

Advancement of the gas industry in Japan

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1. Introduction

The climate surrounding city gas utilities is becoming harsher in Japan than it was a little more than ten years ago. The Government of Japan is pursuing a program of structural reform aimed at the recovery of economic vitality. In this connection, the regulatory and structural reforms are moving ahead in the electricity and city gas industries as well.

On the front of global environmental issues, both the government and industry are joining hands to reduce carbon dioxide emission levels to meet the targets it has pledged in the Kyoto Protocol. Against this background, natural gas, with the least carbon dioxide load of all fossil fuels, is expected to play an increasingly important role.

2. The current situation surrounding Japan's city gas industry

(1) The situation in Japan's city gas industry

In Japan, the demand for city gas continues to show relatively strong growth amidst the current economic situation. The real economic growth rate was 3.2% in fiscal 2003, which was from April of 2003 to March of 2004. The volume of city gas sales rose by about 4.3% from the previous year to 28.6 billion cubic meters. In addition, the total number of city gas customers were some 27.1 million, 1.4% up from the previous year.

In the residential segment, sales are expanding but the share is gradually declining. The industrial share, on the other hand, continues to expand.

(2) Deregulation in the gas industry

The Gas Utility Industry Law has been amended three times since 1995. The

third amendment came into effect in April of this year.

There are two major changes.

1) Expansion of the large-volume gas market

The first is an expansion of the large-volume gas market. Beginning this April, this liberalization was extended to include customers contracting for at least 500,000 cubic meters per year. As such, these customers are expected to account for about 44% of the entire gas sales volume this year. Moreover, the liberalization will be extended to customers contracting for 100,000 cubic meters or more in 2007, for coverage of some 50% of the whole volume.

In addition, to assure the customer's freedom of choice and induce further efficiency in management, the regulatory requirement for large-volume supply was downgraded from the authorization to mere notification.

As of March of this year, a total of 15 newcomers, including oil companies, the firms supplying indigenous natural gas, and trading firms as well as electric utilities, were selling to a total of 52 customers and had an approximately 5% share of the whole large-volume supply.

2) Instatement of the third party access

The second change concerns instatement of the third party access. To stimulate the gas market and encourage fair competition, all companies owning or operating gas pipelines, including the suppliers of indigenous natural gas as well as electric utilities, must provide open access to these pipelines.

3. Harmonization with the environment

Natural gas is anticipated to find an even wider diffusion in view of environmentally-friendliness and energy supply diversification.

In July of 2001, the Advisory Committee for Natural Resources and Energy attached to the Ministry of Economy, Trade and Industry released the Long-term Energy Supply and Demand Outlook. This outlook envisions an increase in the supply of natural gas. The share of natural gas in the total primary energy supply is expected to rise from 12.7 in 1999 to about 14% in

2010.

The Basic Plan for Energy Supply and Demand determined by the Japanese Cabinet in October of last year has a similar orientation. It explicitly calls for an acceleration of the shift to natural gas in light of the wide dispersion of its reserves in regions other than the Middle East and its character as the fossil-fuel energy with the least environmental impact.

At present, the Advisory Committee's Energy Supply and Demand Subcommittee is reviewing the Outlook, which stretches to 2030. It is also discussing the construction of a distributed energy system led by fuel cells and other such systems fueled with natural gas.

Japan's city gas industry earnestly hopes that an accelerated natural gas shift will be spelled out in numerical targets in the national energy policy.

4. Development of the gas market

(1) Gas-fueled air conditioners

First comes the field of gas-fueled air conditioners, which help to generate demand for city gas in the summertime and to level seasonal fluctuation. City gas utilities entered the air-conditioning market for business-use buildings in the 1970s. In the 1980s, they developed systems applying gas heat pumps, which are excellent for conditioning the air in particular space.

The systems installed as of the end of fiscal 2002 numbered a cumulative 122,700. As a result, gas-fueled systems came to account for 21.5% of the nationwide air-conditioning demand in the commercial sector. Natural gas is also being given high marks as a fuel for district heating and cooling systems. As of April first of this year, 106 were being fueled with natural gas.

