

Webinar: Integrating Sustainable Development Goals into Corporate Sustainability

Towngas SDGs and the challenges

Mr. Victor Kwong,

General Manager, Corporate Sustainability, The Hong Kong and China Gas Company Limited

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Towngas SDGs & Challenges



Victor Kwong
GM – Corporate Sustainability

07 Jul 2020



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CSR Programmes

Way Forward

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01 PART

Company Profile

- Our History
- Management and Governance
- Business Overview
- Sustainable Development Goals

Our History

started as the first Public Utility in HK



Founded in 1862,
provided public
lighting in Central,
1st public utility in HK



1860s – 1960s
Our services
expanded to
heating and
cooking business



1990s – 2000s
Business took off on
mainland China



煤氣
Towngas



港华燃气
Towngas



Now

Hong Kong Business

Mainland Utility Business

New Energy Business

As at the end of 2019

- Underground pipeline
> 3,600 km in HK
> 115,000 km in mainland China
- Projects in China and overseas
266 nos.

No. of customers

> 1.9 M in HK

> 32 M in China

No. of employees

Total > 52,800 (~2,500 in HK)

2.3% of Asia's
Total Population

Business Overview

up to end-2019

- **266 projects (26 provinces)** in China
- Major businesses
 - City Gas Supply (natural gas and town gas)
 - Water / Wastewater Treatment
 - Waste to Energy Projects
 - Food Waste recycling
 - Telecommunication
 - etc.



Management Philosophy

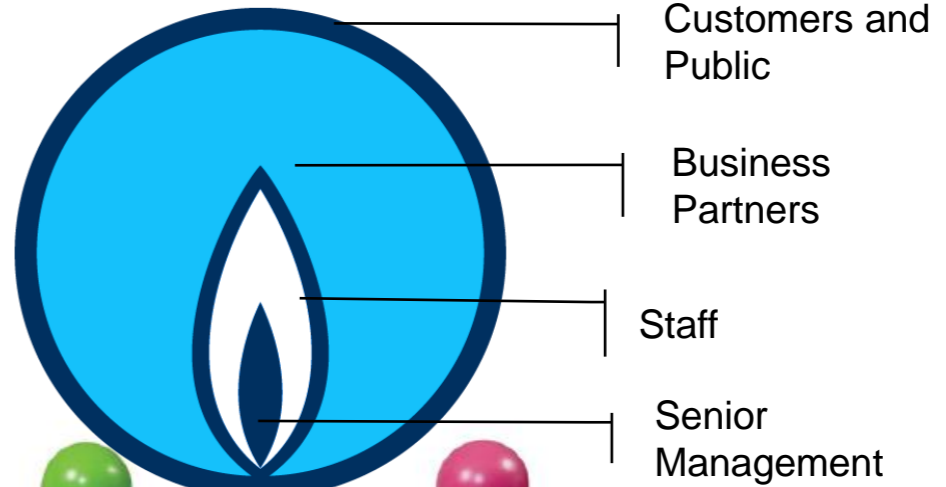
words from Managing Director

“Aspire to be the **Greenest** HK-based company”



pp We share the concerns of our stakeholders and are taking action to address the global challenges we face today by contributing towards a greener, brighter future. 99

Alfred Chan Wing-kin
Managing Director



Our Sustainable Development Goals

Aligning with United Nations to prioritize our strategies for business growth

Take urgent action to combat climate change and its impacts



Make cities and human settlements inclusive, safe, resilient and sustainable

Ensure availability and sustainable management of water and sanitation for all



Ensure access to affordable, reliable, sustainable and modern energy for all



02 PART 02

Green Businesses

- Clean Water
- Clean Energy
- Sustainable Cities
- Climate Actions

Integration of “Green” Businesses

and be Proud of what we are delivering



6 CLEAN WATER AND SANITATION



Clean Water and Sanitation

- Fresh Water Provision
- Wastewater Treatment
- Grey Water Recycling



7 AFFORDABLE AND CLEAN ENERGY



Affordable & Clean Energy

- Natural Gas Conversion
- Clean Production of TG
- High Efficiency Appliances
- Distributed Energy System



11 SUSTAINABLE CITIES AND COMMUNITIES



Sustainable Cities & Communities

- Food Waste Recycling
- Gen 2. Bio-diesel (HVO)
- Used Appliance Recycling Program



13 CLIMATE ACTION



Climate Action

- Landfill Gas Utilization
- Climate Change Risk and Opportunity Assessment
- TCFD

Natural Gas Conversion

Transforming from Coal to a cleaner Fuel – Natural Gas



Gas Sales in 2019:
25.55 Billion m³ NG in mainland
 1.66 Billion m³ TG in HK

7 AFFORDABLE AND CLEAN ENERGY



IGU **Natural Gas: Generating Power to the World**

Natural Gas is up to **50%** cleaner than other fossil fuels

It emits far lower NOx, SOx and especially particulate pollutants, than other fossil fuels.

Natural Gas delivers the lowest capital cost per-megawatt power compared to any other source of fuel

Average cost per Megawatt:

- Advanced CC: 400: \$1,023
- Onshore Wind: \$2,213
- 155MW Photovoltaic: \$3,872
- Single-unit GCC: \$4,400
- Coal (600MW): \$5,550

When Natural Gas replaces other fossil fuels as a power source, air quality improves substantially, and smog clears up.*

Natural Gas plants have much faster construction times and smaller footprints

They are much easier to ramp-up and ramp-down when power is needed

Natural Gas helps renewables grow as Natural Gas provides extra power when needed

* 70% less NOx, 90% less SOx
1100 DOE / IIGU Report, April 2019

Pollutant	NG	Coal
Carbon Dioxide	1x	2x
Carbon Monoxide	1x	5x
Sulfur Dioxide	1x	2,591x
Nitrogen Oxides	1x	5x
Particulates	1x	392x

Project Information	Cumulative
• Phase 1-1 capacity: (3 caverns)	140Mn m ³
• Completion:	Jan 2018
• Phase 1-2 capacity: (+7 caverns)	460Mn m ³
• Construction Commencement:	Mar 2018
• Phase 2 capacity: (+12 caverns)	>1,000Mn m ³



