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Report

Bridge to Nowhere

The Doomed Fate of Korea's LNG Terminals

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The Doomed Fate of Korea's LNG Terminals

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Solutions for Our Climate (SFOC) is an independent nonprofit organization that works to accelerate global greenhouse gas emissions reduction and energy transition. SFOC leverages research, litigation, community organizing, and strategic communications to deliver practical climate solutions and build movements for change.

Executive Summary

The long-term demand for liquefied natural gas (LNG) is anticipated to decline sharply in line with the global trend of net-zero and energy transition. According to the IEA's *World Energy Outlook 2024*, global natural gas demand could fall by up to 79% between 2023 and 2050. Korea is no exception: 15th Long-Term Plan for Natural Gas Supply and Demand projects domestic demand to decrease by 16.5% by 2036. In the power sector, the 11th Basic Plan for Electricity Supply and Demand indicates a substantial increase in renewable energy in the country's energy mix, while the share of gas is expected to drop.

Despite such decline in gas projections both in Korea and globally, Korea still has the world's third-largest LNG terminal capacity and is pushing ahead with further expansions. Recognizing the potential stranded asset risks arising from such expansions, **this report analyzes the decline in utilization rate and quantifies the value of stranded assets for all current and planned domestic LNG terminals under various demand scenarios.**

Projections for LNG demand were developed based on eight scenarios, based on the Business-As-Usual (BAU) scenario, reflecting the government's power sector and long-term gas supply plans, and the government's 2050 Carbon Neutrality scenario. Most scenarios indicate a mid- to long-term decrease in LNG demand, leading to a decline in the utilization rates of LNG regasification facilities.

The value of stranded assets was estimated by calculating terminal profits based on the average LNG margin over the past four years and discounting them to present value at a rate of 4.5%. The calculation suggests a potential stranded asset could be between KRW 6.6 trillion to KRW 12.3 trillion. In particular, the Dangjin LNG terminal, which is currently under construction by Korea Gas Corporation (KOGAS), the stranded asset risk for a single project could reach up to KRW 877 billion.

The findings indicate that Korea's continued investment directed to LNG infrastructure is not sustainable in terms of profitability and policy alignment over the long term. To mitigate stranded asset risks, LNG terminal expansion plans, including the second phase of the Dangjin LNG Terminal, should be terminated, with investment redirected toward renewable energy and green hydrogen projects.

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1. Background

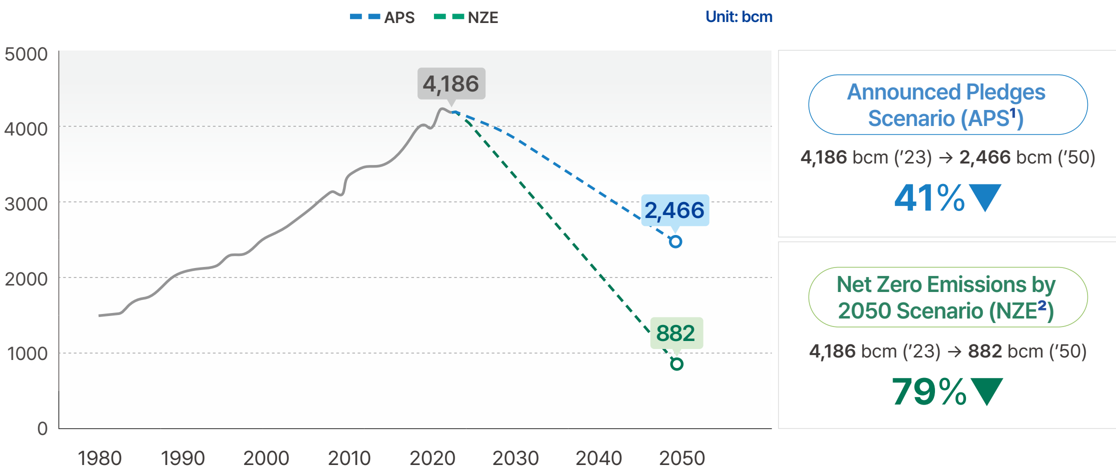
A Developments in the Global LNG Market

As policies and transitions to net zero accelerate across the globe, demand for liquefied natural gas (LNG) is expected to decline significantly. According to projections from leading energy organizations such as the International Energy Agency (IEA), natural gas demand will drop sharply in line with greenhouse gas reduction efforts and the transition to renewable energy. In particular, the IEA's *World Energy Outlook 2024* forecasts that global natural gas demand could fall by as much as 79% by 2050 compared to 2023 levels (4,186 bcm).

In Europe, energy security concerns have grown immensely following the Russia-Ukraine war, leading to strengthened policies for renewable energy and decarbonization. Such move is expected to reduce dependence on fossil fuels, including LNG, and fundamentally reshape the natural gas market in the long term. Meanwhile, recent military tensions between Iran and Israel have further heightened geopolitical instability in the Middle East. The potential closure of the Strait of Hormuz, which serves as a strategic maritime route for 80% of Asian crude oil and LNG supplies, has emerged as a new supply risk.

These developments have led to mounting concerns over stability of LNG supply chain and underscore the importance of renewable energy for energy security. Amid growing calls for energy diversification and self-sufficient energy systems at the national level, renewable energy is increasingly regarded as not only as a decarbonization tool but also as a strategic asset. As a result, the global LNG market faces structural uncertainty and downward pressure on demand due to the net-zero transition and heightened geopolitical risks.

[Figure 1] Global LNG Demand Outlook[3]



B Korea's LNG Policy Landscape

Korea is a major importer of energy, sourcing 93.9%[4] of its total energy consumption from overseas. Most of its primary energy sources including oil, coal, and natural gas are imported, making the country highly vulnerable to external circumstances such as international price volatility and geopolitical instability. This reliance poses significant challenges not only in terms of energy procurement but also for energy security and economic stability.

