

City Gas Business

Business Overview

Toho Gas rolls out the city gas business through its gas pipeline network that covers approx. 30 thousand km centering in Aichi, Gifu and Mie prefectures. We are engaged in everything from the procurement of raw gas materials through to manufacturing, supply, sales, pipeline construction for gas supply and the sale of gas equipment.

City gas sales volumes decreased 4.4% year on year to 3.45 billion m³. Residential use fell 8.8% due to high temperatures and energy conservation, while commercial use was down 3.4% due to decreased production caused by a shortage of parts and other factors.

Despite decreased sales volumes, net sales of city gas increased 41.9% year on year to 460.3 billion yen, and operating income increased 412.1% year on year to 46.1 billion yen, as the raw materials cost adjustment system allowed us to reflect increased costs in unit prices.

	2020	2021	2022
Net Sales (billion yen)	288.6	324.4	460.3
Operating Income (billion yen)	9.8	9.0	46.1
City Gas Sales Volume (billion m ³)	3.61	3.61	3.45

Realization of low-cost and stable procurement

Building an LNG procurement portfolio that is resilient to changes in the business environment

Amid tight supply and demand in the LNG market, we will secure sufficient procurement volume, primarily through long-term contracts. We will also continue building a procurement portfolio that is resilient to changes in the business environment, while making every effort to maintain both price competitiveness and supply stability.



Promoting a dynamic response to changes in the business environment

Prepare and implement a flexible yet dynamic response to sudden changes in supply and demand. We are also planning upstream development and investment in LNG carriers to strengthen the LNG value chain.



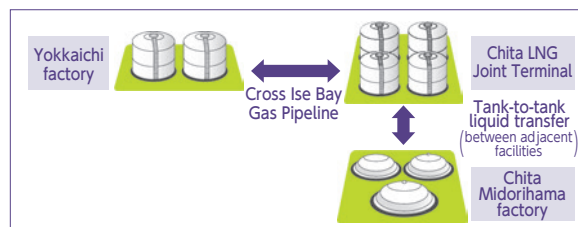
Ichthys central processing facility (CPF)



LNG Canada project (under construction)

Flexible operation of LNG receiving terminals

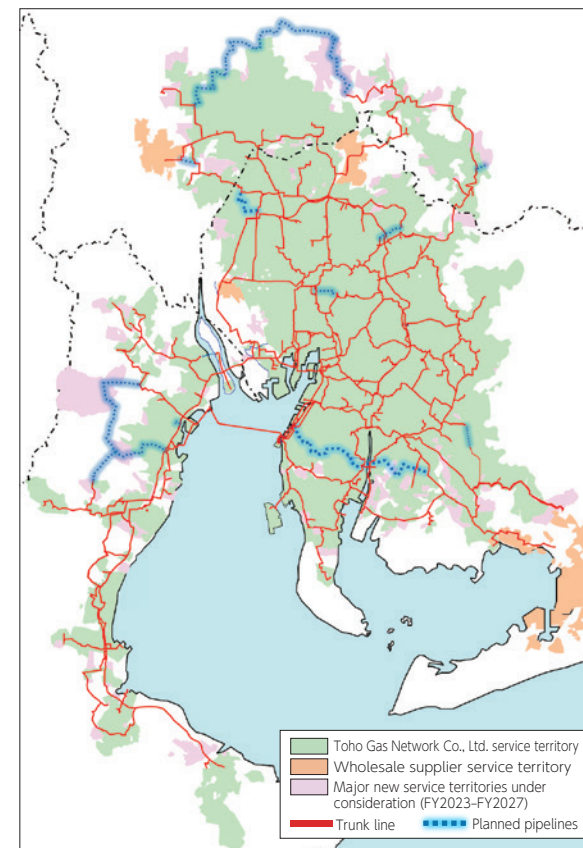
Flexible operation of our receiving terminal is achieved by utilizing both the Cross Ise Bay Gas Pipeline and tank-to-tank liquid transfer facilities.



