

# South Korea's 10th Long-term Natural Gas Supply/Demand Plan (Summary)

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## Summary

On December 31, 2010, the South Korean Ministry of Knowledge Economy released the 10th long-term natural gas supply and demand plan for 15 years between 2010 and 2024. This report summarizes the plan and compares it with the ninth plan. The latest plan includes a long-term natural gas supply/demand outlook, a natural gas import plan and a supply equipment investment plan.

According to the long-term natural gas supply/demand outlook, natural gas demand is projected to increase at an annual average rate of 1.8% between 2009 and 2024. Gas storage capacity is expected to expand from 71.2 million kl at present to 15.36 million kl. The total length of gas supply pipelines is estimated to extend from 2,853 km at present to 4,244 km. The plan also mentions a new policy of enhancing supply/demand management through the expansion of seasonal gas tariff, the expansion of demand for gas air-conditioning and the introduction of biogas.

## Introduction

On December 31, 2010, the South Korean government released the 10th long-term natural gas supply and demand plan<sup>1</sup>. The Minister of Knowledge Economy<sup>2</sup> draws up the plan every two years, based on the Basic National Energy Plan and the fifth electricity supply and demand plan, and a town gas demand projection model, projecting natural gas supply and demand over a long term exceeding 10 years from the year when the plan is made. The natural gas supply and demand plan indicates the direction of comprehensive and long-term South Korean natural gas industry policies for the stable supply of natural gas, based on the country's medium to long-term natural gas demand outlook. The first such plan was released in 1991. The latest plan, the 10th in series, covers the 15 years from 2010 to 2024. This report compares key contents of the 10th and previous long-term natural gas supply and demand plans to organize information on South Korea's natural gas industry, including the outlook of natural gas demand, the LNG import, and gas supply facility expansion plans<sup>3</sup>.

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<sup>1</sup> Article 18-2-2 of the town gas business law provides that the Minister of Knowledge Economy shall make a long-term natural gas supply and demand plan, which covers more than 10 years from the year when the plan is made, and publish its major contents every two years under a Ministry of Knowledge Economy ordinance.

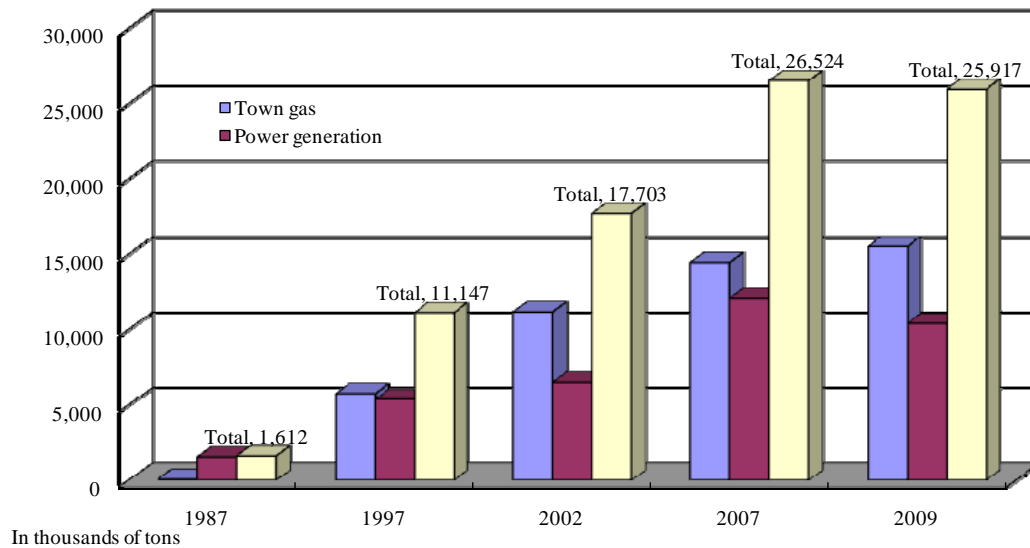
<sup>2</sup> The Ministry of Knowledge Economy is a counterpart to Japan's Ministry of Economy, Trade and Industry.

<sup>3</sup> All long-term natural gas supply and demand plans since the first one made in 1991 have not covered LPG.

