

# The District Cooling System in Hong Kong

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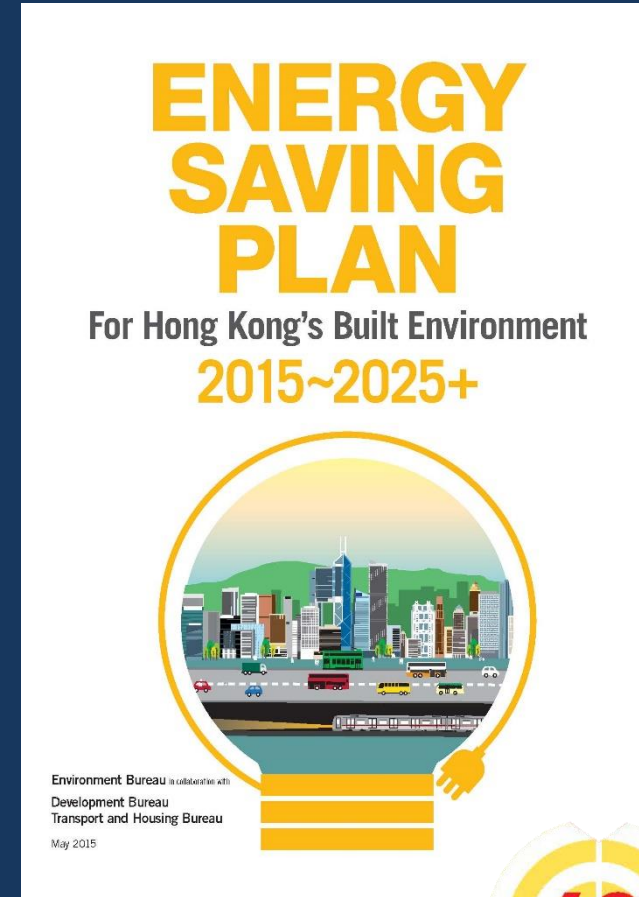
# Climate Change



