Environmental Impact throughout the Daigas Group Value Chain in FY2022.3

The Daigas Group calculated the amount of greenhouse gas (GHG) emissions from companies that constitute the Daigas Group's value chain network, based on the GHG Protocol, an international emission accounting standards. The methodology of the calculation and its results have been certified by an independent organization to verify their reliability and accuracy.

Combined GHG emissions by the Daigas Group and value chain companies, measured by CO_2, totaled about 26.79 million tons in FY2022.3. The sum breaks down into about 4.86 million tons, or about 18%, for GHG emitted through business activities by the Daigas Group (Scope 1 and Scope 2), and about 21.92 million tons, or about 82%, emitted by others in our value chain (Scope 3).

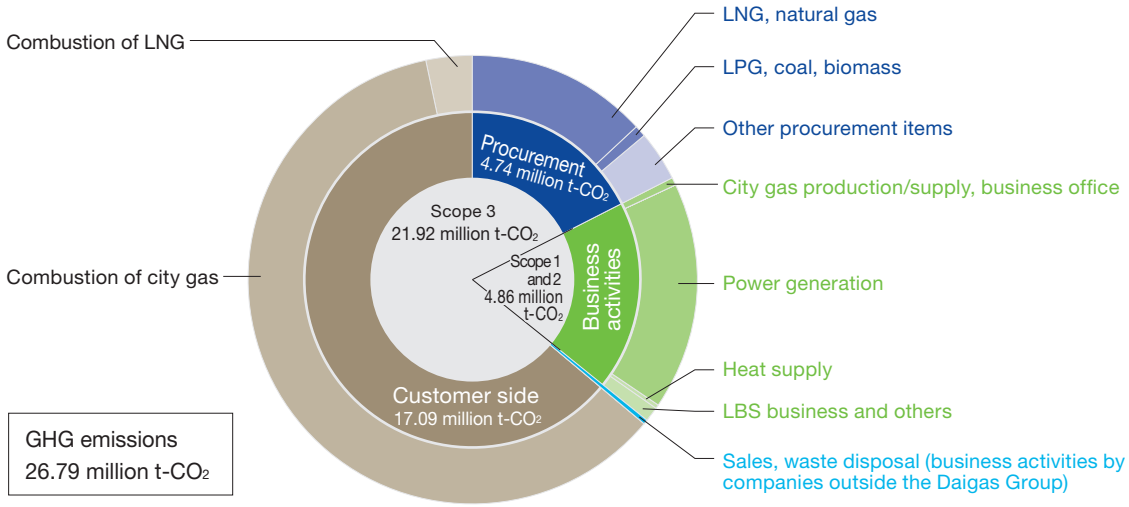
GHG emissions from city gas and LNG combustion on the customer side amounted to 17.09 million tons in the reporting year in terms of CO_2, accounting for about 64% of the total. To reduce CO_2 emissions in society as a whole, it is important for the Group to promote energy conservation using natural gas, an energy source with low CO_2 emissions, and further popularize high-efficiency equipment and systems such as its "ENE-FARM" and cogeneration systems.

GHG emissions through electricity generation, as measured in terms of CO_2 in the year, amounted to 4.38 million tons, accounting for about 16% of the total emissions, which represented the majority of GHG emissions from the Group's own business activities. As a way of reducing GHG emissions from power generation, the Group will continue to actively introduce highly advanced energy-efficient power generation facilities and use renewable energy sources.

GHG emissions from material and fuel procurement totaled 4.74 million tons, as measured in terms of CO_2 in the year, accounting for about 18% of the total emissions. The procurement of energy sources, especially LNG, accounted for over 70% of that amount. Under these circumstances, we will continue our efforts to improve fuel efficiency regarding the operation of LNG tankers in collaboration with resource suppliers.

Activities that have potential environmental impacts other than GHG emissions include the disposal of waste (general waste and industrial waste), and the disposal of excavated soil and polyethylene pipes associated with gas pipe construction. Regarding these items, we have achieved a high recycling rate and will continue to strive to maintain this level. About 97% of water used for our industrial activities is taken from the sea. Such water is mostly used to vaporize LNG at LNG terminals. Seawater is also used as coolant inside the steam turbine condenser at some power plants. Once used, the water is discharged into the sea without being consumed under strict quality control.

GHG emissions throughout the Daigas Group Value Chain in FY2022.3 (actual results)



Companies subject to the calculation of GHG emissions: Osaka Gas Co., Ltd. and 60 companies among 150 consolidated subsidiaries are subject to calculation of GHG emissions. Those housed in office buildings as tenants and whose environmental data are difficult to grasp and whose environmental effects are minimal are not subject to such calculation. Also excluded from the calculation are overseas companies, except one company.

