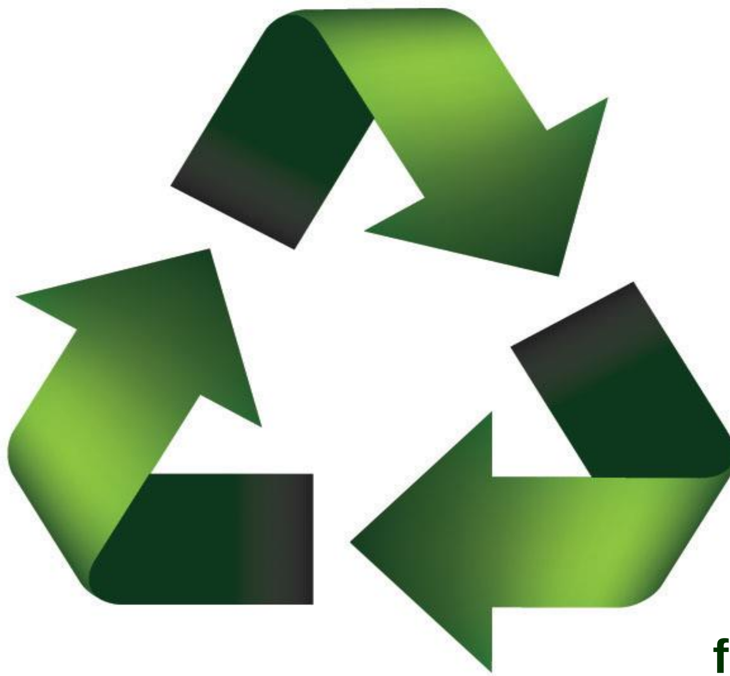
妥善處理迫切廢物問題
綜合廢物管理設施
Tackling Imminent Waste Management Problem
Integrated Waste Management Facilities

2018年2月14日

14 February 2018

廢物管理政策
Waste Management Policy

減廢．回收
Reduce & Recycle



及時擴建
堆填區
Timely Landfill Extension

現代化
處理設施
Modern Facilities for Waste Treatment

選擇技術的過程
Selection of Technology

- 2002年開始有系統及透明的技術選擇

Systematic and transparent process in 2002

- 59份本地及海外意向書

59 proposals from local and overseas

- 諮詢小組成員: 環保團體、專業團體和學術界

Advisory Group: green groups, professional and academic sectors

- 贊成以焚化技術作為核心技術

Agreed incineration as core technology

確認核心技術的過程
Confirmation of Core Technology

- 檢討最先進的技術
  Reviewed most advanced technologies
- 確認以焚化技術作為核心技術
  Reconfirmed incineration as core technology
- 於2009年得到環境諮詢委員會同意
  ACE agreed in 2009

選址的過程
Site Selection

- 初步選出21個考慮地點

21 possible sites identified

- 篩選出8個地點

8 sites shortlisted

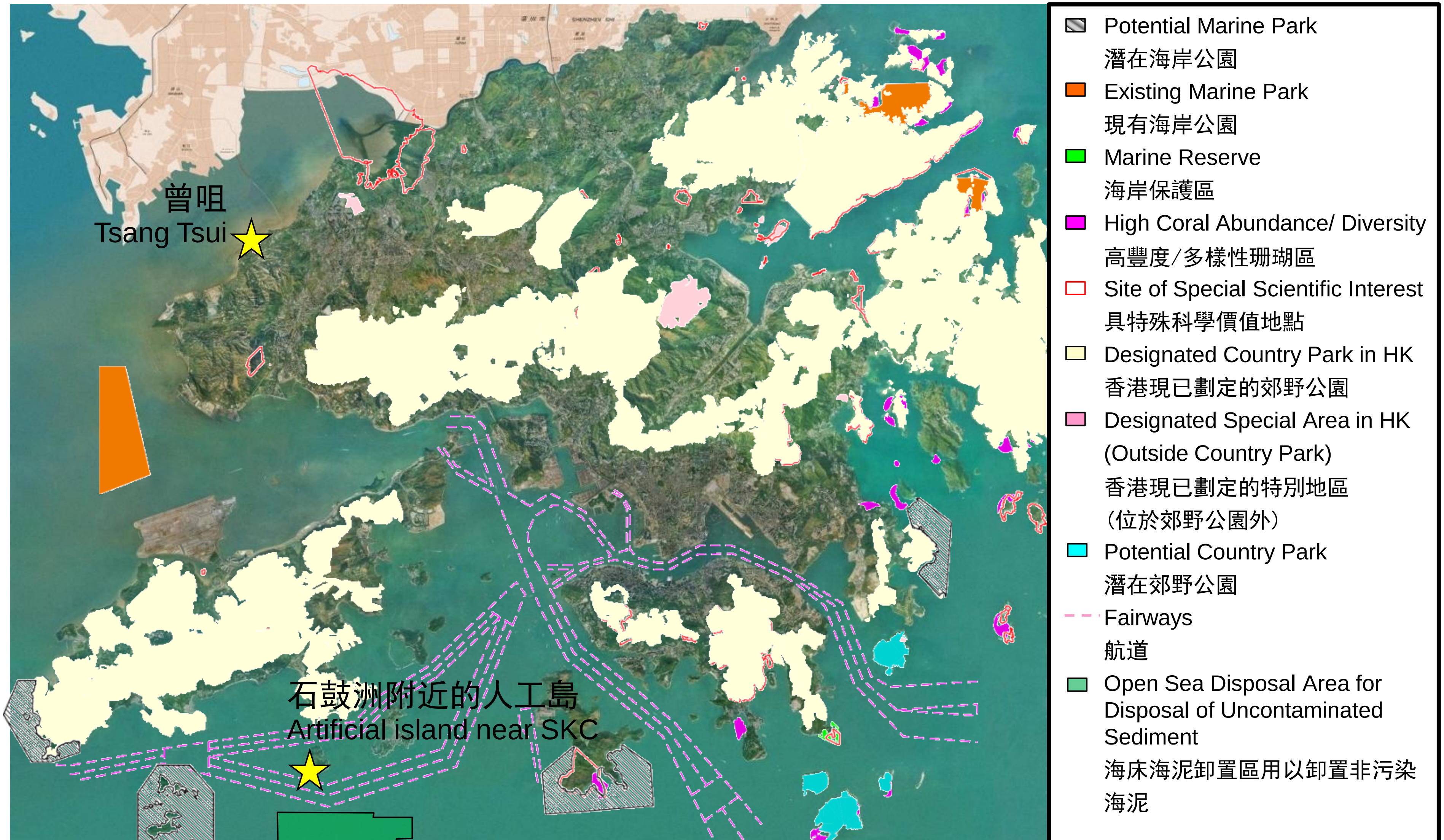
- 最後選出2個地點作評估

2 sites for final evaluation

- 選址結果在2008年向屯門區議會、離島區議會、環境諮詢委員會及立法會簡介

Findings presented to TMDC, IDC, ACE and LegCo in 2008

選址研究 – 不考慮的區域
Areas of Exclusion



選址研究 – 21考慮地點
Site Selection – 21 Possible Sites

選址研究 – 8個篩選地點
Site Selection – 8 Shortlisted Sites

選址研究 – 2個選擇地點
Site Selection – 2 Selected Sites

考察日本廢物焚化設施(2009)
Visit to Incineration Facilities in Japan (2009)