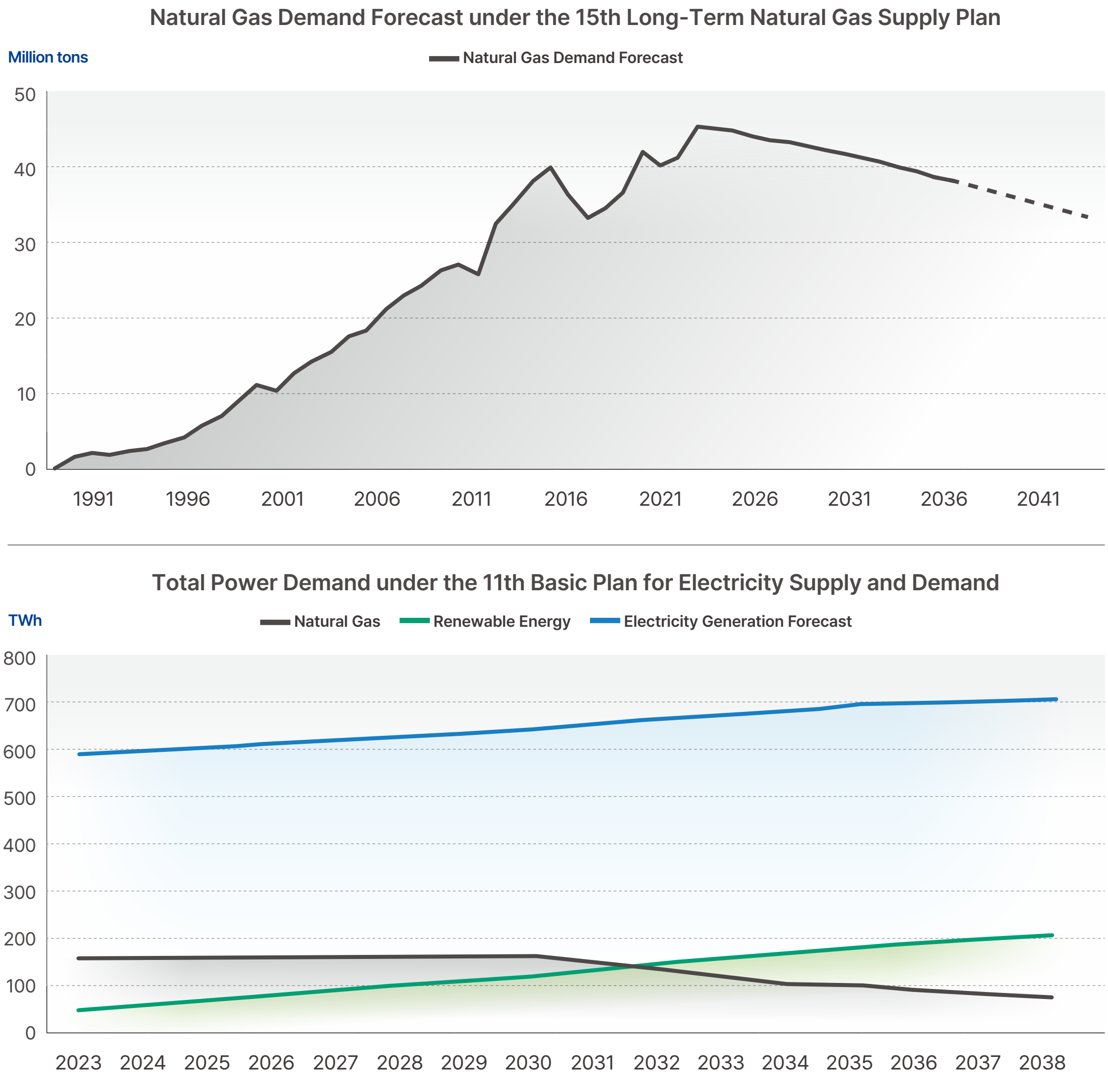
In particular, LNG plays a major role in Korea's energy mix, as it is used across multiple sectors including power generation, industry, and households. As of 2023, the country's imported volume of LNG is 44.11 million tons per annum (MTPA)[5]. Today, in line with its 2050 carbon neutrality target, the government plans to reduce LNG consumption through policy measures[6].

According to the 15th Long-Term Plan for Natural Gas Supply and Demand, which outlines the official medium- to long-term demand and supply for natural gas, demand is expected to decline approximately 16.5%, from 45.09 million tons (Mt) in 2023 to 37.66Mt by 2036. This downward trajectory shows that energy transition policies are beginning to reshape the structure of natural gas demand.

1 APS: Announced Pledges Scenario assumes that each country fully implements its officially announced climate pledges.
2 NZE: Net Zero Emissions by 2050 Scenario
3 IEA (2024). World Energy Outlook 2024
4 Korea Energy Economics Institute. (July 2025). Monthly Energy Statistics, April 2025 Data.
5 Statistics Korea. (2024). LNG Supply and Demand Trends
6 Ministry of Trade, Industry and Energy. (2025). The 11th Basic Plan for Electricity Supply and Demand (2024–2038)

A similar trend can be found in the power sector. The 11th Basic Plan for Electricity Supply and Demand projects that, although overall demand for electricity will continue to rise, gas-fired generation will gradually decrease while renewable energy generation expands significantly in the energy mix. Together, these changes indicate that domestic natural gas demand is anticipated to decline over the long term. In sum, it is evident that LNG will need to be slashed in the medium to long term. A successful transition for Korea's LNG industry would require full-alignment with net-zero policies and industrial competitiveness. The sector faces a critical juncture where long-term risks, such as declining demand, overcapacity, and stranded assets risks must be considered when evaluating future projects.

[Figure 2] Projected Decline in Korea's Gas Demand[7]



7 Ministry of Trade, Industry and Energy. (2023). The 15th Long-Term Plan for Natural Gas Supply and Demand (2023–2036)., Ministry of Trade, Industry and Energy. (2025). The 11th Basic Plan for Electricity Supply and Demand (2024–2038).

C LNG Terminals in Korea: Expansion Amid Declining Demand

An LNG terminal is a complex infrastructure that unloads imported LNG from carriers, stores it in cryogenic tanks, and then regasifies it before delivering it through pipelines to power plants. According to government policy projections, domestic gas demand is expected to decline over the medium to long term. However, against this backdrop of declining demand, domestic LNG terminal infrastructure is expanding rapidly, a contradictory move. Despite holding the third-largest LNG terminal capacity[8] in the world, Korea continues to plan additional terminal constructions across both public and private domains.

A report by the Institute for Energy Economics and Financial Analysis (IEEFA)[9] also highlighted that Korea faces heightened stranded asset risks due to rapid over-investment in LNG infrastructure. The report pointed a growing mismatch between projected LNG demand under Korea's carbon neutrality goals and the scale of planned LNG terminal facilities.

The most noteworthy example is the construction of the Dangjin LNG terminal in Chungnam, led by South Korea's state-owned utility firm, Korea Gas Corporation (KOGAS). The project represents approximately 60% of all planned LNG terminal projects in the country, making it the largest of its kind. The project plans to build 10 storage tanks with a total capacity of 2.7 million cubic metres (mmcm) in three phases

[Figure 3] Structure of LNG Terminal

8 IGU (2025). 2025 World LNG Report.

9 IEEFA (2023). South Korea's LNG overbuild

by 2031. Considering that the LNG terminals typically operate for over 40 years, this facility would remain in operation until 2071, well beyond the target year for carbon neutrality of 2050, contradicting with Korea's climate commitments.

This report assesses the risk of stranded assets across Korea's LNG terminals, including the Dangjin project[10]. Based on the scenarios reflecting government gas demand projections and carbon neutrality plans, the report analyzes the utilization rates of all currently operating and planned LNG terminals and estimates the potential scale of stranded assets under each scenario.

10 **Stranded Asset**: An asset whose value has declined or whose returns fail to cover the investment costs due to changes in the environment.

2. Status and Challenges of LNG Terminals in Korea

A Operational Structure of LNG Terminals

LNG terminals in Korea are operated by KOGAS and private companies, with both managing natural gas supply infrastructure. KOGAS imports approximately 80% of the country's total LNG, stores and regasifies, and then delivers it via national pipelines to power plants and industrial consumers. Private companies, in contrast, directly import about 20% of LNG, primarily for their own consumption.

LNG terminal operations are generally classified into proprietary use and third-party access (TPA). KOGAS owns and operates major LNG terminals, including Incheon, Pyeongtaek, Tongyeong, and Samcheok, adjusting import volumes based on its portfolio through long-term, medium-term, and spot contracts. Some private companies operate their own terminals, while those without terminals secure access by contracting with KOGAS or other private operators for a specified period to jointly use the facilities.

