Planning & Implementation of District Cooling System in Hong Kong China

Make Our District COOL and WARM: From Vision to Action

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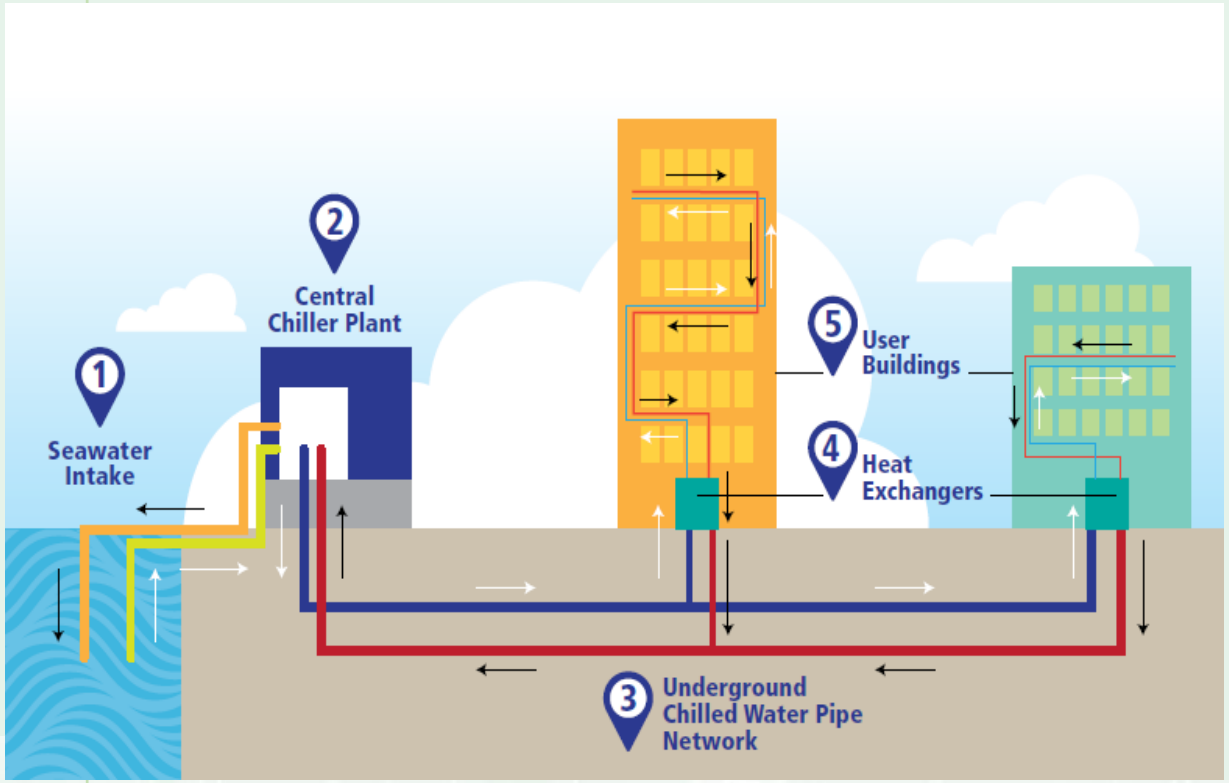
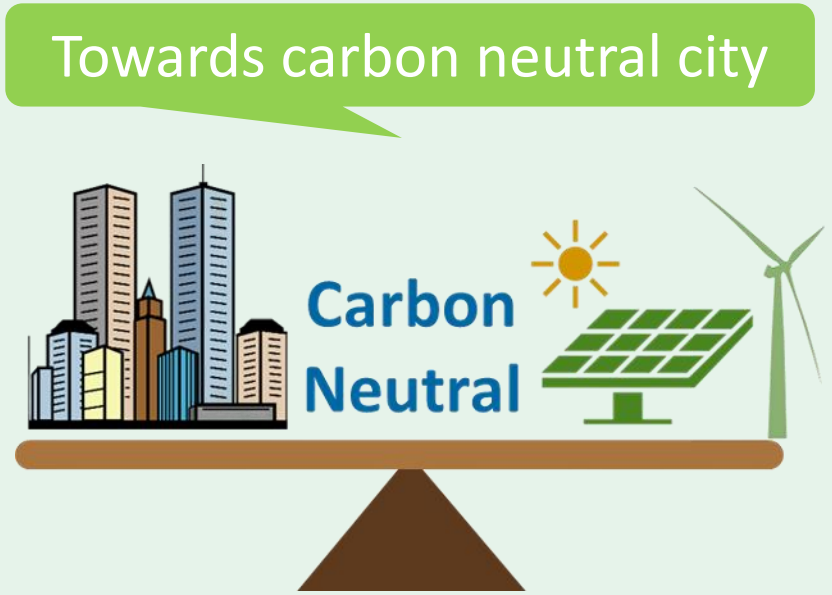
APEC Workshop on District Cooling and/or Heating Systems
EWG 08 2019S

What is District Cooling System - DCS?





