

Medium-Term Management Plan 2022-2025

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Promote carbon neutrality

In addition to promoting low-carbon/decarbonization efforts for our gas customers' premises, we will work to develop technologies with an eye on future decarbonization of gas itself.

We will also work to expand the use of hydrogen, reduce/eliminate carbon in electricity and promote the transition to carbon neutrality.

Promote low carbon and decarbonization at gas customer locations

We provide one-stop support for efforts to realize carbon neutrality at customer locations by promoting fuel conversion to city gas and advanced energy utilization as well as introducing LNG to offset carbon with credits.

Helping our customers achieve carbon neutrality

CNxP business

We are expanding our CNxP business to support carbon neutrality at customer locations by supporting data visualization and development of action plans and introducing renewable energy and high-efficiency facilities.

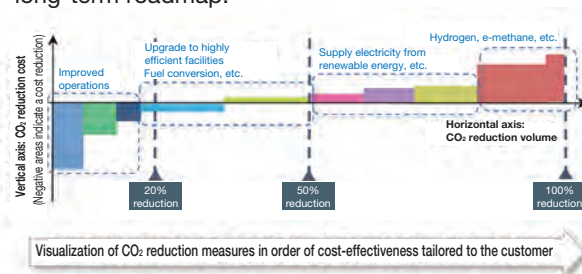


Our CNxP (Carbon Neutrality x Professional/Package/Partner) business is a service provided by our Group as an energy Professional in a full Package, from consultation to engineering, working together with customers as a Partner to help achieve carbon neutrality.

Leveraging our strengths in proposing integrated energy and engineering solutions, we contribute to realizing carbon neutrality by repeating the cycle of analyzing, reducing, and maintaining.

Consultation for reducing CO₂ emissions

We visualize the full picture of a customer's CO₂ emissions, select appropriate CO₂ reduction measures, and prioritize them based on cost-effectiveness. We also support setting emission reduction targets and formulating a medium- to long-term roadmap.



Roadmap to reducing CO₂ emissions
(example of our proprietary carbon neutrality curve)



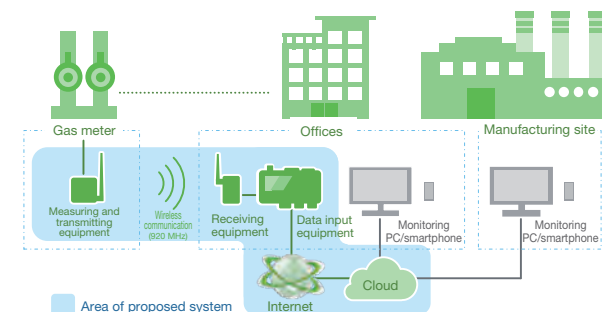
Corporate commercial promoting our efforts in helping our customers achieve carbon neutrality

GreenConnex factory visualization service for improving energy utilization

Our factory visualization service not only visualizes city gas and electricity but steam, air, and other components as well. Various types of visualizations can be used to propose improvements in energy utilization, and they can also be effective in increasing operational efficiency, improving the work environment, and identifying the cause of problems when they occur.

We also launched GreenConnex, a system that visualizes CO₂ emissions per product unit by introducing a production daily report system and combining production data with energy data.

To save energy and solve potential problems, we also provide a steam diagnosis, industrial furnace diagnosis, and chemical analysis service.



Example of implementation (visualization of city gas usage in a manufacturing plant)

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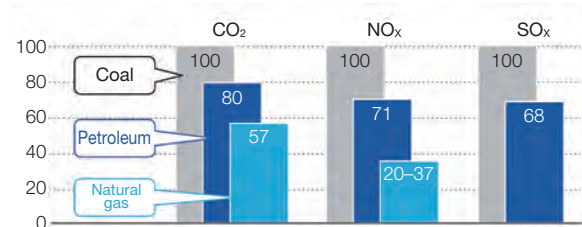
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Promotion of fuel conversion and advanced energy utilization

Fuel conversion for heat demand

To realize carbon neutrality, we are promoting fuel conversion to city gas as one of the established low-carbon technologies on the market today. The Chubu region of Japan is a major industrial hub, and there is room for reducing carbon emissions from fossil fuels, especially in the high-temperature thermal sector. Natural gas, the source of city gas, is the fossil fuel with the least CO₂ emissions, and by converting from coal and petroleum, we are contributing to low-carbon heat demand.



