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.

	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 m³)	3.61	3.61	3.45

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.

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

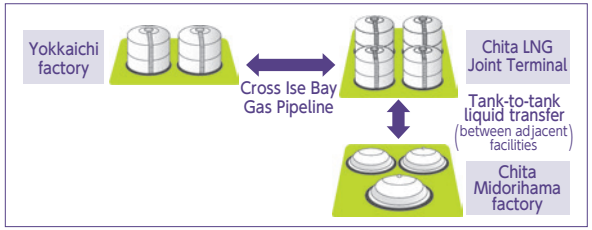
Prepare and implement a flexible yet dynamic response to sudden changes in supply and demand. We are also planning upstream development and investment in LNG carriers to strengthen the LNG value chain.


Ichthys central processing facility (CPF)


LNG Canada project (under construction)

Flexible operation of LNG receiving terminals

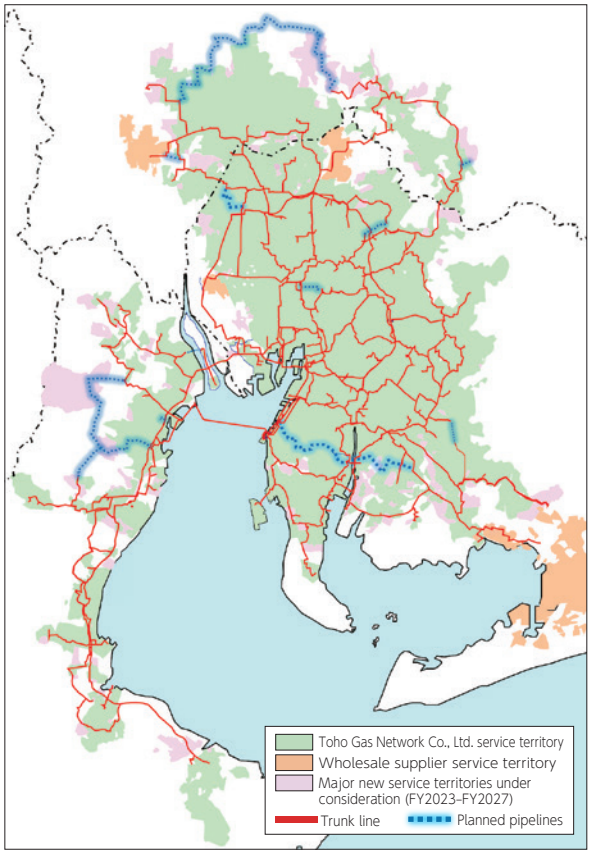
Flexible operation of our receiving terminal is achieved by utilizing both the Cross Ise Bay Gas Pipeline and tank-to-tank liquid transfer facilities.



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


"Tsunami screen" as a countermeasures against flotsam from\ factories

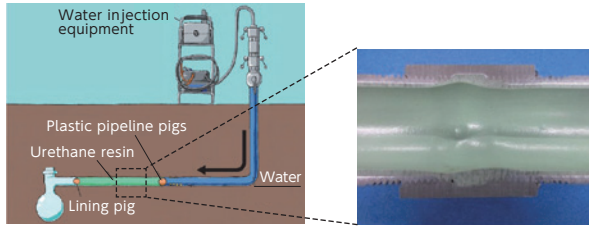
We have completed disaster preparedness countermeasures against large-scale earthquakes, such as the reinforcement of LNG receiving pipelines for city gas production, and against tsunamis, such as increasing the elevation of facilities. Moving forward, we will continue to enhance our disaster response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

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 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.



Trenchless repair and rehabilitation of service lines

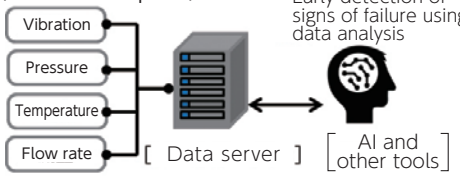
Promoting efficient operation by introducing digital technology

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

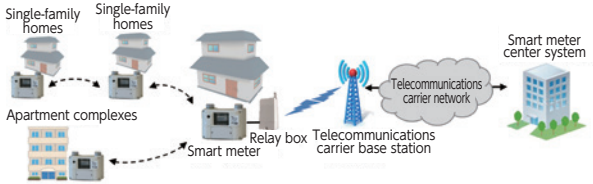
Double-checking with wearable cameras


Job site　　Central monitoring station

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



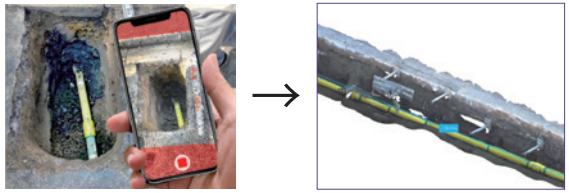
Smart meters, which will be introduced in fiscal 2023, enable remote monitoring of customer conditions. In addition to improved efficiency during ordinary meter reading, early detection of on-site abnormalities will enable us to respond in a timely and reliable fashion. What is more, in the event of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


Electrical power turbine generator

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.

