GREEN COUNCIL
環保促進會

# Webinar:
# Climate Change Mitigation: Decarbonisation Technology and Innovation - What To Know and Do About it

## *Building Decarbonisation Infrastructure for a sustainable city*

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VEOLIA
Webinar on
Climate Change Mitigation:
Decarbonisation Technology and
Innovation
Green Council

# SUMMARY

# Veolia
# Hong Kong

*Veolia Presence in Hong Kong Territory*

# OUR PRESENCE IN HK


Landfills

Transfer stations and collection

Energy

Waste treatment and recovery

Veolia has been **present in Hong Kong since the 1990's.** Nowadays, Veolia is now managing **the majority of Hong Kong's waste management businesses** with presence also in energy and water activity.

**In 2022, Veolia Hong Kong has**

***1600*** *employees in 4 business lines*

Achieving our mission of "**RESOURCING THE WORLD**", Veolia is committed to **TURN THE TIDE** and to become the benchmark company for the **ECOLOGICAL TRANSFORMATION.**

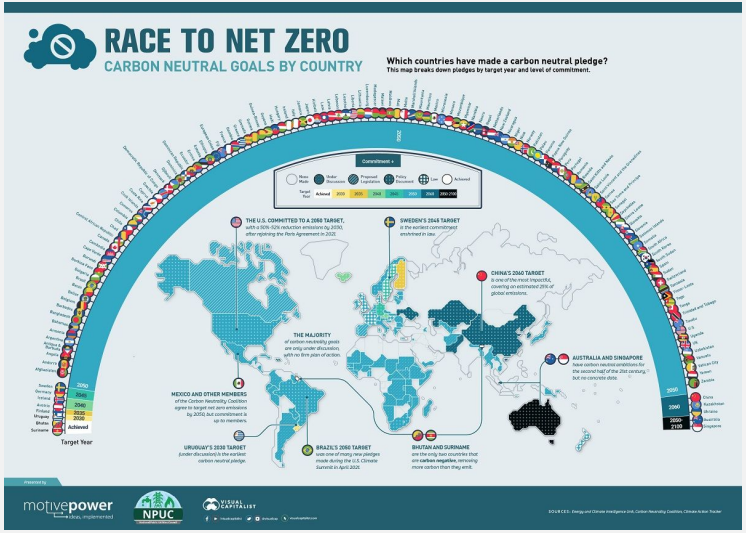
# Climate Change Context

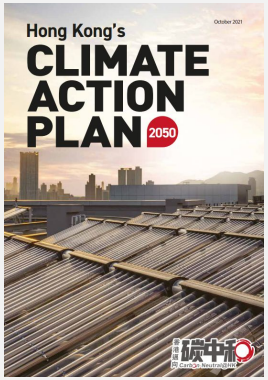
*Countries & Clients commitment*
*Veolia commitment & Purpose*
*Regulations*

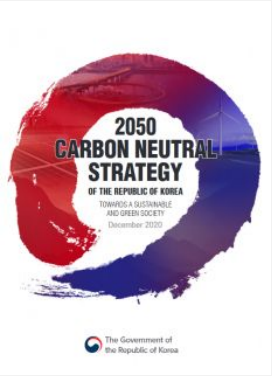
# CLIMATE CHANGE
## Countries commitment

**Governments** are taking measures to reduce GHG emissions

**Clear commitment** to achieve Carbon neutrality by 2050




***As the largest developing country, China has the ambition to switch to a low-carbon development pathway and is on track to achieve its long-term GHG emissions abatement goals***

Last Sep Chinese President XI Jinping announced the goal of China to **peak** $CO_2$ emissions by **2030** and achieve **carbon neutrality** by **2060**.

