Toho Gas Group Initiatives

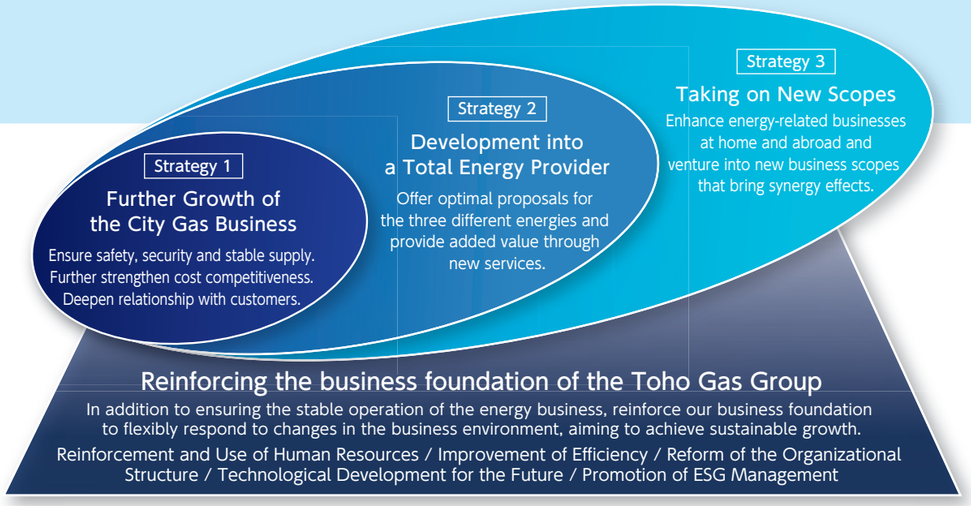
FY2019–FY2021

Toho Gas Group Medium-Term Management Plan

Grow with Energy — Go beyond Energy

In November 2018, the Toho Gas Group formulated a new Medium-term Management Plan (FY2019–FY2021). By implementing our three key strategies while reinforcing our business foundation, we will further strengthen our position as an energy company that is trusted by customers and has strong roots in local communities. We will also further expand our business scope to achieve sustainable growth.

Grow with Energy—Go beyond Energy



Strategy 1

Further Growth of the City Gas Business

Strategy 2

Development into a Total Energy Provider

Strategy 3

Taking on New Scopes

Reinforcing the Business Foundation of the Toho Gas Group

Toho Gas Group Initiatives Strategy 1

Further Growth of the City Gas Business

We aim to further strengthen cost competitiveness and deepen relationships with our customers, while solidifying the basis of our gas business, which consists of ensuring safety, security and stable supply, in order to continue to achieve growth in the city gas business.

Efforts to Support the Lives of People in the Region Materiality 1

As a partner in customers' daily lives, we will offer proposals for a comfortable and ecological life, and provide a wide range of services tailored to the various lifestyles of customers. In addition, by leveraging the strength of the Group's "security and service system close to the community," we will enhance support in the event of a problem and continue to be a company of choice for our customers.

Propose Comfortable and Ecological Life

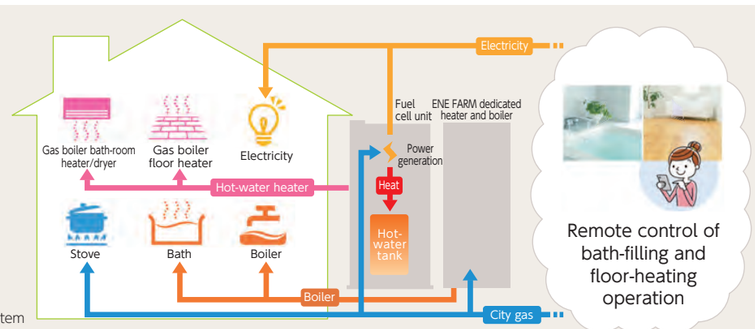
To further the popularization of zero-net-energy houses (ZEH*) and the like, we are promoting expansion of high-efficiency gas equipment that enhances convenience for customers.

ENE FARM is a residential gas cogeneration system that generates electricity for household use through a chemical reaction between hydrogen extracted from city gas and other fuels and oxygen in the air. The heat generated as a byproduct of this process is also effectively used for hot water supply.

We launched sales of the new model of ENE FARM on 2020. In addition to improving power generation efficiency (from 52% for the previous model to 55%), it is equipped with an IoT function to achieve remote control of city gas appliances. In addition, types that can continue power generation even during a power outage are also available in the product lineup.

ZEH: Residential housing whose aim is to realize zero annual net consumption of primary energy by achieving dramatic energy savings by vastly improving insulation performance and the like and adopting high-efficiency equipment systems as well as renewable energy.

ENE FARM type S residential fuel cell system



TOPICS

●Engagement of Mao Asada in a New Series of Television Commercials

Former ice figure skater Mao Asada has been appearing in the "My Answer Is Toho Gas Group" series of television commercial messages as our new brand ambassador since November 2019.

The "My Answer Is Toho Gas Group" messages showcase combination plans for gas and electric power, lifestyles featuring ENE FARM, gas-equipment repair services, and more.

Provide a Wide Range of Life Support Services

We are continuing to expand our living-related service menu, in addition to RakuRaku Kurashi Support, RakuRaku Maintenance, and RakuRaku Lease. As an example, in coordination with Air Trunk Co., Ltd., we are providing preferential use of home delivery storage services according to city gas and electricity contracts (limited to some areas).

らくらくBSUサポート RakuRaku Kurashi Support	Monthly charge of 305yen (tax inclusive)* for the following services 1 Emergency out-call service 2 Gas stove cleaning and water-heater inspection (separate charges apply) 3 Premium discount services
らくらくメンテ RakuRaku Maintenance	Water heater and built-in stove maintenance
らくらくリース RakuRaku Lease	A lease system for a reasonably priced use of various gas equipment
saGAS!	Application website for RakuRaku Lease

* Current as of July 2020 For details, please see our website.

Strengthening and Expanding Housing Renovation

We launched a new service for renovation, My House Meister, responding to a wide range of customer needs related to housing and living as a partner in the area of daily living.

From minor concerns to full-scale renovation, Meister is a one-stop solution as a general partner in customers' daily lives in the region.

わが家のマイスター HOME REFORM by TOHO GAS My House Meister Services (current as of July 2020)

- Awarding of T-Points according to contract amount
- Periodic inspection system
- Daily-life assistance service
- 10-year extended warranty for equipment

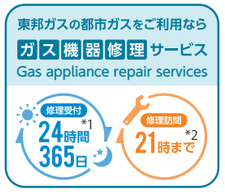
Also
- Easy consultation via LINE
- Prompt response for estimates
- Advance introduction to a construction system
- Support for cashless payment
- Meister membership program (awarding of discount coupons, etc.)
- Customer referral program

For details, please see our website.

Enhancement of Security and Service System Close to the Community

Around-the-clock phone service for customers expanded to cover the acceptance of reservations for gas and electricity connections*1 on top of dealing with requests for repair service. This is designed to enable customers' access to Toho Gas staff 24 hours a day, 365 days a year, as part of our efforts to make our service more convenient and expeditious for customers while relieving them of any source of concern.

High-quality services including a troubleshooting maintenance and repair service offering on-site repair of gas equipment up to 9:00 p.m.*2, free inspection that includes plumbing*3, and more are provided.



*1Acceptance of repair requests and reservations for gas and electricity connections only (on-site repair service is not included)

*2Gas appliance repair services from 7:00 p.m. to 9:00 p.m. are available to our gas customers for residential gas appliances. For details, please see our website.