(2) Gas-fueled cogeneration systems

The second field is that of gas-fueled cogeneration systems. The city gas utilities embarked on the development of products and technologies in the 1980s. At the same time, they began to work for the improvement of technical standards and relaxation of regulations related to power generation facilities, while also availing themselves of the subsidies offered for facility costs. These activities have taken effect: Cogeneration systems fueled with

city gas have been installed in more than 2,000 locations with a combined capacity of about 2.15 GW.

In the residential sector, March of last year saw the launch of sales of Ecowill, a gas-fueled cogeneration system in the one-kilowatt class. More than 4,000 such systems were sold in the first year.

(3) Fuel cells

The third field is that of fuel cells. The city gas industry regards fuel cells as a type of cogeneration system, and has been developing gas-fueled models since the late 1980s. The installed capacity of phosphoric acid models designed for business-use buildings reaches a cumulative total of more than 10,000 kW.

With national support, the Japan Gas Association set about the research and development of small-capacity fuel cells for residential use applying polymer electrolyte models in 1999. These models have made rapid technical strides and are attracting much attention as fuel cells for automobiles.

Japanese gas utilities intend to inject models for residential use into the market around 2005.

National energy policy posts the goal of installation of a combined capacity of 2.2 GW in stationary fuel cells of all types by the end of 2010.

(4) Natural gas vehicles

The Japan Gas Association began promoting practical use of natural gas vehicles in 1990. Beginning in 1994, the government started paying subsidies for the purchase of natural gas vehicles and construction of refueling stations.

As a result, at the end of fiscal 2003, the number of natural gas vehicles on the road reached 20,638. The total number of refueling stations is now 271.

5. Strengthening of the industry foundation

The city gas industry is also taking a number of actions to strengthen its foundation for further natural gas use.

(1) Improvement of city gas safety

The city gas industry has set a target of bringing the number of fatal gas-related accidents even closer to zero by 2010. In keeping with this target, it has conducted a vigorous campaign for the development and use of safety-protecting items. These may be exemplified by appliances that automatically interrupt the flow of gas when they detect incomplete combustion or flame failure, and micro-computer-controlled meters equipped with devices for automatic interruption in the event of gas leaks. The campaign raised the diffusion rate of these appliances to more than ninety percent, in particular 99% for the meters.

(2) Conversion to natural gas and expansion of new supply sources

Secondly, as part of infrastructural preparations for more widespread use of city gas, Japan's city gas utilities are switching to natural gas feedstock for a higher calorific value. As of the end of fiscal 2002, natural gas had become the feedstock for about 90% of the total city gas supply.

LNG imports from Sakhalin will start in 2007. It is also reported that the feasibility study for the construction of gas pipeline from Sakhalin has recently been completed.

These plans are considered to help to increase the supply stability of natural gas by more diversified supply sources. They should also act to strengthen competitiveness relative to other fuels in Japan, considering advantages such as the lower transportation costs deriving from physical proximity.

(3) Approaches of city gas utilities to counter the "Electric Housing" campaign

The third aspect has to do with the "Electric Housing" campaign being conducted by electric utilities. The campaign promotes building those houses where only electricity will be consumed as an energy source. It has had a fairly substantial impact in certain regions, and many city gas utilities are taking it very seriously. To counter it, Japan's city gas utilities are trying

to develop and improve gas appliances with more aggressive publicity programs. They are also redoubling efforts for cost reduction.

6. Conclusion

It is clear that natural gas is being looked to as a key energy for the 21st century. As the liberalization of energy markets proceeds over the coming years, we may anticipate inter-energy competition to become even harder. Under these circumstances, it will be indispensable for the industry to meet the tough requirements of customers for reasonable prices and continued stable supply.

In cooperation with our friends in Western Pacific, Japan's city gas industry would like to continue efforts to tackle those challenges presented by the changing energy market, and thereby pave the way for further natural gas use.

The Japan Gas Association seeks your continued support and collaboration.