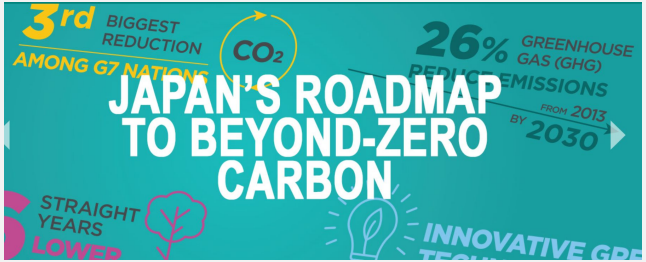
China climate change targets and achievements

| Outcome | Target of 13th FYP (2020) | Achievement by 2019 | NDC Target (2030) |
|---|---|---|---|
| $CO_2$ emissions reduction per unit of GDP relative to 2005 Levels | 40-45% | 45.8% | 65% |
| Share of non-fossil fuels in primary energy consumption | 15% | 14.3% | 25% |
| Increased forest carbon stock volume relative to 2005 levels | 1.3 billion cubic meters | 3.9 billion cubic meters | 6.0 billion cubic meters |

Source: *Ministry of Ecology and Environment, China State Council*

**China is expected to play a leading role in ensuring a "green recovery and low-carbon transition".**

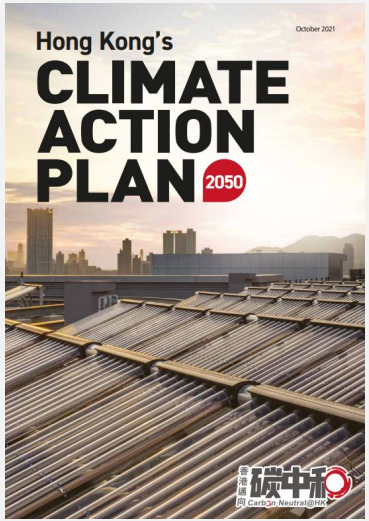
**The country will need to reply on robust growth of clean energy, and advanced technology & innovation to achieve emission reduction at least costs.**



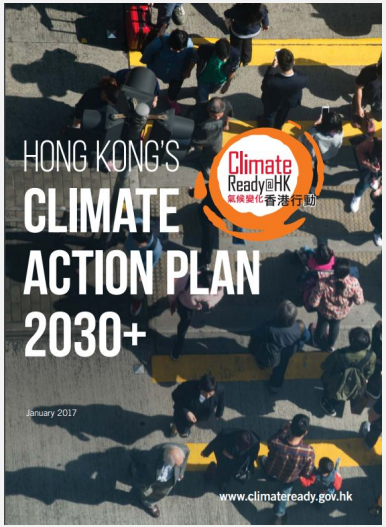
# CLIMATE CHANGE - PRIORITY FOR HONG KONG

## Hong Kong will strive to achieve carbon neutrality by 2050

**To reduce carbon emissions, the Government has taken measures in areas like waste management, energy supply, green building, green transport, cleaner production and green finance.**

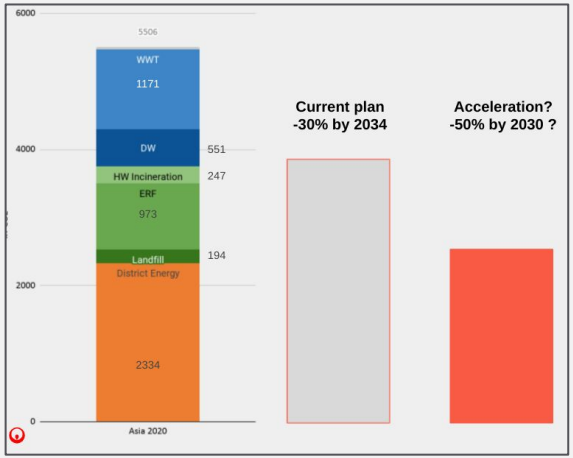




# CLIMATE CHANGE
## Veolia commitment

*COP26: Veolia is preparing to double its commitments for reducing GHG emissions while reinforcing its reputation as the leading partner for its customers' low carbon and resilience strategies*




=> “Internal” Carbon neutrality

## Veolia purpose

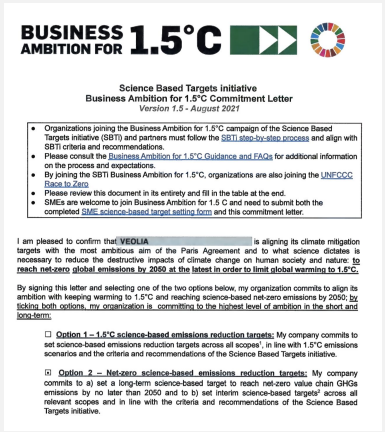
# VEOLIA'S CLIMATE COMMITMENT
## SBTi 1.5°C

- **In September 2021,** Veolia signed the Business Ambition for 1.5°C and commit to define **by end of 2023, a new reduction target** aligned with the latest criteria of the SBTi (Science based targets initiatives) integrating the scope 1, 2, 3 emissions, other GHG than CO2 such as N2O, CH4.

