

Business overview

Overseas business

OVERSEAS BUSINESS



Outline

We have expanded and increased overseas bases and staff, and have participated in LNG or natural gas related business projects in Australia, North America, and Southeast Asia, all in order to make overseas business another major source of growth for the Tokyo Gas Group, as indicated in the Challenge 2020 Vision. Looking ahead, in addition to conducting discussions with a view to further business development, we will also work to ensure efficient distribution of management resources as we advance our overseas business operations.

Strengths

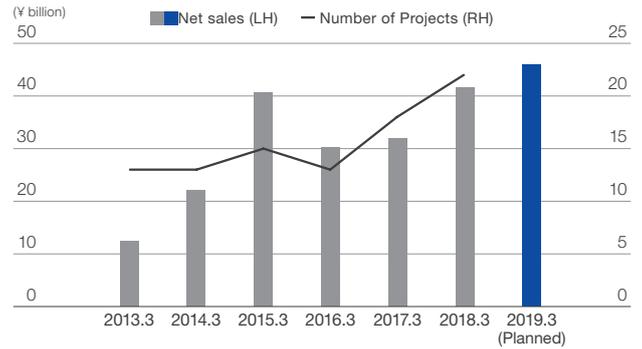
- Know-how in the midstream and downstream businesses accumulated in Japan
- Global network established through activities such as material procurement and business participation

Risks

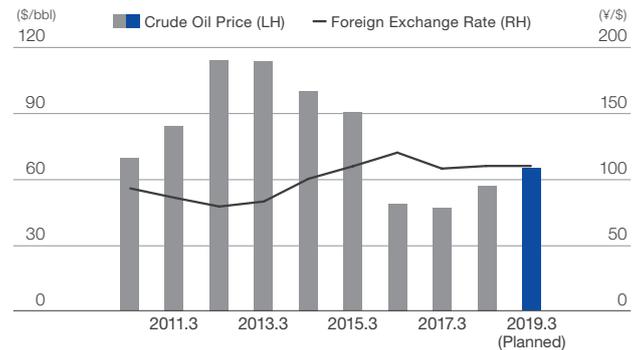
- Business operations may be stalled, or the burden of expenses may increase, as a result of country-specific laws, regulations and/or business practices
- Fluctuations in crude oil/gas prices and foreign exchange rates may impact the revenues and expenditures of all overseas business operations

Net sales	Segment profits
¥41.5 billion FY2017	¥7.7 billion FY2017

Net Sales and Number of Projects



Oil Price and Foreign Exchange Rate



Building an LNG value chain

Projects and business locations



Message  
Tokyo Gas America Ltd.  
Nozomu Nagai

I came to work at Tokyo Gas America—which has its primary business location in Houston, Texas—in 2015. Until recently I had been responsible for new investment projects in the shale gas business, but as of 2017 I have been working on secondment at Castleton Resources LLC. (“CR”), a shale gas business company in which Tokyo Gas recently acquired shares, and have gained six months of field experience in shale gas development.

Shale gas development demands high-difficulty technological capabilities, in achieving the efficient excavation of 5,000-meter-long gas wells. This is an area in which Tokyo Gas had only limited expertise, and we are working amongst professionals with decades of experience in the business. Despite this, I worked diligently and to the very best of my abilities, and was able to identify the cause of digging difficulties occurring deep underground—where we cannot physically see—by making effective use of data. As a result, I was able to contribute to increasing our digging efficiency, which was a source of great joy and satisfaction.

I am currently working at CR headquarters, making assessments of the size of underground reserves and analyzing development costs. I am also learning about American corporate culture, organizational structure, and cost-cutting initiatives. In the future, I will continue contributing to the further advancement of our US business operations and our overseas business operations overall, based on the experience gained during my secondment.

## Aiming to develop and advance our overseas business operations as a global total energy business operator

We plan to expand the breadth and depth of our overseas business operations, in accordance with the characteristics of each region we operate in, by leveraging the global LNG value chain experience that we have developed both domestically and overseas. We will also strengthen our position in the LNG market, as the company that people associate most with LNG (i.e. “Think LNG, think Tokyo Gas.”)

Additionally, we will continue to invest in projects that contribute to the construction of energy infrastructure, with a primary focus on midstream to downstream businesses, for which we can expect to see low-volatility and stable returns. We will aim to build a portfolio that is less influenced by fluctuations in energy prices, and continue working to increase the added value of our existing projects.

We are also setting our sights on expansion into new fields of business which are expected to see a growth in demand in the future, including floating storage and regasification unit (FSRU) and renewable energy; and entry into new overseas regions where we can expect to see market growth, and where we can leverage our strengths.

The Tokyo Gas Group’s overseas operations currently span 13 business locations in nine countries. Over the past year,

our participation in five new projects has been decided. These include projects in North America, which offers extensive opportunities for market entry, and in Southeast Asia, where there is growing use of natural gas.