# Climate Change



Carbon Intensity

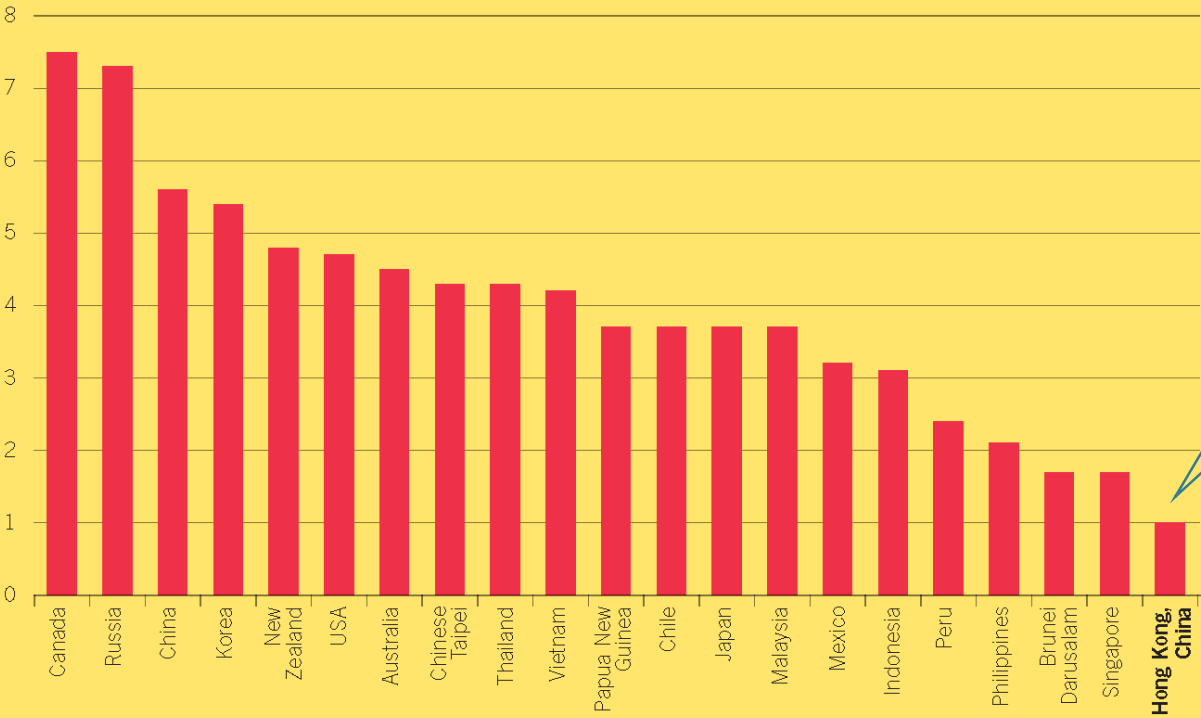


Energy Intensity



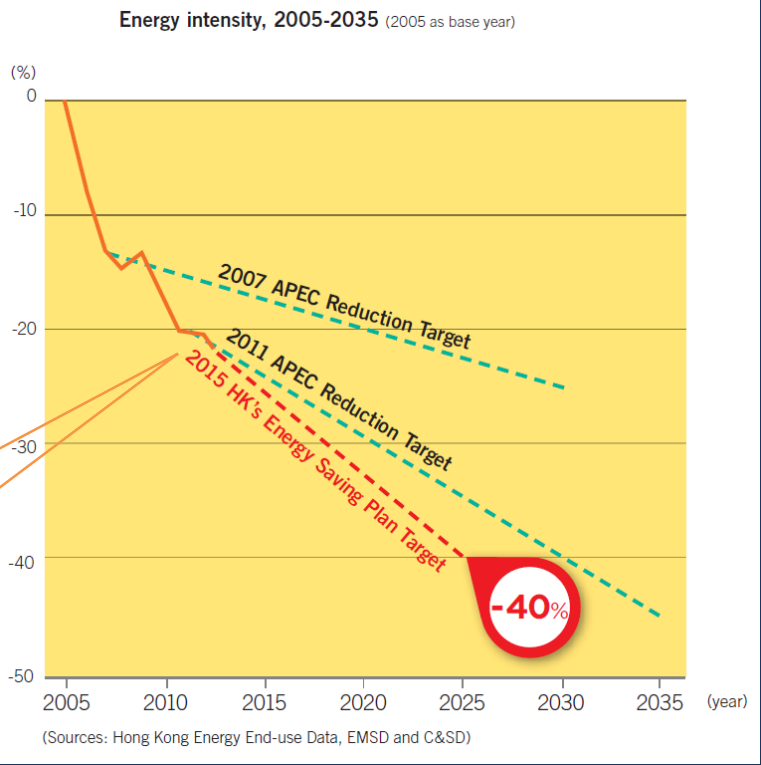
# APEC

APEC energy intensity ranking, 2012



Lowest Energy Intensity at 2012

Save 20% energy intensity up until 2012



# World Economic Forum

1

infrastructure



Energy Saving  
Infrastructure

Economy Profiles

## Hong Kong SAR

The Global Competitiveness Index 2017-2018 edition

### Key indicators, 2016

Population millions	7.4
GDP US\$ billions	320.7

### Performance overview

Index Component	Rank/137	Score (1-7)	Trend	Distance from best
Global Competitiveness Index	6	5.5	—	■■■■■
2nd pillar: Infrastructure	1	6.7	—	■■■■■

# Old Kai Tak Airport



Kai Tak Development



# Landing aircraft to old Kai Tak Airport

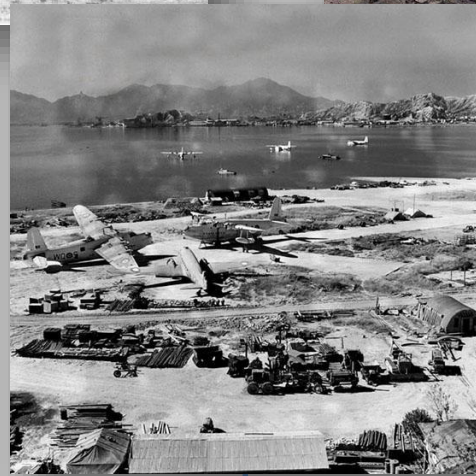


- 'Hong Kong turn'

- World's 10 most difficult airports for pilots



# Old Kai Tak Airport



30s

40s

50s

80s

1998

WWII



# New Kai Tak Development

- Overall greening ratio of 30%

- Large scale of old district redevelopment from 1998



- 2nd Central Business District of Hong Kong

# DCS in New Kai Tak Development

Complex re-development

Multi building types

Recreation areas

- 320 hectare
- 1.73 million m<sup>2</sup> air conditioning area

- Cooling capacity : 284 MW

- Pipes length: ~40km

- Project sum:

