

Meeting with Task Force on Water-land Interface and Harbourfront Activation

Pilot Trial of Floating Photovoltaic System at Kai Tak Approach Channel

Agreement No. CE 77/2021 (DS)
Strategic Planning Study on Flood Management
Against Sea Level Rise and Extreme Rainfall – Feasibility Study

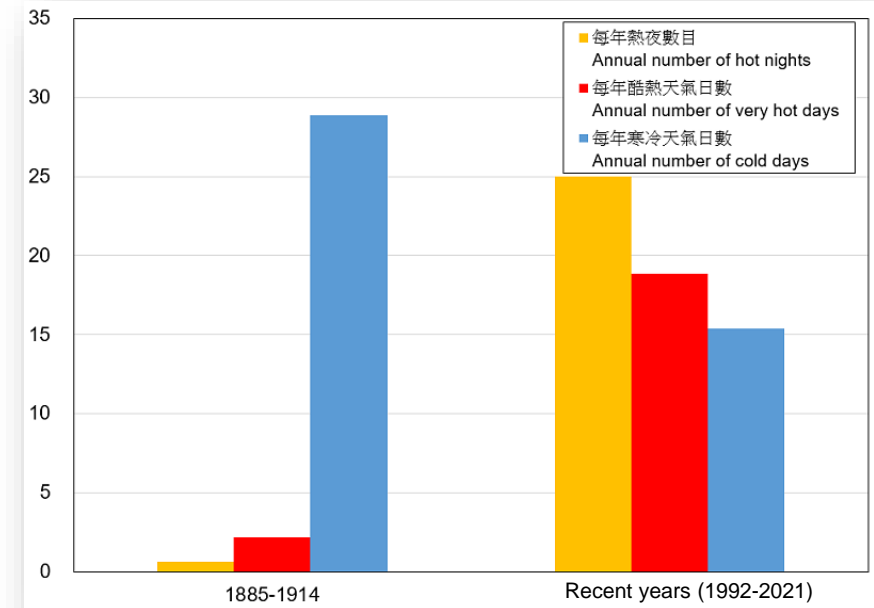
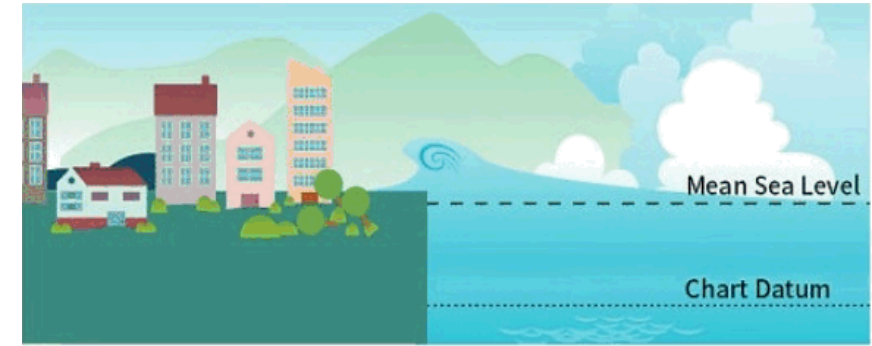
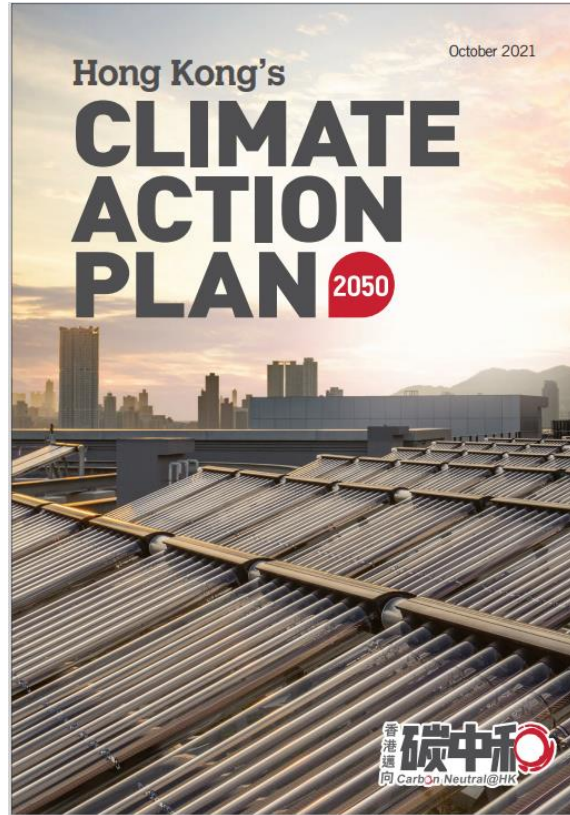
October 2022

