# Action Plan Summary

Overseas Upstream and Downstream Businesses

# Procuring Resources in a Stable and Affordable Manner and Expanding Overseas Operations

## Accelerating Diversification in Three Areas to Reduce Resource Procurement Costs

Natural resources are sparse in Japan, and the country lacks gas pipelines like those seen in North America and Europe, which are needed to provide an alternative for LNG. For these reasons, Japanese buyers have been unable to leverage significant bargaining power in price negotiations, forcing them to accept higher LNG prices than would be granted to North American and European buyers. Always aiming to procure a stable supply of affordable resources, Tokyo Gas is advancing an LNG procurement strategy that advocates three areas of diversification.

Under the "Challenge 2020 Vision," ¥320.0 billion, or 16% of total capital expenditures, investments, and financing, will be directed toward overseas businesses over the period from fiscal 2012 to fiscal 2020. Through this investment, we aim to grow overseas businesses to the extent that 25% of total net income is generated by these businesses, a substantial increase from the level of 10% in fiscal 2011. To realize this growth, Tokyo Gas will develop operations in upstream resource fields like natural gas as well as in other fields where the Company boasts specialties, such as energy services, engineering, and natural gas-fired thermal power generation projects.



### **Three Areas of Diversification for Resource Procurement**



 Shipment destination restrictions
Combination of differing periods
Free shipment destinations
Our Global LNG network
Accumulate gas field and power plant holdings around the world



## **Upstream and Downstream Expansion**

# **Overseas Businesses**

## Strategic Goals-Upstream Businesses

- Secure returns on business investments
- Increase the Tokyo Gas Group's resilience to crude oil price fluctuations to stabilize earnings
- Acquire a diverse range of information by participating in upstream projects

## Strategic Goals-Downstream Businesses

- Secure returns on business investments
- Leverage the Company's strengths in regard to energy services and engineering



# Action Plan Summary

Production <u>an</u>d Supply

# Developing Production and Supply Infrastructure to Cultivate Demand

## Capturing Latent Demand in Northern Kanto

Under the "Challenge 2020 Vision," ¥730.0 billion, or 35% of total capital expenditures, investments, and financing, will be directed toward infrastructure development over the period from fiscal 2012 to fiscal 2020. A particular strategic focus will be northern Kanto, which is home to several largescale industrial zones and therefore contains significant latent gas demand. We will capture this demand by bolstering supply capacity and creating pipeline loops that will boost supply stability. Also, we will encourage fuel conversion from heavy fuel oil and kerosene to natural gas while promoting advanced uses of natural gas. Through these efforts, we aim to expand gas sales volume to 22.0 billion m<sup>3</sup> in fiscal 2020. Specifically, we aim to cultivate an increase in general industrial sales volume from fiscal 2011's 3.4 billion m<sup>3</sup> to 7.0 billion m<sup>3</sup> in fiscal 2020, effectively doubling these sales.



## Expansion of Natural Gas Usage through Infrastructure Development



Northern Kanto Containing Significant Latent Demand



# Infrastructure Development Plan (Non-consolidated, only disclosed for long-term facilities development plan)



15.5 15.7 billion m<sup>3</sup> 15.0 15.2 billion m<sup>3</sup> 15.1 billion m<sup>3</sup> Sodegaura LNG Terminal / Installation 14.5 Obgishima LNG Terminal / Installation of Additional Vaporizer of Additional Vaporizer 14.0 Hitachi LNG Terminal Onahama Satellite Terminal 2014 2015 2016 2017 2018

#### Facility Investment Plans (Non-consolidated)

Billions of yen	Fiscal 2013 result	Fiscal 2014	Fiscal 2015	Fiscal 2016	Fiscal 2017	Fiscal 2018	Total for fiscal 2014–2018
Production facilities	28.9	35.3	31.7	8.5	7.0	7.1	89.6
LNG-related facilities	22.6	27.3	23.8	2.6	0.6	1.1	55.3
Other	6.4	8.0	7.9	5.9	6.4	6.1	34.3
Supply facilities	90.7	100.0	99.3	83.4	79.1	79.0	440.9
Trunk lines	20.5	28.4	28.8	10.7	3.8	0.5	72.2
Other	70.2	71.6	70.5	72.7	75.3	78.5	368.7
Business facilities	18.8	24.4	38.5	53.8	47.5	27.1	190.9
Subtotal for gas business facilities (reduction entry of land contribution for construction)	138.6	159.4	169.5	145.7	133.6	113.3	721.4
Incidental facilities	0.2	0.5	0.5	0.4	0.4	0.4	2.3
Total (reduction entry of land contribution for construction)	138.8	160.4	169.9	146.1	134.0	113.7	723.7

#### **Cultivating Demand Based Out of the Hitachi LNG Terminal**

#### Advancing Demand Cultivation in Northern Kanto and Establishing Pipeline Loops to Boost Energy Security throughout Kanto

Estimating that its gas sales volume will outstrip current supply capacity by the late 2010s, Tokyo Gas is moving forward with the Hitachi Project. The Hitachi LNG Terminal, which we began constructing in July 2012, will play a central role in advancing this project. This terminal will be connected to the Ibaraki–Tochigi Line that we commenced building on the Tochigi Prefecture side in January 2012, and both are scheduled to be operational during fiscal 2015.