## 1. Demand Trends

Since natural gas supply in South Korea started in 1987, natural gas demand has increased at an annual average rate of 17.3%. Since the diffusion of natural gas supply in all major cities was completed in 2002, the annual average increase has slowed down to 5.6%. Of the total natural gas demand, town gas demand expanded by an average 39.6% per year between 1987 and 2002. Since the nationwide town gas supply network was completed in 2002, however, the average annual growth has decelerated sharply to 4.8%. Natural gas demand for power generation increased by an average 10.1% per year between 1987 and 2002. Even since 2002, such demand has posted a relatively firm annual average increase of 6.9% on growing electricity demand and cuts in prices of LNG for power generation.

**Fig. 1-1 Natural Gas Demand Trends**



Compared with the ninth long-term natural gas supply and demand plan (based on actual data between 1987 and 2007), the 10th one, based on data for 2009 when energy demand declined substantially on a global economic slump, projects far less demand for power generation due to a decline in electricity demand which is sensitive to economic conditions.

## 2. Demand Outlook

South Korea's natural gas demand is projected to increase at an average annual rate of 1.8% from 25.92 million tons in 2009 to 34.12 million tons in 2024. Town gas demand is projected to increase at an average annual rate of 2.3%. But natural gas demand for power generation which is to help cover peak electricity demand is estimated to post a lower average annual rise of 1.1% as the weight of power generation using nuclear and renewable energies is expected to increase.

The ninth long-term natural gas supply and demand plan had projected natural gas demand for

power generation to post an annual average drop of 3.0% through 2022. The 10th plan revises the demand upward.

**Table 2-1 Long-term Natural Gas Demand Outlook**

(Unit : 1,000 tons)

Year	Town gas				Power generation				Total
	Household sector	Commercial sector	Industrial sector	Total	Utility power generation	Cogeneration	In-house generation	Total	
2009	7,417	2,779	5,314	15,510	7,660	2,231	516	10,407	25,917
2010	7,932	3,016	6,169	17,117	11,010	3,114	600	14,724	31,841
2015	8,208	3,374	7,628	19,210	12,309	2,946	550	15,805	35,015
2020	7,941	3,545	8,813	20,299	9,071	2,996	550	12,617	32,916
2024	7,928	3,773	10,069	21,770	8,797	2,998	550	12,345	34,115
Growth under 10th plan	0.4	2.1	4.4	2.3	0.9	2.0	0.4	1.1	1.8
Growth under 9th plan	2.5	4.5	5.5	3.9	-6.3	3.2	0.1	-3.0	1.5

Note : Data for 2010 are provisional. Natural gas for in-house power generation indicates consumption at POSCO. Growth rates for the ninth plan cover the period between 2007 and 2022.

### 3. Import Plan

As basic policies for natural gas imports, the 10th long-term natural gas supply and demand plan cites (1) giving top priority to security, (2) securing competitiveness of import contracts, and (3) improving independent LNG development capabilities for national energy security.

Compared with the ninth plan, the 10th plan more strongly calls for the independent development of natural gas resources together with long-term import contracts, based on Korea Gas Corporation's largest LNG purchasing power in the world. As for measures to make up for LNG shortages, the plan calls for securing LNG supply under short-term contracts for surplus LNG from newly developed projects or LNG for resale through 2014. For the years from 2015, it calls for concluding long-term import contracts for new projects starting production in 2015 or 2016 and for extending existing contracts to cover LNG shortages. The 10th plan also envisages that LNG import contracts should include maximum flexible measures<sup>4</sup> that are favorable for supply and demand management with full considerations given to the emerging new LNG importer other than Korea Gas Corporation, and the special characteristics of South Korea's winter LNG demand peak.

The upward revision of future demand leads the 10th plan to project more LNG imports than the ninth one.

<sup>4</sup> Such measures may include the tolerance of resale and the expansion of allowable cuts in LNG imports.

#### 4. Construction of Natural Gas Supply Facilities

The basic policy for the construction of natural gas supply facilities calls for promoting the continuous expansion of nationwide natural gas supply infrastructure including storage tank, regasification facility and distribution pipelines, and the utilization of Donghae gas field as a storage facility in order to improve the efficiency of national energy resource management.

Under a production facility construction plan based on the policy, one gas import base in Samcheok will be put into operation by 2013 to increase the number of such bases in South Korea to four. The three others are in Pyeongtaek, Incheon and Tongyeong. The number of LNG berths will increase to seven with the addition of one in Tongyeong in 2011 and another in Samcheok in 2013. Natural gas storage capacity will be continuously expanded to improve supply stability. The capacity is planned to increase from 7.12 million kl (for an inventory ratio of 10%) in 2010 to 15.36 million kl (about 21%)<sup>5</sup> by 2017 and remain unchanged until 2024. Attention should be paid to a plan to switch the Donghae gas field as the nation's only domestic gas production field to a storage facility with capacity at about 1.7 million kl in 2017. The total length of gas supply pipelines will be extended from 2,853 km in 2010 to 4,251 km in 2024.