Agenda

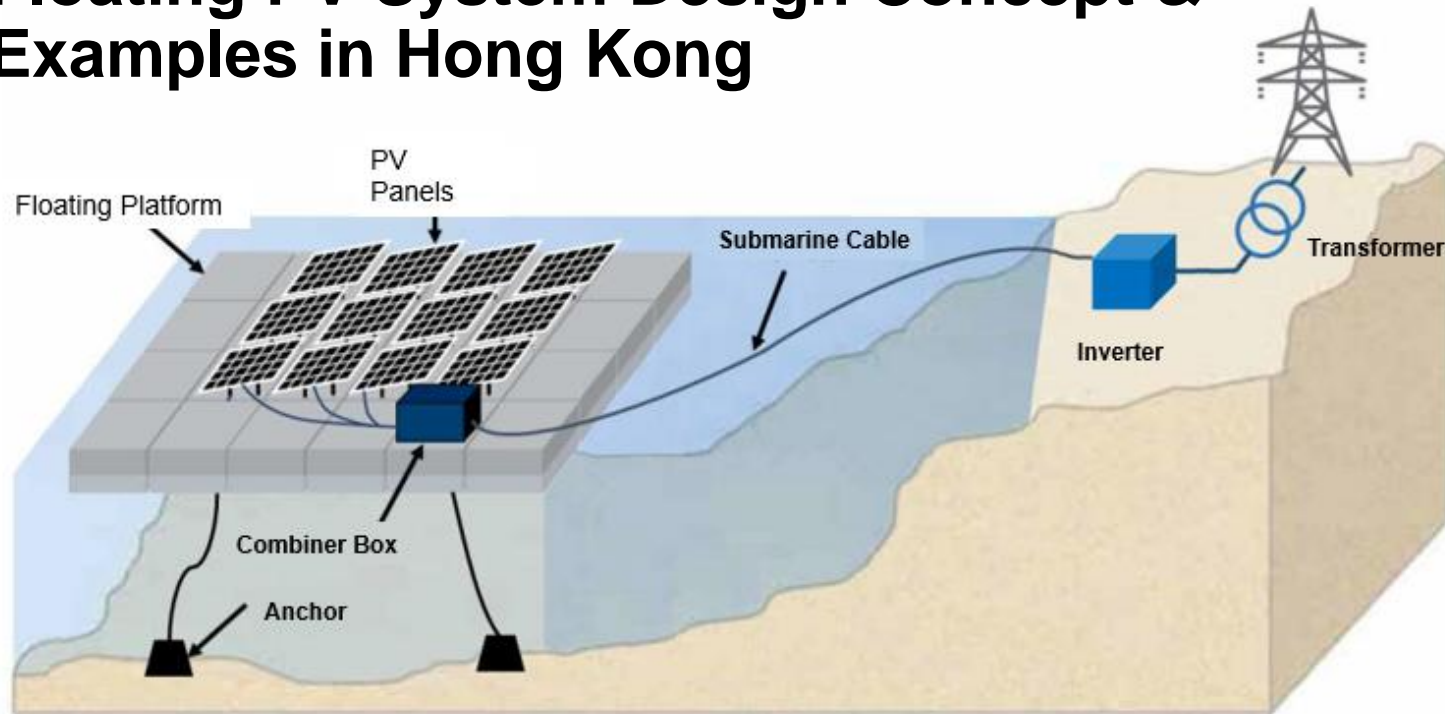
1. Project Background
2. Proposed Location and Layout
3. Advantages and Mitigating Negative Impacts to the Community
4. Compliance with Harbour Planning Principles
5. Tentative Programme

Project Background

- Drainage Services Department (DSD) has been proactively promoting the use of renewable energy (RE) at its facilities, including biogas and solar power generation, in order to reduce carbon emissions and mitigate climate change.
- In October 2021, the Government announced “Hong Kong's Climate Action Plan 2050+” (the climate action plan), setting out the vision of "Zero-carbon Emissions· Liveable City· Sustainable Development", and outlining the strategies and targets for combating climate change and achieving carbon neutrality.
- DSD wishes to study the feasibility of installing a **small scale and temporary** floating Photovoltaic (PV) system in Kai Tak Approach Channel as a **pilot trial**. The electricity generated by the system would be utilized by nearby DSD facilities and public amenities.