[Table 1] LNG Terminal Operations by Operator

Category	KOGAS	Private Companies
LNG Import Volume	~80%	~20%
Import Method	Mostly portfolio-based, long-term contracts	Direct import for own use
LNG Usage	Supply to power plants and industrial users via national pipeline network	Self-consumption and electricity sales
Operational Model	Fully owned and directly operated	Owned terminals or third-party access to KOGAS terminals
Operational Characteristics	Operated based on government plans and long-term contracts	Operated according to self-consumption demand

B Status and Expansion Plans for LNG Terminals

LNG infrastructure is rapidly expanding nationwide. The number of LNG terminals, in particular, has steadily increased in recent years, and despite growing concerns over imbalances in supply and demand, additional facilities continue to be developed. As of 2025, there are a total of 93 storage tanks in operation, with a combined capacity of approximately 15.12 mmcm, with an additional 19 tanks (4.54 mmcm) under construction. Once completed, there will be a total of 112 storage tanks, with an aggregate capacity of 19.66 mmcm.

KOGAS currently operates 77 storage tanks (12.16 mmcm) across five terminals: Incheon (23 tanks, 3.48 mmcm), Pyeongtaek (23 tanks, 3.36 mmcm), Tongyeong (17 tanks, 2.62 mmcm), Samcheok (12 tanks, 2.61 mmcm), and Jeju (2 tanks, 0.09 mmcm). An additional 10 tanks (2.7 mmcm) are being constructed in Dangjin, Chungnam. Once completed, KOGAS's storage capacity will account for 76% of the country's total LNG storage.

In the private sector, seven companies currently operate 16 storage tanks (2.96 mmcm), with nine additional tanks (1.845 mmcm) under construction. Major terminals operated by private players include Boryeong LNG Terminal (Boryeong, 7 tanks, 1.4 mmcm), POSCO (Gwangyang, 6 tanks, 0.93 mmcm), Korea Energy Terminal (KET, Ulsan, 2 tanks, 0.43 mmcm), and Hyundai Development Company (Tongyeong, 1 tank, 0.2 mmcm). Construction projects currently underway include Hanyang (Yeosu, 4 tanks, 0.8 mmcm) and SK Gas (Ulsan, 1 tank, 0.215 mmcm).

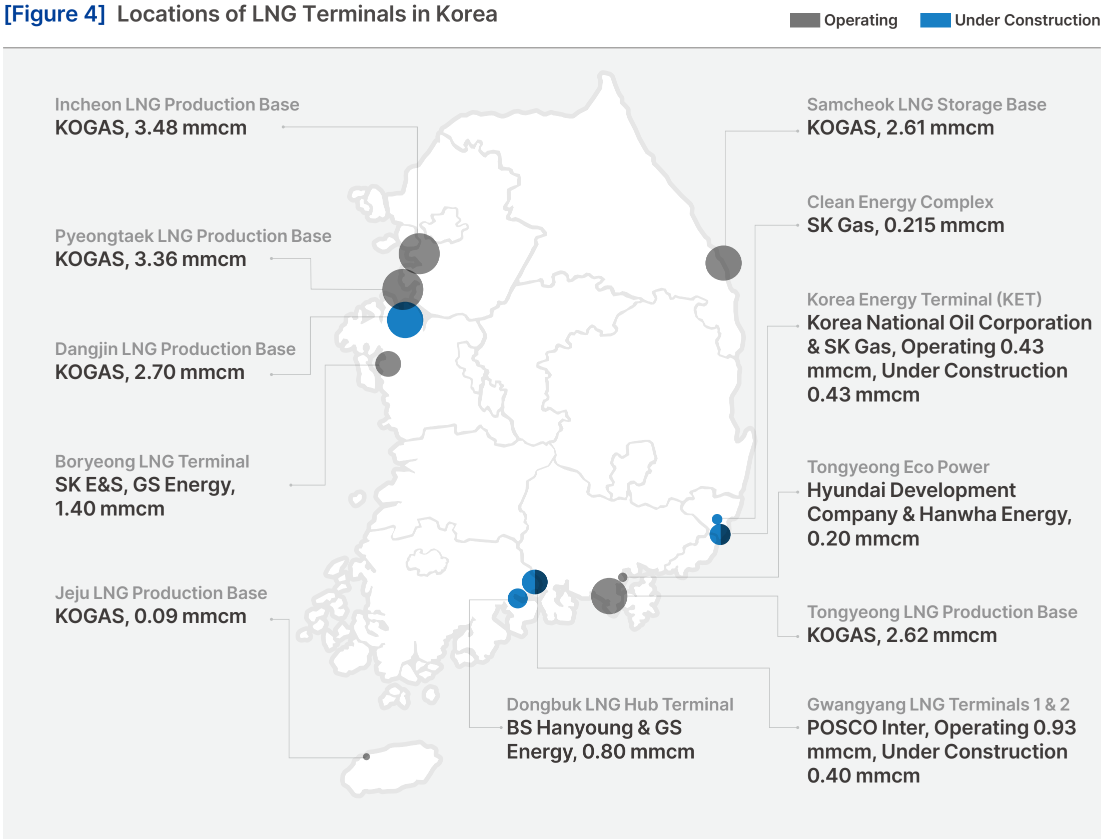
While KOGAS and private companies operate and construct large-scale LNG terminals across the country, the government projections expect domestic natural gas demand to decline in the long run[11]. This divergence has raised concerns about overinvestments and overcapacity, as well as the potential for stranded assets risks in the future.

11 Ministry of Trade, Industry and Energy. (2023). The 15th Long-Term Plan for Natural Gas Supply and Demand (2023–2036)., Ministry of Trade, Industry and Energy. (2025). The 11th Basic Plan for Electricity Supply and Demand (2024–2038).

[Table 2] Current LNG Terminal Infrastructure in Korea

Operator	Location	Operational	Under Construction	Total
KOGAS	Incheon	23 tanks (3.48 mmcm)	–	23 tanks (3.48 mmcm)
	Pyeongtaek	23 tanks (3.36 mmcm)	–	23 tanks (3.36 mmcm)
	Tongyeong	17 tanks (2.62 mmcm)	–	17 tanks (2.62 mmcm)
	Samcheok	12 tanks (2.61 mmcm)	–	12 tanks (2.61 mmcm)
	Jeju	2 tanks (0.09 mmcm)	–	2 tanks (0.09 mmcm)
	Dangjin	–	10 tanks (2.7 mmcm)	10 tanks (2.7 mmcm)
Private Companies	Boryeong LT	7 tanks (1.4 mmcm)	–	7 tanks (1.4 mmcm)
	POSCO International	6 tanks (0.93 mmcm)	2 tanks (0.4 mmcm)	8 tanks (1.33 mmcm)
	Hanyang	–	4 tanks (0.8 mmcm)	4 tanks (0.8 mmcm)
	KET	2 tanks (0.43 mmcm)	2 tanks (0.43 mmcm)	4 tanks (0.86 mmcm)
	SK Gas	–	1 tank (0.215 mmcm)	1 tank (0.215 mmcm)
	Hyundai Industrial	1 tank (0.2 mmcm)	–	1 tank (0.2 mmcm)
Total		**93 tanks (15.12 mmcm)**	**19 tanks (4.545 mmcm)**	**112 tanks (19.665 mmcm)**

[Figure 4] Locations of LNG Terminals in Korea



C LNG Demand Outlook and Stranded Asset Risks from Terminal Expansion

According to the 15th Long-Term Plan for Natural Gas Supply and Demand, gas demand is projected to decline on average, at an annual rate of 1.38% from 2023 to 2036, of 7.43Mt. This decline is expected to have significant implications for the existing LNG terminals and future projects.

