

# 小蠔灣污水處理廠 太陽能發電場簡介

## Solar Farm in Siu Ho Wan Sewage Treatment Works

位於小蠔灣污水處理廠的太陽能發電場，由超過四千二百塊太陽能光伏板組成，最高總發電裝機容量達1,100千瓦。這些太陽能光伏板分別安裝於污水廠內的三個區域，即太陽能發電場A區、B區及C區。

此太陽能發電場佔地超過11,000平方米，於2016年12月投入運作時，為當時全香港最高總發電裝機容量的太陽能光伏系統。

此太陽能發電場每年可產生約1,100,000千瓦時的電量。

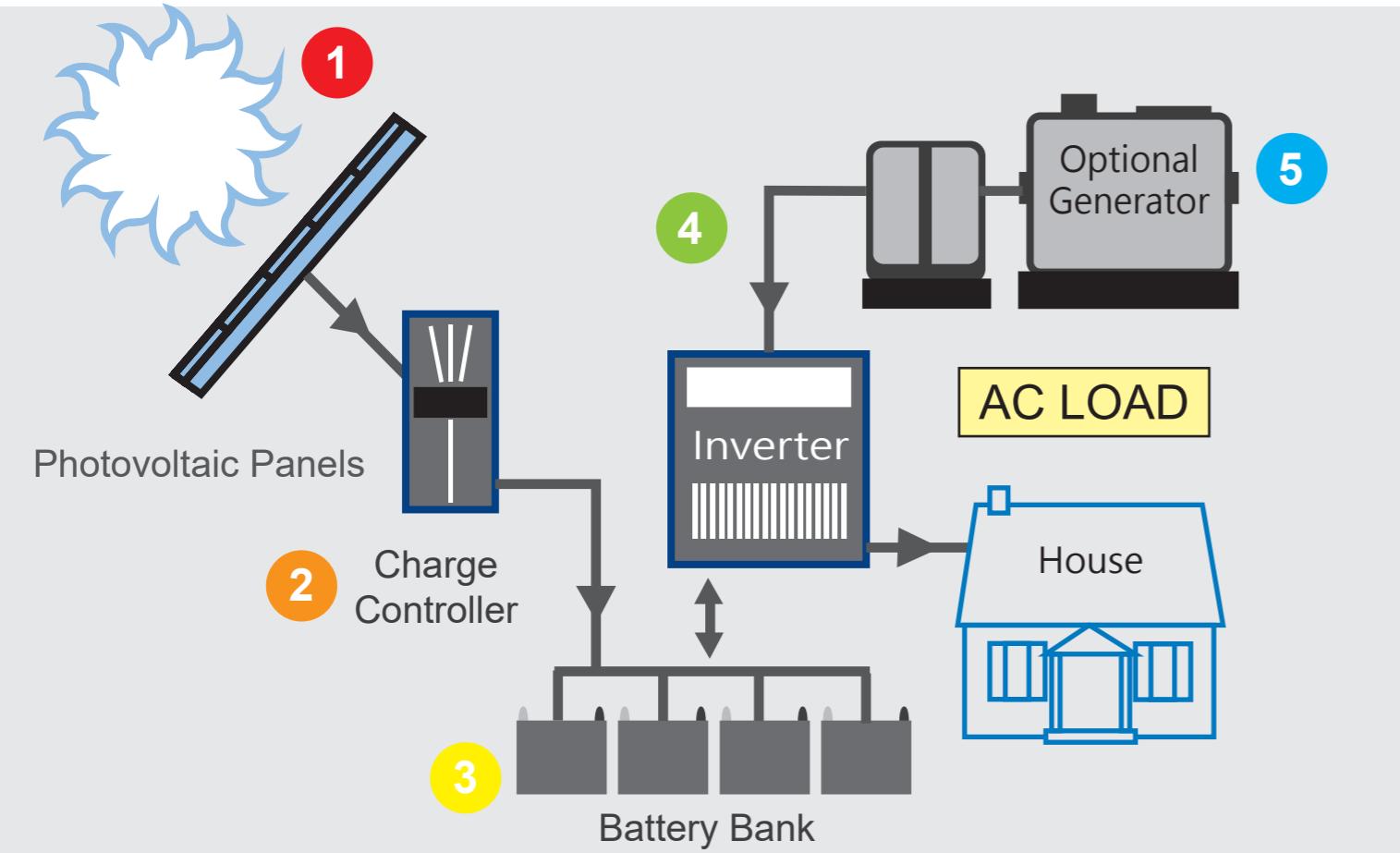
Solar Farm in Siu Ho Wan Sewage Treatment Works, which comprises over 4,200 photovoltaic (PV) panels, has an installed generation capacity at around 1,100 kilo-watt. The PV panels are installed in three areas, namely Solar Farm Areas A, B and C, within the Sewage Treatment Works.