Floating PV System Design Concept & Examples in Hong Kong



Shek Pik Reservoir



Plover Cove Reservoir



Tai Lam Chung Reservoir

- Water Supplies Department Floating Solar Power System Pilot Projects:
 - ✓ Shek Pik Reservoir (completed in 2017)
 - ✓ Plover Cove Reservoir (completed in 2017)
 - ✓ Tai Lam Chung Reservoir (completed in 2022)
- Each location has about 350 solar panels, with an installed capacity of 100 kW, which can generate 120,000 kWh of electricity per year.

Examples of DSD's Floating PV System

- DSD's Floating PV System Projects:
 - ✓ Pilot trial at San Tin Polder (completed in March 2022, installed capacity of 37 kW)
 - ✓ Mock-up at Shing Mun River (completed in August 2022, installed capacity of 3 kW)



Pilot trial in San Tin Polder



Mock-up in Shing Mun River

Proposed Location



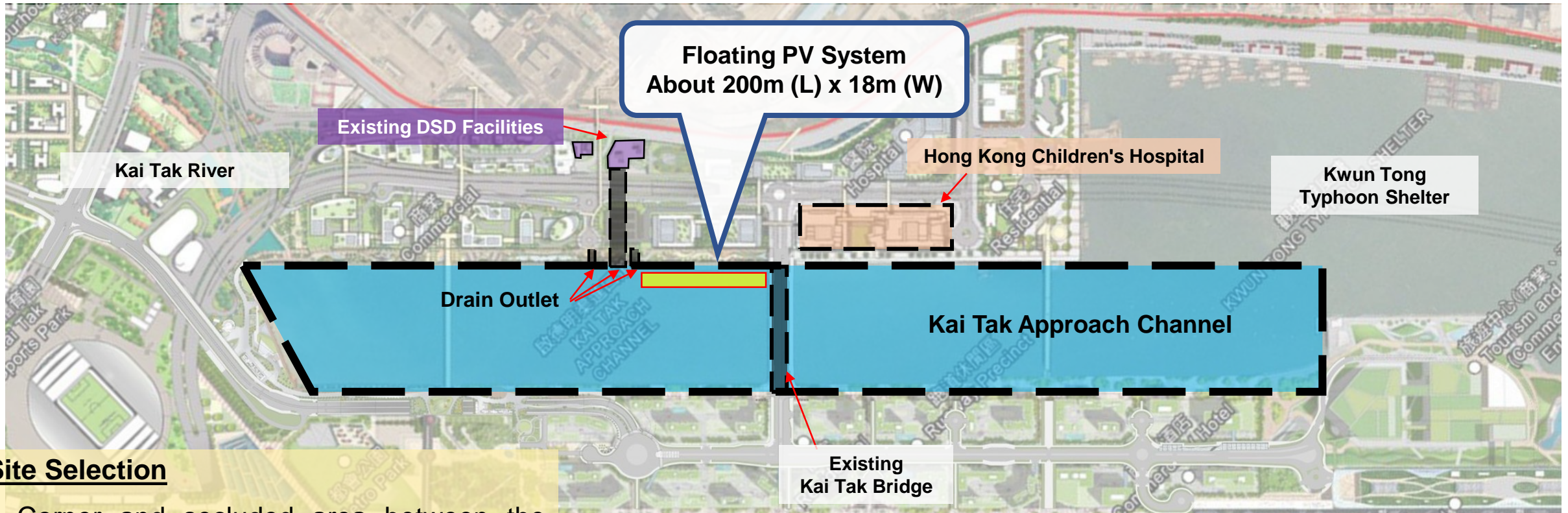
What is the purpose of this Pilot Trial?

- The pilot trial aims to test the suitability of the FPV system design in a river outlet/ marine environment, testing the durability in seawater condition under the effects of current, tide, wind and wave in Hong Kong.

Why Kai Tak Approach Channel?

