

Information disclosure based on TCFD recommendations

The Tokyo Gas Group regards the Task Force on Climate-Related Financial Disclosures (TCFD) framework as being an effective way to promote information disclosure and dialogue with stakeholders on climate-related issues. We therefore signed the statement of support for the TCFD, in May 2019. We are using the TCFD recommendations as an indicator to examine our response to climate change, and will continue to appropriately disclose information on the impact of climate change on the Tokyo Gas Group’s business activities and the measures to be taken.

Required item	Details	Disclosures recommended by TCFD	Where applicable as per Integrated Report 2022
Governance	Disclose the organization’s governance around climate-related risks and opportunities.	A. Describe the board’s oversight of climate-related risks and opportunities.	<ul style="list-style-type: none"> Promoting Sustainability and Materiality
		B. Describe management’s role in assessing and managing climate-related risks and opportunities.	<ul style="list-style-type: none"> Corporate Governance
Strategy	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning where such information is material.	A. Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	<ul style="list-style-type: none"> Promoting Sustainability and Materiality
		B. Describe the impact of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning.	<ul style="list-style-type: none"> Compass Action Challenge 1: Leadership in the effort to achieve Net-Zero CO₂
		C. Describe the resilience of the organization’s strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	<ul style="list-style-type: none"> Information disclosure based on the TCFD proposals
Risk management	Disclose how the organization identifies, assesses, and manages climate-related risks.	A. Describe the organization’s processes for identifying and assessing climate-related risks.	<ul style="list-style-type: none"> Promoting Sustainability and Materiality
		B. Describe the organization’s processes for managing climate-related risks.	<ul style="list-style-type: none"> Corporate Governance
		C. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization’s overall risk management.	<ul style="list-style-type: none"> Risk Management System
Metrics and targets	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	A. Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	<ul style="list-style-type: none"> Progress of the Medium-term Management Plan and KPIs
		B. Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	<ul style="list-style-type: none"> Compass Action Challenge 1: Leadership in the effort to achieve Net-Zero CO₂
		C. Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	<ul style="list-style-type: none"> Information disclosure based on the TCFD proposals

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Strategy

Risks and Opportunities

In November 2021, we have formulated “Compass Action” as a detailed roadmap for achieving Compass 2030, and it sets roadmap for transitioning to carbon neutrality.

(Challenge 1: Leadership in the effort to achieve Net-Zero CO₂) [▶ P.25-29](#)

In line with this, we reviewed the climate-related risks and opportunities over two phases by adding the 2030-2050 period in addition to the up to 2030. In reviewing the Tokyo Gas Group’s risks and opportunities, we referred to two representative scenarios of the International Energy Agency and the Intergovernmental Panel on Climate Change—the below 2°C warming scenario and the 4°C warming scenario, and assumed changes in the business environment.

* Scenarios for reference: Below 2°C warming scenario:
Sustainable Development Scenario (SDS) (IEA WEO 2019); B2DS (IEA ETP 2017); RCP2.6 (IPCC AR5)
4°C warming scenario:
IEA Stated Policies Scenario (STEPS) (IEA WEO 2019); RTS (IEA ETP 2017); RCP8.5 (IPCC AR5)

	Classification	Details	-2030: Accelerate transition (Growth of the potential and role of LNG/natural gas)		2030-2050: Advance toward carbon neutrality (Phase for achieving decarbonized society)	
			Opportunities and risks	High financial impact	Opportunities and risks	High financial impact
Below 2°C	Markets and energy resources	• Global (including Japan) demand for natural gas and LNG	Opportunities	○	Opportunities and risks	
		• The global (including Japan) spread of carbon-neutral gaseous energy	Opportunities		Opportunities	○
		• The spread of renewable energy	Opportunities	○	Opportunities	○
		• Securing of the balancing renewable power	Opportunities		Opportunities	
		• Conversion to non-fossil energy	Risks		Opportunities and risks	○
	Technology	• Decarbonization technology innovation	Opportunities and risks		Opportunities and risks	○
	Policies and regal	• Introduction of carbon pricing	Opportunities and risks	○	Opportunities and risks	
4°C	Reputation	• Focus on low carbon and decarbonization in investment standards	Opportunities and risks	○	Opportunities and risks	○
	Resilience	• Enhancement of resilience through a decentralized energy system	Opportunities		Opportunities	
	Acute	• Impact on operations by increasingly severe abnormal weather	Risks		Risks	