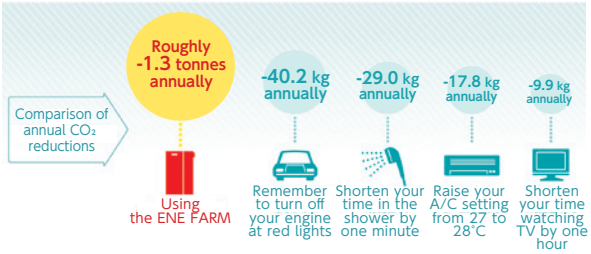
City Gas Business

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 CO_2 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.

わが家のマイスター
HOME REFORM by TOHO GAS

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

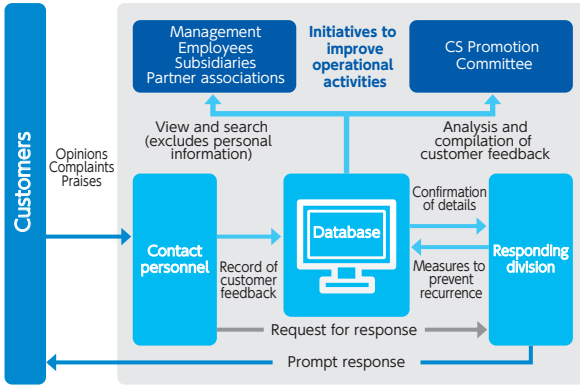
Our Gas Exhibition is held annually in October and November. We think it is an event that will please all visitors with raffles, demonstrations of the latest gas appliances, remodeling products, a diverse range of services, and consultations on improving your daily lifestyle.

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.

City Gas Business

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 CO_2 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 use 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 uses 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 CO_2 emissions and energy costs.

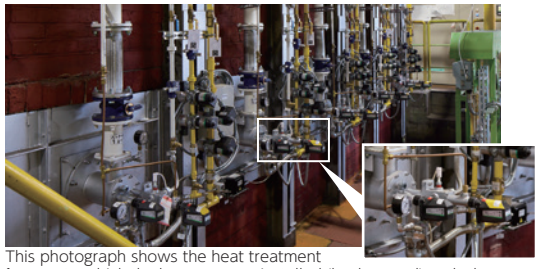
Two highly efficient, natural chiller units

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.

TOHO BIZNEX

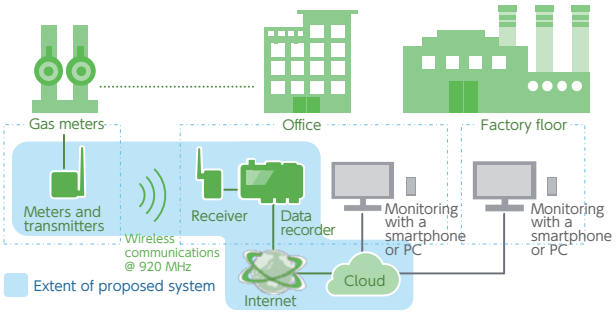
Major services offered by TOHOBIZNEX

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.

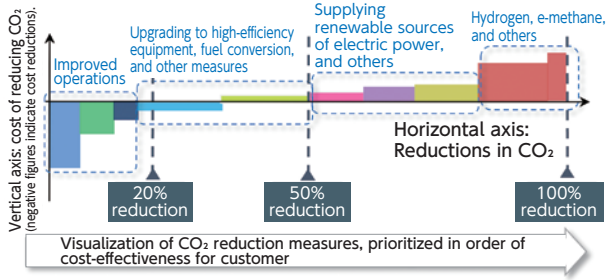
We also provide a variety of diagnostic services, including those for steam, chemical analysis, and industrial furnaces, which help save energy and solve problems.



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

Consulting on the reduction of CO_2 emissions

We make an overall visualization of the customers' CO_2 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.

Technical and Product Development

Technical Development Linked to Promotion of Carbon Neutrality

Toho Gas Group contributes to the achievement of carbon neutrality and other characteristics of a sustainable society by developing technologies that address the diverse needs and challenges of our customer's lives, businesses, and communities.