- A straight, relatively sheltered and calm water channel at the downstream/outlet part of the drainage channel Kai Tak River
- Not heavily used for mooring of vessels or navigation purposes
- Prime location to promote innovative RE installations, to raise awareness and to educate the public in urban area
- Near existing DSD's facilities and future public promenade to harness RE generated

Proposed Layout



Site Selection

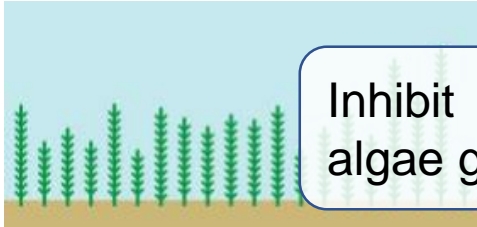
- Corner and secluded area between the existing 7-cell box culvert outlet and the section of Kai Tak Bridge with reduced headroom.
- Near the seawall of future landscape promenade to create new points of interest
- Facilitate co-use of the water channel with future water sports activities

- About 260kW installed capacity. Occupying water surface area of about 3,700m² (=approx. 1/70 of the total area of Kai Tak Approach Channel).
- Equivalent to the annual power consumption of 77 three-person households.
- Reducing 180 metric tons of carbon emissions annually (equivalent to carbon absorption of about 7,700 nos. of trees)

Advantages to the Community



Reduce carbon emission



Inhibit algae growth



Avoid competing with land resources



Improve power generation efficiency

Information board with power generation data

Solar-powered mobile charging station



(subject to design)

Information board and kiosk to provide information and renewable power to promenade amenities

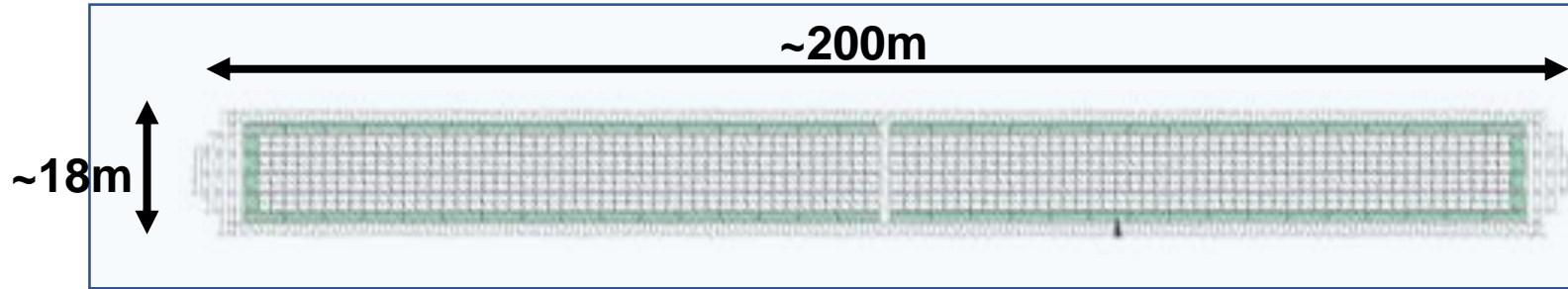
Enhance public understanding of solar power generation installations to combat climate change

Promote green community to the public, with innovative and aesthetic installation to enhance promenade appeal

Facilitate co-use of the waterfront areas/ water bodies by not obstructing the planned promenade development

Generated electricity use to enhance user experience

Greenery



(subject to design)

