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Is Jeju’s Proposed 300MW Gas Power Plants Economically viable?

Key Findings

Stable Power Supply

2025 Reserve Margin
Summer 43.3%
Winter 81.1%

HVDC Third Interconnector has expanded Jeju’s electricity supply capacity

Gas Plants in Deficit

2025 Operating Profit
Jeju Combined -29.4B
Namjeju Combined -26.4B

Existing gas plants have already entered loss-making structure

Renewables Expanding

Renewables now generate 20% of Jeju’s electricity

2025 Renewables capacity 1,199MW

Green Hydrogen cost

Generation Cost
KRW 594-1,200/KWh

Even the lowest cost is about 2x offshore wind and up to 8x solar pv

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Jeju's Electricity Demand Remains stable, While Supply Capacity Has Expanded

01 Key Trends

Electricity Demand

Jeju's spring and autumn base load remained stable at around 730 MW from 2021 to 2025

Peak Demand

Both summer and winter peak demand declined in 2025 compared to the previous year

Expanded HVDC

Jeju-mainland power transfer capacity increased from 360 MW to 600 MW

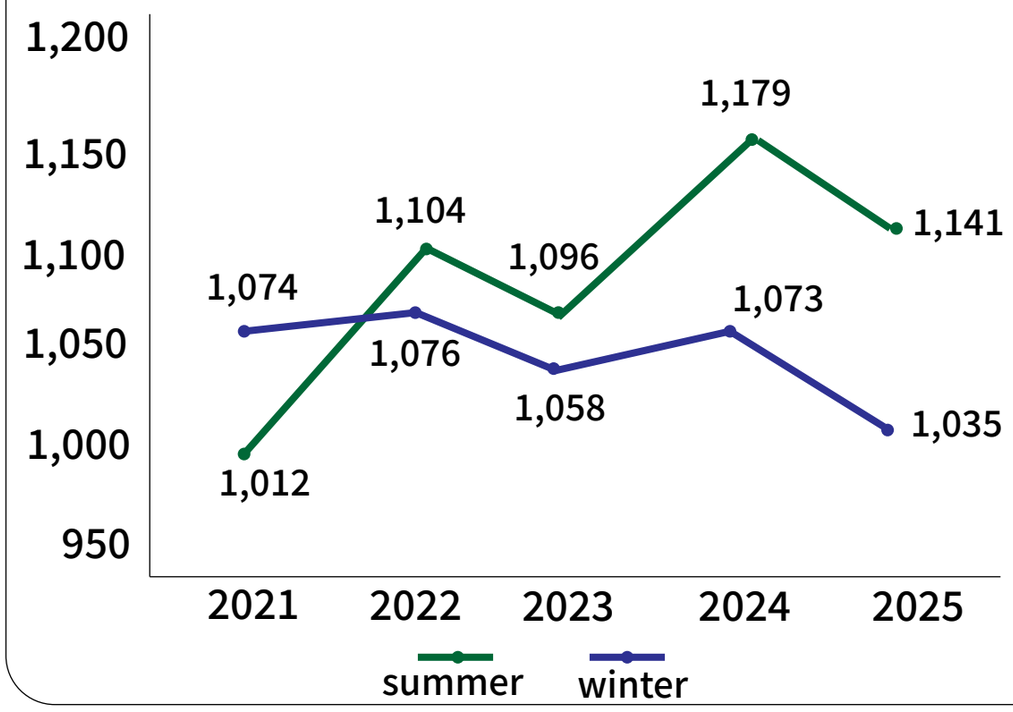
Rise in Reserve Margins

In 2025, reserve margins rose to 43.3% in summer and 81.1% in winter

02 Key Indicators

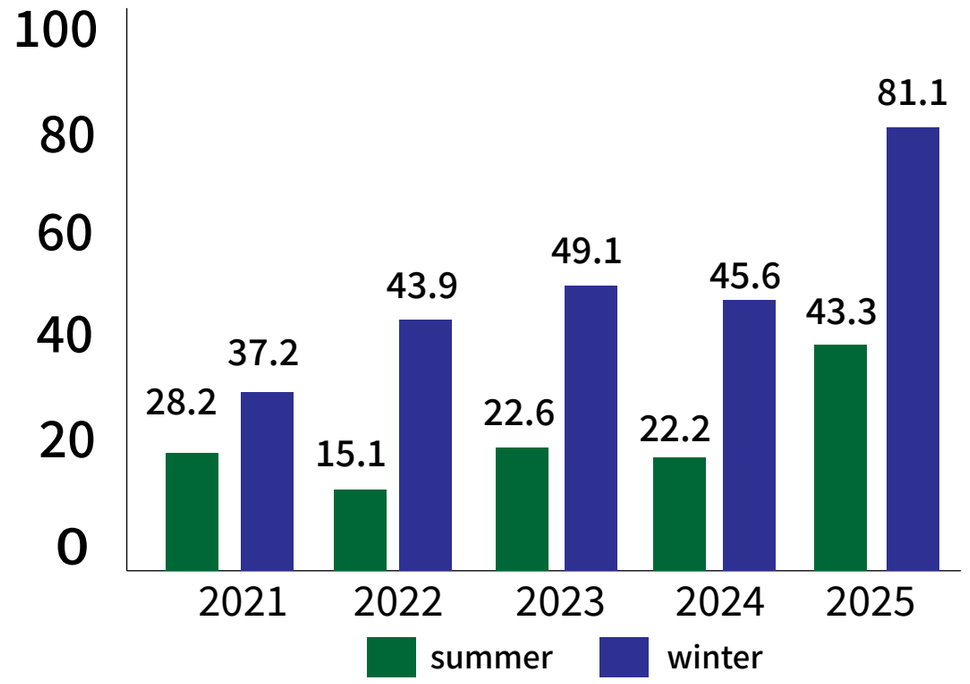
Changes in Summer and Winter Peak Demand

2021~2025/ unit: MW



Changes in Summer and Winter Reserve Margins

2021~2025 / unit: %



Jeju's electricity demand remains stable, and supply capacity is expanding. Instead of adding new gas power plants, the project should be re-evaluated based on Jeju's changing power system.