Development of technology to capture CO_2 from the atmosphere using cryogenic heat

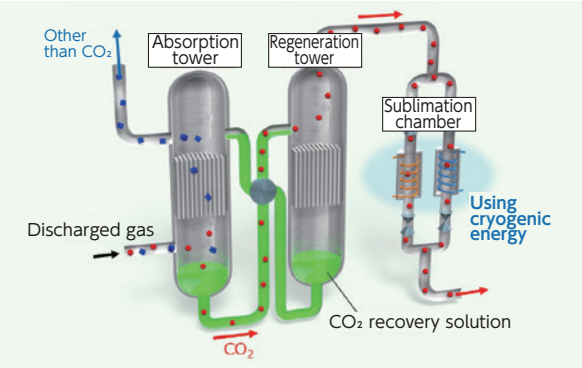
We are working to develop technology that will be widely available by 2050 to enable commercial-scale facilities to separate and capture CO_2 from the atmosphere as part of a project subsidized by the NEDO Moonshot Research and Development Program.

Cryo-DAC®* technology is unique in that it radically reduces the heat load required to regenerate CO_2 by adopting a CO_2 sublimation (dry ice conversion) system that utilizes cryogenic energy from LNG.(*Direct Air Capture)

Development of high-efficiency CO_2 capture technology using cryogenic energy

The Japanese government has established a Green Innovation Fund to subsidize development of technology that will drastically reduce CO_2 capture costs, and Toho Gas is working to meet that goal by developing a CO_2 capture technology called Cryo-Capture®, which utilizes unused cryogenic energy from LNG.

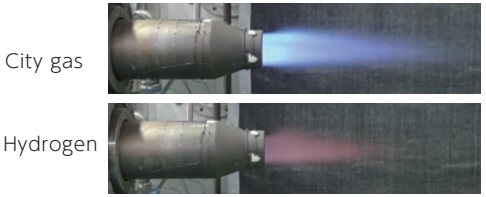
Once the pilot phase begins in FY2028, Cryo-Capture® technology will be implemented at an LNG terminal, and a series of carbon-recycling tests will be performed, in which the captured CO_2 together with hydrogen produced through water electrolysis will be used in the production of e-methane and its conversion to raw materials for the production of city gas.



Development of hydrogen burners

Toho Gas is working to develop new technologies for using hydrogen as a fuel for industrial furnaces, which are indispensable in manufacturing. Solutions to technical issues such as backfiring and other combustion instability, increased emission of NOx, and leakage of hydrogen are being developed by making improvements to burners for city gas and evaluating the suitability of solenoid valves, check valves, and other auxiliary devices for use with hydrogen.

We are using both test furnaces and our customers' production furnaces to evaluate temperature rise time and its effect on product quality when using hydrogen.



Trial operation of a hydrogen cogeneration system

We are working on the development of a city gas/hydrogen co-firing engine technology that can contribute to both low-carbon and decarbonized electric power generation. The results of both co-firing tests of gas engines and model simulations are used to solve problems that arise during hydrogen co-firing, such as suppressing abnormal combustion and reducing emissions of NOx. Toho Gas is promoting the future application of this technology to gas-engine cogeneration.

Developing products that enrich people's lives

Commercialization of the anti-cold, Trans-Warming® L Mat

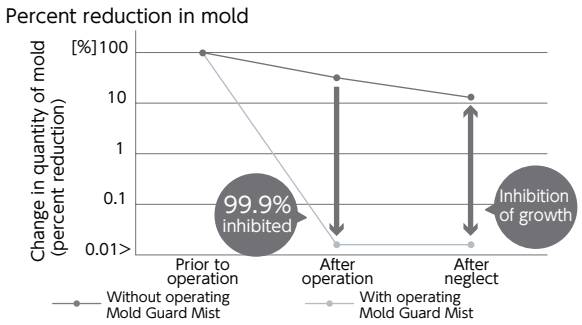
Toho Gas has commercialized its anti-cold, Trans-Warming® L Mat, a thermal mat that alternately stores and releases heat using a material developed by Toho Gas that retains latent heat. Using a solar collector to store heat from sunlight and then dissipating the stored heat by warping the metal strips built into the mat, the Trans-Warming® L Mat is perfect for keeping your feet warm. Capable of staying warm all night long, it can be used either as thermal protection during outdoor leisure activities or as a welcome addition to a disaster-preparedness kit.

Anti-cold mat

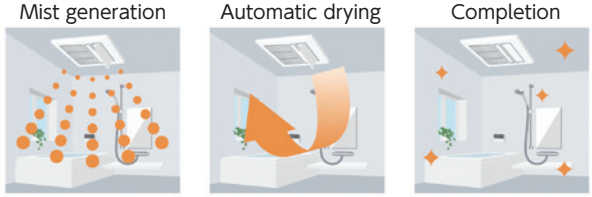
Development of a bathroom heater-dryer that inhibits the growth of mold

Noting that mold is susceptible to extremely hot water, we verified that the high temperature and high humidity of a mist sauna is capable of inhibiting the growth of mold and correlated the growth of typical molds present in the bathroom against temperature, humidity, and exposure time.