Kai Tak Development (KTD)

Kai Tak Airport in 1998

KTD under redevelopment

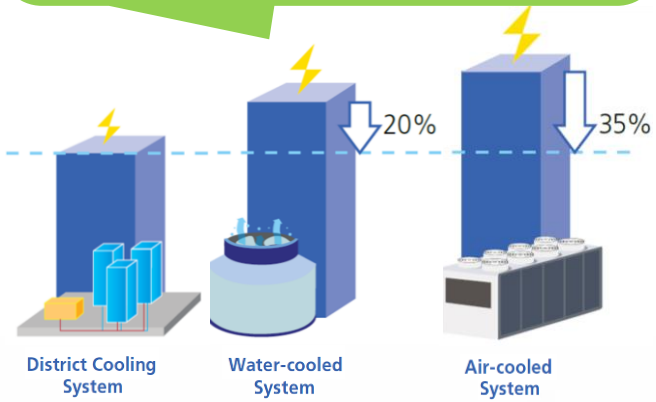
Proposed KTD in Future

- Large scale of old district redevelopment from 1998
  - 2nd Central Business District of Hong Kong

Benefit of DCS at KTD

COOL

High energy efficiency
- Load diversity
- Economies of scale



Electricity Consumption for Cooling

Mitigate heat island effect

Increase reliability
- 3 pipes/Ring pipe network
- Dual feed power supply
- Bank of chillers

