Tokyo Gas Group Management Vision

Compass 2030

Providing energy and solutions for future lifestyles, society and the earth

VISION - What we aim to be in 2030 -

Our goal will be a business group which continues to create value together with our customers, business partners and society as a whole while becoming a leader in future energy systems.

On November 27, 2019, we announced a new management vision called "Compass 2030", in which we presented what we aim to be in a decade from now, as a leading domestic company dealing in natural gas (a fossil fuel).

Our thoughts incorporated in Compass

In the half-century since we introduced LNG in Japan, we have promoted more widespread use of this new source of energy, leading the way to the age of natural gas. At present, with decarbonization, digitalization, customer diversification, and deregulation in the energy market, we are on the cusp of a new age of innovation. We believe that the proper roles of energy and energy suppliers will be questioned over the next ten years leading up to 2030. Looking toward the next half-century, we have formulated the "Compass 2030" management vision outlining the course that we should pursue in this age of uncertainty.

Management guidelines and key figures

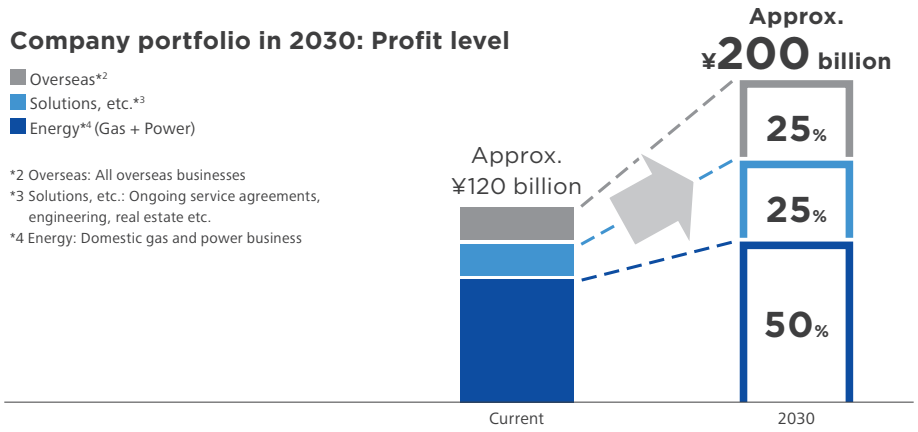
	FY2019 forecast*1	2030
Profit level	¥ 118.5 billion	**Approx. ¥200 billion**
Contribution to CO_2 emission reductions (base year: FY2013)	-5 million tons	**-10 million tons**
Renewable power source transaction volume (FY-end)	0.59 million kW	**5.0 million kW**
No. of customer accounts (FY-end)	12.2 million	**20.0 million**
Natural gas transaction volume (FY)	16.7 million tons	**20 million tons**

*1 At time of 3Q results

Company portfolio in 2030: Profit level

Overseas*2
Solutions, etc.*3
Energy*4 (Gas + Power)

*2 Overseas: All overseas businesses
*3 Solutions, etc.: Ongoing service agreements, engineering, real estate etc.
*4 Energy: Domestic gas and power business



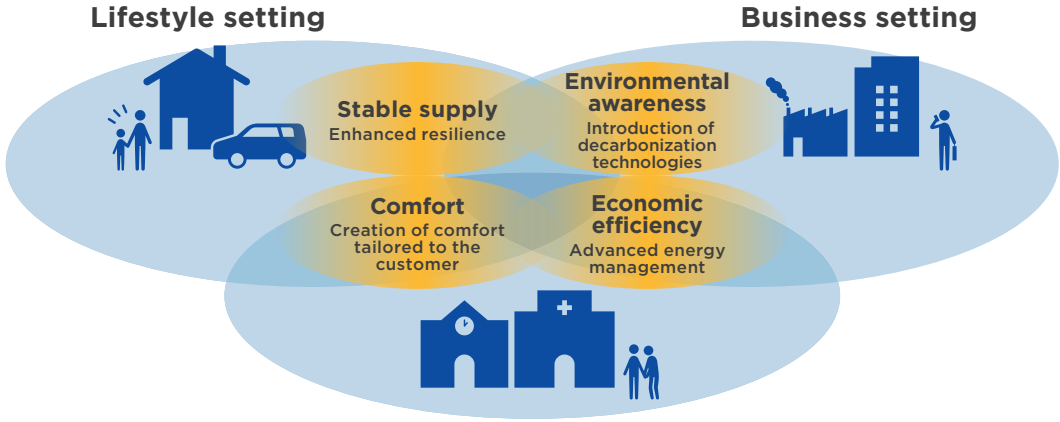
Q

What do you mean by "a business group which continues to create value"?

A

We envision a business group that establishes a "value co-creation" ecosystem and provides a variety of solutions.

A value co-creation ecosystem*1



Provision of solutions for the home

- Comfortable living spaces
- Lifestyles solutions that match life cycles

Local community

Expansion of management service

- Air conditioning control for office spaces
- Inter-area energy exchange between redeveloped or industrial parks and the local community

Customer participation	×	Strengths of the Tokyo Gas Group	×	Business partner participation
• Volume of energy use and equipment operation • Data on spaces and living environments • Excess energy from prosumers • Life cycle and lifestyle preferences		• Data and connections with customers (primarily through Tokyo Gas Lifeval) • Provision of gas, electricity and solutions • Equipment/appliances, construction and maintenance		• Energy technologies (IoT equipment, storage batteries) • Digital technologies (blockchain) • Data analysis (AI) • Connections with individual company customers

Toward our goal in the management vision of becoming a "business group which continues to create value together with our customers, business partners and society as a whole while becoming a leader in the future energy systems," we will strive to establish a value co-creation ecosystem. We will realize this by leveraging the strengths of our group, such as Tokyo Gas Lifeval, which functions as our last mile*2, alliances with business partners, including companies in different industries and venture firms, use of open-innovation, and cooperation with local governments. Moreover, by having customers participate in the ecosystem, we will flexibly combine diverse products, technologies and services, and provide a variety of solutions that resolve various issues in areas ranging from individual lifestyles to the local community.

*1 Ecosystem: Business environment in which many companies combine their technologies, expertise, and knowledge in their specific areas of strength in order to create new value.
*2 Last mile: Site operations that require human intermediation in the final process of the value chain.

Establishment of a value co-creation ecosystem: the strengths of the Tokyo Gas Group

INVISIBLE ASSETS

Lifeval—the last mile operator of Tokyo Gas

Our bonds and relationships of trust with our customers, developed over the past 135 years, are our greatest strength.

Tokyo Gas Lifeval acts as the face of Tokyo Gas in each community. We precisely meet customers' needs and serve as a one-stop provider of products and services that help improve the quality of life, in order to build close ties with individual customers.

Speedy response to customers and various efforts made in direct contact with them

I am in charge of repairing gas appliances in an area of around 150,000 households in Izumi-ku, Totsuka-ku, and Sakae-ku in the city of Yokohama and I visit 5-10 customers per day. When a customer requests a repair, I try my best to visit the customer as soon as possible and promptly complete the repair, so as not to cause inconvenience to the customer's life. I also have to tailor my visit to the lifestyle of the customer who will be present for the repair and efficiently and safely complete the repair. In order to accomplish this, I make continuous efforts to obtain knowledge and know-how needed for the repair, and to prepare in advance and bring all parts which may possibly be needed, depending on the type of repair.

Communication aimed at obtaining new business opportunities

I am in my eleventh year with the company. When I was assigned to repairs, I had little specialized knowledge of repairs. I have therefore absorbed knowledge and know-how from my seniors and steadily accumulated experience. I have also accompanied my sales associates and learned how to communicate well with customers. I now can make proper greetings and explanations to customers by myself, depending on their situation. I try to speak slowly and clearly to elderly customers, while I explain repair details concisely and accurately with fewer words to customers who are busy. To every customer, I make sure to say after the repair, "Please feel free to let me know if you have any problems related to your residence, other than gas appliances." This has led to consulting about customers' plumbing problems and receiving a designated order for renovations in many cases. I will continue to make various improvements so that I can receive new requests.

As the last-mile operator of Tokyo Gas, we are committed to helping support customers' lives