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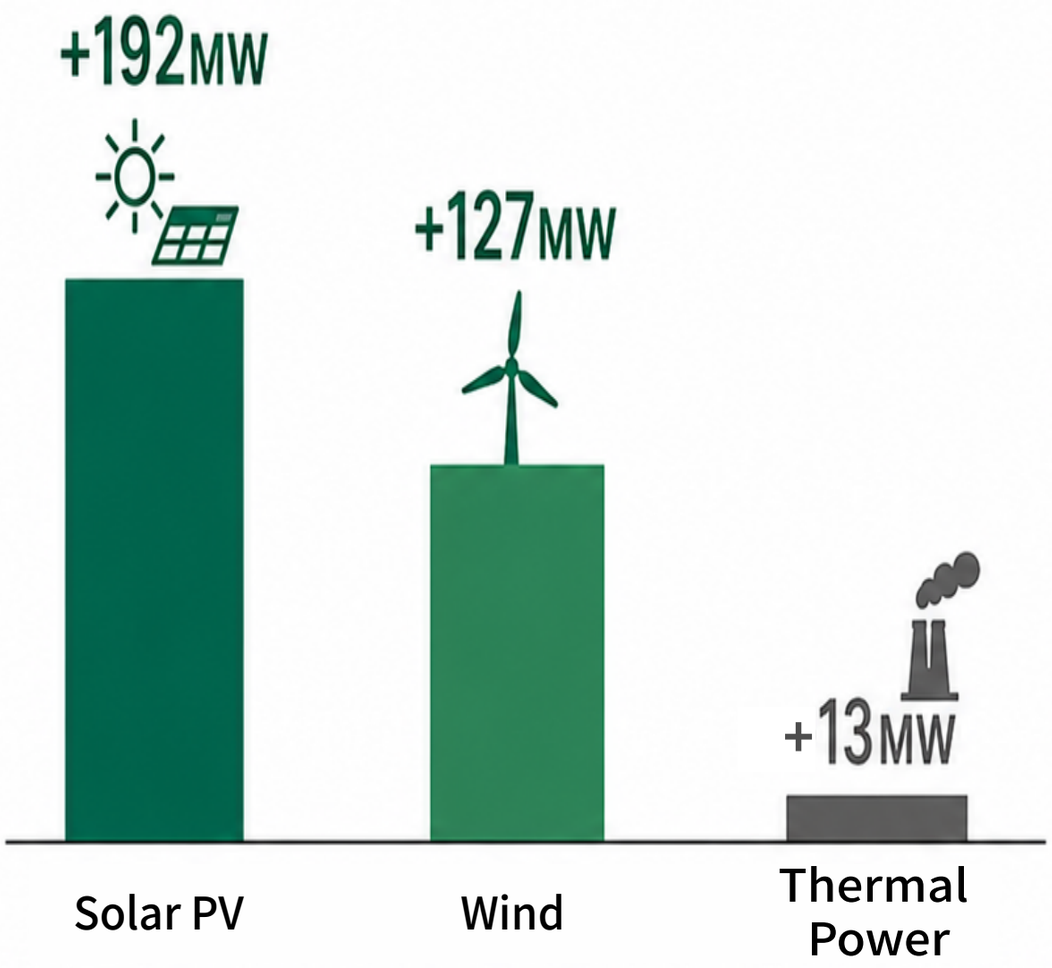
Renewables Are Growing, Fossil Fuel Generation Is Declining

