Core Businesses

In order to achieve the targets in the "Challenge 2020 Vision," Tokyo Gas has to attain sure and steady growth through sound and bold measures for each business. Our main businesses are the gas business, electric power business and overseas business. We once again describe these three businesses as our core businesses within the context of other initiatives being made to evolve into a total energy business, one of the objectives under our vision.



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Gas Business

Stable and affordable resource procurement through Diversification

As a nation poor in natural resources, Japan has practically zero natural gas resources, and there are no gas supply pipelines, such as those in North America and Europe, that are alternatives to LNG imports. For these reasons, Japan is in a relatively weak bargaining position for settling prices with sellers. Japan must procure LNG at higher prices than Europe and the U.S.

Prices for LNG currently imported into Japan are generally set under a framework that is linked to the price of crude oil. If crude oil prices rise, LNG prices also increase.

Under these circumstances, Tokyo Gas continues to engage in harsh negotiations with LNG sellers. The Company has engaged in ongoing efforts to to stably procure natural gas at as low a price as possible.

Tokyo Gas has been advancing an LNG procurement strategy by diversifying into three areas in order to ensure stable and affordable resource procurement through diversification.

Diversification

Resource Suppliers

We are diversifying our procurement sources, which have mainly been in Asia and Australia, to other regions of the world such as North America.



Significance of Export Project in North America In addition to procurement from sources in Asia and Australia, Tokyo Gas has been diversifying sources of procurement to ensure reliability of supply by working to import LNG from the North America.

The price of LNG imports from the U.S. will be linked to the Henry Hub price, the benchmark price for natural gas in the U.S. Tokyo Gas aims for more stability in procurement prices through portfolio effects, by procuring LNG from the U.S. at prices linked to the Henry Hub benchmark, on top of LNG procurement contracts with suppliers in Asia and Australia that use prices linked to the crude oil price.



Tokyo Gas Group's LNG procurement by country						
(year ended i	warch Stj			1,000 tons		
Country	FY2012	FY2013	FY2014	Composition		
Malaysia	4,409	4,767	5,638	(40.4%)		
Australia	3,379	3,992	4,179	(29.9%)		
Brunei	1,439	962	1,003	(7.2%)		
Indonesia	835	614	192	(1.4%)		
Russia	1,682	1,813	1,812	(13.0%)		
Qatar	235	325	749	(5.3%)		
Other	734	330	395	(2.8%)		
Total	12,712	12,804	13,967	(100.0%)		





Diversification 2 Contract Terms and Conditions

Tokyo Gas aims to diversify contract terms and conditions, by shifting from links to crude oil prices to links to various benchmarks, such as Henry Hub, as well as by shifting from forwarding with destination clauses to forwarding without destination clauses.



Tokyo Gas aims to own interests in gas fields and electric power stations around the world. We aim to eliminate price differences among regions by building distribution channels that bridge Asia, North America and Europe.



Deploy own ships

The Tokyo Gas Group aims to reduce resource prices by diversifying and expanding sources of procurement through the possession and management of its own LNG carriers.



	Name	Capacity	Туре	Built	LNG project
	LNG Vesta	127,000m ³	Moss	1994/6	Expand North West Shelf (NWS) MalaysiaI,II Darwin SakhalinII Pluto Gorgon, Others
Vessels owned and managed by the company	Energy Frontier	147,000m ³	Moss	2003/9	
	Energy Advance	147,000m ³	Moss	2005/3	
	Energy Progress	147,000m ³	Moss	2006/11	
	Energy Navigator	147,000m ³	Moss	2008/6	
	Energy Confidence	155,000m ³	Moss	2009/5	
	Energy Horizon	177,000m ³	Moss	2011/9	
	New Vessel (1)				
	New Vessel (2)	 165,000m ³	SPB	2017	Cove Point. Others
	New Vessel (3)				
	New Vessel (4)	165,000m ³	SPB	2018	
Vessels chartered to third party	LNG Flora	127,000m ³	Moss	1993/3	/
	GDF SUEZ NEPTUNE	145,000m ³	Membrane (Regasification Vessels)	2009/11	
	GDF SUEZ CAPE ANN	145,000m ³	Membrane (Regasification Vessels)	2010/6	

Expansion of Natural Gas Usage through Infrastructure Development

Under the "Challenge 2020 Vision," Tokyo Gas plans to invest around ¥730 billion, equivalent to 35% of its total investment budget, in infrastructure upgrades over the nine-year period from fiscal 2012 to fiscal 2020. Our strategic focus is on the northern Kanto region, where there is strong potential demand for gas with a number of large-scale industrial zones.