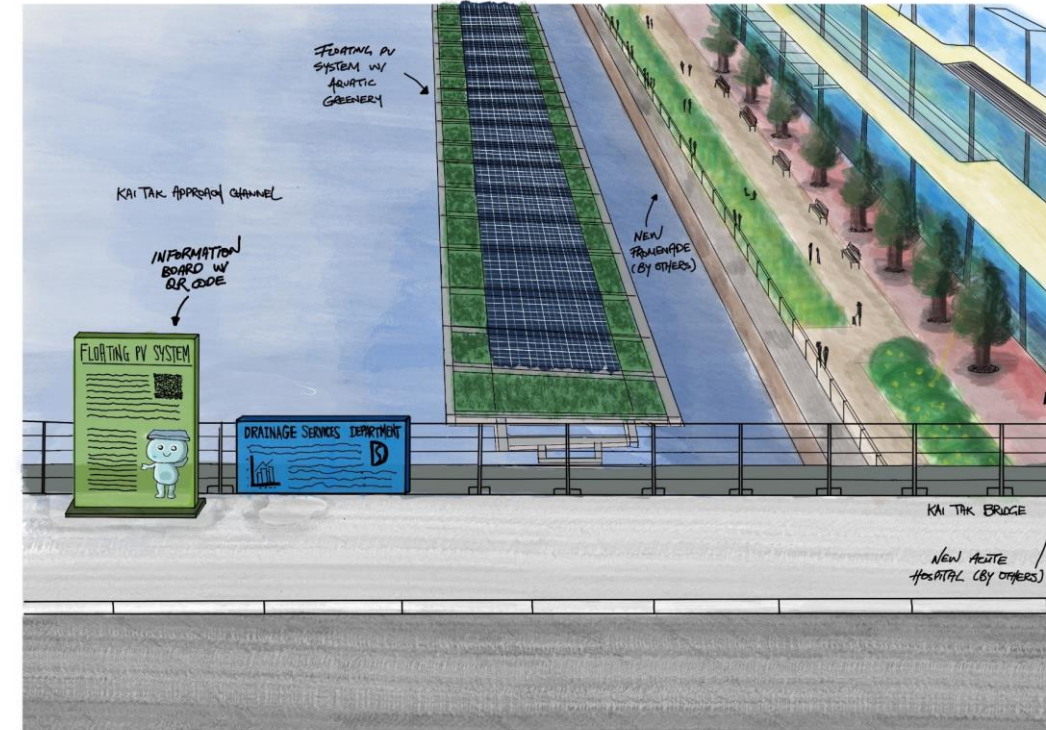


To be decorated with DSD mascot

Prospective Planting Species



Name	Acrostichum aureum (Gold Leather Fern) 鹵蕨	Cyperus malaccensis (Malacca Galingale) 茼茼	Fimbristylis sieboldii (Fimbristylis) 锈鳞飘拂草
Growth Rate	<1m/yr	<1m/yr	<0.3m/yr
Remarks	Robust and hardy mangrove ferns Herbaceous	Found in margins of wet salt marshes, sea shore Brackish water species Herbaceous	



Greenery Percentage of planting trial: about 20%

Mitigating Negative Impacts to Community

Information board with power generation data



Solar-powered mobile charging station

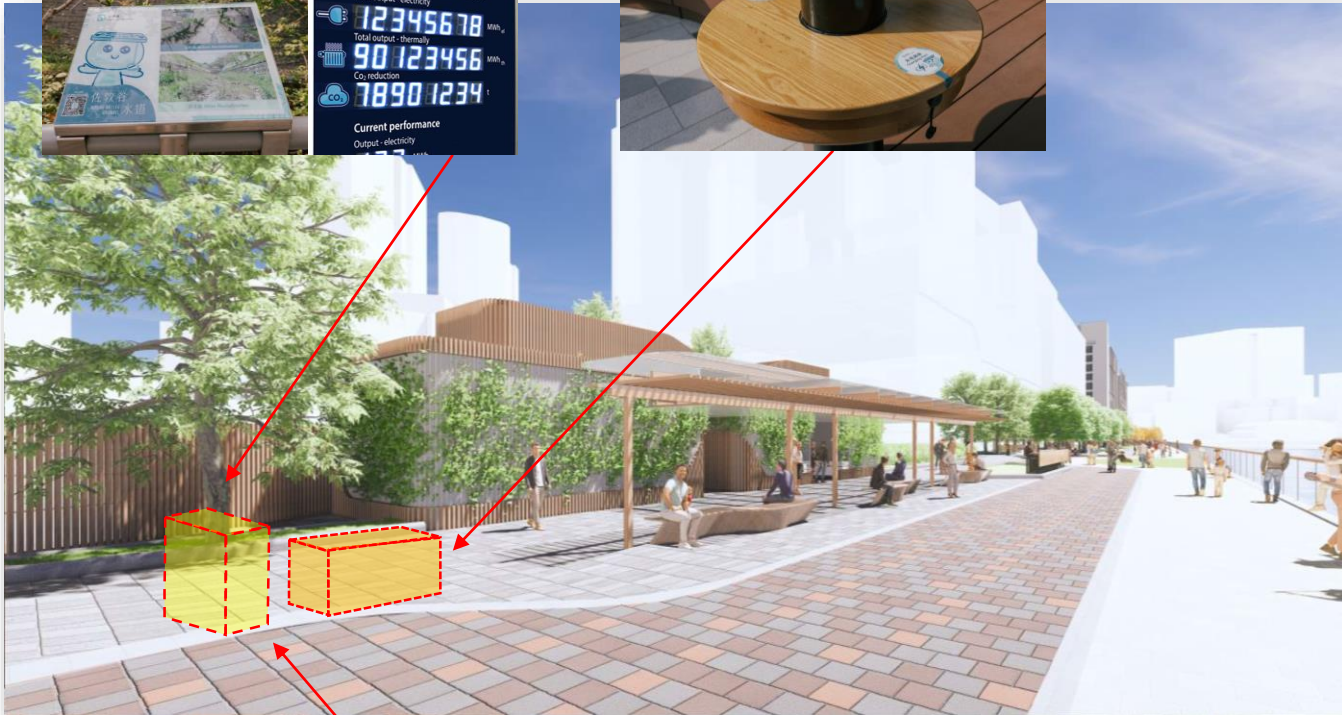


Tempered glass to enhance safety/durability and with anti-reflective coating to minimise glare

