

Progress toward Achieving “Challenge 2020 Vision” (draft)

Tokyo Gas Co., Ltd.

Tokyo Gas Co., Ltd. (President: Mr. Tsuyoshi Okamoto; “Tokyo Gas”) compiled Challenge 2020 Vision (“Vision”) in November 2011 to indicate the path for the Tokyo Gas Group toward 2020 as a top runner in the field of natural gas, in order to boost the value we provide to customers and society and contribute to national economic development and the improvement of the national standard of living. The Vision aims at enhancing the LNG value chain from LNG procurement and transportation through to the production and supply of city gas and the provision of energy solutions which resolve diverse customer energy issues. The Group has been steadily implementing efforts toward achieving the Vision, and this release summarizes the main efforts since October 30, 2012 when the progress status was last announced.

In raw materials procurement and overseas business, Tokyo Gas has been working to reduce raw materials prices by diversifying suppliers and contract contents, and to expand overseas business. In April, 2013, Tokyo Gas decided to procure LNG from **the Cove Point LNG Project** aiming to import U.S. natural gas LNG, including shale gas, to Japan starting around 2017. This is the first Tokyo Gas long-term LNG contract that imports LNG at a price linked to U.S. natural gas market prices. In March 2013, Tokyo Gas reached a transaction agreement with Quicksilver Resources Inc. (“QRI”) to acquire a 25% interest in QRI’s shale gas development business at **the Barnett basin in Texas, U.S.** Tokyo Gas also signed an agreement in February 2013 to purchase **U.S. LPG** at a price indexed to U.S. propane market prices.

In efforts to upgrade and expand the production and supply infrastructure, in April 2013 **the joint LNG terminals with Tokyo Electric Power Company (TEPCO) began to discharge low-calorie LNG for LNG thermal power plants and high-calorie LNG for city gas.** By decreasing the receipt of LPG for city gas and increasing the receipt of LNG for electric power generation, Tokyo Gas is advancing stable and efficient energy supply in the Tokyo Metropolitan Area.

What is more, in February 2013 Tokyo Gas decided to accelerate **the upgrading of the natural gas infrastructure in Ibaraki Prefecture** to respond to the growing demand for natural gas and improve the overall stability of the prefectural energy supply infrastructure. In addition to steadily implementing the construction works at the Hitachi LNG Terminal and the Ibaraki-Tochigi Line which are already underway, Tokyo Gas also reached an agreement with **Tobu Gas Co., Ltd. on the joint construction of a new pipeline for the Mito area.** In the construction of the Hitachi-Kashima Line (provisional name), examinations have begun on a land route and a seabed route toward an early start of operations by 2020.

In energy solutions, Tokyo Gas is promoting the spread and expansion of distributed energy systems and of gas appliances that contribute to cuts in peak electricity demand. Sales of **ENE-FARM residential fuel cells, co-generation systems and gas fueled air-conditioning systems** are steadily increasing. Efforts to promote **the advanced utilization of natural gas and fuel conversion** are moving forward with the development of approximately 500 million m³ in demand in FY2012 along with the initiation of supply through the Chiba-Kashima Line in March 2012,

Tokyo Gas will continue striving to enhance the LNG value chain toward achieving Challenge Vision 2020.

Current Status of Progress of Main Themes in Challenge 2020 Vision

(Main efforts since October 30, 2012 release)