Tokyo Gas aims to expand gas sales volumes to 22.0 billion cubic meters (including tolling gas usage and LNG sales) by fiscal 2020, by further enhancing the stability of supply through expanded supply capacity for the development of potential demand and the completion of its pipeline loops, as well as by facilitating the transition from heavy oil and kerosene as fuel to natural gas and promoting the advanced use of natural gas. In particular, Tokyo Gas aims to double the volume of gas used by general industry, from 3.4 billion cubic meters in fiscal 2011 to 7.0 billion cubic meters.





Near the Tokyo metropolitan area, northern Kanto, centered on Tochigi Prefecture and Ibaraki Prefecture, is a region with strong potential demand for natural gas with a number of large-scale industrial zones.

As a first step toward capturing latent demand through the development of infrastructure, we completed the Chiba-Kashima Line in March 2012. Gas sales volumes increased dramatically in the Kashima Waterfront Industrial Zone.

Tokyo Gas plans to enhance the stability of supply by completing its pipeline network. We are working to spread natural gas usage by developing new customers in northern Kanto.

- High-pressure lines (existing)
- High-pressure lines (construction commenced after
- "Challenge 2020 Vision" launch)
- High-pressure lines (under construction / information in parentheses is the date operations are scheduled to commence)
- High-pressure lines(under consideration / route selection progress)
- High-pressure lines (medium-to-long-term concept) Other companies' pipelines (existing)
- Other companies: pipelines (existing
 Tokyo Gas Group supply area
- Industrial zones
- Factories







Cultivating Demand Based Out of the Hitachi LNG Terminal

The Hitachi LNG Terminal began construction in July 2012 as a strategic production and supply base for the company's expanding service area and to penetrate markets further. The Ibaraki–Tochigi Line will connect existing pipelines in Moka City, Tochigi Prefecture to the Hitachi LNG Terminal. We plan for the Hitachi LNG Terminal to be fully operational in March 2016. Here, we introduce the comments of project managers working on the construction site for the new terminal.



Tokyo Gas has expanded gas production facilities in tandem with growth in demand for natural gas. However, the maximum receiving capacity at our three LNG terminals around the Tokyo Bay is approximately 18.0 billion cubic meters. New terminals need to be constructed to meet future demand for natural gas. Since a large number of ships pass through Tokyo Bay and from a security standpoint, we decided to build our first offshore receiving terminal located outside Tokyo Bay.

When choosing a construction site, it is important to be on good terms with local residents. Hitachi City is located in northern Kanto, where we think there is potential demand, and our Hitachi Branch Office has built relationships of trust with government officials over 70 years. Taking into consideration the distance for laying the trunk line and other factors, we decided to build our new terminal in the Hitachi port area. We have worked very hard with representatives of Ibaraki Prefecture and Hitachi City to gain the understanding of local residents and to change port harbor plans.

The most important aspect of construction is the sharing of our concept of the terminal, which is to create a new energy hub for the northern Kanto region with our first LNG terminal for developing new large-lot customers. The most ambitious aspect of the new terminal is its aim to unearth new demand for gas. In the northern Kanto region, the deregulated sector for large-lot customers is the main battleground in the competition over energy. Tokyo Gas must reduce the cost of production as much as possible without sacrificing safety and reliability. Construction of the new terminal requires a variety of technologies, from civil engineering and machinery to electrical facilities and fixtures. When pursuing optimal configurations in various parts of construction, the tendency is to over-engineer. By sharing the concept of the new terminal with everyone involved in the project, we take care to maximize use of the LNG terminal construction and operating know-how nurtured over four decades and make sure everyone's eyes are on the same goals.

The terminal site is approximately 10 hectares in size, smaller than our other three terminals, so construction work efficiency has suffered. Being an offshore project, sea conditions can also slow construction down and pose many challenges for the project. Leveraging our long years of accumulated LNG terminal construction know-how, we have successfully cut costs through the modularization* of pier facilities and substantially reduced construction time for storage tanks. After experiencing the Great East Japan Earthquake, Tokyo Gas has reassessed building specifications for stronger resistance against earthquakes larger than the Great Hanshin-Awaji Earthquake, while making preparations to prevent cyberattacks against IT systems.

The Hitachi LNG Terminal is a strategic base for developing new customers in northern Kanto, and it will also enhance energy security in the Kanto region by connecting together our networks of trunk lines while also making it possible to supply high-pressure gas (7MPa) from the northern area. Kobe Steel's decision to build its Moka power plant near our facilities is proof that our strategy to develop new customers in northern Kanto is working. I believe the new terminal is helping to establish the Tokyo Gas brand in the northern Kanto area as we strive to cooperate with local residents through contributions to local communities and stable operations.

*Modularization: Pipes and other assembly work is performed at other plant locations in order to reduce work volume on sites with limited area. Only installation work is performed on-site.



Providing Diverse Energy Solutions

Stably Supplying Energy

Under the "Challenge 2020 Vision," ¥600.0 billion, or 29% of total capital expenditures, investments, and financing, will be directed toward cultivating energy demand over the period from fiscal 2012 to fiscal 2020. By providing various energy solutions centered on natural gas, we aim to diversify the range of fields in which natural gas is used and thereby enhance the LNG value chain.