*3For details, please see our website.

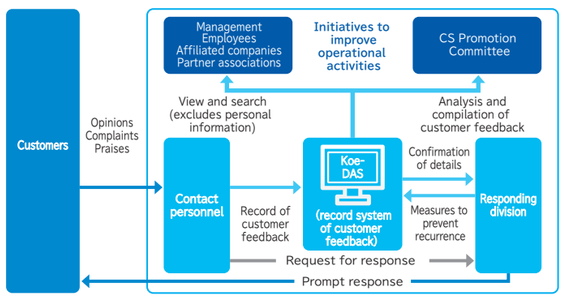
Improvement in CS* ※Customer Satisfaction

Based upon our management policy of "Customer First," Toho Gas Group has a CS Promotion Committee with members including officers and department heads, where we decide upon basic policy for CS activities. Based upon this, the CS Governing Board and CS organizations within each division, together with affiliated companies, ENEDO, gas engineering companies and others, work together to improve work quality and service.

Customer feedback gained through contact with various customers is used to create a valuable management resource database. In FY2019, we received 9,516 instances of feedback, including opinions, complaints, and praise. We share these with related divisions for the purpose of prompt response and operational improvements.

Also, we conduct a Customer Satisfaction Survey when customers subscribe to gas, have gas equipment repaired, or have our regular safety inspections. The results are reported to the relevant divisions, which leads to improvements for gaining better CS.

◎Flow of customer feedback



◎Examples of Improvements Made Through Customer Feedback (FY2019)

Customer feedback	Response
I want to pay my gas bill using electronic money.	LINE Pay added to payment slips as an available payment method
I want to earn Gas-Teki Points with my gas bill.	Launched service to automatically award Gas-Teki Points according to gas and electricity payment amounts
Making non-Japanese customers aware that there are different gas appliances for city gas and for LPG gas would ease concern.	Expanded the "FOR YOUR SAFETY" safety-awareness leaflet to provide information for non-Japanese.

Efforts to Support Manufacturing and Businesses in the Region

Materiality 1

Toho Gas proposes to customers a shift from oil-based fuels to gas, the introduction of energy-efficient gas facilities, and the use of diverse energy sources. These measures enable customers to conserve energy, reduce CO_2 emissions, and curtail business costs. We are also committed to providing high-quality services (total business support) to customers while using our advanced, up-to-date technologies. By doing so, we can contribute to manufacturing and other business development in our service area.

Highly Efficient and Diverse Use of Natural Gas

We are promoting fuel conversion for oil fuel customers by proposing high-efficiency burners utilizing our combustion technology.

We are also promoting the use of city gas in line with customers, such as energy savings, CO_2 savings, cost savings, and BCP by proposing highly efficient gas air conditioning and cogeneration.

We are also leveraging the energy-related technical capabilities and expertise that we have cultivated to strengthen proposals of diverse energy utilization.

Energy-saving diagnosis for an industrial furnace

Gas cogeneration system with a BOS* function
*Blackout start: A function to start up engine and supply electricity without using an external power supply source

TOPICS

●Sales Launch for GHP XAIR III

Sales began in April 2020 for he GHP XAIR III, which achieves even further improvements in energy savings and other aspects of performance and functionality as a next-generation high-efficiency gas engine heat pump – a gas air-conditioning system that achieves energy savings and lower power consumption.

GHP XAIR III

●LNG Bunkering

We conducted demonstration test at the Port of Nagoya in November 2019 for LNG bunkering, which entails using LNG tank trucks to supply LNG-fueled marine vessels with LNG. The LNG fuel was taken from the Chita-Midorihama Works to the Port of Nagoya by LNG tank truck, then supplied to a berth LNG-fueled tugboat.

We are using the findings from the demonstration test to make an appeal for the conversion of marine vessels to LNG fuel, and devoting effort to reduce the load on the environment.

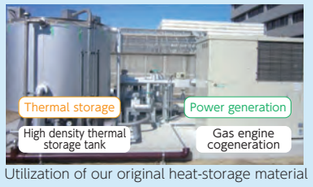
LNG bunkering demonstration test

Provision of Total Business Support

We are promoting moves that include proposal of energy saving and cost saving using heat storage material by our original technology, cost-saving proposals for utility equipment other than energy, such as water treatment equipment and compressors, and improvements in added value by utilizing digital tools, such as emergency response and maintenance of industrial furnaces.

High-density Thermal Storage Material

We developed heat-storage material with about 10 times the amount of heat storage of water. We will actively use our cogeneration system in various fields to promote energy conservation and cost cutting. For example, unused exhaust heat will be stored as thermal energy using the cogeneration system.



Utilization of our original heat-storage material

Expansion of Natural Gas Service Areas

Materiality 2 3

We will expand gas pipeline networks for city gas, broaden gas supply areas, and increase the capacity of gas transportation.
In addition, we will provide natural gas to a broader area by strengthening the supply system through the active use of LNG tank trucks.

Expansion of City Gas Service Areas

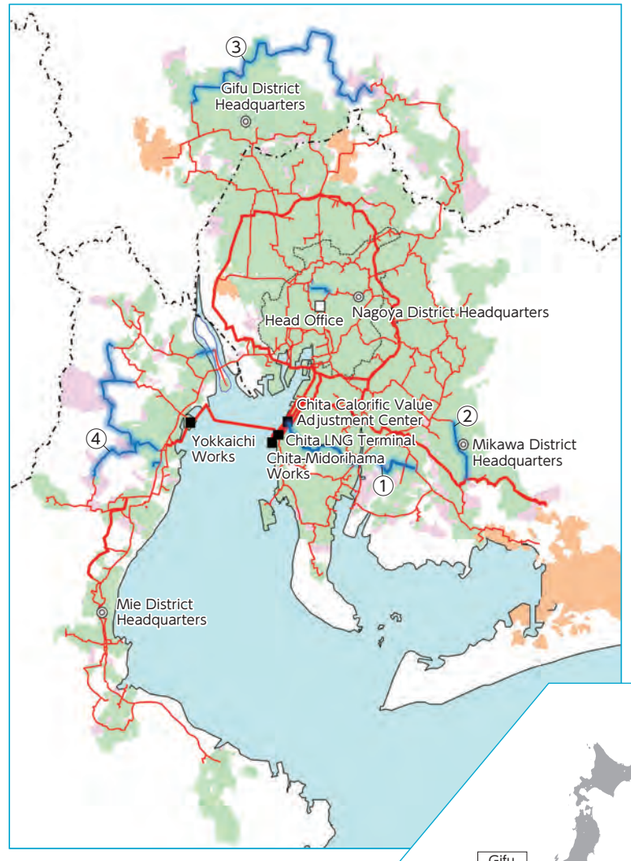
The gas pipeline network that Toho Gas has constructed heretofore has a total length of 30,000 km.

To supply city gas in a stable way, we are promoting improvement and expansion of the gas pipeline network from a medium- to long-term perspective, expanding the area of supply and increasing the amount of gas sent.

In FY2019 the Taketoyo-Mihama Line was completed, expanding the suppliable area for city gas on the Chita Peninsula.

We are promoting enhanced gas transportation capacity by laying trunk gas pipelines in southeastern Aichi Prefecture, together with expanding our service area for city gas through line extension works in Gifu and Mie prefecture.

Main planned lines		Pipeline length
Aichi	① Nambu Trunk Line (Chita-Anjo)	30km
	② Daimon-Sakazaki Line	10km
Gifu	③ Motosu-Gifu-Minokamo Line	60km
Mie	④ Inabe-Yokkaichi-Kameyama Line	50km



Trunk line construction work

Expand LNG Tank Supply to Wider Areas

We are promoting stimulation of gas demand not only in the three prefectures in the Tokai region but also in peripheral areas and the Hokuriku region by deploying LNG tank trucks.