Ensuring safe, secure, and stable supply

Improvement of supply infrastructure

As of the end of FY2022, Toho Gas Network Co., Ltd. maintains and operates approximately 30,000 km of gas pipelines in the Tokai region, supplying city gas to 76 municipalities (54 cities, 21 towns, and 1 village) in Aichi, Gifu, and Mie Prefectures.



Promoting disaster preparedness for earthquakes, tsunamis, and other natural disasters

We have completed disaster preparedness countermeasures against large-scale earthquakes, such as the reinforcement of LNG receiving pipelines for city gas production, and against tsunamis, such as increasing the elevation of facilities. Moving forward, we will continue to enhance our disaster response capabilities by improving software measures.



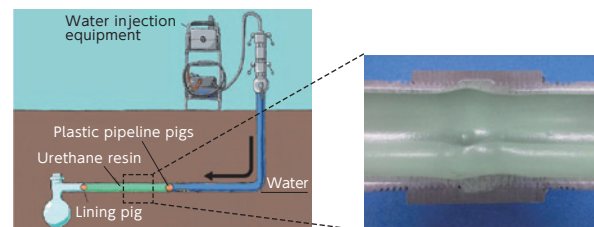
"Tsunami screen" as a countermeasures against flotsam from factories

We have adopted a three-pronged approach to disaster preparedness for earthquakes, windstorms, floods, and other natural disasters. This three-pronged approach includes "preventive measures," which are designed to protect gas pipeline supply facilities against earthquakes and tsunamis; "emergency measures," which are intended to prevent secondary disasters in severely damaged areas by temporarily suspending the supply of gas; and "restoration measures," which are implemented in cooperation with regional gas retailers and nationwide gas utilities in the event of a large-scale earthquake. We also are strengthening our ties with local communities by coordinating our response to natural disasters with local governments and administrative agencies.

Promoting countermeasures for older equipment

We are steadily promoting countermeasures for our city gas plants, such as the replacement of aging electrical equipment and instrumentation.

We are steadily implementing measures for our gas pipelines that are prioritized according to the type of pipe and the soil in which it is buried together with periodic inspection



Trenchless repair and rehabilitation of service lines

and testing of gas facilities. We are also developing and introducing into use trenchless methods for the installation as well as the repair and rehabilitation of gas pipelines.

Promoting efficient operation by introducing digital technology

The introduction of digital technology affords us greater efficiency and sophistication in the operation and maintenance of our city gas plants.

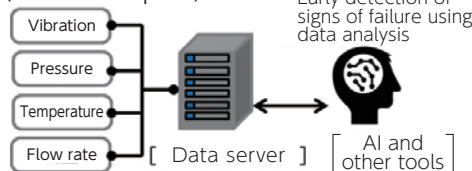
Double-checking with wearable cameras



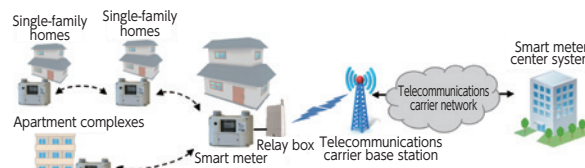
Job site

Central monitoring station

Preventive maintenance at facilities using operation data (artist's conception)



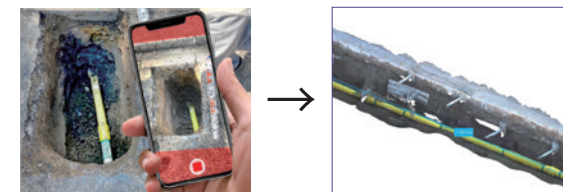
Smart meters, which will be introduced in fiscal 2023, enable remote monitoring of customer conditions. In addition to improved efficiency during ordinary meter reading, early detection of on-site abnormalities will enable us to respond in a timely and reliable fashion. What is more, in the event of a natural disaster, remote shutdown and startup of service can be expected to help expedite restoration work.



Configuration of the gas smart meter system

In addition, the introduction of 3D pipeline burial information and other advanced digital technology will promote efficiency and sophistication in on-site, management, and maintenance operations.

In addition, we are promoting more efficient gas pipeline replacement by prioritizing and targeting areas that are predicted to exhibit deterioration using AI developed in collaboration with the U.S. startup company Fracta. We also plan to market a system developed jointly by Toho Gas Network and Fracta.