Jintan Underground NG Storage

Environmental friendly salt caverns for NG storage

Shifting to a Greener Fuel Mix

with carbon neutral bio-gas and low carbon fuels



70s

1999

2006

2007

2017 onwards

Replacing Coal & Heavy Oil by using **high quality Naphtha**

Landfill gas from **Shuen Wan Landfill** site was utilized for town gas production

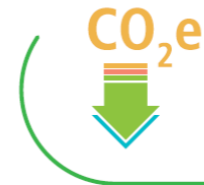
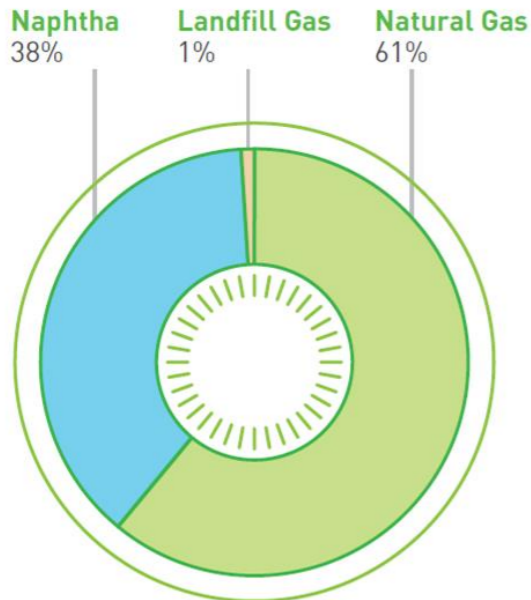
Natural gas was introduced as production feedstock of town gas

Landfill gas from **NENT** was utilised

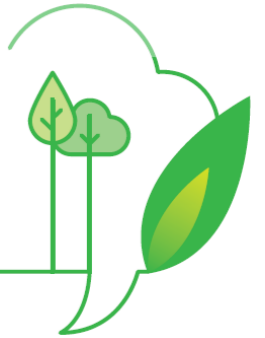
*Utilisation of Landfill gas from **SENT***

*Exploring Biogas from **Foodwaste***

2018 Fuel Mix for Town Gas Production

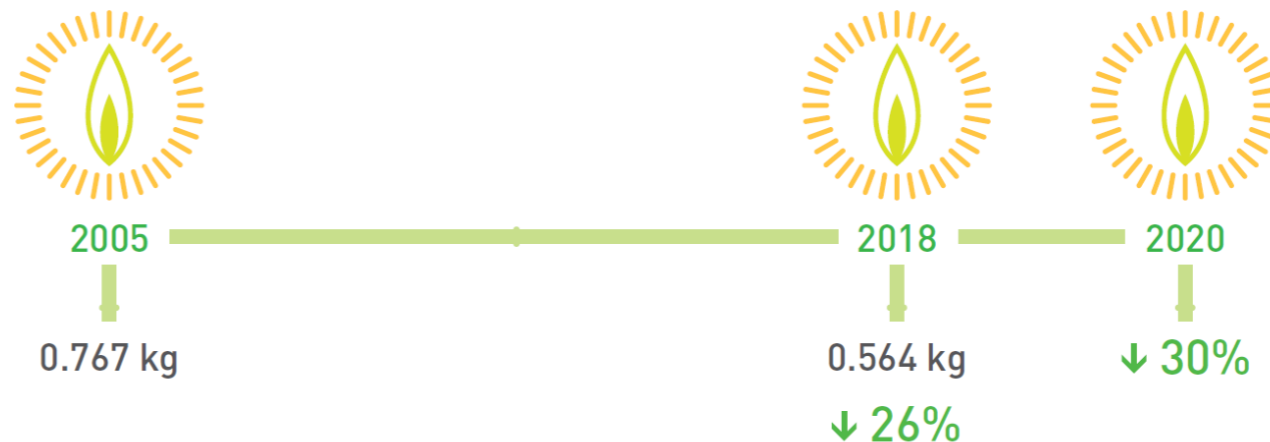


In 2018, our avoided carbon emissions from our landfill gas utilisation projects were more than our carbon emissions from our gas supply related operations in Hong Kong



Carbon Intensity (for Gas Production)

Our Target





Concession Schemes

monetary support for the needy

- Benefitted about 45,000 households every year
- Total up to **HK\$25,000,000**
- Started to offer first concession scheme back in 1995 (Elderly)



Concession Scheme for the Elderly



Concession Scheme for People with Disabilities



Concession Scheme for Single-parent Families



Concession Scheme for Low Income Families

Energy Efficient and Waste Reduction Appliances

to reduce GHG emission and waste with our customers



Cool Kitchen Four Treasures (efficiency up to 95% with heat recovery features)



Water Heater Hydropower Generator Module



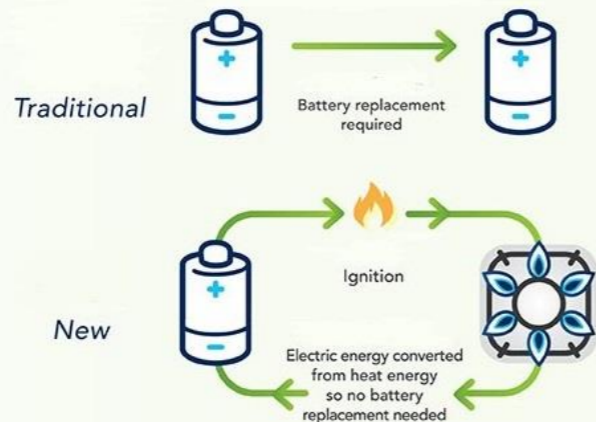
Energy Efficient Appliances



Regenerative Electric Energy Module (REEM)



Difference between new and old electric supply



No need to replace batteries

一同為環保出一分力
Let's contribute to environmental protection



SIMPA WZH2SE 煤氣雙頭座枱煮食爐
Two Burner Gas Hotplate



- 200 appliance models with energy-saving & eco-friendly features
- Launches new energy-efficient appliances every year