LNG tank trucks

Stable Energy Procurement at a Reasonable Price

Materiality 2

We are promoting further diversification of procurement including procurement from new areas to ensure stable LNG procurement at reasonable prices and work to improve flexibility in procurement systems, including LNG receiving facilities.

Diversification of LNG Procurement

In order to ensure stable LNG procurement at reasonable prices, we will continue to implement measures to diversify procurement areas, price indexes, and contract types.

[Procurement areas]

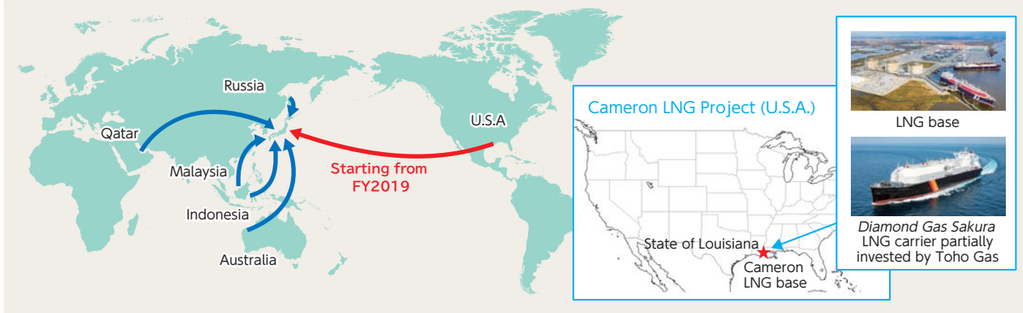
We have started procurement from the Cameron Project in the U.S.A, and expanded the number of suppliers under long-term LNG contracts to six countries. We utilizing LNG carriers partially invested by Toho Gas to transport LNG from the U.S.A.

[Price indexes]

We will establish a procurement system in which price indexes for crude oil and for natural gas in Western countries are combined in a well-balanced manner.

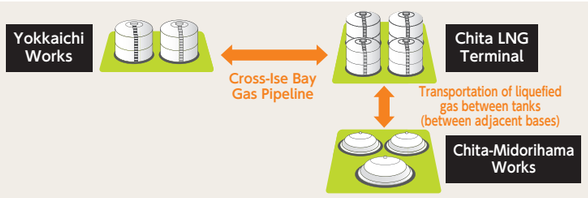
[Contract types]

We will work to effectively use spot and short-term procurement and improve flexibility in trading volume.



Flexible Operation of LNG Receiving Bases

We are utilizing the Cross-Ise Bay Gas Pipeline and LNG transfer between bases, strengthening inter-base operations, and establishing flexible and efficient operation of the terminals.



Secure Stable Supply and Safety (Strengthening the Resilience)

Materiality 2

To ensure the stable supply of gas, safety and security, which is the mission of an energy company, we will steadily advance security measures for production and supply facilities and disaster control measures.

Advance Security Measures

We are working to further reduce risk, repairing very aging facilities and preventing gas pipe damage caused by other construction work, and strengthen emergency security systems.
In the face of spreading new coronavirus infections, we will strengthen infection-prevention measures and sustain gas manufacturing and supply systems based on our business continuity plan (BCP).

[Measures against aging]

We are advancing the replacement and repair of plant pipework, electrical equipment, control equipment, etc. and replacement of aging pipes, including white gas pipes.

[Strengthening the security system]

We are working to establish a robust emergency security system in association with the expansion of gas supply areas and strengthen measures to suppress damage to gas pipes caused by other construction work.


Emergency security center

Advance Disaster Control Measures

We are promoting measures to protect facilities from earthquakes, windstorms, and floods (facility protection measures), to prevent secondary disasters (emergency response measures), and strengthening systems for recovering quickly from disasters (recovery measures), in terms of hard and soft infrastructure.

Facility Protection Measures

●Measures to Protect Manufacturing Facilities Against Earthquake and Tsunami

Equipment such as LNG tanks is designed to withstand major earthquakes, windstorms, and flooding. Tsunami screens have been installed to prevent damage caused by driftage from a tsunami.


Anti-driftage measures(tsunami screen) at a gas works

●Measures to Protect Supply Facilities Against Windstorms and Flooding

We are promoting incorporation of anti-flooding systems into governors (pressure adjusting equipment) to ensure a stable gas supply in the event of typhoon or torrential rain.


Governor anti-flooding system

●Gas Pipes with Superior Earthquake Resistance

We are promoting the spread of adoption of gas pipe materials and connection methods that offer superior resistance to earthquakes.

Polyethylene pipes have an indefinite lifespan with no risk of corrosion, and physical flexibility is excellent.


Laying polyethylene piping

●Measures to Protect Supply Facilities Against Tsunami

To carry out emergency response rapidly and reliably when a tsunami occurs, we are adopting a system that integrates warning and water-level information.

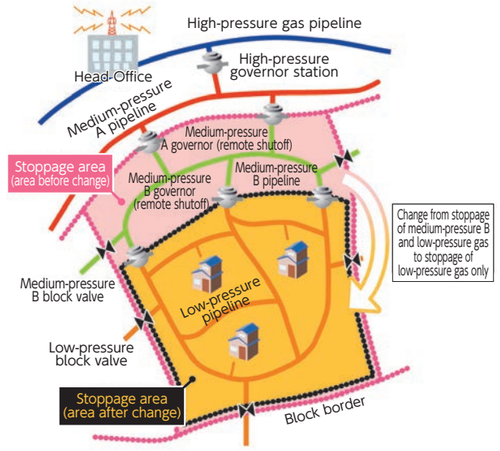

Tsunami decision support system

Emergency Response Measures

●Segmentation of Supply-stoppage Blocks

When an earthquake occurs we collect seismic data from approximately 250 seismometers (SI sensors) installed in our supply area and perform remote gas shutoff of medium-pressure A governors to stop the supply of gas in individual gas-pipeline network blocks, thereby preventing secondary disaster.

Further, to hold the impact of supply stoppages to a minimum and help bring about quick recovery, we are expanding the target areas for cutoff of medium-pressure B governors stopping only low-pressure supply.



Recovery Measures

●Disaster Drills and Establishment of an Emergency Supply System

To heighten the effectiveness of our BCP, we conduct an annual disaster drill in integration with our Group companies and partner companies, along with conducting constant reviews of the BCP to ensure it reflects the latest damage projections.

We have also made preparations for the emergency supply of city gas to core disaster hospitals and other socially vital facilities by means of mobile gas production equipment.


Mobile gas production equipment

●Use of IT to Speed Recovery After a Disaster

We will make gas-connection work after a disaster or accident more expeditious through the active use of IT. For example, arranging for gas-connection work will be accepted via the internet.

●Strengthened Cooperation in the Event of a Disaster

In aims of hastening mutual disaster recovery, we conduct joint drills with local municipalities, Self-Defense Forces, and other gas operators and retail operators.


Earthquake drill with the Nagoya City Sewerage & Waterworks Bureau


Material and equipment transport training with the Japan Ground Self-Defense Forces

TOPICS

●Agreement on Cooperation Signed with the National Research Institute for Earth Science and Disaster Resilience

In order to share information rapidly in the event of a disaster, we have entered into an agreement regarding cooperation with The National Research Institute for Earth Science and Disaster Resilience (NIED)*. By Toho Gas sharing information on areas where gas supply is stopped and receiving information on road damage, landslides, and the like provided by NIED, we will contribute to quick recover of gas service as well as to disaster response made with other involved entities.