Fuel Conversion

The Benefits of Converting to Natural Gas

If we identify coal as the base rate of 100, the level of CO₂ emissions produced by natural gas during combustion comes in at 60. In this regard, natural gas offers outstanding eco-friendly properties. Coupled with efforts to increase the efficiency of burners, successful steps can be taken to further reduce the amount of CO₂ emissions.

Unlike heavy fuel oil, which requires various storage facilities including tanks, gas is delivered through a network of pipes. This

The Benefits	 Eco-friendly (helps to reduce
of Fuel	CO ₂ emissions) Eliminates the need for storage
Conversion	equipment and facilities Offers improved operability Delivers labor savings
	OEnsures high supply stability

helps to minimize management costs. Moreover, natural gas generates low levels of soot during combustion, making it easier to clean the equipment used compared with other fuels.

Natural gas also offers benefits from a BCP perspective. Tokyo Gas uses medium- and high-pressure pipelines that are laid underground. These pipelines provide exceptional strength and flexibility allowing the Company to ensure the stable supply of natural gas even when earthquakes cut off traffic along roadways.



Promoting the Widespread Use and Expansion of Distributed Energy Systems

Commercial and Industrial Cogeneration Systems

Against the backdrop of increased demand for energy security and business continuity plans, we have been promoting sales of commercial and industrial cogeneration systems, and our cumulative stock of these systems has reached 1,790 MW. We plan to raise this cumulative stock to 4,000 MW in fiscal 2020.

Cogeneration systems supply electricity and heat through engines and other sources of power. In addition to the installation of facilities at the point of demand, cogeneration systems help to enhance energy efficiency, reduce the amount of CO₂ emissions, and improve economic efficiency through the conservation of energy by effectively utilizing both electricity and waste heat. The introduction of cogeneration systems continues to advance from a BCP perspective. This reflects the ability of these systems to provide stable supplies of electricity and heat as concurrent disaster prevention facilities at the time of commercial power network blackout if certain conditions are met.

Benefits of Cogeneration Systems Reduced Energy Usage and Costs
 Reduced environmental impact
 Improved Energy Security



Cogeneration Systems



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"ENE-FARM"

The "ENE-FARM" residential fuel cell system is a type of distributed energy system that is installed onsite at customers' homes. This highly efficient system uses city gas to generate electricity while also utilizing the heat created through the generation process to heat water. Moreover, "ENE-FARM" is an important strategic product in residential gas sales as customers using this system also consume greater volumes of city gas.

Advances to Date

"ENE-FARM" has continued to evolve since the first unit was launched in 2009. In April 2015, our "ENE-FARM" stock had risen to approximately 43,000 units.

The "Challenge 2020 Vision" calls for a stock of 300,000 "ENE-FARM" units to be accumulated by fiscal 2020, and we will continue to refine these systems and promote sales with the aim of achieving this goal.



ľ	Advances to Date						
	May 2009	First unit sold					
	Apr. 2011	New "ENE-FARM" model launched, priced approximately ¥700,000 less than previous offerings (MSRP: ¥2,630,000 plus tax)					
	Apr. 2013	New, more affordable "ENE-FARM" model launched (MSRP: ¥1,900,000 plus tax)					
	Apr. 2014	New "ENE-FARM" system for housing complexes launched					
	Apr. 2015	New product developed for detached house use; sales at a record low price (MSRP: ¥1,600,000 plus tax)					

Supplying LNG throughout Japan

Not limiting its operations to the Kanto region, the resources procured by Tokyo Gas are provided throughout Japan. We thereby meet the needs of gas companies throughout the country, supplying them with LNG via tank lorries, large ocean-going tankers, and smaller domestic vessels. The expansion of our sales channels in this manner is yet another one of our efforts to enhance the LNG value chain.

As one facet of these efforts, we commenced supply to the Ishikari LNG Terminal of Hokkaido Gas Co., Ltd., in October 2012. This project is our first endeavor to provide a domestic gas company with gas procured by the Company via ocean-going tankers. Through this venture, the Ishikari LNG Terminal will be supplied with between 300,000 tons and 400,000 tons of LNG per year during the 11-year period beginning fiscal 2012. Further, we acquired a 20% stake in Hokkaido LNG Co., Ltd., a consolidated subsidiary of Hokkaido Gas that is the direct owner of the Ishikari LNG Terminal, to deepen our relationship as we work to advance the spread of LNG. We also signed an LNG sales agreement with Saibu Gas Co., Ltd., for the supply of about 300,000 tons of LNG per year over the 16-year period beginning fiscal 2014. and commenced supplying them from October 2014.



LNG liquid sales volumes