Choice of site and size considered other users of waterfront areas as well as Kai Tak Approach Channel (including those engaging in water sports)

Minimise the sizing of E&M units at promenade

Conduct site trials of initiatives to improve the water quality and promote biodiversity

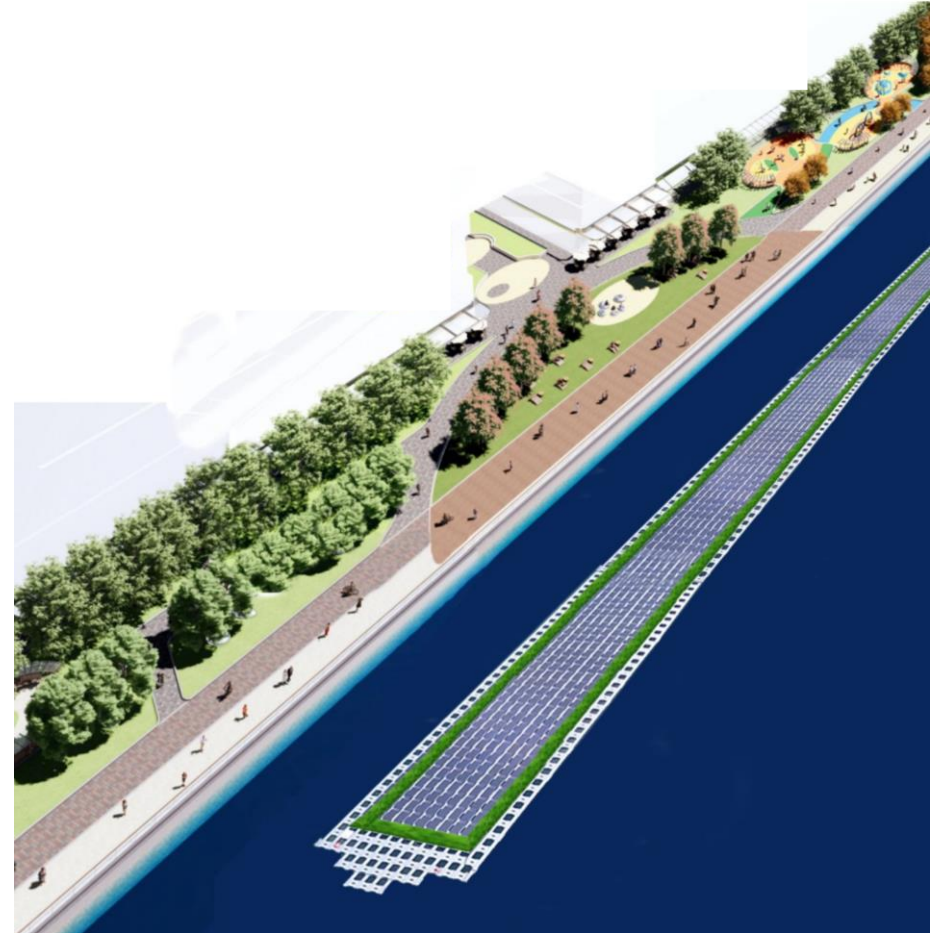


(subject to design)

Information board and kiosk to provide information and renewable power to promenade amenities



Visualisations



(subject to design)

Compliance with Harbour Planning Principles



- Combat climate change thereby protecting and preserving the harbour against inundation/ flooding risks (#1)
- Existing/proposed uses of the waterfront/harbour not adversely affected (#1 & # 7)
- No reclamation work or forming land (#1 & #5)
- Consultation with the relevant stakeholders/ interfacing parties conducted to seek comments (#2 & #4)
- Demonstrate sustainable development by being a source of renewable energy (#3)
- Promote the new Kai Tak Development Area as an advance green community to the public (#3)
- Enhance public understanding of solar power generation installation to combat climate change (#3)
- Conduct site trials of initiatives to improve the water quality and adding greenery elements to give visual interest (#3 & #6)
- Facilitate co-use of the water bodies by not obstructing the planned promenade or affecting the accessibility of the harbour (#7 & #8)

Tentative Programme





Thank you