

Global Warming Countermeasures

Basic Concept

Global Warming Countermeasures are an important management issue for the Toho Gas Group. As an energy business operator, Toho Gas Group is implementing countermeasures against global warming taking into consideration the value chain.

Toho Gas not only aims to reduce our own CO₂ emission factor but also sets environmental action goals aimed at restraining CO₂ emissions at customer locations. We promote a wide range of initiatives, including supplying environmentally friendly energy, switchover from other fuels to natural gas or LPG, promoting the adoption of advanced and highly efficient devices such as fuel cells, fostering the utilization of renewable energy in collaboration with local communities, as well as pursuing technological development and testing such as methanation and CO₂ separation, capture, and utilization, all in the pursuit of achieving carbon neutrality by 2050.

Climate Change Mitigation at Customer Locations

Toho Gas has set the target of contributing to CO₂ reduction through our business activities. The actual CO₂ reduction contribution for FY2022 amounted to 307 thousand tonnes-CO₂.

Transition to natural gas

Among fossil fuels, natural gas is an environmentally superior energy source with lower CO₂ and NO_x emissions upon combustion, and no SO_x emissions. By transitioning fuel sources at customer locations, such as from petroleum and the like to natural gas, we are contributing to the reduction of CO₂ emissions.

Promoting implementation of high-efficiency gas equipment and systems

In addition to transitioning fuels, we introduce high-performance burners and other equipment to our customer locations, which can further reduce CO₂ emissions.

We are also advancing the adoption of energy-efficient equipment and systems, including household fuel cell systems like "Ene-Farm" for residential use, gas cogeneration

systems for commercial use, high-efficiency boilers, and gas heat pump (GHP) air conditioning systems.



Gas cogeneration system



Flow-through boiler

Suppression of fluorocarbon emissions

Fluorocarbons used in air conditioning equipment and the like have very high global warming potentials, making their emissions control a significant concern.

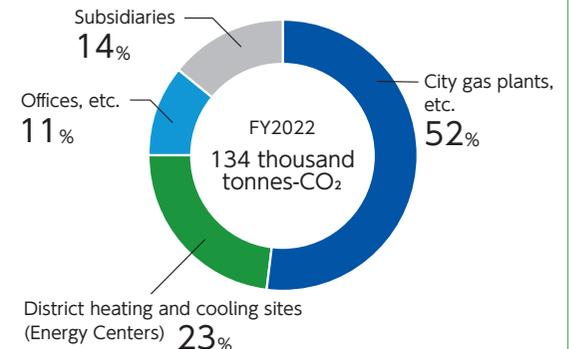
We conduct the collection of refrigerant fluorocarbons generated during maintenance and upgrading of commercial air conditioning equipment. In FY2022, we collected and appropriately processed the entire amount of fluorocarbons from the targeted equipment (1,291 units, with a collected amount of 13.9 tonnes of fluorocarbons).

CO₂ reduction in business activities

The Toho Gas Group promotes energy-saving initiatives throughout various aspects of our business operations as an energy provider. In FY2022, the CO₂ emissions from our business activities across the entire Toho Gas Group amounted to 134 thousand tonnes-CO₂.

We establish targets for global-warming prevention within each business sector, invest in energy-saving equipment, and implement thoroughgoing efficient operational management to achieve these targets. Consequently, we have consistently received the "Class S" (excellent performer) rating in the classification assessment of the Act on Rationalizing Energy Use.

CO₂ emissions in business activities (consolidated)



Initiatives at City Gas Plants

City gas plants use a manufacturing method of extremely high energy efficiency during manufacturing, in which vaporized gas is manufactured by heat exchange using seawater of liquid natural gas (LNG) at a temperature of around -160°C.



Efficient utilization of the cold energy of LNG is made in supplying cold energy, manufacturing dry ice and liquid nitrogen in adjacent plants, and in advanced energy-saving equipment that reliquefies the BOG (boil-off gas) produced in LNG tanks.

In addition to these initiatives, pipelines built as back-ups between plants and to adjust inventory, for example, are also used to adjust the amount of gas sent to new plants as part of our efforts to further reduce the amount of energy used by reviewing operation methods for the overall optimization of operation methods at all LNG plants.

Initiatives in District Heating and Cooling

In district heating and cooling, we aim to achieve low carbon for entire neighborhoods by supplying hot water and thermal energy (cold energy and heat) for heating and cooling to

multiple buildings within an area and by optimizing equipment operation. We conduct heat-supply business in ten areas that Toho Gas operates directly and six areas in which we are invested in operations, mainly in the City of Nagoya.

At the Minato AQLS Energy Center, which is an example of the latest district heating and cooling, we are optimizing energy for the entire town by means of a community energy management system (CEMS) that utilizes exhaust heat during power generation and the unused energy of canal water in addition to distributed power sources that include gas cogeneration offering high overall efficiency, renewable energy, and storage batteries. Further, all condominium units in the area are installed with ENE FARM type S in rated operation around the clock as standard equipment, with excess power used town-wide. In this way, we are promoting local production and local consumption of energy.

Initiatives in Offices, etc.

In our offices, for example, we are striving to reduce CO₂ through various energy-saving countermeasures, including the introduction of highly efficient gas air conditioning, LED illumination, and other energy-saving equipment, as well as low-emission vehicles.

To enhance the energy-saving awareness of each individual employee, we continue our efforts to curb increases in energy consumption by providing feedback on energy usage for each building, raising awareness about the Office Energy-saving Manual, and promoting practices such as turning off unnecessary lighting, optimizing air-conditioning temperatures, and reducing elevator usage.

Utilization of Internal Carbon Pricing

When considering investments such as adopting energy-saving equipment or upgrading existing equipment to high-efficiency models, we are experimentally implementing

internal carbon pricing.

We are consistently conducting evaluations of facility investments to restrain CO₂ emissions associated with business activities. In FY2022, we identified comprehensive company-wide measures for reducing CO₂ emissions and assessed the investment payback period, considering the CO₂ reduction effects. Using a carbon price range of 3,000 to 15,600 yen per tonnes* as a reference, we evaluate implementation with priority given to high-efficiency, cost-effective, low-carbon initiatives, and have newly formulated investment plans for the enhancement of efficiency in city gas production facilities and the expansion of LED lighting in office buildings.

* Reference was made to the APS Scenario 2030 prices in the International Energy Agency (IEA) World Energy Outlook 2021.

TOPIC

Participation in GX League

In March 2022, our company endorsed the "GX (Green Transformation) League Basic Concept" advocated by the Ministry of Economy, Trade, and Industry

We are also participating in the full-scale activities of the GX League that began in FY2023.

Through our participation in the GX League, we will steadfastly advance efforts to reduce greenhouse gas emissions and collaborate with customers and partners, and work to bring about a sustainable society.



List of District Heating and Cooling Sites (Energy Centers)

| City | Operated by Toho Gas | Operated by Companies in which Toho Gas Holds an Equity Stake |
|---------------|---|--|
| Nagoya City | <ul style="list-style-type: none"> ·Imaike ·Sakae 3-chome north ·Nagoya Station south ·Sakae 3-chome ·Chiyoda ·Higashi Sakura ·Ikeshita ·Johoku ·Minato AQLS | <ul style="list-style-type: none"> ·JR Central Japan Nagoya Station area ·Nagoya Station east ·Quality Life 21 Johoku ·Sasashima Live 24 ·JR Central Japan Nagoya Station north |
| Komaki City | <ul style="list-style-type: none"> ·Komaki Station west | |
| Tokoname City | | <ul style="list-style-type: none"> ·Chubu Centrair International Airport |