Eliminate noise and vibration

Benefit of DCS at KTD

WARM

Save Spaces
for more flexible building design

Create
job opportunities

Utilize
low development potential land

Achieve
overall greening ratio of 30%

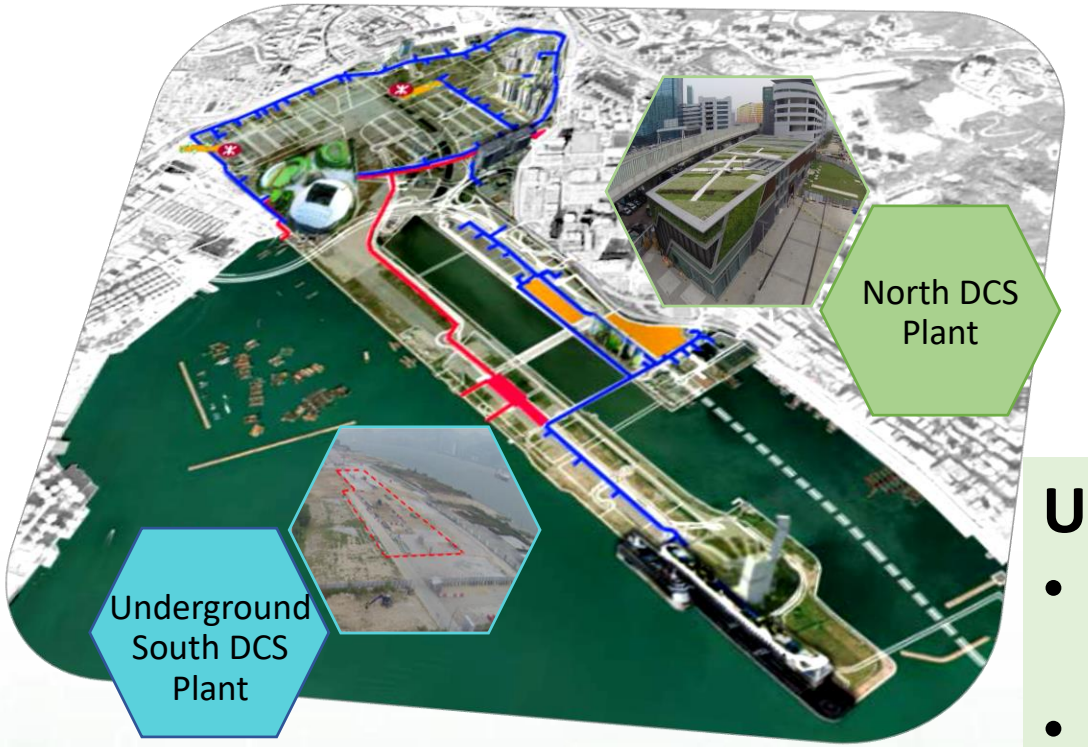
Health

DCS at KTD

Complex re-development and Multi building types

North and South Plant

- Serving areas
  320 hectare
  1.73 million m^2
  (air-conditioning area)
- Cooling capacity
  284 MW
- Pipes length
  Nearly 40km
- Project Sum
  HK$4,945 million
  (~USD$640M)



Saving 85 million kilowatt-hours per year

59,500 tonnes carbon dioxide reduction

Upcoming Additional Plant

- Cooling capacity
  178MW
- Serving Area
  0.81million m^2
  (air-conditioning area)

Green Bond

Proceeds allocated:

HK$501 million

(about US$64 million)

Energy Efficiency and Conservation

Project Financed:

District Cooling System at the Kai Tak Development

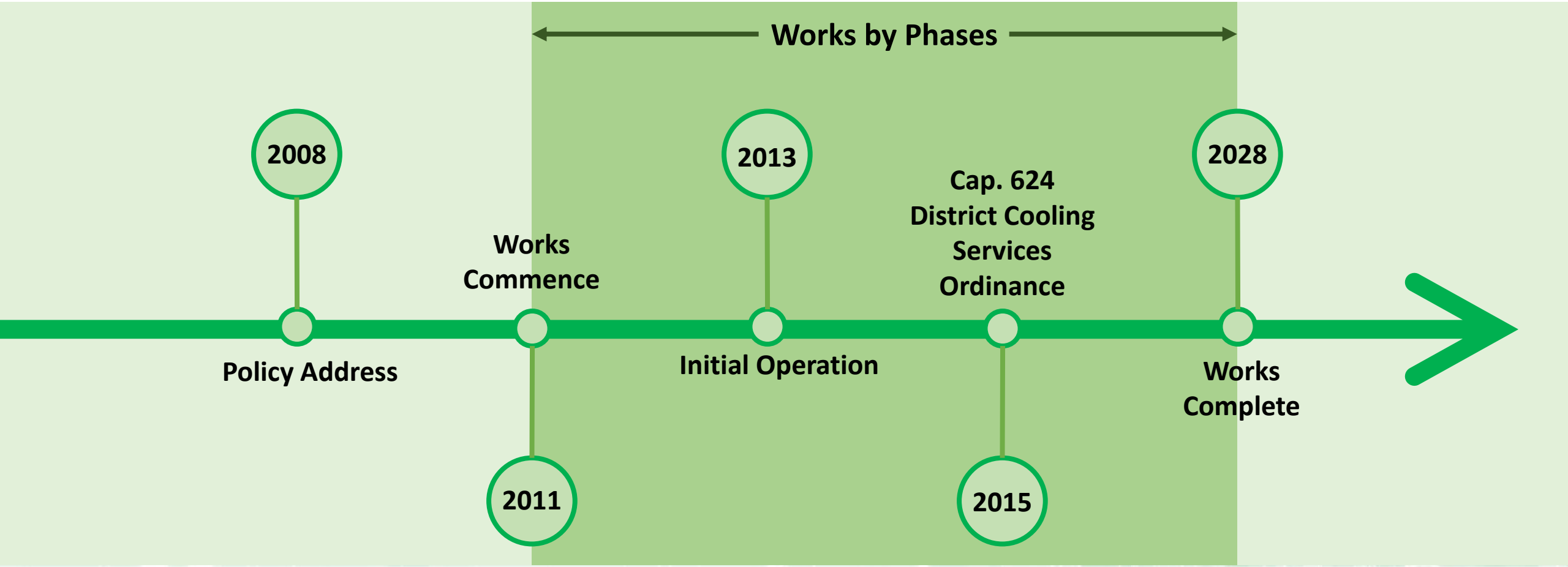
Government roles & Stakeholders

Government Roles: Project Manager + Promotor + Regulator + Facilitator

Stakeholders: Government, Building Owners, Public

Project Manager

Implementation of DCS



Project Manager

Implementation of DCS

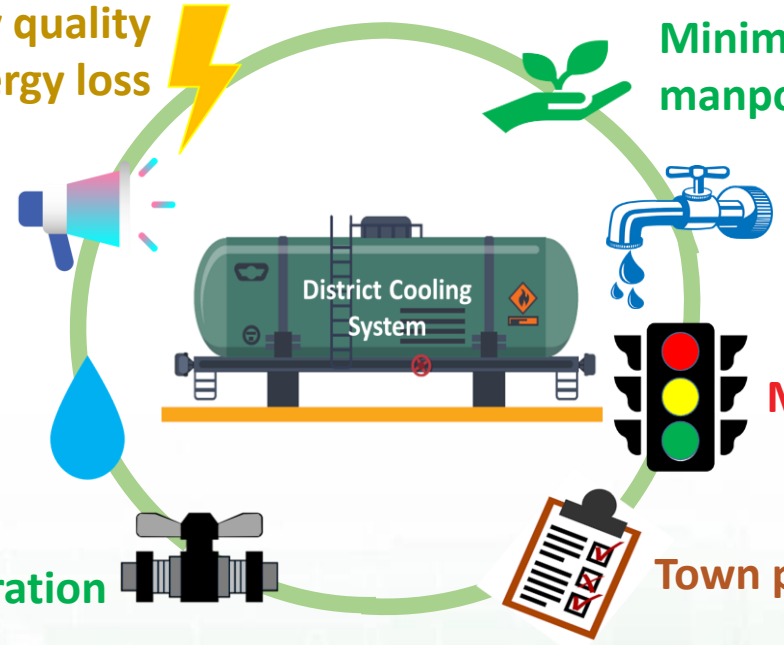
Work with different government departments, utility companies and building owners