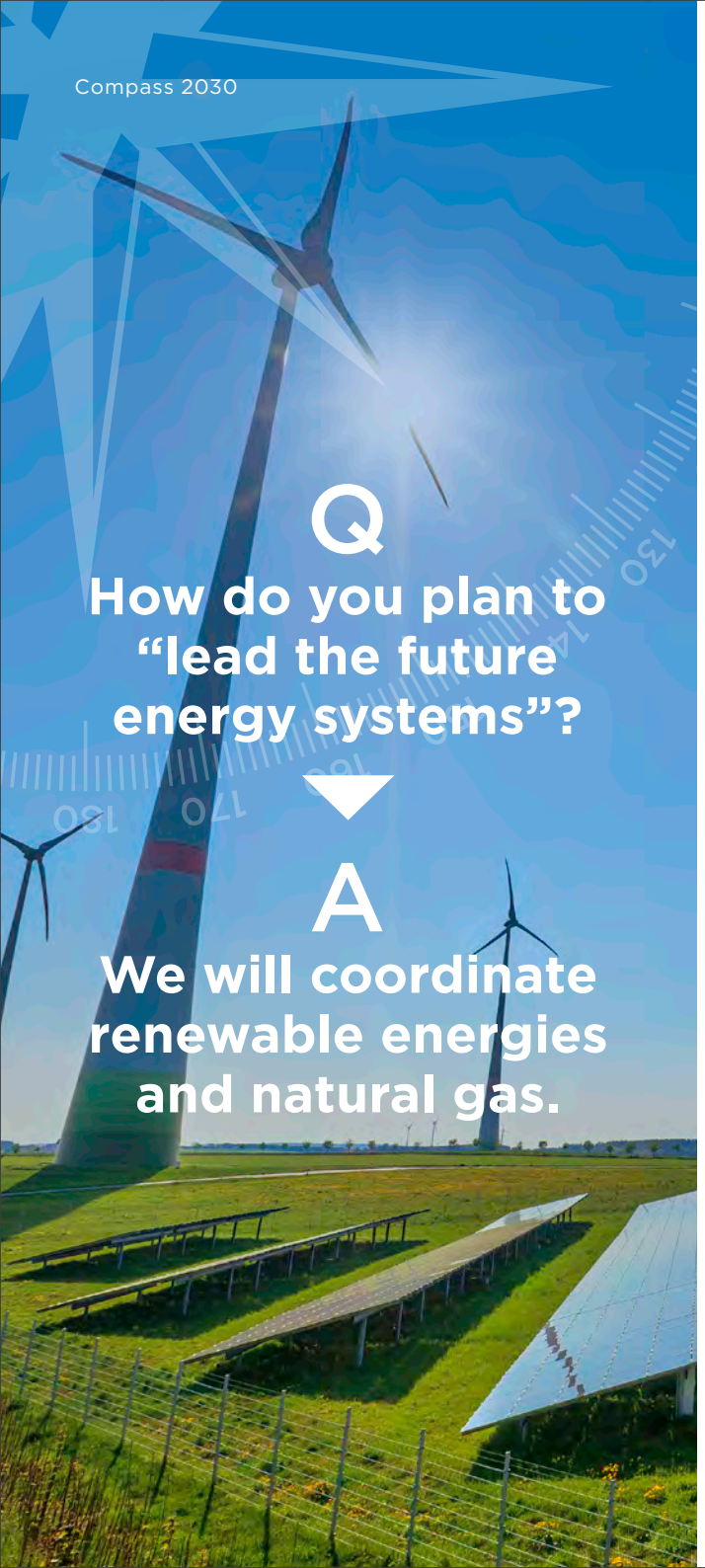
Our job is to closely ascertain the needs of customers through direct contact with them and provide solutions that are actually necessary. This cannot be possible unless we establish bonds and relationships of trust with customers. In addition to conducting thorough and reliable repairs, I try to remember the customer's name and the conversation I had in the past and to show up at their residence when I am in the neighborhood. Such small encounters, when they accumulate, enhance relationships of trust with customers, capture their needs in a timely manner, and lead to new business opportunities. I am determined to continue to enhance my technical skills, cherish the contacts with customers, and help them to create a safe, reliable, and pleasant lifestyle.

Bonds with customers*1

Community-based	Outlets	174 outlets
	Employees	13,000
Direct contacts	Repairs, etc.*2 and periodic safety inspections*3	5.2 million contacts

*1 Including Enesta and Enefit
*2 Repairs, etc. include opening/closing of gas fixtures.
*3 FY2019 result

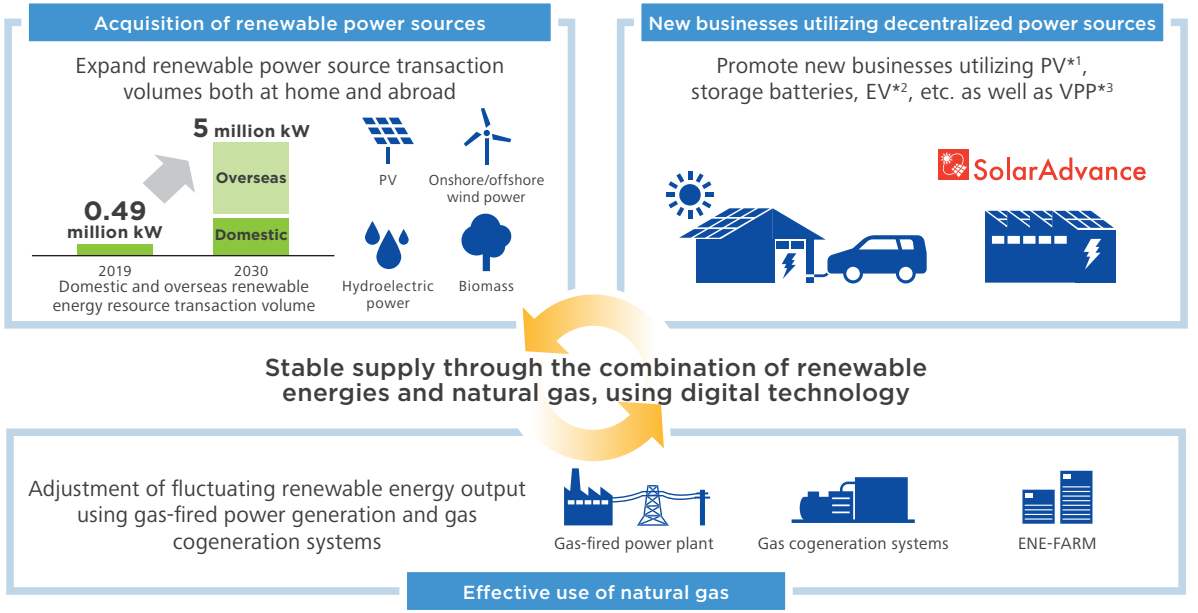
Maintenance Group,
Izumi Outlet
Yokohama Totsuka
Tokyo Gas Lifeval
Tokyo Gas Ecomo Co., Ltd.
Abe Masaru



Q
How do you plan to “lead the future energy systems”?

A
We will coordinate renewable energies and natural gas.

Coordination of renewable energies and natural gas



*1 PV: Photovoltaic power, *2 EV: Electric vehicles,
*3 VPP: Virtual power plant. A mechanism that uses IoT to manage and control decentralized power sources, batteries, etc. as if they were a single power plant.

Tokyo Gas Group is striving to coordinate renewable energies and natural gas

In order to achieve decarbonization, the Tokyo Gas Group is accelerating efforts to acquire renewable power sources both in Japan and global markets while striving to combine renewable energies with clean natural gas, which offers excellent controllability. Toward the same goal, Tokyo Gas will also expand the transaction volume of renewable energy sources by making use of the strengths of domestic and overseas business partners. However, renewable energy’s susceptibility to the weather is an issue. In contrast, natural gas-fired power plants can be flexibly operated and complement fluctuation in the generation volume of renewable energy. The role of natural gas-fired power plants will therefore expand along with an increase in the use of renewable energies. We are therefore promoting effective use of natural gas that leverages its strength.

We are also developing a service to purchase excess PV electricity, targeting customers whose Feed-in Tariff (FIT) purchase period is to be terminated, and a new business to use PV, storage batteries, and other decentralized power sources. Further, we are promoting Virtual power plant or VPP, which uses digital technology to automatically integrate and control renewable energies, gas cogeneration, and decentralized power sources, such as batteries, as if they were a single power plant.

By combining decentralized power sources with large-scale power sources, which include renewable energies and natural gas-fired power plants, we intend to achieve a stable and inexpensive supply of energy, and to enhance environmental awareness, comfort, stable supply, and economic efficiency.

Coordination of renewable energies and natural gas: the strengths of the Tokyo Gas Group

INVISIBLE ASSETS

A track record of achievements and unique latest technologies in district heating and cooling and smart energy networks

The Tokyo Gas Group will evolve its track record of achievements in the district heating and cooling (DHC) business of over 40 years into smart energy networks (SEN), using ICT-driven energy management. We have established the most optimal energy network of heat and electricity for a district and helped create a low-carbon, low-environmental-burden city.

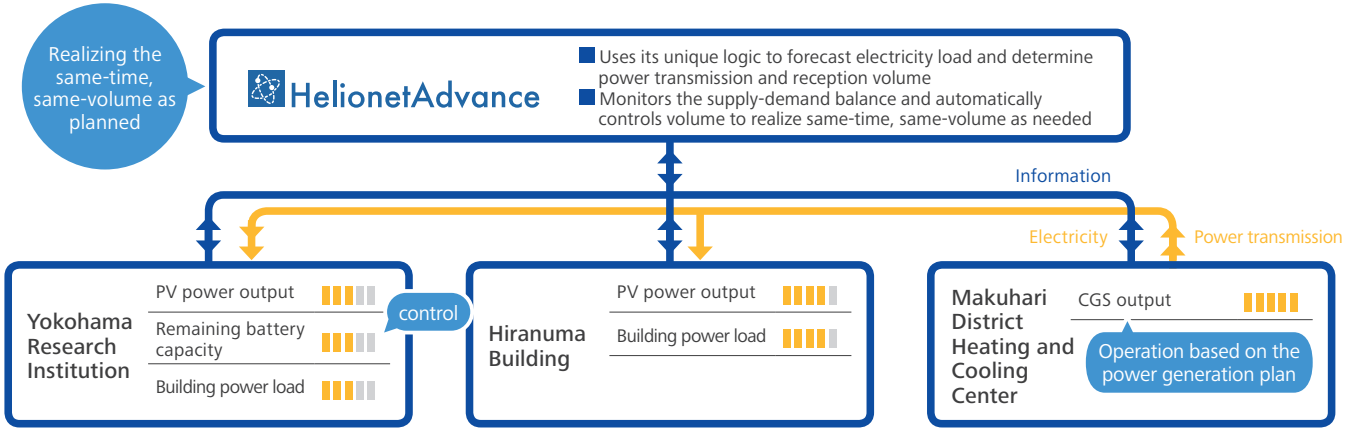
From district heating and cooling (DHC) to Smart Energy Networks (SEN)

For over 40 years, the Tokyo Gas Group has been engaged in the DHC service, in which heat for steam and chilled and hot water used in a certain area are produced together and distributed to multiple buildings for heating, cooling, and hot water supply. DHC is now evolving to SEN, which mainly uses cogeneration that locally generates heat and power, consumes heat and electricity, and also effectively utilizes renewable and unused energy to enhance energy saving and energy security. By constructing a network for heat, electricity, and information, and using ICT in energy management, an optimal energy system for an area is established.