Environmental impact of natural gas (city gas feedstock)

Source: (CO₂ data) "Demonstration Survey Report on Atmospheric Impact Assessment Technology for Thermal Power Plants" (March 1990), Institute of Applied Energy
(NO_x and SO_x data) "Natural Gas Prospects to 2020" (1986), International Energy Agency

Energy savings and advanced energy utilization

By promoting the introduction of high-efficiency gas air conditioning, cogeneration, and district heating and cooling, we are contributing to energy savings

and low-carbonization at customer sites. In addition to conventional energy savings and advanced energy utilization, we are also promoting new initiatives, such as carbon recycling and hydrogen utilization, thereby supporting low-carbonization and decarbonization at customer sites.

Procurement initiatives in response to customer needs

Carbon offset using CO₂ credits

In April 2021, we began receiving LNG with CO₂ credits, offsetting CO₂ emissions from extraction to combustion. City gas that utilizes this LNG is in demand among customers in a wide range of industries as a means of contributing to reducing CO₂ emissions, and the volume of gas we handle is increasing. In addition, the operational status is verified by a third-party organization to ensure transparency and reliability. We will continue to examine projects that lead to flexible procurement and creation of credits, thereby contributing to our customers' efforts to reduce CO₂ emissions.



Control CO₂ emissions on a global scale

* All processes from natural gas extraction to combustion at customer location

Initiative to decarbonize gas itself

To realize carbon neutrality, we are focusing on procuring e-methane from overseas and steadily promoting the development and demonstration of key technologies, such as CO₂ separation and capture and methanation.

Methanation

Methanation is the technology of generating synthetic methane by reacting hydrogen with CO₂. The e-methane synthesized during this reaction is expected to become a future means for decarbonizing gas itself.

With methanation as the core method for gas decarbonization, we will promote demonstration tests and other activities to address issues such as improving efficiency and reducing costs through a broad alliance, with the goal of implementing the technology in society by 2030.

Domestically, we began methanation demonstrations in March 2024 in collaboration with the city of Chita and utilized city gas in this technology for the first time in Japan.

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Characteristics of e-methane

e-methane, synthesized by methanation from captured CO₂ and hydrogen, is a decarbonized fuel that does not increase atmospheric CO₂ when used, similar to hydrogen and ammonia.

The use of e-methane allows for effective use of existing city gas infrastructure and end-use equipment as well as efficient energy transport, thereby reducing costs to society while maintaining customer convenience.

e-methane イーメタン

Overseas procurement of e-methane

To promote the adoption of this fuel, it is important to build an international supply chain capable of producing highly competitive e-methane using inexpensive renewable electricity and the existing LNG supply chain and procure it to Japan, and we are accelerating full-scale efforts to realize this goal in the future.

Agreement reached on the establishment of an international alliance for e-methane

Together with companies from around the world engaged in the energy sector, we have agreed to establish e-NG Coalition, an international alliance aiming for the global proliferation of e-methane. Through the efforts of this alliance, we are collaborating across countries and industries to promote the use of e-methane worldwide and contribute to realizing a carbon neutral society.