	North America	Southeast Asia	Australia
<b>Upstream Business</b>	<ul style="list-style-type: none"> <li>■ Operation and management of existing projects</li> <li>■ Exploration of new projects</li> </ul>	—	<ul style="list-style-type: none"> <li>■ Operation and management of existing projects</li> </ul>
<b>Midstream- and Downstream Business</b>	<ul style="list-style-type: none"> <li>■ Gas-fired thermal power generation</li> <li>■ Exploration of new projects</li> </ul>	<ul style="list-style-type: none"> <li>■ LNG terminal business</li> <li>■ Gas-fired thermal power generation</li> <li>■ Gas supply</li> <li>■ Energy service</li> <li>■ Exploration of new projects</li> </ul>	—
<b>Business Location</b>	<ul style="list-style-type: none"> <li>Tokyo Gas America Ltd.</li> <li><b>Houston, Texas</b></li> <li>—</li> <li>TGES America Ltd.</li> <li><b>South Carolina</b></li> <li>—</li> <li>Acario Ventures</li> <li><b>Silicon Valley</b></li> </ul>	<ul style="list-style-type: none"> <li>Tokyo Gas Asia Pte. Ltd.</li> <li><b>Singapore</b></li> <li>—</li> <li>Bangkok Representative Office</li> <li><b>Thailand</b></li> <li>—</li> <li>Jakarta Representative Office</li> <li><b>Indonesia</b></li> <li>—</li> <li>Ho Chi Minh &amp; Hanoi Representative Offices</li> <li><b>Vietnam</b></li> <li>—</li> <li>Manila Representative Office</li> <li><b>Philippines</b></li> <li>—</li> <li>Kuala Lumpur Representative Office</li> <li><b>Malaysia</b></li> </ul>	<ul style="list-style-type: none"> <li>Tokyo Gas Australia Pty Ltd.</li> <li><b>Perth &amp; Brisbane</b></li> <li>—</li> <li>—</li> <li><b>Others</b></li> <li>—</li> <li>Paris Representative Office</li> <li><b>France</b></li> </ul>

## North America

In North America, there is a substantial demand for energy. Deregulation and market trading of energy are advancing, and we can expect to see long-term growth in the natural gas market. In this market, we will continue to participate in upstream, midstream and downstream businesses. In the future, we will aim to increase synergies between individual business operations, and to acquire and use knowhow that will contribute to our other businesses both in Japan and abroad, while at the same time establishing a stable revenue base.



Birdsboro Power Plant (under construction)

### Upstream Business

Monitoring commodity price trends and carefully estimating the productivity and reserves of gas fields we are proceeding to form appropriate alliances with experienced operators and invest in prime assets. Tokyo Gas has so far participated in three gas development projects in the United States.

Project Name	Start of Participation	Investment ratio
U.S.A. Barnett shale gas development	<b>Mar. 2013</b>	<b>25%</b>
U.S.A. Eagle Ford shale gas development	<b>Jun. 2016</b>	<b>25%</b>
U.S.A. East Texas gas development business	<b>May 2017</b>	<b>30%</b>

### Midstream- and Downstream Business

When planning gas-fired power generation we will continue to use well-defined criteria to select projects in which to participate, giving due consideration to demand and supply of electricity, competition with other power sources, regulations and business environments on a state-by-state basis. We have recently participated in two gas power generation businesses in the East Coast region, where there is large-scale demand.

Project Name	Start of Participation	Investment ratio
Mexico Natural gas-fired thermal power plant business (Bajío Power Plant)	<b>Oct. 2004</b>	<b>49%</b>
Mexico Natural gas-fired thermal power plant business (MT Falcon Power Plant)	<b>Jun. 2010</b>	<b>30%</b>
U.S.A. Industry-oriented energy services business (TGES America)	<b>Feb. 2015</b> (Foundation)	<b>100%</b>
U.S.A. Natural gas-fired thermal power plant business (Empire Power Plant)	<b>Oct. 2016</b>	<b>25%</b>
U.S.A. Natural gas-fired thermal power plant business (Birdsboro Power Plant)	<b>Apr. 2017</b>	<b>33.33%</b>

Southeast Asia

Tokyo Gas Group's Bases in Southeast Asia



Midstream- and Downstream Business

In Asian countries, where LNG imports and natural gas usage are expected to increase, the Tokyo Gas Group will utilize its knowledge and experience regarding the use of LNG and natural gas in order to provide wide-ranging value to customers, from natural gas engineering to operational know-how and energy-saving services, with the aim of contributing to the development of natural gas infrastructure.

Specifically, we will seek to contribute by participating not only in tangible aspects (such as in the construction of LNG terminals, power stations and other energy infrastructure that will occur in various countries in the near future), but also intangible aspects such as demand creation, LNG terminal operation and LNG procurement. In this way, we will seek to increase our involvement and presence across the entire LNG value chain.

In 2017, we invested in gas distribution businesses in Vietnam and Indonesia, while in 2018 we have made the decision to invest in the gas business company in Thailand.

In the field of engineering, in 2017 we were awarded an order of feasibility studies and engineering work concerning the construction of LNG receiving terminals in Bangladesh, while in 2018 we were awarded an order to provide project management consultant (PMC) services for the construction of LNG terminals in Thailand.

