Fact Sheet

Hong Kong Integrated Waste Management Facilities Phase 1

(HKIWMF Phase 1)

20 December 2017

1. Summary IWMF Project

1st Integrated Waste Management Facility in HK

With clean and green as its core theme, the unique architectural and landscaping treatment with extensive greening blends the IWMF with the natural landscape of Shek Kwu Chau. Includes a visitors gallery for environmental education, to raise awareness towards a greener Hong Kong

IWMF project highlights

- Keppel Seghers and Zhen Hua Engineering awarded Design-Build-Operate (DBO) contract by the Government of the Hong Kong Special Administrative Region for Hong Kong's first integrated waste management facility, via a competitive international tender
    - Total contract value : HKD 31 billion (approx. EUR 3.3 billion) including escalations and provisions
    - Keppel Seghers share for the EPC and O&M phases account for more than two-third of the total contract value
- Total 16 ha will be reclaimed from the sea
- Includes breakwaters and a reclaimed island upon which an integrated waste management facility with port handling and other ancillary facilities such as desalination and wastewater plants are built upon
- Facility will process 3,200 tonnes of mixed municipal solid waste per day:
    - 3,000 tonnes per day will be converted into electricity
    - 200 tonnes per day will be sorted and recycled (glass, plastics, ferrous and non-ferrous metals)
- Construction will be completed in 2024
- 15 years operation & maintenance (O&M) of the IWMF

2. Details of the IWMF Project

An iconic project for Hong Kong's waste management

- The Waste-to-Energy plant will feature Keppel Seghers' proven WTE technology with its air-cooled grate, heat recovery boiler, and advanced combustion control system (SIGMA). In addition, the WTE Plant will also use Keppel Seghers' advanced flue gas cleaning system, ensuring that the plant's emissions will comply with EU standards, which are amongst the most stringent international standards available
- 1.2 million tonnes per annum of municipal solid waste are converted into 480,000,000 kWh of net electricity per year powering up to 100,000 Hong Kong households:
  - Contracted capacity of around 3,000 tonnes per day of municipal solid waste per day
  - Volume reduction by more than 90%
  - 440 000 tonnes of CO_2 reduction per year
- A 200 tonnes per day Mechanical Treatment Plant for sorting and recycling of Glass, Plastics and Metals. The separated materials will be transported back to other parts of Hong Kong for further processing into end products
- The onsite desalination and demineralization plants will supply process water for the IWMF and the wastewater treatment plant will ensure that all effluents are treated and reused as process water in either the WTE or mechanical treatment plant or for general washing and landscape irrigation within the IWMF

The reclaimed Island

- The island will be formed by reclamation at the south-western coast of Shek Kwu Chau, an island located to the southwest of Cheung Chau and to the South of Chi Ma Wan Peninsula, Lantau Island.
- The development includes a 11.8 hectares of reclaimed land and berth area, and 4.1 hectares of breakwater protecting the berth area of the IWMF and water basin from strong waves.
- The coast of Shek Kwu Chau and the reclamation area are separated by a water channel.

Joint venture

- The project will be undertaken by Keppel Seghers and Zhen Hua
  - Reclamation and site formation works of a 16 hectares Island (Zhen Hua)
  - Construction of breakwaters and seawalls, civil and structural works, port facility (Zhen Hua)
  - Design, engineering and supply of all process equipment and machinery (Keppel Seghers)
  - O&M of IWMF for 15 years (Keppel Seghers)

- Keppel Seghers
  - Keppel Seghers is a leading Waste-to-Energy technology player
  - Its proprietary WTE technology has been selected for many large landmark waste management projects around the world
  - Keppel Seghers is a subsidiary of Keppel Infrastructure Holdings Pte Ltd, which is wholly-owned by Keppel Corporation, a leading company listed on the Singapore Exchange

- Zhen Hua Engineering
  - Hong Kong subsidiary of China Harbour Engineering Company (CHEC)
  - CHEC is one of the largest dredging companies in the world
  - CHEC is owned by China Communication Construction Company (multi-billion dollar company listed in China)