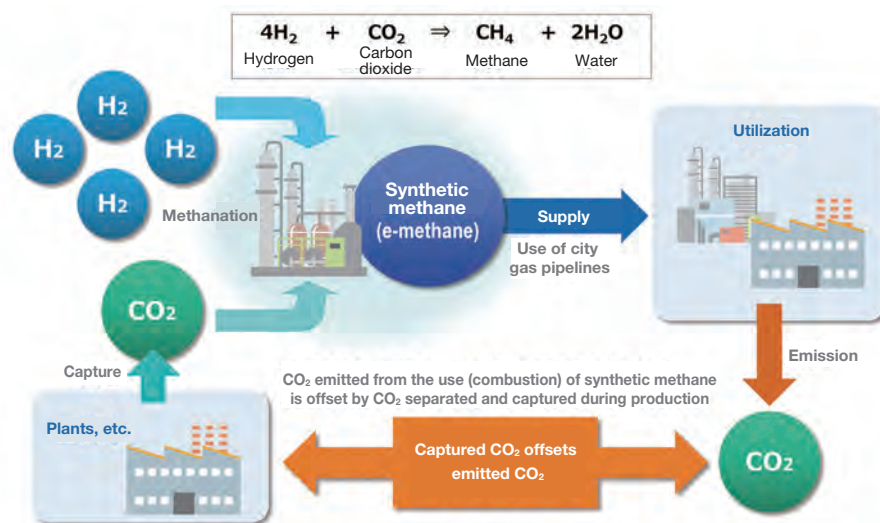


Exploring business related to e-methane production and export in Australia

We signed a joint study agreement with Santos Ventures Pty Ltd on the production of e-methane and its export to Japan. This study will assess the feasibility of producing e-methane using hydrogen produced from abundant renewable energy in Central and Eastern Australia as a feedstock and its export to Japan using existing LNG bases.

Comprehensive partnership regarding e-methane

We signed a memorandum of understanding on comprehensive collaboration with Tree Energy Solutions Belgium B.V. aimed at building an e-methane supply chain and implementing it in society. In addition to jointly exploring an e-methane



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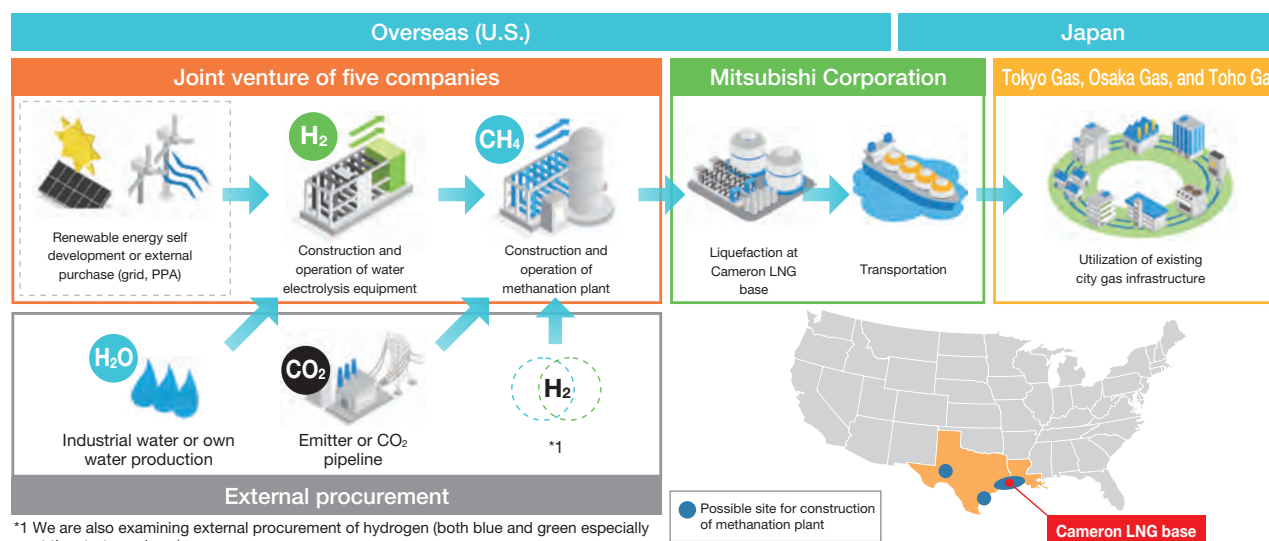
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supply chain, we are working together to raise awareness of e-methane and designing a system for rules on measuring CO₂ and economic support.