Measures taken by the Tokyo Gas Group

Sophisticated use of natural gas	<ul style="list-style-type: none"> • Switch from coal, oil, etc. to natural gas as fuel, introduce cogeneration systems, develop smart cities, strengthen resilience in Japan and global markets. • Increase provision of carbon-neutral LNG (CNL) • Expand use for balancing renewable power • Develop & expand CCU, Expand commercial use of CCUS 	Decarbonization of gas and electric	<ul style="list-style-type: none"> • Carbon-neutral methane: Transition to large-scale & high-efficiency methanation and commercial use • Hydrogen: Establish practical, affordable hydrogen production technologies • Expand renewable power sources (Increase solar, wind & biomass power generation) • Achieve zero emissions in our thermal power generation (Explore use of hydrogen & ammonia)
Infrastructure development (resilience)	<ul style="list-style-type: none"> • Enhanced resilience in the natural gas infrastructure • Expanded use of decentralized energy systems that are highly resilient, such as smart energy networks, cogeneration systems, and ENE-FARM (home fuel cells), etc • Enhanced establishment of a water hazard-resilient public utilities (i.e., disaster countermeasures for LNG terminals and power stations) and full preparation for BCP 		

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Major Initiatives Taken in FY2021

Sophisticated use of natural gas	
CCUS	<ul style="list-style-type: none">World's 1st! Commence Manufacturing of CO₂-absorbing Concrete that Uses Exhaust Gas Emitted During the Use of City Gas Devices (July 2021)Produced Japan's first potassium carbonate using CO₂ from city gas devices (September 2021)Launch CCU Verification Test Jointly with Yokohama City and MHI Group (February 2022)
CNL	<ul style="list-style-type: none">Receipt of Third-party Validation Report for Japan's First Carbon Neutral City Gas Plan (June 2021)Tokyo Gas to supply carbon neutral city gas to the Tokyo 2020 Summer Olympics athletes' village (July 2021)Introduced carbon neutral city gas in Tokyo's Marunouchi district, as the largest project of its kind in Japan (October 2021)
Other	<ul style="list-style-type: none">TG Natural Resources: Started a methane leak detection and repair project using a helicopter (November 2020-)Commencement of verification of virtual power plant using ENE-Farm residential fuel cells and residential storage batteries group control (June 2021)Tokyo Gas launches verification of residential demand-response (July 2021)Establishment of the Joint Venture with the PTT Group Company-Promotion of Decarbonization through On-site Energy Service Business including Improving Efficiency Technology Solutions and Fuel Supply in Thailand (October 2021)Signed a business alliance agreement with The Kansai Electric Power Company, Inc. for VPP business using decentralized energy resources (November 2021)Joint development of EP420G, full-time gas cogeneration system that achieves world-class power generation efficiency (January 2022)Tokyo Gas issues a transition bond for the first time as a city gas supplier (February 2022)Modification of the power supply equipment of the Sodegaura Power Plant (formerly Tokyo Gas Bay Power) to gas engine as the balancing power source to renewable energy (scheduled to start operation in 2024)

Decarbonizing gas and electricity	
Hydrogen Methanation	<ul style="list-style-type: none">Tokyo Gas and SCREEN Agree to Jointly Develop a Water Electrolysis Cell Stack for Low-cost Green Hydrogen Production (May 2021)Started feasibility study toward creation of a carbon-neutral methane supply chain with Petronas, Sumitomo Corporation and Mitsubishi Corporation (November 2021)Launch of joint research project with JAXA and Yamaguchi University for demonstrating methanation technology (December 2021)The City of Yokohama and Tokyo Gas sign collaboration agreement on methanation demonstration testing (January 2022)Start of feasibility study for methanation project aimed at city gas pipeline supply of synthetic methane made with CO₂ from cement production (March 2022)Launched demonstration testing of the methanation process toward achieving carbon neutrality and a decarbonized society by 2050 (March 2022)
Renewable energy	<ul style="list-style-type: none">Acceleration of the Development of Kashima Port Offshore Wind Project (April 2021)Launched "Sasutena Denki," an electricity rate plan with 100% real renewable energy (June 2021)Launch of Commercial Solar Power Operations Begins in Iwakuni, Yamaguchi Prefecture (July 2021)The Aktina Solar Power Project in the U.S. began partial operation (150 MW) (August 2021)Jointly implemented the Sakaide biomass power generation project (October 2021)Tokyo Gas selected as the prospective recipient in NEDO's Green Innovation Fund Project / Offshore Wind Power Cost Reduction Project (for the development of low-cost technology for manufacturing and installing floating foundations) (January 2022)Establishment of a subsidiary in Denmark and joint development of renewable energy in the Nordics through business collaboration with EWII S/I (January 2022)Participated in the dedicated biomass combustion power generation project in Sendai City, Miyagi Pref. (March 2022)
Other	<ul style="list-style-type: none">Signing of Comprehensive Agreement for Carbon-neutral Urban Development in local government (November 2021-)Launched "EVrest" EV charging service for housing complexes (November 2022)