26位屯門及離島區區議員考察東京及大阪4個焚化處理設施

26 TMDC & IDC members visited 4 incineration facilities in Tokyo and Osaka

綜合廢物管理設施的效益
Benefits of IWMF

- 大幅減少廢物體積達九成

Substantially reduce the volume of waste by 90%

- 轉廢為能 (產生每年約4億8千萬度電, 可供十萬戶家庭使用)

Recover energy and generate electricity from waste (~ 480 million kilowatt-hours of electricity per year for use by 100,000 households)

- 減少溫室氣體排放 (每年約44萬噸二氧化碳)

Reduce greenhouse gas emissions (~ 440,000 tons CO_2 /year)

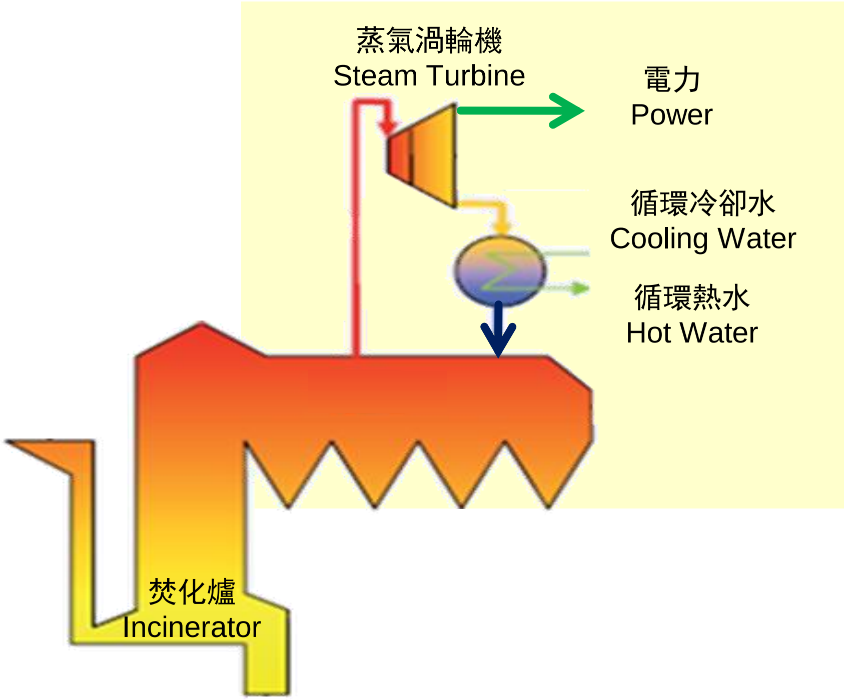
綜合廢物管理設施的主要組成部份
Key Components of IWMF

① 機械式分類及回收設施
Mechanical Sorting and Recycling Facility

Courtesy: www.theskip.net

④ 環境教育設施
Environmental Education Facilities

② 廢物熱能回收及發電系統
Waste Heat Recovery and Power Generation System



③ 先進的焚化設施
Advanced Incineration Facility

先進焚化技術 – 3T技術
Modern Incineration Technology – 3T

- 溫度850°C或以上可以完全分解有機物

T**emperature** at least 850°C to completely destroy organic matters

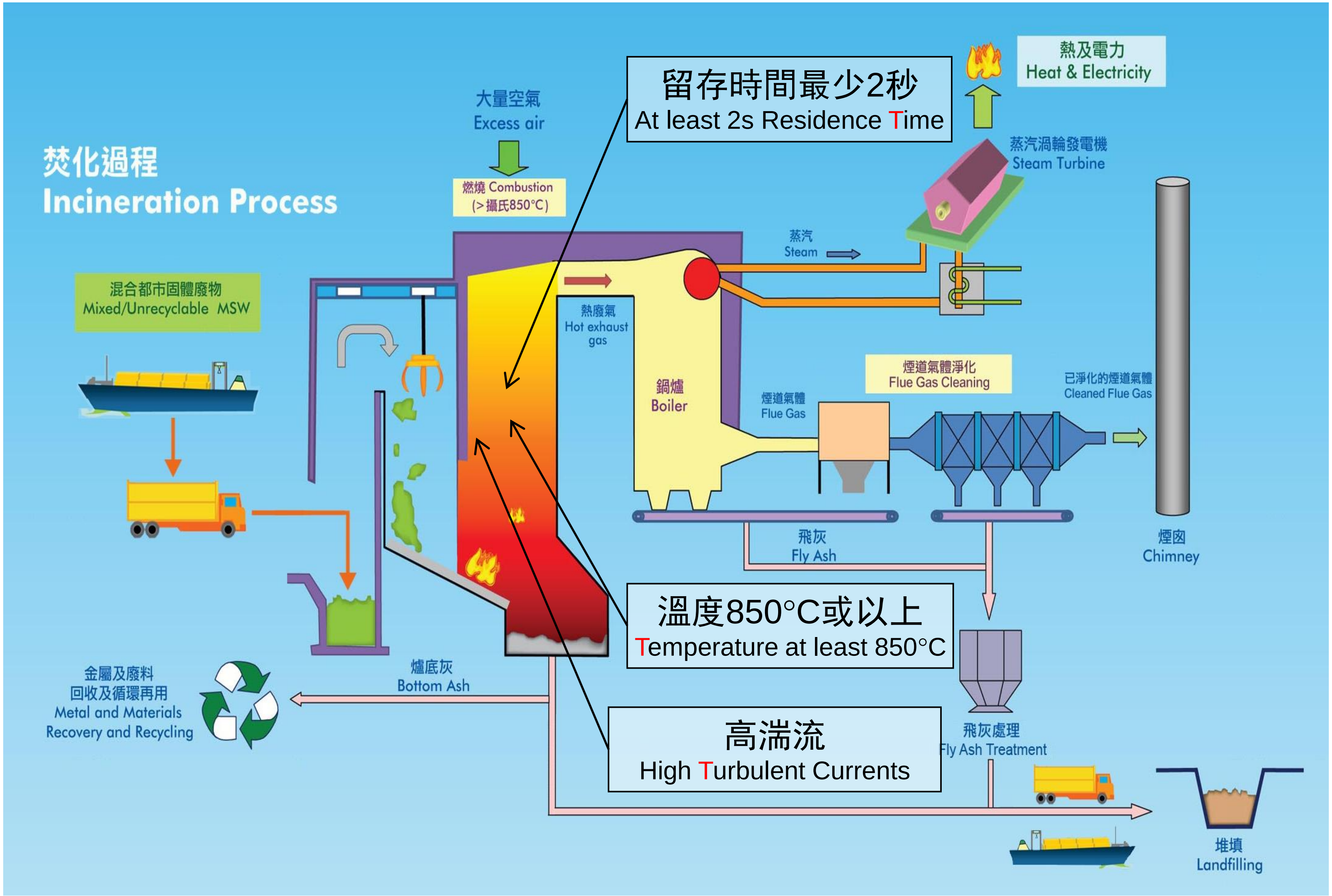
- 高湍流可以達至完全燃燒

High **T****urbulent** Currents to achieve complete combustion

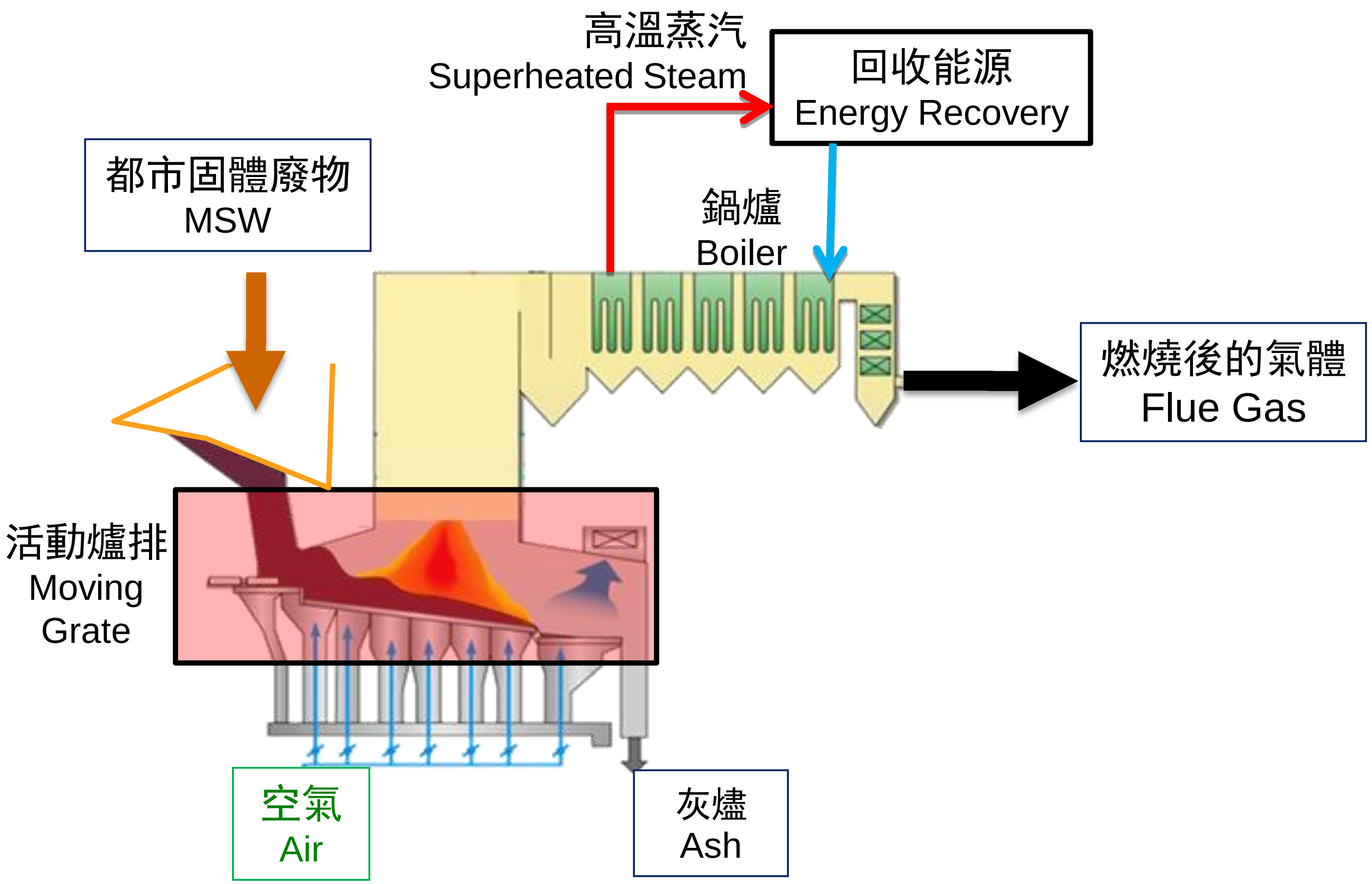
- 煙氣在850°C或以上留存時間最少2秒可以達至完全燃燒

At least 2s residence **T****ime** at 850°C or above to achieve complete combustion