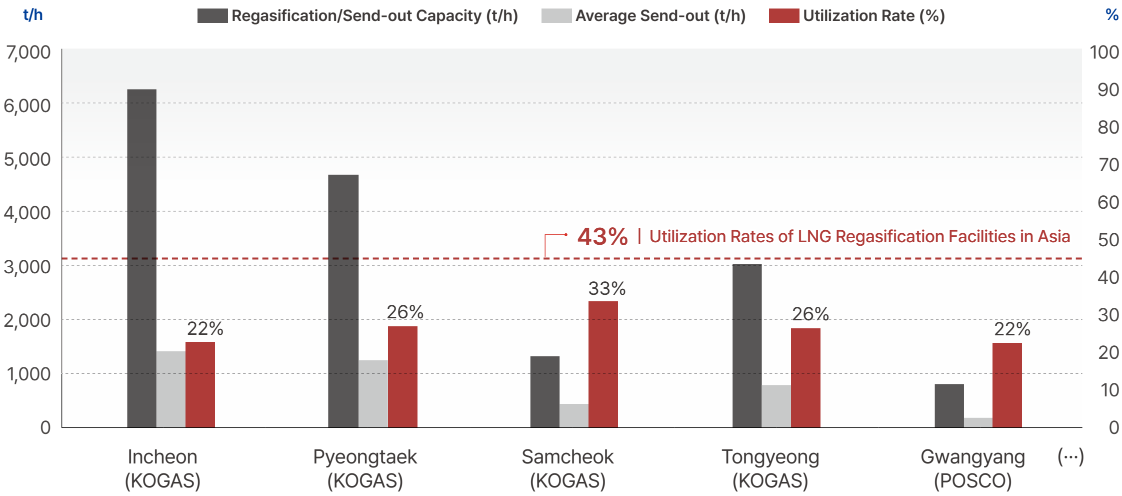
LNG terminals are infrastructure projects that require a minimum utilization rate to remain economically viable. However, despite the downward trend in gas demand, both KOGAS and private companies continue push for terminal expansion projects. Such investment decisions make it increasingly difficult to recover capital costs and are likely to reduce revenues, thereby heightening the risk of LNG terminals becoming stranded assets in the long term.

In reality, utilization rates of regasification plants at operational LNG terminals are significantly below the Asian average of 43%[12], with Incheon at 22%, Pyeongtaek at 26%, Samcheok at 33%, Tongyeong at 26%, and Gwangyang at 22%. Despite such underutilization, expansions are still being justified under the pretext of ensuring supply stability, raising questions about their legitimacy.

Expanding LNG infrastructure without reflecting actual demand and utilization rates not only results in inefficient allocation of resources but also imposes financial burdens on both public and private sectors, while creating stranded asset risks. To prevent overcapacity and overinvestment of LNG infrastructure, it is essential to conduct quantitative assessment of stranded asset exposure for existing and new projects to verify their economic viability.

12 IGU (2025). 2025 World LNG Report.

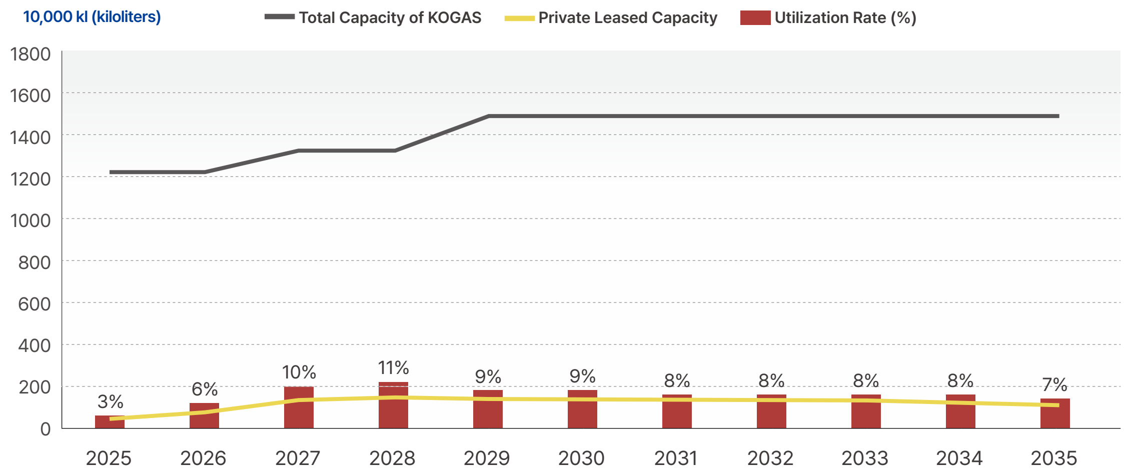
[Figure 5] Utilization Rates of Domestic LNG Terminals in Operation (as of Dec. 2022)



* The utilization rate of regasification facilities is calculated by dividing the average send-out volume by the regasification send-out capacity.

As a measure to address low utilization, KOGAS introduced a "Third-Party Access (TPA)", leasing part of its LNG terminal capacity to private companies. However, according to data submitted to the National Assembly, the capacity leased to private operators accounts for only **3–11%** of KOGAS's total capacity. This indicates that the TPA alone is insufficient to resolve the underutilization problem.

[Figure 6] Utilization rate of KOGAS-leased capacity[13]