HK\$4945 million

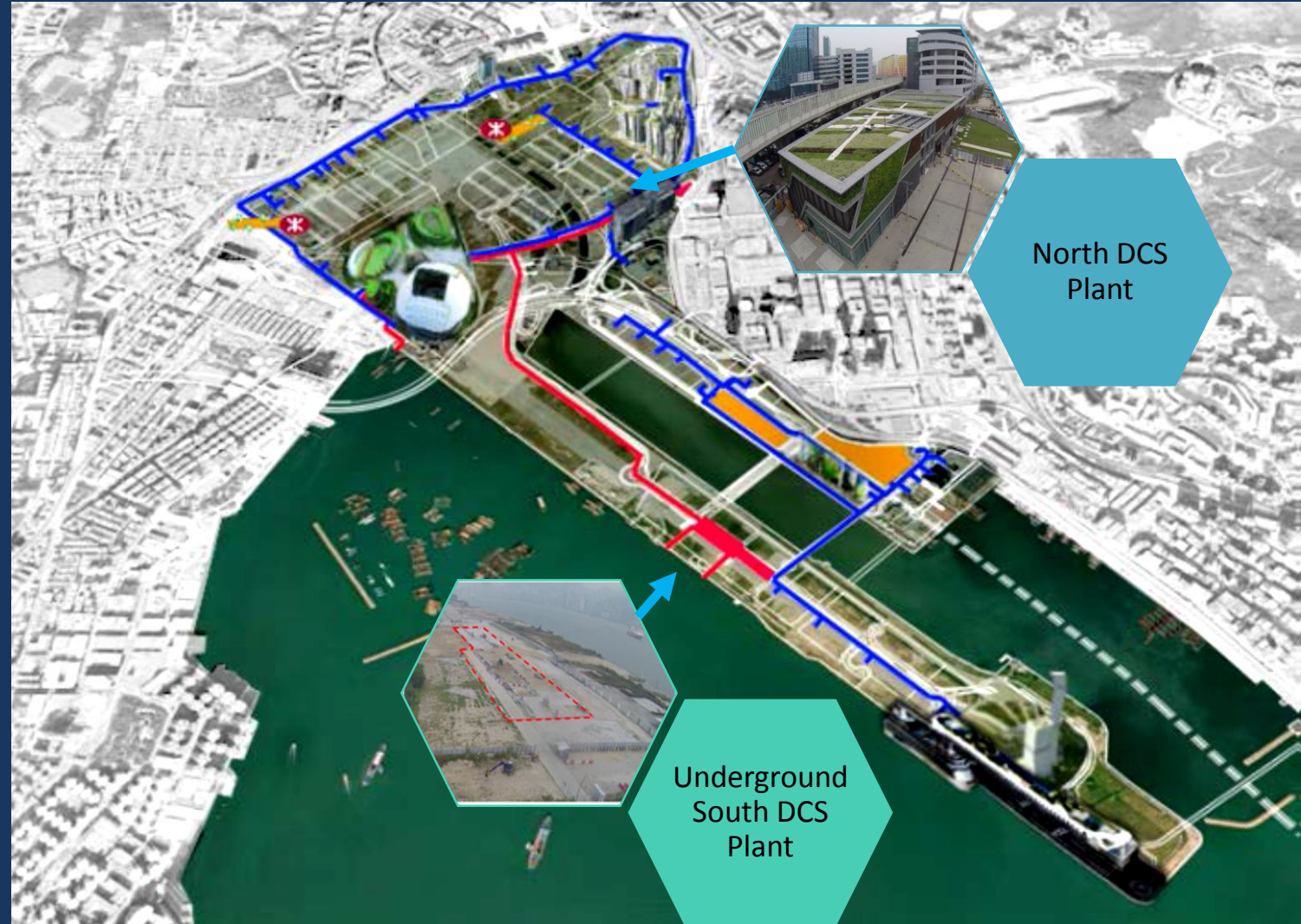
(~JPY 68680 million /

~USD 634 million)

Significant annual saving:

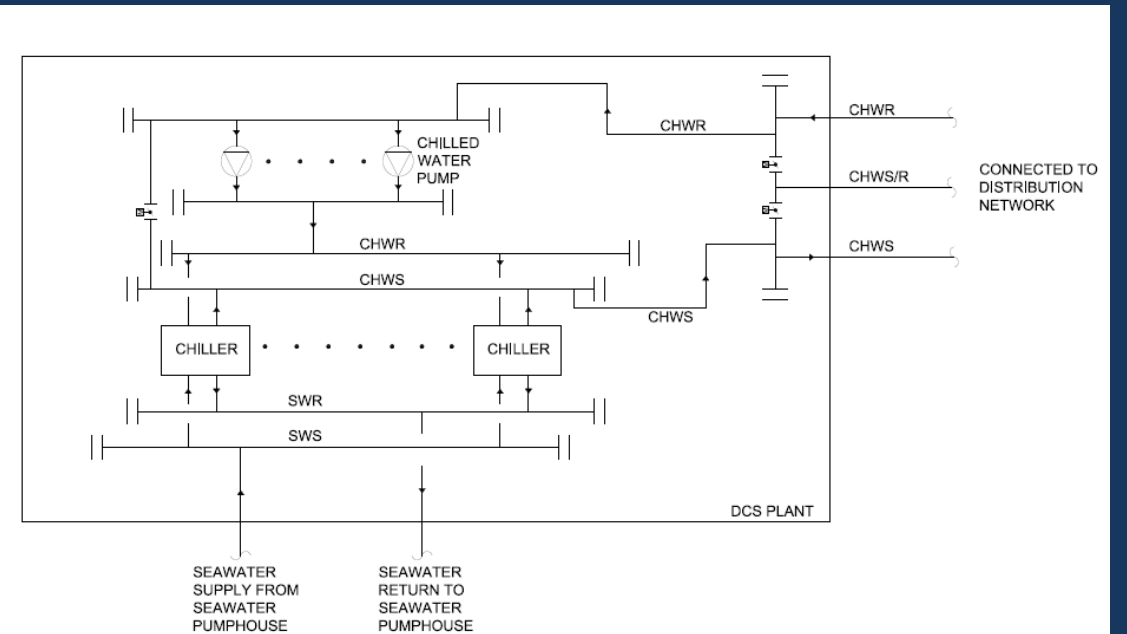
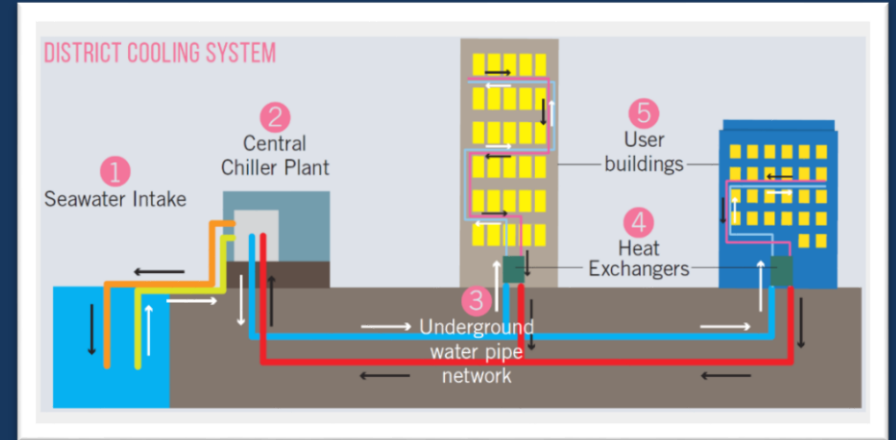
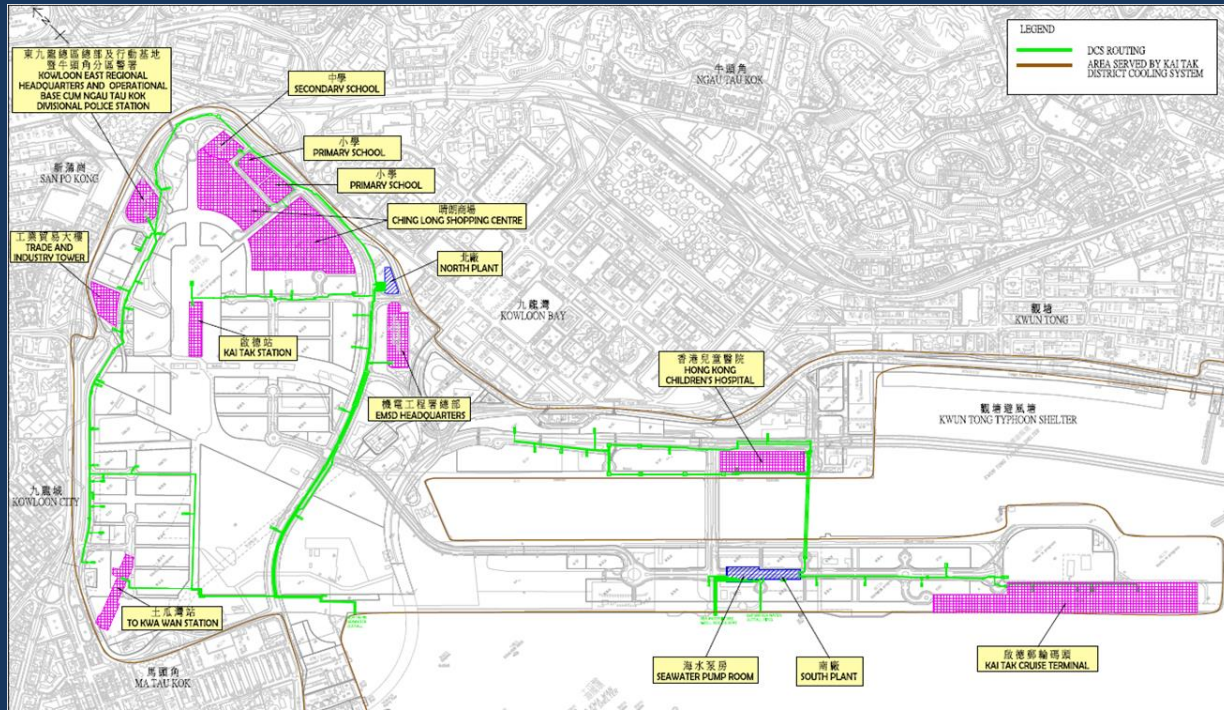
- Electrical Saving  
~85 million kWh