先進焚化技術 – 流程圖
Modern Incineration Technology – Process Flow Diagram



先進焚化技術 – 活動爐排
Modern Incineration Technology – Moving Grate

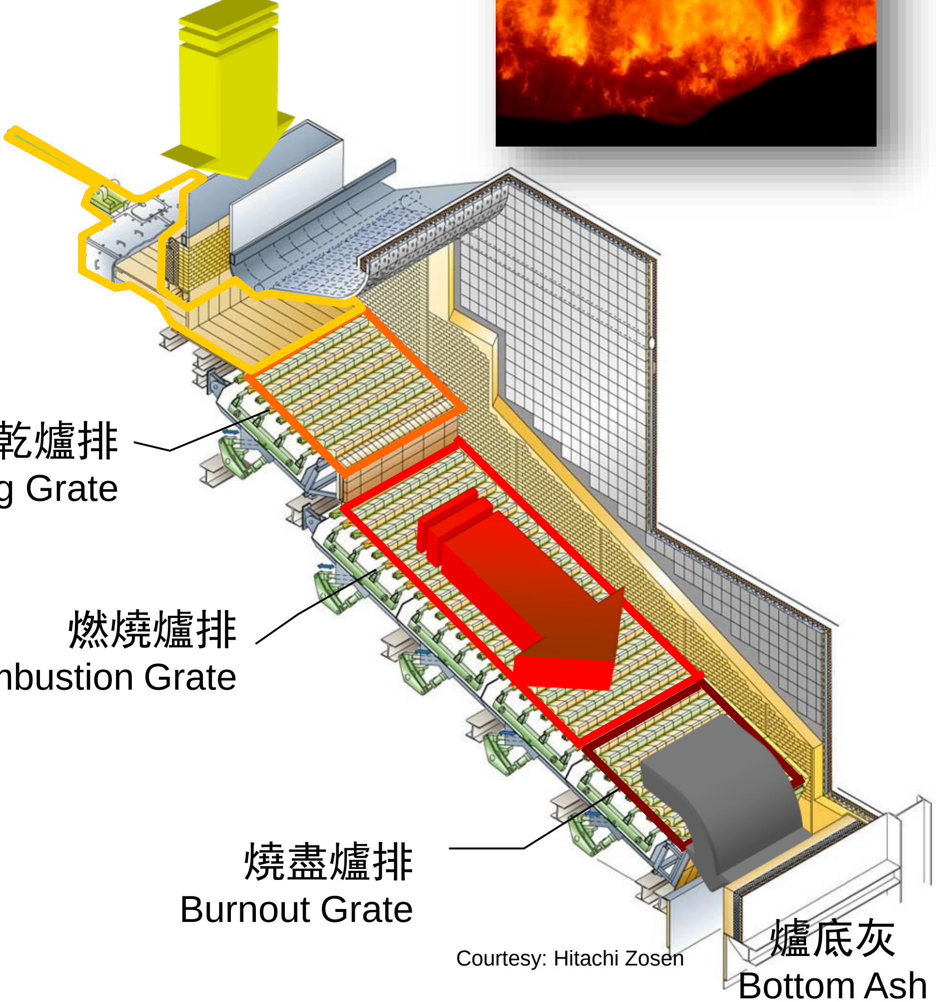


- 大部份廢物焚化設施採用活動爐排技術(>900個設施)
Majority MSW incineration facilities adopting moving grate (>900 plants)

先進焚化技術 – 活動爐排
Modern Incineration Technology – Moving Grate

優點 Merits

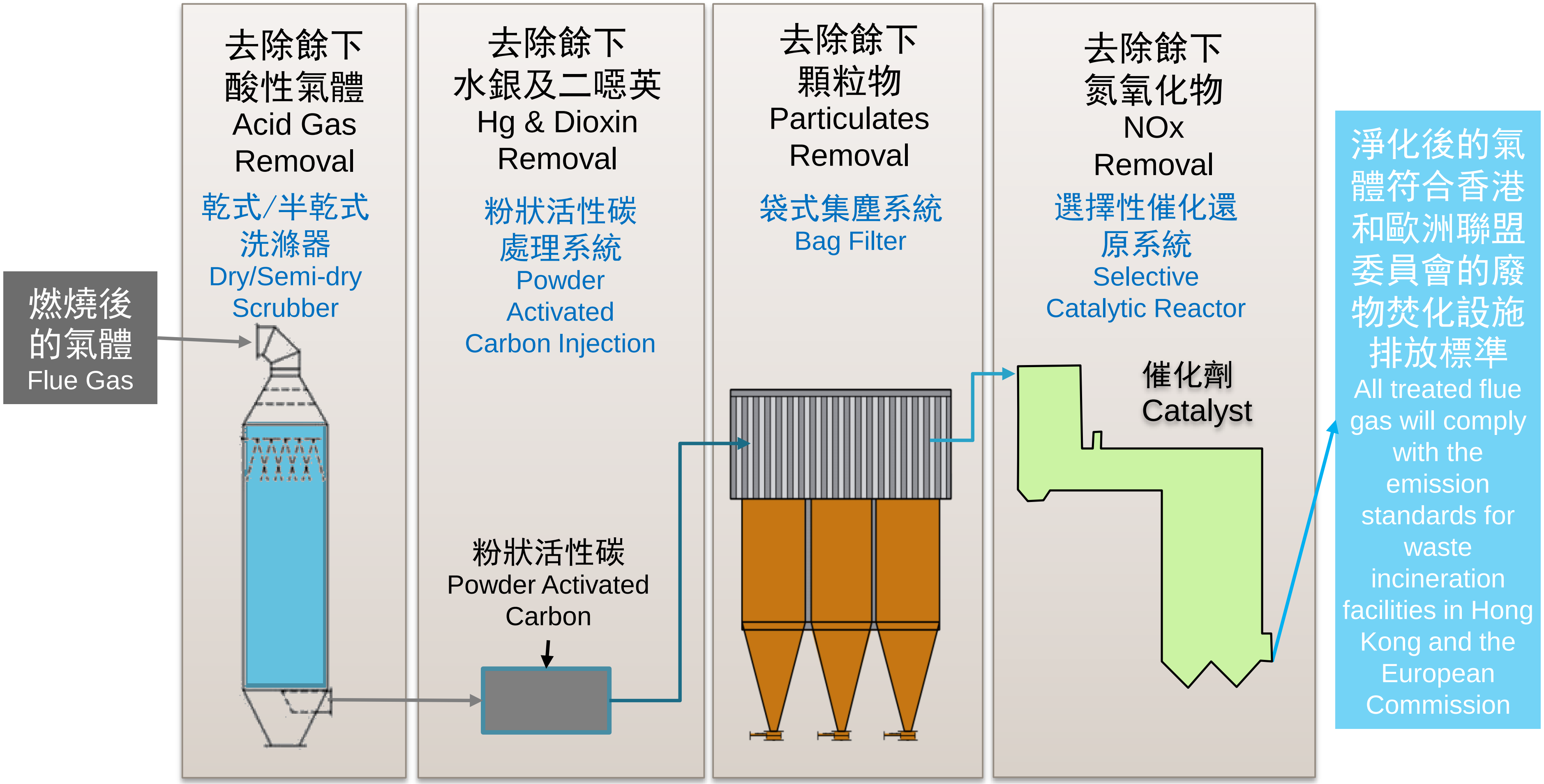
- 有充分經驗證的紀錄
  Proven experience
- 系統安全可靠
  Safe and robust system
- 達到歐盟煙囪排放標準
  Meeting EU Emission Standards
- 建造及營運成本低
  Low construction and operation costs
- 佔地面積小
  Small footprint
- \>10 家主要供應商
  \>10 major suppliers