The Solar Farm occupies an area of over 11,000 square meters. At the time of system commissioning in December 2016, this system became the largest PV system installation in terms of installed generation capacity in Hong Kong.

The annual electricity generation by the Solar Farm is approximately 1,100,000 kilowatt-hours.

# 太陽能發電系統運作原理

## Solar System Operation Principle

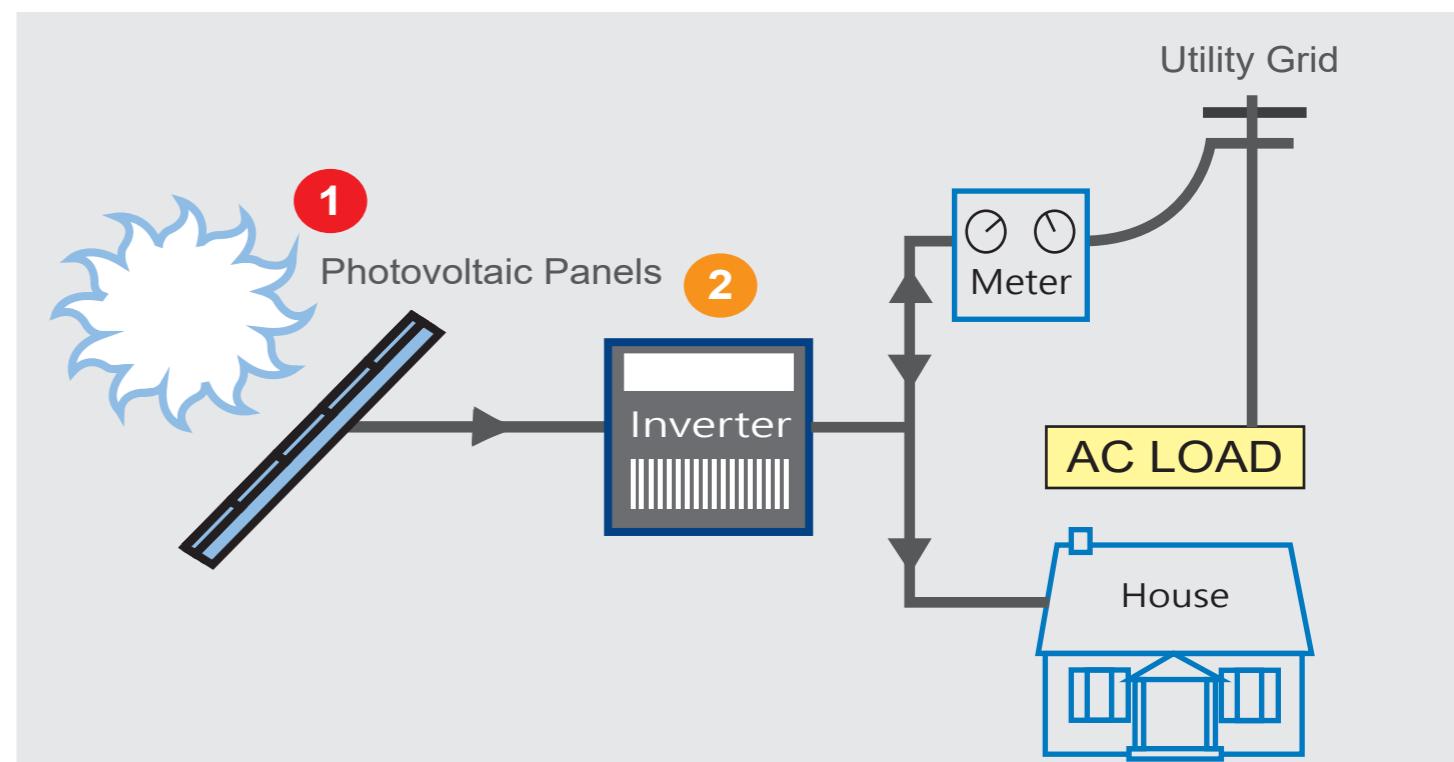


### 獨立光伏系統 Standalone

- ① 太陽能光伏板  
Photovoltaic Panels
- ② 電流調節器 (供直流電負載)  
Solar Charge Controller for Direct-current (DC) Load
- ③ 蓄電池  
Battery Bank
- ④ 可選擇-獨立光伏系統逆變器 (供交流電負載)  
Optional-Off-Grid Inverter for Alternating-current (AC) Load
- ⑤ 可選擇-後備發電機  
Optional-Backup Generator