Distributed Energy System

Integrated energy supply for **Power** + **Hot Water / Steam** + **Air-Conditioning** with higher efficiency



VS

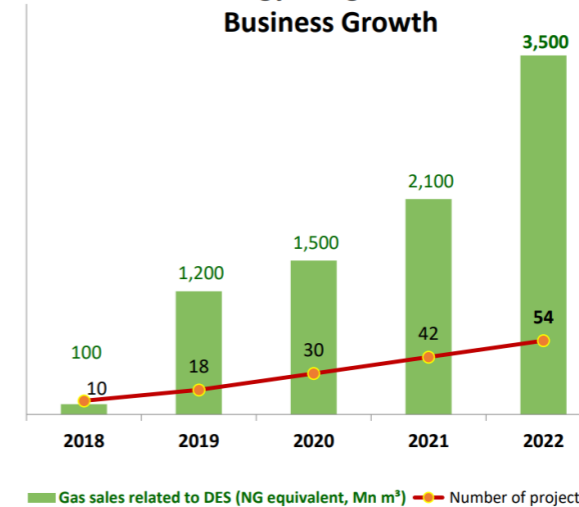


Traditional Power Plant
Efficiency **~40-50%**
(and transmission loss)



Distributed Energy System
Combined Efficiency **~80%**

Green Energy Integrated Services
Business Growth



- **Central Space Heating**
- **Air-conditioning**
- **Electricity**
- **Central Steam Supply for Industrial Parks**
- **Pipelines for Steam Supply from Power Plants**

Landfill gas utilization at Nethersole Hospital since 2016

1st Commercially Viable CHP Project in HK and one of lowest carbon project among the world



Energy efficiency can reach

87%



Total GHG Reduction for HK
4,500 tonnes / year

Hua Yan Water

ensuring adequate supplies of clean water to **2.4M customers**, particularly in **rural areas**



华衍水务
Hua Yan Water

6 CLEAN WATER AND SANITATION



SAMSUNG

- ✓ Complies with National Standards
- ✓ Detects Water Leakages (SCADA + GIS)
- ✓ Ensure Pipeline Integrity (self produced pipes)
- ✓ Optimizes Operation Efficiency (Big Data)
- ✓ Minimizes Construction Waste (Trenchless Technology)
- ✓ Educates the Public



10 Freshwater Supply Plants
Capacity > 916 MT/yr
(eqv. >366,000 swimming pools)



3 Wastewater Treatment Plants
Capacity 135 MT/yr
(eqv. 54,000+ swimming pools)

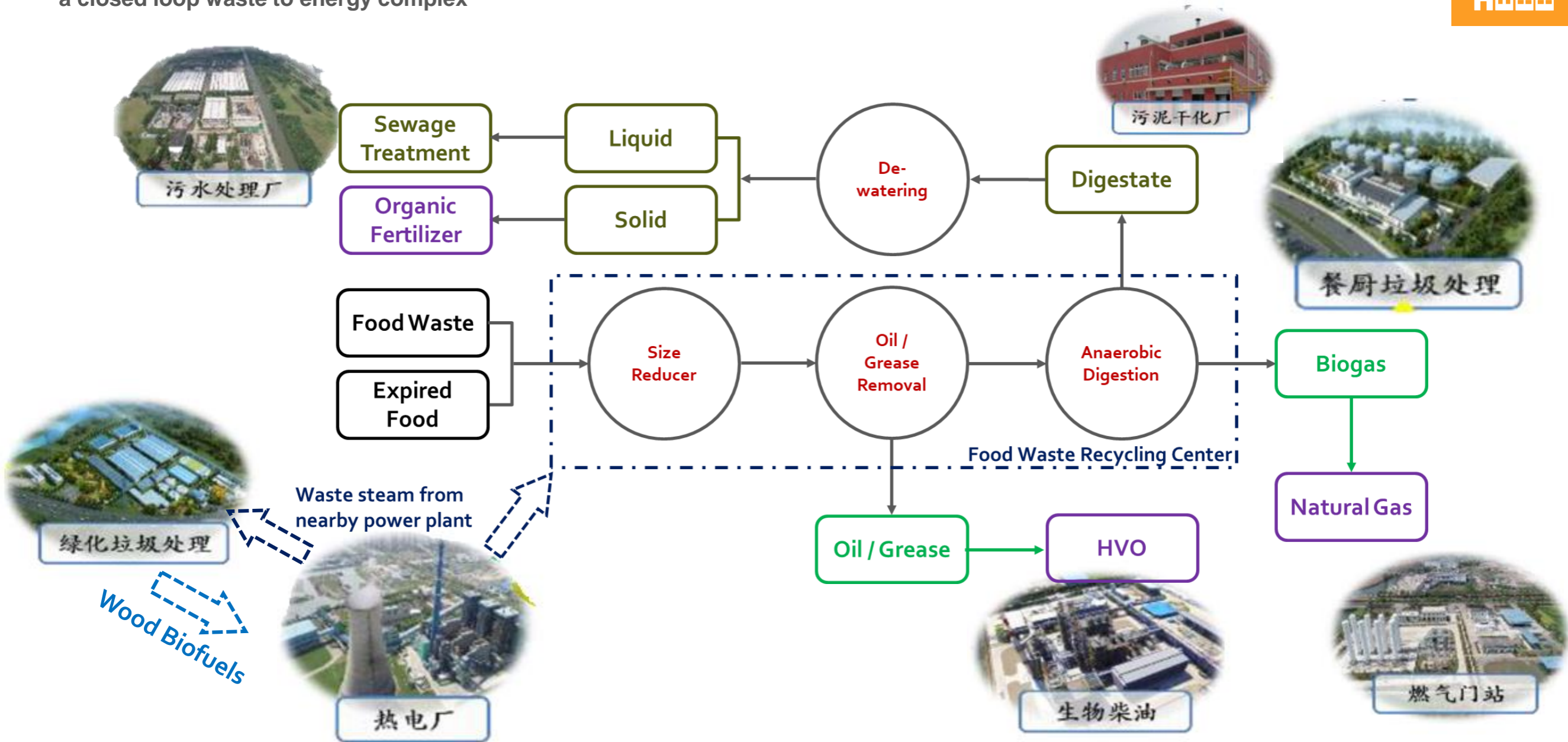


Grey Water Recycling
Capacity 14.6 MT/yr
(eqv. 5,800 swimming pools)

