煤氣 Towngas 160TH ANNIVERSARY

港華智慧能源有限公司
Towngas Smart Energy Company Limited

CLIMATE-RELATED AND NATURE-RELATED DIRECTIVE GUIDE

VISION

To be Asia's leading clean energy supplier and quality service provider, with a focus on innovation and environmental-friendliness.

MISSION

To provide our customers with a safe, reliable supply of energy and the caring, competent and efficient service they expect, while working to preserve, protect and improve our environment.

CONTENT

* *TCFD refers to Task Force on Climate-related Financial Disclosures*

* *TNFD refers to Task Force on Nature-related Financial Disclosures*

ABOUT TOWNGAS AND TOWNGAS SMART ENERGY

Founded in 1862, The Hong Kong and China Gas Company Limited (Towngas) is Hong Kong's first public utility. Today, we are one of the largest energy suppliers in Hong Kong, operating with world-class corporate management and leading-edge business practices. For the past years, Towngas has grown with Hong Kong, evolving from the simple gas company supplying fuel for street lamps to our current leading position in the energy industry of Chinese mainland and beyond.

A major reason for our success has been the reputation that we have established over the years, enabling us to win the trust of the people of Hong Kong. We supply town gas to about 1.9 million customers in Hong Kong and provide a full range of gas applications to cater to their needs. Expanding our business horizons in recent years, we have diversified our business into telecommunications, engineering and new eco-energies, among many others.

Towngas made its foray into Chinese mainland in 1994. Currently, we have more than 550 projects, including smart energy and piped city-gas projects, upstream and midstream developments, water supply and urban waste utilisation projects, natural gas refilling stations, as well as new energy exploration and utilisation ventures, across 28 provincial regions.

In 2021, the Group's subsidiary, Towngas China was renamed Towngas Smart Energy Company Limited (Towngas Smart Energy). This name change repositions us as a leading integrated clean energy supplier, with technology and innovation as our focus. Through our clean and reliable energy supply, we are supporting the objective of carbon neutrality.

MANAGING DIRECTOR'S MESSAGE

The Glasgow Climate Pact, an outcome of the United Nations Climate Change Conference last year (COP26), is a countries' agreement to a provision calling for the elimination of "inefficient" fossil fuel subsidies and the phasedown of coal. It also includes commitments to slash methane emissions and stop deforestation.

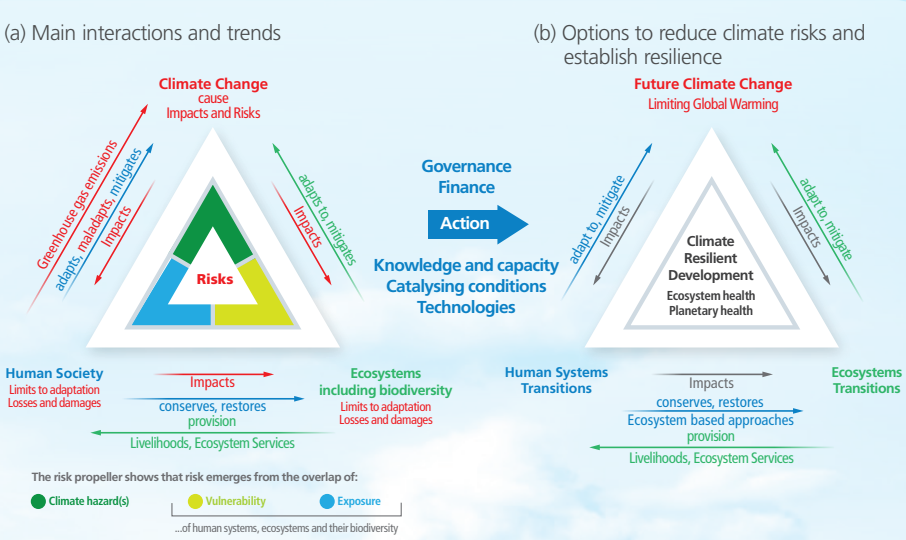
Built on The Paris Agreement, it sets out a series of resolutions to tackle climate change, including the Glasgow Leaders' Declaration on Forests and Land Use to protect natural habitats, a significant commitment pledged by 137 countries to end deforestation by 2030. It highlights the role that nature could play in helping solve the climate crisis, and it became one of the conference's key action items. Meanwhile, COP26 Nature stated there is no pathway to net zero without protecting and restoring nature. Countries are encouraged to include Nature-based Solutions (NbS) in their climate plans, as well as mobilise finance for nature from public and private sources.

In terms of how nature is impacted by climate change and vice versa, biodiversity and climate change are becoming more connected. The adoption of NbS to address climate crisis is foreseeable in the agenda of bridging climate change and biodiversity loss in the coming future.

Back at the 75th United Nations General Assembly, the Chinese government announced that China would continue to make greater contributions to mitigate the impact of climate change through low carbon transition. The country had set emission reduction targets, with the aim of peaking carbon dioxide emissions by 2030 and achieving carbon neutrality by 2060. China has further pledged to fight climate change and submitted its Nationally Determined Contributions in 2021. Besides the renowned "30-60" decarbonisation goals, China also states ambitions to increase non-fossil fuels in primary energy consumption to around 25%, to bring the total installed capacity of solar and wind power to over 1,200 GW by 2030, and to increase forest stock volume by 6 billion cubic metres from the 2005 level.

In 2022, the Intergovernmental Panel on Climate Change (IPCC) Working Group II published the latest assessment report – *Climate Change 2022: Impacts, Adaptation and Vulnerability*. The report assesses the observed and projected impacts and risks of climate hazards, and the interactions among climate systems, ecosystems (including biodiversity), and human society. It also reviews the vulnerability, limits, and exposure of affected socioeconomic and ecological systems, as well as their adaptability.

From climate risk to climate resilient development: climate, ecosystems (including biodiversity) and human society as coupled systems



(Credit: Summary for Policymakers (SPM) by The IPCC Working Group II (WGII)
https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryForPolicymakers.pdf)

In the report, the interconnection model has illustrated the interactions among climate change, human society and ecosystems (including biodiversity). These interactions are the basis of emerging risks from climate change, ecosystem degradation and biodiversity loss and, at the same time, offer opportunities for the future. It is critical for businesses to grasp the opportunities through timely action on their governance structure, and invest in knowledge, capacity and new technologies.

At The Hong Kong and China Gas Company Limited (Towngas, Stock Code: 0003.HK), not only do we address global energy security concerns, we are dedicated to accelerating the greening of our business. With the pace at which society has been moving on sustainability, this guide is a pilot step for us to respond to both climate- and nature-related risks and opportunities in an integrated document to evaluate and outline our future plans for our operations.

With reference to the IPCC's publications, Task Force for Nature-related Financial Disclosures (TNFD) v0.2 Beta, and aligns with the Task Force for Climate-related Financial Disclosures (TCFD) recommendations, this guide was prepared as an interim update on our sustainability commitments of both Towngas and its subsidiary Towngas Smart Energy Company Limited (Towngas Smart Energy, Stock Code: 1083.HK), and to aid stakeholders who are explicitly interested in understanding climate change and ecosystems in the context of the Group's business.

As we understand the strong demand from the regulatory and capital markets for climate-related disclosures, the climate chapter in this guide is prepared as recommended by the TCFD in four pillars: governance, strategy, risk management, and metrics and targets. With growing concerns on how nature loss poses both risks and opportunities for business in general, the next chapter on nature is a pilot assessment focusing on the strategy pillar using the locate, evaluate, assess, and prepare (LEAP) model assessment.

Looking forward, policy updates, disruptive innovation, and new challenges will reshape the energy sector. With our direction set, we are fully focused on delivering our strategy and the sustainability aims that underpin it.

In September 2022, we joined the Climate Governance Initiative Hong Kong Chapter. It is the local Chapter of the Climate Governance Initiative, a global initiative set up by the World Economic Forum in 2019, with over 20 Chapters in over 50 countries. Towngas Smart Energy is one of the founding members in town, demonstrating our commitment to propagating best board practices in climate governance.

Being a 160-year-old energy supplier in the region, we will continue to strive for progress in the spectrums of climate change and nature conservation in the coming decades, as well as to build and secure a livable future for our city. At the same time, we will continue to work closely with substantial stakeholders in our sustainability sphere to ensure our business grows sustainably.

Peter WY Wong

Towngas
Managing Director

Towngas Smart Energy
Executive Director and
Chief Executive Officer

11th November 2022

CORPORATE GOVERNANCE STRUCTURE

The Boards of Directors of Towngas and Towngas Smart Energy are committed to our Environmental, Social and Governance (ESG) development for a sustainable future. This commitment is reflected in our Vision and Mission, which guide our evolving ESG strategy. The Boards have the overall responsibility of overseeing material ESG issues and evaluating, determining and integrating relevant risks and opportunities into our key governance processes.

As part of overall ESG management, our ESG Committees and Board Audit and Risk Committees (BARCs) have separate but complementary roles in climate change and other environmental issues.

Board Audit and Risk Committees (BARCs)

The BARCs support the Boards in overseeing the overall risk management system and provide assurance to the Boards at least annually that the system is operating effectively. With all the members being the Independent Non-executive Directors of the respective company, the BARCs are responsible for reviewing top risks and adopted measures. Key risks, including climate change, are reviewed continuously and reassessed by adopting the risk assessment criteria set out in the Enterprise Risk Management Framework.

The Executive Risk Management Committees (ERMCs), composed of all Executive Committee Members of Towngas, are responsible for the system formulation and its effective implementation to control risk exposures within the risk appetite. They are assisted by the Group Risk Management Committees (GRMCs), which comprise risk owners who are also the key business management team. The GRMCs conduct reviews on major risk exposure, monitor the implementation of risk-mitigating controls and report to the ERMCs regularly on the progress and results of the risk management review. The risk management process is embedded into the day-to-day operation and is an ongoing process carried out by everyone in the organisation across all business units.

ESG Committees

The ESG Committees for both Towngas and Towngas Smart Energy shall assist the Boards of Directors of respective company in overseeing management in ESG matters, including but not limited to climate- and nature-related risks and opportunities, health and safety, environmental protection, operating practices, relationships with employees, customers and suppliers, and community engagement, as well as pursue innovative practices to promote sustainable growth.

The Boards appointed the Managing Director of Towngas, Chief Executive Officer of Towngas Smart Energy, who is also a member of the Boards of both companies, to be the Chairman of the ESG Committees, who reports ESG matters to both Boards on a regular basis. The Committees of Towngas and Towngas Smart Energy comprise Board members and the Head of Corporate ESG Department, and meet bi-annually to provide updates on ESG-related policies, initiatives, progress, goals, targets and achievements.