Introducing e-methane utilizing a U.S. LNG base

Together with Mitsubishi Corporation, Tokyo Gas, Osaka Gas, and Sempra Infrastructure Partners LP, we are continuing detailed project studies on the production of e-methane near the Cameron LNG shipping terminal in southwest Louisiana and the export of e-methane to Japan utilizing the existing

LNG infrastructure of LNG shipping terminals, LNG vessels, and receiving terminals. With the goal of beginning implementation by 2030, the plan is to produce and export 130,000 tonnes of e-methane annually, which is equivalent to 1% of gas sales for Tokyo Gas, Osaka Gas, and Toho Gas.

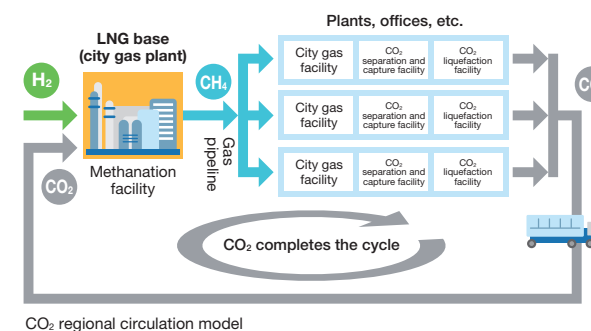


Domestic e-methane production

Examining the regional cooperation of methanation in the Chubu region

We are continuing to study a CO₂ regional circulation model together with Aisin Corporation and Denso Corporation.

To secure means for the carbon neutrality of heat demand at an early stage, we are focusing our study on a model case in which CO₂ emitted from inland plants is captured, transported by land to city gas production plants, and methanated, thereby circulating CO₂ within the country and region.



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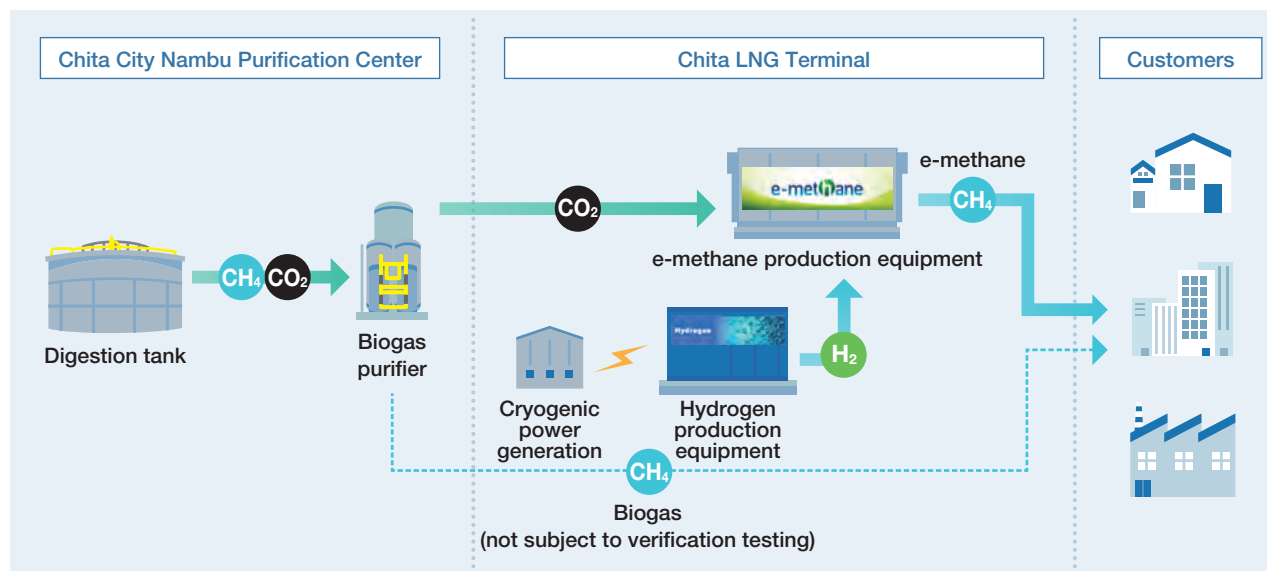
e-methane production demonstrations using biogas-derived CO₂