Best power supply quality
Minimize power and energy loss

Minimize waste of materials and manpower

Promote and explain the sustainable benefits for DCS consumers

Shorter pipe length to reduce piping materials



Maintain harbour's water quality and sustainability

Minimize the disturbance of road use

Optimize DCS operation

Town planning

Promotor

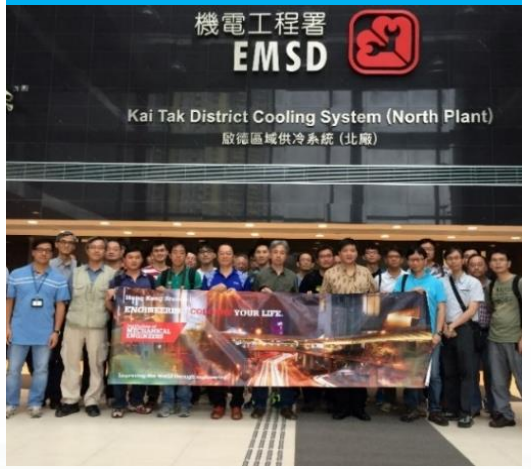
Stakeholders' Engagement

First for DCS in HK

Apply BIM Technology

DCS Presentation in CIBSE Symposium 2018, London

Public Engagement



DCS Open Day

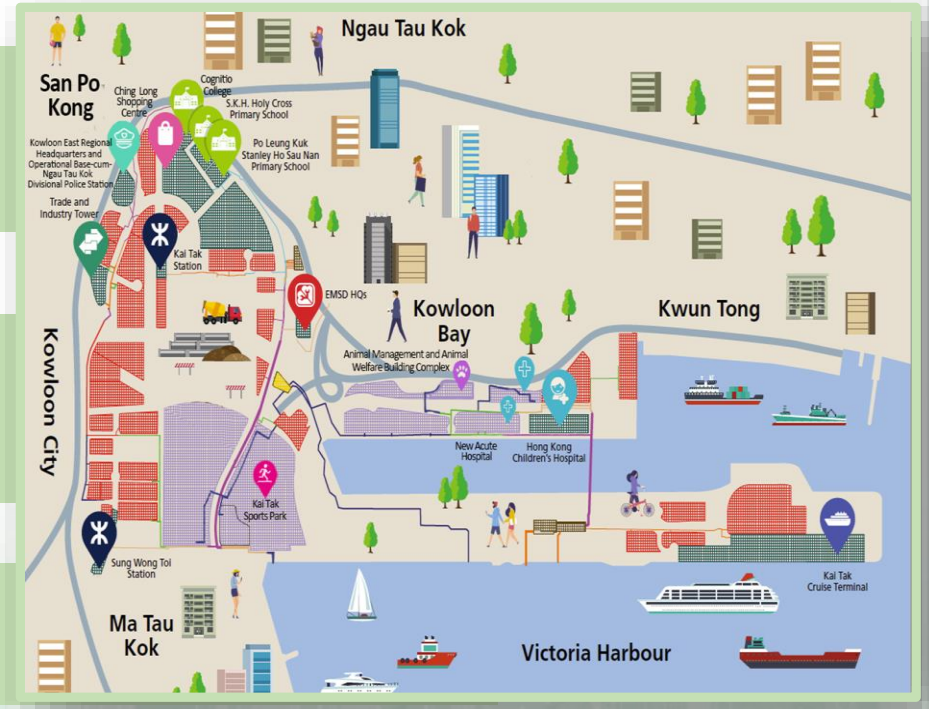
Regulator

Statutory Requirements

District Cooling Services Tariff
(Cost Recovery: 30 years)

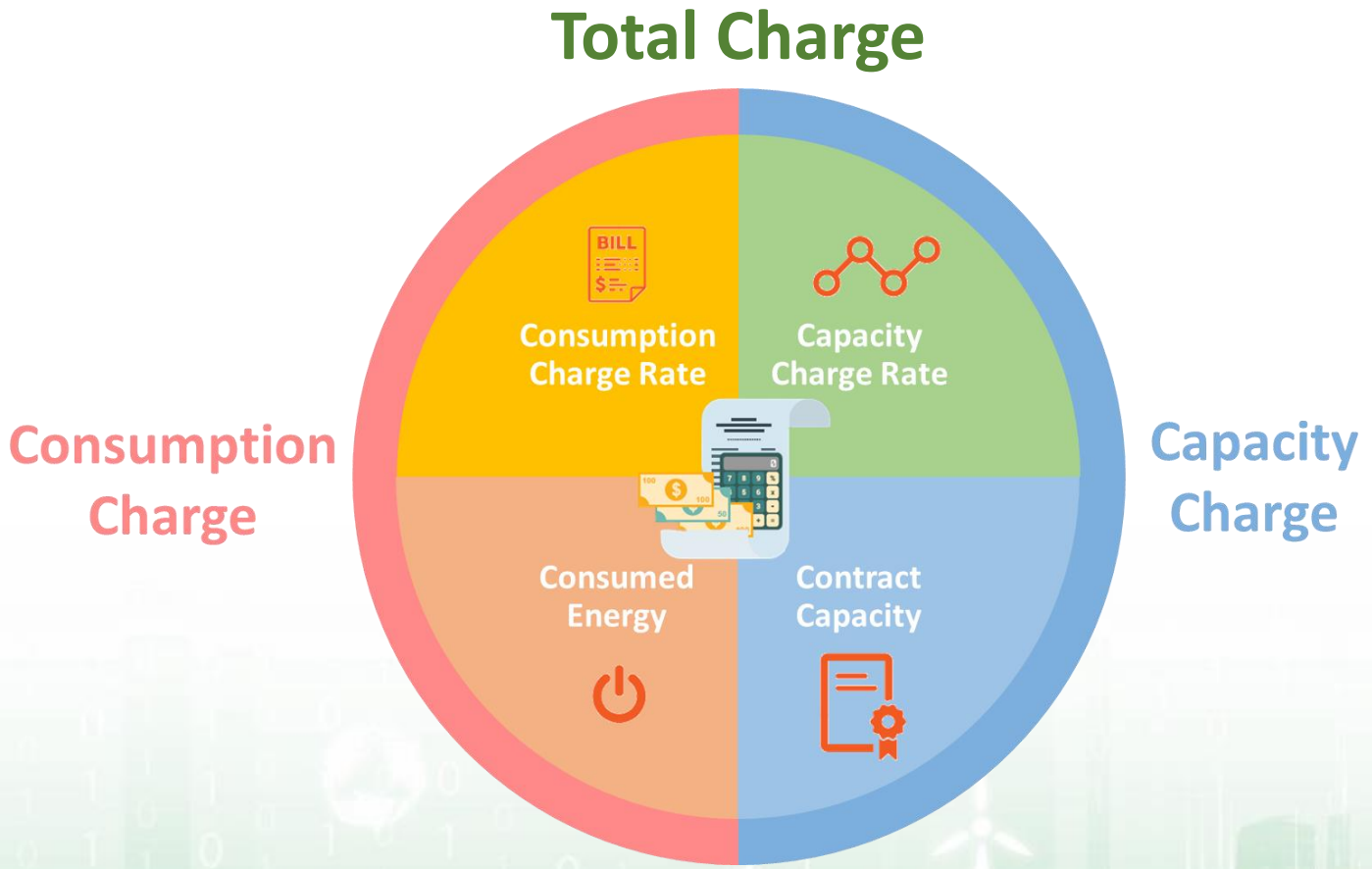
District Cooling Services Ordinance
(Cap. 624)