+

Food Waste Recycling Center at Suzhou

a closed loop waste to energy complex



Waste to Energy



- Bio-methane from food waste plant help L' Oreal factory to achieve carbon neutral in June 2019
- Use bio-methane as fuel source for CHP system to generate steam and electricity
- Earn Carbon Credits thro' national carbon emission trading system
- Yard waste to fuel sources for furnaces

L'ORÉAL
PARIS

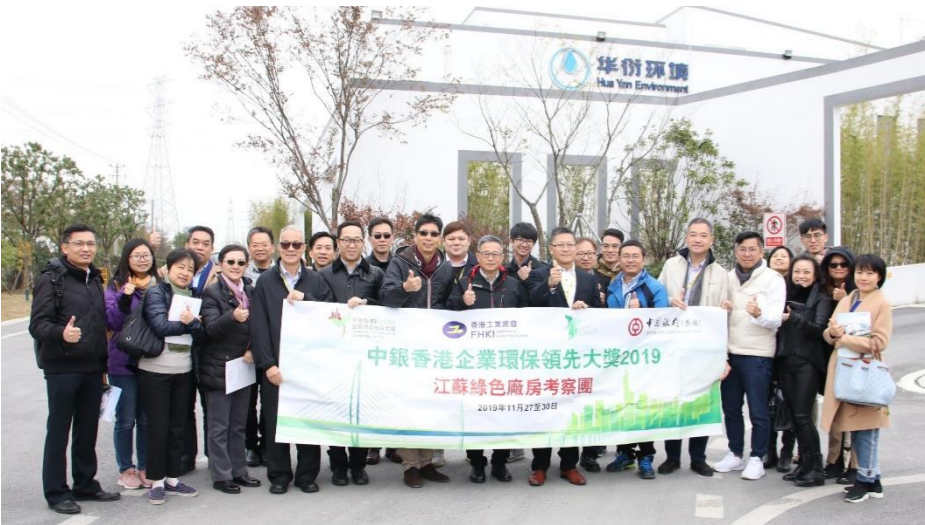
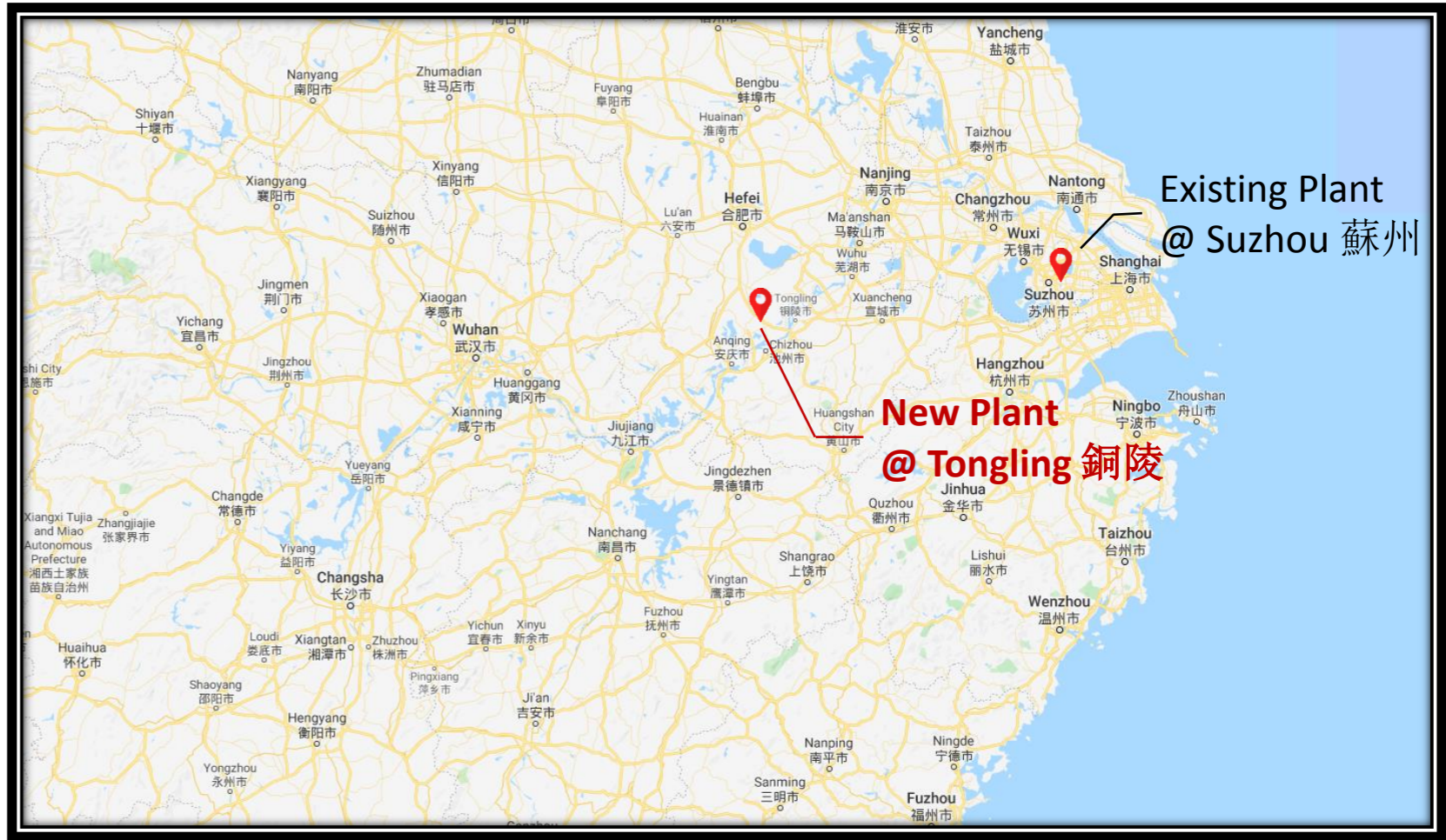