Courtesy: Hitachi Zosen

先進焚化技術 - 煙道氣體淨化及控制系統

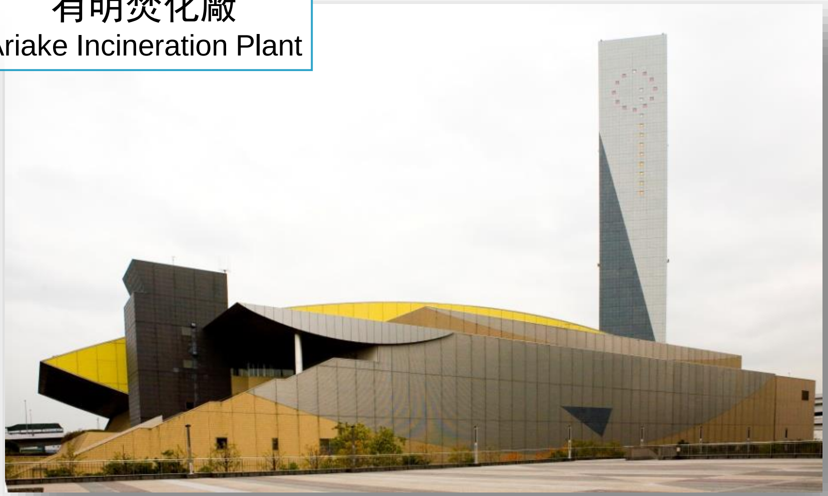
Modern Incineration Technology – Flue Gas Cleansing and Control System



現代焚化爐例子
Examples of Modern Incineration Facilities

法國 Gien焚化廠
France Gien Incineration Plant

有明焚化廠
Ariake Incineration Plant



新江東焚化廠
Shin-Koto Incineration Plant

舞洲固體廢物焚化廠
Maishima MSW Incineration Plant

環境影響評估研究
EIA Study

- 評估兩個選址在工程施工及運作期間所產
評估兩個選址在工程施工及運作期間所產
生的累積環境影響、並提出緩解措施以確保對環境的影響可達至可接收水平

  Identifying cumulative impacts for both sites during construction and operation phases, recommending mitigation measures to ensure impacts at acceptable levels
- 評估的範圍涵蓋空氣、噪音、水質、廢物、生態、漁業、健康、景觀及視覺、文化遺產遺產

  Assessment covering air, noise, water, waste, ecology, fishery, health, visual & landscape, cultural heritage
- 環評是根據 《環境影響評估條例》及《環境影響評估程序技術備忘錄》進行

  In accordance with EIAO and Technical Memorandum on EIA Process

空氣質素評估
Air Quality Impact

- 三維光化學的空氣質素模型 3-D photochemical air quality model
- 考慮了區域性(包括珠江三角洲) 和本地 (包括電廠、汽車、海事活動等)排放源所造成的累積影響 Cumulative impact taking into account regional (including PRD) and local (including power plant vehicular & marine activities etc) emission sources power plant, vehicular & marine activities, etc) emission sources
- 符合香港和歐洲聯盟委員會的廢物焚化設施的排放標準
  Comply with the emission standards for waste incineration facilities in Hong Kong and the European Commission

主要空氣污染物 Major Air Pollutants	綜合廢物管理設施第1期煙囪排放標準 IWMF Phase 1 Emission Standards
可吸入懸浮粒子 (毫克/立米) Respirable Suspended Particulates (mg/Nm^3)	10 ^
氮氧化物 (毫克/立米) Nitrogen Oxides (mg/Nm^3)	80 ^
汞 (毫克/立米) Mercury (mg/Nm^3)	0.05 *
二噁英和呋喃 (納克/立米) Dioxins & Furans (ng-TEQ/Nm^3)	0.1 #

^ 日平均 daily average

* 在最少30分鐘和最多8小時的採樣週期內平均 average over a sampling period of minimum 30 minutes and maximum 8 hours

在最少6小時和最多8小時的採樣週期內平均 Average value over the sampling period of a minimum of 6 hours and a maximum of 8 hours

空氣質量監測
Air Quality Monitoring

煙道氣體排放連續監測系統
Continuous Emission Monitoring System

主控制室
Main Control Room

定期煙道氣體採樣
Regular Emission Sampling

實驗室測試
Laboratory Testing

監測參數
Monitoring Parameters

可吸入懸浮粒子、有機化合物、氯化氫、氟化氫、二氧化硫、一氧化碳、氮氧化物、汞、鎘和鉈、重金屬總含量、二噁英和呋喃

Respirable Suspended Particulates, Organic Compound, HCl, HF, SO_2, CO, NO_x, Hg, Cd & Tl, Total Heavy Metals, Dioxins & Furans

監測數據將於環保署網站公佈
Air quality data will be published on the EPD’s website

零污水排放
Zero Wastewater Discharge

- 自建污水處理設施作循環再用零污水排放

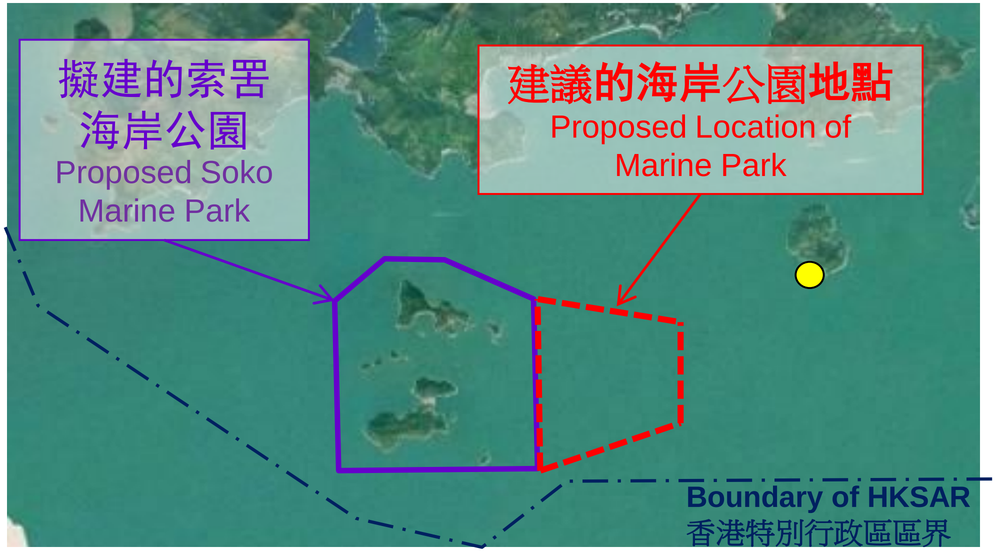
  On-site wastewater treatment plant for reuse, zero wastewater discharge

融合周邊環境
Matching with Surrounding Environment

- 利用石鼓洲作天然屏障
  Make use of Shek Kwu Chau to screen off structures
- 將設施佔地減至最少
  Minimize site layout and footprint
- 以大自然為建築及園景設計概念、盡量綠化
  Emphasize nature as the design concept; provide extensive landscape areas & greening

顧及海洋生態
Caring Marine Ecology

- 選址避免生態保護區
  Site location avoided conservation zones
- 填海區不會連接石鼓洲以保護天然海岸線
  Reclamation area not connected to SKC to conserve natural coastline
- 建議緩解措施包括規劃海岸公園（約700公頃）
  Mitigation measure including Designated Marine Park (~700 ha)