Artist Impression IWMF

3. Background Information on WTE and Hong Kong

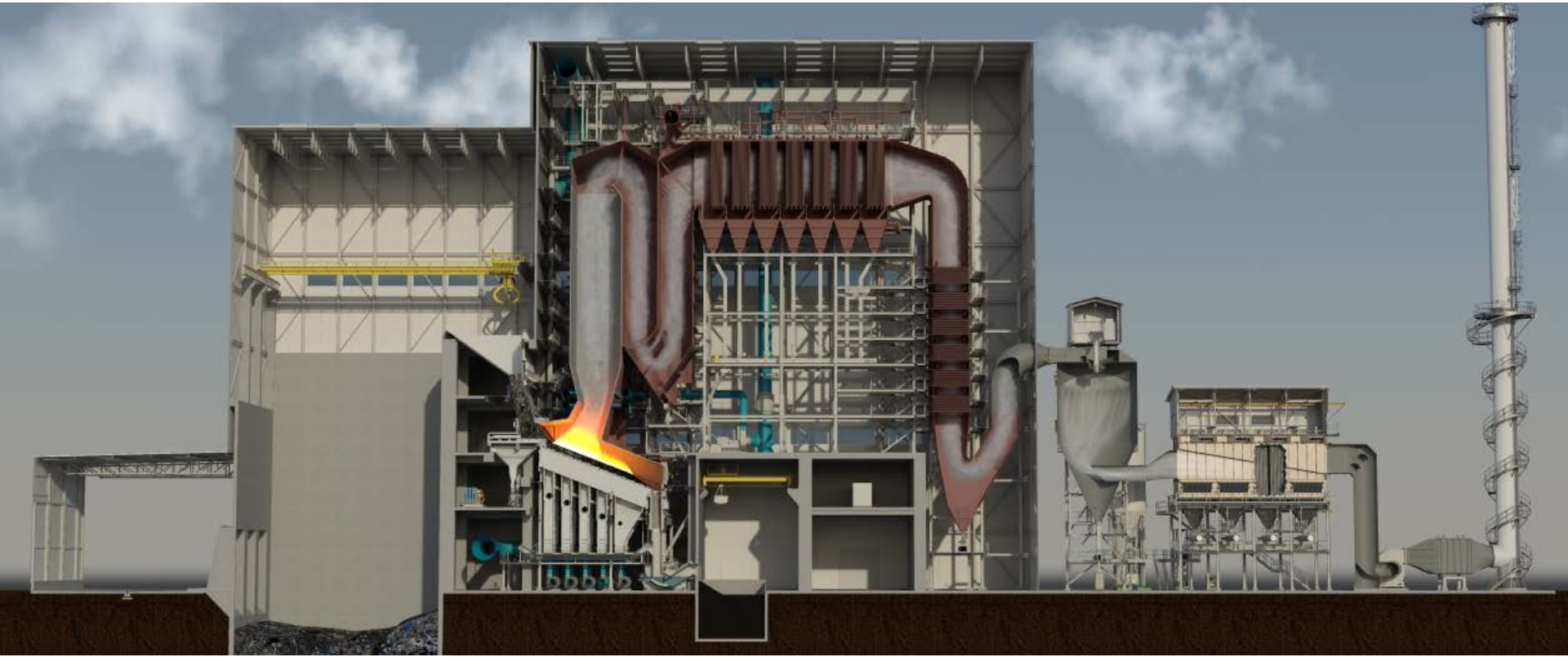
Waste-to-Energy (WTE)

- Allows up to 95% landfill diversion rate
- Forms an essential part of a sustainable waste management chain
- Is one of the most robust and environmentally-friendly method of processing residual waste since it reduces land occupation (landfilling) and provides a meaningful outcome for waste through energy production
- Recovers valuable renewable energy and helps to diversify energy sources to increase energy independence
- Fully complementary to recycling by recovering energy from residual waste
- Reduces carbon footprint of human activities due to (1) reduced methane emissions from landfill (methane has 28 times higher global warming potential than CO_2), (2) offsets the use of fossil fuels for energy production and (3) recovery of materials
- See following links for more information on WTE

  www.youtube.com/watch?v=_7SsOuGwUKQ

  www.eswet.eu

Typical Waste-to-Energy Process



Hong Kong

- The sovereignty of Hong Kong was transferred from Britain to the People's Republic of China in 1997
- Today, Hong Kong is a special administrative region in China having its own law and currency (HK$)
- Hong Kong has the world's most developed infrastructure[1], which supports an effective and fast growing economy
- Population of Hong Kong : 7.3 million (World Bank, 2016)
- Population Density : 6,690 persons/km^2 (HK Gov, 2015)
- Municipal Waste landfilled : 3.7 million ton/year (HK Gov, 2015)
- Treats close to 1.2 million ton/year at the IWMF, this is approximately 30% of today's landfilled municipal solid waste

Source of picture: https://fedotov.co/hong-kong-most-competitive-economy/

[1] According to the World Economic Forum's Global Competitiveness Report 2015-2016

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