2021-2022 Discussed/Approved Topics

Corporate ESG Department

As the risk owner of climate change, the Head of Corporate ESG Department is a member of both ESG Committees and regularly reports to the ESG Committees and manages climate-related strategies at the Group level, including:

- Managing the Group's greenhouse gas (GHG) inventory
- Reviewing the progress of Towngas' Carbon Neutrality Roadmap
- Ensuring quality and timely disclosures of climate-related issues
- Implementing recommendations of the TCFD, including climate scenario analysis
- Monitoring evolving climate-related issues, such as policy change and stakeholder expectations, and developing strategies to respond

as well as nature-related matters by:

- Recognising the interrelated risk of climate change and biodiversity loss
- Exploring the TNFD's development and maintaining progressive disclosure
- Providing timely updates and reviews on nature strategies

CLIMATE CHAPTER: TCFD RESULTS AND CASE STUDY

Climate-related Risk Management

Climate change is one of the major risks for the Group and is embedded in the risk management process, with the Head of Corporate ESG Department as the risk owner.

The Group identifies and assesses climate-related risks across all business units, and implements response measures to mitigate risks. We continuously monitor climate-related risks and regularly report to the ESG Committee/ BARC to ensure such risks are managed properly, ultimately contributing to enhancing business performance.

Progress and Development of Climate-related Risk Assessment

2022

Further align disclosures with the Recommendations of TCFD by disclosing financial information to meet stakeholders' expectation

2021

Initiated another round of physical risk assessments for our critical facilities in Hong Kong and on the Chinese mainland using computer modelling

2020

Assessed our transition risks and opportunities across the Group's energy-related businesses in Hong Kong and on the Chinese mainland

2019

Conducted gap analysis to better align our climate change management against the Recommendations of the TCFD

2016

Extended the climate-related risk assessment to our project companies on the Chinese mainland

2015

Conducted a comprehensive climate-related risk assessment of the Hong Kong operations under extreme weather events

With the nature of uncertainty about future events, it is difficult to assess climate risks. The Group has developed various scenarios for transition and physical risks referencing internationally recognised models to stress test our resilience to climate change, allowing us to develop more robust strategic plans for different possible futures.

Transition Risk Scenarios

The Group developed its first set of transition risk scenarios in 2020 by referencing the International Energy Agency (IEA)'s World Energy Outlook (WEO) 2019, and by factoring in the pace of technological development and adoption, as well as the stringency of new policy implementations. Four scenarios were identified in total.

With the evolving models and scenarios, we revisited our transition risk scenarios with the most recent information from the IEA's WEO 2021 and the Network for Greening the Financial System (NGFS) scenarios. The new Net Zero Emissions by 2050 Scenario published by the IEA in May 2021 has been incorporated to ensure our analysis aligns with the latest trend by limiting the global temperature rise to 1.5°C. We also mapped the developed scenarios with the NGFS scenarios for our analysis/stress test of financial risks posed by climate changes.

Example Trends by NGFS on the Chinese Mainland (2050 vs 2020):

	Net Zero 2050	*Current Policies*
Carbon Emissions	**Peak before 2025 and decrease by 91% in 2050**	**Peak in 2030 and decrease by 12% in 2050**
Natural Gas Demand	**Decrease by 17%**	**Increase by 50%**
Carbon Intensity for Energy	**Decrease by 89%**	**Decrease by 23%**

Temperature Rise	Scenario Developed in 2020	IEA Reference	Description
4°C			
	Hothouse Earth	Current Policies Scenario (CPS)	Governments do not follow up on climate-related commitments.
	Climate is Business	Stated Policies Scenario (STEPS)	Implementation of announced climate-related policies and targets.
	Marathon to Compliance	SDS with a less optimistic assumption for technological development and adoption	Very stringent policies and regulatory measures to meet climate goals but cost of technologies is high.
	Best of Both Worlds	Sustainable Development Scenario (SDS)	The world is determined to meet the goals of the Paris Agreement.
1.5°C			

	NGFS Reference	Scenario Developed in 2022	
	Current Policies Scenario	Current Policies	
	Nationally Determined Contributions Scenario	Stated Policies	
NGFS Model of IEA'S WEO 2021	—	—	
	Below 2°C Scenario	Below 2°C	
	Net Zero 2050 Scenario	Net Zero 2050	NEW

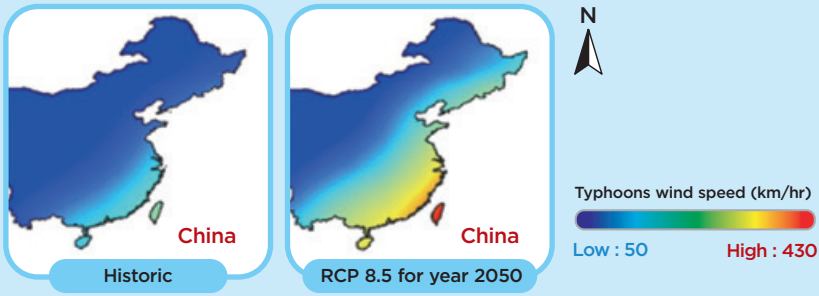
Physical Risk Scenarios

The latest Sixth Assessment Report published by the Intergovernmental Panel on Climate Change (IPCC) provided the forecast on future greenhouse gas emissions and associated climate risks based on climate scenarios such as Shared Socioeconomic Pathways (SSPs, modelling of socioeconomic factors) and Representative Concentration Pathways (RCPs, projection of climate change impacts).

In order to evaluate the impacts of physical risks present in our assets, three RCP scenarios (RCP 2.6, RCP 4.5, RCP 8.5) were used. From limiting the global average temperature of 1.5°C to align with The Paris Agreement (RCP 2.6), to a drastic increase of average temperature of 4°C (RCP 8.5), these scenarios provide insights on how climate risks may develop in the future, thus facilitating our preparation on future adaptation and mitigation measures.

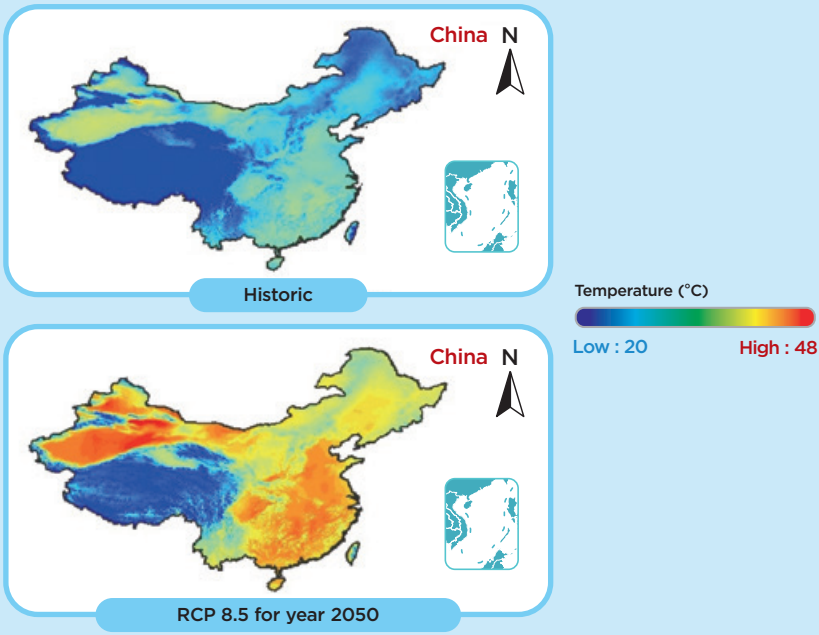
Example Trends:

Acute Typhoon: Difference between historical values and RCP 8.5 in 2050



Typhoons are moving north with stronger winds likely exceeding 450km/hr

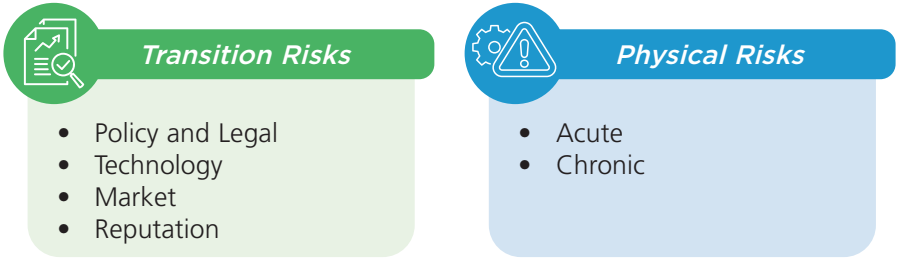
Chronic Extreme Temperature: Difference between historical values and RCP 8.5 in 2050



Temperatures are increasing, with colder areas likely warming up over 5°C

Identification, Assessment and Management of Risks and Opportunities

According to the Recommendations of the TCFD, climate-related risks are divided into two major categories: (1) risks related to the transition to a low-carbon economy and (2) risks related to the physical impacts of climate change, as illustrated below:



Through internationally recognised third-party climate models and in-depth discussions with representatives from the relevant business units, the Group has identified climate-related risks and opportunities relevant to its assets and products/ services. Various scenarios were employed to consider risks and opportunities that could be most significant to the Group, and we used stress tests to evaluate our portfolio's resilience.

Transition Risks and Opportunities

We conducted a comprehensive assessment of the transition risks and opportunities across our core energy-related businesses in Hong Kong and the Chinese mainland under various climate scenarios. By deepening our understanding of how policy changes, technological developments, reputational impacts, and shifts in market preferences could significantly impact our businesses both positively and negatively, we can develop plans to mitigate risks and build resilience strategies.

We analysed various assumptions under four scenarios and identified a long list of potential transition risks that may impact the Group. The risks were then assessed and prioritised by considering the probability of occurrence of the event and its negative or positive impacts through engagement with different business units and internal stakeholders under short, medium, and long term, as well as four climate scenarios.

Top transition risks were prioritised mainly under the Net Zero 2050 Scenario and Below 2°C Scenario for gas-related business. The Group has been diversifying its businesses to work toward on the path of energy transition.

To enhance our climate resilience, the Group will keep up with policy developments and watch for any early warning signals to ensure we are well prepared. We will also drive sustainability-related consumer education and brand messaging to communicate the Group's position in the transition to a low-carbon economy, as well as develop a strategic plan with investments in innovative green technology that helps us gradually transform into a sustainable energy company.

Risk/Opportunity	Policy and Legal
Time Horizon	Short to Medium Term (2020-2030)
Description	• Mandates on/ regulation of products and services • More difficult to secure a license to operate polluting activities
Potential Financial Impact	• Lower revenue due to lower demand for gas-related products and services • Increased cost for compliance (e.g. carbon price) • Higher cost of insurance • Higher revenue from low-carbon products and services
Management Plan/Response Measure	• Align with government policies to develop low-carbon products and services • Reduce direct GHG emissions by utilising low-carbon sources of energy and improving energy efficiency

Risk/Opportunity	Technology
Time Horizon	Medium to Long Term (2025-2050)
Description	• Extra costs incurred for the transition to lower emissions technologies • Unsuccessful investment in new technologies • The widespread adoption of new low/zero carbon technologies that disrupt the existing markets
Potential Financial Impact	• Increased capital investment in new technologies • Increased expenditure for research and development • Lower revenue due to lower demand for gas-related products and services • Lower operating costs due to higher energy efficiency
Management Plan/Response Measure	• Reduce emissions from our operations • Support research and development with self-developed patented technologies

Risk/Opportunity	Market
Time Horizon	Medium to Long Term (2025-2050)
Description	• Change in fossil fuel prices • Shifting consumer behaviour
Potential Financial Impact	• Lower revenue due to lower demand for gas-related products and services • Increased operating cost due to change in raw materials (e.g. natural gas) price • Higher revenue from low-carbon products and services
Management Plan/Response Measure	• Diversify businesses to transform into a multi-energy provider

Risk/Opportunity	Reputation
Time Horizon	Long Term (2030-2050)
Description	• Shareholders are likely to divest from fossil fuels and invest in low-carbon business
Potential Financial Impact	• Change in capital availability • Higher cost in communication activities
Management Plan/Response Measure	• Develop open and transparent communication/disclosure to increase capital availability

Physical Risks

The Group conducted physical risk assessments at asset level for 100 major assets on the Chinese mainland that are prone to extreme climate hazards, and whose businesses could be interrupted by the physical impacts of climate change, including the likelihood of critical operational and financial impacts on our assets, like city gas transmission facilities, water treatment plants and chemical plants.