TOPIC 1

Launch of methanation demonstration testing for supporting achievement of carbon neutrality and decarbonized society in 2050

Methanation demonstration testing commenced at Tokyo Gas Yokohama Techno Station in Tsurumi Ward, Yokohama City. The purpose of this demonstration is to acquire a range of technologies and know-how, from the procurement of electricity from renewable energy sources to the production of green hydrogen by water electrolysis, and the production and utilization of synthetic methane.

In addition, we are collaborating with Yokohama City and other parties*1,*2 to consider a local-production, local-consumption model for the carbon neutralization of a community. We will also identify issues and study solutions for larger-scale demonstration testing and establishment of a supply chain.



Methanation facilities

- *1: The City of Yokohama and Tokyo Gas sign collaboration agreement on methanation demonstration testing (announced January 18, 2022).
- *2: Launch CCU Verification Test Jointly with Yokohama City and MHI Group (announced on February 24, 2022).

TOPIC 2

Acceleration of the development of Kashima Port Offshore Wind Project

In April 2021, the Company decided to accelerate the development of the Kashima Port Offshore Wind Project, which is located at Kashima Port in Ibaraki Prefecture, through joint investor Wind Power Energy Co., Ltd.*3

The Project is located in 'Kashima Coastal Industrial Area,' which is one of the top such areas in Japan and located near Tokyo, a major consumer of energy. With approval and certification from Ibaraki Prefecture, we will install 19 newly selected wind turbines in 'areas that utilize renewable energy sources' (680 hectares) designated in the port area of Kashima Port. We will promote construction of an offshore wind power plant with a power generation capacity of approximately 160,000 kW, equivalent to the annual consumption of approximately 70,000 households.



Rendering of the Project

- *3: In addition to the Company, joint investors include Wind Power Group Co., Ltd. and Nippon Wind Energy K.K., a wholly owned subsidiary of Vena Energy Holdings Ltd.

TOPIC 3

Reduced methane leakage resulting from a methane leak detection and repair project using a helicopter

TG Natural Resources, a shale gas development and production company in the United States, has effectively identified areas where there were leaks (and later repaired them) by using a helicopter equipped with a laser methane detector to inspect from the air an area approximately twice the size of the 23 wards in Tokyo. This has resulted in achieving a 15% reduction in methane leakage. We will continue our efforts to reduce methane leakage, which is a global challenge.



Satellite map of detection

Above: BH206 JetRanger helicopter equipped with a laser unit
Below: Example of methane leakage detection (blue lines indicating underground integrated pipeline channels)

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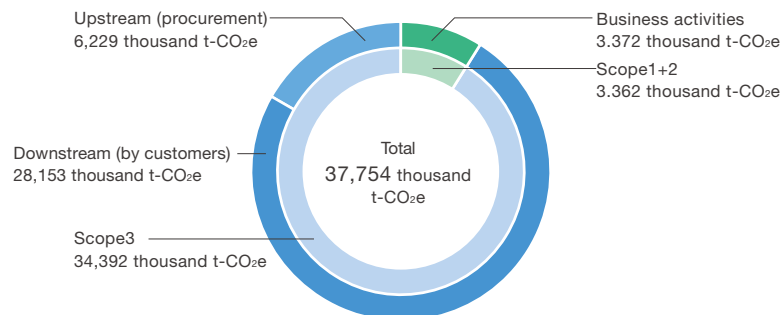
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Metrics and Targets

A cross-industry climate-related index category

GHG emissions: Figure for FY2021 result

* The sum of individual data may not be equal to the total due to the way figures are round.