Connection to DCS as one of Land Sale Conditions



Regulator

Charging principles of DCS Tariff

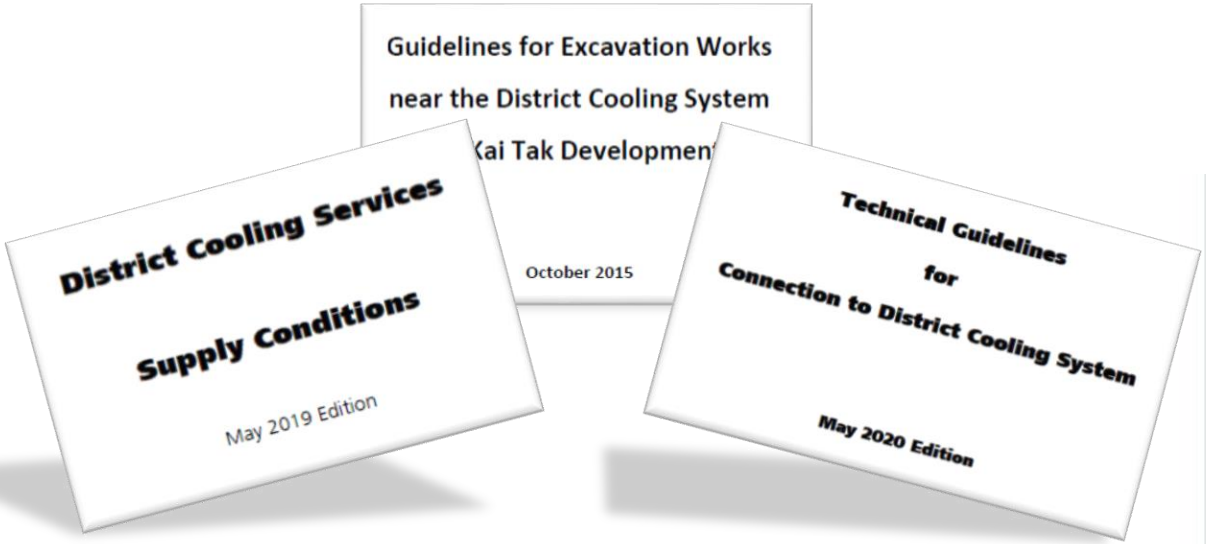


Provision of Advices

Facilitator

Standard & Guidelines

CHWRP

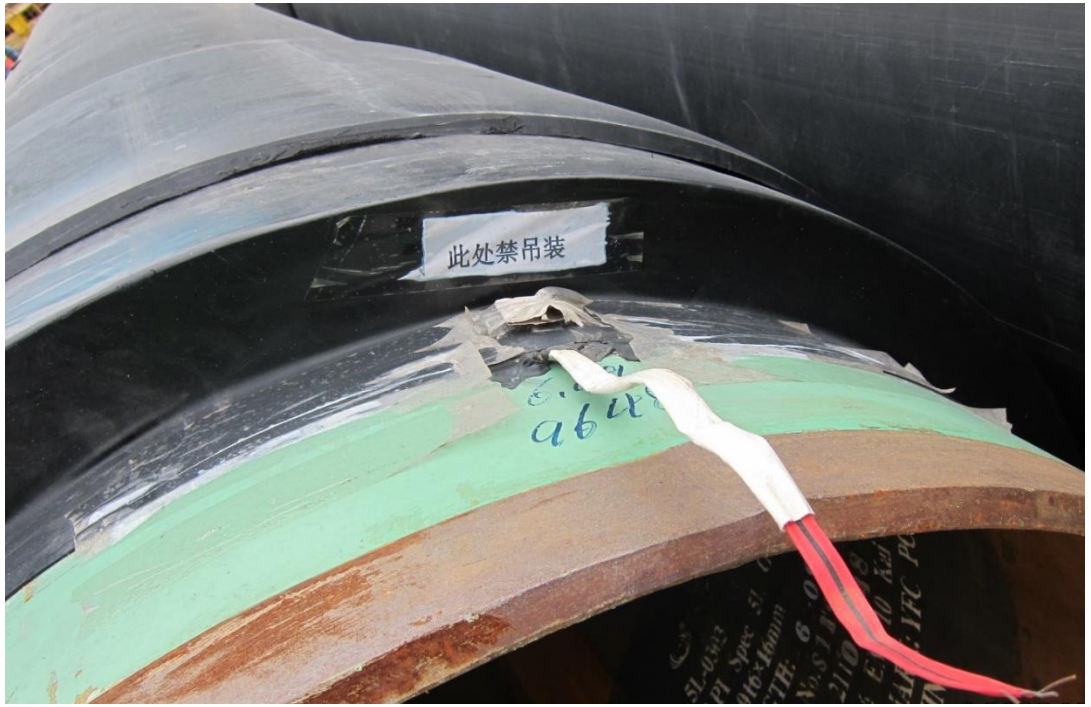