The modelling consisted of risks related to the physical impacts of climate change driven by events (acute risks) and longer-term shifts in climate patterns (chronic risks). The identified climate risks were modelled under different climate stressor for scenarios up to 2050 using robust historical meteorological data sets from international and local sources. This data has allowed us to more accurately evaluate the physical climate risks of each asset in selected timeframes.

The analysis took into consideration the business nature and geographical locations of each asset. The risk level of business interruptions and/or direct damage across operations and supply chains was also assessed.

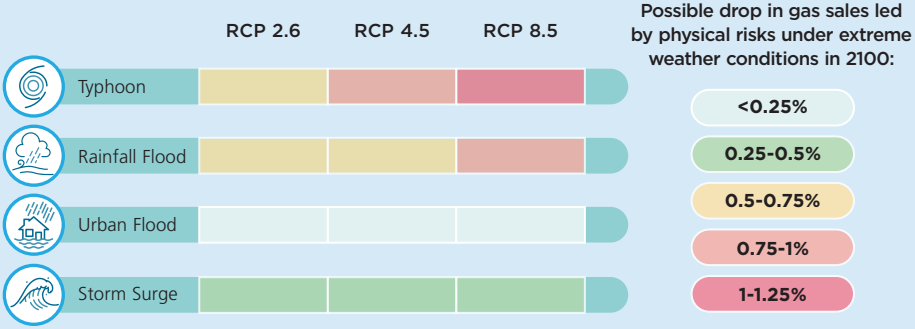
Based on the probability of hazardous events occurring and our asset exposure and vulnerability to these events, the Climate Value at Risk (which reflects the maximum amount of loss incurred over a one-year period) was evaluated. The scenario analysis identified the climate risks to which our assets are most exposed, including acute climate events such as typhoons, heavy rainfall and river flooding, and chronic events such as extreme heat.

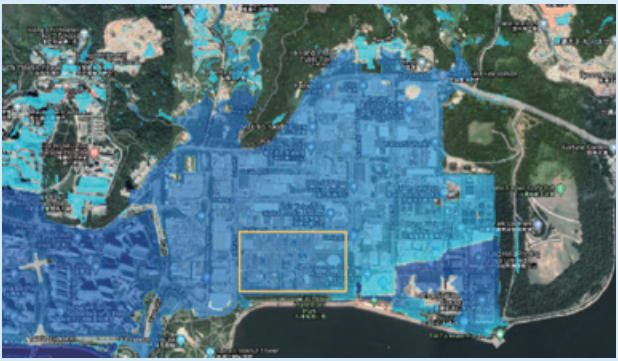
CASE STUDY

Case Study: Tai Po Gas Production Plant Physical Risk Assessment

The Tai Po Gas Production Plant is our most critical asset in Hong Kong. Therefore, we conducted a deep asset scenario analysis, taking into account the relative locations, as well as the physical setting of the equipment and facilities, such as naphtha tanks, production plants and switch rooms. All of these were thoroughly modelled for three RCPs up to 2100.

The analysis showed an overall low-to-moderate risk of flooding and typhoons for the Tai Po Gas Production Plant, while the remaining risks assessed were minimal. This can be attributed to the robust adaptive capacity and mitigation measures that have already been integrated into our Tai Po Gas Production Plant over the years.





Rainfall flood may occur only when all the drainage system fails to take surface runoff from the ground (RCP 8.5 in 2100)

A heatmap was also developed to indicate the risk level of each of our assets. In 2022, we visited sites that are considered climate sensitive from the assessment. Five water plants and one organic waste resource plant were identified as the total potential asset value loss among these assets, which could have a significant effect on the Group. Therefore, it is necessary to ensure vulnerable assets are well prepared for and protected from climate hazards.

We observed that effective systems to prevent different climate stressors are in place. For example, flood prevention equipment is installed, including emergency water pumps and flood barriers in critical locations. Sandbags are readily available to reduce the extent of flooding should the Yangtze River overflow. These measures provide a high level of resilience and protect the stable operation of the facility. We also hold ESG and climate change training for management-level employees on site to show them the climate impact projections of the respective asset they work in, as well as equip them with a better knowledge to tackle climate hazards in the future.

Looking ahead, we will continue to closely monitor our climate resilience strategy, and conduct regular checks and inspections for our assets in both Hong Kong and the Chinese mainland, referencing the risk assessment results. For any updates on future climate risk predictions by local and international agencies, we would improve our mitigation and adaptation measures accordingly to ensure our climate resilience.

Risk	Acute
Time Horizon	Medium term (From 2030)
Description	• Heavy rainfall • Increased frequency and intensity of river floods • Stronger typhoons and more frequent super typhoons
Potential Financial Impact	• Increased cost/lowered revenue due to damage to assets • Increased cost to upgrade resilience measures • Health and safety hazards for staff • Increased cost for insurance premiums and claims
Management Plan/Response Measure	• Review adaptation plan to climate change in infrastructures • Strengthen crisis management plans

Risk	Chronic
Time Horizon	Long term (From 2050)
Description	• Extreme heat and increased temperature
Potential Financial Impact	• Lower revenue due to lower demand for gas-related products and services • Increased operating costs from energy consumption • Health and safety hazards for staff
Management Plan/Response Measure	• Diversify businesses to transform into a multi-energy provider

Financial Impacts of Climate-related Risks

For the quantification of climate change risks, the developed transition and physical scenarios were considered to estimate the impacts on the Group.

The table below illustrates the financial impacts of potential risks under scenarios with the most significant negative effect on the Group's gas-related business in 2050. Such stress testing allows us to assess our resilience against scenarios developed by independent, recognised international organisations.

With the uncertainties in the future, as well as assumptions made and limitations of climate models, indicative estimates of the potential financial impacts are provided.

Risk			Scenario	Type of Impact	Financial Impact (HK$ million)		
					<500	500-1,500	>1,500
1.5°C scenario	Transition	Policy and Legal	Net Zero 2050	EBITDA*			•
		Market		EBITDA*			•
		Technology		Expenditure	•		
		Reputation		Expenditure	•		
4°C scenario	Physical	Acute	RCP 8.5	Expenditure		•	
		Chronic		EBITDA*	•		

* *For gas, water and related businesses in Hong Kong and the Chinese mainland*

The Group has been diversifying its business to propel our transition into a clean energy company and contribute to a low-carbon future. For our business on the Chinese mainland in 2021, the revenue from low carbon business over gas business was approximately 10%, which we expect to grow continuously in the future. The effects of risks would be offset by the opportunities the company has identified in the field of low-carbon business development.

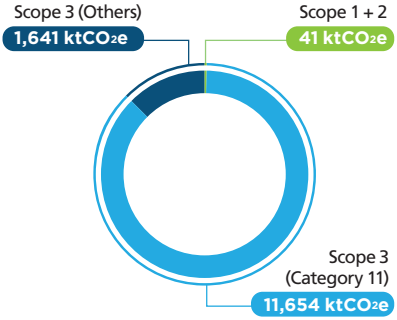
Decarbonisation Strategy

Greenhouse Gas Emissions Reduction Strategy

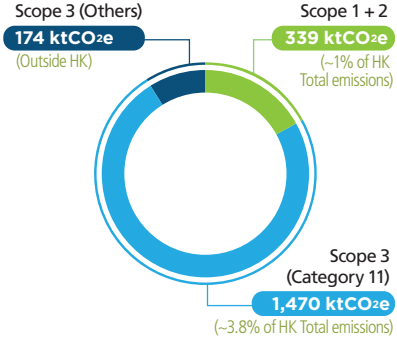
One of the major ways to combat climate change is to reduce greenhouse gas emissions. In 2021, the Group's total carbon emissions (Scope 1 and 2) were 1,503,000 tCO_2e.

For Scope 3, we calculated the emissions for gas production in Hong Kong and gas distribution business on the Chinese mainland, as illustrated in the charts below:

2021 GHG Emissions of Gas Distribution Business (Chinese Mainland)

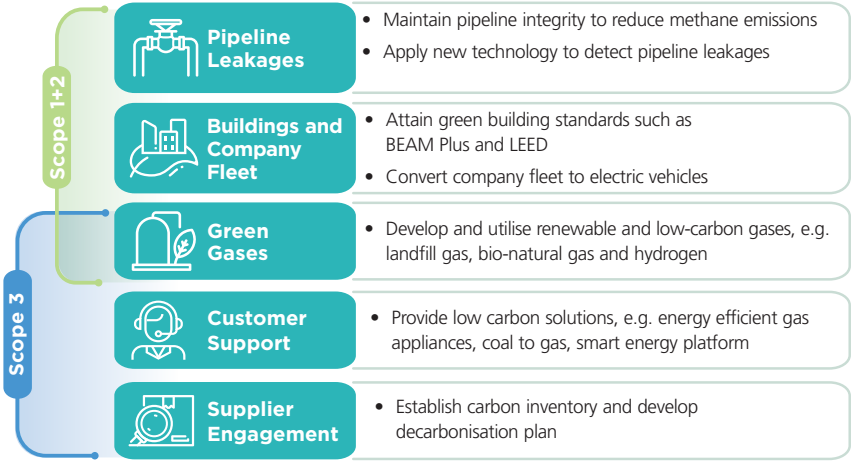


2021 Hong Kong Gas Production GHG Emissions



We will continuously explore the practicality of extending our Scope 3 emissions calculation to cover other businesses within the Group to have a more comprehensive view of our emissions along the value chain.

