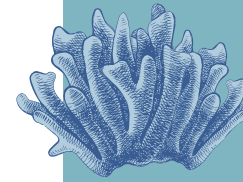
Accolades and acknowledgements such as the Fish Friendly Marina from the Marina Industries Association were other indicators—in 2015, Marina at



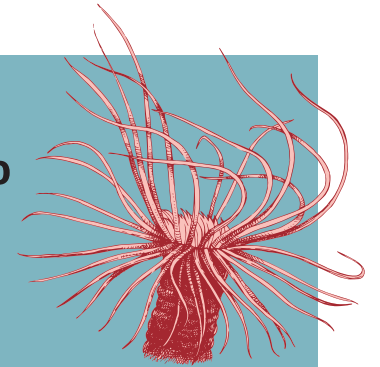
Keppel Bay was the first in Asia to receive such a recognition from the Sydney-based association.

Keppel also supported Jurong Town Corporation and NParks in the Grow-a-Reef-Garden initiative. The project includes a purpose-built reef garden—the largest in Singapore—at Small Sister’s Island. Prefabricated reef structures, built off-site, were sunk in the waters off the island for the project, which will add an estimated 1,000 sqm to the reef area of Sisters’ Islands Marine Park by 2030.

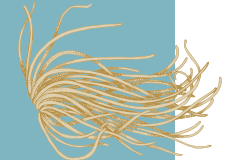
Healthy coral reefs are important—as they thrive, so do we, and Keppel’s relentless efforts to maintain and nourish Keppel Bay’s underwater life is a pledge towards a greener future. 🌿



Coral reefs are like rainforests in the sea—**1%** they cover less than **1%** of the ocean, but are home to almost **25%** of all known marine species.



Coral reefs are the largest structures on earth of biological origin. They provide homes for over **4,000** species of fish, thereby supporting the livelihood of about **500 million** humans around the world.



Recent studies suggest that the planet has lost approximately half of its coral reefs in the last **30 years,** and could lose more than **90%** by the year **2050** if drastic changes are not made to protect the habitats of coral reefs and to reduce global carbon emissions.





# Meet Carol the Coral

A short film and an adorable sea-worthy storybook was commissioned by Keppel Land in a bid to reach out to young minds on preserving Singapore's marine ecosystem.



*Carol the Coral* tells an endearing tale of a coral larva's relentless hunt for a home where she can thrive, while introducing children to the different types of marine fauna.

Homes matter. In the same way that humans need a healthy environment in order to thrive, so do the corals in the sea. As corals are a life-giving source, the future of Singapore's marine biodiversity in general is in fact hinged on their well-being.

The role of corals as substrates that house and feed a plethora of marine organisms makes them significant to the human food chain. In addition, corals protect our marine coastlines and have medicinal benefits.

In the past 20 years, however, corals have suffered intensive damage due to urban development and pollution—organic and man-made. Apart from these, human activities such as coral mining—for construction and other purposes, as they are a rich source of limestone—and recreational activities, including careless boating and diving, overfishing and blast fishing, have taken their toll.

In a time when conservation and sustainability are important touchpoints, they are still not often part of mainstream conversation when it comes to marine life.

To promote the importance of marine conservation, Keppel Land embarked on its "Homes in the Sea" initiative in 2016.


As part of the initiative, Keppel Land created a short film, with artiste Rebecca Tan following a marine specialist from DHI. It shows young coral, first grown in a nursery off-site, being transplanted onto coral enhancement structures at King's Dock at Keppel Bay.



## LET'S DO OUR PART

Being a conscious coral saver means taking care of the habitat in which they live and the environment around it. Actively learn about local marine conservation initiatives by participating in coastal clean-ups and citizen science surveys, and choose sustainable seafood options whenever possible.

Climate change is one of the biggest threats to coral reefs, as elevated sea temperatures and ocean acidification can cause coral bleaching, slowing down coral growth and causing reef mortality. Therefore, further action to reduce our carbon footprint can go a long way in preserving coral reefs. Take public transport, switch off appliances when they are not in use, and remember to reduce, reuse and recycle.

A children's picture book was also launched to create awareness about nurturing corals. *Carol the Coral*, by Singapore-based American author Jason Erik Lundberg and local illustrator Annabella Goh, tells a whimsical tale about a feisty young coral who discovers King's Dock while looking for a new home. This endearing story also addresses the topics of agility and "Can Do" attitude in tough situations—which are among Keppel's core values. 

### Want to Know More?

Find out about coral reefs at NParks' website  
[nparks.gov.sg/biodiversity/our-ecosystems/coastal-and-marine/coral-reefs](https://nparks.gov.sg/biodiversity/our-ecosystems/coastal-and-marine/coral-reefs)





Keppel rallies its stakeholders in its journey towards a cleaner, greener tomorrow.

# Sustainable Footsteps

Together with its stakeholders, Keppel is committed to building a brighter, better future for generations to come.

