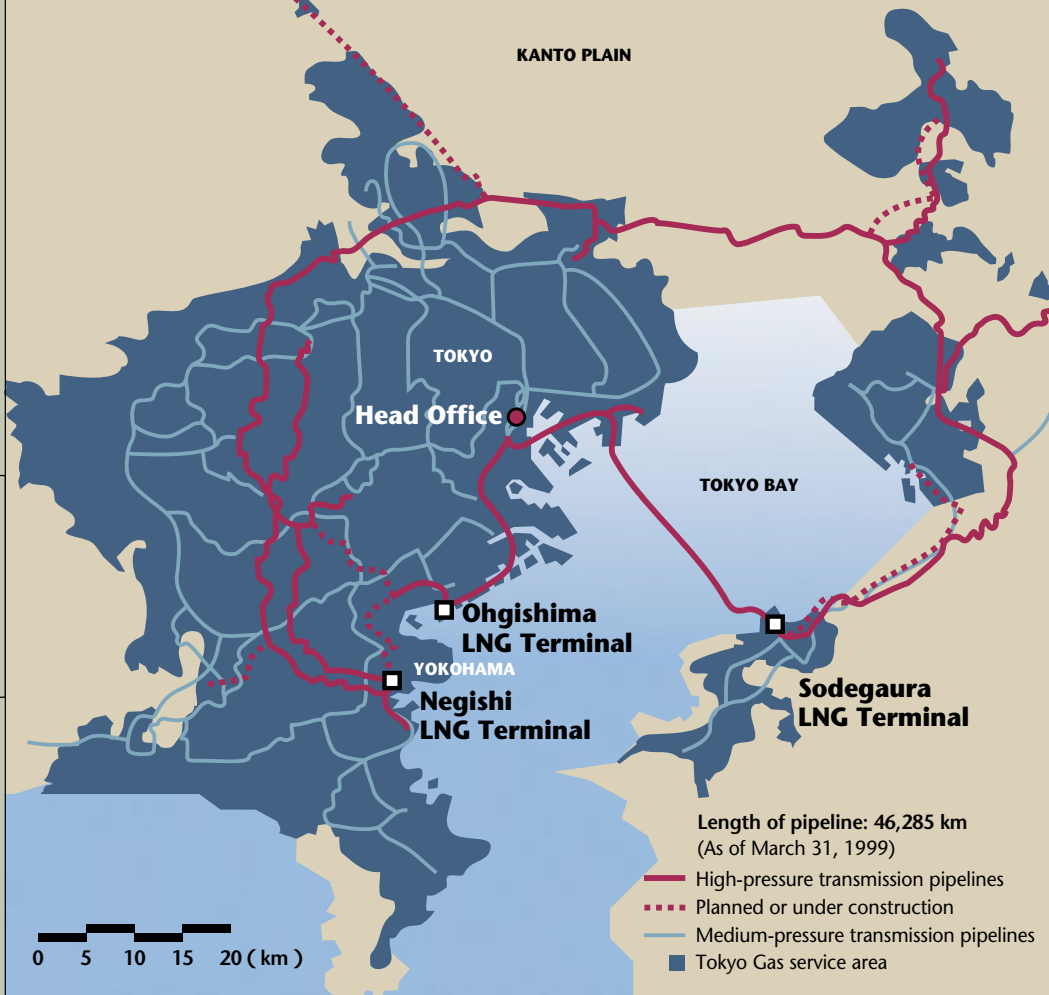


# Honing a Sharper Competitive Edge



### Negishi LNG Terminal

Commenced operations: 1969  
 Daily production capacity:  
 1.0 trillion Btu (21 million m<sup>3</sup>)  
 Storage capacity: 1.2 million m<sup>3</sup>  
 Special feature: Received Japan's first shipment of LNG in 1969

### Sodegaura LNG Terminal

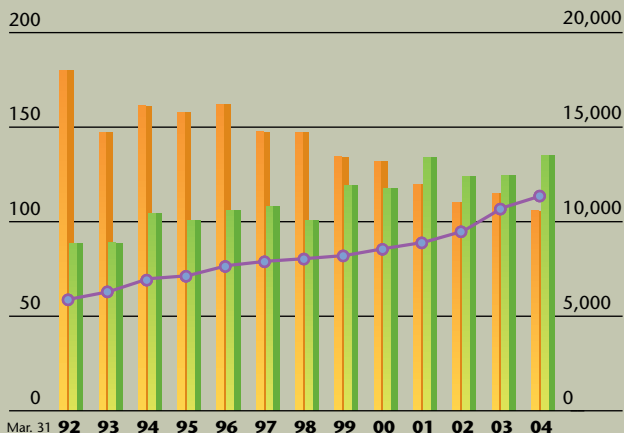
Commenced operations: 1973  
 Daily production capacity:  
 1.3 trillion Btu (29 million m<sup>3</sup>)  
 Storage capacity: 1.6 million m<sup>3</sup>  
 Special feature: The world's largest LNG receiving terminal

### Ohgishima LNG Terminal

Commenced operations: 1998  
 Daily production capacity:  
 0.4 trillion Btu (10 million m<sup>3</sup>)  
 Storage capacity: 0.2 million m<sup>3</sup>  
 (another 0.4 million m<sup>3</sup> is presently under construction)  
 Special feature: The world's first completely underground 200,000 m<sup>3</sup> LNG storage tank and Japan's first offshore LNG receiving berth

Length of pipeline: 46,285 km  
 (As of March 31, 1999)

- High-pressure transmission pipelines
- ... Planned or under construction
- Medium-pressure transmission pipelines
- Tokyo Gas service area



### Capital Expenditures and Depreciation in Relation to Gas Sales Volume

(1992~2004)  
 (Left scale: billion ¥)  
 (Right scale: million m<sup>3</sup>, 46.047 MJ/m<sup>3</sup>)

- Capital expenditures
- Depreciation
- Gas sales volume

Note: 2000~2004 are projected figures.  
 The above graph represents non-consolidated data.