* An institute whose basic objective is "realization of a society resilient to natural disasters" conducting research activities in a broad range of fields, including earthquakes, wildfires, meteorology, snow and ice, disaster-reduction studies, and social disaster mitigation.

防災科研 NIED
TOHO GAS

Toho Gas Group Initiatives Strategy 2

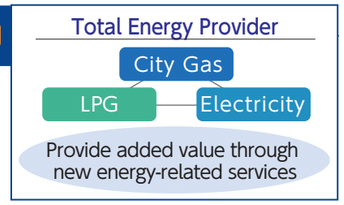
Development into a Total Energy Provider

We aim to become a Total Energy Provider that provides a one-stop service for offering optimal proposals for the three energies—city gas, LPG and electricity—and providing added value through new energy-related services.

Provision of Added Value Through New Services

Materiality 1

In addition to direct contact with customers, one of the Group's strengths, we will steadily provide new services by enhancing digital channels and provide one-stop added value beyond energy supply.



Provision of New Services

Under the concept of "providing services that satisfy tomorrow's lifestyles," the e-commerce website* ASMITAS was launched in March 2020 as a life service platform that provides services other than energy.

* An Internet website for product sales

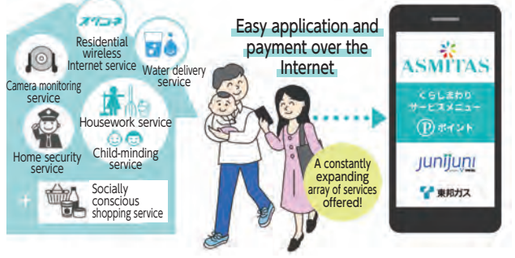
ASMITAS こころ、みたす、明日の暮らし。

[ASMITAS Life Service Platform]

With smartphones as the point of contact, we are providing one-stop services that make everyday life more convenient, comfortable, safe, and secure from this point on.

The first batch of services being provided is monitoring service through the installation of network cameras, home security services, water delivery through water servers, housework services, and operation of online shopping sites, with part of the sales earmarked for donations in order to contribute to society*. In July 2020, we began offering Sugu-Conne, our own independent wireless Internet service.

As well as energy supply, we will continue to expand a wide range of services to suit the tastes and various lifestyles of our customers.



Service	Description
スグコネ Sugu-Conne wireless Internet service	This is a residential wireless Internet service provided by Toho Gas. The basic usage charge is free for the first month of the contract, and no penalty fees are charged for contract cancellation. No wiring installation work is required – usage is simple and easy.
Peace Eye camera monitoring service	This is a camera monitoring service that can be used with no installation work required. Also, using it in combination with an appliance controller (optional) makes it possible to operate appliances using a smartphone.
SMART ROOM SECURITY Smart Room Security home security service	This is a home security service that can be used with no installation work required. With sensors that detect unwarranted opening of doors and windows and send alerts to a mobile phone, as well as a security company response service (optional), this provides support for safety and security.
PREMIUM WATER Premium Water water delivery service	This is a periodic delivery service for natural water dispensed from home-installed water servers.
Aqua Clara Aqua Clara water delivery service	This is a periodic delivery service for mineral-added designer water dispensed from home-installed water servers. The bottles used are collected for reuse.
Bears Bears housework service	This provides services that include everyday cleaning, cooking, shopping, laundry, ironing, and other such housework, as well as such services as house cleaning and child minding. Disinfection cleaning services were added in June 2020.
junijuni junijuni sponsored by TOHO GAS socially conscious shopping service ("JUNIJUNI" and "junijuni" are pending trademarks of Tokyo Gas Co., Ltd.)	This service sources products from manufacturers who endorse reducing product disposal due to such reasons as approaching best-by dates, and makes them available to customers for easy and convenient purchase. It aims to contribute to achieving SDGs through such means as reducing food loss. A portion of purchase amounts are donated to social-contribution organizations.

(Current as of end of July 2020)

Strengthening of the LPG Business

Materiality 1 2 3

We are expanding our business activity areas from the core areas of the three Tokai prefectures to increase the number of customers and sales volume, and reinforce the business foundation.

Business Deployment to Wider Areas

We are expanding our business activity areas to Hokuriku, Shiga, Shizuoka, and Nagano.

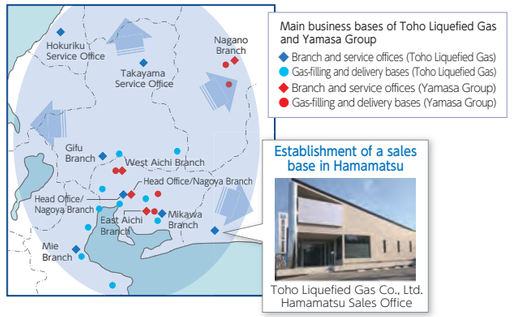
We set up a sales base in Hamamatsu in April 2020 to expand the area toward Shizuoka.

We are promoting the further expansion of demand by using the business bases of both Toho Liquefied Gas Co., Ltd. and the Yamasa Group.

Reinforcement of the Business Foundation

We are expanding shipping facilities as well as strengthening delivery networks and widen involvement in distribution networks in cooperation with other companies, thereby achieving both greater efficiency and stable supply.

We aim to realize stable and reasonably priced LPG procurement by using the non-international *Daiichi Horin-maru* cargo vessel jointly owned with Toho Liquefied Gas Co., Ltd., and by taking advantage of Meiko LPG Terminal, one of the largest secondary terminals for gas companies in Japan.



Horinmaru No.1
non-international cargo vessel

Meiko LPG Terminal

Expansion into the Electricity Business

Materiality 1 4

We are steadily increase power demand and diversify procurement to ensure stable electricity procurement at reasonable prices. We are also increasing the adoption of renewable energy to help further brings about lower carbon and decarbonization.

Electrical character "Ambear"

Smartphone app

Stable and Flexible Electricity Procurement at Reasonable Prices

We will achieve a stable, reasonably priced, and flexible power supply by taking into account customer usage conditions and optimizing the combination of procurement sources – power generation operators, wholesale markets for electricity, and the Yokkaichi Power Plant.

◎Changes in Numbers of Electricity Customers P64 Major Data

Enhancement of Services

Together with implementing measures such as sales promotion campaigns in cooperation with other companies, we are promoting verification testing for new service development, including construction of virtual power plants and home demand response.

[Demonstration of Virtual Power Plant (VPP) Construction]

Toho Gas has been taking part in the experimental project for building a virtual power plant (VPP) system (undertaken by the Ministry of Economy, Trade and Industry) since May 2019, which involves verification of power control technology utilizing multiple cogeneration systems.

[Demonstration of Home Demand Response (DR)]

Verification on an experimental basis has been underway since June 2020 for the effects of a demand response (DR) adjustment by Toho Gas, which is aimed at enabling customers to save electricity continuously in an enjoyable way. Through this verification testing, we are verifying the responses of participating monitors to requests from Toho Gas to conserve electricity during periods and times of rising demand for electricity, as well as the effectiveness of curtailment through such power conservation.

We will also develop power-cutting systems and hold events aimed at expediting power saving, both with the use of smartphone apps, in partnership with Nanzan University. By promoting such systems and events, which should be enjoyable for customers, we aim to develop new services.

Expansion of the Introduction of Renewable Energy

We are actively working to secure renewable energy power sources from the perspective of meeting social demand and customers needs with respect to reduction of carbon emissions and decarbonization.