- Set-up **short (5 to 10 years)** and **long term targets** toward **net-zero emissions by 2050.**

SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION



BUSINESS AMBITION FOR 1.5°C

**Science Based Targets initiative**
**Business Ambition for 1.5°C Commitment Letter**
*Version 1.5 - August 2021*

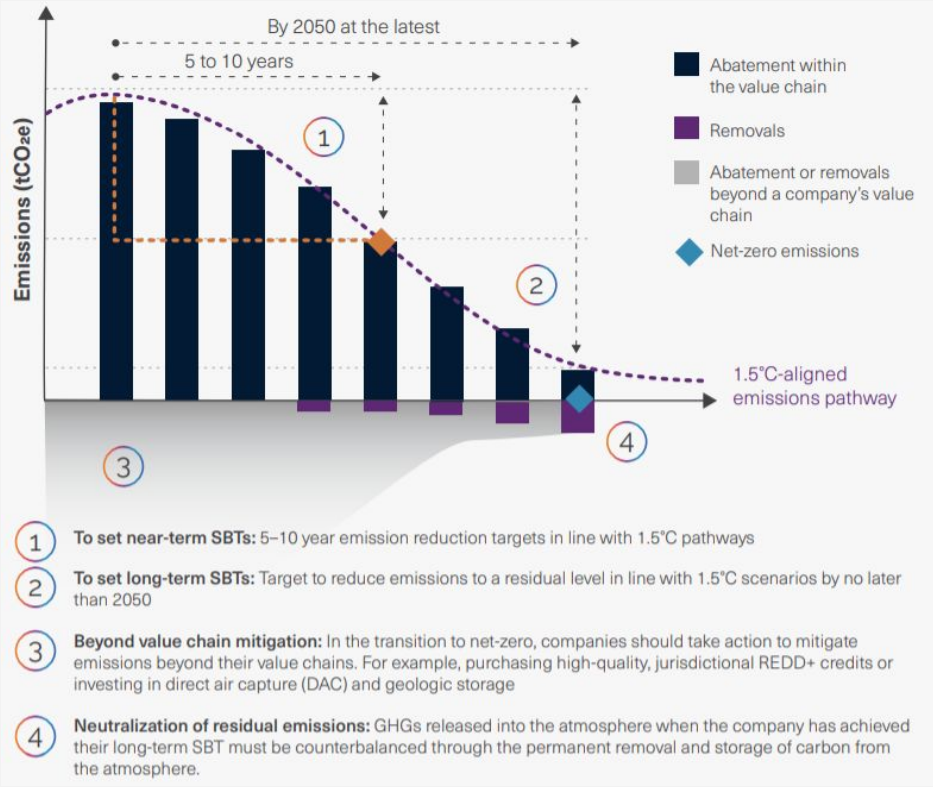
- Organizations joining the Business Ambition for 1.5°C campaign of the Science Based Targets initiative (SBTi) and partners must follow the SBTi step-by-step process and align with SBTi criteria and recommendations.
- Please consult the Business Ambition for 1.5°C Guidance and FAQs for additional information on the process and expectations.
- By joining the SBTi Business Ambition for 1.5°C, organizations are also joining the UNFCCC Race to Zero
- Please review this document in its entirety and fill in the table at the end.
- SMEs are welcome to join Business Ambition for 1.5 C and need to submit both the completed SME science-based target setting form and this commitment letter.

I am pleased to confirm that VEOLIA is aligning its climate mitigation targets with the most ambitious aim of the Paris Agreement and to what science dictates is necessary to reduce the destructive impacts of climate change on human society and nature: to reach net-zero global emissions by 2050 at the latest in order to limit global warming to 1.5°C.