# I. Investing in a Powerful Supply Infrastructure

**Demand for natural gas has risen as energy providers look for alternative energy sources other than petroleum and the government looks for solutions to environmental problems. According to MITI's Long-term Energy Demand and Supply Outlook for Japan (1998), growth is set to continue—the demand for natural gas is expected to rise 18% compared to 1996 by 2010. Overall energy demand, by comparison, is predicted to increase 3%. We are well placed to benefit further from this trend. Here's why.**

## Foresight Set to Pay Handsome Dividends

Recognizing the potential of natural gas, Tokyo Gas invested in a powerful supply infrastructure. With deregulation set to fuel even more demand for gas, our investments are giving us a competitive advantage. Significantly, these large-scale investments will approach completion in 1999—investments have already passed their peak. We are thus poised to start recovering on our investments.

## Unrivaled Natural Gas Supply Capacity

Just how powerful is Tokyo Gas' supply infrastructure? Tokyo Gas has Japan's largest natural gas supply capability and is progressively upping capacity. Three LNG terminals—each of which plays a prominent role in Japan's gas industry—are at the heart of this strength. Our Negishi LNG Terminal received Japan's first shipment of LNG in 1969. Our Sodegaura facility is the world's largest LNG receiving terminal. And then there is the new Ohgishima LNG Terminal, the first phase of which came on stream in October 1998. Boasting the most sophisticated technologies, Ohgishima is of particular strategic importance. The terminal's location in the high-demand Keihin district near Yokohama means lower costs because a new long-distance pipeline is not required. Ohgishima will eventually have a production capacity of approximately 4 billion m<sup>3</sup> per annum to respond to increasing demand.

## Extensive Transmission and Distribution Network

Investments to bolster our transmission capacity are allowing us to take maximum advantage of our competitive edge in production. Two new pipelines, the Keihin Transmission Pipeline and the Yokohama Transmission Pipeline, slated for completion by the end of 1999, will augment our supply capability and complete a transmission loop and mutual backup system for our three LNG receiving terminals. What this means is that should an LNG receiving terminal go out of action, supply will continue as the other terminals can step in to take up the slack. The result: an even more powerful network for providing customers with a reliable supply of gas.

With these enhanced infrastructures we will be able to meet growing demand during the next few decades with minimum additional investment.



**LEFT**  
*Ohgishima LNG Terminal  
offshore receiving berth*

**CENTER**  
*Sodegaura LNG Terminal*

**RIGHT**  
*Part of Tokyo Gas' trans-  
mission pipeline*

# Honing a Sharper Competitive Edge



**Cogeneration system testing laboratory**

## Program Objectives and Strategies

- Increasing the capacity of cogeneration (high efficiency, high reliability)
- Promoting the use of gas-fired air conditioning (high efficiency)
- Developing gas appliances for residential use (high quality, low cost)
- Minimizing environmental impact

**Promoting the use of natural gas**

**New businesses and directions**

**Strengthening the foundation of gas production, supply, and service**

- Advancing into new fields of business
- Diversifying resources for the production of gas

- Reducing construction and maintenance costs for plants and pipelines
- Enhancing the quality and efficiency of operations through advanced information technology
- Ensuring further increases in safety

## II. Innovative Technology, More Competitive

**An extensive and sophisticated supply network for gas is just one way in which we are honing a sharper competitive edge. Fully aware that a deregulated climate forces us to compete against other forms of energy, particularly electricity, we are strategically targeting R&D. Our aim is to give customers even more compelling reasons to choose gas over other energy sources. R&D will be a driver of future growth at Tokyo Gas.**

### Technologies to Create Demand

**1. Gas Cogeneration Systems** One of our main research themes is cogeneration systems, which optimize energy use by providing electricity and recovering thermal energy. The ability of these systems to save energy and reduce greenhouse gas emissions makes them an attractive alternative for customers. Presently, we are working on micro turbines and fuel cells for residential cogeneration systems.

**2. District Heating and Cooling (DHC) Systems** Tokyo is one of the most densely populated cities in the world. With land at a premium, building space must be used as effectively as possible. DHCs achieve this goal, in addition to energy savings, by circulating chilled water, hot water and steam from centralized energy plants via a network of pipes.

**3. Gas-fired Air Conditioning** National energy policy is now promoting gas-fired air conditioning because of the increasing need to (1) raise the load factor of both gas production and gas distribution systems throughout the year, and (2) alleviate the electricity demand peak during the summer period. In this way, Tokyo Gas is helping to balance energy supply and demand, as well as reduce the overall energy costs of its customers.

### Technologies for Enhanced Infrastructure

Our gas infrastructure is underpinned by the development of innovative technologies that improve safety and reliability and yield cost savings. Foresighted investments in technologies such as high-pressure transmission and underground storage systems will ensure a stable, reliable and economic supply of gas to our customers in the future.

### Technologies for Future Operations and Profits

Information technology (IT) is playing a vital role in expanding the gas market by helping to forge stronger relationships with customers. Our advanced services that draw on IT to establish effective two-way communication with gas users are raising customer satisfaction while adding an extra element of flexibility to our operations.

#### R&D Budget Allocation by Program Objective

(Year ended March 31, 1999)