飛灰處理
Fly Ash Management

- 混合英泥加以固化
  Cement solidification
- 檢定後運往堆填區
  Compliance check before disposal at landfill
- 符合國際要求
  In line with international practices

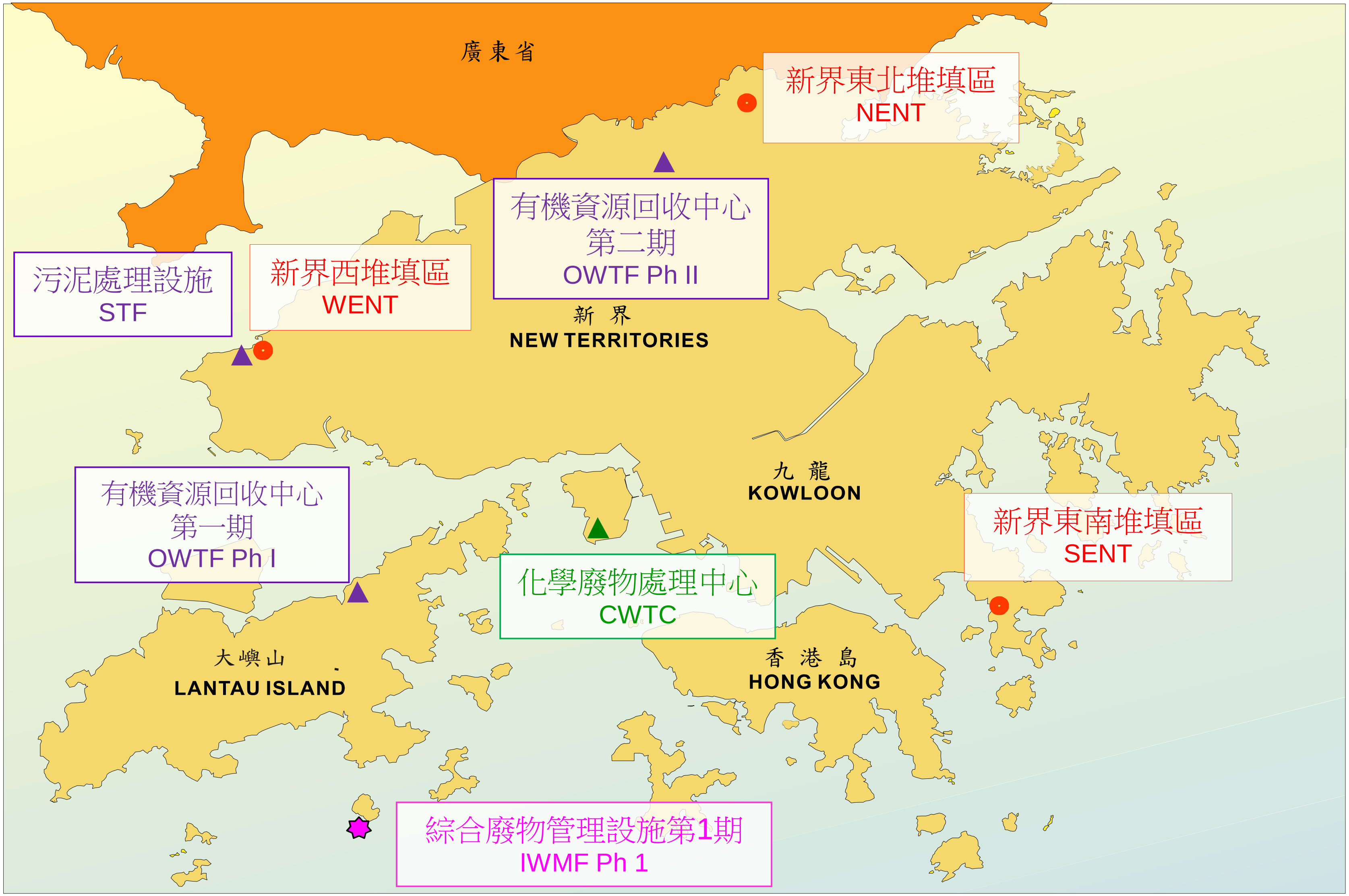
環境影響評估研究結論
EIA Study Conclusion

- 採取先進技術及適當的緩解措施後，於兩個選址興建現代化的焚化設施，在環境上都是可以接受

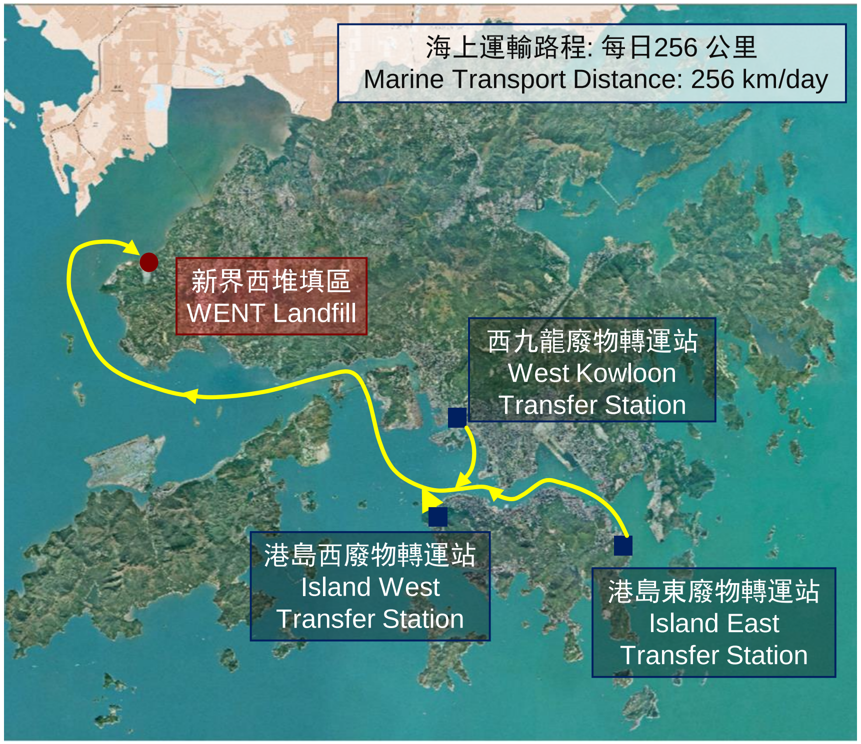
  With advanced technologies and implementation of appropriate mitigation measures, construction of modern incineration facilities at two sites under three scenarios is environmentally acceptable