Emissions Reduction Plan



Metrics

The table below provides key metrics related to the decarbonisation strategy:

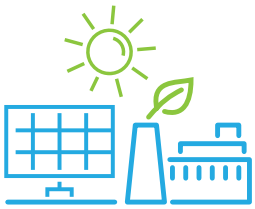
Category	Metric	Unit	2021
GHG Emissions	Scope 1	tCO_2e	893,000
	Scope 2		610,000
	Scope 3 (HK)		1,644,000
	Scope 3 (MU Gas)		13,295,000
Risk Adaptation & Mitigation	GHG reduction – Food waste processing project	tCO_2e	16,900
	GHG reduction – HVO project	tCO_2e	596,000
	Landfill gas utilisation	GJ	135,146
	Renewable energy generated by photovoltaic systems in Hong Kong	kWh	306,589
	Revenue from low-carbon business per gas business*	%	10
	Investment of low-carbon business per gas business*	%	11
Capital Financing	Green Finance^	Billion HK$	4.3

* *Scope: the Group's business on the Chinese mainland*

^ *Cumulative amount issued by Towngas and Towngas Smart Energy since 2017*

Financing Decarbonisation

Investment in Low-carbon Businesses



In 2021 in the Chinese mainland business,

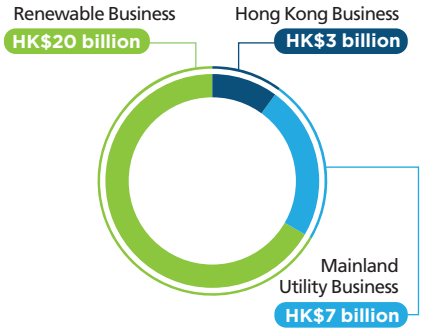
Invested in
low carbon business over gas business about **11%**

Acquired
Food resource waste utilisation project in Tongling City with a purchase consideration of **over HK$ 130 million**

The Group invested **over HK$2 billion** in four waste-to-energy projects:

- Landfill Gas Utilisation in Tseung Kwan O, Hong Kong
- Foodwaste Processing in Suzhou city, Jiangsu province
- Hydro-treated Vegetable Oil in Zhangjiagang city, Jiangsu province
- Agricultural Waste to Green Chemicals and Paper Pulp in Tangshan city, Hebei province

Capital Investment* in 2023-2025



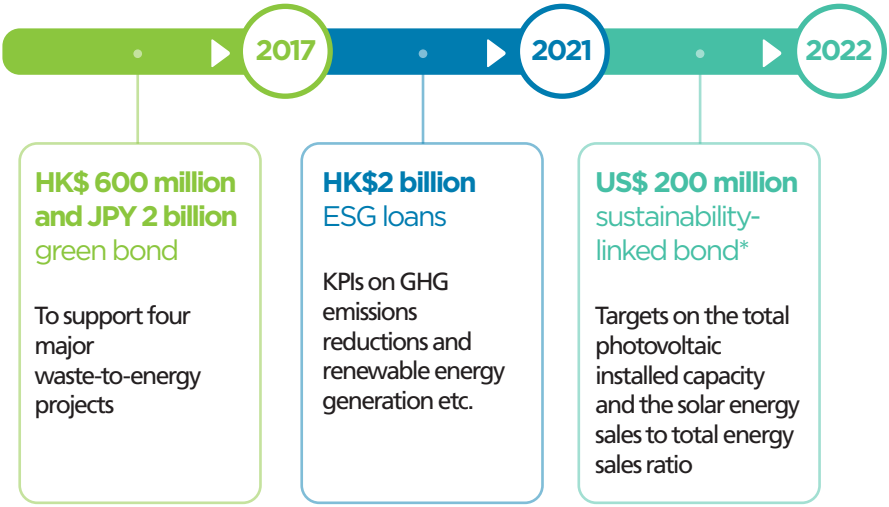
* *Including Towngas and Towngas Smart Energy*

Green Finance

The total amount of green finance as at 30 June 2022 for the Group was over HK$4 billion.

The Group keeps abreast of the latest development of green financial instruments to fund the Group's innovative environmental technology projects, and we are the first energy company in Hong Kong to issue green bond in 2017.

In 2017, the Group established its first Green Bond Framework, which was prepared in accordance with the International Capital Market Association's Green Bond Principles (GBP) 2017. This has been reviewed in an independent Second-Party Opinion Report by Sustainalytics, a global ESG and corporate governance research and rating provider. In 2022, Towngas Smart Energy developed a Sustainability-Linked Financing Framework which aligns with the Sustainability-Linked Bond Principles and the Sustainability-Linked Loan Principles, and obtained a Second Party Opinion from DNV.



* *Issued by Towngas Smart Energy*

NATURE CHAPTER: TNFD INITIAL ASSESSMENT

Nature-related Risk Management

Given that climate change and biodiversity loss are inextricably linked, the Group is proud to be starting the journey to align with the TNFD. To enhance the transparency on nature, we are excited to present the initial findings from our pilot LEAP nature risk assessment in alignment with the TNFD beta v0.2.

The TNFD was established in 2021 in response to the growing appreciation of the need to factor nature into financial and business decisions. Similar to the four-pillar structure of the TCFD, the TNFD provides a risk management and disclosure framework for organisations to report and act on evolving nature-related risks and opportunities. It also focuses on effectively understanding nature-related dependencies and impacts.

The TNFD working groups include Global Canopy, UNDP, UNEP FI, and WWF, amongst other technical experts, and the TNFD has been endorsed by the G7 Finance Ministers and G20 Sustainable Finance Roadmap.

The TNFD beta v0.2 framework was released in June 2022, with further beta iterations planned before the release of v1.0 in September 2023.

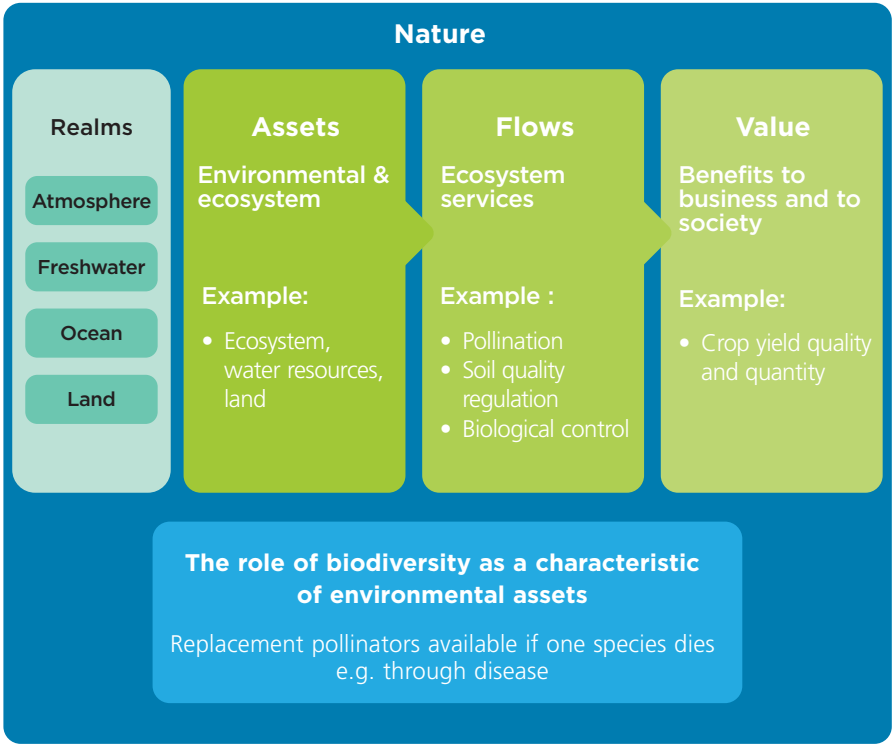
We recognise that this assessment is the first of many steps in our journey to better nature-related reporting, with significant progress yet to be made.

Natural Capital

The TNFD defines nature as the natural world, with an emphasis on the diversity of living organisms (biodiversity) and their interactions among themselves and with their environment. We can understand nature via four realms of land, ocean, freshwater, and atmosphere, which provide an entry point for understanding how we depend on and impact natural capital.

As in the financial world, where assets exist that give rise to flows of revenue, natural capital consists of stocks of environmental assets that give rise to associated flows of benefits to people and the economy.

TNFD's building blocks for understanding nature



Locations, Dependencies and Impacts

The TNFD framework emphasises the importance of location, specifically the interface of business processes with stocks (environmental assets) and flows (ecosystem services) as key to understanding nature-related dependencies and impacts.

Therefore, a location-based assessment forms the basis for nature-related risk identification, mitigation, avoidance and management, and is essential for determining the financial implications of such risks to cash flows, revenues, and enterprise value.

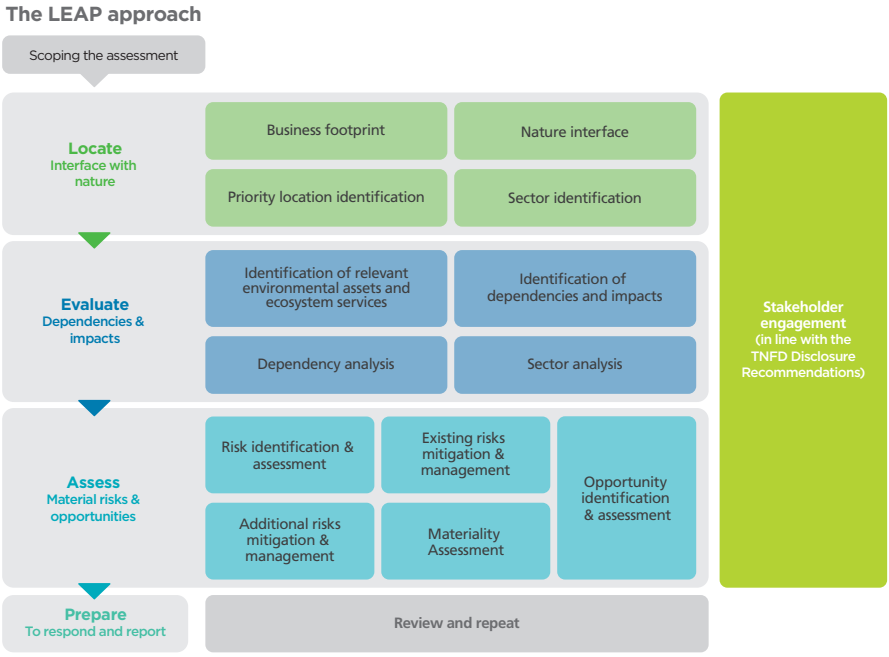
In the initial stages of assessment, the specific natural context (i.e. the biome and located ecosystem) of particular operating locations is essential to acknowledge their actual, rather than potential, nature-related risks and opportunities. The nature of an organisation's business, such as products and services, will define its relationship with nature.

The LEAP Nature Risk Assessment

TNFD provides a prototype integrated assessment process for nature-related risk and opportunity management called LEAP, based on the following four high-level steps:

- **L**ocate your interface with nature
- **E**valuate your dependencies and impacts
- **A**ssess your risks and opportunities; and
- **P**repare to respond to nature-related risks and opportunities and report

This phase of our assessment focuses on the Locate, Evaluate, and part of the Assess steps of the LEAP framework, detailed in figure below, aiming for a high-level initial screening across the Group's business.



Further work under the Assess and Prepare steps will be completed in due course following discussion amongst key stakeholders on the findings of this initial assessment and the release of the TNFD v1.0.

Assessment Scope

For this pilot, we started with a limited scope, consistent with the TNFD guidance. The Group chose to focus on a "100+" scope of analysis which uses the 100 prioritised locations[1] across the Group's businesses identified for our TCFD reporting, alongside an additional 17 projects included based on the potential impact of their business activities on nature.