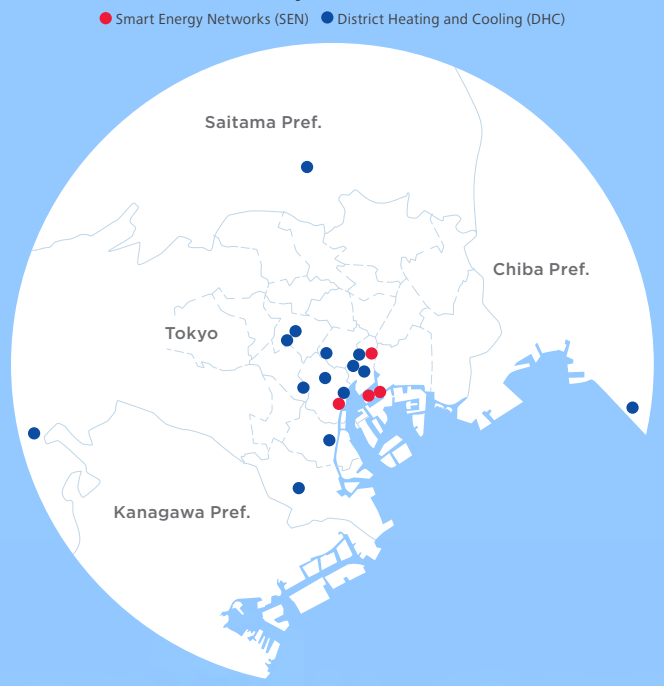
Combining SEN with VPP to establish the next advanced energy business

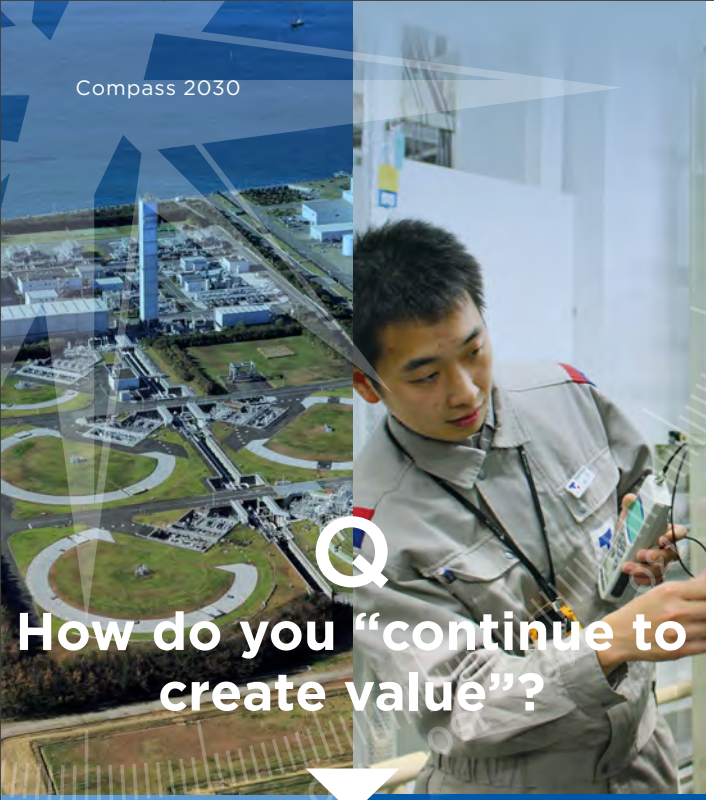
Using the Tokyo Gas Group's unique know-how, accumulated in the establishment and management of SEN, and the advanced digital technologies of its remote automatic control system Helionet Advance and central management system SENEMS, a combination of SENs that have renewable energies, gas cogeneration, and other decentralized power sources with VPP*, will lead to the next advanced energy business. Recently, we commercialized and began operation of VPP, which uses Helionet Advance and automatically integrates and controls PV power, batteries, and gas cogeneration, which are installed in decentralized locations of multiple facilities of the Tokyo Gas Group.

* VPP: Virtual power plant. A mechanism that uses IoT to manage and control decentralized power sources, batteries, etc. as if they were a single power plant.



Tokyo Gas Group's SEN and DHC project record in the Tokyo metropolitan area





Q How do you “continue to create value”?

A We plan to continue to create value by taking the following four measures.

1 Transformation of the LNG value chain to maximize each of its functions

Our existing business model provides value in retail sales, which is the final function of the LNG value chain. Through transformation of the LNG value chain, we intend to create and provide various types of value in each of the functions— from trading to production and power generation, networks, and customer solutions— so as to expand our customer base.

2 Resolving problems in daily life and businesses

We will confront customers’ needs and problems and provide various solutions, beginning with “Energy as a Service (EaaS)”. A digital infrastructure for value co-creation will also be established and the range of solutions to be created and provided will be broadened. This should be facilitated by advanced digital marketing, as well as the expansion of the number of business partners, the amount of data used, and products and technologies.

3 Leading the transition to a decarbonized society

The Tokyo Gas Group is promoting effective use of natural gas, expansion of renewable energy sources, and development of core element technologies for decarbonization, as we are taking up the challenge to achieve Net-Zero CO_2 emissions, including customer emissions, in our overall business activities. Our target is to contribute to a reduction in carbon emissions on a scale of 10 million tons by 2030 (which exceeds Japan’s target ratio*) and to lead the way to reducing CO_2 emissions on a global scale.

4 Overseas expansion

We will develop LNG infrastructure that utilizes the Group’s strengths in the LNG value chain, such as LNG engineering capability, exploit shale gas and other resources, invest in renewable energy businesses, and expand LNG transaction and LNG trading by making use of our related asset holdings, such as LNG vessels and receiving terminals. By taking these actions, we aim to triple overseas profits.

* Japan’s reduction target ratio: The greenhouse gas reduction target in the Intended Nationally Determined Contribution submitted to the United Nations (26% reduction in FY2030 as compared to FY2013).

1

Transformation of the LNG value chain to maximize each of its functions

Transformation of the LNG value chain

	Trading	Production & power generation	Networks	Customer solutions
	Pursuit of "safety, security and reliability" through diverse procurement, increased resilience Persistent improvement in productivity and cost efficiency through innovation of work processes			
Crystallize	Stable, inexpensive and flexible purchasing through the use of AOT*1	Achievement of world class digitalized terminals	Streamlining and increased efficiency for pipeline maintenance work	Deepening of the "last mile" services*3
	Use of digital technologies (AI and IoT)			
Explore	Full fledged deployment of LNG and power trading	Global deployment of Construction of LNG receiving terminals, power plants, engineering and O&M*2	Deployment of new services, including those that utilize smart meters	"Energy as a Service" to expand the domains in which value is provided in daily life and businesses*4

Expand the customer base for whom value is created and provided

For markets, energy providers and service providers ◀ Customers in the Tokyo metropolitan area ▶ Nationwide and internationally

*1 AOT: Asset Optimization & Trading (use of digital technology for optimal linkage of LNG transactions, LNG vessels and receiving terminals)
*2 O&M: Operation & maintenance
*3 Last mile: Site operations that require human intermediation in the final process of the value chain.
*4 Energy as a Service: Sale not of energy alone but of a menu of services combining energy, equipment, control technologies and maintenance, etc.

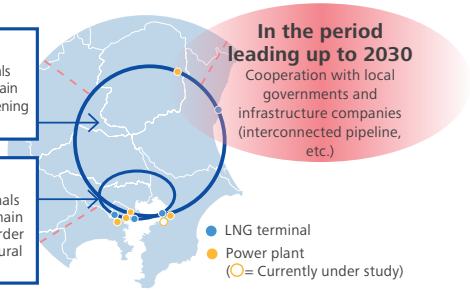
We will "crystallize" the business expertise accumulated up to now through the pursuit of "safety, security and reliability", which has been realized by diversity in procurement and increased resilience, as well as persistent improvement in productivity and cost efficiency through innovation of work processes. In addition, we will "explore" new domains for each function with customers, society, and business partners in order to expand the customer base for whom value is created and provided, and expand them across Japan and abroad.

Enhanced resilience functions through the use of natural gas

Enhanced resilience of natural gas infrastructure

2020
Four LNG receiving terminals interconnected through a main trunk pipeline network by opening of the Ibaraki Line

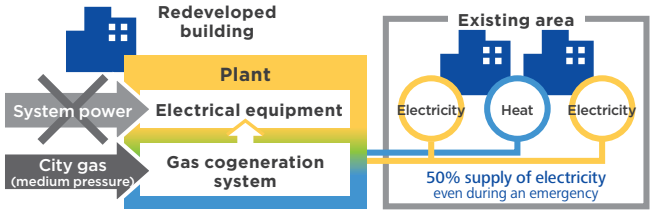
1999
Three LNG receiving terminals interconnected through a main trunk pipeline network in order to increase and expand natural gas use



Natural gas has increasingly become an important energy source along with its diffusion and expansion, which were facilitated by the establishment of LNG receiving terminals and pipelines. With the aim of allowing customers to use our infrastructure with ease of mind, the Tokyo Gas Group is working to strengthen the resilience of the natural gas infrastructure in the Tokyo metropolitan area through the opening of its second circular trunk pipeline network— the Ibaraki Main Pipeline— and stronger cooperation with local governments and other infrastructure companies. By expanding decentralized energy systems, we will also promote disaster-resilient lifestyles and urban design that enable customers to use information telecommunication and data in addition to energy, even in the event of an emergency.