<p>Raw Materials Procurement</p> <p>Overseas Business</p>	<p>(1) Diversification of raw materials sources and overseas upstream projects</p> <p>[1] Decision on U.S. LNG natural gas procurement, including shale gas (April 2013)</p> <ul style="list-style-type: none"> • Tokyo Gas subsidiary TG PLUS Co., Ltd. (established February 2013) and Sumitomo Corporation reached a basic agreement regarding LNG purchases from the U.S. Cove Point LNG Project (Contract term: 20 years from the scheduled start date in 2017, Volume: 1.4 million tons/year). This is the first Tokyo Gas long-term LNG contract that imports LNG at a price indexed to U.S. natural gas market prices. • Consigned liquefaction to Dominion Cove Point LNP, LP (Contract term: approx. 20 years, Volume: 2.3 million tons/year). Will hold future discussions with Sumitomo Corporation regarding purchase of natural gas feedstock and establishment of a joint venture for LNG sales. <p>[2] Participation in U.S. shale gas development business (March 2013)</p> <ul style="list-style-type: none"> • Concluded a contract to purchase a 25% interest in the shale gas development business of Quicksilver Resources Inc. at the Barnett basin in Texas (equity interest gas production volume: 350,000 – 500,000 tons/year LNG equivalent). <p>[3] Purchase of LPG indexed to U.S. propane market prices (Feb. 2013)</p> <ul style="list-style-type: none"> • Reached an agreement with Astomos Energy Corporation on the purchase of U.S. LPG (Contract term: 6 years from 2013, Volume: a total of 400,000 tons). This is the first Tokyo Gas LPG purchase indexed to U.S. propane market prices. <p>(2) Expansion of overseas business</p> <p>Participation in energy service business in Brazil (Dec. 2012)</p> <ul style="list-style-type: none"> • Tokyo Gas subsidiary Energy Advance Co., Ltd. (ENAC) and Mitsui & Co., Ltd. agreed to acquire all the shares of Ecogen Brasil Soluções Energéticas S.A. (“Ecogen”), a commercial and industrial energy service company in Brazil using natural gas cogeneration systems, through a jointly-established subsidiary.
<p>Production & Supply</p>	<p>(1) Improving the stability and efficiency of Tokyo Metropolitan Area energy supply by expanding joint operations at LNG terminals</p> <ul style="list-style-type: none"> • In April 2013 the joint LNG terminals with TEPCO began to discharge low-calorie LNG for LNG thermal power plants and high-calorie LNG for city gas. By decreasing the receipt of LPG for city gas and increasing the receipt of LNG for electric power generation, Tokyo Gas is advancing stable and efficient energy supply in the Tokyo Metropolitan Area. <p>(2) Upgrading the natural gas infrastructure centered on Ibaraki Prefecture</p> <p>[1] Hitachi LNG Terminal; Ibaraki-Tochigi Line</p> <ul style="list-style-type: none"> • Hitachi LNG Terminal: Completed soil stabilization works; advancing tank and berth engineering works (operations scheduled to begin from FY2015). • Ibaraki-Tochigi Line: Reached an agreement with Tobu Gas on the construction of a new branch pipeline from the trunk line to the Mito area and initiated examinations (Feb. 2013). <p>[2] Koga-Moka Line</p> <ul style="list-style-type: none"> • Completed the Koga-Moka route examinations and confirmed a basic route of about 50km. Construction is scheduled to begin from the 2nd half of FY2013 (operations scheduled to begin from FY2017). <p>[3] Hitachi-Kashima Line (provisional name)</p> <ul style="list-style-type: none"> • Initiated examinations of a land route and a seabed route aiming at the early start of operations by 2020.

(3) Earthquake, tsunami and other natural disaster measures and ensuring security

- [1] Reorganized into 179 disaster prevention blocks in FY2012 to prevent secondary disaster from earthquakes and to restore gas supply as soon as possible. (The total number of disaster prevention blocks will be increased to about 200 by around 2018). Also raised the supply suspension criteria for high seismic-resistance blocks to secure the continuity of low-pressure gas supply in areas with high seismic resistance. (April 2013)
- [2] Completed urban flooding countermeasures for manufacturing equipment in FY2012 including equipping buildings with waterproof doors.
- [3] Began works to reinforce emergency gas transmission facilities and in-house power generation to secure continued supply from LNG terminals during prolonged power outages (scheduled for completion in FY2016).

Energy Solutions

(1) Promoting the spread and expansion of distributed energy systems and gas air conditioning

- Promoted the spread and expansion of distributed energy systems and gas-fueled air conditioning in response to customer demand for improved energy security, reduction of peak electricity demand, energy conservation and CO₂ reduction.
- Jointly developed and released a new version of the ENE-FARM residential fuel cell together with Panasonic Corporation and achieved reduced prices, improved installation, and higher overall efficiency (April 2013).