選址傾向 - 廢物設施的均衡布局

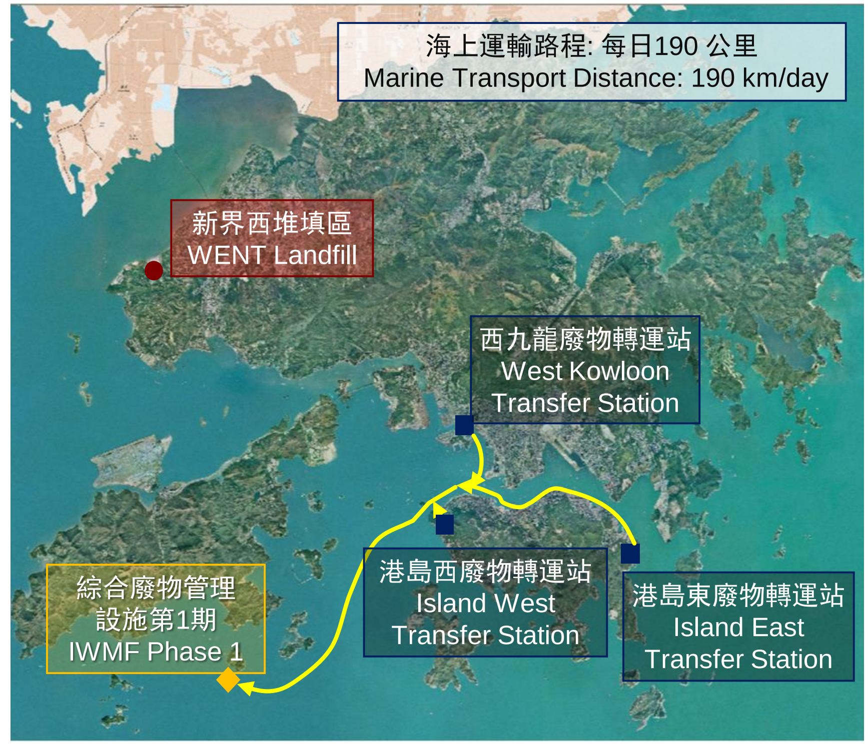
Site Preference - Balanced Distribution of Waste Facilities