Food Waste Recycling Center at Suzhou

State of the art and pioneer of closed loop recycling



Benchmarking Visit with EnB & EPD



Showcase Tour with FHKI representatives

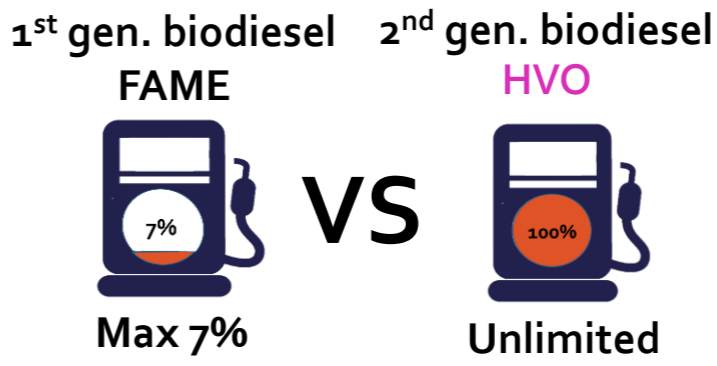
Waste-to-energy “2nd Generation Biodiesel (HVO)”

made from waste oil (palm oil residue and used cooking oil)



Production Capacity
 Ph1: 120K ton/yr
 Ph2: 250K ton/yr

Blending ratio



Waste and Residues in Palm Oil Mills Effluent (POME)

Used Cooking Oil (UCO)

100% waste and residues

~90% GHG Saving

- Innovative Green Technology
- Biofuels promote a closed system of carbon to reduce carbon emission
- Market and recognition from all countries
- Blending with fossil diesel is not required

Used Appliances Recycling Program

a **Win-Win-Win** situation for Customer, Contractor and Non-government Organizations

Delivery of new gas appliance



Free removal of customer old appliances



Deliver to recycling contractors



Disassemble for recycling

> 86,000 items or >95% were collected in 2018

> 16,000 tonnes of used appliances collected since 2003

>\$1 million revenue per year



Subcontractor labor cost



Towngas Green Fund
(To support Green Activities)



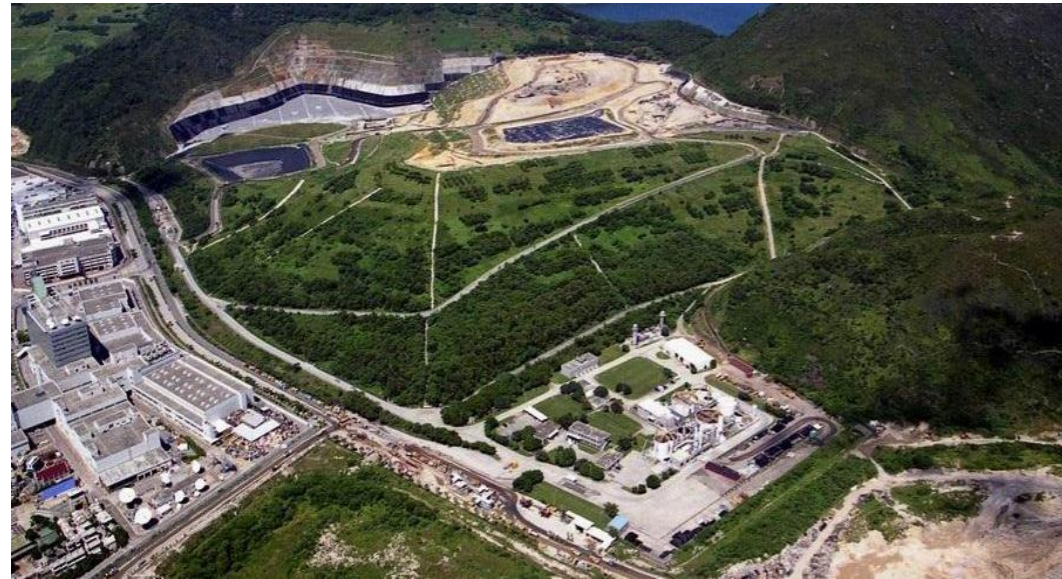
Waste-to-Energy from SENT Landfill

largest landfill gas conversion facility of its kind in Asia

13 CLIMATE ACTION



- ✓ Commissioned in Nov 2017
- ✓ Avoided energy waste (originally flared on site)
- ✓ Reduced carbon emissions
- ✓ Costed approximately HK\$350 million investment



Landfill gas upgraded into synthetic natural gas (SNG) and transmitted to Tseng Lan Shue regulating station through a 12 km pipeline and then integrated into gas supply network.