Based on this know-how, we developed jointly with Rinnai Corporation the Mold Guard Mist function, which can inhibit the growth of mold merely by operating the unit once every two weeks, and have incorporated this function into a commercially available bathroom heater and dryer with a mist sauna unit.



*Based on a survey by Rinnai Corporation. Test conditions as follows. ●Testing organization: NPO Mold Consultation Center ●Test Method: Mold was cultured at 25°C and humidity of 90% for 7 days, after which spores were transferred to a test specimen and placed on a wall near the floor of the bath and shower unit. ●Test subject: Black mold (Cladosporium cladosporioides) ●Before operation: Prior to operation of Mold Guard Mist ●After operation: Under rainy season conditions, 187 minutes of Mold Guard Mist operation (67 minutes of mist + 120 minutes of drying). Without Mold Guard Mist operation, the unit was left standing under rainy season conditions (rainy season conditions: 25°C, humidity 80%). ●After neglect: After neglecting the room for 14 days under rainy season conditions, both with and without Mold Guard Mist operation ●Test No. CFCJ Contract 22-045



Mist and warm air are used to maintain a high temperature and humidity, thereby inhibiting the growth of mold.

Operates automatically until dry.

Keeps your bath and shower unit clean by inhibiting growth of fungi that cause blackening.

Gour-meal — a multifunctional, reduced-pressure cooker— goes on sale

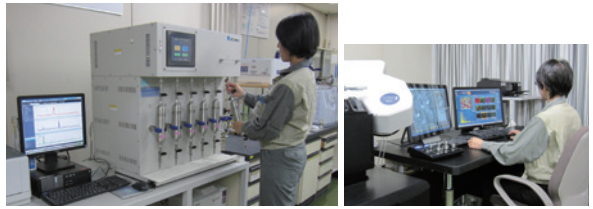
Toho Gas has begun sales of Gour-meal—an energy-saving, economical, multi-functional, reduced-pressure cooker, which it developed independently and now sells through the Toho Gas webstore and other sales channels. Reduced-pressure cooking is a great way to prepare meals that are flavorful, take less time to cook, and are less prone to boiling over.

Gour-meal—a multifunctional, reduced-pressure cooker

Sales of technology and know-how to third parties

Chemical analysis technology in support of business

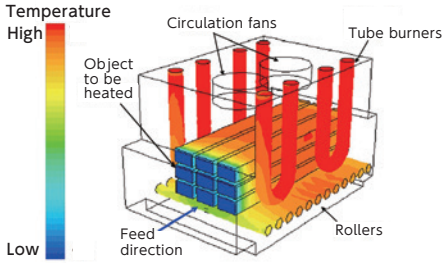
We utilize chemical analysis to ensure a safe and stable supply of city gas and to develop carbon neutrality technologies. We also maintain the capability to perform analysis as necessary to ensure the quality of the hydrogen gas we produce. We also include many of our analytical technologies developed in-house as part of the analytical services we offer our customers.



Chemical analysis

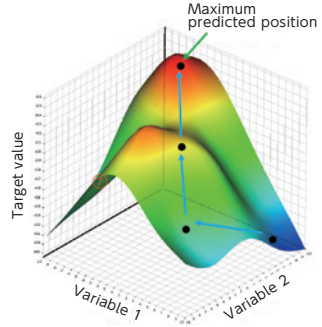
Technical support services using simulation technology

Toho Gas uses simulation technology to ensure a safe and stable supply of city gas, to promote new business activities, and to support our customers' efforts to achieve carbon neutrality. We conduct preliminary evaluations of heating performance and propose improvements for fuel conversion in industrial furnaces as well as performance evaluations and improvement proposals for city gas production and supply facilities.



Creating new added value using digital technology

In order to provide new services to our customers as well as to promote efficient and sophisticated business operations, Toho Gas is working to utilize cutting-edge data analysis technologies, including big data analysis of energy usage and machine learning in forecasting energy demand. By combining these digital technologies with our accumulated knowledge of energy-related equipment, we are able to create operating schedules for air conditioning and power generation equipment that minimize CO_2 emissions.



Optimal solution mapping

LPG and Other Energies

Business Overview

The LPG and LPG equipment sales businesses are being expanded. In addition, we are conducting LNG sales, fuel supply business, and sales of coke and petroleum products.

Sales in LPG and other energy businesses increased 15.6% year-on-year to 110.5 billion yen, and operating income increased 17.6% to 2.3 billion yen. The number of LPG customers increased by 1,000 to total 604,000 with a sales volume of 475,000 tonnes at the end of FY2022.