[Expansion of the Adoption of Renewable Energy]

In FY2019, a total of 2.7 MW (at 5 locations) of solar power plants started operation, mainly in the three Tokai prefectures.

A solar power plant having an electricity production capacity of 1.4 MW on the former site of a Toho Gas factory began operating in April 2020. In this and other ways, we are promoting the development of power systems using other renewable energy sources.

Solar power plant ona former factory site

Toho Gas Group Initiatives Strategy 3

Taking on New Scopes

We will work to enhance energy-related businesses at home and abroad and venture into new business scopes with synergy effects, in order to expand our revenue-earning sources.

Reinforcement and Development of Group Businesses

Materiality 1

We will steadily expand Group businesses, particularly focused on the four scopes: the comprehensive utility service business, the renovation business, outside sales of production and supply technologies, and the use of our owned properties.

Strengthen Comprehensive Utility Services

We will provide a one-stop service ranging from design, construction and execution to maintenance and management of energy generation facilities including air-conditioning systems, cogeneration, and hydrogen stations. We installed gas air-conditioning systems at facilities in the cities of Okazaki, Toyota, and Yokkaichi in fiscal year 2019. The plan is in response to the adoption of gas air-conditioning systems at many elementary and junior high schools in these cities.

Construction work for a gas air-conditioning in an elementary school

Strengthen Renovation Business

Toho Gas will join hands with Toho Gas Group companies and ENEDO to steadily promote the housing renovation business. Toho Gas will thereby play a supporting role for local people in their daily lives.

We will offer renovation services in response to the diverse needs of customers. To that end, the Toho Gas Group will be united in deploying its marketing expertise, enhancing its technological expertise, expanding the range of products and services to be offered, and adopting a business approach targeting a broader spectrum of customers.

Promote the Expansion of Outside Sales of Production and Supply Technologies

We will step up the marketing of a new protective material for medium-pressure polyethylene pipes that were developed using our state-of-the-art pipeline technology called the "stream method," which received an award for excellence (2020) at the IGRC*, and the new calorific value adjustment system that received the Japan Gas Association's 2016 Technology Award.

* IGRC: The International Gas Research Conference, organized chiefly by the International Gas Union (IGU) 2020 (IGRC 2020)

Stream method

New calorie adjustment equipment

Use of Our Owned Properties P26

We are promoting development of Minato AQULS, together with expanding leasing business utilizing properties we own and expanding the rental meeting-room business utilizing our knowledge from our own buildings.

[Hivi Casa Rental Apartment Complexes]

Following on Hivi Casa Mizuho, which was completed in February 2020, a rental apartment complex is under construction on the site of the former Nakamura Sales Office in Nakamura-ku, Nagoya.

Hivi Casa Mizuho

Development of New Businesses

Utilizing the expertise and resources of business we have cultivated heretofore, we are actively engaging in expanding energy-related business operations in Japan and abroad.

Domestic Energy P47

We are utilizing the expertise and resources of city gas, LPG, and power business operations to strengthen business development such as regional electricity business installations and renewable power generation.

Regional Shin-denryoku operations are regarded as contributing to regional economic development by promoting local production and local consumption of energy and making active use of the profit generated through business operations. Toho Gas took part in a project for a Shin-denryoku facility in Okazaki City, which began supplying electrical power in July 2020. This follows previous participation in a Shin-denryoku project in Matsusaka City.

Overseas Energy

We are promoting entry into the energy-usage and LNG-terminal businesses as well as other businesses where we can make the utmost use of technologies and expertise in conduits and other components.

We have also initiated overseas power generation business initiatives.

[Joint Participation in a Gas-fired Power Project in the U.S.A.]

Toho Gas established a new company in March 2020 jointly with Saibu Gas Co., Ltd. and Hiroshima Gas Co., Ltd., and acquired an equity stake in a gas-fired power project participated in by Sojitz Corp. and Kyushu Electric Power Co., Inc. in Birdsboro in the U.S. state of Pennsylvania.

Birdsboro Power Plant

Minato AQULS

Materiality 1 3

[Promotion of Development of Minato AQULS]

Since its opening in September 2018, Minato AQULS, a smart town in Minato-ku, Nagoya City, has bustled with many visitors to LaLaport Nagoya Minato AQULS and sports facilities, and events, as well as fact-finding tours and more. In March of this year, occupants began to take up residence in the 165 condominium units at Park Homes LaLa Nagoya Minato AQULS (main developer: Mitsui Fudosan Residential Co., Ltd.), with 100 units expected to be filled by this October.

Park Homes LaLa Nagoya Minato AQULS (left and center: exterior, right: Enefarm)

In phase II development, attraction of facilities such as those related to education, health care, and welfare is planned, and foundation improvement work has begun.

Going forward, we will continue to promote development that can contribute to sustained growth together with the local community and the realization of an environmentally harmonious society.

[Cooperative Activities with the Region]

The Minato AQULS Urban Development Promotion Council is devoting effort to vitalizing Minato AQULS and the local community and engaging in urban development for safety, security, and comfort through such moves as upkeep and management of public spaces, creating vitality and interchange, and conducting disaster-response and crime-prevention activities while working in cooperation with the local community and administration.

Canal cleanup

Disaster drill

Starry-sky film festival

Eco-tour

[Smart Energy System]

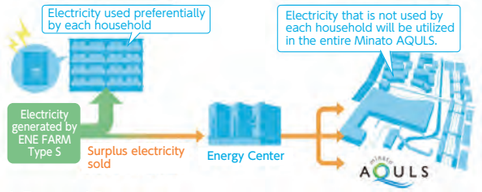
The Energy Center that is centrally located at Minato AQULS provides a centralized supply of electricity, heat, and gas to the town's facilities.

In addition to such distributed power sources as gas cogeneration (which enjoys high overall efficiency), renewable energy, and storage batteries, by optimizing the energy of the entire town using a community energy management system (CEMS) that utilizes waste heat from power generation and canal water as unused energy, at one year after the town's opening, we achieved a 60% reduction rate in CO_2 emissions (compared with 1990). In addition to the condominium units in which ENE FARM is implemented, we are engaged in bringing about optimized energy usage for the entire town.

We are also contributing to strengthening disaster-mitigation functionality in the region, including continuing to supply energy to the towns facilities together with supplying emergency electrical power to the adjacent Minato Ward Office in the event of a disaster, thereby achieving both low-carbon performance and disaster-response performance.

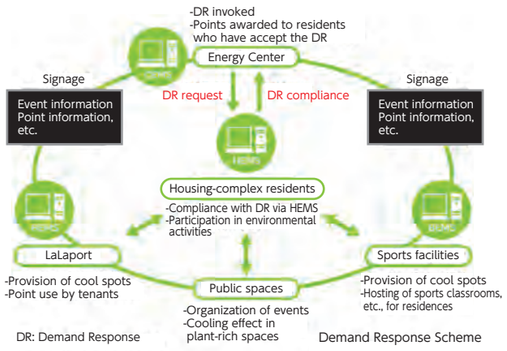
▶Local Production and Local Consumption of Energy

ENE FARM type S, standard equipment in all condominium units, is in rated operation around the clock, with the generated electrical power used preferentially by the residence, and any surplus used by the entire town. In this way, we are promoting local production and local consumption of energy.



▶Demand Response

Depending on the state of energy demand, facilities and residents are requested to conserve energy as needed, with cooperating residents receiving redeemable points that they can use in the town. Holding concurrent events and the like to encourage spending time out in the town is also planned.