	FY2011	FY2012	FY2013 (plan)
ENE-FARM	5,700 units	7,600 units	12,000 units
Co-generation	50,000 kW	150,000 kW	220,000 kW
Commercial gas air conditioning	140,000 RT	170,000 RT	180,000 RT

(2) Advancing stable and efficient energy supply with district heating and cooling

- Group company Energy Advance began supplying 3,000kW of electricity to the Tokyo Metropolitan Government Building using the 4,000kW gas cogeneration turbine in the Shinjuku district heating and cooling system and a dedicated transmission line (Dec. 2012)
- Implemented construction works for heat interchange between the Shinjuku and Nishi Shinjuku 1-chome district heating and cooling systems, promoting further CO₂ emissions reductions through area energy interchange (scheduled to begin interchange from May 2013)

(3) Expansion of the electric power business

Construction of Ohgishima Power Station Unit 3

- Began design works in Nov. 2012 toward commencing operations within FY2015; construction scheduled to begin from June 2013.

(4) Nationwide development of LNG sales

- Promoted LNG sales for trucks, coastal vessels and ocean vessels. Increased LNG sales contract with Hokkaido Gas Co., Ltd. (approx. 300,000-400,000 tons per year for FY2012-FY2022) by tens of thousands of tons per year in FY2013-FY2015.

	FY2011	FY2012	FY2013 (plan)
LNG sales	440,000 tons	600,000 tons	790,000 tons

(5) Promotion of advanced utilization of natural gas and fuel conversion

- With the initiation of supply through the Chiba-Kashima Line in March 2012, developed demand of approx. 500 million m³ in FY2012 and developing approx. 300 million m³ more in FY2013 for an expected total of about 800 million m³.

	<p>(6) Promotion of smart energy systems</p> <p>[1] In the smart energy network being planned for the north district of Tamachi Station east exit, the development work began on the SENEMS energy management system for unified management of meteorological data and other external information and the energy use conditions of each building, and the optimal operational command of each air conditioning unit and other equipment.</p> <p>[2] In the smart energy network being planned for the Toyosu wharf district, the heat source and other equipment for the energy supply plant is being designed. This project was recognized as the first project of the Ministry of Land, Infrastructure, Transport and Tourism support program “Leading Urban Environment Formation Promotion Model Project” (Dec. 2012).</p> <p>[3] In the Nihombashi Smart City project which includes the first district electricity supply to an existing central urban area in Japan and strengthens urban disaster-resistance, Tokyo Gas began examinations on district electricity supply and heat supply across the entire redevelopment area and existing area through introduction of a cogeneration system together with the promoter, Mitsui Fudosan Co., Ltd.</p> <p>[4] Tokyo Gas is advancing the Smart Apartment Project at its company housing in Isogo as an effort in the housing field under the Yokohama Smart City Project led by the City of Yokohama, Along with examining the effects of HEMS and promoting energy conservation behavior, investigations are being pursued on introducing smart energy at the community level including multiple buildings and non-residential demand.</p> <p>[5] Together with Panasonic Corporation and other partners, Tokyo Gas established the joint venture Fujisawa SST Management Company, which will be engaged in housing and building maintenance, power generation, supply and sale of electricity, and the provision of communications and other services to the entire town toward realizing the Fujisawa Sustainable Smart Town (March 2013).</p>
<p>Strengthening Foundations</p>	<p>(1) Implementation of organizational reform toward achieving the Vision</p> <p>[1] Established a new Ibaraki Division in Mito City to build close relations with Ibaraki Prefecture and the cities, towns and villages in Ibaraki Prefecture (April 2013).</p> <p>[2] Established a new Smart Energy Promotion Division to survey and analyze domestic and foreign smart energy network trends, plan and develop a business model, and draft a comprehensive strategy (April 2013).</p> <p>(2) Introduction of a new personnel system</p> <ul style="list-style-type: none"> • Introduced a new multiple-track personnel system for highly refined evaluation of the nature and strengths of each employee and to further advance human resources development, aimed at maximizing organizational performance (April 2013).