Data acquisition

Creating 3D drawings

Technology for 3D gas pipeline burial information

TOPIC

Sales of gas production and supply technology to third parties

Toho Gas has developed a compact electrical power generation system that utilizes the unused energy source of pressure differential in city gas, and is preparing to sell this system to third parties. By integrating a turbine and generator into a single unit, we have significantly reduced the space required for and the costs of installation. Toho Gas offers unique pipeline engineering services, such as trenchless excavation, repair, and rehabilitation methods as well as remote monitoring systems that we make available to other gas utilities. We also collaborate with water utilities with which we have strong affinity in maintenance and management operations. We also cooperate with water utilities, with whom we share significant common interests, in maintenance and management operations. Toho Gas is working to grow into a dependable and versatile infrastructure provider.



Electrical power turbine generator

Business Report

City Gas Business

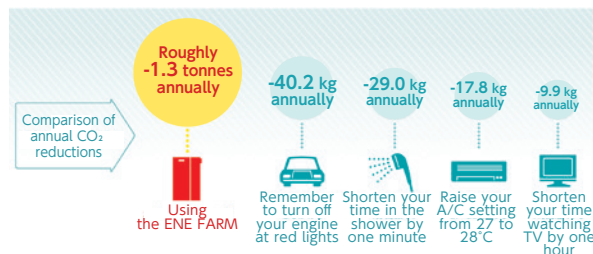
Expansion of services that enrich people's lives

We are developing products and services to fill a variety of needs above and beyond energy through our "This and That for Your Lifestyle, Toho Gas" program.



Household fuel cell ENE FARM

Models sold in FY2022 will have as a standard feature an electrical power generation function that helps strengthen household resilience against interruptions in energy supply.



Artist's conception of ENE FARM CO₂ reduction
Source: August 2017 *A Complete Guide to Energy Conservation in the Home: Spring, Summer, Fall, and Winter*, from the Agency for Natural Resources and Energy at the Ministry of Economy, Trade and Industry

Contributing to the spread of ZEH —net Zero Energy Homes

We promote proposals for ZEH that combine gas-powered hot-water floor heating with solar power generation and ENE FARM for a comfortable lifestyle. Our latest ENE FARM model, released in April 2023, is more efficient than ever.

Club TOHOGAS

—A website where you'll find special offers and added convenience

Club TOHOGAS is a convenient and economical web-based membership service that will help you "make

beautiful tomorrows." Members are able to check their monthly gas and electricity bills in a timely and easy-to-understand format that helps us protect the environment by reducing the use of paper.

Other features include "GASUTEKI," which is a fun-to-read column that offers useful tips for daily life, "GASUTEKI Points," which accumulate in accordance with your contracts for gas and electricity service and can be used to pay your gas and electricity bills, and the convenience of making a variety of requests online from your smartphone or PC.

As of March 31, 2023, more than 800,000 customers have become Club TOHOGAS members, and we are continually enhancing the services available via this digital point of contact with our customers.

Launch of the e-commerce website Kurashi Soko

Kurashi Soko is an e-commerce service available from Club TOHOGAS that aims to deliver enjoyment and excitement to your life. It's a place where you'll find goods and services you'd never imagined before that provide you with the thrill of trying new things. And we are continually adding new products and services that will fill the many different needs of your daily lifestyle.



Emergency Response Plumbing Service

In January 2023, we launched our Emergency Response Plumbing Service to provide customers with immediate help in response to sudden problems 24 hours a day, 365 days a year. Both Toho Gas customers and non-customers alike in Aichi, Gifu, and Mie (excluding isolated islands) can find help for sudden problems such as leaking faucets, clogged drains, and toilets that do not flush.



TOPIC

Using AI to improve customer service by accurately predicting requests for starting or stopping service

Since April 2023, we been using artificial intelligence (AI) to predict the number of requests we receive to start or stop gas service. Our goal is to optimize staffing levels by accurately predicting upcoming workloads, thereby improving our ability to respond to customer requests in a timely manner.