- CO<sub>2</sub> emission reduction  
59,500 tonnes



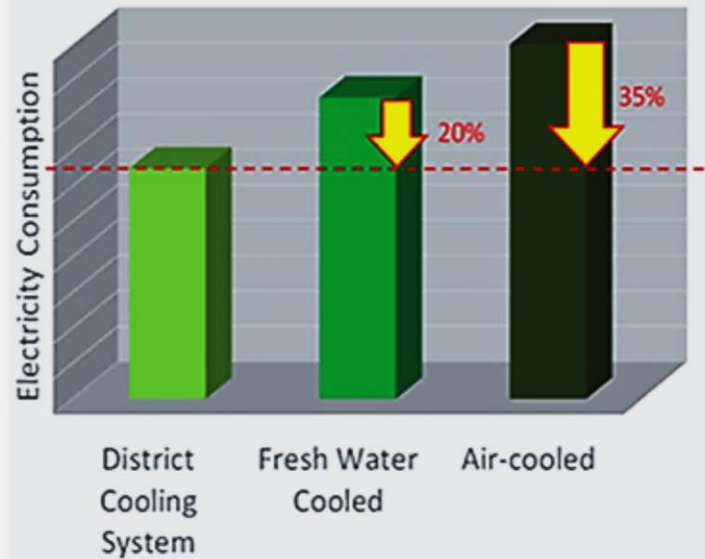


# Principle of DCS





# Benefit of DCS



Energy saving

- Load Diversity
- Economies of scale

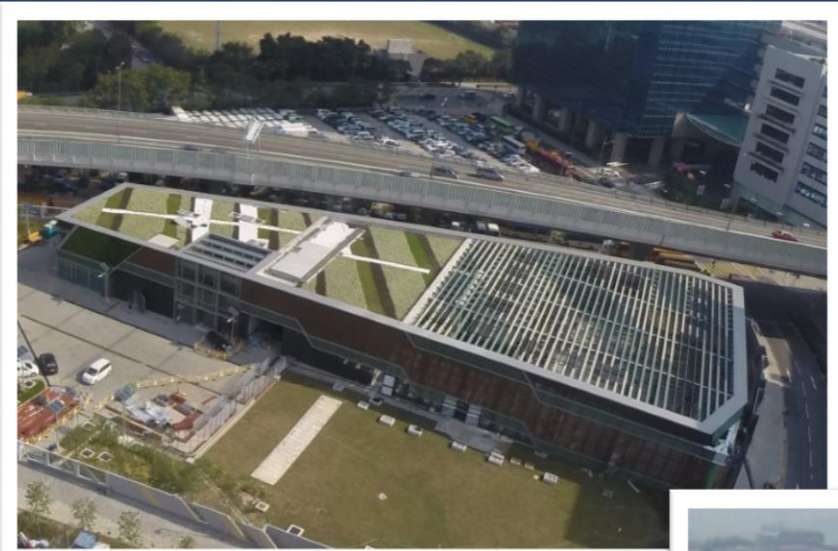


Increase reliability



Mitigate heat island effect and eliminate the noise and vibration

# Benefit of DCS



Utilize low development potential land to build the plant room



Save spaces for more flexible building design

Achieve the overall greening ratio of 30% in KTD

# Government roles

Regulator

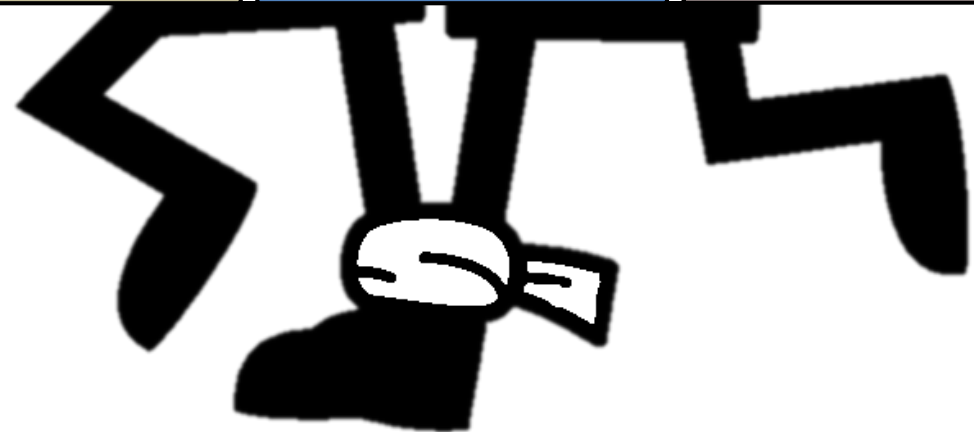
Promoter

Facilitator

Government

Owners

Public





# Design – Build - Operate

First for DCS in HK

Dynamic Development

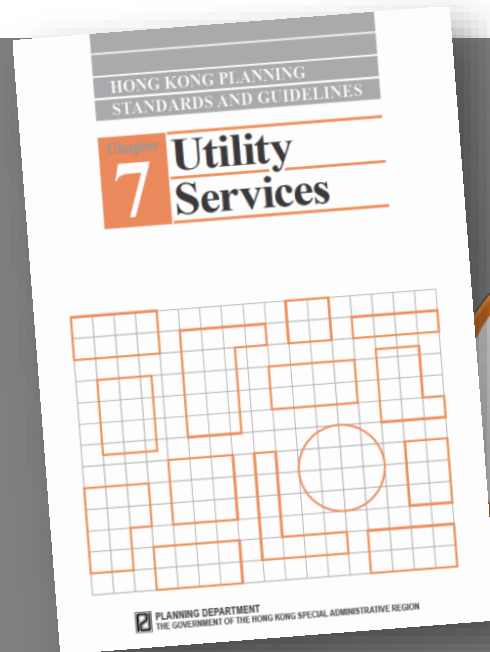
Energy saving driven

Public Engagement



## Implementation of DCS

### Standard & Guidelines



- Summarize the experiences
- Provide standard and guidelines
- Facilitate the implementation in New Development Area (NDA)

# Kai Tak Development



## Regulator



Connecting DCS as one of Land Sale Conditions



The District Cooling Ordinance (Cap. 624)