The nation is expected to invest about 8 trillion won (about 590 billion yen) in the construction of these gas facilities between 2010 and 2024.

The 10th long-term natural gas supply and demand plan contains no major difference with the ninth one with respect to gas facilities.

**Table 4-1 Natural Gas Storage Facility Construction Plan**

(Unit : 100,000 kl)

		2010	2011-2012	2013-2014	2015-2016	2017	2018-2024
Storage tank	Construction	10	17.4	8	20	-	-
	(Cumulative total)	71.2	88.6	96.6	116.6	116.6	116.6
Donghae gas field	Storage capacity	-	-	-	-	37.0	37.0
	(Cumulative total)	-	-	-	-	37.0	37.0
Total	Construction	10	17.4	8	20	37	-
	(Cumulative total)	71.2	88.6	96.6	116.6	153.6	153.6
Inventory ratio (%)		10	12	13	17	22	21

Note : Excluding in-house facilities of POSCO and K-power.

<sup>5</sup> Capacity at in-house consumption facilities of Posco and K-power is excluded.

## 5. Demand Management

In a bid to narrow seasonal gas demand gaps attributable primarily to greater winter demand, the government has been stepping up efforts to control demand while securing stable supply. It plans to expand the gap of seasonal gas tariff to hold down winter demand and expand summer demand. The government is seeking to take advantage of government and KOGAS research and development funds for developing and diffusing highly efficient gas equipment and biogas<sup>6</sup> to reduce dependence on energy imports and stabilize the supply-demand balance. The gas tariff revisions for supply and demand improvements and the development and diffusion of efficient gas equipment are planned to make steady progress under the 10th plan as under the ninth.

## Conclusion

The long-term natural gas supply and demand plan is prepared every two years to specify LNG import and facility expansion plans, building on the Basic National Energy Plan, the electricity supply and demand plan, and a gas demand outlook by sector based on an analysis of past multi-year consumption trends. The 10th plan is designed to secure the stability of the natural gas supply-demand relationship and the efficient utilization of facilities in the entire country over 15 years between 2010 and 2024.

Natural gas demand in South Korea is projected to increase at an average annual rate of 1.8% from 25,917,000 tons in 2009 to 34,115,000 tons in 2024. Although the household sector's town gas demand growth is expected to slow down, overall town gas demand is projected to increase at an annual average rate of 2.3% due to such factors as the industrial sector's switch to gas from other fuels. Natural gas demand for power generation is projected to expand at a lower annual average rate of 1.1% over the 15 years as demand is expected to decline on the rising weight of nuclear and renewable energy power generation from 2015.

A natural gas import plan calls for securing imports mainly from Asia-Pacific sources under short to medium-term (five-year and shorter) contracts until around 2014. For the years from 2015, it seeks to ensure long-term import contracts, pricing systems responding to higher oil prices, independent development of overseas resources and improved flexibility in the terms and conditions of import contracts.

Regarding LNG terminals, the plan calls for expanding storage capacity from 7.12 million kl in 2010 to 15.36 million kl in 2024 to raise the inventory ratio from 10% to 21% for a stable supply-demand balance. Nationwide natural gas supply networks will be expanded continuously to extend the total length of gas pipelines from 2,853 km at present to 4,244 km by 2024.

In addition to these measures for stabilizing the natural gas supply-demand balance, the government plans to enhance supply and demand management functions through the expansion of a gap of seasonal gas tariff and the introduction and diffusion of gas air-conditioning systems and

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<sup>6</sup> A legal revision led town gas to include biogas and other alternative natural gases from September 2009.

biogas for the flexible operation of seasonal natural gas inventories in a bid to improve the supply capacity utilization rate and save equipment investment. The 10th plan highlights a new policy of stabilizing the natural gas supply-demand balance through the introduction and expansion of a gap of seasonal gas tariff as well as long-existing efforts to increase gas supply system capacity and improve the terms and conditions of import contracts.

In addition to these independent efforts, cooperative relations with Taiwan and Japan that are major LNG buyers and geographically close to South Korea are apparently indispensable to South Korea because Taiwan has a reversed gas demand pattern (including a demand peak in summer) and Japan has more affordable gas storage capacity.

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