In general, the number of requests for start or stop of service tends to increase in March and April as well as on Saturdays, which is when many people change residences. We are sometimes forced to make sudden adjustments to our staffing levels to accommodate all requests. Pilot operation of this system was conducted from October to December, 2022, and achieved efficient staffing levels in just half the time previously required for forecasting.

Toho Gas is continually working on ways maintain safety and security while improving efficiency.

Improving customer service

Our Toho Gas Kurashi Shop sales outlet has long been a strength of the Toho Gas Group, and now, as we expand and strengthen our points of contact with our customers. In addition to providing expertise in the sale, installation, repair, and remodeling of a wide variety of appliances and equipment, we aim to be close to our customers as a partner in their daily lives by configuring an integrated and effective means of providing them with both energy and a diverse lineup of useful services.

Gas appliance repair service

Do you have a gas appliance that needs repair? You can schedule a service call with Toho Gas by phone or via the Internet 24 hours a day, 365 days a year.

Toho Gas customers with a valid contract who request repair of a household gas appliance by 7 p.m. will receive a service call no later than 9 p.m. that same day.



Toho Gas remodeling specialists: My House Meister

The My House Meister brand has 25 locations where you can find specialists in remodeling homes. Customer needs for housing are becoming more and more diverse. Let My House Meister will help you

address each of your needs in remodeling your house into the ideal home.



Gas Exhibition to be held concurrently with the 100th Anniversary Campaign

Our Gas Exhibition is held annually in October and November. We think it is an event that will please all visitors with raffles, demonstrations of the latest gas appliances, remodeling products, a diverse range of services, and consultations on improving your daily lifestyle.

The 62nd exhibition in FY2022 featured raffles that were held at exhibition sites in commercial facilities and Toho Gas facilities or sales outlets as well as on the exhibition website, all of which took place concurrently with the Toho Gas 100th Anniversary campaign.



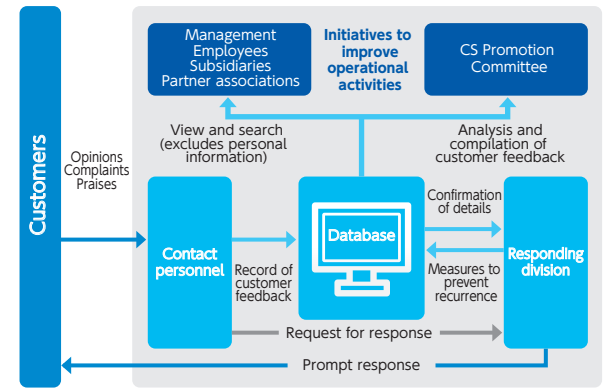
The Gas Exhibition



Enhancing customer satisfaction

The Toho Gas Customer Service Promotion Executive Committee and customer service committees from each of our departments, affiliates, sales outlets, and gas contractors are working together to enhance the quality of all operations and services in accordance with basic policies for customer service activities adopted by the Customer Service Promotion Board,

which comprises executive offices and general managers. Customer opinions are valuable management resources, which we share with the relevant departments, leading to prompt measures and business improvement, and the results of Customer Satisfaction Surveys are reported to the relevant departments to make improvements that enhance customer satisfaction.



TOPIC

Qualifications and training for sales outlets to develop gas professionals

Employees at sales outlets acquire the basic knowledge and skills they will need in the field and obtain the qualifications necessary to perform repairs on gas appliances or other related work at Toho Gas Training Centers. Currently, roughly 3,000 gas professionals are working to protect the safety and security of our customers.

Toho Gas Training Centers are where our employees not only learn how to suggest appropriate gas appliances but also acquire service knowledge and the skills to make proposals for remodeling for kitchens, baths, and toilets. Our skilled professionals help create comfort by responding to the individual needs of each customer.

Responding to diverse customer needs

We will further strengthen our proposals to integrate energy and engineering in helping customers solve their business issues, starting with the reduction of CO₂ emissions in their supply chains by measures such as fuel conversion to city gas, promotion of advanced energy use, and supply of carbon-neutral city gas.