減省運輸路程
Savings in Transport Distance



新界西堆填區 – 約每年94, 000公里
WENT Landfill - about 94,000 km/yr

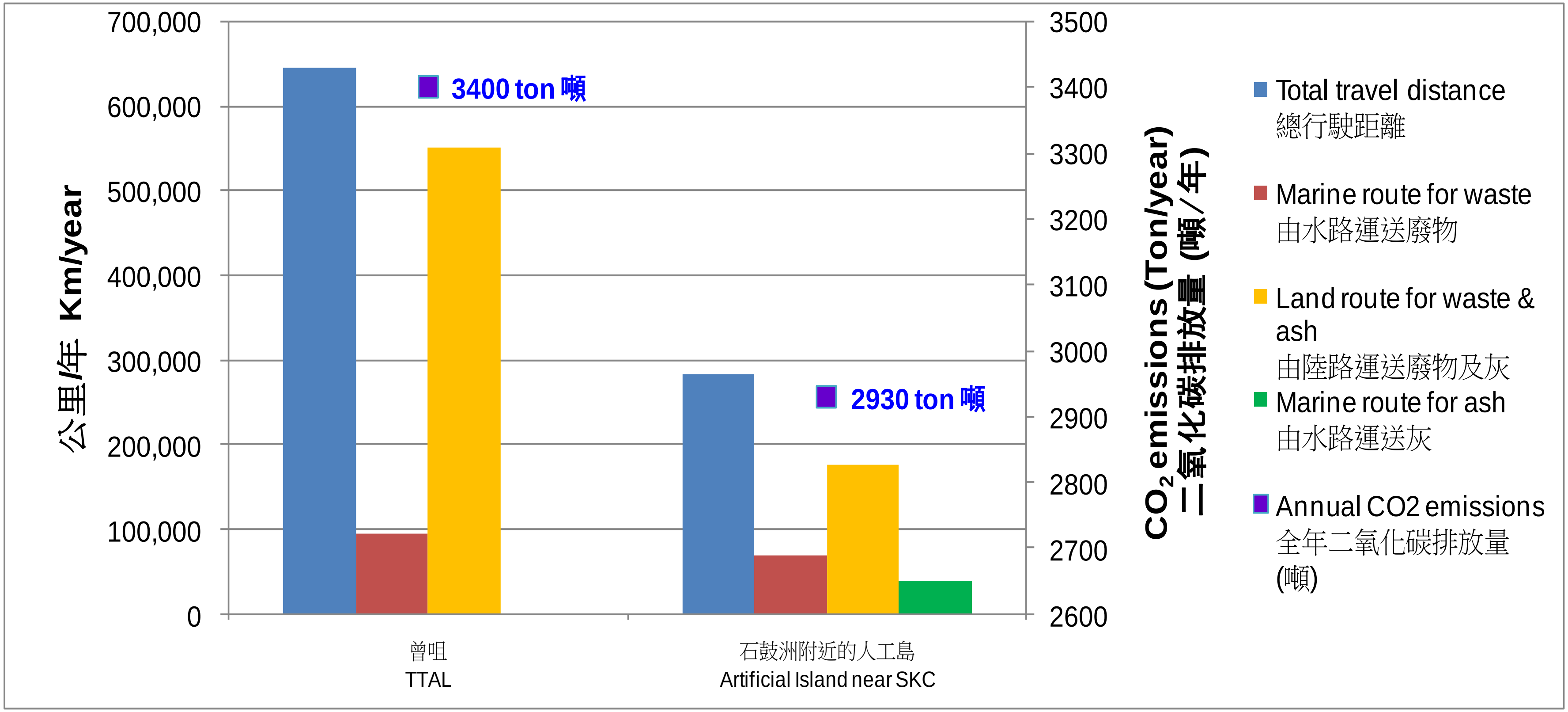


毗鄰石鼓洲的人工島 – 約每年69, 000公里
Artificial Island near SKC - about 69,000 km/yr

毗鄰石鼓洲的人工島 :減省 27%
Artificial Island near SKC : Reduce 27%

減省二氧化碳排放量

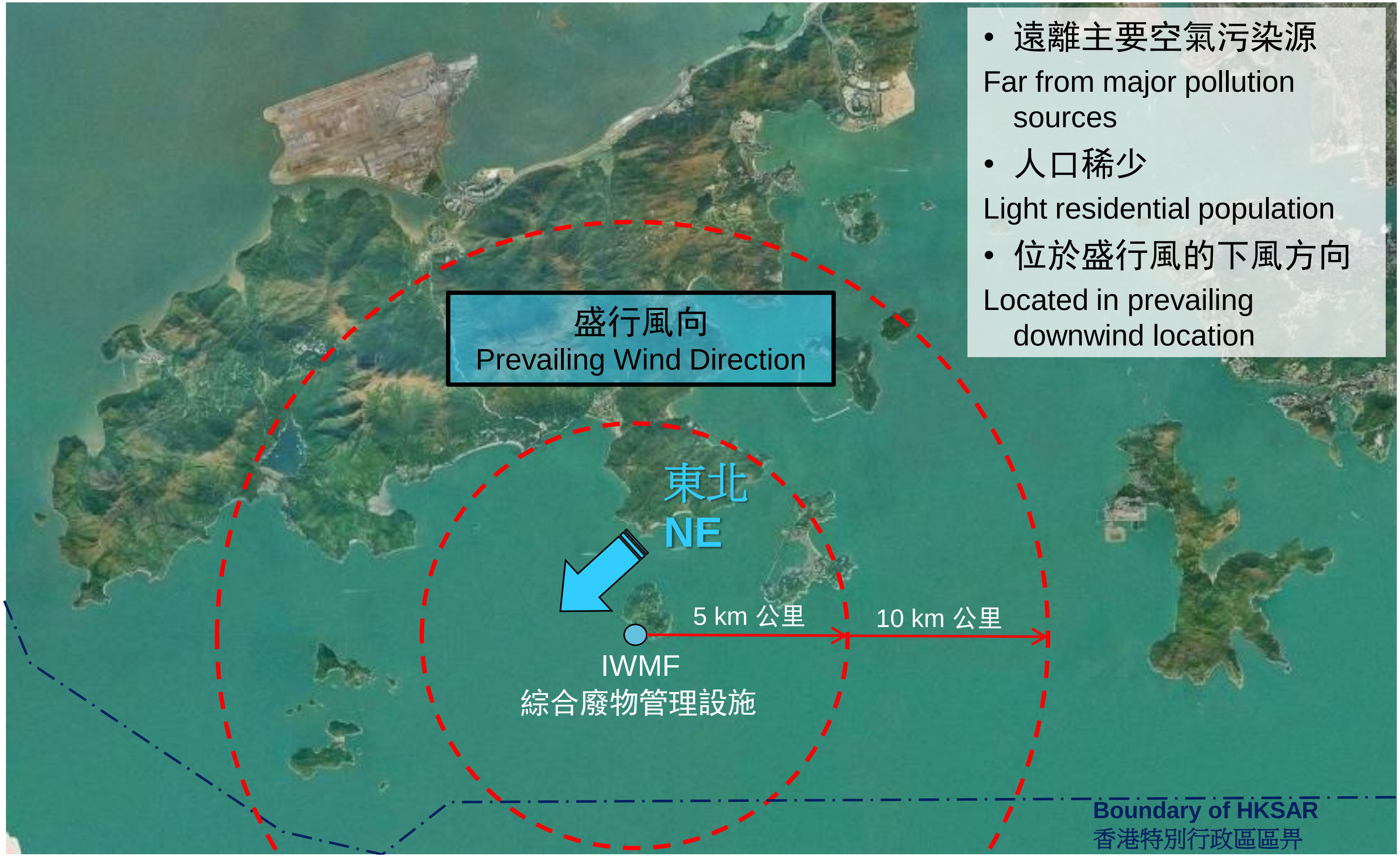
Savings in CO_2 Emission



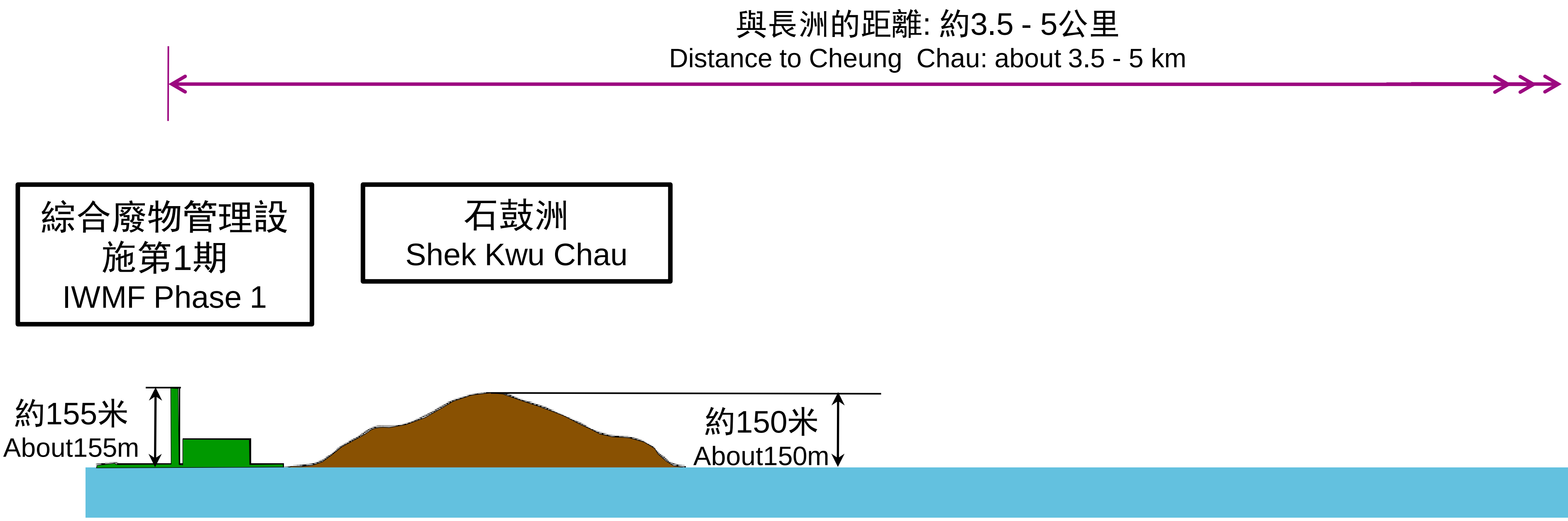
毗鄰石鼓洲的人工島 ：減省 14% (約20,000棵樹)

Artificial Island near SKC : Reduce 14% (~20,000 nos. of tree)

空氣污染源及盛行風向的考慮
Major Air Pollution Sources and Prevailing Wind Direction



利用石鼓洲作天然屏風
Make Use of Shek Kwu Chau as Natural Screen



綜合廢物管理設施第 1 期進展
Progress of IWMF Phase 1

- 環保署於2017年11月批出綜合廢物管理設施第1期的設計、建造和營運合約 (合約包括15年的營運期)

  EPD awarded design, build and operate contract for the IWMF Phase 1 in November 2017 (the contract includes a 15-year operation period)

- 該合約由吉寶西格斯及振華合資公司（Keppel Seghers – Zhen Hua Joint Venture）成功投得

  Keppel Seghers-Zhen Hua Joint Venture won the contract of the IWMF Phase 1

- 設施預計在二零二四年全面運作

  The IWMF Phase 1 is expected to be fully commissioned by 2024