District Cooling Services Tariff



# IIC Approach for Applying DCS

**Innovative**



**Collaborative**



**Interactive**



# Innovative

## Water Leakage Detection Cable



3-Pipes or in ring circuit Network







# Interactive

## Approach Channel improvement

Approach Channel sea water  
for cooling



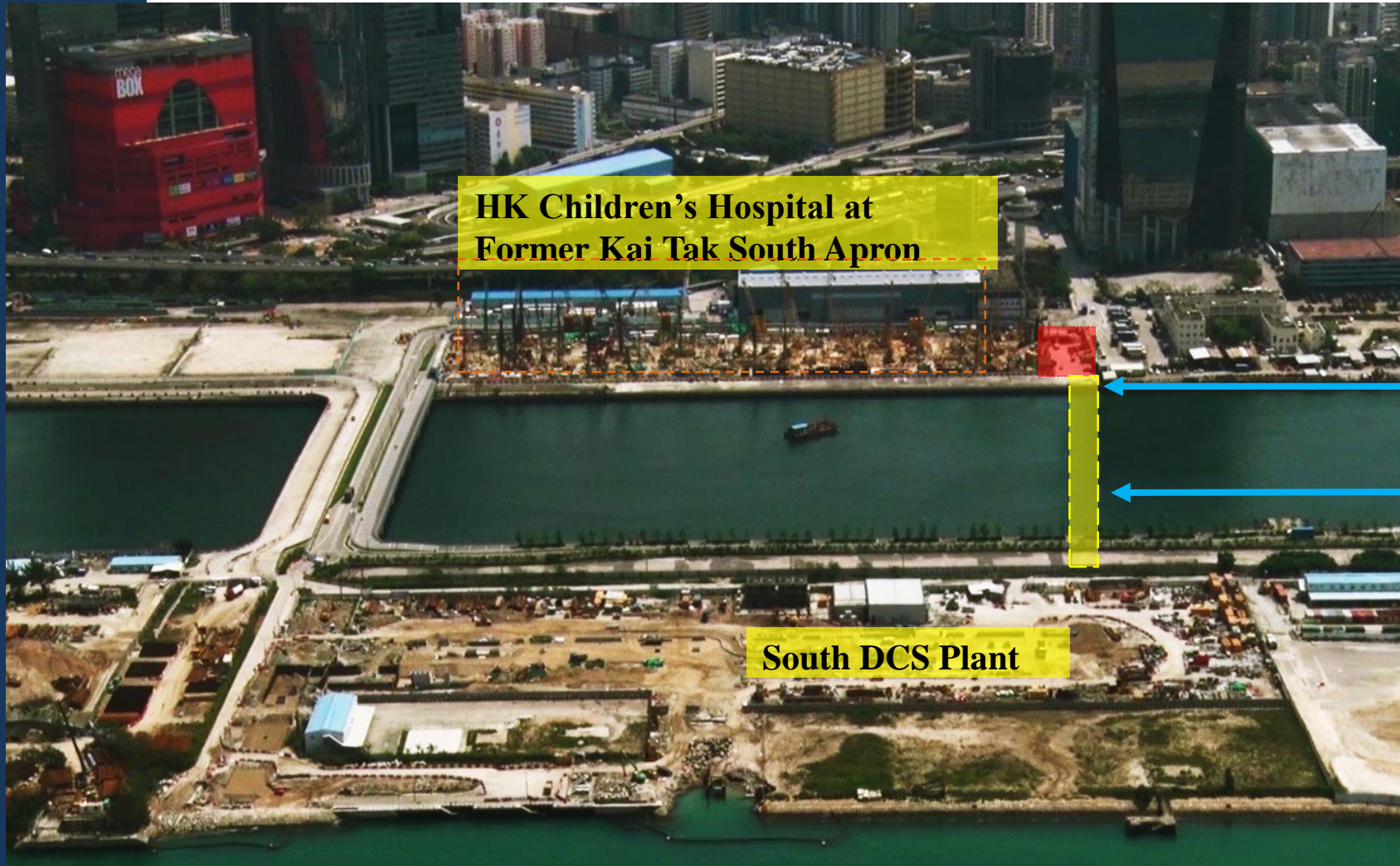
Using DCS pumps



Enhancing water circulation at  
Kai Tak Approach Channel



# Collaborative



TBM in Jacking Pit at 25m depth below ground level



Subsea Tunnel (350m) at Kai Tak Approach Channel





## Collaborative



- Consider to adopt of Common Utility Enclosure (CUE) in critical locations such as local roads and major junctions with heavy traffic volume.
- Well coordination with other Utilities to avoid re-excavation of road for pipe laying works.