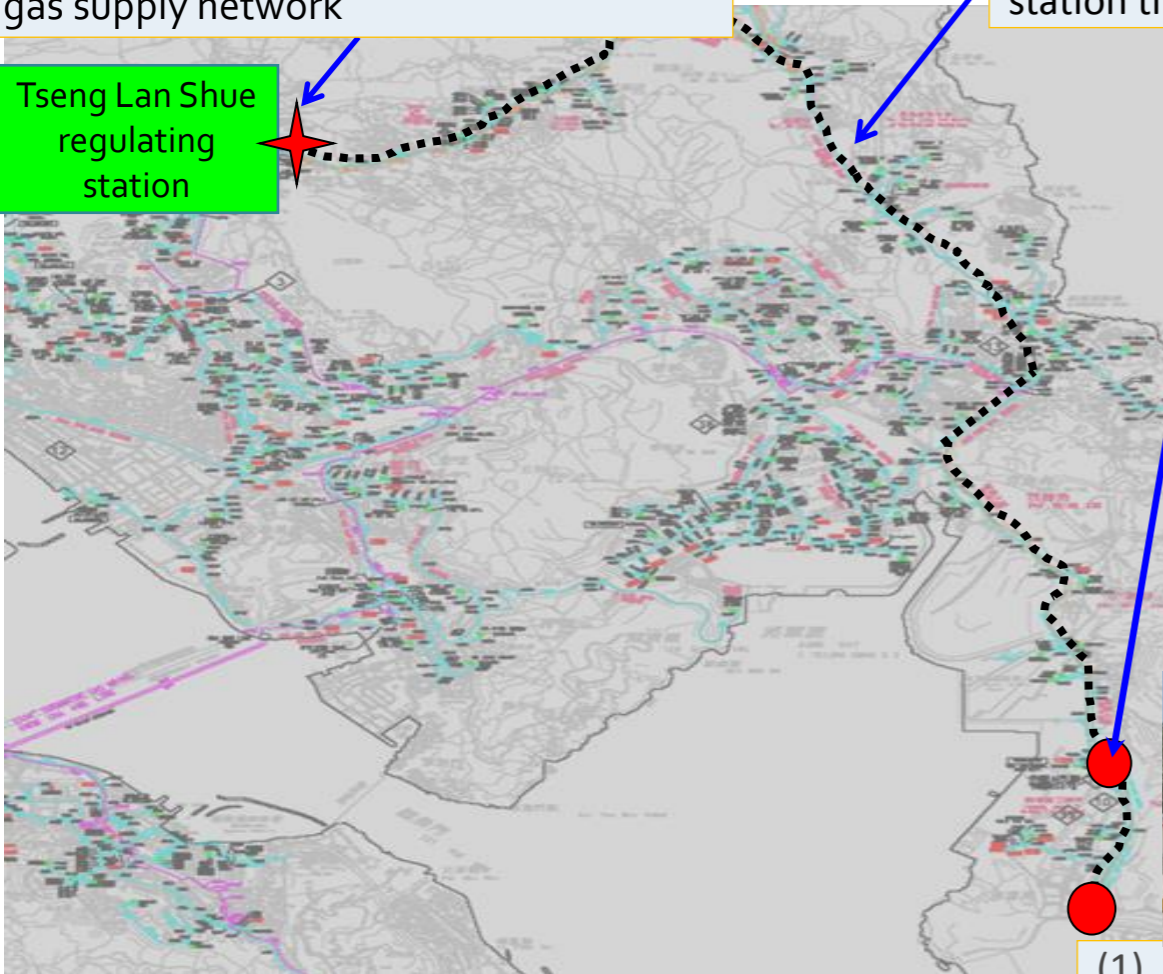
Gas Absorption Chiller at Towngas Telecom

Carbon Neutral through the use of Landfill Gas

(3) Synthetic natural gas integrated into gas supply network

(2) Transmitted to Tseng Lan Shue regulating station through a 12 km pipeline

Tseng Lan Shue regulating station



(4) TGT – Absorption Chiller



(1) Turn landfill gas into synthetic natural gas



Estimated GHG Emission Reduction
 ~ 56,000 tonnes per year
 (Eqv. to 2.4 million trees' CO₂ absorption per year)



Climate Change Risk & Opportunity Assessment (HK & PRC)

Evaluating and getting prepared for extreme weather conditions



- Conducted in 2015 for major weather risks
 - Typhoon & Heavy Rain
 - Flooding & Sea Level Rise
- Typhoon Mangkhut signal No. 10
 - Wind Speed = 256 km/h (Max. gust peak speed from HKO)
 - Severe Storm Surge



Power outage to 20,000 households at Macau



Flooding in Heng Fa Chuen



Damage in Whampoa

<u>Fatalities</u>	Hato	Mangkhut
Mainland	11	4
Macau	12	0
Hong Kong	0	0

Towngas

- Minor damage to several facilities
- **No gas leakages or personal injuries**

Preventative measures taken

- Increase **Gas Plant Switch Room** Flood Gate level to **7.5 mPD**
- Cover **Unpaved Pipelines** near coastal areas by **concrete** or other suitable materials
- Install **wires to secure Governor Kiosk** roof and Fasten the kiosk door