	2020	2021	2022
Net Sales (billion yen)	73.8	95.5	110.5
Operating Income (billion yen)	1.9	2.0	2.3
LPG Sales Volume (thousand tonnes)	462	486	475

Strengthening of the LPG Business

Increasing demand across our retail service territories and in wholesale

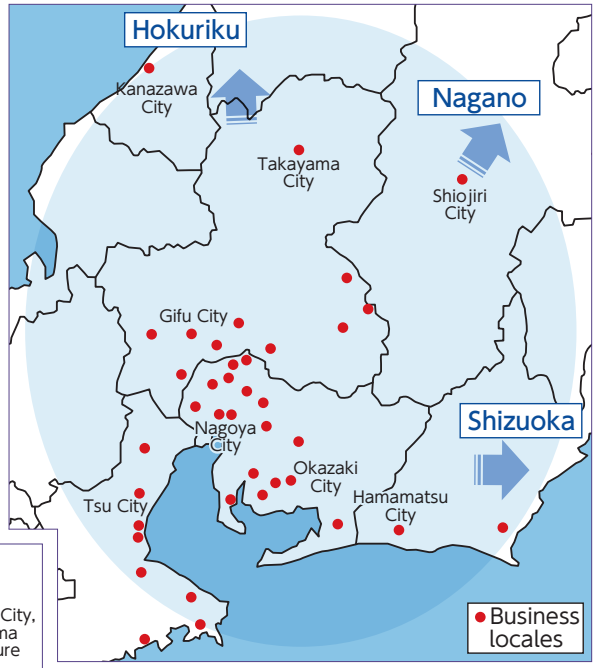
In addition to proactively developing demand throughout our core service territories of the three Tokai prefectures and Kurashiki City in Okayama Prefecture, we are working to develop residential, commercial, and industrial demand in the Hokuriku, Shizuoka, and Nagano areas. We are also working to expand our share of wholesale sales through contracted delivery and systemization support.

Stable Energy Procurement at a Reasonable Price

We are making every effort to achieve low-cost, stable LPG procurement by taking advantage of economies of scale and our own strengths as operators of one of the largest secondary terminals in Japan (storage capacity of over 5,000 tonnes).

Enhancing Filling and Delivery Foundations

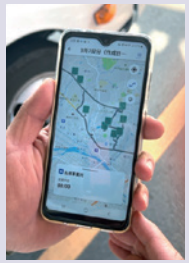
We are promoting improved efficiency of filling and delivery by reviewing the locations of our base facilities and other aspects of our operations. Moving forward, we are looking to improve efficiency even further by using remote meter reading technology and AI-based delivery route optimization in combination with our filling and delivery system.



TOPIC

Using LPWA wireless communications and AI

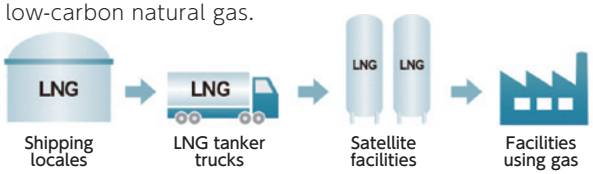
Toho Liquefied Gas Co., Ltd. is in the process of installing low-power, wide-area (LPWA) wireless communications terminals at its LPG supply facilities. The use of LPWA technology will enable remote meter reading of our customers' gas consumption. Also, in collaboration with Optimind Inc., a Nagoya University launched AI venture in logistics, we have developed a system that uses AI to automatically identify and display on a driver's smartphone optimal delivery routes. The implementation of these technologies in our delivery system will contribute both to reducing the burden on our delivery staff and ensuring a stable supply of gas.



Displaying an optimal delivery route on the driver's smartphone

Expanding our LNG business

LNG is delivered from the Chita Midorihama and Yokkaichi plants to satellite facilities on the customer's premises by LNG tanker trucks. The LNG is stored and then vaporized at the satellite facilities to supply clean, low-carbon natural gas.



Typical workflow from a shipping locale to a facility using gas

Electricity Business

Business Overview

The electricity retail business is expanding. We are providing electricity fee plans using renewable energy and a Company-oriented Solar Power Generation On-site Service.

The number of electricity customers increased by 62,000 to a total of 576,000 at the end of FY2022, with a sales volume of 2.37 billion kWh yielding a 51.5% year-on-year increase in sales to 108.2 billion yen but resulting in an operating loss of 10.5 billion yen due to increased procurement costs.

	2020	2021	2022
Net Sales (billion yen)	48.3	71.4	108.2
Operating Income (billion yen)	△2.9	2.4	△10.5
Electricity Sales Volume (billion kWh)	1.60	2.13	2.37

Strengthening our electricity business

As we work to build our reputation in our service territories as a rock-solid provider of energy, strengthening our electricity business as one of the diverse sources of energy we offer to our customers is a priority. We are also making every effort to lower or completely decarbonize our electric power sources and expand our electric services so that customers will choose Toho Gas electricity.