13 Data submitted by Korea Gas Corporation to the National Assembly

3. Scenario-Based Analysis of Stranded Assets in LNG Terminals

A LNG Demand Forecast Scenarios

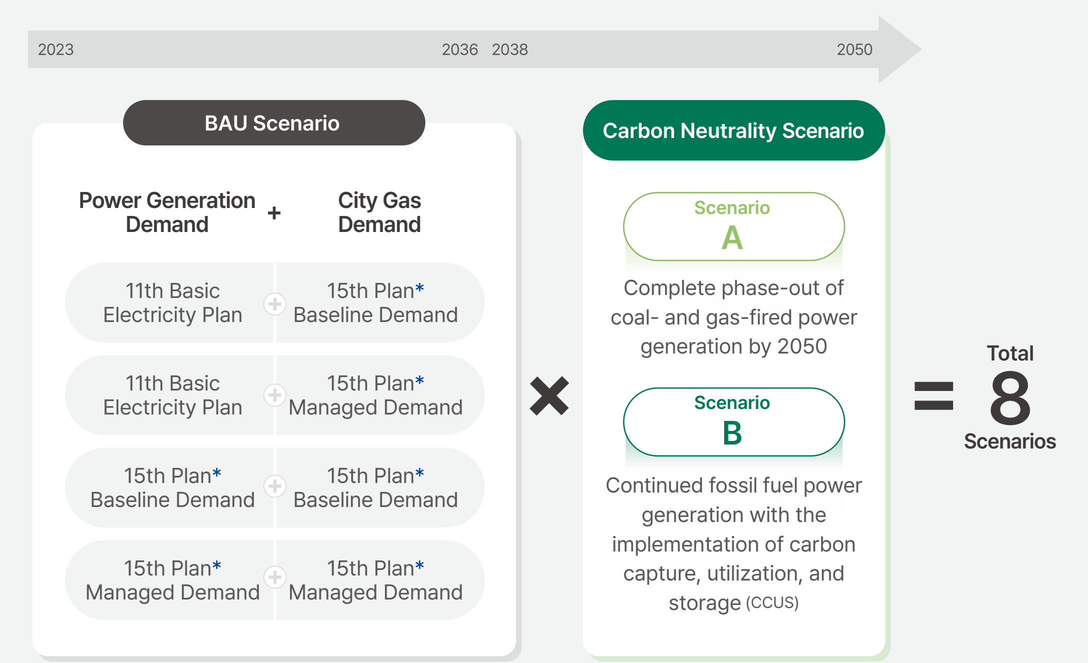
To estimate changes in LNG terminal utilization rates and the potential scale of stranded assets, scenarios were developed under two scenarios: the Business-As-Usual (BAU) Scenario and the Carbon Neutrality Policy Scenario. For each scenario, annual changes in utilization rates of LNG regasification plants and the stranded assets value of LNG terminals were calculated.

The projection of LNG demand combined the *BAU Scenario* (medium-term demand) and the *2050 Carbon Neutrality Scenario* (long-term demand) to create a range of scenarios. The BAU Scenario is a scenario reflecting existing government policies and was set based on the demand projections of the 15th Long-Term Plan for Natural Gas Supply and Demand and the 11th Basic Plan for Electricity Supply and Demand. This scenario forecasts near-term LNG demand and infrastructure operations under current policies and plans. The Carbon Neutrality Scenario incorporates greenhouse gas reduction and net-zero targets and was designed based on the 2050 Carbon Neutrality Scenario announced in October 2021. The Carbon Neutrality Scenario is divided into two types depending on the extent of decarbonization in the power sector.

- **Scenario A** — Complete phase-out of coal- and gas-fired power generation by 2050
- **Scenario B** — Continued fossil fuel power generation with the implementation of carbon capture, utilization, and storage (CCUS)

Based on these assumptions, LNG demand under the BAU Scenario was projected by combining demand for power generation and city gas. In total, four BAU Scenarios with two Carbon Neutral Scenarios combined, resulted in a total of eight scenarios.

[Figure 7] Framework for LNG Demand Forecast Scenarios



* **15th Plan** : 15th Plan for Long Term- Plan for Natural Gas Supply and Demand

[Table 3] LNG Demand Forecast Scenarios

Scenario	Reference for Power Generation Demand	Reference for City Gas Demand	Scenario (A/B)
1	11th Basic Plan for Electricity Supply and Demand	15th Long-Term Plan for Natural Gas Supply and Demand (Baseline Demand)	A
2	11th Basic Plan for Electricity Supply and Demand	15th Long-Term Plan for Natural Gas Supply and Demand (Managed Demand)	A
3	15th Long-term Plan for Natural Gas Supply and Demand (Baseline Demand)	15th Long-Term Plan for Natural Gas Supply and Demand (Baseline Demand)	A
4	15th Long-Term Plan for Natural Gas Supply and Demand (Managed Demand)	15th Long-Term Plan for Natural Gas Supply and Demand (Managed Demand)	A
1-1	11th Basic Plan for Electricity Supply and Demand	15th Long-Term Plan for Natural Gas Supply and Demand (Baseline Demand)	B
2-1	11th Basic Plan for Electricity Supply and Demand	15th Long-Term Plan for Natural Gas Supply and Demand (Managed Demand)	B
3-1	15th Long-Term Plan for Natural Gas Supply and Demand (Baseline Demand)	15th Long-Term Plan for Natural Gas Supply and Demand (Baseline Demand)	B
4-1	15th Long-Term Plan for Natural Gas Supply and Demand (Managed Demand)	15th Long-Term Plan for Natural Gas Supply and Demand (Managed Demand)	B

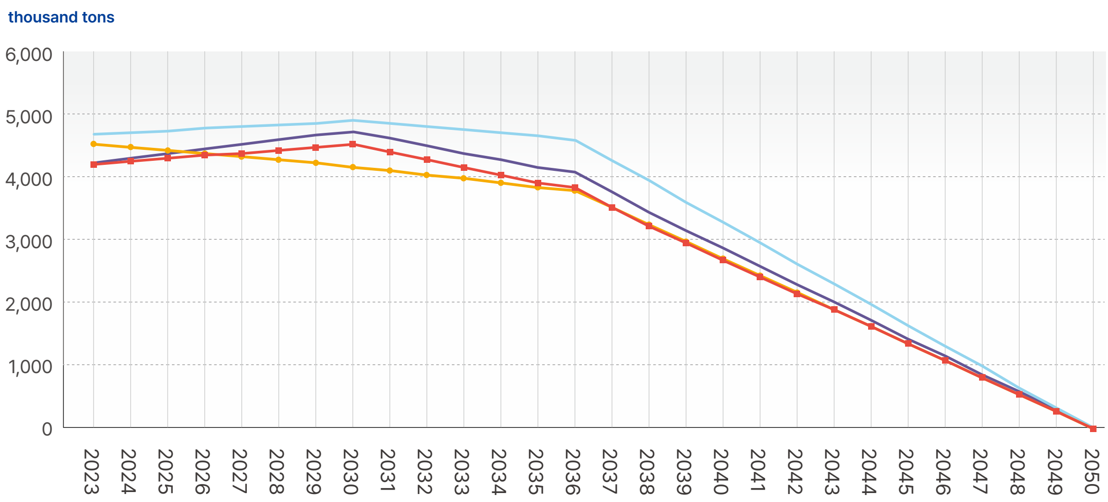
Among the derived scenarios, the analysis primarily focused on Scenario A, which assumes a full phase-out of fossil-fuel power generation by 2050. Scenario B with CCUS has faced repeated delays in commercialization, and many are becoming skeptical over its technological stability. It is deemed unlikely that the gradual retirement of gas-fired power would be postponed solely due to reliance on CCUS[14]. Additionally, scenarios were designed based on the Baseline and Managed Demand from the 15th Long-Term Plan for Natural Gas Supply and Demand. Scenarios 1 and 3 were selected accordingly for the key analysis.

B LNG Demand Changes

Examining the demand trends by scenario, under the Carbon Neutrality Scenario A, LNG demand remains relatively stable until 2036 but declines sharply by 2050, as fossil fuel power generation is completely phased out. In the Carbon Neutrality Scenario B, where CCUS is implemented alongside existing power generation, LNG demand does not converge to zero by 2050 but still shows a downward trend. This indicates that carbon neutrality policies will have a profound impact on the utilization and economic viability of LNG in the long run.