As a responsible corporate citizen and a leading green developer, Keppel Land adopts an integrated approach towards sustainability. It is committed to supporting the UN Sustainable Development Goals through responsible business practices as well as developing properties that harmonise with and enhance the environment.

As the call for climate action takes on greater urgency, with global greenhouse gas emissions reaching record levels and showing no sign of peaking, countries worldwide are committing to delivering more ambitious national climate plans.

Singapore has pledged to reduce its emissions intensity by 36 per cent from 2005 levels by 2030 and to stabilise its emissions with the aim of

peaking around 2030. Beyond 2030, Singapore aspires to halve emissions from its peak to 33 MtCO<sub>2</sub>e by 2050, with a view to achieving net-zero emissions as soon as viable in the second half of the century.

Keppel Land is committed to supporting the efforts of the international community and the Singapore Government to accelerate climate action. Keppel Land met its target to reduce its carbon emissions intensity by 16 per cent below 2010's level by 2020 ahead of time. In 2020, given the significant reduction in activities and the ensuing lower energy consumption due to COVID-19, as well as Keppel Land's efforts in optimising and transforming its portfolio assets into low-carbon/low energy buildings, Keppel Land's carbon emissions intensity was about

*Keppel Land supports the efforts of the international community and the Singapore Government to accelerate climate action. We are committed to reducing the carbon footprint from the development of our properties and our operational activities.*

—Louis Lim, CEO, Keppel Land





In November 2020, Keppel Land collaborated with the Sustainable Singapore Gallery, which is managed by PUB, to launch a public outreach programme, named "R.I.S.E. to the Challenge", aimed at raising awareness on the pressing environmental issue of rising sea levels, as well as the urgent need for climate action. Pictured is guest-of-honour Grace Fu, Minister for Sustainability and the Environment (centre), accompanied by Keppel Land's directors and senior management, viewing the exhibition panels at the launch.

42 per cent below 2010's levels. Excluding the impact of COVID-19, the reduction is estimated to be at about 30 per cent. Keppel Land has set a long-term emission intensity reduction target of 40 per cent below 2010's levels by 2030. Keppel Land will also be setting absolute reduction targets that are aligned with climate science.

Keppel's Vision 2030 sees Keppel as one integrated business

providing solutions for sustainable urbanisation with sustainability at the core of its strategy. In line with this vision, Keppel Land has been a strong proponent of environmental responsibility and social responsibility. Over the years, Keppel Land has established itself as a leading sustainable company, delivering innovative and multi-faceted urban space solutions that enrich people and communities.



Programmes such as the Floating Classroom at Marina at Keppel Bay aim to educate the public on the effects of global warming on marine biodiversity.

In Singapore and overseas, Keppel Land seeks to raise awareness among its stakeholders on environmental issues, including marine conservation. This is done through a variety of initiatives, such as beach clean-ups, roadshows, art installations and exhibitions, as well as documentary screenings to promote environmental conservation and encourage better protection of Singapore's marine environment.

In the development of Keppel Bay, Keppel Land has seamlessly integrated liveability with environmental conservation and responsibility. Not only do residents enjoy well-landscaped surrounds within the developments, they also have easy access to nature in their backyard. For example, a walkway connects residents from one end of Keppel Bay to the other. They can also further explore the lush Labrador Nature Reserve via the Bukit Chermin Boardwalk.

The City Reef at Keppel Bay initiative, for example, is one that brings together different stakeholders, including residents of Keppel Bay, as well as boaters who berth at Marina at Keppel Bay, to learn more about the thriving life in Keppel Bay's waters, and the ways they can better care for and protect the marine environment. Keppel Land has also been organising programmes and guided tours to share with various stakeholders about the environmental initiatives undertaken at Keppel Bay. These include the Floating Classroom educational programme, which aims to educate the public on how global warming impacts marine biodiversity,



# HUMAN

(From top) The Reef at King's Dock is strategically located in the HarbourFront and Keppel Bay precincts, and within the Greater Southern Waterfront. The one-bedroom show suite at The Reef at King's Dock.

as well as the CoralWalk at Keppel Bay series that is organised in collaboration with the Lee Kong Chian Natural History Museum.

To further promote the growth of marine life, Marina at Keppel Bay has teamed up with the National University of Singapore to install enhancement tiles on select seawalls of the marina. These tiles create more surface area and are specially designed with complex topography that creates microhabitats for intertidal organisms.

Just a stone's throw away from the marina is The Reef at King's Dock, a sustainable, next-generation luxury development for discerning urbanites that encompasses the convenience of city living, the tranquility of nature and the luxury of true waterfront living. The development will feature Singapore's first floating deck in a residential development, located within the waters of King's Dock. The 180m-long iconic floating deck will house an ensemble of swimming pools, a sun deck and a marine viewing area that will allow residents and visitors to view and better appreciate the marine ecology in King's Dock, thus further promoting environmental awareness and conservation.