#### Capturing Demand in Kanto's Leading Industrial Zone

The Chiba–Kashima Line was completed in March 2012. The construction of this trunk pipeline enabled us to commence supply to the Kashima Waterfront Industrial Zone. Situated in Ibaraki Prefecture, this is one of the Kanto region's leading industrial zones, and we are working to capture industrial demand therein. Located in this zone, the Kashima Thermal Power Station of Tokyo Electric Power Company, Incorporated, replaced all three of its gas turbines with highly efficient combined cycle turbines in June 2014. Tokyo Gas plans to take advantage of this development to expand gas sales volumes. Moreover, we aim to cultivate future demand in this zone in the range of 1.5 billion m<sup>3</sup> to 2.0 billion m<sup>3</sup>.



# Gas Sales Volumes in the Kashima Waterfront Industrial Zone



16.8 billion m<sup>3</sup>

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# Action Plan Summary

Energy Solutions

# Providing Diverse Energy Solutions

# Stably Supplying Energy to the Tokyo Metropolitan Area

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 circumstances in which natural gas is used and thereby enhance the LNG value chain.



## Expanding Power Generation (Natural Gas-Fired Thermal Power Generation)

Tokyo Gas is utilizing the insight and expertise it has developed through handling LNG in the gas business to conduct natural gas-fired thermal power generation projects, another area where it boasts strength. In addition, we anticipate that substantial synergies can be generated by developing natural gas-fired thermal power generation operations in conjunction with the gas business. For details, see P.33 Focus Story

The scope of the Company's power generation operations encompasses the procurement of resources (fuel), generation, and sales. In these operations, wholly owned subsidiary Nijio Co., Ltd., procures its own fuel (LNG) and then subcontracts power generation using this fuel to four Group-owned power plants that employ gas turbine combined cycle generation\*. These plants have a total combined generation capacity of 2,000 MW (of which, the Tokyo Gas Group's ownership share is 1,300 MW). Generated power is primarily sold to ENNET Corporation, a power producer and suppliers (PPSs), and on the Japan Electric Power Exchange, a power wholesale exchange. At present, we are not conducting retail sales.

\* This generation method generally entails combinations of gas turbines and steam turbines. The gas turbine burns fuel to generate electricity, and the heat from this generation process is used to boil water to power the steam turbine. This two-step generation process realizes high thermal efficiency.



Under the "Challenge 2020 Vision," we aim to raise the generation capacity of the electric power business from the current 2,000 MW to between 3,000 MW and 5,000 MW over the period from fiscal 2012 to fiscal 2020. One way we are boosting generation capacity is through the construction of the third unit at the Ohgishima Power Station. The unit will have a generation capacity of approximately 407 MW and is slated to commence operation in fiscal 2015. In addition, in March 2014, we reached a basic agreement with Kobe Steel, Ltd., to purchase a total of 1,200 MW of electricity annually from this company's power station in Moka City, Tochigi Prefecture, after both Unit 1 and Unit 2 commence operations in 2019 and 2020, respectively. At the moment, we expect our total power portfolio to have a generation capacity of approximately 3,600 MW in fiscal 2020 after these power sources are incorporated.



Aiming to further diversify our power source portfolio, we are examining the possibility of employing power sources other than natural gas-fired thermal, such as coal-fired thermal. At the same time, we will continue to develop our electric power business by carefully monitoring trends in Japan's supply and demand situation for electricity as well as developments regarding electricity system reform to accurately evaluate the economic rationality of future ventures.

## Supplying LNG throughout Japan

Not limiting its operations to the Kanto region, Tokyo Gas provides the resources that it procures 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.



# Promoting the Proliferation and Expansion of Dispersed Energy 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 1,810 MW. We plan to raise this cumulative stock to 4,000 MW in fiscal 2020.



#### Benefits of Cogeneration Systems

#### 1. Reduced Energy Usage and Costs

As cogeneration systems make effective use of waste heat or direct this heat for use in air conditioning or water heating equipment, they contribute to reductions in energy costs.

#### 2. Environmental Preservation Benefits

City gas is a clean source of energy and its systems make effective use of waste heat, thereby helping cut  $CO_2$  emissions by approximately one-third in comparison with conventional systems.

#### 3. Improved Energy Security

Cogeneration systems enable the usage of several power sources, making it easier to secure a supply of electricity during times of disaster.



Cogeneration system



LNG tanker Energy Frontier