TOPICS

●Recipient of the 2020 Aichi Environmental Award Gold Prize

Toho Gas received the 2020 Aichi Environmental Award Gold Prize in recognition for contributing in a major way to reducing the environmental load and forming a low-carbon society through development of the Minato AQULS smart town.

Award ceremony

Toho Gas Group Initiatives

Reinforcing the Business Foundation of the Toho Gas Group

In addition to ensuring the stable operation of the energy business, we will reinforce our business foundation to flexibly respond to changes in the business environment, aiming to achieve sustainable growth.

Reinforcement and Use of Human Resources P51~54 Human Resource Management

We are developing human resources to support the growth of the Group and realize flexible working styles to utilize human resources.

Employment and Development of Diverse Human Resources

In addition to recruiting new graduates, we are promoting recruitment and development of diverse human resources, such as strengthening career recruitment and follow-up training.

Human Resource Development Through an Internal Recruitment System

We publicly recruit new businesses for young and mid-level employees, and proposers of excellent ideas will be transferred to the business development department to develop human resources who can start new businesses.

Innovation leader training program utilizing the internal recruitment system

Strategy Workshop Training

We select leader classes in each department and develop them into management human resources who can lead business structure reforms into the future through in-house strategy formulation training.

Realization of Flexible Working Styles

We are improving the teleworking environment, which also contributes to enhanced working-style flexibility and emergency response.

In addition to promoting active participation by women and the elderly, we also work to support the balance between work and childcare, nursing care, and medical treatment so as to promote a work-life balance for employees.

Teleworking

Improvement of Efficiency

Promote radical improvements in efficiency, including the use of new and digital technologies.

Use of New and Digital Technologies

We are promoting teleworking and paperless operations by introducing company-wide cloud-type groupware.

We are investigating how to make field work more advanced and efficient by using tablets and drones.

Cloud utilization

Utilization of Drones in Pipeline Construction

We are streamlining on-site surveying and design work for pipeline construction through drone-based imaging combined with image processing. We are also considering alternatives to visual inspection of gas pipelines in bridges.

Drone utilization

TOPICS

●Joint Verification of Projected Pipeline Deterioration Using AI

Since August 2019, Toho Gas and Fracta (California, U.S.A.) have been conducting verification testing for using artificial intelligence (AI) and machine learning to predict deterioration in gas pipelines managed by the Toho Gas. This takes a piping-deterioration prediction AI algorithm employing over a thousand environmental variables and applies it to gas pipelines, and is the world's first attempt at such an endeavor.

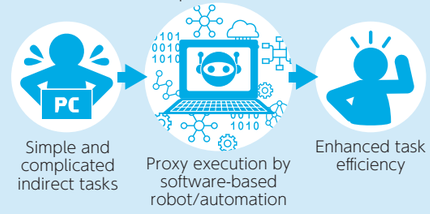
With the aim being to raise return on investment with respect to replacement of aging gas pipes, using the data on gas pipelines and inspection results that Toho Gas has collected and Fracta's leading-edge AI and machine-learning technology and environmental databases, we are promoting the creation of an algorithm to predict the degree or deterioration in gas pipes.

Business Process Re-engineering (BPR)

We are promoting radical increases in the efficiency of business by reviewing business flow and utilizing robotic process automation (RPA).

RPA was implemented in 130 operations by the end of FY2019, achieving an increase in efficiency by 74,000 hours per year.

■Illustration of RPA Implementation



Reform of the Organizational Structure

In addition to smoothly and surely taking measures to legally separate the pipeline division, we will promote a transformation of organization so that we can flexibly respond to changes in the environment for sustainable growth.

Actions Toward Legal Separation of Gas Pipeline Divisions

We established the Pipeline Network Company in April 2020, aiming for legal separation (spin-off) of pipeline division in April 2022.

To ensure neutrality and transparency, efficient business operation, and ensure group governance, the Pipeline Network Company has the necessary internal control and corporate functions as an independent operating company.

We are promoting steadily made preparation for spin-off while taking into account trial execution of tasks within the company structure.

FY2019	FY2020	FY2021	FY2022
	★Establish Pipeline Network Company		★Legal separation
Distribution Division	Pipeline Network Company		Pipeline-business company

Restructuring the Sales Organization

To respond to broad-ranging customer needs in accurately and promptly, in April 2020 we revised the structure of the sales division, consolidating the planning functions responsible for formulating sales policy, together with reorganizing the front sales functions responsible for actual operations up through providing services.

We will continue to enhance proposals that support lives and manufacturing in the region.

Technological Development for the Future Materiality 4

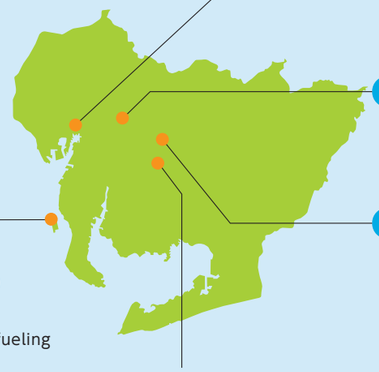
Initiatives with Our Eyes Set on Energy Distribution and a Hydrogen-based Society P33

Amid hydrogen being regarded as a major energy, we are promoting the development of hydrogen supply infrastructure and utilization technology. We are also promoting surveys and research into future technologies such as CO_2 separation and capture from combustion exhaust gas, and methanation utilizing CO_2.

Building of Hydrogen Supply Infrastructure

We will launch operations at the fifth hydrogen station in Toyota City by the end of 2020.
We are also promoting efforts toward cost reductions for hydrogen stations.

Centrair hydrogen station
Method: On-site
Feature: Operation of large-volume fueling (compatible with buses)
Operation start: March 2019



Minato AQULS Hydrogen Station
Method: Off-site
Features: Attached to Eco Station
Operation start: April 2016

Nisshin Hydrogen Station
Method: Off-site
Features: Attached to Eco Station
Operation start: May 2015

Toyota Ecoful Town Hydrogen Station
Method: On-site
Feature: Adoption of a packaged hydrogen station from overseas
Operation start: May 2015

Work underway for launching operations at the fifth hydrogen station in Toyota City by the end of 2020

Development of Hydrogen-use Technologies

We are promoting development of technology to use hydrogen as fuel at factories and other facilities.

Participation in Hydrogen Utilization Study Group in the Chubu Area

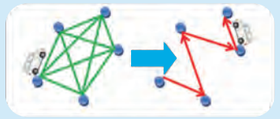
This consists of private-sector companies (including Toyota Motor Co., Ltd.) working on hydrogen use, and is engaged in discussing supply-chain and demand potential in the Chubu area and the possibility of large-scale use of hydrogen.

Utilization of Digital Technology

We are promoting utilization of the latest digital technologies to develop new services, enhance existing services, and improve efficiency.

Development of New Services

We are engaged in virtual power plant (VPP) construction (P24), demonstration of demand response (DR) for home use (P24), demonstration tests with start-up companies to utilize quantum annealing technology, which performs high-speed processing ft combination-optimization problems to elucidate the best-condition choice from among a combination of various choices.



Example of a combination-optimization problem (shortest route)

Enhancing Existing Services

We are utilizing data such as on energy consumption and owned equipment to strengthen proposals for products and services that meet customer needs.
We are also promoting an augmented lineup of gas appliances equipped with IoT functions, as well as support for diversifying fee settlement methods by introducing LINE Pay and other means.

LINE Pay

Promotion of Efficiency P28

We are promoting teleworking and paperless operations through the use of digital technology, as well as promoting endeavors such as the utilization of drones for route survey of new pipelines and the development of a gas-pipe deterioration prediction system using AI.