We have begun demonstrations of e-methane production in cooperation with the city of Chita in Aichi Prefecture, and we are identifying and examining technical and regulatory issues. This initiative makes effective use of local resources by utilizing CO₂ derived from biogas generated in sewage sludge treatment at Chita City Nambu Purification Center and hydrogen produced using electricity from cryogenic power generation for methanation to be used as a feedstock for city gas. This is the first use

of e-methane as a feedstock for city gas in Japan. This demonstration will lead to a larger scale production facility and lower costs.



e-methane production equipment



Overview of e-methane production demonstration in collaboration with the city of Chita

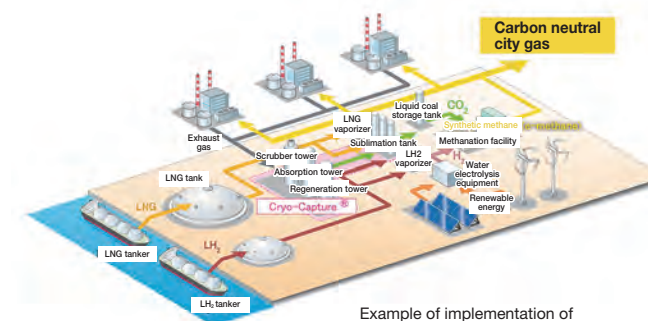
CO₂ separation, capture, utilization, and storage

Toho Gas has focused its efforts on developing CO₂ separation and capture technology early on, and we will continue to refine our technical expertise in CO₂ utilization (conversion to fuel and fixation) and storage.

Development of CO₂ capture technology using unused cold energy

As part of our technology to utilize unused cold energy from LNG and capture CO₂ affordably, we are focused on developing Cryo-Capture®, which captures waste gas from large-scale plants on the bay, and Cryo-DAC®, which will capture atmospheric CO₂ in the future.

In terms of CO₂ separation and capture at large-scale plants on the bay, we are working with Nagoya University as part of the Green Innovation Fund project sponsored by the New Energy and Industrial Technology Development Organization (NEDO) for the commercialization of technology. During the demonstration phase (FY2028 to FY2030), we are planning to conduct a demonstration in



Example of implementation of Cryo-Capture® in society

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Cryo-Capture* testing facility

which CO₂ captured at an LNG base using Cryo-Capture® will be used to produce e-methane. Regarding separation and capture of atmospheric CO₂, we are conducting R&D in collaboration with academia as part of a “moonshot”-type research and development project.

Feasibility study of Japan-Australia CSS value chain

We signed a memorandum of understanding with Sumitomo Corporation, Kawasaki Kisen Kaisha, Ltd., and Woodside Energy Ltd. for a feasibility study on building a CCS value chain between Japan and Australia. This study will evaluate the technology for separating and capturing CO₂ using unused cold energy from LNG that we are currently developing with the aim of commercialization, as well as the entire process from CO₂ separation, capture, accumulation, and liquefaction to export to Australia and storage.

Commercialization of CO₂ concrete fixation technology

Together with Aisin Corporation and Taisei Corporation, we are studying the commercialization of technology for fixing CO₂ captured from waste gas at plants as a raw material for use in concrete. The “Regional Carbon Recycling Project Using CO₂ Concrete Fixation Technology” was selected for commercialization support at the Aichi Carbon Neutrality Strategy Meeting led by Aichi Prefecture.