### 與電網接駁的光伏系統 Grid-connected

- ① 太陽能光伏板  
Photovoltaic Panels
- ② 逆變器 (供交流電負載)  
Inverter (for AC Load)

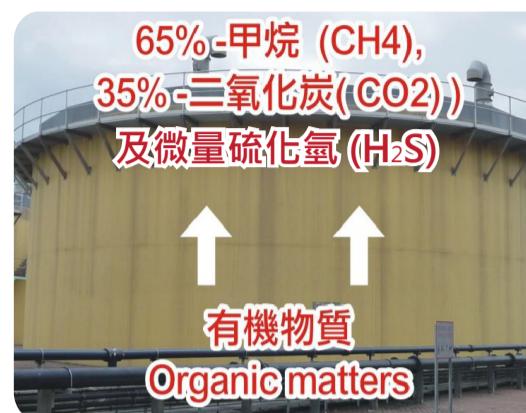


# 生物氣

# Biogas



生物氣儲存缸  
Biogas Holder



污泥消化缸  
Sludge Digester



Sludge collected  
during Sewage  
Treatment

硫化氫 (百萬分之五百至一萬)  
 $H_2S$  (500 - 10,000 ppm\*)



除硫系統  
Desulphurization System

熱水供污泥消化系統使用  
Hot water for sludge digestion process



熱交換器  
Heat Exchanger



例如：鼓風機  
e.g. Air Blower

硫化氫 (百萬分之一百至二百)  
 $H_2S$  (100 - 200 ppm\*)



除濕及氣體加壓  
Moisture Removal &  
Gas Pressurization

熱能  
Heat



電熱聯供發電系統  
CHP Generating System

電力供廠內設備使用  
Electricity for plant equipment

- 於污水處理廠內，生物氣（可再生能源）在處理污泥的過程中產生
- 渠務署自二零零六年起逐步安裝電熱聯供及微型渦輪發電系統，以轉化生物氣內的能源為電能和熱能，以供廠內設備使用
- 生物氣因而能夠被有效地使用，從而減少化石燃料的使用，並減緩溫室效應
- Biogas (a form of renewable energy) is produced in sewage treatment works in the course of sludge treatment
- Since 2006, DSD has progressively installed several combined heat and power (CHP) and micro-turbine generating systems to turn the energy in biogas to electricity and heat for in-house use
- As a result, biogas is effectively utilized, use of fossil fuel is reduced, and greenhouse effect is mitigated