Breakdown of the 117 in-scope facilities included by project categories:

Project category	No. of projects
Piped City-Gas Projects	77
Midstream and Upstream Projects	4
Water and Waste Treatment Projects	19
Biomass Projects	4
Zero-carbon Industrial Parks	12
Logistics Projects	1
Total	**117**

[1] *The Group maintains both linear (pipeline) and hub (facility) infrastructure. For the purposes of locating the Group's interface with nature, projects have been mapped using point coordinates with appropriate buffers applied. We recognise the impact of linear infrastructure on nature, for example due to habitat fragmentation. Further analysis of the pipeline network will be conducted in a later phase of this project.*

Locate

Ecoregions

The Group sites are located in 5 different biomes and 14 different ecoregions across the Chinese mainland and Hong Kong[2]. The majority (92 out of 117) of sites are within a temperate broadleaf & mixed forests biome, including 43 sites in Changjiang Plain evergreen forests, and 24 sites in Huang He Plain mixed forests.

The Changjiang Plain evergreen forests ecoregion is home to the critically endangered Yangtze alligators, Chinese paddlefish and Yangtze sturgeons, and Siberian cranes (80% of the population of this species spends winter in the plain). The Huang He Plain mixed forests ecoregion has a small, fragmented population of North China leopards, and provides an area for stopovers for migratory birds and nesting for seabirds.

A further 18 sites are in a tropical & subtropical moist broadleaf forest biome, with remaining sites within flooded grasslands & savannas (3 sites), montane grasslands and savannas (2 sites), and temperate grasslands, savannas, and shrublands (2 sites).

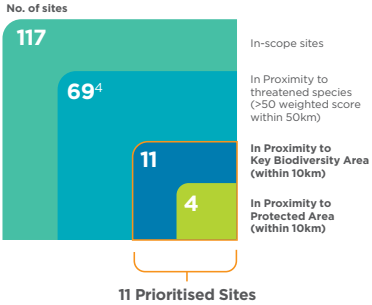
Significant biodiversity areas

The 117 in-scope sites have been mapped against three key criteria to screen for high biodiversity value locations of operations. A multi-site report was produced using the Integrated Biodiversity Assessment Tool (IBAT)[3], which highlights the overlap of sites' direct and indirect influence (point coordinates with a radius buffer applied) with biodiversity indicators, including (1) Protected Areas (PAs), (2) Key Biodiversity Areas (KBAs), and (3) counts of threatened species. In addition, the IBAT outcome is relevant for Global Reporting Initiative (GRI) standard GRI 304: Biodiversity.

[2] *Resolve Ecoregions 2017*

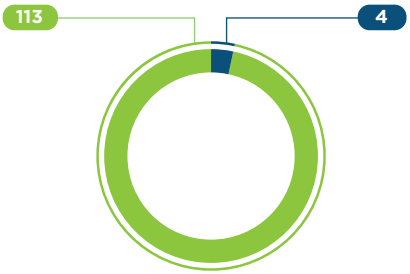
[3] *The IBAT Alliance brings together BirdLife International, Conservation International, IUCN, and the UNEP WCMC. The IBAT tool is referenced in TNFD guidance on tools to use in the Locate phase.*

In total, there are 69[4] identified higher biodiversity value locations. 11 of these sites are located within 10km of a KBA, of which 4 are also within 10km of a PA. The 11 sites in proximity to a KBA are priority sites from a biodiversity perspective.



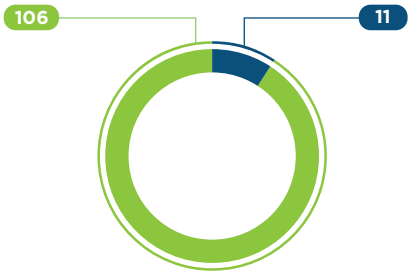
Significant biodiversity areas	Analysis against screening criterion	Higher biodiversity value screen	No. of higher biodiversity value locations	Data source[5]
Proximity to Protected Area (PA)	Do the operating site and its area of influence overlap with an area identified as a **Protected Area**?	The area of direct and indirect influence (10km buffer) overlaps with a Protected Area	4	Protected Areas sourced from IBAT
Proximity to Key Biodiversity Area (KBA)	Do the operating site and its area of influence overlap with an area identified as a **KBA**?	The area of direct and indirect influence (10km buffer) overlaps with a KBA	11	Key Biodiversity Areas sourced from IBAT
Proximity to Threatened Species (TS)	What is the weighted number[6] of **threatened species** overlapped by the area of influence?	Weighted score over 50 (50km buffer)	69[4]	IUCN Red List sourced from IBAT

Summary of PAs overlap



- 4 (3.42% of sites) are within 10km of a Protected Area.
- 113 (96.58% of sites) are not within 10km of a Protected Area.

Summary of KBAs overlap



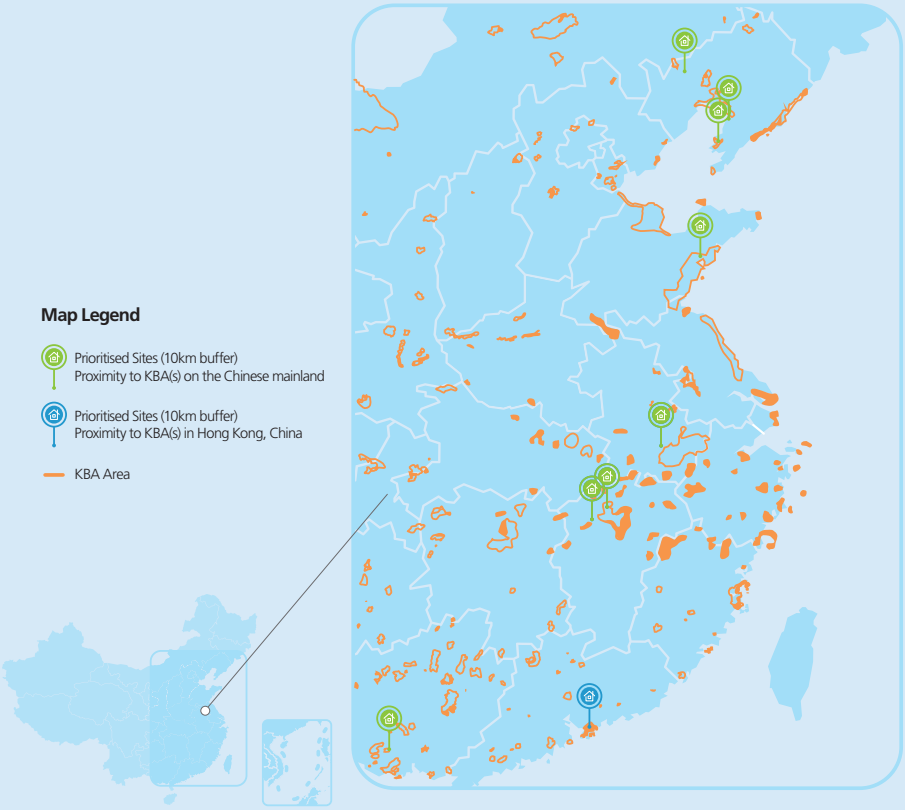
- 11 (9.40% of sites) are within 10km of a Key Biodiversity Area.
- 106 (90.60% of sites) are not within 10km of a Key Biodiversity Area.

4 *One of our sites is in close proximity (10km) to a KBA, with a weighted TS count of 36 (less than 50) in 50km radius. Therefore, it does not fall into TS criteria (within 50km) but remains in a higher biodiversity value location group.*

5 *IBAT Multi-site Report. Generated under licence 30954-34574 from the Integrated Biodiversity Assessment Tool on 26 September 2022 (GMT).*

6 *Defined as a weighted score of over 50 where each Critically Endangered (CR) species is weighted 3, Endangered (EN) weighted 2, Vulnerable (VU) weighted 1.*

Map of the outcome of the location-based biodiversity risk screening[7], showing priority sites with a 10km buffer overlap with KBAs.



[7] *IBAT Multi-site Report generated under licence 30954-34574 from the Integrated Biodiversity Assessment Tool on 26 September 2022 (GMT).*

Priority sites of higher biodiversity value based on overlap with KBAs:

	Key Biodiversity Areas	Number of site(s) overlapped
Chinese mainland	• Anhui Chinese Alligator National Nature Reserve	1
	• Laotieshan	1
	• Longtan Reservoir	1
	• Poyang Hu wetlands	2
	• Qingdao-Rizhao coastal wetlands and islands	1
	• Shangsi-Biannian	1
	• Wafangdian Fuzhou Wan	1
Hong Kong, China	• Hong Kong Island and associated islands	2
	• Inland New Territories	3
	• Inner Deep Bay and Shenzhen River catchment area	1
	• Tai Po Kau, Shing Mun and Tai Mo Shan	2

Evaluate

Business activities for the 117 in-scope locations have been initially assessed using the Exploring Natural Capital Opportunities, Risks and Exposure[8] (ENCORE) tool to identify key business impacts and dependencies on nature.

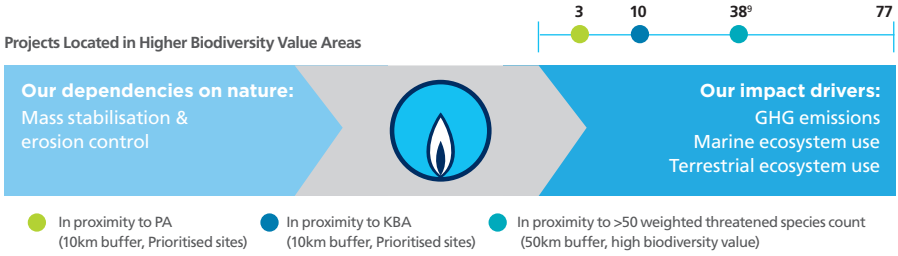
The most significant impact drivers for the Group's activities are GHG emissions, terrestrial ecosystem use, and water use, whilst key dependencies are water and mass stabilisation & erosion control.

Of the 11 priority sites as identified in the Locate phase, 10 are Piped City-gas Projects, with 1 Midstream and Upstream Project (Tai Po gas production plant), with higher biodiversity value sites due to proximity to threatened species across multiple project categories.

The impacts of business activities for locations identified as priority sites and with higher biodiversity value are assumed to be more critical, and therefore these projects will be prioritised in our future risk management efforts. Further details are provided in the proceeding sections for each key business activity.