CO_2 emission factors used

- Electricity: 0.65 kg-CO_2/kWh (Average emission factor of thermal power plants in FY2014.3, stipulated in the Plan for Global Warming Countermeasures issued by the government in 2021.)
- City gas: 2.29 kg-CO_2/m^3 (based on Osaka Gas data)
- Others: Factors listed under the Law Concerning the Promotion of Measures to Cope with Global Warming

Sources of emission factors used for calculating CO_2 emissions

- Production and transmission of city gas: "Life cycle evaluation of city gas" on the website of the Japan Gas Association
- Production and shipment of LNG: Calculation of life cycle greenhouse gas emissions of LNG and City Gas 13A (papers presented at research presentation meetings of the 35th Meeting of the Japan Society of Energy and Resources, June 2016)
- Production and shipment of LPG and coal: Future forecast for life cycle greenhouse gas emissions of LNG and City Gas 13A (Energy and Resources, Vol. 28, No. 2, March 2007)
- Other main emission factors: Emission factors for calculating supply-chain greenhouse gas emissions, etc. (Database Ver. 3.2) published in March 2022 by the Ministry of Environment

Please see our website for reports on sustainability activities at the Daigas Group.

Verified by a third party A third-party verification has been conducted by Bureau Veritas Japan Co., Ltd.

Main Materials and Fuels

Amount of LNG handled	**6,520 thousand tons** The figure above includes the amounts of the items listed below: ● Materials of city gas ● Fuels at LNG terminals ● Fuels used by Group companies for power generation
LPG used for calorific adjustment of city gas	**213 thousand tons**

Amount of Energy Used

City gas	**1,390 million m³** (including gas whose calorific value has yet to be adjusted)
Purchased electricity	**509 million kWh**
Other energy sources	**15,011 TJ**

Amount of Vehicle Fuel Used

Gasoline	**1,600 kl**
City gas	**49 thousand m³**
Diesel	**730 kl**
LPG	**5 thousand m³**

Sales volume of main products

Gas	**7,096 million m³**
Electricity	**16,760 million kWh**

Procurement of materials and fuels (activities by outside companies)

- **LNG, natural gas**: City gas use / power generation use / marketing use
- **LPG**: City gas use / marketing use
- **Coal, biomass**: Power generation use
- **Other purchased goods**: Materials / consumable goods / capital goods / gas equipment for sale / electricity / gasoline and others

Business activities by Osaka Gas

- City gas production/ supply
- Business office
- Power generation
- Heat supply
- LBS business
- Others*

* Engineering / energy services / renovation / maintenance / R&D etc.

Sales, waste disposal (Business activities by companies outside the Daigas Group)

- Commuting, business trips
- Waste disposal
- Product shipment
- Leasing of assets
- Outlets providing sales support to Osaka Gas

Customer side

- City gas
- Gas appliances
- Electricity
- Chemical products
- LNG
- Services

GHG (Scope 3[*1])

	Emissions (1,000 t-CO_2)
LNG, natural gas	3,536
LPG, coal, biomass	206
Other procurement items	997
Total	**4,739**

GHG (Scope 1 and 2)

	Emissions (1,000 t-CO_2)	
	Scope 1	Scope 2
City gas production	29	83
Business office (including supply)	15	16
Power generation	4,357	23
Heat supply	59	33
LBS and others	66	181
Total	**4,526**	**334**

GHG (Scope 3[*2])

Emissions (1,000 t-CO_2)
96

GHG emissions due to energy consumption arising from various activities, including commuting of employees, business trips, transportation of products, business activities at outlets that provide sales support to Osaka Gas, disposal of own waste, disposal of product waste, and leasing of assets.

GHG (Scope 3[*3])

	Emissions (1,000 t-CO_2)
Combustion of city gas	16,250
Combustion of LNG	840
Total	**17,090**

Waste

	Generated	Recycled
General waste	1,060 t	96%
Industrial waste	113,737 t	97%
Excavated soil	629,000 t	100%
PE pipe	125 t	100%
Used gas appliances recovered	1,517 t	86%

Amount of water intake and water discharge

Stated on page 46

Breakdown of Scope 3 categories

*1 Category 1–4 (purchased products, capital goods, fuel procurement, upstream transportation)
*2 Category 5–9, 12–14 (waste, business trips, commuting, leased assets, downstream distribution, end-of-life treatment of sold products, franchises)
*3 Category 11 (use of sold products)