Gas cogeneration systems

Power is generated via the gas engine and gas turbine, while the gas cogeneration system that collects the waste heat contributes to the improvement of power security, a reduction in the environmental load, and BCP.

Steam and hot water boilers

City gas boilers are widely used anywhere hot water, steam, or other forms of heat are needed, such as in medical care, cleaning linen, bathing facilities, and factories. Thanks to a high combustion efficiency and highly efficient operation in accordance with the load, not only are city gas boilers more energy-efficient than conventional oil boilers, they save space and represent a lower management burden.

Gas-powered air conditioning

In response to the diverse needs of our customers, we offer support for the installation of highly efficient, electric power independent gas turbines (heat pumps) that offer enhanced resiliency.

Suzuchu®*

Here is our proposal for an economical kitchen that minimizes heat from appliances even while cooking delicious meals with gas.

*Suzuchu® is a registered trademark of Osaka Gas.

Installing highly efficient, natural chillers

Natural chillers (gas absorption chiller/heaters) are eco-friendly, non-Freon air conditioning systems that use water as a refrigerant. Not only do they offer superior economy and ease of installation, they come with the benefit of helping prevent air pollution and leveling power loads by peak shaving, which is why they are widely used for central air conditioning at large facilities. These compact, light-weight units are also easy to replace.

A typical installation

Installation at the Aeon Mall Atsuta for the Aeon Retail Co., Ltd.

Some 20 years after installation, with their previous energy service contract about to expire and aging equipment increasingly prone to breakdowns, Aeon Retail Co. began to consider replacing its outdated facilities with new equipment.

Since replacement, there have been almost no equipment breakdowns, and we feel that tenant complaints about the air conditioning not working have decreased, as well. Not only that, but energy consumption has markedly decreased due to the greater efficiency of the new equipment, which in turn has reduced both CO₂ emissions and energy costs.



Two highly efficient, natural chiller units

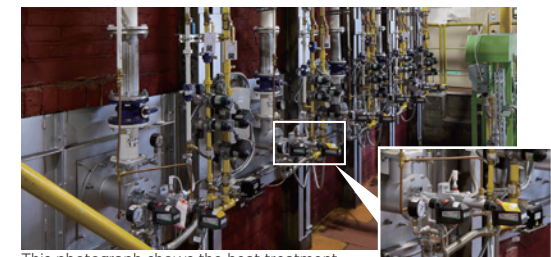
Demonstration of hydrogen combustion technology using a burner that combines hydrogen and city gas

In collaboration with Nippon Furnace Co., Ltd., Toho Gas has developed an industrial burner that can switch from city gas to hydrogen combustion without replacing any parts. Having overcome issues related to the use of hydrogen, such as backfire and other abnormal combustion as well as the deterioration of metal parts caused by high-temperature flames, this burner will enable easy, low-cost fuel conversion once a hydrogen supply network is in place.

A typical installation

Installation at the Kariya Plant of Aichi Steel Corporation

As part of our effort to achieve carbon neutrality by 2050, Toho Gas is promoting fuel conversion to low-carbon city gas. One of our projects was the conversion from heavy-oil burners to hydrogen and city gas burners in anticipation of the future availability of hydrogen at Aichi Steel Corporation's Kariya factory, which is a model plant for carbon neutrality. Carbon neutrality at the Kariya factory began with the introduction of renewable electric power and was achieved with the introduction of this burner as part of a fuel conversion to carbon-neutral city gas. Moving forward, Toho Gas intends to take on the challenge of testing prototype equipment and continuing its development of hydrogen combustion technology in preparation for the future availability of hydrogen.



This photograph shows the heat treatment furnace to which the burners were installed (background) and a burner assembly with piping attached next to the furnace (foreground).

Expansion of services to support business

In addition to launching the Toho Gas CN×P Business in support of our gas customers' efforts to achieve low-carbon and decarbonization, we are strengthening our energy-related services with an expanded range of products and services that will contribute to solving energy issues for customers in a wide range of industries. Services such as TOHOBIZNEX, a web-based membership service that provides total business support, will afford greater convenience and offer a wide range of useful information to our business customers.