- Summarize the experiences
- Provide standard and guidelines
- Facilitate the implementation in New Development Areas (NDAs)

Features

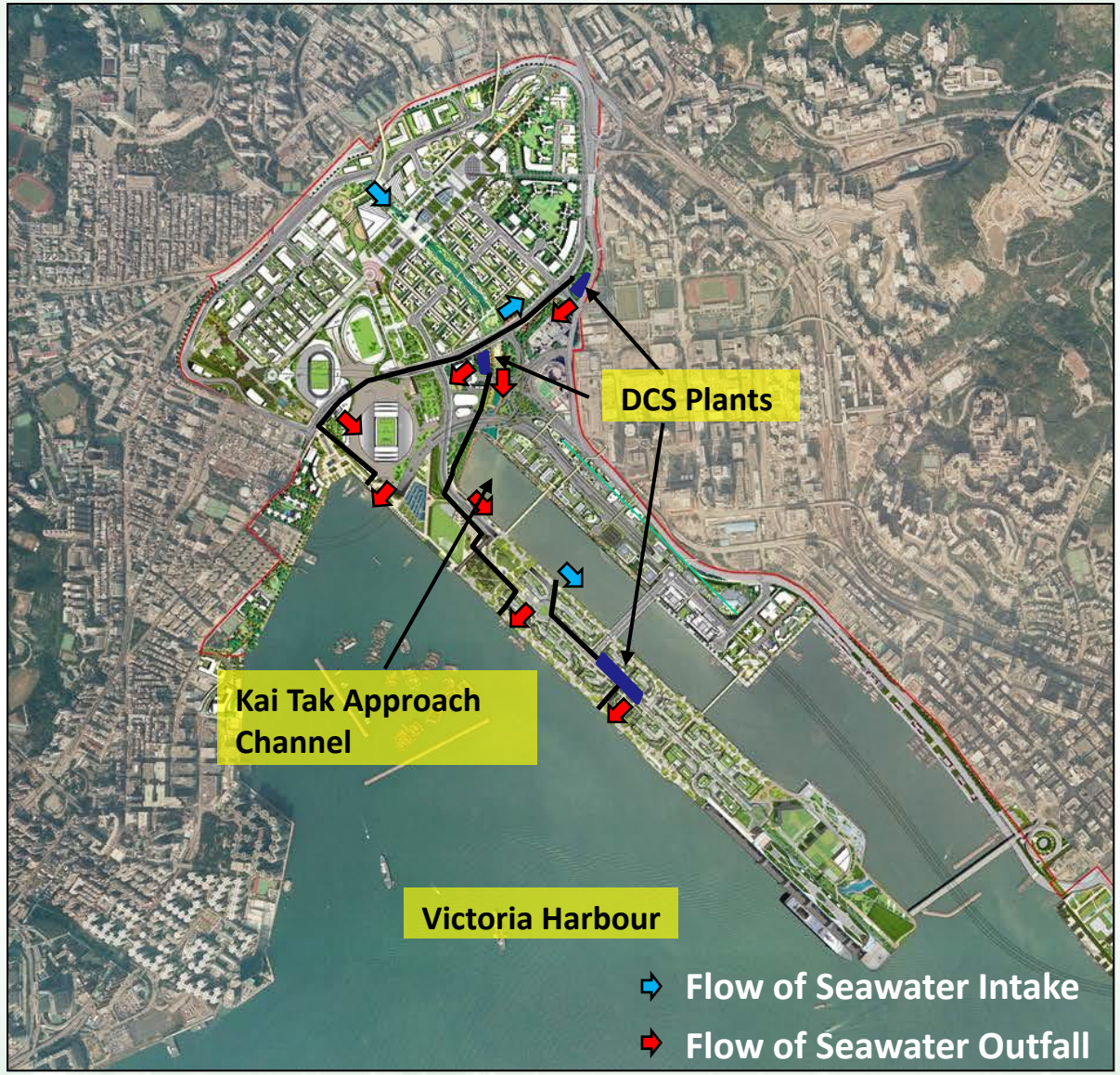
3 pipes/Ring circuit for chilled water distribution pipe network