Procuring a stable supply of electric power

In addition to our own power sources such as the Yokkaichi Power Station, we procure a stable supply of electric power by combining several methods of procurement. We will also install large-scale storage batteries (grid storage batteries) that connect directly to the power grid. We are promoting initiatives to increase our in-house power sources, including studying the feasibility of acquiring large-scale power sources and the use of VPPs and storage batteries. Even as we diversify our electric power sources, we are working steadily to expand development and procurement of renewable energy sources in order to achieve our targets for volume of renewable energy sources handled.


Yokkaichi Power Station


Tsu Power Station (under construction)

Low-carbonize/decarbonize electricity

Expansion of renewable energy power sources

We are promoting the development and procurement of diverse sources of electric power, including solar and biomass as well as onshore and offshore wind power, while strengthening our system to stabilize the operation and management of power plants.

Electricity services

We offer a service menu that utilizes renewable and other energy sources to contribute to the low-carbon and decarbonization of electricity. And we are expanding that service menu to promote the efficient use of energy.

Green Eco Plan for Home Use

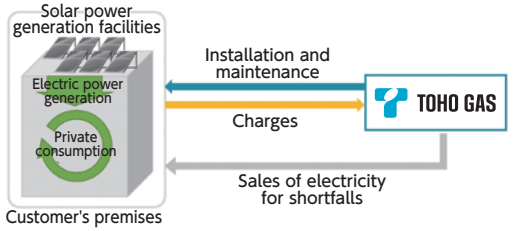
The Green Eco Plan for Home Use is an electricity rate plan utilizing electricity supplied from renewable energy sources with virtually zero CO_2 emissions. And we use non-fossil certificates derived from renewable energy sources.

For a home using 300 kWh of electricity per month (3,600 kWh/year), this amounts to a reduction equivalent to the CO_2 absorbed by about 100 cedar trees in one year.

*The carbon storage capacity per hectare of 50-year cedar trees in a planted forest is estimated to be 170 tons or about 190 kg of carbon per tree. Dividing 190 kg by 50 years, we can say that each tree is estimated to absorb about 3.8 kg of carbon or about 14 kg of CO_2 per year. (Source: Forestry Agency, Absorption of Carbon Dioxide by Forests)
*CO_2 emission coefficient is estimated to be 0.000462 tonnes of CO_2/kWh (national average for FY 2018)

On-Site Solar Power Generation Services for Corporations

This service enables a business to install, own, maintain, and manages solar power generation facilities on their own premises as an electric power supply for their own facilities. It also provides the customer with a renewable energy source that does not generate CO_2 emissions for an initial investment of zero yen.



Residential demand response service —Energy saving challenge

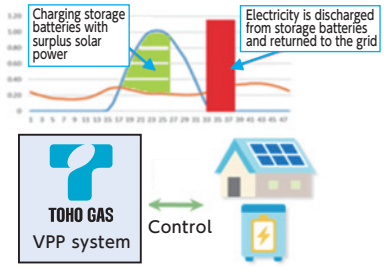
Toho Gas is offering rewards commensurate with the amount of energy saved to customers who respond to requests for energy savings made through the Club TOHOGAS app during the designated time period.

Screenshot of a typical energy saving challenge request

*The Ministry of Economy, Trade and Industry surveys, evaluates, and publicizes the level of information and services provided by electric and gas utilities to consumers in promoting energy efficiency and conservation.

Trial operation of VPP for residential use

We working on a plan to contribute to the availability of renewable energy by building virtual power plants (VPP) utilizing storage batteries and other means for residential customers, thereby increasing their contribution to the supply-demand balance of electricity.



Conceptual diagram of VPP trial operation (control of solar power generation and storage batteries)