Artist's Impression

Keppel Bay Tower, where Keppel Corporation is headquartered, is also located in the vicinity. Keppel Bay Tower has been certified as a Green Mark Platinum Zero Energy building by the Building and Construction Authority (BCA). It is the first commercial building in Singapore to achieve this accolade. Keppel Bay Tower incorporates various innovative technologies that have significantly improved its energy efficiency.

Keppel Land, the operator of the building, also places great importance on employees' health and well-being. In recognition of Keppel's efforts to promote a healthy lifestyle among





## KEPPEL BAY TOWER—SINGAPORE’S FIRST GREEN MARK PLATINUM ZERO ENERGY COMMERCIAL BUILDING

A Green Mark Platinum Zero Energy building must, in addition to achieving a low energy use index (EUI) of less than 115 kWh/m<sup>2</sup> per year, also have all of its energy consumption, including plug load, supplied from renewable sources, both on-site and off-site.

### EUI of <115 kWh/m<sup>2</sup> per year

Almost 50% more energy efficient compared to typical office buildings in Singapore.

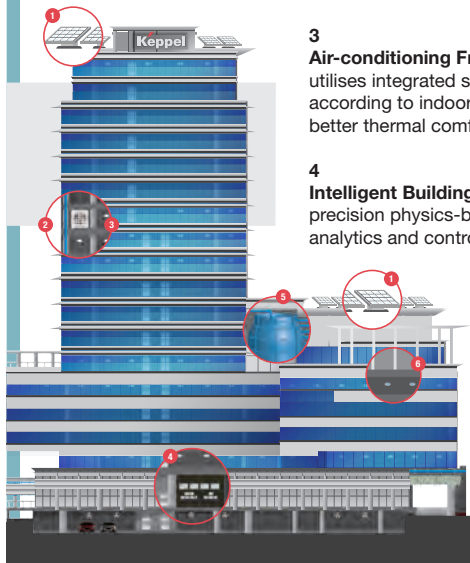
### Reduction of more than 2,400 tonnes of carbon emissions per annum

Purchase of Renewable Energy Certificates generated from PV panels installed in Keppel Offshore & Marine’s yards in Singapore. Together with the installation of on-site PV panels at Keppel Bay Tower, these initiatives will result in a reduction of more than 2,400 tonnes of carbon emissions per annum.

### Overall energy savings of more than 30% or 2.2 million kWh/year

Equivalent to the amount of energy required to power more than 400 five-room HDB flats for a year.

### SMART, ECO-FEATURES OF KEPPEL BAY TOWER



**1 PV Panel System** allows the harvesting of about 100,000 kWh of energy per annum.

**2 Energy-efficient Air Distribution System** features air handling unit fans that are about 45% more energy efficient than other best-in-class technologies.

**3 Air-conditioning Fresh Air Intake Control System** utilises integrated sensors to regulate fresh air intake according to indoor activities, optimising energy usage for better thermal comfort and indoor environmental quality.

**4 Intelligent Building Control System** employs a high-precision physics-based simulation engine to improve data analytics and control.

**5 Cooling Tower Water Management System** utilises a patented solution that reduces cooling tower water usage and eliminates the need for chemical water treatment.

**6 Smart Lighting System** utilises occupancy sensors which allow seamless transition in lighting levels according to building occupancy.



its employees, Keppel Land was conferred the Platinum Award under the BCA-HPB Green Mark for Healthier Workplaces scheme, by the BCA and the Health Promotion Board.

Keppel encourages its building tenants at Keppel Bay Tower to adopt green practices. All tenants of the building have signed green leases, which is a demonstration of Keppel’s commitment to work with its tenants to provide energy-efficient, resource-efficient and healthier interior spaces for building occupants.

Keppel Land will continue to deliver innovative solutions that enrich people and communities, as it seeks to redefine urban spaces for a sustainable future. With its picturesque location and pristine waters, Keppel Bay will remain a destination of choice for those seeking a waterfront home, boaters, or just anyone looking for some respite from the bustling city.

Keppel Land will continue in its active engagement efforts with



(From top) Waterways cleverly incorporated into the design of Keppel Bay provide residents the opportunity to spot the thriving marine life in the clear waters. As part of its community outreach efforts, Keppel Land hosted about 100 senior citizens from Thye Hua Kwan Moral Society to a cruise around Singapore’s southern coast.

stakeholders to enliven the crown jewel of Singapore’s shores that is Keppel Bay, and protect the world above and below its waters. 🌐



We would like to express our appreciation for the hard work and dedication of many organisations and individuals, including countless Keppelites, who have contributed to the development of Keppel Bay.

We would also like to thank our partners from the National Parks Board, the Tropical Marine Science Institute and the Department of Biological Sciences at the National University of Singapore, as well as DHI, whose valued insights and support have been key to this booklet. We hope this booklet would help all stakeholders better understand the transformation of and conservation efforts at Keppel Bay.





# Keppel Land

Please scan the QR code to  
read the book online