Disaster resilient lifestyles and urban design

Urban design that not only provides electricity in the event of an emergency but also ensures the stable use of heat, water, and IT and data systems



Nihonbashi Smart Energy Project

1 Transformation of the LNG value chain to maximize each of its functions: the strengths of the Tokyo Gas Group

INVISIBLE ASSETS

Safe and stable energy supply infrastructure

In order to help our customers use gas with ease of mind, we are working on various safety measures. They include earthquake-resistant measures for production and supply facilities, development of a disaster-readiness system for a large earthquake, and safety inspection of customers' gas equipment.

In order to fulfill our public duty as an integrated energy company, we intend to further enhance the resilience of our natural gas infrastructure in the Tokyo metropolitan area, which is the center of politics, the economy, and industries.

Measures to help customers use gas with ease of mind

Earthquake-resistant production and supply facilities

We adopted structural designs with superior anti-seismic properties for LNG terminals, and introduced materials that are resilient to ground deformation to our pipeline network. As a result, our city gas production and supply facilities are highly resistant to seismic activity, even in the case of major earthquakes, such as the Great Hanshin-Awaji (Kobe) Earthquake, or the Great East Japan Earthquake.

Development of a disaster-readiness system

We have developed a disaster-readiness system, which subdivides our low-pressure pipeline network into approximately 300 blocks and remotely stops the supply of gas, in block units, depending on the extent of the damage. This enables minimization of the impact of supply stoppages and prevention of secondary damage.

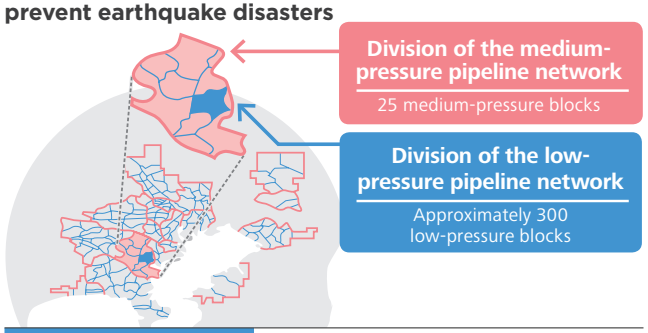
Monitoring and control of production and supply facilities, and safety inspection of gas facilities

We conduct inner-pipe leakage testing and periodic safety inspections of gas appliances for all customers at least once every four years. The Supply Command Center performs 24/7 monitoring and control of the status of operation of city gas production and supply facilities. When the Safety Command Center receives gas leak reports from customers, personnel at Gaslight 24 will immediately visit the reporting customer to take swift action even on holidays or at night.

Enhancement of resilience functions

We are accelerating enhancement of the resilience of our natural gas infrastructure in the Tokyo metropolitan area by creating our second circular trunk pipeline network through the opening of the Ibaraki Main Pipeline in 2020 and by enhancing cooperation with local governments and other infrastructure companies.

Safety know-how and measures to prevent earthquake disasters

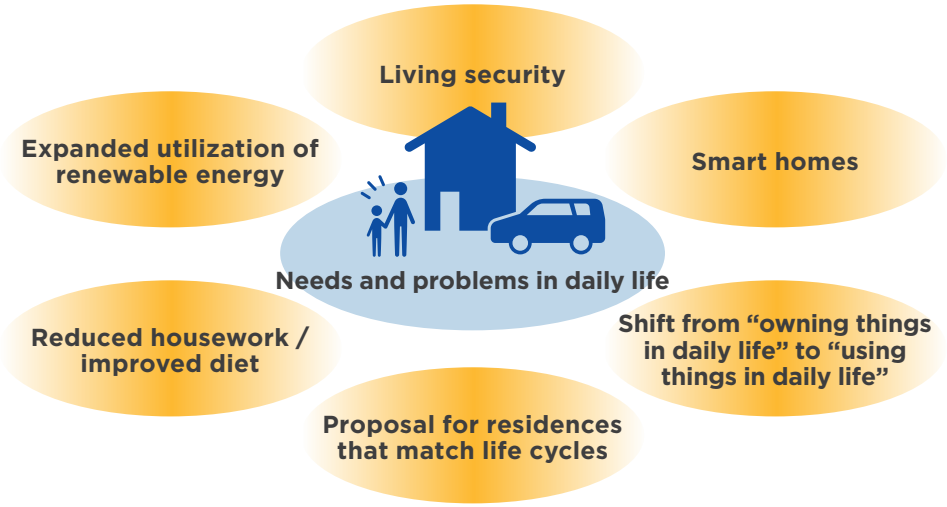


Resistance to seismic activity	High level of resistance to seismic activity, even in the case of major earthquakes, such as the Great Hanshin-Awaji (Kobe) Earthquake, or the Great East Japan Earthquake
Subdivision of units for supply stoppage in the event of an earthquake or other disasters	Subdivided the medium-pressure pipeline network into 25 blocks
	Subdivided the low-pressure pipeline network into approx. 300 smaller blocks
	Installation of 4,000 seismometers (SI sensors)
Periodic safety inspection	2.7 million (FY2019)

2 Resolving problems in daily life and businesses

Resolving various customer needs and problems

Accelerate the creation of new solutions including the establishment of new companies



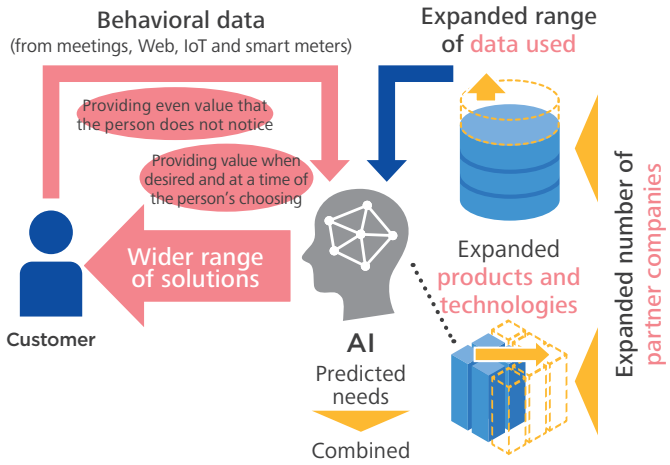
Creating and offering wide-ranging solutions tailored to customers’ needs and problems

Various kinds of solutions are required today, along with change and diversification in customers’ values, such as a change in their consumption behavior from “things” to “experiences” and “value”. With the aim of speedily creating new businesses, the Tokyo Gas Group has started to create and provide new services which are beyond the existing business framework of Tokyo Gas. This includes the establishment of new business-creating companies in FY2019.

We also plan to establish a digital infrastructure for value co-creation and advance efforts to instantly combine a solution proposal with an energy supply to each individual customer. This will be realized by using our customer data obtained from the Tokyo Gas Group’s direct contacts and web marketing and the data held by our business partners, and by forecasting a potential need or problem that even customers are not aware of via AI analysis and other means.

Instantly offering wide-ranging values tailored to customers

Establishment of a digital infrastructure for value co-creation



2 Toward resolving problems in daily life and businesses: the strengths of the Tokyo Gas Group

INVISIBLE ASSETS

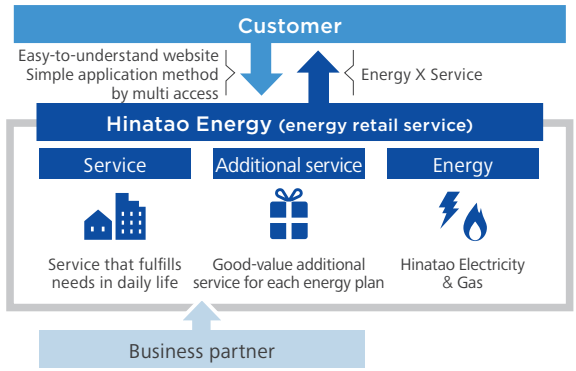
Establishment of new business-creating companies that help solve customers' various needs and problems

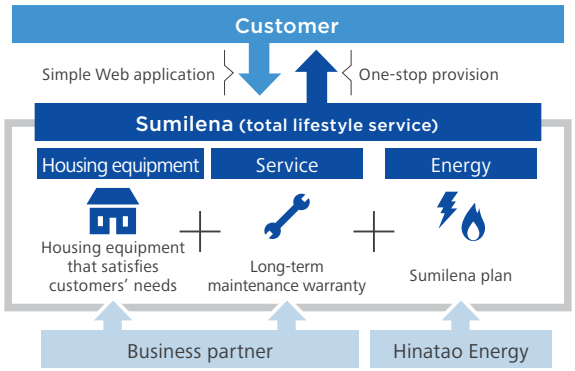
Tokyo Gas Liv Solutions Co., Ltd. and its subsidiary Hinatao Energy Co., Ltd., as well as Sumilena Co., Ltd. were established in December 2019, with the aim of speedily creating new businesses as a part of establishing a value co-creation ecosystem. Putting emphasis on the "Customer First" concept, we intend to defy the boundaries of the existing business of Tokyo Gas and to help solve customers' needs in daily life through speedy decision-making, promotion of flexible, dynamic corporate alliances, and the use of external human resources.