Business Development

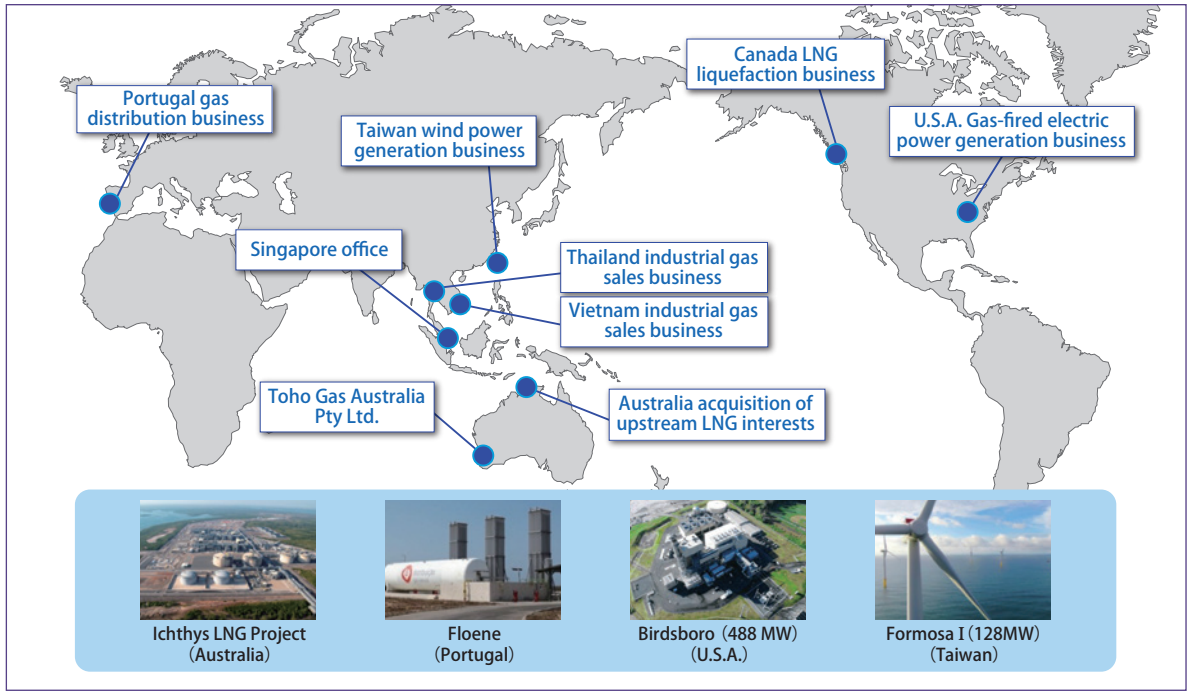
Business Overview (Other Businesses)

Business is expanding in Japan and in other countries, including overseas natural gas development and investment, LNG contract processing, LNG cooling and sales of liquid nitrogen, security control of gas equipment, real estate management and leasing, plant and equipment design and construction, the integrated utility services business, sales of residential equipment, data processing services, vehicle and equipment leasing, and more.

Net sales of other businesses increased 14.6% year-on-year to 54.5 billion yen, and operating income rose 36.9% to 4.2 billion yen, primarily due to increased sales at overseas subsidiaries.

	2020	2021	2022
Net Sales (billion yen)	46.3	47.6	54.5
Operating Income (billion yen)	3.3	3.1	4.2

Overseas energy businesses



As a strategic initiative to utilize the knowledge and expertise we have accumulated through our business operations to date, we are working to expand our overseas energy businesses, including gas, LNG, and renewable energy.

In Southeast Asia, where demand for energy is rising, Toho Gas Group's knowledge and expertise in the use of natural gas and other resources is contributing to both local economic growth and low-carbonization.

In Singapore and Australia, we are building information networks to identify new projects and provide sales and technical support to our investee companies.

In Europe, the U.S., and elsewhere, we are deepening our involvement in the management of businesses involved in the use of natural gas and promoting business surveys about carbon neutrality.

Australia	In addition to the Ichthys project and its LNG upstream concessions, we are involved in feasibility studies of projects related to carbon neutrality, including renewable energy and CO_2 capture and storage (CCS).
Portugal	Working jointly with Marubeni Corporation, we have set up a special purpose company for participating in the gas distribution business as well as investing in privately owned businesses that own gas distribution operators with business rights in their respective regions.
U.S.A.	Working jointly with Saibu Gas Holdings and Hiroshima Gas, we have set up a special purpose company to participate in a gas-fired electric power generation business in which Sojitz Corporation and others have invested.
Canada	Working with partner companies, we are participating in a project to liquefy natural gas.
Taiwan	Working jointly with Mitsui O.S.K. Lines and Hokuriku Electric Power Company, we have set up a special purpose company to participate in an offshore wind power generation project funded by JERA and other companies from Europe and elsewhere.
Thailand	Working jointly with Shizuoka Gas, we have set up a special purpose company to develop natural gas sales for industrial use with local companies.
Vietnam	With Vietnam continuing to experience economic growth, we have invested in local companies that are developing gas businesses and participating in sales of natural gas for industrial use.

Expanding Services and Contact Points with Customers

Toho Gas is working to enhance the content and convenience of its Club TOHOGAS membership service (▶ P.73) and the ASMITAS service platform in expanding its points of contact with customers.

ASMITAS life service platform

ASMITAS features a variety of services that will make your life more convenient and more enjoyable.

The Mitasu Kurasu information dissemination medium, the e-commerce site Mitasu Shop

To enhance the appeal of ASMITAS and keep customers coming back, we are strengthening our ability to communicate with consumers by launching Mitasu Kurasu, a website that features information on local products useful for daily life from local creators. And our e-commerce site Mitasu Shop offers visitors the opportunity to purchase little known gems from the Tokai region that can be found in content from Mitasu Kurasu.