[8] *The ENCORE tool was developed by the Natural Capital Finance Alliance in partnership with UNEP-WCMC.*

Piped City-gas Projects



Note: Focus on 'Potentially High' or 'Very High' materiality dependencies and impact drivers

Dependencies and impact drivers

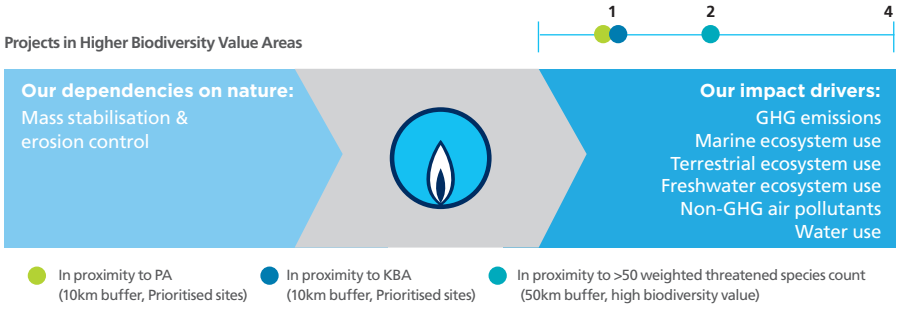
Mass stabilisation & erosion control	Degradation of ecosystem assets, including habitats, land geomorphology, soils and sediments, can result in damages from landslides and erosion
GHG emissions	GHG emissions, particularly methane, from pipeline leakage lead to atmospheric pollution
Marine ecosystem use **Terrestrial ecosystem use**	Pipelines used to distribute gas have a significant spatial footprint, which can lead to habitat degradation and fragmentation throughout the pipelines' life cycle

10 of 11 priority sites are piped city-gas projects. Further, 38[9] sites are of higher biodiversity value due to proximity to threatened species. The site locations are primarily gas storage facilities and/or stations, the control centres and the head office in Hong Kong.

The gas pipeline network is significant in terms of impact drivers for emissions and terrestrial ecosystem use. Throughout Hong Kong, Towngas has a 3,700-km pipeline network which may pass through or nearby areas of high biodiversity value.

[9] *One of our sites is in close proximity (10km) to a KBA, with a weighted TS count of 36 (less than 50) in 50km radius. Therefore, it does not fall into TS criteria (within 50km) but remains in a higher biodiversity value location group.*

Midstream and Upstream Projects



Note: Focus on 'Potentially High' or 'Very High' materiality dependencies and impact drivers

Dependencies and impact drivers

Mass stabilisation & erosion control	Degradation of ecosystem assets, including habitats, land geomorphology, soils and sediments, can result in damages from landslides and erosion
GHG emissions	Upstream processes emit a significant amount of GHG exacerbating climate change
Marine ecosystem use **Terrestrial ecosystem use** **Freshwater ecosystem use**	Pipelines made for gas transportation led to habitat fragmentation in freshwater, marine, and terrestrial ecosystems
Non-GHG air pollutants	Chemical emissions of sulphur and nitrogen oxides can return to the environment as acid rain, negatively impacting natural resources. Other toxic pollutants may also cause harm to nearby ecosystems
Water use	Upstream processing can use large amounts of water from the localised area water

Towngas' Hong Kong Tai Po gas production plant is situated in proximity to PAs and three KBAs – (1) Inland New Territories, (2) Inner Deep Bay and Shenzhen River catchment areas[10], and (3) Tai Po Kau, Shing Mun, and Tai Mo Shan areas. The location renders the operation of the Tai Po gas production plant very high risk with respect to potential impacts on the local natural environment.

[10] *The Mai Po Marshes falls into the Inner Deep Bay and Shenzhen River catchment areas KBA, yet outside the Tai Po gas production plant's 10km radius.*

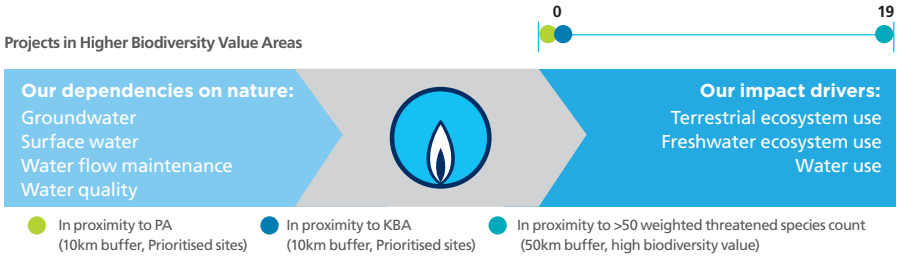
In addition, the underground salt cavern gas storage facility in Jintan, Jiangsu Province is located in an area of higher biodiversity value due to proximity to threatened species. This site is situated near the Yangtze Basin, a WWF priority ecoregion, which supports a diverse range of species, including the giant panda, snow leopard, and the Yangtze finless porpoise. Habitat loss and industrialisation are key threats to species in the region, with interruptions to the natural water flow resulting in ecosystem degradation.

Giant Panda

Snow Leopard

Yangtze Finless Porpoise

Water and Waste Treatment Projects



Note: Focus on 'Potentially High' or 'Very High' materiality dependencies and impact drivers

Dependencies and impact drivers

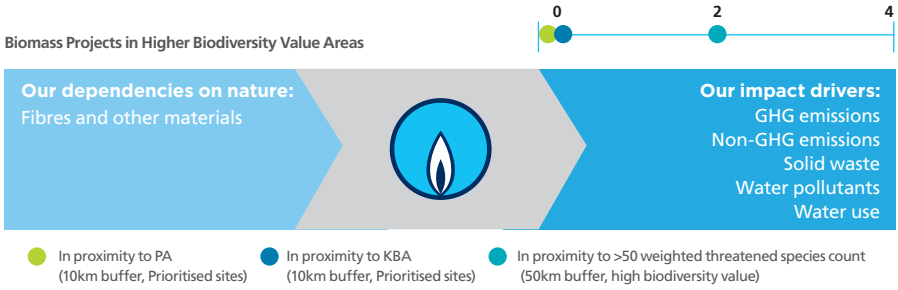
Groundwater **Surface water** **Water flow maintenance** **Water quality**	Critical for water and waste treatment projects since the disruption of such supply would prevent operations
Terrestrial ecosystem use **Freshwater ecosystem use**	Water abstraction for distribution can negatively impact sensitive habitats and ecosystems if abstraction levels exceed a sustainable threshold. Water withdrawal mechanisms used to collect water for distribution purposes can harm or kill aquatic species. Water abstraction for the distribution of water can also lead to land subsidence, which can impact freshwater ecosystems
Water use	Water utilities contribute to water abstraction, removing directly from freshwater sources (e.g. groundwater aquifers and surface water bodies). This can have associated impacts on sensitive habitats and ecosystems if abstraction levels exceed a sustainable threshold

All water and waste treatment projects are located in areas of higher biodiversity value due to proximity to threatened species.

Given the significant impact and dependency on water sources for the water projects, sites have been mapped using the WRI Aqueduct Risk Atlas to determine the location-specific level of water risk[11]. Out of the 14 water projects, eight locations have a high level of baseline water stress. However, the baseline water depletion risk level is low-medium for all sites.

[11] *Baseline water stress measures the ratio of total water withdrawals to available renewable surface and groundwater supplies. Baseline water depletion measures the ratio of total water consumption to available renewable water supplies. Groundwater table depletion measures the average decline of the groundwater table.*

Biomass Projects



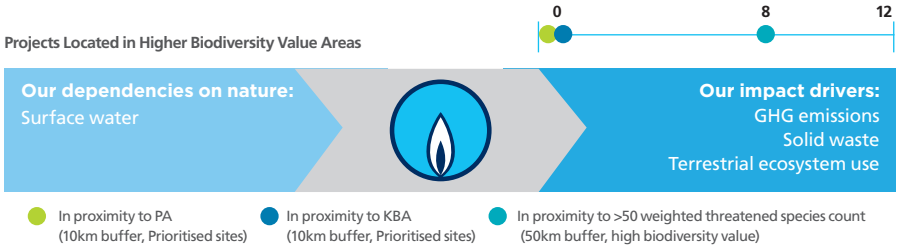
Note: Focus on 'Potentially High' or 'Very High' materiality dependencies and impact drivers

Dependencies and impact drivers

Fibres and other materials	Irreplaceable for the production processes in biomass projects. If such dependency is disrupted, the operation of biomass projects would be severely impacted as biomass projects rely on the conversion of fibres and other materials into sources of energy
GHG emissions **Non-GHG emissions** **Solid waste** **Water pollutants**	Biomass energy production through direct combustion (burning) results in emissions of greenhouse gases, toxic air pollutants, solid waste production, and water pollution of suspended soils and metals
Water use	A large amount of water is needed to convert energy from biomass

Two sites (in Zhangjiagang and Hebei province) are higher biodiversity value due to proximity to threatened species. Two sites in Hebei also have a high or extremely high level of baseline water stress, with one of these sites having a medium-high level of baseline water depletion.

Zero-carbon Industrial Parks



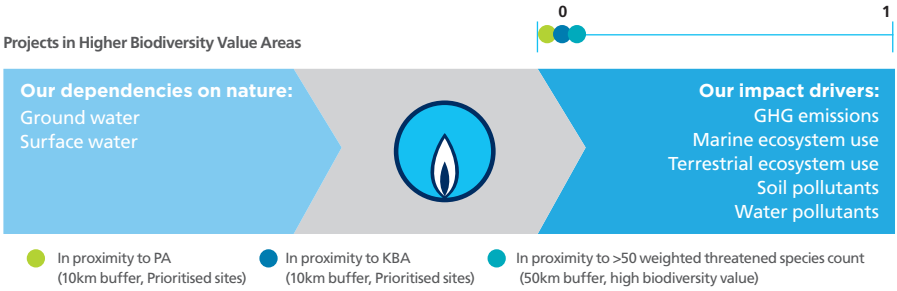
Note: Focus on 'Potentially High' or 'Very High' materiality dependencies and impact drivers

Dependencies and impact drivers

Surface water	Water is a critical resource for the operation of industrial parks
GHG emissions **Solid waste**	Whilst GHG emissions and solid waste are impact drivers associated with diversified real estate services, the Group's zero-carbon industrial parks aim to minimise their footprint through initiatives such as the installation of on-site solar energy systems and waste reduction programs
Terrestrial ecosystem use	Property construction can result in the clearing and degradation of habitats, leading to the loss of biodiversity and natural capital on the construction sites and surrounding areas The use of heavy vehicles and machinery can cause soil compaction, which can impede root growth Construction may lead to flooding as hard surfaces, e.g. concrete pavement, reduces the land's capacity to absorb rainwater

Eight sites have a higher biodiversity value due to proximity to threatened species, with three of these having a weighted threatened species count of >250, and three with a count of >100. The highest risk sites are in Guangzhou and Fujian provinces. Four of the 12 sites have a high or extremely high level of baseline water stress, with one site in Shandong province experiencing high baseline water depletion.