By signing this letter and selecting one of the two options below, my organization commits to align its ambition with keeping warming to 1.5°C and reaching science-based net-zero emissions by 2050; by ticking both options, my organization is committing to the highest level of ambition in the short and long-term:

☐ Option 1 – 1.5°C science-based emissions reduction targets: My company commits to set science-based emissions reduction targets across all scopes[1], in line with 1.5°C emissions scenarios and the criteria and recommendations of the Science Based Targets initiative.

☒ Option 2 – Net-zero science-based emissions reduction targets: My company commits to a) set a long-term science-based target to reach net-zero value chain GHGs emissions by no later than 2050 and to b) set interim science-based targets[2] across all relevant scopes and in line with the criteria and recommendations of the Science Based Targets initiative.



# Carbon Footprint Introduction

*Scope 1, 2 and 3 emissions*
*Avoided and reduced emissions*
*Examples*

# CARBON NEUTRAL & NET-ZERO
## For Veolia

**Carbon Neutrality:**

Examples:

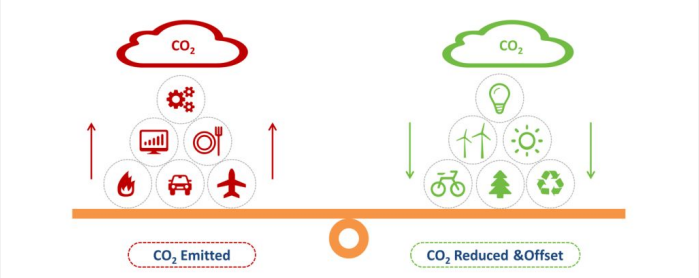
- Production of renewable energy
- Restocking of existing or creating forests
- Soil management: attempt to preserve or increase the amount of carbon sequestered in soil
- Methane capture and usage

**Net-Zero Carbon**

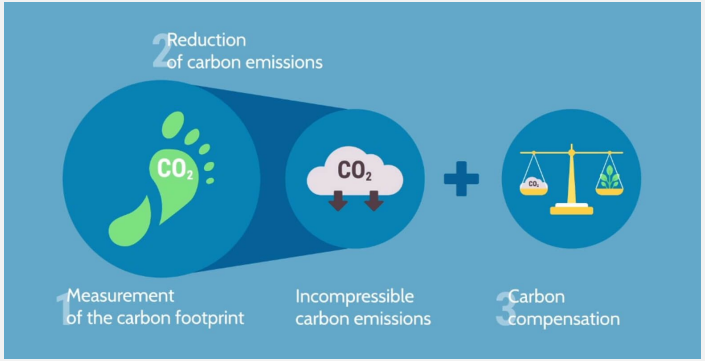
Examples:

- Usage of renewable energy instead of fossil energy
- Usage of carbon capture technology
- Energy efficiency management to reduce the energy consumption
- Choose the consumable with the lowest footprint possible (supplier footprint)

### Carbon Neutrality concept

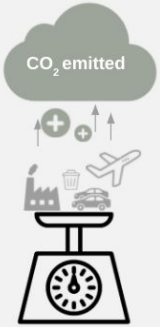


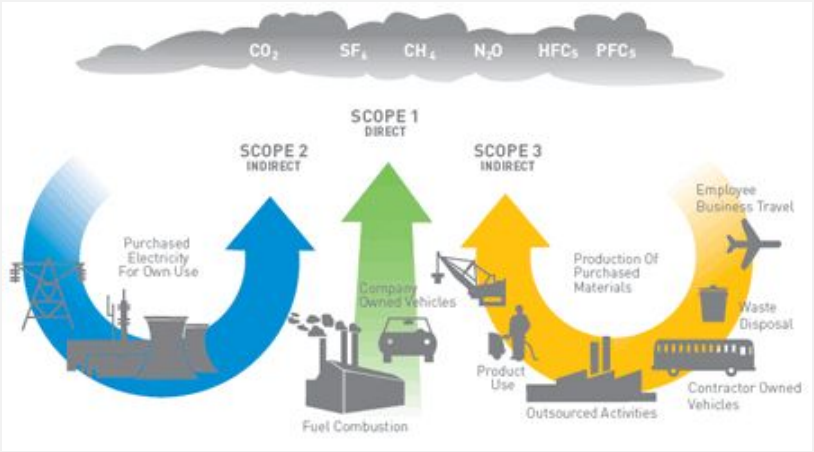

### Net-Zero Carbon concept



# EMISSIONS TYPES
## Direct & Indirect emissions

Differents potential sources of GHG emissions
Categorised into 3 types also called scopes