Building a foundation to expand the use of hydrogen

In addition to solidifying the concept for creating a hydrogen supply base, we will promote initiatives to commercialize hydrogen utilization technology and establish a solid position as a hydrogen supplier in the region by meeting growing demand for hydrogen.

Building a hydrogen supply chain with Chita-Midorihamma Works as the base

Construction of a hydrogen production plant at Chita-Midorihamma Works

We constructed a hydrogen production plant at Chita-Midorihamma Works and began operations in June 2024. As part of our efforts to achieve carbon neutrality, we will start by producing and supplying 1.7 tonnes of hydrogen per day from natural gas, and then expand the size of the plant according to growing regional demand for hydrogen.



Hydrogen production plant at Chita-Midorihamma Works

Promotion of collaboration for hydrogen business

We are promoting a collaboration with Taiyo Nippon Sanso Corporation in the hydrogen business to achieve carbon neutrality. As part of this collaboration, we will supply hydrogen from the hydrogen production plant at Chita-Midorihamma Works and coordinate alternative hydrogen procurement, and Taiyo Nippon Sanso Corporation plans to procure and sell some of

the hydrogen produced at this plant. Together we will work to build a hydrogen supply chain in the region.

Hydrogen utilization

We are promoting the development of hydrogen combustion-related technology to expand its application in the thermal sector and other fields, as well as its early commercialization after conducting demonstrations at customer locations. In the mobility sector, we are utilizing a cross-industry framework to develop and operate hydrogen stations with the aim of expanding vehicle models and applications.

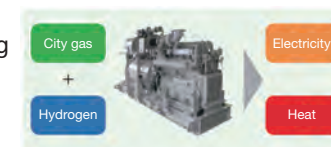
Commercialization of burners for both hydrogen and city gas

We commercialized* multiple industrial burners that can switch between city gas combustion and hydrogen combustion while minimizing the need for replacement parts. In addition, a burner jointly developed with Nippon Furnace Co., Ltd. received the Technology Award at the 2023 Technology Grand Prize sponsored by the Japan Gas Association for being able to eliminate the need to replace parts in the main unit.

* One type for direct heating, and two types for indirect heating

Test run of hydrogen co-combustion cogeneration

We conducted a city gas and hydrogen combustion demonstration using a gas engine for commercial cogeneration systems, and our test run achieved rated power output and a hydrogen mixing rate of 35% (by volume) for the first time in Japan.



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Expanding our hydrogen combustion trial service

By utilizing our expertise and technology in fuel conversion and burner development, hydrogen is burned in combustion equipment at customer plants and other locations, and we help customers identify and address issues related to hydrogen use. In March 2023, we constructed a dedicated testing facility to enable testing in a larger furnace.



Hydrogen combustion test field
(inside research institute)

Growing mobility demand

In the Chubu region of Japan, the use of hydrogen for mobility purposes continues, and we are developing hydrogen stations to support the adoption of fuel cell vehicles. We are utilizing a cross-industry framework to make effective use of the hydrogen infrastructure with the aim of expanding vehicle models and applications, such as industrial and transport vehicles.

Hydrogen station development
(4 locations operating)



Toyota Hoi hydrogen station



Hydrogen technology implementation at Minato AQULS

Hydrogen is positioned as a new energy source in the second phase of construction of the Minato AQULS urban development project that is currently underway.

As hydrogen usage is expected to start from hydrogen stations, hydrogen will be produced at a hydrogen station in Minato AQULS and supplied to fuel cell vehicles and other applications. In addition, progress is being made on installing hydrogen pipelines from the station to supply hydrogen to hydrogen utilization facilities such as cogeneration systems and fuel cells.