# Feedback



Owners

End-users

Public

- Energy saving
- Money Saving
- More greenery space



Engineers

Architects

Construction manager

Operators

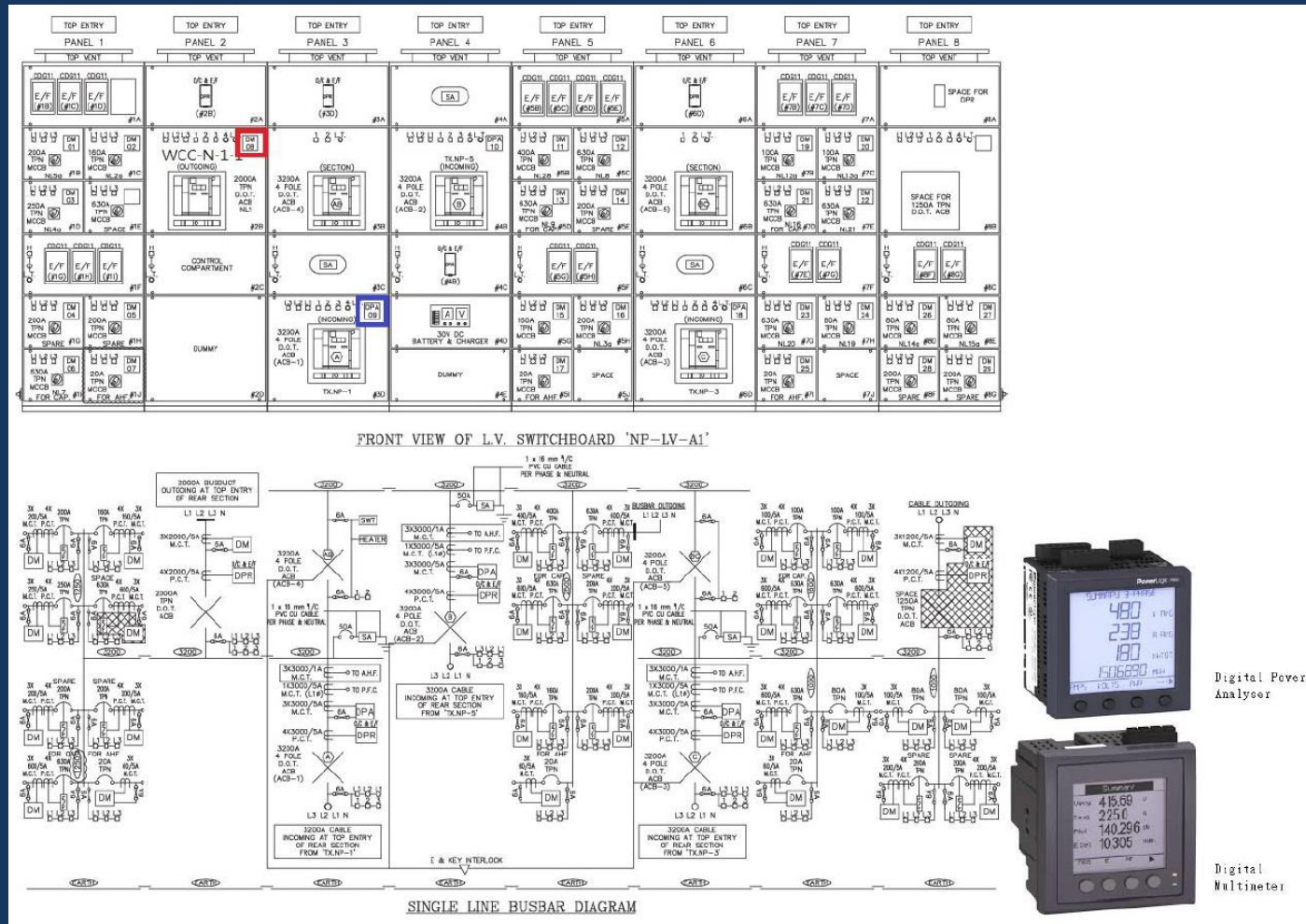


- Flexible design
- Space saving
- Professional maintenance
- Reliable

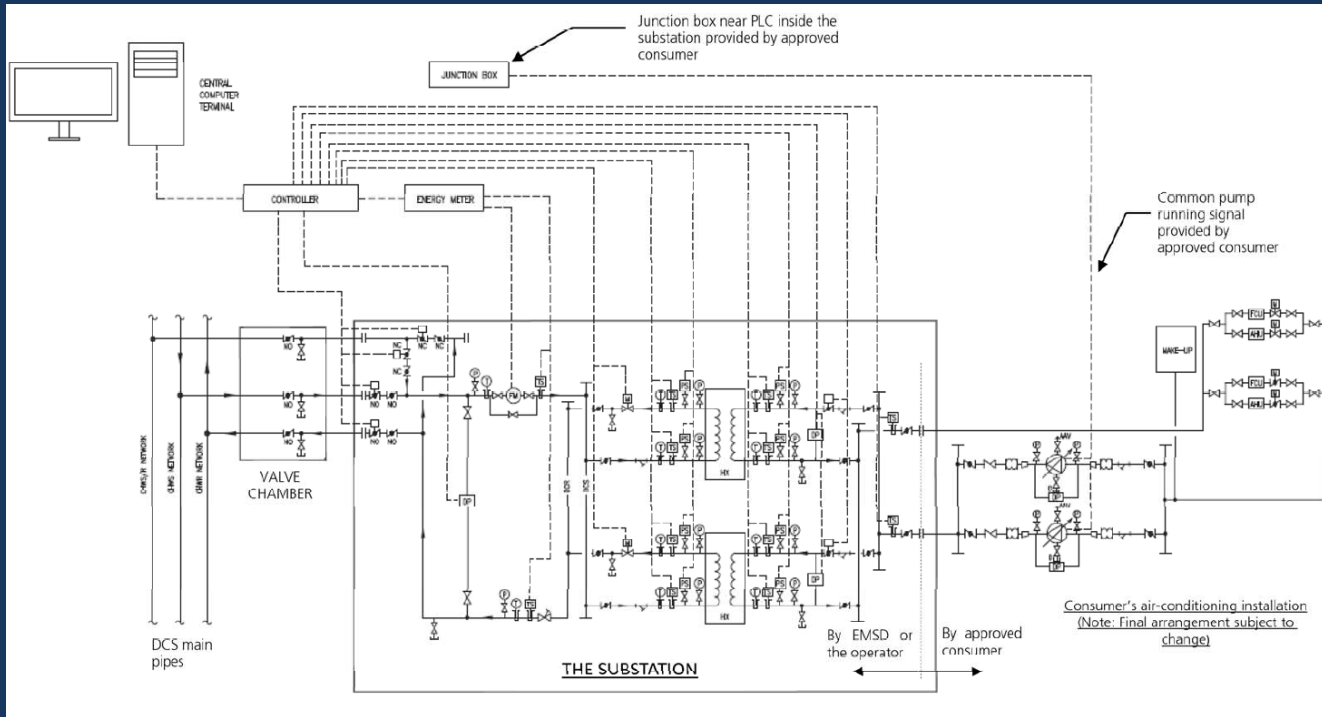




# DCS Energy

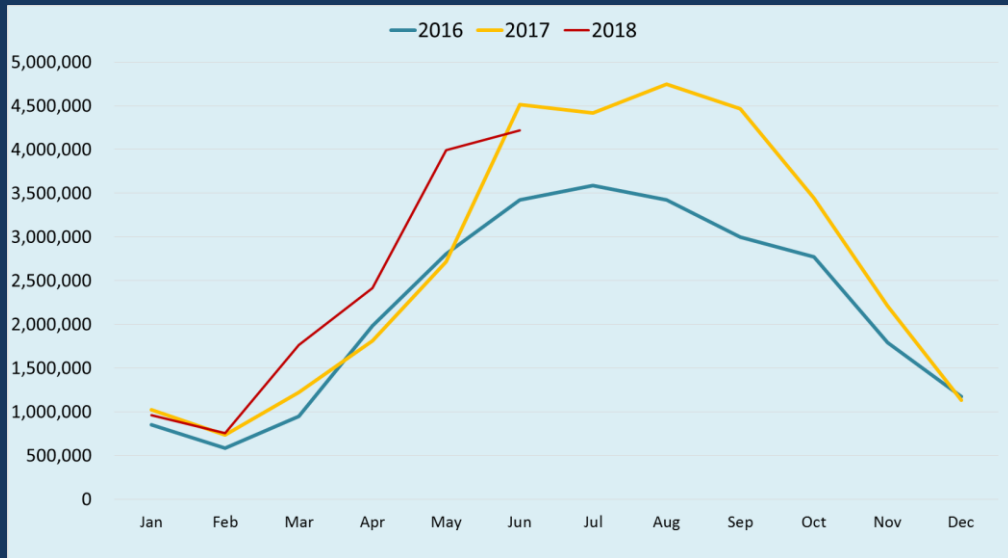