Franomista receives an Honorable Mention from the Japan Subscription Business Awards

In December 2022, Franomista, a single-drink subscription service, received an Honorable Mention at the 2022 Japan Subscription Business Awards. For a monthly fee of just 550 yen (tax included, as of July 2023), Franomista subscribers receive a free drink daily at each participating restaurant they patronize. As an energy provider, it is only fitting that we take the slogan "Bringing more cheer to Japan" literally in providing energy to the people and communities we serve.

フラノミスタ

Enjoy a potager garden on your veranda: Nana Plants (7 Plants)

Our Seven Plants service enables customers to create a small potager that combines fruits, vegetables, and herbs to turn a balcony into a practical yet decorative kitchen garden. Toho Gas offers services that propose new lifestyles, such as ethical permaculture, which is a means to design a society where people and nature coexist in harmony.

ナナプランツ
7plants

Toho Gas Parking parking share system

Toho Gas Parking is a parking share system that enables owners to go through just a simple registration process in making effective use of vacant parking spaces by renting them out on a daily basis. Toho Gas Parking also enables drivers to easily find vacant parking.

TOHO TOHOGAS PARKING powered by 軒先

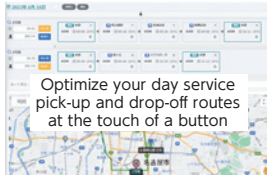
Toho Gas Car Share, an easy and convenient car sharing service

Toho Gas Car Share is a convenient car sharing service that enables users to reserve, check out, and check in a car from their smartphone 24 hours a day, 365 days a year. Toho Gas customers are also able to take advantage of a Toho Gas Electricity Contract Discount Menu.

TOHO TOHOGAS カーシェア

Welfare vehicle transport service supports nursing care facilities (day care providers)

This cloud-based service automatically creates optimized pick-up and drop-off routes for providers of day care who must pick up and drop off different people each day. Not only does this system reduce the manpower needed to create pick-up and drop-off plans manually, it also enables a facility to track the current location of each vehicle.



Walking application TOHOGASU

TOHOGASU is the name of our new walking application that contributes to better health. Achieve the targeted number of steps to receive points that can be accumulated and redeemed for Amazon gift certificates. Enjoy this easy-to-use app with a simple design.

E-commerce site Kurashi Soko ▶ P.73
TOHOBIZNEX, a web-based membership service that provides total business support ▶ P.76

Business Development

SUGUKONE Mobile

Toho Gas announces SUGUKONE Mobile, a mobile WiFi service that combines gas, electricity, and mobile service into an economical set.

Your device comes with 100 GB of monthly data usage and a free support center to ensure that you can enjoy the service with peace of mind.

スグコネモバイル

Utilizing real estate holdings and unused land

Toho Gas Group promotes initiatives that contribute to solving social issues and enriching local communities by proactively utilizing our expertise and assets, such as the sites of former sales offices and supply centers. Together with our affiliate, Toho Real Estate, we are working to create higher added value in urban spaces and to foster growth of local communities.

Highly efficient agriculture

As part of our efforts to contribute to regional development by promoting both the use of unused land and local production for local consumption, we are collaborating with Towing Co., a start-up that has developed technology for high-performance, artificial soil. During FY2022, after conducting trial cultivation of crops, Toho Gas invested in Towing, which is currently studying business models and cooperative arrangements for the sales of high-performance soil as they move toward commercialization of their technology as soon as possible.

High-performance soil

Cultivating strawberries

New bouldering gyms

In May 2022, a bouldering gym opened at Howa Minato Sports & Culture operated by Toho Real Estate. Popular with everyone in the community from children to adults, the facility includes a beginners wall, a 6.5-meter climbing wall, and the first cube-shaped attraction wall in the Tokai region.

Bouldering gym

Effective use of cryogenic energy

Low-temperature and cryogenic grinding business

Toho Reinetsu utilizes cryogenic energy to perform low-temperature crushing primarily of resins by means of a system that integrates crushing, classification, and mixing.

While there are some materials, such as rubber and plastics, that are difficult to crush at room temperature, many such materials rapidly become brittle at low temperatures, and our technology meets a diverse range of needs. Powders milled at low-temperatures are suitable for a variety of applications, including the grinding of substances with low melting points as well as those with high oil or water content, because of excellent flow characteristics, no heat-induced alteration, and low oxidative deterioration.

Low-temperature grinding plant

TOPIC

Chita Cool Salmon Land-Based Aquaculture

Land-based aquaculture of Chita Cool Salmon (second stage) began in November 2022, using unused cryogenic energy from LNG at the Chita Midorihama Plant.

Approximately 9,000 fish, almost three times as many as during the first phase from November 2021 to June 2022, were introduced and sold at major supermarkets from May to June 2023. The feasibility of commercialization is being evaluated based on the results of these trial operations.

Catch of salmon trout