Minato AQULS hydrogen station

Promoting low carbon and decarbonization of electricity

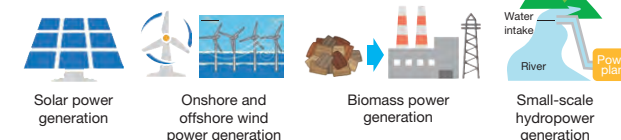
We are contributing to our customers' achievement of carbon neutrality by expanding the development and procurement of renewable energy sources while diversifying energy sources and providing services utilizing these sources.

Expansion and utilization of renewable energy sources

To achieve a decarbonization of energy sources, we are working on developing, procuring, and diversifying renewable energy sources such as solar power, biomass, and onshore and offshore wind power. In addition, we are strengthening our system to ensure stable operation and management of power plants. Furthermore, we are working with local governments and other organizations to utilize potential renewable energy resources in the region through new regional electric power companies and others to contribute to solving regional issues such as local production and local distribution of energy and strengthening resilience.

By utilizing these renewable energy sources and other energy sources, we will expand our products that contribute to low-carbon and decarbonization of electricity as well as services that promote efficient use of electricity.

Diversification of energy sources



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Renewable energy source development and introduction

This fiscal year, we will begin operation of woody biomass power plants as a joint investment with other companies. (Operation in Yatsushiro, Kumamoto Prefecture began in June, and operation in Karatsu, Saga Prefecture is expected to begin in December.) We will promote collaboration and cooperation among all related parties to ensure safe and secure operation of power plants.

In addition, by owning non-FIT solar power plants and procuring power, we expanded the volume of renewable energy sources handled, reaching 120,000 kW by March 31, 2023. We aim to expand that to 180,000 kW by the end of this fiscal year.



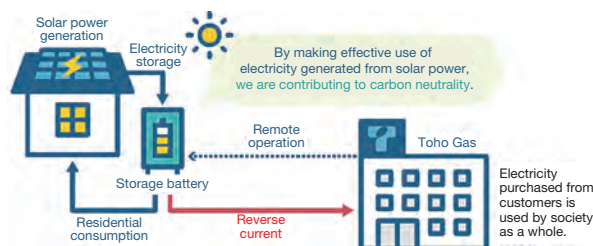
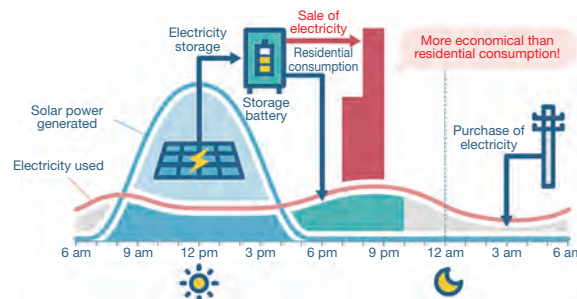
Yatsushiro Biomass Power Plant

Expansion of electricity services

In addition to promoting the adoption of diverse distributed energy resources, such as solar power generation and storage batteries, we are promoting a service that rewards customers and achieves efficient use of energy by integrating and controlling these resources using digital technology and interconnecting electricity.

Demonstration of “Waketoku,” a new electric power service using residential storage batteries

This service uses a system in which we remotely discharge the customer’s storage battery and buy back the resulting reverse flow of electricity during times of electricity supply and demand constraints. We are continuing demonstrations in efforts to reward customers, adjust the electricity supply and demand balance, and expand the use of renewable energy.



“Waketoku,” a new electric power service using residential storage batteries

Launching of the Toho Gas Kurashi Battery service

This service combines free* installation of a solar power generation system with the leasing of a storage battery. The customer pays no initial cost or maintenance fees for the solar power generation system, which can be a barrier to its installation and use.



Toho Gas Kurashi Battery

* Customer is responsible for scaffolding installation costs and costs requiring special construction.

Energy saving challenge —a residential demand response service

Customers responding to requests to save energy made through the Club TOHO GAS app at specific times are awarded energy-saving achievement incentives based on the amount of energy saved.



Screenshot of energy saving challenge