CHWSP



Water leakage detection cable along pipe network

Creativity 😎



Improvement of Sea Water Quality

Sea Water of Kai Tak Approach Channel for Cooling

Using DCS pumps

Enhancing water circulation at Kai Tak Approach Channel to Victoria Harbour

Recent DCS Awards

2017

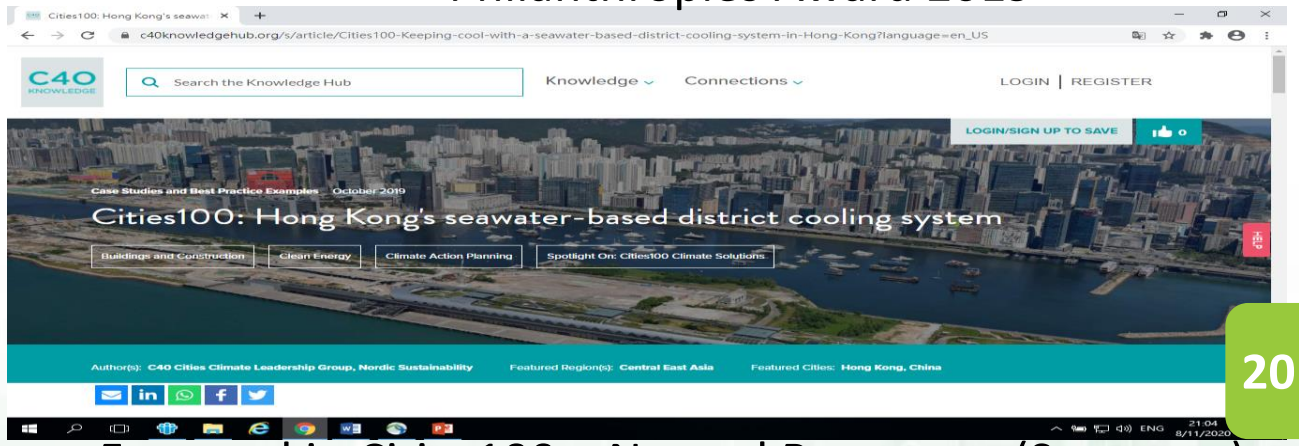
ACEHK Annual Award 2017
"Overall Best"

2018

CIC Sustainable Construction Award 2018 – Excellent Award of Young Practitioner

2019

"The Future We Want" – C40 Bloomberg Philanthropies Award 2019



2019

Featured in Cities100 – Natural Resources (Seawater) for Cooling and 30-Years Cost Recovery

Feedback

Owners

End-users

Public

- Energy saving
- Money Saving
- More greenery space

Engineers

Architects

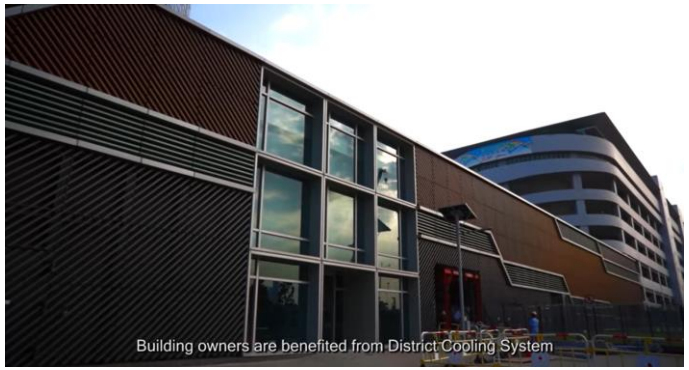
Construction manager

Operators

- Flexible design
- Space saving
- Professional maintenance
- Reliable

New Development Areas under Planning

Lets' Make
Our District
COOL 😎 AND WARM 💐 !!



Search "District Cooling System at Kai Tak Development"
https://www.youtube.com/watch?v=_evMIhtohKg

Search "Cooling Air while Cutting Emissions"
https://www.youtube.com/watch?v=po0YjbUqKg0

Thank You!

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