Confirm Pump Capacity



Frozen Lake Surface



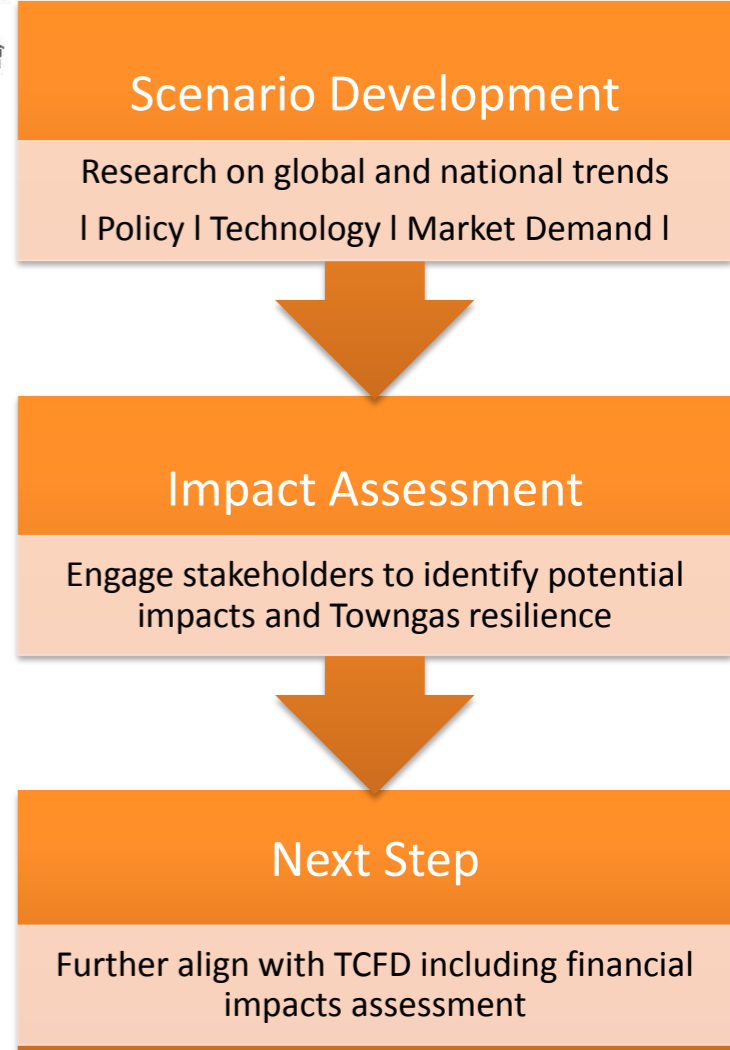
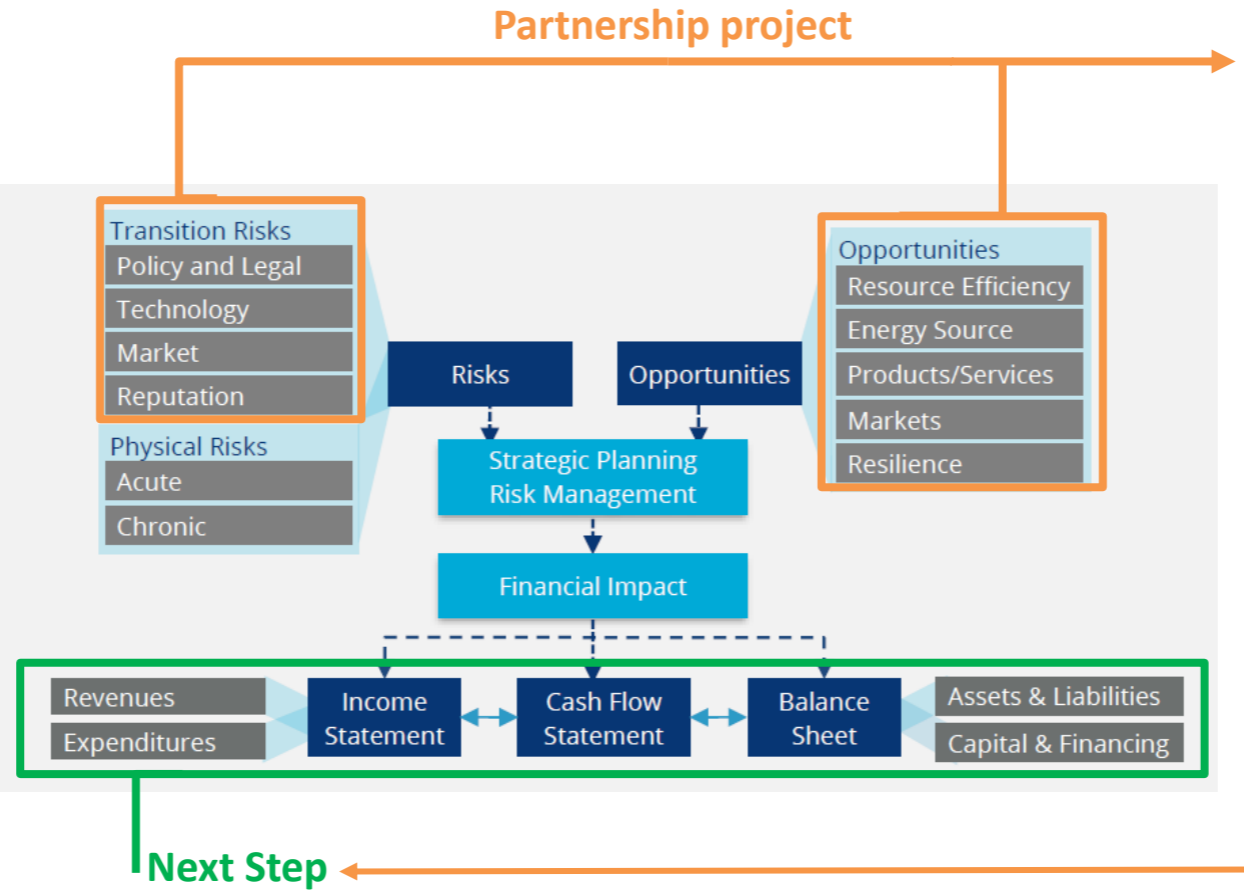
Frozen Water Meters & Pipes



Task Force on Climate-related Financial Disclosures

what are the opportunities and risks brought by Technology and Policy Advancement in 2050

- Conducted **gap analysis** against the recommendations of TCFD
- Partnership with BEC to promote implementation of TCFD in HK



3 PART 3

Way Forward

- Awards and Accolades
- Re-defining Waste
- Solar Systems

Awards and Recognitions

in recognition of our relentless efforts to build a better future

Average **over 50** industry awards
in each of the past 5 years

**HKAEE – Gold Award
Public and Community
Services**



**HKMA – Hong Kong
Sustainability Award
Large Sized
Organizations**



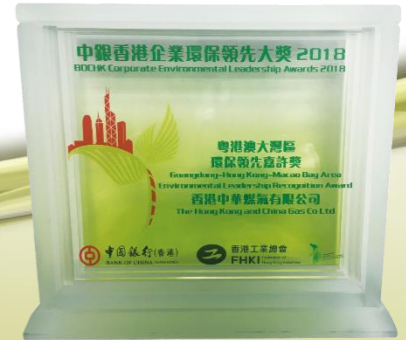
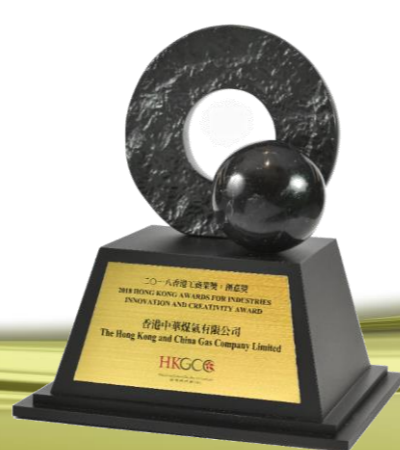
**ACES – Top Green
Companies in Asia
(to be presented)**



TOP GREEN COMPANIES IN ASIA

The award is bestowed upon companies that run their business operations yielding minimal negative impact on the environment, community, and society. The winning companies undertake environmentally friendly activities at all facets of the organization to ensure that its processes, products, and production activities adequately address current environmental concerns while maintaining a profit.