### Scope 1

**Direct emissions:** emissions directly coming from Veolia activities:

- Combustion of fuels for process and transport
  - Ex: combustion for boiler, incinerator, on-site vehicle operated by Veolia
- Physical and chemical processes:
  - Ex: CO2/N2O/CH4 emissions from waste incineration, wastewater treatment or uncaptured CH4 from landfill
- Fugitive emissions
  - Ex: intentional or intentional releases from valves, methane emissions from flares

### Scope 2

**Indirect emissions from energy** purchase from third parties: electricity, heat steam, cooling

- Emissions from energy production

### Scope 3

**All the other indirect emissions**

- Water and consumables production
- By-products treatment
- Upstream and downstream transport

# EMISSIONS TYPES
## Avoided & Reduced

**What is not emitted by Veolia's activities:**

- Veolia Site level impact (reduces Site's CF)
- External impact (reduces third parties CF)

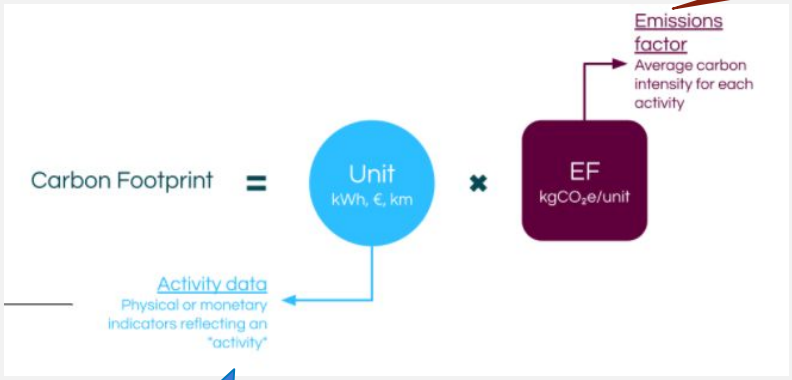

**Also called Scope 4**

**Reduced emissions:** Veolia sites do not generate
Thanks to auto-usage of renewable sources, biogas/energy recovery, energy saving **=> auto-consumption (internal carbon footprint impact)**

**Avoided emissions:** Third parties do not generate by using Veolia's service with products/energy valorisation
**=> third party consumption (external carbon footprint impact)**

# CARBON FOOTPRINT
## Calculation

**Conversion factors** used to calculate the carbon impact from a basic indicator
Can come from National/international/Veolia database (IEA, Global Report, GreenPath, Ademe, etc)




*EF used by default for in this methodology calculation:*

- ***GreenPath Global Report for scope 1 & 2*** *- using the International Energy Agency (IEA) for scope 2 (electricity & heat)*
- ***GreenPath*** *for scope 3 emissions*

=> China emissions factors 2022: **here**

**Primary indicator - Ex:**
-Fuel, electricity, water, chemicals consumption, etc
-Transport: distance - type of vehicles
-COD, TN removal rates

The use of local emissions factors must be explained, sourced and traced

When local CFP calculation exist, it must prevail

# Veolia’s decarbonization solutions

*Worldwide*

# CARBON CAPTURE UTILISATION AND STORAGE
## What has been our journey within Veolia so far ?

**Partnership Carbon Clean Solutions** with CCUS cost reduction (-30%) competitive advantage (~ **40 to 70 $/tCO2)**

- ***Joint offer with VWT to capture 410KtCO2/y*** *Oslo WtE plant (feed study lost against Shell & Technip)*

- ***Joint offer with VNA to capture & reuse 110KtCO2/y*** *on Solvay Sodium bicarbonate plant in Wyoming US*

**2017**

**2020**

**Veolia India to build with Carbon Clean a 30 KtCO2/y CCUS** plant at Veolia industrial waste site and sell the CO2 to local stakeholders.