Accelerating creation and offering of EaaS and various other solutions

Responding to customers' desires to contribute to the community through their purchase behavior, Hinatao Energy provides in its gas and electricity retail energy service business an option plan to support the community. The first plan of its kind is "F.C. Tokyo Electricity." Through payment of a service charge in addition to the electricity bill, the customer can participate in community support in the form of F.C. Tokyo's football promotion activities and hometown activities. Another business we will expand is to provide a PV energy service and combine it with an electricity and gas retail business, given customers' rising expectations for renewable energy and greater requests to enhance energy resilience.

In addition, we are developing services to fulfill the changing needs of customers from owning to using "things". In June 2020, Sumilena launched a monthly fixed-charge service that enables customers to use the latest household equipment with no initial cost but by means of monthly payments, including installation expenses as well as emergency visits and repair warranties. Sumilena's line-up of household equipment is carefully selected based on its proposal-making capabilities. The company is also offering a good-value electricity rate plan and a campaign in alliance with a start-up company in a different industry among others in order to aggressively expand service offerings.





Speed creation of new businesses

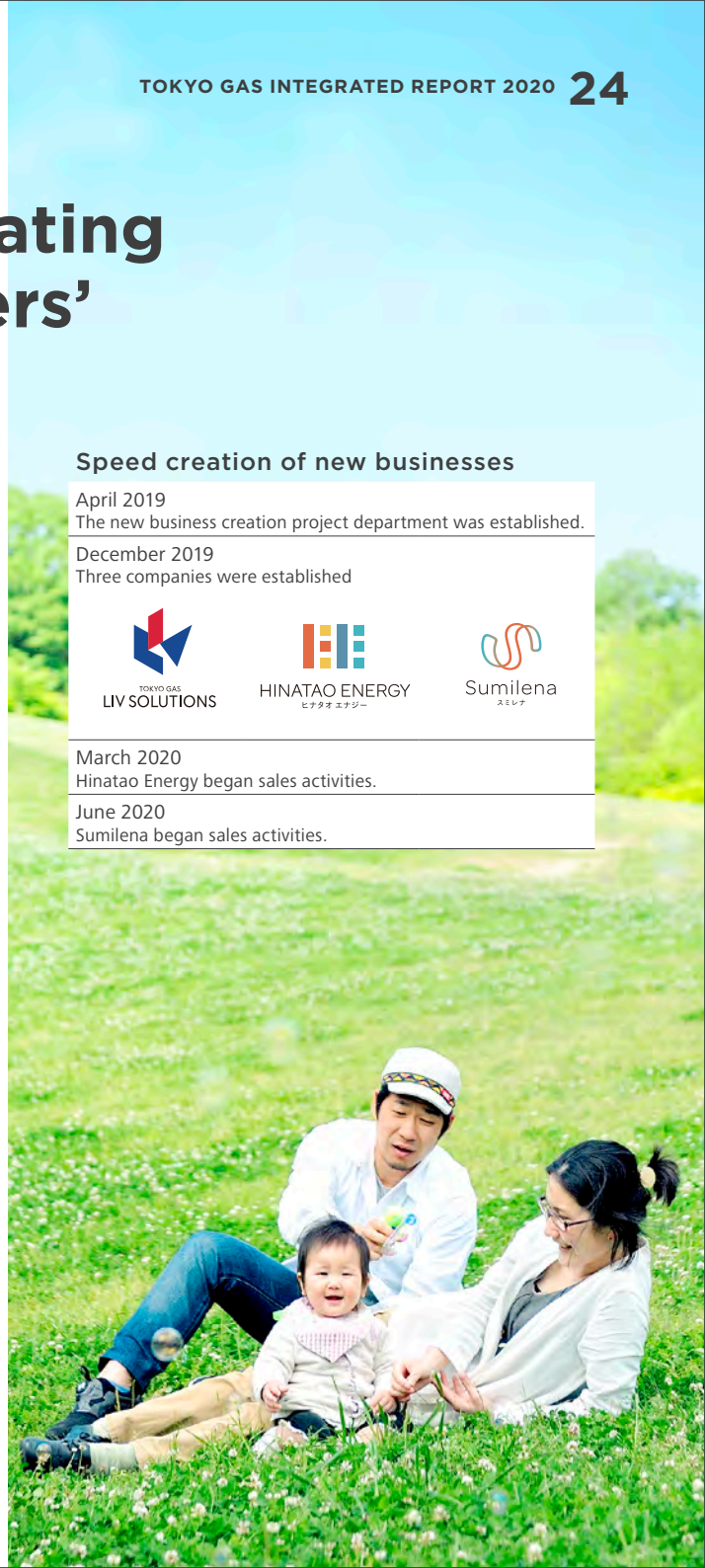
April 2019
The new business creation project department was established.

December 2019
Three companies were established

TOKYO GAS LIV SOLUTIONS
HINATAO ENERGY ヒナタオ エナジー
Sumilena スミレナ

March 2020
Hinatao Energy began sales activities.

June 2020
Sumilena began sales activities.



3

Leading the transition to a decarbonized society

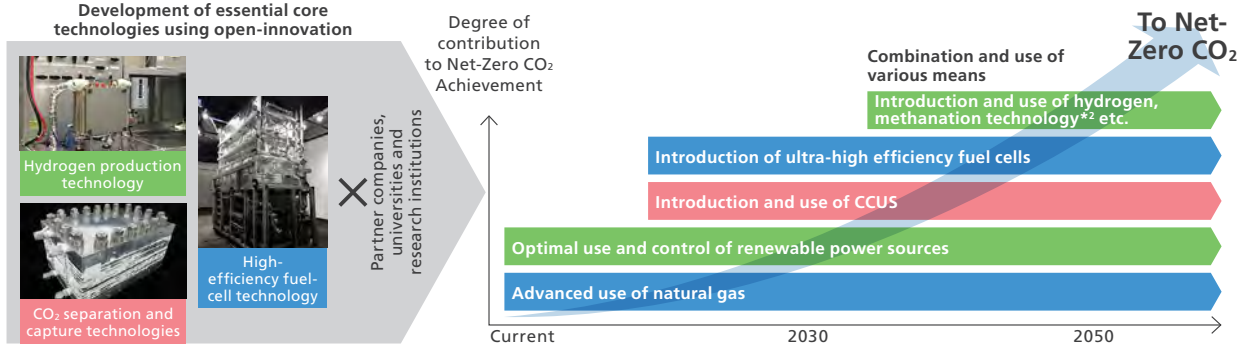
Efforts to achieve Net-Zero CO_2 in the Tokyo Gas Group's style

Efforts domestically and internationally	-2030	-around 2050
	Emissions reductions not only in the Tokyo metropolitan area but on a global scale	
① Zero emissions	Expanded use of renewable power sources	
	Development of decarbonization technologies for gaseous energy	Decarbonization in the electricity and heat sectors
② Zero emissions achieved through offsetting	Effective use of natural gas (reduced energy consumption through efficient use of natural gas, coordination with the fluctuating output of renewable energy sources)	
	Use of CCUS*1 technologies (capture of emitted CO_2)	
	Incorporation of successful reduction efforts overseas	

The combination of these activities will lead to Net-Zero CO_2

*1 CCUS: Carbon Capture, Utilization, and Storage

Roadmap to Net-Zero CO_2



*2 Methanation technology: Producing carbon-neutral methane by combining hydrogen and CO_2

Leadership in the effort to achieve Net-Zero CO_2

We believe that a realistic approach toward getting closer to a decarbonized society is to make use of the properties of natural gas, such as its limited environmental impact among fossil fuels and excellent controllability, and combine it with renewable energy. We thus mainly focus on the effective use of natural gas and are working on the expanded use of renewable power sources, the use of CCUS (Carbon Capture, Utilization, and Storage) technologies, and the curbing of CO_2 emissions. Our target is to achieve a 10 million ton reduction in CO_2 emissions in Japan by 2030. In addition, we will use technologies and expertise for the effective use of natural gas in promoting decarbonization in the electricity and heat sectors and CCUS, and implement initiatives aimed at Net-Zero CO_2 emissions (by offsetting the emission amount with the absorption amount). Our ultimate aim is Net-Zero CO_2 emissions of the Tokyo Gas Group's style.

Decarbonization technology innovations

With regard to the development of core element technologies (i.e., hydrogen production, CCUS, and high-efficiency fuel cell technologies) for decarbonization leading up to 2030, we will promote the open innovation type of technology development by incorporating technologies and ideas of other companies, universities, and research institutions in addition to our own. From 2030 onward, we will introduce and use hydrogen, methanation*2 and other technologies and combine various means which may contribute to Net-Zero CO_2 emissions via IoT and AI.

3 Leading the transition to a decarbonized society: the strengths of the Tokyo Gas Group

INVISIBLE ASSETS

Innovation of core element technologies, that contribute to decarbonization

The Tokyo Gas Group aims at achieving Net-Zero CO_2 emissions through all of our business activities, including customer emissions. We will develop CO_2 separation and capture technologies in addition to using various technologies and know-how for effective uses of natural gas, with the aim of achieving low carbon in the electricity and heat sectors. The development of high-efficiency fuel cells will contribute to the reduction in energy consumption and CO_2 emissions and ultimately to the achievement of Net-Zero CO_2 emissions.