Capacity Growth Is Shifting Toward Renewables

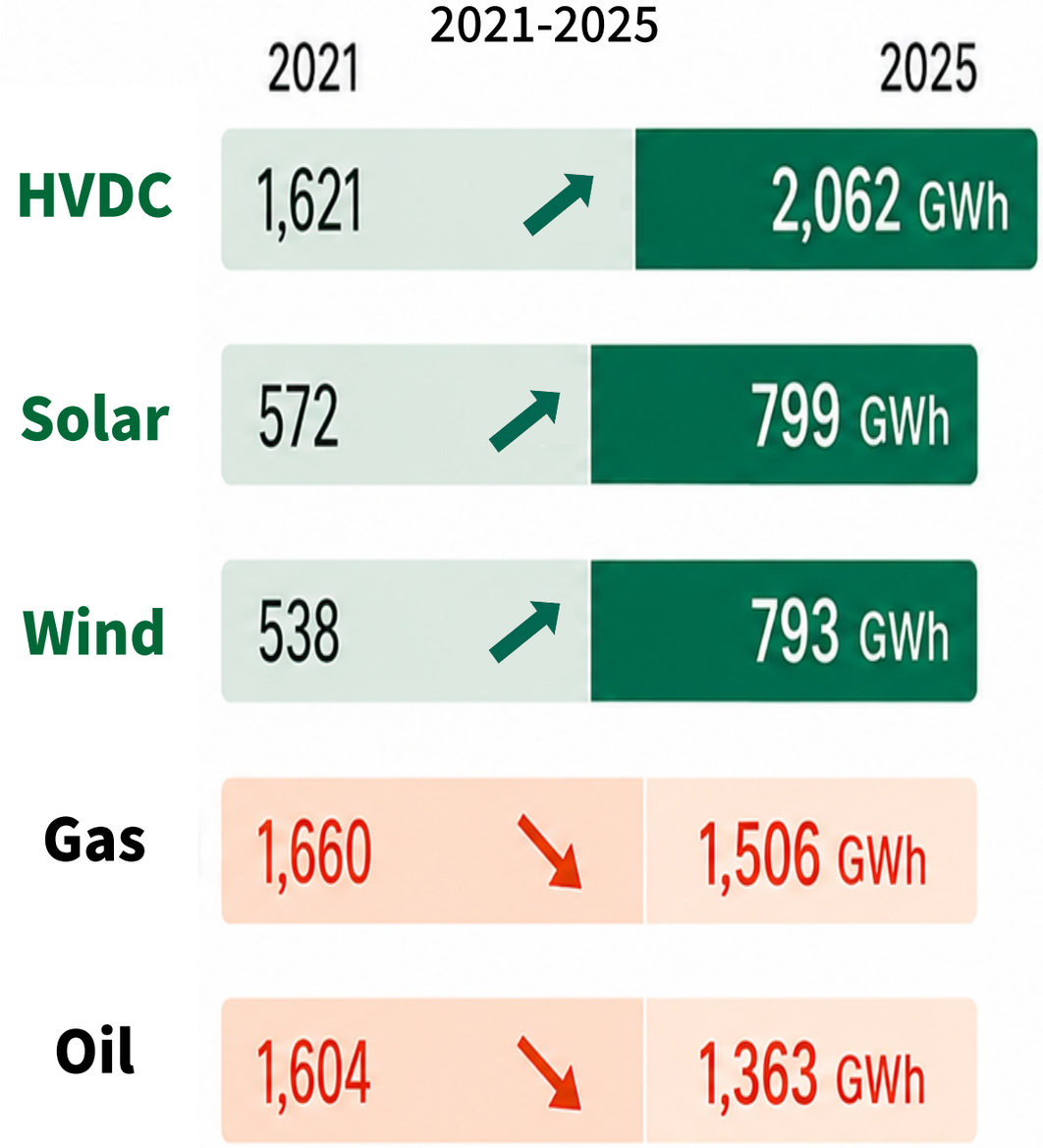
Comparison of Capacity Additions, 2021-2025