(thousand t-CO ₂ e)		
Scope 1 and 2 Target: Consolidated subsidiaries		
3,362		
Japan	Scope1+2	3,126
	Scope1	2,922
	Scope2	205
Overseas	Scope1+2	236

(thousand t-CO ₂ e)		
Scope3		
34,392		
1) Purchased goods and services		
3) Fuel and energy related activities not included in Scope 1 and 2		
6,229		
4) Transportation (upstream)		
5		
5) Waste generated in operations		
2		
6) Business trips		
3		
7) Commuting by employees		
2,957		
10) Processing of sold products		
25,196		
11) Use of sold products		

Physical risks

Operational impacts by typhoon and other flood damages

- With the anticipated increase in typhoons and torrential rains due to climate change, the influx of water and sand into gas pipes caused by submerged or buried gas supply facilities, and by collapse of houses may affect the gas supply.
- As a flood prevention measure, measures are implemented based on hazard map information of each region having gas supply facilities, and equipment are to be raised above the expected flood level and equipped with flood sensors and other devices as needed. Furthermore, in order to minimize the damage caused by flood, we have been working on both hard and soft measures, such as advanced use of weather information and writing of the wind and water damage section of the Business Continuity Plan (BCP).
- Incidentally, the Typhoon No. 19 in 2019 that caused immense damage in various places did not cause any serious damage to Tokyo Gas Group.

The Tokyo Gas Group's management indicators and key quantities to realize growth are laid out in its management vision statement Compass2030 and FY2020-2022 Mid-term Management Plan.

Progress of the Medium-term Management Plan and KPIs P.23

Climate-related opportunities

Progress of the Medium-term Management Plan and KPIs P.23

1) LNG and natural gas

- Natural gas and LNG are important energy sources in the transition phase toward decarbonization, globally and particularly in Asia. Further, in Japan, for industries which emit high amount of GHG but find it difficult to quickly decarbonize due to ongoing need for high temperature heat, conversion to natural gas and advanced energy usage will be extremely effective solutions during the transition period. LNG and natural gas are also expected to be used as balancing force to stabilize energy supply in conjunction with the large-scale reliance on renewable energy.
- During the transition period, LNG and natural gas, through fuel conversion, smart city conversion, and carbon neutral LNG and CCUS, will contribute to CO₂ emissions reduction at domestic and overseas customers' sites. In the future, the decarbonization of gas itself by means of methanation will lead to the realization of a carbon-neutral society with suppressed social costs obtained by use of existing infrastructure.

2) Renewable energy

- The introduction and spread of renewable energy is essential in achieving a carbon-neutral society, and government policy support is essential. In Japan, which is surrounded by the sea, the potential for offshore wind power is high.
- The Tokyo Gas Group is steadily expanding development of solar, land wind, biomass, and offshore (seabed-fixed) wind power sources. It is also focusing on technology development for floating offshore wind power, and is working to realize early implementation.
- Furthermore, by taking advantage of the Group's strengths of long-term stable operation of power generation infrastructure, operation & maintenance (O&M) capability, and the scale of our customer base, we will build a renewable energy value chain unique to the Tokyo Gas Group by being engaged in all stages from development to O&M and from power generation to electricity sales.

Natural gas
transaction
volume in 2030
20 million tons

Renewable
energy transaction
volume in 2030
6 million kW

Capital allocation

CFO's message P.21

Active investment in growth areas, including decarbonization, while leveraging ESG financing

- In December 2020, Tokyo Gas issued a green bond (issue amount: 10 billion yen) to finance the renewable energy business. Specifically, it was used for the Aktina Solar Power Project (Wharton County, Texas, 630,000 kW) and the Annaka Solar Power Project (Annaka City, Gunma Pref., 63,000 kW).
- In March 2022, Tokyo Gas issued transition bonds* (71st, 72nd domestic unsecured notes: 20 billion yen in total) through a domestic public offering platform for the first time by a city gas supplier in Japan. Based on the Ministry of Economy, Trade and Industry's Technology Roadmap for Transition Finance in the Gas Sector, the bonds were issued by a new financing method to promote low-carbon and decarbonization initiatives during the transition period toward realizing a decarbonized society. The proceeds would be used for investments in three projects (Niihama LNG Project, Smart Energy Network Project, and Harumi Hydrogen Project).

* Selected as a model case of the Ministry of Economy, Trade and Industry's 2021 Climate Transition Finance Model Project.

Approx. 2 trillion
yen investment
by 2030 in growth
areas, including
decarbonization

Remuneration

Officer remuneration P.50

The bonuses of Corporate Executive Officers reflects the evaluation of the term performance against non-financial indicators related to climate change (contribution to CO₂ emissions reduction; renewable power source transaction volume), in addition to financial indicators.

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