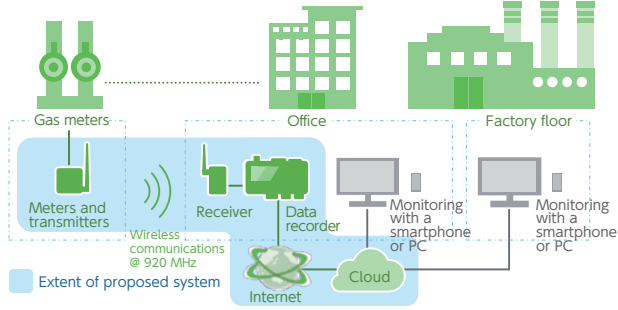
Major services offered by TOHOBIZNEX

Consulting services in support of achieving carbon neutrality Initiatives for Carbon Neutrality ▶ P.25
Visualizing your factory—Toho Gas Visualization Services
Toho Gas CN×P hydrogen burners
Hydrogen combustion trial service / Toho Gas hydrogen combustion testing
On-site solar power generation system (PPA model) ▶ P.80
Web reference service: Inquiries about Toho Gas city gas and electricity usage and rates
Franomista: Toho Gas inbound marketing (customer attraction) service for restaurants ▶ P.82

Factory visualization service for improved energy use

Toho Gas Factory Visualization service enables you to see city gas and electricity as well as steam and air. By visualizing a wide range of energy uses, we are able to propose improvements in how that energy is used. In addition to energy savings, factory visualization will help to improve the workplace environment and operational efficiency as well as to identify the cause of problems when they occur.

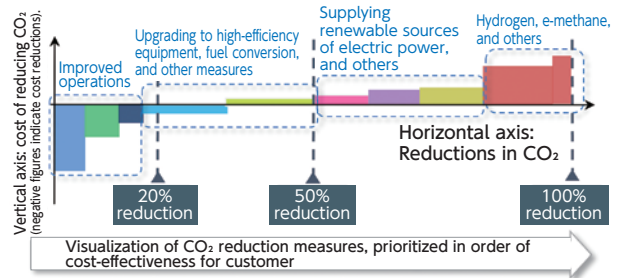
We also provide a variety of diagnostic services, including those for steam, chemical analysis, and industrial furnaces, which help save energy and solve problems.



A typical implementation (example of visualization of city gas at a manufacturing plant)

Consulting on the reduction of CO₂ emissions

We make an overall visualization of the customers' CO₂ emissions, determine appropriate countermeasures for reducing those emissions, and prioritize them based on cost-effectiveness. We also determine emission reduction targets and develop a medium- to long-term roadmap.



Emission Reduction Roadmap (based on Toho Gas's own carbon-neutrality curve)

Subsidy Application Support Service for aiding the introduction of energy-saving equipment or other measures

While there are a variety of grants and subsidies available from national, prefectural, and municipal governments to

support the installation of energy-saving equipment in factories and other facilities, there are also complex screening criteria and application procedures to be aware of when preparing applications. Given our many years experience dealing with all kinds of grants and subsidies, Toho Gas is uniquely qualified to assist companies that are applying for subsidies.

Expansion of hydrogen combustion trial services

Utilizing our know-how and expertise in the development of fuel conversion and burner technology, we actually use hydrogen as fuel in the existing equipment at the customer's factories and other facilities to identify issues in and devise countermeasures for enabling the use of hydrogen. In March 2023, construction will begin on a dedicated testing facility that will be able to accommodate larger furnaces.



Hydrogen combustion test field at the Toho Gas Technical Research Institute

Business Continuity Plans for IT systems: Housing Services (data center)

Toho Gas Housing Services enable our customers to store the servers for their own IT systems at the Toho Gas Information System Data Center. Information and data that are crucial to our customers' businesses are stored securely at our data center in a building that conforms to the latest earthquake resistance standards and is situated in a location that is relatively safe from the threat of earthquakes and other disastrous events. Toho Gas offers high-quality services based on our own extensive experience with security systems, data transfer systems with financial institutions, and other mission-critical core business operations.