Development of high-efficiency fuel cells

Tokyo Gas and Miura Co., Ltd. have jointly developed high-efficiency solid oxide fuel cells (SOFC) in the 5kW class with power generation efficiency of 65%*1 LHV and started demonstration tests in April 2020. This is the world's first innovative development in realizing high-efficiency power generation by combining multiple technologies, such as the system design of two-stage SOFC cell stacks and fuel regeneration process so as to utilize supplied fuel effectively. This development will enable a 53% reduction*2 in CO_2 emissions.

Approach to introduction of SOFC systems

Since the developed SOFC system is mono-generation type, which does not use waste heat, we are thinking of introducing it to the untapped segment of small-scale buildings and stores, such as offices and convenience stores with no demand for hot water. In the future, by adding a function of self-sustaining operation, the system can be used in evacuation centers in the case of a disaster and is anticipated to enhance the resilience function that utilizes the city gas network.

Challenges of innovation in future hydrogen generation technology

In addition to reducing CO_2 emissions through the development of high-efficiency fuel cells, we will utilize our know-how accumulated in these developments to take on the challenge of innovation, such as innovation in hydrogen generation technology, and to lead the transition to a decarbonized society.

Innovation in element technology

AC power generation efficiency in the world's first 5kW-class fuel cell system	CO_2 emission
Achieved 65% LHV*1	53% reduction*2

*1 Data by Tokyo Gas and Miura, as of March 3, 2020

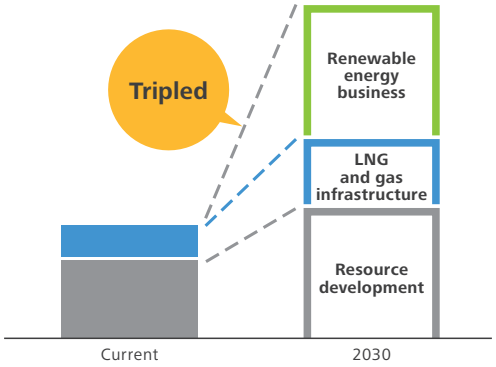
*2 Estimate based on using a prototype. Grid power's emission coefficient of 0.66kg-CO_2/kWh (emission coefficient of thermal power generation in FY 2030, in the Plan for Global Warming, May 2016)

4 Overseas Expansion

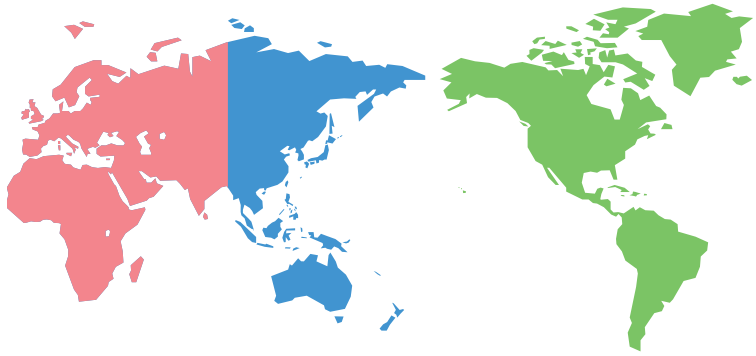
Wind power generation (Mexico)

Utilization of LNG value chain functions Expansion into renewable energy business

Photovoltaic power generation (Mexico)



Expansion of LNG trading



Use in each LNG value chain function
Provided to customers both at home and abroad (Southeast Asia, etc.)
Expansion of trading scale to 5 million tons

The Tokyo Gas Group will utilize its LNG engineering capability cultivated in the LNG value chain for a half century and develop the LNG infrastructure business mainly in Southeast Asia, where the shift to natural gas is advancing. With regard to investment in shale gas and other resource development in North America and renewable energy businesses in Europe and North America, we intend to expand operations at an accelerated pace by means of growth engine type investment*1 that utilizes our expertise cultivated through project investments.

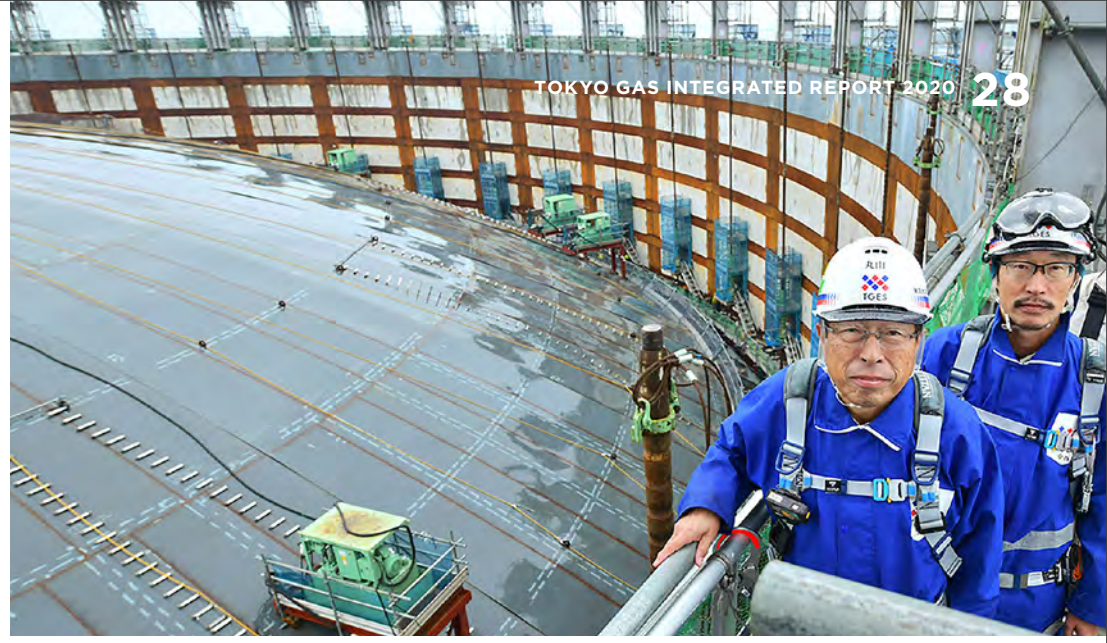
We will also cooperate with business partners, make use of respective strengths and different geographical exposures, and develop full-fledged trading in the LNG markets. Our target is to optimally combine LNG trading (LNG purchasing contracts, actual demand) and assets (owned LNG vessels, receiving terminals, power generation facilities, etc.) with digital technologies so as to expand LNG transaction volume. Trading can be further expanded by use of transportation and other operations as added-value of LNG.

*1 Growth engine type investment: Initiative to invest in an operating company, get involved in its management, and help it grow

4 Overseas expansion: the strengths of the Tokyo Gas Group

INVISIBLE ASSETS

LNG infrastructure engineering capability



The Tokyo Gas Group plans to leverage its LNG infrastructure engineering capacity, cultivated in the LNG value chain from upstream to downstream for a half century, and aims at overseas business expansion mainly in Asia, where demand for natural gas is increasing.

Accumulated "user know-how" regarding LNG engineering

Since 1969, when we first imported LNG in Asia, Tokyo Gas Engineering Solutions Corporation (TGES) has been engaged in the LNG value chain from upstream to downstream. The company is accumulating "user know-how", thanks to its technologies, knowledge, and experience, obtained from design, construction, and consulting services for close to one half of the LNG terminals in Japan (20+), including LNG receiving terminals owned by Tokyo Gas (Sodegaura, Negishi, Ohgishima and Hitachi), and their operation and maintenance (O&M).

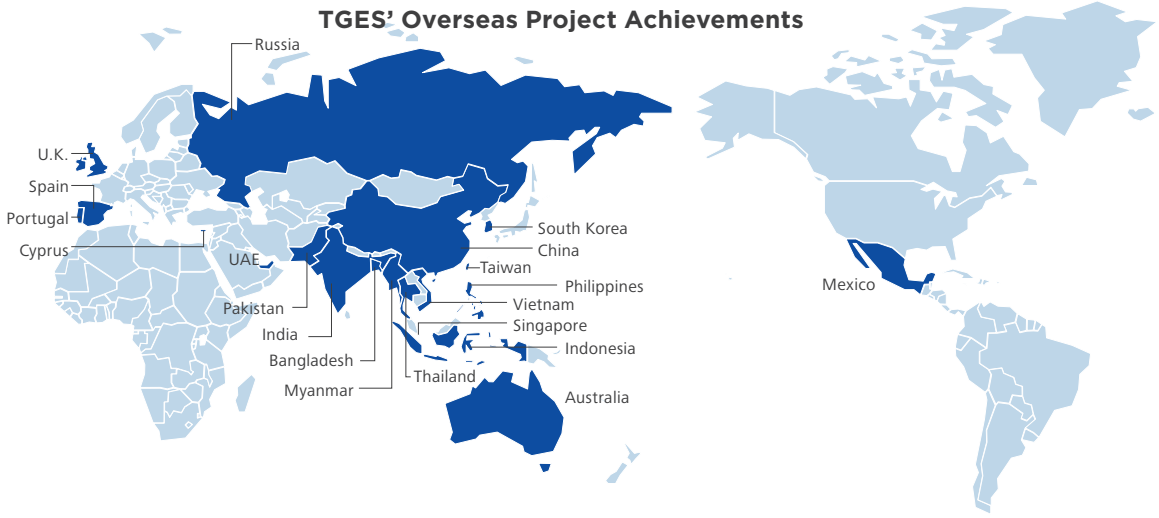
World top-class LNG engineering capability

We have accumulated "user know-how" regarding LNG facilities—from tanks and other main facilities to peripheral ones of LNG terminals— as we became an expert on various and numerous LNG facilities in Japan and overseas and mastered "what works" and "what does not work" through abundant design experience and O&M practice over many years. We thus provide numerous engineering solutions to improve reliability, reduce risks, and raise efficiency and achieve labor saving in O&M from the customer's viewpoint. With regard to pipelines for the stable, safe supply of gas, we are also experienced in a wide range of engineering services, from feasibility studies and planning to design, construction, and O&M.