[Figure 8] Changes in LNG Demand by Scenario - Carbon Neutrality Scenario A

- **Scenario 1:** 11th Basic Electricity Plan (Power Generation) + 15th Long-Term Plan for Natural Gas Supply and Demand (City Gas, Baseline Demand)
- **Scenario 2:** 11th Basic Electricity Plan (Power Generation) + 15th Long-Term Plan for Natural Gas Supply and Demand (City Gas, Managed Demand)
- **Scenario 3:** 15th Long-Term Plan for Natural Gas Supply and Demand (Baseline Demand, Total Demand)
- **Scenario 4:** 15th Long-Term Plan for Natural Gas Supply and Demand (Managed Demand, Total Demand)

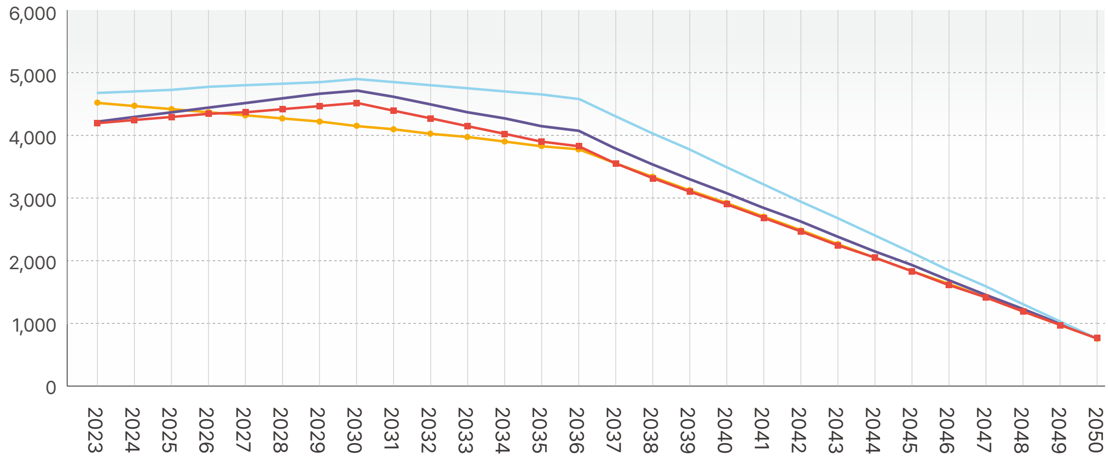


14 SFOC (2021). Status and Challenges of Carbon Capture, Utilization and Storage (CCUS) Technologies | https://forourclimate.org/ko/research/438

[Figure 9] **Changes in LNG Demand by Scenario - Carbon Neutrality Scenario B**

Scenario 1: 11th Basic Electricity Plan (Power Generation) + 15th Long-Term Plan for Natural Gas Supply and Demand (City Gas, Baseline Demand)
Scenario 2: 11th Basic Electricity Plan (Power Generation) + 15th Long-Term Plan for Natural Gas Supply and Demand (City Gas, Managed Demand)
Scenario 3: 15th Long-Term Plan for Natural Gas Supply and Demand (Baseline Demand, Total Demand)
Scenario 4: 15th Long-Term Plan for Natural Gas Supply and Demand (Managed Demand, Total Demand)

thousand tons



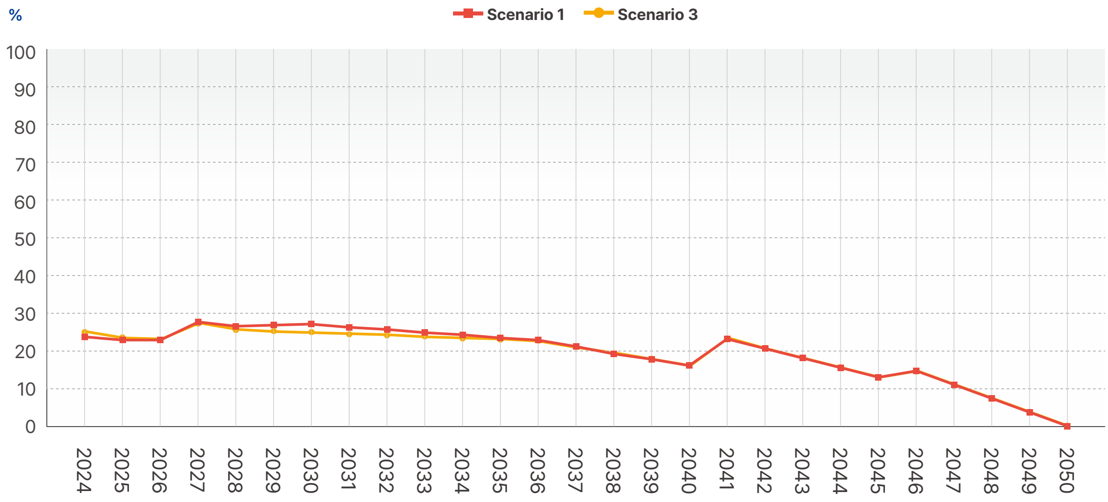
C Utilization Rate of LNG Regasification Plants

To assess the utilization rate of LNG regasification facilities, annual utilization rate by terminal was calculated based on demand projections for each scenario. Here, utilization rate was defined as the ratio of LNG demand to the annual regasification capacity of each terminal (i.e. processing capability of the regasification facilities). This approach allows for a quantitative assessment of both the economic viability of terminals and their potential stranded asset risks.

Regasification capacity for each terminal was taken from the 15th Long-Term Plan for Natural Gas Supply and Demand, with 2024 actual demand figures serving as the baseline. Future annual demand under each scenario was then projected by applying the demand growth rates per scenario. For some private terminals, for which 2024 actuals are not disclosed, the remaining demand was allocated proportionally to each terminal's share of regasification capacity, allowing utilization rates to be calculated relative to demand. Although there was an attempt to conduct analysis for individual terminal, it was suspended due to the unavailability of transport volumes. Therefore, this report presents utilization analysis results primarily for KOGAS-owned terminals.

For the Dangjin LNG Terminal, which is still under construction and has no operational history, the average utilization rate from KOGAS terminals was used. This assumption is grounded in the fact that there are fundamental differences in operational strategies, customer bases, and contractual structures between KOGAS and private terminals, making it more appropriate to apply the average utilization rate of KOGAS terminals rather than that of private companies.

[Figure 10] Utilization Rate of Regasification Plants in LNG Terminals



∗The average utilization rate of LNG regasification plants in Korea is 33%.

The overall utilization rate of LNG regasification plants shows a clear long-term declining trend. However, temporary upticks appear in some years in utilization rate depending on the assumed closure timing of specific terminals. This is because the operational lifespan of existing terminals was conservatively assumed to be 40 years. For example, the assumed closure of the Pyeongtaek LNG Terminal in 2027 shows a one-off increase in the overall utilization rate for that year. Nevertheless, such fluctuations only represent short-term deviations within an otherwise downward trend.

The figures below show the utilization rates of LNG regasification plants by terminal under different scenarios.