Logistics Projects



Note: Focus on 'Potentially High' or 'Very High' materiality dependencies and impact drivers

Dependencies and impact drivers

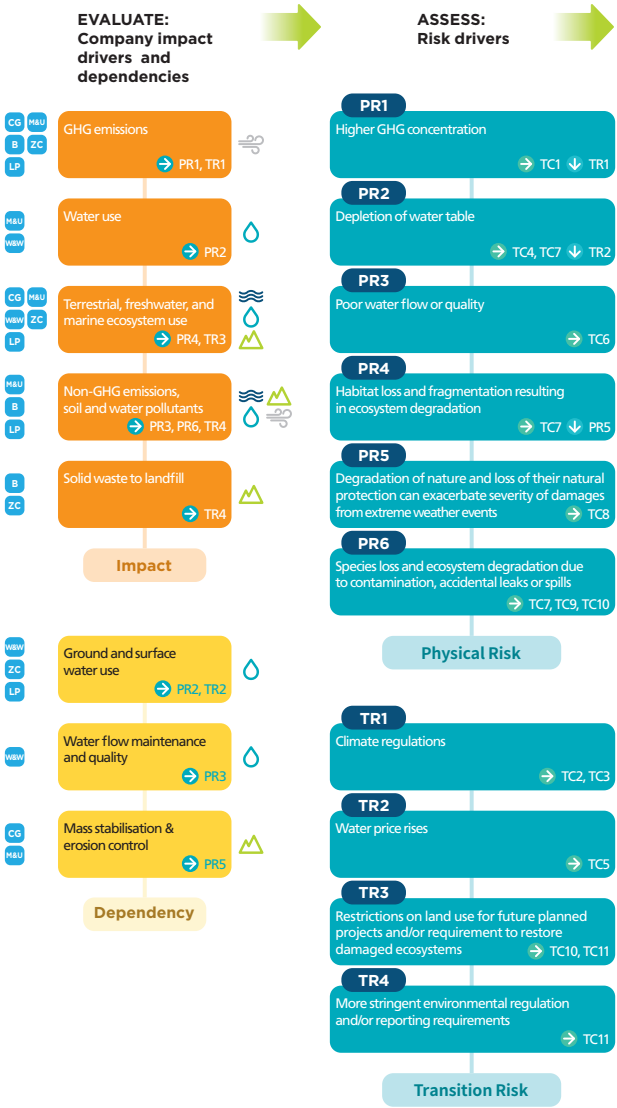
Ground water **Surface water**	Water is a critical resource for the operation of ports
GHG emissions	GHG emissions can occur from various activities that are associated with shipping, from loading and unloading to ship activities
Marine ecosystem use	Ports require regular dredging to remain operational and are constructed along rivers or coastlines, which impact freshwater or marine ecosystems
Terrestrial ecosystem use	Some substances transported and stored may create risks of fire
Soil pollutants	Changes to soil chemistry can occur from the mixing of soils due to excavation and storage during maintenance processes Additional pollution of soils and water may result from waste and litter, as well as from dredging processes required to maintain ports
Water pollutants	Water pollution, such as oil and chemical leakage from ships and products, can occur in ports and their vicinities

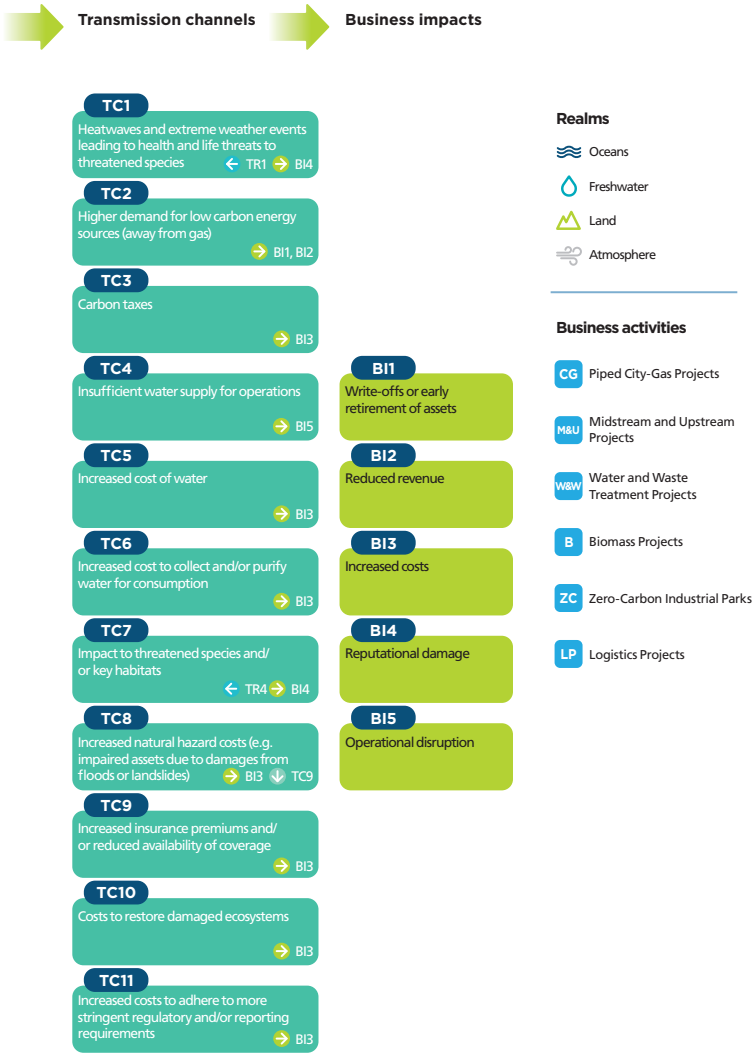
The Group operates an 800,000 square metres logistics port in Shandong province. The site does not reach the high biodiversity value threshold set. The site is located in an area with extremely high baseline water stress and a high level of baseline water depletion.

Assess

Based on our dependencies and impact drivers identified across our business activities, we have subsequently assessed our risk drivers, transmission channels, and business impacts as presented below.

The Group's nature-related risk pathways




Transmission channels
Business impacts
TC1
Heatwaves and extreme weather events leading to health and life threats to threatened species
TR1
BI4
TC2
Higher demand for low carbon energy sources (away from gas)
BI1, BI2
TC3
Carbon taxes
BI3
TC4
Insufficient water supply for operations
BI5
TC5
Increased cost of water
BI3
TC6
Increased cost to collect and/or purify water for consumption
BI3
TC7
Impact to threatened species and/ or key habitats
TR4
BI4
TC8
Increased natural hazard costs (e.g. impaired assets due to damages from floods or landslides)
BI3
TC9
TC9
Increased insurance premiums and/ or reduced availability of coverage
BI3
TC10
Costs to restore damaged ecosystems
BI3
TC11
Increased costs to adhere to more stringent regulatory and/or reporting requirements
BI3
BI1
Write-offs or early retirement of assets
BI2
Reduced revenue
BI3
Increased costs
BI4
Reputational damage
BI5
Operational disruption
Realms
Oceans
Freshwater
Land
Atmosphere
Business activities
CG
Piped City-Gas Projects
M&U
Midstream and Upstream Projects
W&W
Water and Waste Treatment Projects
B
Biomass Projects
ZC
Zero-Carbon Industrial Parks
LP
Logistics Projects

BUSINESS OUTLOOK

The Role of Gas

Natural gas is considered a critical component in the transition from fossil fuels to renewables. Under all transition scenarios, natural gas demand will increase in short to medium term.

The Group has been expanding its gas supply network in Hong Kong and the Chinese mainland. We also work closely with commercial and industrial customers, such as hotels, hospitals and commercial laundries, to switch from coal/diesel to gas. We are also promoting the use of gas-powered desiccant dehumidifiers to improve indoor air quality and reduce energy consumption, thereby lowering carbon emissions.

Hong Kong in 2021

Town gas

>3,700 km network length

1.96 million customers

27,677 million MJ sales

Chinese Mainland in 2021

City-gas

28 provincial regions

35 million customers

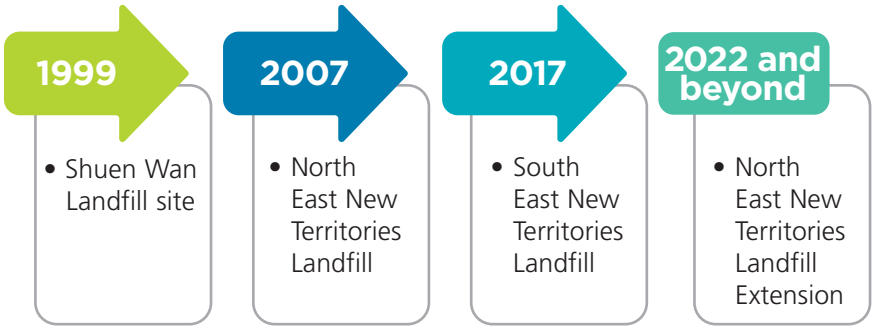
31.1 billion m^3 sales

Under the Net Zero 2050 Scenario, demand for natural gas will drop by 17% by 2050. The Group is leveraging its existing sustainable and safe pipeline network/infrastructure it has developed over the years to invest in new projects, such as landfill gas, hydrogen and energy efficiency.

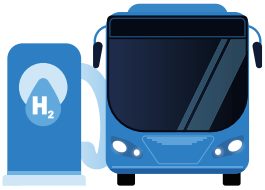
Landfill Gas Utilisation

Towngas is the pioneer of utilising landfill gas in Hong Kong and has been adding landfill gas to the fuel mix of town gas since 1999. We are currently using landfill gas from two strategic landfills and one closed landfill in Hong Kong, and remain committed to continually increasing the proportion of renewable energy used in our operations and for our customers. We are working with the potential operators of the Northeast New Territories Landfill Extension on future renewable energy applications of this new landfill extension.

Progress and Development of Towngas' Landfill Gas Utilisation



Hydrogen Economy



First hydrogen extraction project ongoing with 99.99% high-purity hydrogen

Town gas is 49% rich in hydrogen, and Towngas is one of the two companies in the world with vast experience handling piped manufactured gases with a high percentage of hydrogen. Our first hydrogen extraction project is ongoing to support the Clean Air Plan for Hong Kong 2035. This pilot project of extracting hydrogen from town gas will be used in hydrogen fuel cell buses. With our expertise in handling hydrogen, as well as an extensive distribution network across Hong Kong, we believe we can become an important supplier to provide Hong Kong with safe, efficient and low-cost hydrogen energy. Apart from fuel cell buses, there are potential applications in other heavy-duty vehicles, ferries and combined heat and power systems.

On the Chinese mainland, the replacement of natural gas with green gas appears to be one of the key options in enabling energy transition. Capitalising on our extensive hydrogen transmission experience in Hong Kong, we are supporting the local government in studying the feasibility of blending hydrogen into the natural gas pipeline. When the supply of hydrogen produced from renewable energy, i.e. green hydrogen, become available, it can be mixed with natural gas and transported to the end users to decarbonise piped gas.