# 可再生能源的概覽和展望

## Overview and Outlook of Renewable Energy

抱負：

提供世界級的污水和雨水處理排放服務，  
以促進香港的可持續發展

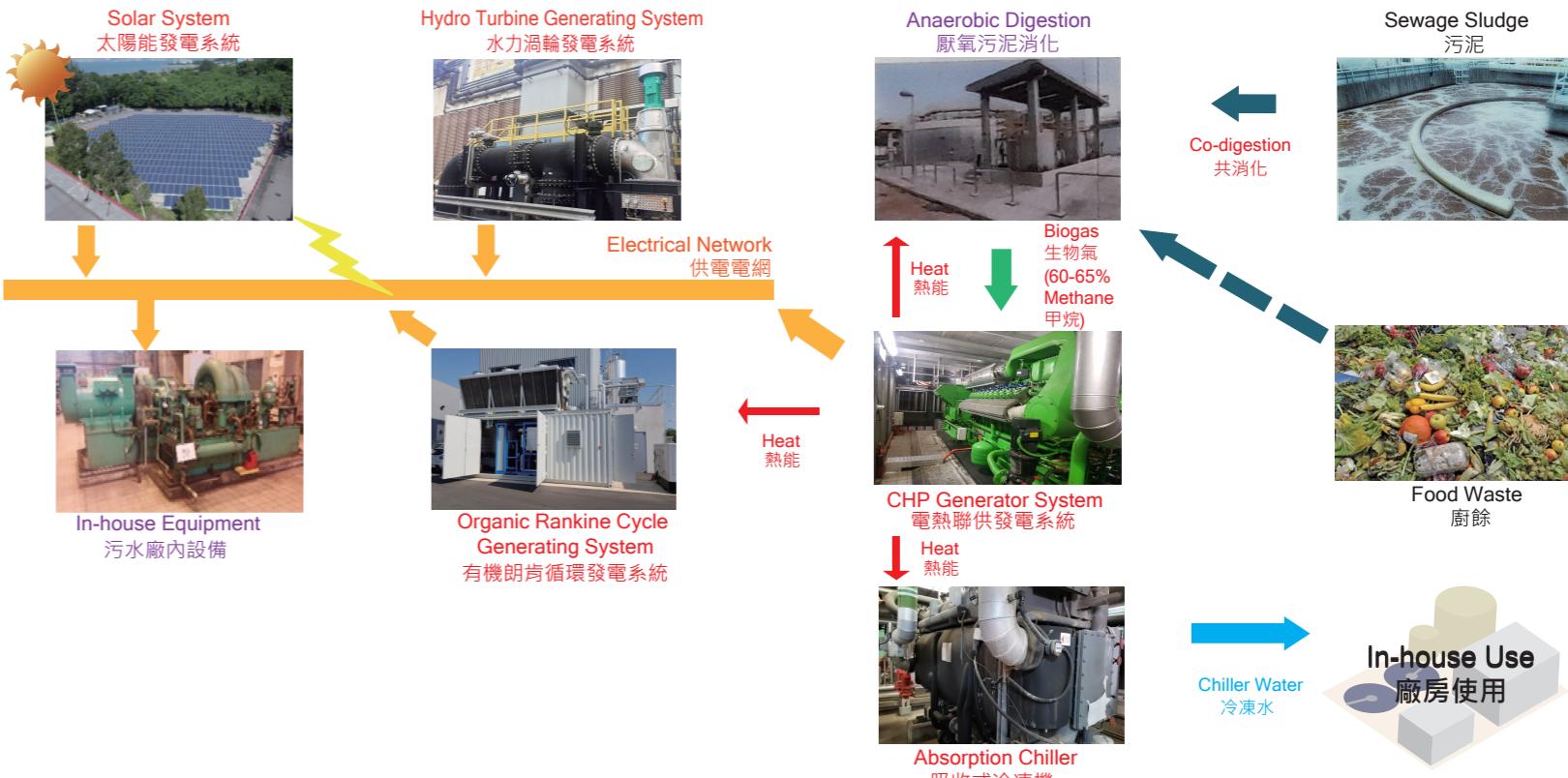
Vision:

To provide world-class wastewater and stormwater drainage services  
enabling the sustainable development of Hong Kong



九龍城一號污水泵房  
Kowloon City No.1 Sewage Pumping Station

### 概覽 Overview



### 展望 Outlook

可再生能源種類 Renewable Energy Type	現有可再生能源 Existing Capacity of Renewable Energy	/ 潛在可再生能源 / Potential Capacity of Renewable Energy
水力發電 Hydro Power	<ul style="list-style-type: none"><li>● 水力渦輪發電系統 Hydro Turbine Generating Systems</li></ul>	
太陽能 Solar Energy	<ul style="list-style-type: none"><li>● 太陽能發電場 Solar Farm</li><li>● 薄膜太陽能發電系統 Thin-film PV Systems</li></ul>	
生物能 Biomass Energy	<ul style="list-style-type: none"><li>● 冷熱電三聯供技術 Tri-generation</li><li>● 更多電熱聯供發電系統 More Combined Heat and Power (CHP) Generating Systems</li></ul>	<ul style="list-style-type: none"><li>● 污泥熱水解技術 Thermal Hydrolysis of Sludge</li><li>● 有機朗肯循環發電系統 Organic Rankine Cycle Generating Systems</li></ul>
污泥 + 廚餘 Sewage Sludge + Food Waste	<ul style="list-style-type: none"><li>● 廚餘及污泥共消化技術 Food Waste and Sewage Sludge Co-digestion</li></ul>	

# 渠務署的可再生能源 Renewable Energy in DSD



昂船洲污水處理廠水力渦輪發電系統  
Hydro Turbine Generating System in  
Stonecutters Island Sewage Treatment Works



小蠔灣污水處理廠太陽能發電場  
Solar Farm in  
Siu Ho Wan Sewage Treatment Works



沙田污水處理廠電熱聯供發電系統  
CHP Generating System in  
Sha Tin Sewage Treatment Works



元朗污水處理廠微型渦輪發電系統  
Micro-turbine Generating System in  
Yuen Long Sewage Treatment Works



石湖墟污水處理廠電熱聯供發電系統  
CHP Generating System in  
Shek Wu Hui Sewage Treatment Works



大埔污水處理廠電熱聯供發電系統  
CHP Generating System in  
Tai Po Sewage Treatment Works

主要系統  
Major Systems

# Solar Farm Monitoring Room in Siu Ho Wan STW



小蠔灣  
污水處理廠  
太陽能發電場監察中心