[Figure 11] **Utilization Rate of KOGAS LNG Terminals - Scenario 1**

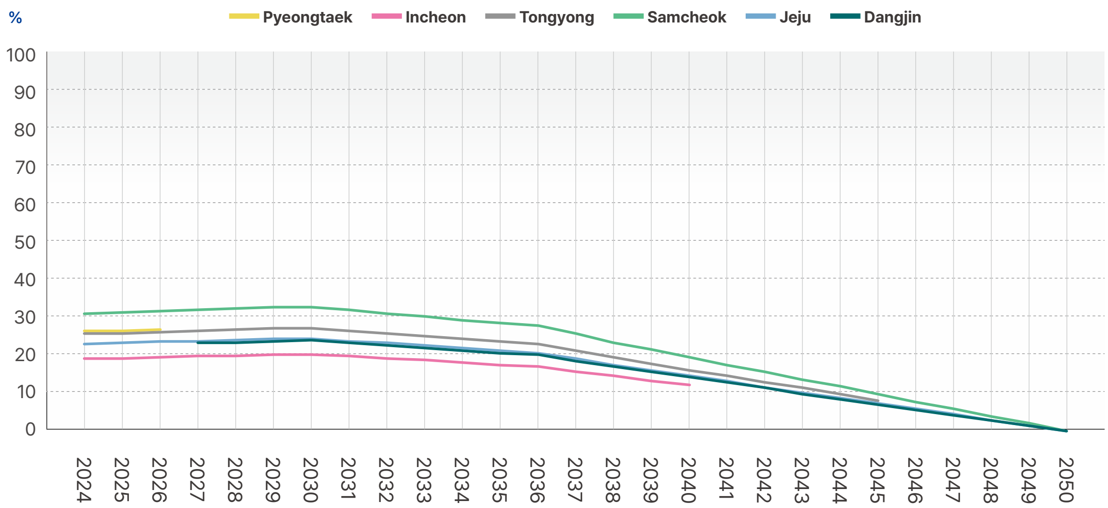


Figure 11 illustrates how the utilization rates of major KOGAS LNG terminals are projected to change under Scenario 1. This scenario is based on BAU Scenario, with power generation demand following the 11th Basic Plan for Electricity Supply and Demand, city gas demand based on the 15th Long-Term Plan for Natural Gas Supply and Demand (Baseline Demand), and incorporates Carbon Neutrality Scenario A.

Under this scenario, the utilization rates of all regasification plants in all terminals—Pyeongtaek, Incheon, Tongyeong, Samcheok, Jeju, and Dangjin—are projected to decline steadily over time. Even the LNG Terminal in Samcheok, which has the highest utilization rate, does not exceed the average utilization rate of Korean LNG terminals (33%), while the Dangjin LNG Terminal is expected record a low utilization rate, staying below 25% for most of the period.

[Figure 12] **Utilization Rate of KOGAS LNG Terminals - Scenario 3**

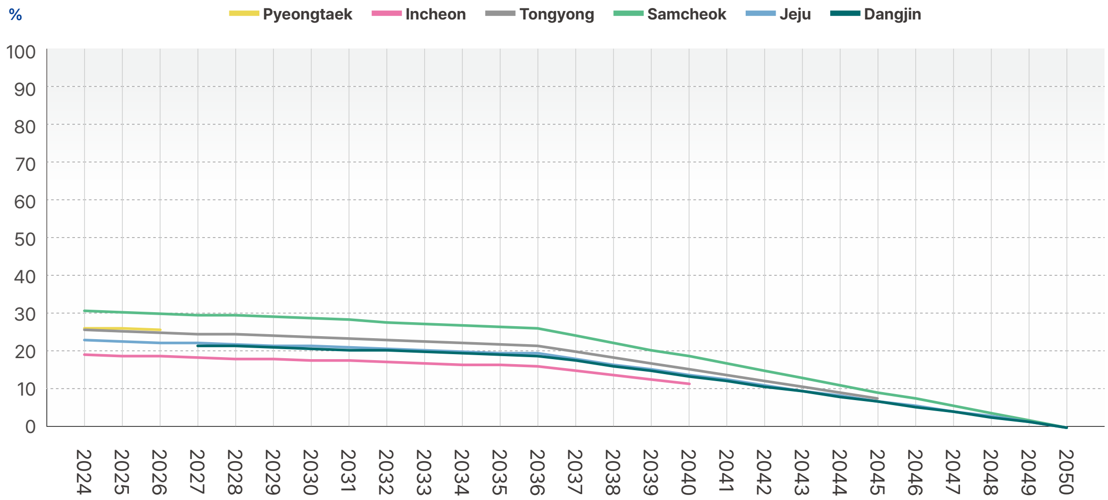


Figure 12 represents Scenario 3, in which both power generation and city gas demand are set according to the Baseline Demand from the 15th Long-Term Plan for Natural Gas Supply and Demand, combined with Carbon Neutrality Scenario A. Similar to Scenario 1, utilization rates of all terminals show a gradual decline over time.

Even the Samcheok LNG Terminal, which exhibits the highest rate of utilization, starts at only 31% and continues to decrease thereafter. The Dangjin LNG Terminal begins at a low 21% utilization, which further falls over time.

The scenario analysis indicates that both overall LNG terminal network and individual terminals are likely to remain below current operational levels. In particular, with continued decrease in demand and oversupply of LNG terminals, some terminals may operate at extremely low utilization rates. Consequently, the construction of new terminals could further depress overall utilization, leading to reduced investment inefficiency and heightened financial risks.

D Estimated Value of Stranded Assets in LNG Terminals

In the LNG demand scenarios, stranded assets for LNG terminals are as defined follows:

Stranded Asset = Expected Revenue of LNG Terminals under the BAU Scenario − Expected Revenue under the Demand-Reduction Scenario

Stranded assets refer to assets whose value declines sharply or whose expected returns cannot be recovered due to external factors such as environmental changes, and policy shifts. In this analysis, the value of stranded assets is defined as the difference between the revenues under normal operations (BAU Scenario) and the reduced revenues resulting from policy changes or declining demands (Demand-Reduction Scenario). The Korea Energy Economics Institute (KEEI), in a similar study, has defined stranded assets as assets that lose their economic function due to abrupt devaluation caused by unforeseen external factors[15].

The BAU scenario assumes that the current revenue level in 2024 remains unchanged going forward, while the Demand-Reduction Scenario applies the LNG demand projections from Scenario 1 through Scenario 4-1.

[Table 4] Estimated Stranded Asset Value of LNG Terminals in Korea

Unit: KRW 100 million

Scenario	Discount rate				
	0.0%	2.5%	4.5%	7.5%	10.0%
1	249,215	143,439	93,289	49,693	29,676
2	230,285	129,142	81,721	41,099	22,846
3	301,226	181,685	**123,954**	72,501	47,987
4	251,341	142,861	91,935	48,169	28,366
1-1	208,423	120,046	78,073	41,520	24,705
2-1	189,501	105,757	66,511	32,930	17,879
3-1	260,434	158,293	108,739	64,328	43,016
4-1	210,556	119,476	76,725	40,001	23,398

15 Korea Energy Economics Institute. (2017). A Study on the Conditions of Stranded Assets in Coal-Fired Power Plants.

Table 4 shows the estimated value of stranded assets for LNG terminals in Korea. Revenues were estimated by applying the average LNG revenue margin over the past four years (excluding outliers) to all LNG terminals in Korea, and then discounted to present value at a 4.5% rate. Depending on the scenario applied, the resulting stranded asset value ranges from approximately KRW 6.6 trillion to KRW 12.3 trillion. The findings that if LNG demand continues to decline, Korea's LNG infrastructure may fail to fully recover its investments, leading to a substantial reduction in asset values, significantly lower than anticipated.