# DCS Energy

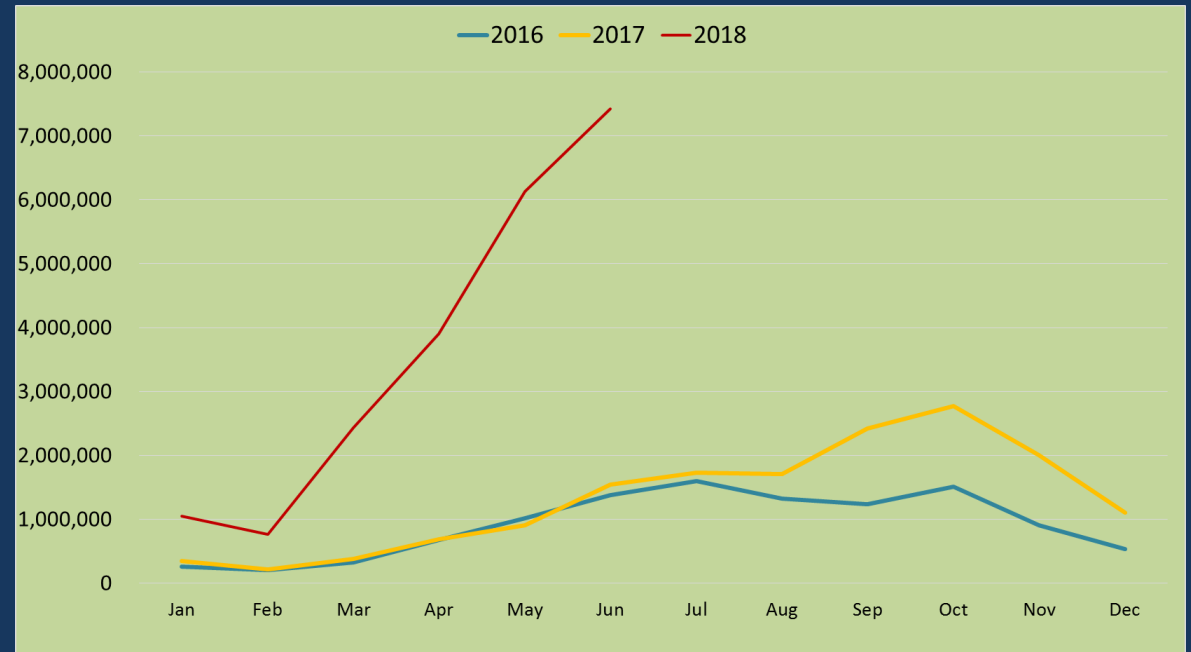


# DCS Energy

## Total Plant Electricity Consumption (kWeh)



## Total Cooling Consumption (kWrh)





# Potential New Development Areas

~ 1600 ha  
in total



Lok Ma Chau  
Loop  
87.7 ha

Hung Shui Kiu  
Development  
714 ha

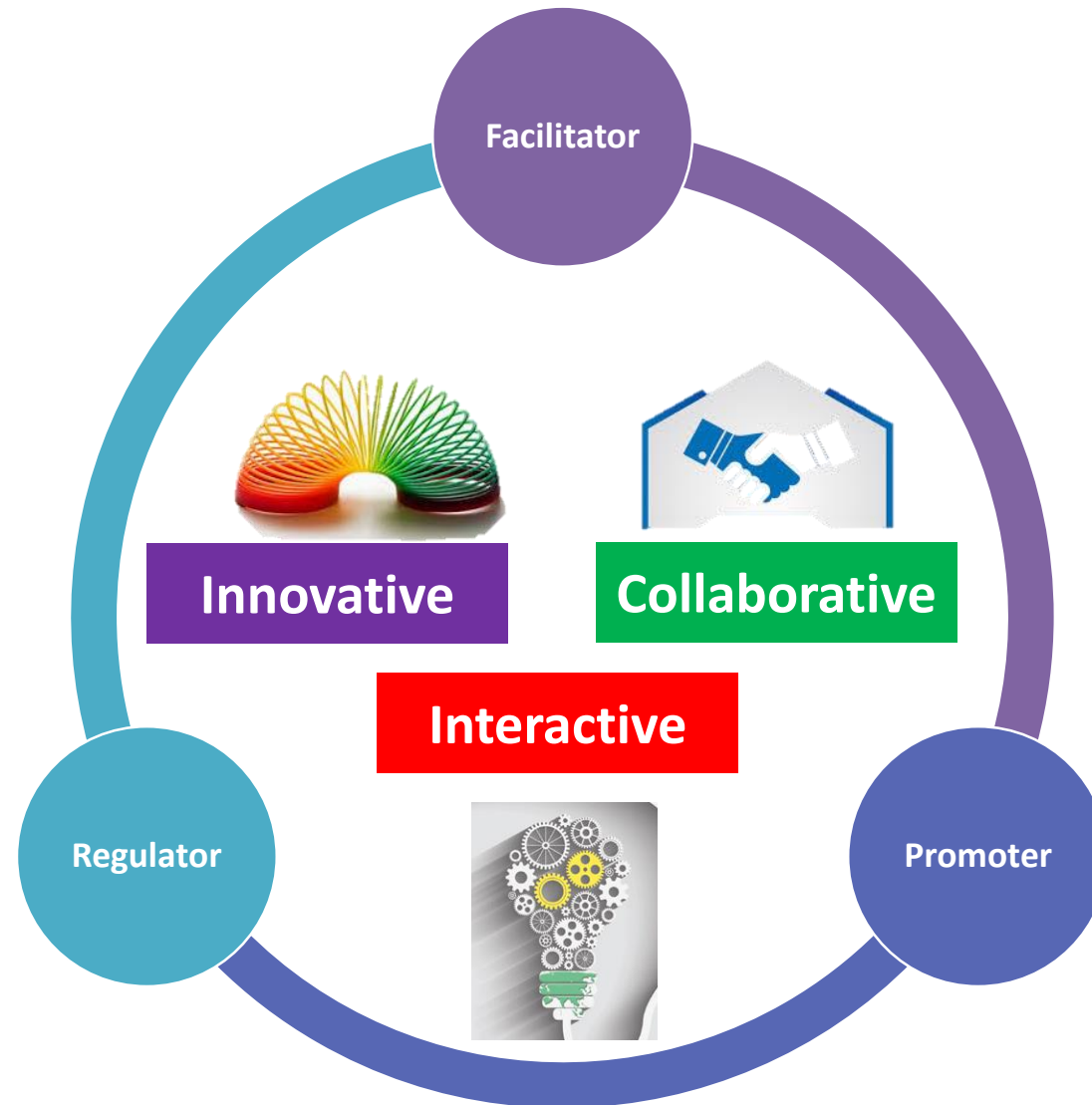


Hong Kong  
Boundary  
Crossing Facilities  
Island  
150ha

Tung Chung New  
Town Extension  
>200 ha

Kwu Tung North  
Development  
447 ha

# Better Use of Resources





# Our Team for DCS





Lets Take off for our sustainable future  
Welcome your ideas and eager to collaborate with you  
Thank you



[https://www.youtube.com/watch?v=\\_evMIhtohKg](https://www.youtube.com/watch?v=_evMIhtohKg)

Search “District Cooling System at Kai Tak Development”