Participation in Keidanren's "Challenge Zero"

Challenge Zero

The Toho Gas Group is taking part in Keidanren's Challenge Zero* project, and is promoting technical development oriented to future decarbonization.
For detailed information, please visit the Challenge Zero website (https://www.challenge-zero.jp/en/member/119).

* Challenge Zero initiative by the Japan Business Federation (Keidanren), announced December 9, 2019
This initiative encourages innovation and serves as a sourcepoint for the economic sphere to take up the challenges of investment and financing aiming to proactively publicize, support, and implement actions to create net-zero-carbon technology (including transitional technology) and innovation taken by companies and organizations toward a decarbonized society.

Challenge1 Construction and operation of hydrogen stations and development of hydrogen usage technology for the sake of building hydrogen supply chains

Together with moving forward on the construction and operation of hydrogen stations for the sake of decarbonization in the mobility field, we are anticipating the building of hydrogen supply chains and working on the development of hydrogen combustion technology in industrial fields. We will contribute to the attainment of net zero carbon in multiple fields through the use of hydrogen.

Challenge2 Establishment of both advanced energy management and enhanced resilience for the sake of spreading renewable energy and distributed power sources

Through feasibility evaluation of virtual power plants (VPP), we are working on developing technology for electricity supply and demand coordination and are moving forward toward practical viability. In this way, we will contribute to expanding the amount of renewable energy installed. Also, through actual operation of smart energy systems composed of distributed power supply and heating equipment, we are accumulating energy management know-how that contributes to extremely minimizing CO_2 emissions and enhancing resilience. We will also investigate and research CO_2 capture and utilization (CCU) technology and combine the technology with the smart energy systems in order to contribute to the attainment of net zero carbon.

Challenge3 Development of high-density heat storage technology that contributes to the effective use of heat energy

With the objective of working for the effective utilization of unused heat in a wide variety of applications, we are working on developing performance improvements for high-density heat storage materials as well as expanding the range of usage temperatures for heat storage materials and opening up applications for them. In this way, we will promote the utilization of unused heat in a wide variety of fields and contribute to further energy conservation.

Promotion of ESG Management

Together with embracing international standards, we are promoting ESG management by rolling out local-community activities that contribute to achieving SDGs (P36) and strengthening corporate governance.

Promotion of ESG Management Based on International Standards

Identification of Key Issues (Materiality)

The Toho Gas Group, in moving toward "promotion of ESG management" as espoused in the Medium-term Management Plan (FY2019-FY2021), identified social issues of high importance to society (stakeholders) and the Group as materiality. (P13~14)

- Materiality 1 Provision of energy and related services
- Materiality 2 Ensuring safety and security, and stable supply
- Materiality 3 Contribution to local communities
- Materiality 4 Realization of a society in harmony with the environment
- Materiality 5 Reinforcement of human resources

Compliance and Governance

Endorsement of the TCFD As Efforts Addressing Climate Change P33

The Toho Gas Group announced endorsement in April 2020 of the Task Force on Climate-related Financial Disclosures (TCFD) to promote analysis of the risks and opportunities that climate change brings to business as well as disclosure of the information this yields. Together with this, we also became a member of the TCFD Consortium, which was established to serve as a forum for discussion by corporations, financial institutions, and other entities endorsing this initiative.

Participation in the UN Global Compact

The Toho Gas Group is a signatory to and participant in the UN Global Compact advocated by the United Nations.

The UN Global Compact is a voluntary initiative through which companies and organizations, by demonstrating responsible and creative leadership, act as good members of society and participate in the creation of a global framework for achieving sustainable growth.

The Toho Gas Group supports the Ten Principles of the United Nations Global Compact in the four areas of *human rights*, *labor*, *the environment*, and *anti-corruption*, and will promote resolution of social issues through business activities, together with contributing to achieving SDGs.

The Ten Principles of the United Nations Global Compact

Human Rights	〈Principle1〉	Businesses should support and respect the protection of internationally proclaimed humanrights; and
	〈Principle2〉	make sure that they are not complicit in human rights abuses.
Labour	〈Principle3〉	Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
	〈Principle4〉	the elimination of all forms of forced and compulsory labour;
	〈Principle5〉	the effective abolition of child labour; and
	〈Principle6〉	the elimination of discrimination in respect of employment and occupation.
Environment	〈Principle7〉	Businesses are asked to support a precautionary approach to environmental challenges;
	〈Principle8〉	undertake initiatives to promote greater environmental responsibility; and
	〈Principle9〉	encourage the development and diffusion of environmentally friendly technologies.
Anti-Corruption	〈Principle10〉	Businesses should work against corruption in all its forms, including extortion and bribery.

Promotion of Environmental and Social Activities P37~54

We have set goals for business activities and reducing environmental impact at customer sites, and are promoting the development of local community activities that contribute to achieving SDGs in cooperation with local governments and other entities.

Establishment of Toho Flower Co., Ltd.

Toho Flower was established in October 2019 with the aim of working to encourage hiring and lasting employment for persons with disabilities, and to achieve the Group's legally mandatory proportion of jobs for persons with disabilities in a sustainable way as well as to contribute to the local community.

Going forward, we will promote the creation of workplaces where individuals with disabilities can thrive while developing their own personal qualities and strengths through various office-support tasks in the Group.

Toho Flower's entire workforce proposed and discussed ideas and created this graphic logo, which presents an image of gentle kindness and *love* that is grounded on the corporate philosophy and course of action.

Toho Flower

Recognized As a "Certified Health & Productivity Management Outstanding Organization 2020 (White 500)"

In March 2020, Toho Gas was recognized as a "Certified Health & Productivity Management Outstanding Organization 2020 (White 500)" under a program administered jointly by the Ministry of Economy, Trade, and Industry (METI) of Japan and the Nippon Kenko Kaigi.

This program recognizes corporations that practice especially excellent health management based on efforts to address regional health problems and efforts to promote health that are advocated by the Nippon Kenko Kaigi. Toho Gas earned acclaim for the Health and Body Health Promotion Measures for Employees implemented by the company to support health and security around the clock, 365 days a year.

Establishment of Toho Gas Forest Seto in Seto City, Aichi Prefecture

To put into practice "protection of life on land," the 15th of the sustainable development goals (SDGs) adopted at the UN summit in 2015, we opened Toho Gas Forest Seto in Seto City, Aichi Prefecture, in May 2020. This follows upon earlier conservation initiatives in Odai, Mie Prefecture, and Mitake, Gifu Prefecture. With this, we are now engaging in forest conservation efforts by means of Toho Gas Forests in all three Tokai prefectures.

Going forward, we will encourage more employees and their families to experience the importance of nature for themselves and contribute to local communities together with working to raise awareness with respect to the environment.

Toho Gas Forest Seto

Reinforcement of Corporate Governance P55~58

We are strengthening internal controls through thorough risk management and compliance, including measures for disasters and cyber-security.

Efforts Addressing Climate Change

The Toho Gas Group has heretofore actively devoted effort addressing climate change through such moves as the spread and expansion, highly efficient use, and high-degree application of clean energy sources, such as environmentally friendly natural gas. Amid this, in financial markets where ESG investment is expanding, taking into account the frequent occurrence of natural disasters in recent years and in particular the focus of attention on the risks and opportunities accompanying climate change, in April 2020 we endorsed the Task Force on Climate-related Financial Disclosures (TCFD).

Henceforth, we will contribute to realizing a low-carbon society through supplying energy, together with also devoting effort to technical development with its sights fixed on future decarbonization.