**New technology from Carbon Clean targeting a cost of capture below 30$/tCO2** could be tested with a potential industrial roll-out beyond 2025.

**2012**

**CO2 capture lab pilot at Sedibex** in France (Industrial waste) developed by VERI & SARPI.

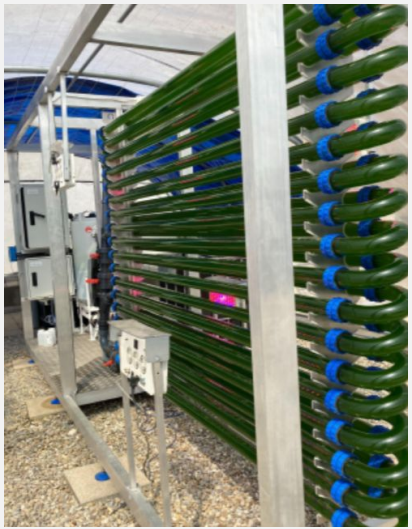
**2021**

**Innovation Committee has decided to create a "Team CCUS" at the HQ focusing on the development of CCUS projects and the support BU's in their CCUS initiatives:**
**UK, US, Taiwan?, China?**

# HYDROGEN PRODUCTION
## Wastewater treatment plant in France

The pilot allows to produce **10 kg per day of hydrogen**

The hydrogen produced will be used to fuel **two vehicles**



The biogenic CO2 produced during the reforming will be used to **produce microalgae**

# Veolia’s decarbonization solutions

*Hong Kong*

# GREEN ELECTRICITY
## T-Park

Tuen Mun,
Nim Wan

One of the World's Largest Sludge Treatment Facility

A self-sufficient facility that **treats sewage sludge from 11 wastewater treatment plants** in Hong Kong:

**Convert the thermal power produced during sludge treatment into green electricity to sustain its own operation.**

The surplus of electricity will be **channeled to the local electricity grid**.

**Sludge Treatment Facility**

Sludge treatment
Desalination
Wastewater treatment
Electricity production
Public education center

# GREEN ELECTRICITY
## O-Park

Siu Ho Wan

### Hong Kong's First Food Waste Recycling Facility

O ·PARK1 is able to **treat 73,000 tons of food waste** from restaurants and food factories annually.

The project applies biological treatment, such as **anaerobic and composting processes, to convert waste into methane gas and organic fertilizer**.

The methane produced by O · PARK1 is used as renewable energy. It is expected to **generate 14 million KWh of electricity per year**, adequate for the use by 3,000 households meaning **25,000 tons of carbon reduction** by using fossil fuel otherwise.

# ENERGY EFFICIENT DISTRICT COOLING SYSTEM
## Kai Tak

Kai Tak

**Hong Kong's First District Cooling System**

Two cooling plants, using sea water as a heat rejection medium, help the community **save up to 85,000,000 kWh** in electricity consumption per year, achieving higher energy efficiency with less space.

# ENERGY OPTIMIZATION
## via Hubgrade by Southa

**Real time data monitoring and analysis to boost energy efficiency**

Contributing to improve user comfort and preserving the resources consumed, our experts will help our clients to:

- **Collect, monitor, analyze and control energy, water and waste flows in real-time to define areas for optimization and predictive maintenance to boost performance**
- **Achieve and guarantee savings** for clients over the long term
- **Give you a direct access to consumption data**

# LANDFILL GAS TO ENERGY
## SENTX / WENT / NENT

**SENTX**, **WENT, NENT** are the three strategic landfills that serve as the major disposal solution for solid waste generated in Hong Kong.

Methane generated by landfills is collected to avoid being released into the atmosphere

Collecting, treating and converting landfill gas into electricity and clean gas

Landfill Gas
for **Electricity Production**

Using Landfill Gas
for **Ammonia Stripping**

Landfill Gas
will be delivered to
**Towngas or CLP**