Amid rapid economic growth, Southeast Asia is expected to see a rise in demand for natural gas and an increase in imports of LNG. Tokyo Gas aims to work with the respective governments of and companies in these countries in order to contribute to the building of energy infrastructure, and the introduction of natural gas in these regions.

Specifically, we will be engaging in midstream and downstream business operations including LNG terminal, gas-fired thermal power generation, gas supply and energy service businesses.

In addition to opening offices in Indonesia, Thailand, and Vietnam in 2015, we established a representative office in the Philippines in April 2017. Our ultimate goal for the future is to form an LNG value chain in Southeast Asia.



Jakarta Representative Office

Project Name		Start of Participation
Philippines	Submitted declaration of interest regarding formation of an LNG value chain	Oct. 2017
Vietnam	Invested/acquired a stake in a gas supply business company and formed a strategic alliance	Jul. 2017
Thailand	Secured an order to provide PMC services in the construction of the Nong Fab LNG receiving terminal	Jan. 2018
Thailand	Invested/acquired a stake in a gas supply business company	Jan. 2018
Indonesia	Invested/acquired a joint stake in a gas supply business company	Oct. 2017
Bangladesh	Secured an order for work relating to LNG receiving terminals	Jul. 2017



*Message*  
Bangkok Representative Office  
**Manakan Lertsamattiyakul**

The Thai government is currently advancing the deregulation and promotion of third-party entry to the natural gas market, and private-sector companies—including overseas-based corporations—are expected to enter the market.

In view of this, one of my roles is to gather energy-related information by holding meetings and conducting interviews with government agencies and other private-sector companies on matters such as government policy, regulatory trends, and the state of other companies' activities; and to report that information to our Tokyo head office, and to Tokyo Gas Asia Pte. Ltd. in Singapore (which is responsible for the management of the Asia region).

In January 2018, we participated in the gas supply business, which was a first for a private-sector company in Thailand. We have received many inquiries from outside parties, indicating a high level of interest in the gas retail business.

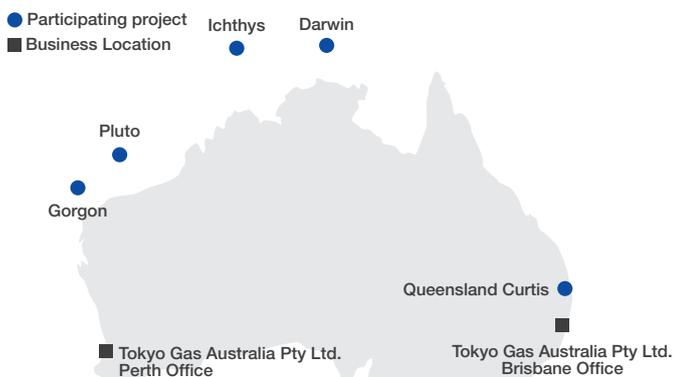
In 2011, Thailand became the first country in Southeast Asia to introduce LNG. Due to the depletion of domestically-produced gas reserves, LNG imports are expected to continue growing further in the future. We are receiving numerous inquiries for details and requests to visit our LNG terminals, primarily from government personnel.

I myself have many years of experience in the field of power generation, but this was actually my first post in the world of LNG. Through opportunities such as this, I want to learn more about a wide-range of topics concerning the LNG value chain, and to continue to act as a bridge between Thailand and Japan in the future.

## Investing our energies into the operation and management of existing projects

### Australia

#### Participating projects and business locations



Gorgon LNG Project

**Upstream Business** We have invested in five projects in Australia, which has grown as a major LNG supply base to the East Asia. Four of these LNG projects are already in operation today. We will continue to focus on the operation and management of these projects, as well as the Ichthys Project (which is scheduled to commence operation in the near future), with a view to maximizing their value as Group assets.



Tokyo Gas Australia Pty Ltd. (Perth)

Project Name	LNG Production Capacity (Million tons / year)	Start of Participation	Tokyo Gas Interest	Start of Production (Operation)
Darwin	3.0	2003	3.07%	Jan. 2006
Pluto	4.7	2008	5.00%	Apr. 2012
Gorgon	15.6	2009	1.00%	Mar. 2016
Queensland Curtis	8.5	2011	1.25% (Gas Field) / 2.50% (No. 2 Liquefaction Plant)	Dec. 2014
Ichthys	8.9	2012	1.575%	2018 (Planned)

#### Sustainable Development Goals

##### Initiatives Towards Achieving the Sustainable Development Goals (SDGs)

##### Taking up the challenge of creating an LNG value chain in Southeast Asia

- In 2017, we invested and acquired stakes in gas supply businesses in Vietnam (July) and Indonesia (October). In January 2018, we acquired a stake in a similar business in Thailand. In October 2017, we also submitted a declaration to the government of the Philippines regarding our interest in constructing an LNG value chain.
- By leveraging our Group's technological capabilities and know-how to provide energy solutions and construct infrastructure, we are seeking to promote the widespread adoption of clean, environmentally-friendly natural gas. We also hope that contributing to the creation of jobs and economic development through our local business operations will lead to an increase in educational opportunities and help to eliminate disparities in wealth and living standards in those countries.