Distributed Energy System

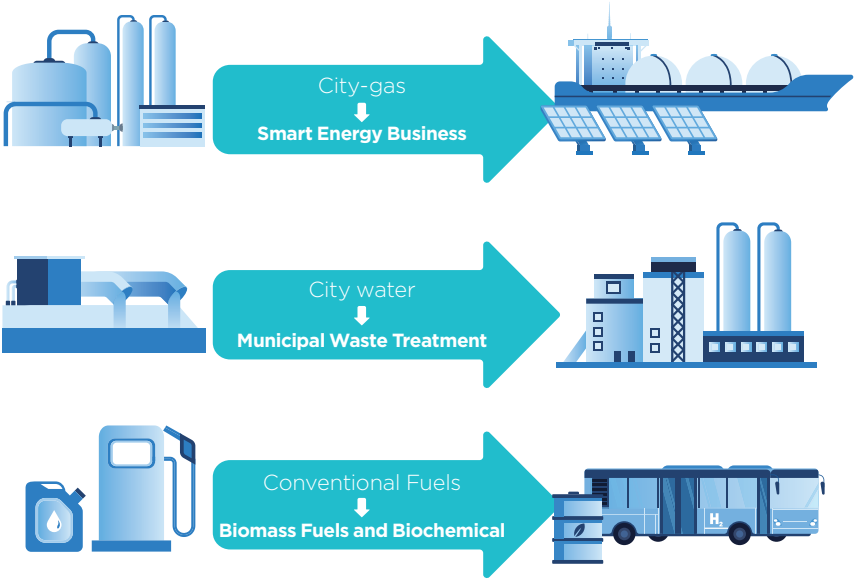
By combining heat and power generation, our highly efficient Distributed Energy System (DES) helps customers reduce carbon emissions, as well as energy costs.

In Hong Kong, the Alice Ho Miu Ling Nethersole Hospital is the first landfill gas-powered combined heat and power project in Hong Kong. This project utilises landfill gas to generate electricity, and exhaust heat to produce steam and hot water for disinfection, laundry and other purposes. With the success of this project, we are now planning to extend this system to the North District Hospital.

The Group has also actively developed a DES business since 2017 in the Chinese mainland, creating energy-efficient applications and enhancing customer benefits. Widely acclaimed by our commercial and industrial customers, DES offers a decentralised energy supply for generating electricity as well as producing hot water, steam and chilled water using waste heat. The economies of scale with DES have enabled us to extend these efficient, cost-saving systems into residential districts and industrial development zones for space heating and cooling, as well as steam supply.

Low-Carbon Business Transition

By developing sustainability-based solutions, we propel our transition into a clean energy company and contribute to a low-carbon future. Today, the Group is investing in smart energy projects, waste-to-energy projects and more to become a more sustainable business model and support carbon neutrality.



Smart Energy

We have a long-term vision to create an integrated, sustainable and tangible smart energy business built on three core pillars:

Integration	Digitalisation	Decarbonisation
• providing multiple energy solutions, including natural gas, solar photovoltaic (PV), power storage, micro-grid, etc.	• leveraging cloud computing, software-as-a service (SaaS), smart energy systems and our digital partnership with Tencent	• supporting our customers' emissions reduction efforts through our carbon management service

Towngas Smart Energy is developing zero-carbon industrial park projects in cities across the Chinese mainland. These projects involve installing solar photovoltaic power generation systems on the rooftops of large-scale production plants and logistics warehouses; the configuration of energy storage, charging and swapping power stations, multi-energy (cold, heat and electricity) supply and other energy facilities to provide zero-carbon smart energy supply services for industrial parks. Demonstration projects have been established in Taizhou, Jiangsu province, and Tangshan, Hebei province, which provide large-scale promotion and replication values and help expedite the development of zero-carbon smart industrial parks.

In addition, Towngas Smart Energy has increased its investment in energy management technologies, including establishing an energy ecological platform for zero-carbon industrial parks, and promoting carbon asset custody and green power trading services so as to boost its energy and carbon service capabilities for broadening its business prospects.

Moving forward, Towngas Smart Energy will continue to focus on investing in the Beijing-Tianjin-Hebei region, Yangtze River Delta and Guangdong-Hong Kong-Macao Greater Bay Area, providing industry leaders in sectors such as steel, papermaking and data centres with carbon-neutral solutions.

Food Waste Utilisation

The Group is currently developing various food and green waste treatment projects across the Chinese mainland. By processing and fermenting organic food waste and then purifying the product into natural gas for injection into the pipeline network, these projects help downstream customers to reduce carbon emissions.

Location		Processing Capacity

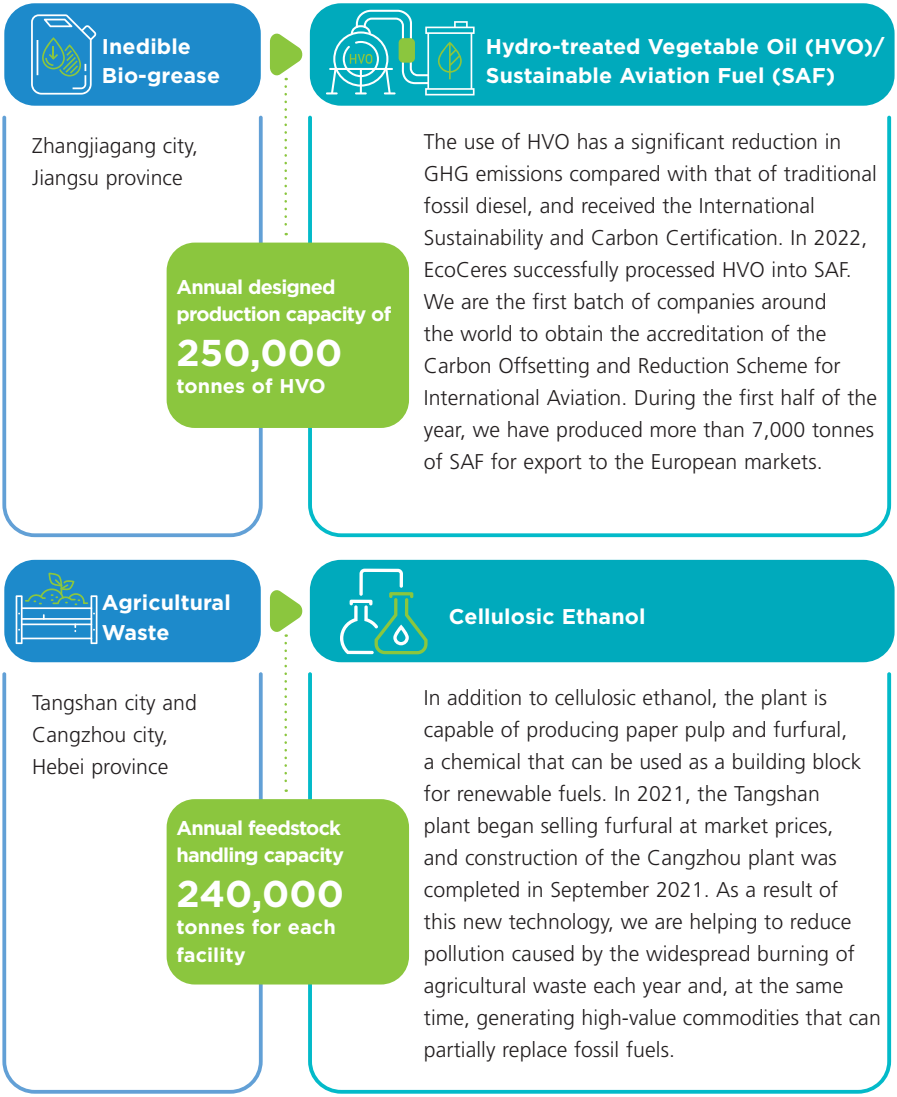
Suzhou Industrial Park, Suzhou city, Jiangsu province	• First organic waste resource utilisation project
	• In 2021
	  • **> 160,000** tonnes of organic waste were processed
	  • **↓16,900** tCO_2e for customers
		800 tonnes/day
		Commissioned in **2020**

Tongling city, Anhui province	Double food waste processing capacity in 2023	**100** tonnes/day Acquired in **2020**
Changzhou city, Jiangsu province		**300** tonnes/day Expected to be commissioned in **2023**

With the country's efforts to build "zero-waste cities" and the opportunity arising from the effort to reduce the burial of solid waste, the Group strives to steadily increase the output of bio-natural gas for supply to the Group's gas projects, thus creating synergies, and is now actively expanding this business into more regions.

Biomass Utilisation

The Group has been developing proprietary technologies to utilise inedible bio-grease and agricultural waste as the two major renewable feedstocks, to develop advanced biofuels.



ENGAGING FOR IMPACT

The Group believes in the importance of global partnership and cooperation, and proactively connects with local and international parties to combat climate change through the following initiatives:

BEC Low Carbon Charter	As one of the signatories, Towngas is committed to supporting the decarbonisation journey of Hong Kong and implementing strategic actions against climate change. Insights and experience are shared among signatories for co-learning purposes.
Carbon Neutrality Partnership	Towngas is one of the participating organisations in the Hong Kong Government's Carbon Neutrality Partnership. Together with 60 partners from various sectors, we pledged to support Hong Kong's goal of achieving carbon neutrality before 2050. Action plans and targets to support decarbonisation are developed to drive a green economy and promote climate action.
China Oil and Gas Methane Alliance	As one of the members, Towngas Smart Energy will strengthen cooperation with the whole industry and actively promote methane control actions along the whole industry chain, with an aim to influence Chinese oil and gas enterprises in global climate governance.
Chinese City-Gas Enterprise Methane Emission Control Proposal	Pledge on the part of Chinese city-gas enterprises to proactively drive methane emission control efforts.

Climate Governance Initiatives	Towngas Smart Energy joined the Climate Governance Initiatives (CGI) in Hong Kong as one of the eight founding partners. Dr Christine Loh, the Independent Non-Executive Director of Towngas Smart Energy, was appointed to the Advisory Council and Mr Isaac Yeung, Senior Vice President of Towngas Smart Energy, was appointed to the Steering Committee. The Hong Kong Institute of Directors launched CGI Hong Kong, aiming to mobilise directors to address climate change in their businesses.
Hong Kong International Carbon Market Council	Towngas will offer useful insights on the development of carbon trading issues, covering Hong Kong and international markets, to support Hong Kong in developing an international carbon market.
Methane Guiding Principles partnership	Together with other signatories, Towngas reduces the impacts of methane emissions along the natural gas value chain.
TCFD Supporter	Commit to working toward its own implementation of TCFD recommendations to disclose and manage climate risks and opportunities.

TERA-Award	The first TERA-Award smart energy innovation competition jointly launched with State Power Investment Corporation Limited has been successfully held, and 208 projects from 23 countries and regions have been received. The research results are mostly in the fields of hydrogen energy, new energy batteries, and energy internet projects, which fully reflect the innovation trend of zero-carbon technology. The second edition of the TERA-Award was launched, carrying on from last year's theme of "Exploring Zero-Carbon Innovations for the Future". The new edition aims to promote the realisation of the country's "dual carbon" goals and sustainable development.
Towngas Energy Academy	Towngas Energy Academy is established to attract and lead scientific research in partnership with other scientific institutions. In this regard, Towngas Smart Energy also cooperated with Tsinghua University to set up a joint research centre for virtual power plant technologies in zero-carbon smart industrial parks, seeking to overcome technological bottlenecks as well as to drive the development and technological progress of energy Internet and new power systems.

FOR DETAILS, PLEASE VISIT:

Towngas Corporate Website

Towngas Smart Energy Corporate Website

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