- renewable capacity first surpassed fossil fuel in 2022
- 2025 renewable capacity: 1,199MW

Increasing for Renewables, HVDC While Gas is Declining

Changes in Output by Major Power Sources, 2021-2025



The growth of renewables and the expansion of HVDC Third Interconnctor are steadily reducing the role of fossil fuel generation in Jeju's power system

Jeju's power system is shifting toward renewables and away from fossil fuel generation.
A new gas power plants would go against this trend.

Economic Feasibility on the Gas Power Plant FactSheet 04

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Existing Gas Power Plants Have Already Entered a Loss-Making Structure

Changes in Capacity Factor of Major Gas Power Plants

Jeju Combined Cycle

2023 → 2025

60.6% → 39.9%

NamJeju Combined Cycle

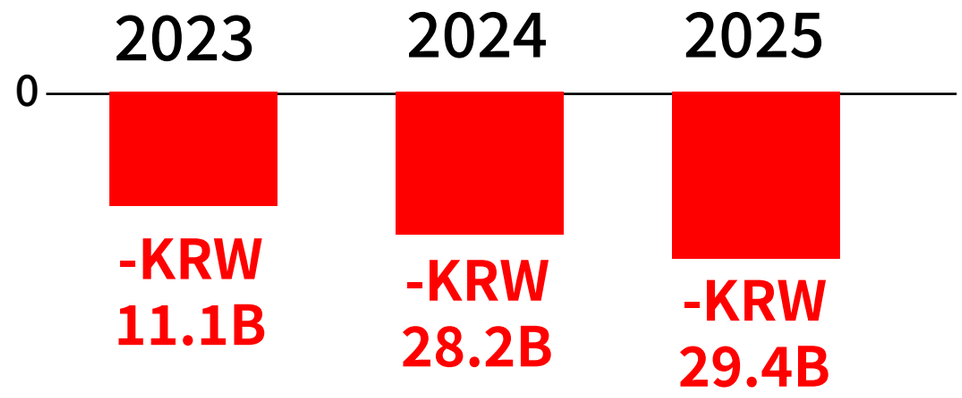
2024 → 2025

64.14% → 47.12%

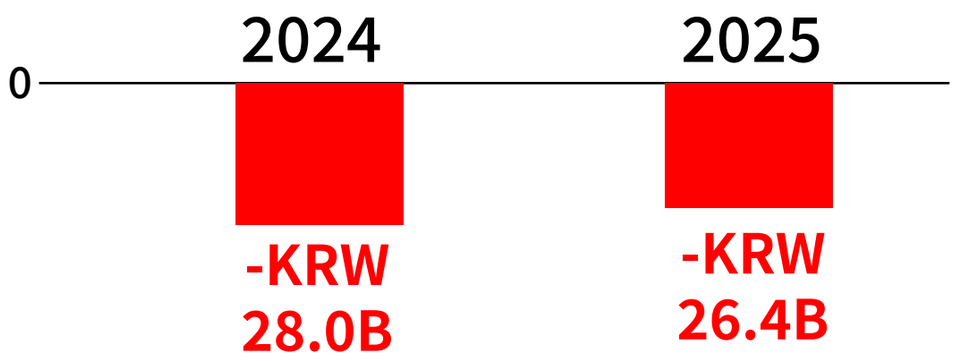
since 2024, gas power plant capacity factor have declined overall

Operating Losses Are Growing

Jeju Combined Cycle



NamJeju Combined Cycle



a raverse margin structure has taken hold, where generation costs exceed sales revenue

Fuel Price Volatility

International gas price volatility makes it difficult to restore past economic viability.

Structural Limitations

Combined-cycle power plants face difficulties in recovering fixed costs.

Utilization Recovery

As renewables expand, opportunities for gas power generation are shrinking.

Existing gas power plants in Jeju are already facing lower capacity factor and operating losses. Buliding another plants under the same structure would expand the financial deficit.

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Green Hydrogen Is Not a Solution

01 Key Issues

High-Cost Infrastructure

Estimated Construction Cost:

Over KRW 20 Trillion

Rise in Generation Costs

Green Hydrogen Generation cost Far higher than solar and wind power

Limited Emissions Reduction

50% Co-firing → 24% Co2 Reduction
77% Co-firing → 50% Co2 Reduction

Insufficient Hydrogen supply

2030 supply target 4,242 tons
Hydrogen required for 50% Co-firing : about 14,000 tons

02 Comparison Of Generation Costs

Power Source	Genration Cost Range
Solar PV	KRW 123-144
Onshore Wind	KRW 166-168
Offshore Wind	KRW 271-300
Green Hydrogen	KRW 594-1,200

The lowest green hydrogen cost (KRW 594/KWh) is about **2 times higher** than the highest offshore wind cost (KRW 300/KWh)

The highest green hydrogen cost (KRW 594/KWh) is about **8 times higher** than the highest solar PV cost (KRW 1,200/KWh)

Green hydrogen co/full-firing can’t improve the economic viability of a new gas power plants. Instead, they may add a heavier burden through massive infrastructure and fuel costs.

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What Jeju Needs Now Is Project Re-Evaluation

Policy Recommendations

1

Reassess Economic viability

Existing gas power plants are facing **declining capacity factor** and **growing operating losses**

The proposed new gas power plants must be reviewed in terms of **LNG price volatility, low capacity factor,** and **stranded asset risks**

2

Review Alignment with Carbon Neutrality Goals

Jeju aims to achieve **carbon neutrality and RE100 by 2035**

The proposed new fossil fuel power plant must be carefully assessed for its compatiability with these goals

3

Reflect the Results of Power Planning Review

Jeju's power system is changing through **HVDC expansion, renewable energy growth, and wider ESS deployment**

These changes should be reflected in the **12th Basic Plan for Long-Term Electricity Supply and Demand**

4

Role of the Next Jeju Provincial Administration

The next Jeju Provincial administration has a responsibility to throughly review the new gas power plant plan

It should formally request the central governmet to **suspend and re-evaluate the project**