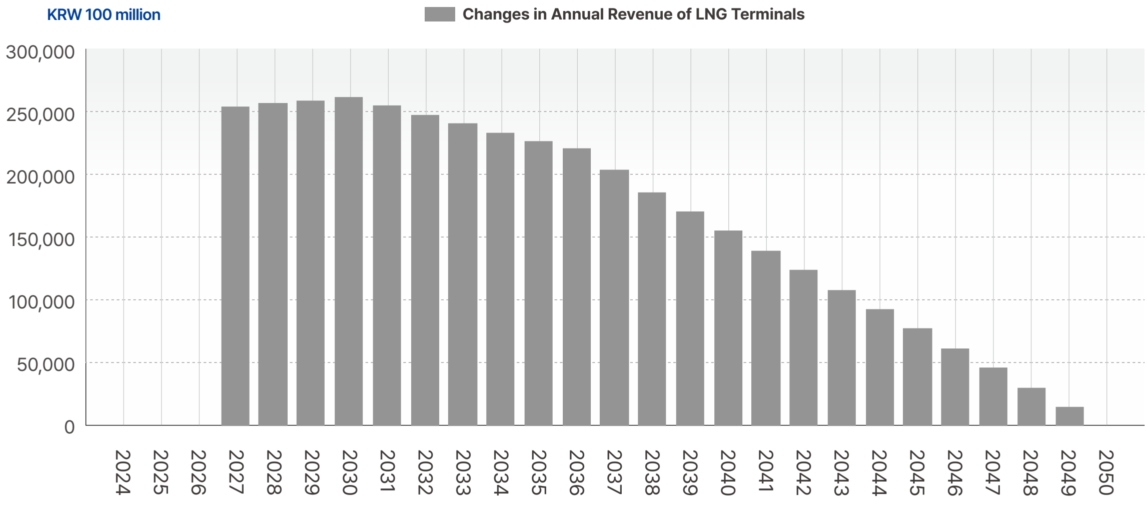
[Table 5] Estimated Stranded Asset Value of Dangjin LNG Terminal

Unit: KRW 100 million

Scenario	Discount rate				
	0.0%	2.5%	4.5%	7.5%	10.0%
1	22,527	13,217	8,770	4,865	3,045
2	21,876	12,708	8,352	4,554	2,800
3	21,427	12,711	8,533	4,843	3,108
4	19,923	11,489	7,507	4,059	2,481
1-1	19,166	11,290	7,516	4,192	2,636
2-1	18,555	10,803	7,113	3,888	2,396
3-1	18,234	10,880	7,342	4,203	2,719
4-1	16,890	9,750	6,376	3,451	2,111

Table 5 shows the stranded asset value of the Dangjin LNG Terminal. Even for this single terminal, which is currently under construction by KOGAS, applying the same profit assumptions and a 4.5% discount rate results in an estimated stranded asset value ranging from approximately KRW 637.6 billion to KRW 877 billion. This indicates that even at the level of a single terminal, substantial investment losses could arise under demand decline scenarios in the future.

[Figure 13] **Annual Revenue Changes of Dangjin LNG Terminal under Scenario 1**



Examining the annual revenue changes of the Dangjin LNG Terminal under Scenario 1 (see **[Figure 13]**), revenue increases during the construction period but drops sharply from 2031, when full-scale operations begin. Given the projected decrease in LNG demand and the requirement of maintaining minimum utilization rate for economic viability, the Danjin LNG terminal is expected to operate at low utilization rates, resulting in significantly reduced profitability.

4. Conclusion and Policy Recommendations

A Key Findings

To assess the utilization rates of LNG terminal regasification plants, annual utilization rate by terminal was calculated for each scenario. Based on these utilization rates, revenue shortfalls relative to expected revenues were derived estimate the value of stranded assets. The utilization rate of regasification plants is defined as the ratio of LNG demand to each terminal's annual regasification capacity. This enables a quantitative evaluation of a terminal's economic viability and potential stranded asset risks. The key findings are as follows:

1. **Utilization Rates of Terminals** - Analyses of LNG regasification plants' utilization rates across scenarios show that it would remain well below 30%. This highlights that actual operational rates are very low relative to terminal capacity, raising concerns about inefficiencies from overinvestment in infrastructure.

2. **Overall Value of Stranded Asset** - Compared to current demand levels, the stranded asset value of the entire LNG terminal network is estimated to range between KRW 6.6 trillion to KRW 12.3 trillion, under declining demand scenarios. Such substantial profit losses underscore the need to reassess demand projections when planning future LNG infrastructure investments and operational strategies.

3. **Dangjin LNG Terminal Faces High RIsk of Stranded Assets** - For the Dangjin LNG Terminal, currently under construction by KOGAS, the same assumptions yield an estimated stranded asset value ranging from KRW 637.6 billion to KRW 877 billion. This illustrates that even at the level of a single terminal, weakened demand can significantly erode economic viability, suggesting that additional investments, such as storage tank expansions, carry substantial risks.

B Policy Recommendation

As highlighted in the key findings, utilization rates of LNG terminals in Korea are projected to remain below 30% under most scenarios, with potential stranded assets exceeding KRW 12 trillion due to declining LNG demand. This clearly indicates that the current investment trajectory focused on LNG infrastructure is neither financially nor sustainable policy-wise, signaling the need to overhaul the energy infrastructure policy.

Korea ranks third globally in LNG import capacity[16], reflecting significant overinvestment in infrastructure. Nevertheless, approximately 28% of new LNG terminal capacity is still under development, including large-scale developments such as the Dangjin LNG Terminal.

Considering the 2050 carbon neutrality target and domestic and international gas demand projections, further LNG infrastructure expansion carries serious financial risks. Adding new terminals to an already underutilized system, would further reduce profitability and heighten the risk of stranded assets. Under these conditions, additional infrastructure investment could lead to inefficient allocation of resources.

While some argue that LNG can serve as the bridge fuel in the shift to renewable energy, the current operating capacity of LNG terminals is already substantial. Moreover, the expansion projects are planned to operate beyond 2050, leaving the "bridge" rationale an invalid argument. Not only this argument risks conflicting with net-zero goals but there are mounting concerns that this could potentially delay renewable energy deployment.

Therefore, investment plans for new LNG terminals and storage facilities need to be thoroughly revised. For large-scale projects such as the Dangjin LNG Terminal expansion, it is essential to establish procedures that assess alignment with long-term supply-demand forecasts, financial feasibility, and consistency with climate commitments.

Given that fossil fuel-based infrastructure will face stranded assets risks in the course of the net-zero transition, regulatory safeguards must be in place to prevent overinvestment. Moreover, even existing and already-approved fossil fuel

16 IGU (2025). *2025 World LNG Report.*

infrastructure projects should be reassessed for alignment with net-zero targets, with phased-out plans established where necessary. To conclude, it is imperative that Korea should move away from fossil fuel-centric infrastructure and accelerate the transition toward renewable energy and green hydrogen.

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