NOTE: Highest ranked winner in this category will be conferred with the ASIA'S GREENEST COMPANY OF THE YEAR award.



Renewable Energy Systems

Support local Renewable Targets

Phase 1 (~270 kW)

Offtake and Pigging (6 nos.)



Cha Kwo Ling

Ta Pang Po

Tai Po Production Plant (Completed at Apr, 20)



North Point Headquarter (To be installed)



Expected Revenue

HK \$1 M/yr

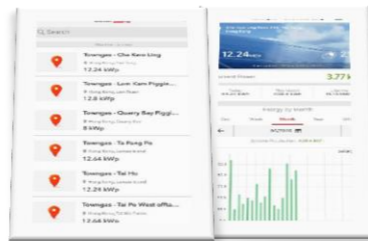
*Feed-in Tariff (\$4-5/kwh)

Expected Energy Yield

~ 250,000 kWh/yr

Payback Period

~ 6-7 yrs



Phase 2

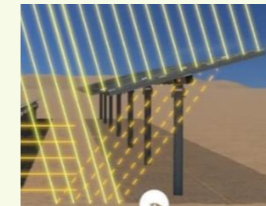
Offtakes to be awarded in April

- Route Twisk, Au Tau, Sha Tin North (Area 11)

Design Criteria

- Avoid shading effect
- Case study on

Bifacial solar panel



Energy yield +5 to +10%
(as much as 30% by simulation)

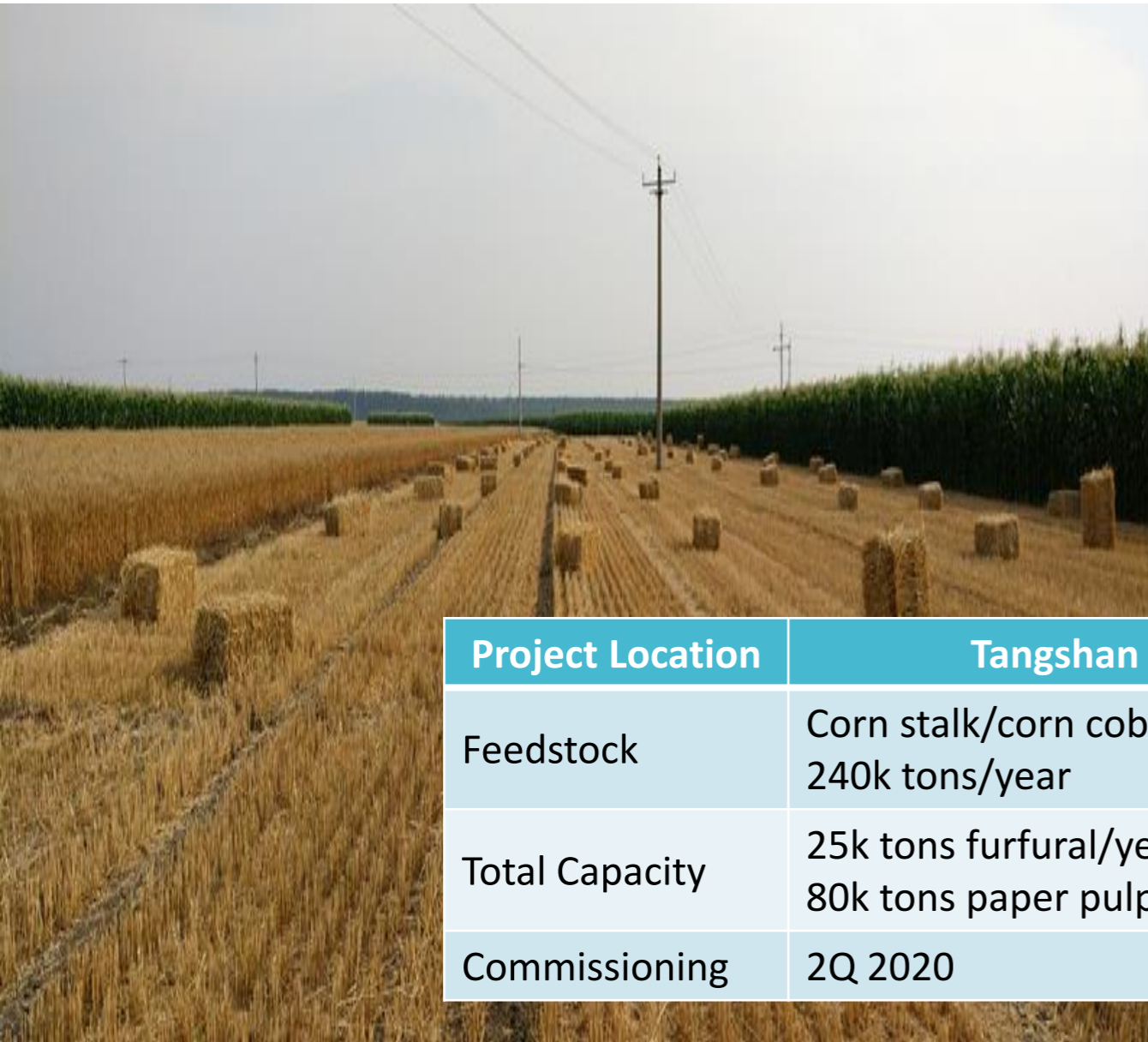
Sun tracker



Energy yield +12 to +30%

Re-defining “Waste”

with our strong R&D expertise and patented technologies



Project Location	Tangshan	Cangzhou
Feedstock	Corn stalk/corn cob, 240k tons/year	Corn cob, 240k tons/year
Total Capacity	25k tons furfural/year 80k tons paper pulp/year	25k tons furfural/year 25k tons bio ethanol/year
Commissioning	2Q 2020	4Q 2020