Overseas achievements

Being accredited for advanced LNG technologies cultivated in Japan and our abundant experience, we have been engaged in LNG engineering services overseas since the late 1970s. Our list of achievements includes more than 20 LNG terminals and over 100 projects in 20 countries and regions. We are further advancing our engineering capability and know-how by utilizing our network of engineers and engineering companies in various countries, which was established through overseas projects. Such a business growth spiral has helped us to receive a large-scale consulting service project that required about 60 personnel and to acquire an entire management order for construction of a large LNG terminal in recent years.

TGES' Overseas Project Achievements



Toward realization of Compass 2030: the strengths of the Tokyo Gas Group

INVISIBLE ASSETS

Personnel Strategy

Through the realization of the Three Promises defined in the Compass 2030, we aim to develop personnel who work energetically, make maximum effective use of their abilities, and consistently deliver strong results.

To this end, we are working on promoting workstyle reforms and diversity so that each and every employee can make maximum use of their knowledge, ability, and experience.

Personnel hiring and development

In order to continue to create value with customers, business partners, and society while becoming a leader in the future energy system, we strive to hire and foster personnel who can flexibly cope with the changing business environment and play a core role in diverse fields.

Hiring personnel with high levels of expertise	Strategic shift to growth domains	Developing business leaders
In addition to hiring new graduates for specific job types (in humanities, sciences and the professional domain), we also engage in flexible hiring of experienced and highly-specialized mid-career personnel.	In addition to our gas business, we also prioritize assignment of personnel to strategically-important fields such as our electric power and overseas business operations. In this way, we are promoting growth and expansion in a diverse range of fields.	We train business leaders who will lead the Tokyo Gas Group in the future, with a training program that focuses primarily on development through a wide range of on-the-job training (OJT) experiences gained by means of transfers and rotations, combined with additional off-the-job education and training (OFF-JT).

Hiring, fostering and placing of personnel who realize "Compass 2030"

Workstyle reform

(Improving productivity and achieving a healthy work-life balance)

In order to enable each and every one of our employees to work energetically and make maximum effective use of their abilities, we are working proactively to rectify and reduce long working hours, and to implement workstyle reforms with awareness of "the value of time," which we regard as important issues for management involvement.

Specific initiatives

Collaborative work space of a new office of the Digital Innovation Division

- **Promoting workstyles with awareness of the value of time**
  Premium Friday (a program to leave work early on the last Friday of the month), Day to leave office on time, etc.
- **Environmental improvement to allow diverse personnel to display their full potential**
  - Introducing a "Work Anywhere" program which eliminates restrictions on working location (Work at home, mobile work)
  - Building satellite shared offices
  - Improving the office environment toward further improvement in productivity
  - Working to create workplaces that enable innovation to occur
  - "Work in a Free-form Animated Manner" (Online video conferencing, office reforms, etc.)
  - Promoting automation / mechanization using ICT, and more sophisticated use of data (utilizing RPA, audio AI, etc.)

Promoting diversity

(Promoting active roles for diverse personnel)

The Tokyo Gas Group is promoting diverse workstyles and the empowerment of diverse personnel in order to create an invigorated organization in which each and every Group employee can make maximum effective use of their knowledge, skills and experience. With the aim of realizing the President's "Diversity Top Management Commitment," we are promoting diversity based on various themes, starting with women's empowerment, and including more employment of disabled people and support for the career development of employees in their 50s and over.

Specific initiatives

Promoting empowerment of women in workplace	■ **2016: First female executive officer appointed** **2018: First female senior executive officer appointed** ■ **Almost 100% return-to-work rate for female employees returning from childcare leave** ■ **Almost no difference in gender in terms of average years in service of the company**
Promoting employment of people with disabilities	■ Employment rate of 2.55%, exceeding the mandatory rate (as of June 2020) ■ Established a liaison committee to promote employment of disabled people as a group ■ Working to create safe and comfortable working environments
Career development support for employees in their 50s and over	■ Established the "Grand Career System" to support career development for employees in their 50s and over, through training sessions and interviews with career consultants, etc.

External Evaluation

Selected as a Nadeshiko Brand
Tokyo Gas was selected for the fourth consecutive year as an attractive corporate brand in terms of its proactive efforts to encourage and empower women.

Granted Kurumin certification
Tokyo Gas was certified by the Ministry of Health, Labour and Welfare as a company that formulated an action plan, achieved targets, and met certain criteria in accordance with the Act on Advancement of Measures to Support Raising the Next Generation of Children.

Selected as a Health & Productivity Stock
Tokyo Gas was selected as a Health & Productivity Stock, in recognition of its strategic efforts regarding its employees' health from a management perspective.

INVISIBLE ASSETS

More diversity to create a new Tokyo Gas

Executive Officer
General Manager of Wholesale & Regional Service Dept., Regional Development Div.

Konishi Masako

April 1988	Joined Tokyo Gas Co., Ltd.
April 2012	Manager, Residential Sales PR Sect, Residential Sales Planning Dept.
April 2014	Manager, General Administration Sect, Affiliated Companies Dept
April 2015	Assistant General Manager, Sales Marketing II Dept
April 2016	General Manager, Sales Marketing II Dept
April 2019	General Manager, Wholesale & Regional Service Dept.
April 2020	Executive Officer General Manager, Wholesale & Regional Service Dept., Regional Development Div. (current)

Experience in diverse kinds of work and encounters with many people are my treasure

I joined Tokyo Gas in a research position and carried out research on gas cookers and rice cookers. Back then, the concept of diversity was not well established but I was able to manage both my work and my private life and experience major life events, such as marriage, childbirth and child rearing. This was because Tokyo Gas had begun to establish programs for childcare leave, shorter working hours for childcare, and a flextime system. In addition, I was blessed with good forward-thinking superiors and was supported by my family and colleagues as well.

I have kept in mind to "set priorities and prioritize the work that only I can do." While both work and child rearing were no easy task, they both allowed me to reset myself, focus on the task at hand, and keep moving forward. I can now see that in retrospect.

This consciousness also helped me when I was assigned to various work and workplaces, such as PR as well as personnel affairs, general affairs at a group company, and sales. Experience in diverse kinds of work and encounters with many people in and out of the company have become my treasure.

Diversity brings new values – a source of corporate growth

We are on the cusp of a new age of innovation. The Tokyo Gas Group aims to creating diverse values in each of its value chains and offer them across Japan and overseas. To achieve this, it is important to promptly respond to customers' needs, be flexible, and appreciate various sets of values.

I think Tokyo Gas has established a great working environment for women, as evidenced in the return rate of employees from childcare leave and their years in service of the company. In order to create various values, we will increasingly need more diversity in personnel, such as in nationality and career background, in addition to gender.

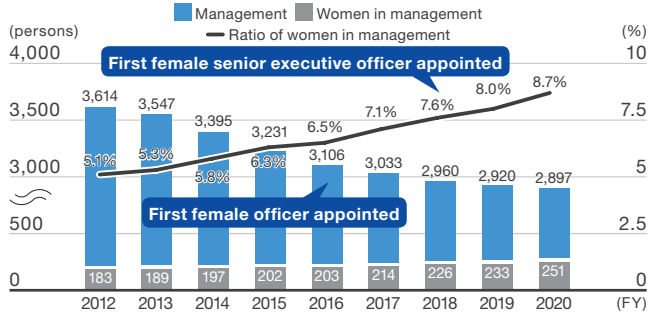
Fostering various values means developing different opinions, which may bring disorder or friction within the company. This can be overcome if we willingly accept it. This may not be easy to do but I firmly believe that such experiences or struggles will result in corporate growth.

Diversity is such an appealing buzzword but it is no easy task to realize diversity and to actually lead it to some accomplishment.

According to our management vision, Compass 2030, the company promises to employees that it will enhance the personnel strategy and initiatives on diversity. I would like to encourage employees to have various experiences through work, develop their strengths gained through these experiences, and work without pressure or reserve. Each employee should have his or her own unique strength. I believe that is what diversity is.