TCFD TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES

The TCFD was established by the Financial Stability Board (FSB)* at the request of the G20 Finance Ministers and Central Bank Governors to study how to conduct disclosure of climate-related information and accommodate financial institutions. The TCFD released its final report in June 2017, which recommends that corporations and other such entities disclose the items shown below relating to climate-related risks and opportunities.

* An international body composed of financial ministers and central banks of G20 member nations which conducts governance relating to international finance

Item		Response	For reference
Governance	Governance for organizations involved in climate-related risks and opportunities	Risks and opportunities accompanying climate change are reported to the Management Committee and Board of Directors as key business issues, with the Board of Directors conducting governance regarding the status of execution.	·Corporate governance system P55 ·Risk management system P57 ·Environmental management system P37
Strategy	Accommodation of the impacts of climate-related risks and opportunities	We used scenario analysis to identify climate-change risks and organized our response to the impacts of risks and opportunities.	·See the chart on the page at right for an overview.
Risk management	Identification, assessment, and management processes for the climate-related risks	Risks arising from climate change are integrated into the risk-management systems and processes of all Group companies, and reported to the Management Committee and Board of Directors.	·Risk management system P57
Metrics and targets	Metrics and targets used for assessment and management	Risks and opportunities accompanying climate change are managed using gas sales volumes, environmental action goals, etc.	·Global warming countermeasures P40 ·Environmental action goals P38

Strategy (Impacts of and Responses to Risks and Opportunities Accompanying Climate Change)

The Toho Gas Group conducted TCFD-recommended scenario analysis using the 2°C and 4°C climate-related scenarios*. Referencing data from the International Energy Agency (IEA) for transition risks and data from the Japan Meteorological Agency and other such sources for physical risks, we modeled society in 2050 and organized "major risks and opportunities," "impacts," and "main responses" as indicated below.

For "major risks and opportunities," with our basic aim being to steadily advance energy policies and responses based thereon under the 3E+S principles grounded on the 5th Energy Basic Plan with cognizance of transitions, and thereby securely achieving the 2030 energy mix, we investigated response measures with our sights fixed on reducing carbon and future decarbonization.

* 2°C scenario: A scenario for the case of implementing the necessary measures to hold the increase in global temperatures to no more than 2°C lower above pre-industrial levels (RCP 2.6).
* 4°C scenario: A scenario an increase in the global average temperature to 4°C or lower above pre-industrial levels. This is a natural-course scenarios in the case of no implementation of additional measures with respect to climate change (RCP 8.5).

Classification		Major risks and opportunities*1	Impacts	Main responses
Transition risks	Policies and regulation	Increased carbon taxes	- Changes in competitiveness - Cost increases	>If carbon taxes are levied indiscriminately for fossil fuels, spread and expansion can be expected for natural gas, which produces low CO_2 emissions. Response Promotion of switching fuel types through application of fuel-related technology, promotion of expanding LNG supply using tank trucks to wider areas, promotion of LNG bunkering, etc.
		Sweeping policies for transition to renewable energy	- Impact on gas sales volume - Expanded demand for renewable energy	>We will promote efforts to spread renewable energy together with the spread and expansion of high-affinity distributed generation systems. Response Spreading renewable energy + distributed generation systems, high-level area energy networks (demand optimization using CEMS and VPP technology), realization of both minimization of energy consumption and resilience, etc.
	Market	Change in customer preferences	- Impact on industrial/commercial-use gas sales volume accompanying greater use of ZEVs (including FCVs)	>We will promote responses to the spread of fuel cell vehicles (FCVs) accompanying greater use of ZEVs. Response Accommodating supply of hydrogen for fuel cell vehicles, promoting improvement of hydrogen infrastructure, etc.
			- Impact on gas sales volume due to a shift to ZEHs and electrification	>We will promote the high-efficiency use of natural gas, including for heating, and proposals for energy optimization. Response Promotion of technical development and spread of high-efficiency cogeneration and fuel cells (SOFCs, etc.), proposal of optimal energy, including for heating, proposal of life support services, etc.
Physical risks*2	Acute	Increasing weather intensity	- Impact on manufacturing and supply equipment	>We will promote security and disaster measures for readiness against increasing weather intensity Response Reinforcement of shore protection and other high-tide measures, improved watertightness and other flood measures. Measures aimed at accelerating disaster recovery through segmentation of supply-stoppage blocks, etc.
	Chronic	Rising temperatures	- Impact on demand for heating and hot-water boilers	>We will proposed high-efficiency air conditioning in response to increasing air-conditioning needs accompanying rising temperatures. Response Promotion of technical development and spread of high-efficiency gas air conditioning (heating and cooling), proposal of optimal energy, including for heating, etc.

> Research and development relating to CO_2 separation, capture, and effective utilization (CCU) technology, methanation technology, etc.

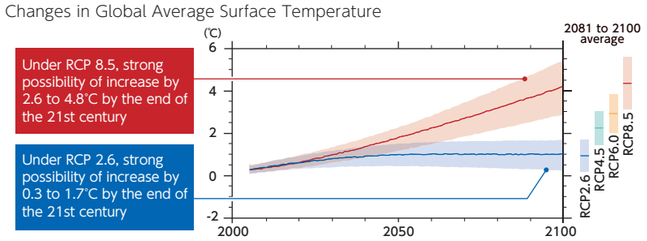
*1 ■ indicates risk and ■ indicates opportunity.
*2 Physical risk and its impact under the 2°C scenario is projected to change less in comparison with the 4°C scenario.

Glossary

RCP (Representative Concentration Pathways) scenarios

The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) presented four scenarios for increase in average global temperature by 2100 and indicated projections. The temperature was projected to rise by around 2°C in the scenario with the smallest temperature rise (the RCP 2.6 scenario) and by about 4°C in the scenario having the greatest rise (the RCP 8.5 scenario. The values of "2.6," "8.5," and the like following "RCP" represent effectiveness in causing global warming (called "radiative forcing"). The high is the value, the higher are greenhouse-gas concentrations and the greater is the effectiveness in causing warming.

Changes in Global Average Surface Temperature



Note: Changes from average temperature for 1986 to 2005*
Source: *Annual Report on the Environment in Japan 2020*
* In the period of 1986 to 2005, temperature rose by approximately 0.61°C compared with before the Industrial Revolution (1850 to 1900).
Source: Climate change 2014 Intergovernmental Panel on Climate Change Fifth Assessment Report Synthesis Report Summary for Policymakers

LNG bunkering
Supplying a marine vessel with liquid natural gas (LNG) fuel.

CEMS (Community Energy Management System)
A system of centralized management of the energy of an entire area.

VPP (Virtual Power Plant)
Controlling (utilizing) the energy resources of various consumers as if they were a single power plant.

FCV (Fuel Cell Vehicle)
An automobile whose motor is driven using electrical energy generated by the chemical reaction of hydrogen and oxygen in a fuel cell.

ZEV (Zero Emission Vehicle)
An automobile such as an electric vehicle (VEHICLE) or fuel cell vehicle (FCV) that produces no gas emissions.

ZEH (Net Zero Energy House)
A house whose aim is realize zero annual net consumption of primary energy by achieving dramatic energy savings by vastly improving insulation performance and adopting high-efficiency equipment systems as well as renewable energy.

SOFC (Solid Oxide Fuel Cell)
A solid oxide fuel cell is composed of ceramic material and is characterized by having a high power-generation temperature of 600 to 1,000°C. Expectations are high for its use as a cogeneration system offering excellent energy-saving and nonvolatile performance.

CCU (Carbon Capture and Utilization)
Technology for separating, capturing and utilizing the CO_2 in emissions from sources such as thermal power plants.