Ratio of women in management at Tokyo Gas

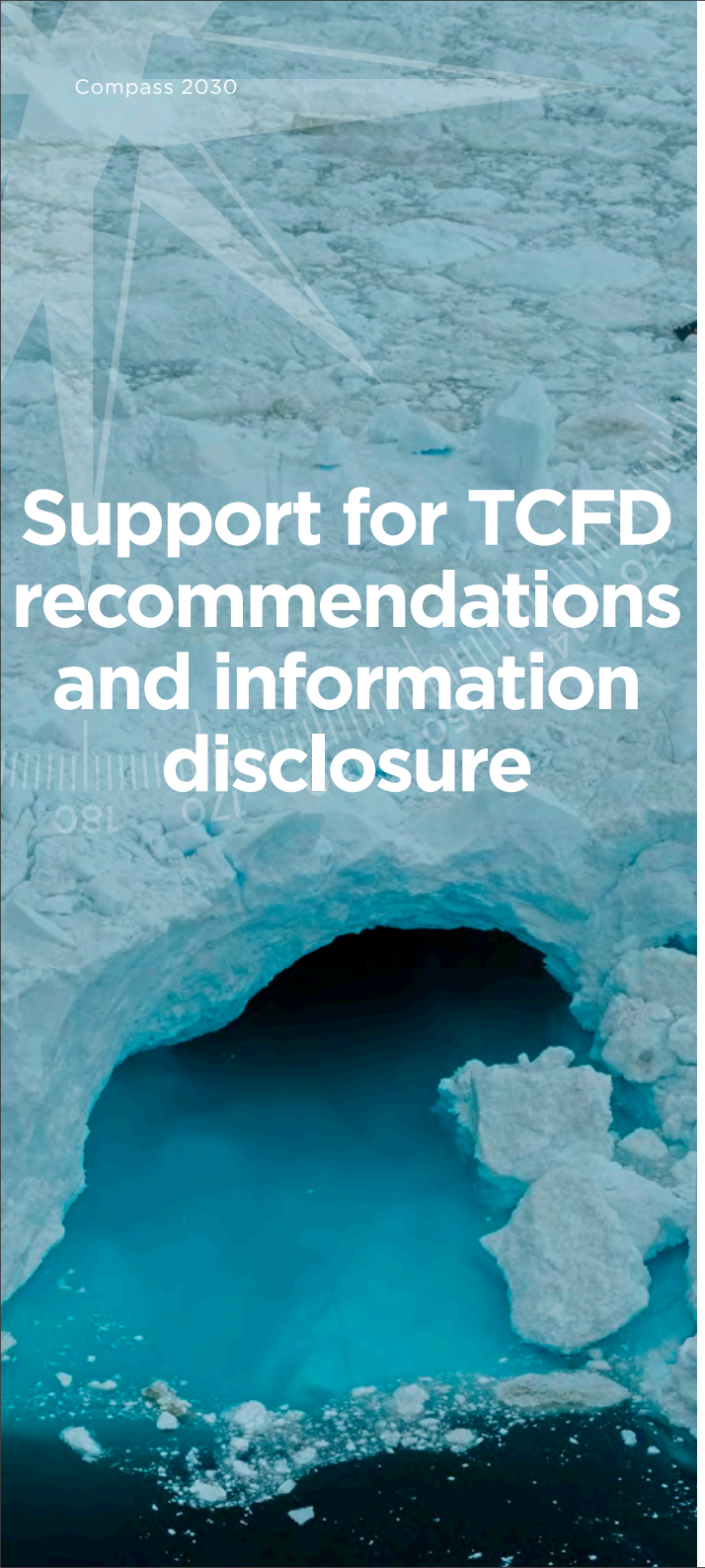
(as of April 1 of each fiscal year)



* Managerial staff are those who have subordinates or those in equivalent position.

Average Years in Service by Gender: Almost no difference

		Period	2018.3	2019.3	2020.3
Men	Non-consolidated	Year	19.3	19.5	19.7
	Consolidated		16.7	17.0	16.8
Female	Non-consolidated		19.3	18.5	18.5
	Consolidated		14.8	14.5	14.1



Support for TCFD recommendations and information disclosure

Climate-related risks and opportunities could significantly affect many companies' financial positions and destabilize financial conditions. In order to reduce such risk, in response to the request from the G20, the Financial Stability Board (FSB) established the Task Force on Climate-related Financial Disclosure (TCFD) in December 2015 and the TCFD released its recommendations in June 2017.

We recognize climate change as one of the priority issues that the Tokyo Gas Group is facing today and regard the TCFD as an effective framework in promoting information disclosure and dialogue with stakeholders on climate-related issues. We therefore signed the statement of support for the TCFD in May 2019. We intend to disclose information on the impact of climate change on the Tokyo Gas Group's business activities and the measures we are taking.

Governance

The Tokyo Gas Group forms in-house committees as appropriate for studying, coordinating or promoting actions to address important management issues. These include the Sustainability Committee, which is intended to promote climate change research and other sustainability issues and chaired by the President, and the Sustainability Promotion Committee, a subordinate body of the previous committee chaired by the Officer in charge of sustainability. They deliver reports on important matters to the Board of Directors.
(See also Corporate Governance System on page 43.)

Strategies

In preparation for the next half-century, the Tokyo Gas Group has formulated its "Compass 2030" management vision outlining the course that should be pursued in this age of uncertainty.

Natural gas, one of the pillars of the Tokyo Gas Group's business, is expected to play an even larger role due to its stability, environment-friendly nature, and economic viability, as well as its affinity for use in combination with inherently unstable renewable energy sources. In the meantime, as a leading company dealing in natural gas, (a fossil fuel), we feel it is our responsibility to deal forthrightly with the issue of climate change, look beyond CO_2 emission reduction, and promote decarbonization.

While maintaining S+3E*1 as the bedrock of our business activities, we are striving to help reduce CO_2 emissions by customers by continuing to promote a shift to natural gas in fuel conversion and advanced use of natural gas, such as in diversified energy systems. Over the longer-term toward 2030, we plan to effectively use natural gas as an adjusting function for renewable energy, which is expected to be increasingly used. We also intend to globally promote our technology and know-how regarding natural gas. By doing so, we will contribute to the stable supply of energy and a reduction in CO_2 emissions in Japan and overseas.

We will promote decarbonization technology innovation from a long-term perspective. At the same time, we will combine various means, including natural gas and renewable energy, and aim to achieve Net-Zero CO_2 emissions by our entire group, including customer emissions, while leading the transition to a decarbonized society.

■ Major risks and opportunities driven by climate change, and the Tokyo Gas Group's initiatives

In identifying the Tokyo Gas Group's risks and opportunities related to climate change, we referred to two representative scenarios*2 of the International Energy Agency (IEA) and the Intergovernmental Panel on Climate Change (IPCC)—the below 2℃ scenario and the 4℃ scenario. Considering the medium- to long-term time span of 2030 and after, we comprehensively summarized important factors that may affect our group's business and evaluated (mainly qualitatively) the impacts from two aspects—magnitude of impact and possibility to be affected—for both scenarios. We then identified major factors and put together our initiatives for each factor.

We are determined to steadily implement these initiatives and to realize our business sustainability as well as the measures against climate change even after 2030.

*1 S+3E: Safety plus 3Es for Energy security, Energy efficiency, and Environment
*2 Scenarios for reference:
•Scenario of limiting the global average temperature to well below 2℃ above pre-industrial levels: Sustainable Development Scenario (SDS)(IEA WEO 2019)/B2DS (IEA ETP 2017)/RCP2.6 (IPCC AR5)
•Scenario of limiting the global average temperature to 4℃ above pre-industrial levels: IEA Stated Policies Scenario (STEPS) (IEA WEO 2019/RTS (IEA ETP 2017)/RCP8.5 (IPCC AR5)

	Opportunities and risks	Factors	Details of opportunities and risks	Tokyo Gas Group's Initiatives
Below 2℃ scenario	Opportunities	Markets	Global increase in demand for natural gas	■ Resources development and expansion of LNG/gas infrastructure and other overseas business to increase the natural gas transaction volume
	Opportunities	Energy source	Affinity of renewable energy with natural gas	■ Effective use of natural gas to adjust fluctuation of output of renewable energy ■ Increase in renewable energy transaction volume in Japan and overseas ■ Use of PV, storage batteries, EV, etc. to promote new decentralised power source business and VPP
	Opportunities and risks	Resource Efficiency; Technology	Decarbonization technology innovation	■ Development of decarbonization technologies for gaseous energy, such as hydrogen and methanation ■ Introduction and use of CCUS technologies
	Opportunities and risks	Markets; Policy and Legal	Introduction of carbon tax (Introduction of appropriately-designed carbon tax may promote shift to energies with less CO_2 emissions but excessive taxation may raise energy cost and negatively affect the company's business)	■ Fuel conversion, etc. to accelerate shift to natural gas ■ Effective use of natural gas to adjust fluctuation in output of renewable energy ■ Increase in renewable energy transaction volume in Japan and overseas ■ Use of PV, storage batteries, EV, etc. to promote new decentralised power source business and VPP
4℃ scenario	Opportunities	Resilience	Diversified energy system using natural gas to enhance resilience	■ Enhanced resilience in the natural gas infrastructure ■ Expanded use of diversified energy system, such as smart energy networks, co-generation, ENE-FARM, etc. that are highly resilient and reduce energy consumption
	Risks	Acute	Impact on operations, associated with severer abnormal weather (disruption to the operation of facilities for production and supply)	■ Enhanced establishment of water hazard-resilient Life Line, such as and full preparation for BCP., disaster countermeasures of LNG terminals and power stations

Risk management

The company has established an enterprise risk management (ERM) system, and drawn up risk management regulations that include documented rules concerning major risks faced by the group.

The Risk Management Committee was established with the aim of improving the management level of the ERM system. The Committee checks progress regarding the establishment and operational status of the ERM system, including periodic risk assessments. It also reports to the Corporate Executive Committee and obtains the necessary approvals.

As for specific initiatives, the environment management system (EMS) has been established for the entire group, led by the top management, and we conduct not only compliance with laws and regulations but also various initiatives regarding climate change by promoting a PDCA (Plan-Do-Check-Act) cycle.

Key figures and targets

The Tokyo Gas Group management vision Compass 2030 has set the management guidelines and key figures for realizing corporate growth.

Contribution to CO_2 emission reductions	**-10 million tons**[*3]
Renewable power source transaction volume	**5 million kW** (domestic and international, including purchasing)
No. of customer accounts	**20 million**[*4]
Natural gas transaction volume	**20 million tons**[*5]

*3 Base year: fiscal 2013, including contribution of emission reduction during consumption by customers

*4 Total no. of gas, power, and service agreements (domestically and internationally)

*5 LNG equivalent Including overseas business and trading