

RENEWABLE ENERGY

Global Market Size/Forecast

- ▶ **(MARKET SIZE)** In 2024, an additional 534 GW of renewable energy generation capacity is expected to be added, bringing the total cumulative capacity to 4,403 GW.
- **(Investment in Renewable Energy)** According to the IEA, global investment in renewable energy has grown at an average annual rate of 10% over the past five years. However, the investment amount in 2024 is expected to increase by only 5%, reaching USD 771 billion, showing a slowdown compared to the average growth rate of recent years.

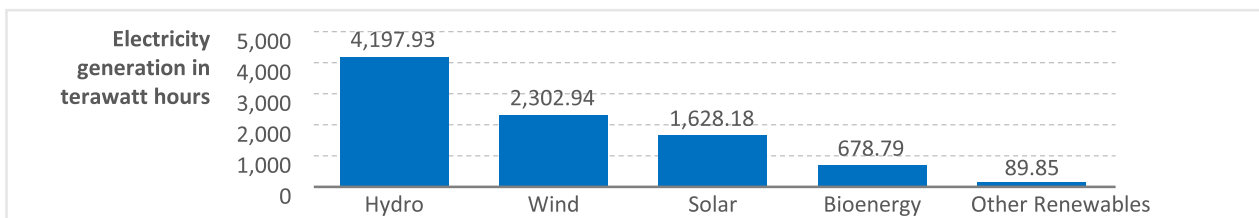
<Global Renewable Energy Generation Capacity and Investment Amounts (2020-2024)>

Division	2020	2021	2022	2023	2024
Cumulative capacity (GW)	2,823	3,088	3,396	3,869	4,403(estimate)
Newly added capacity (GW) (growth rate)	N/A	+265 (9.4%)	+308 (10.0%)	+473 (13.9%)	+534(estimate) (13.8%)
Investment amount (USD 100 million)	4,460	4,700	6,050	7,350	7,710

* Source: 「Renewable Capacity Statistics 2024(IRENA), 「Global Power & Renewable Report Q4 2024」(Fitch Solutions), 「World Energy Investment 2024(IEA), Invest KOREA)

- ▶ **(GENERATION OUTLOOK)** Renewable energy generation is expected to increase by 9% annually between 2025 and 2026. The IEA predicts that in 2025, renewable energy will surpass coal to become the largest power source, providing more than one-third of the global electricity supply.(「Electricity 2024: Analysis and forecast to 2026」, IEA)
- ▶ **(ENERGY SOURCE BREAKDOWN OF GENERATION)** In 2023, the global renewable energy generation was led by hydro > wind > solar > bioenergy > other renewable sources.

<Electricity generation from renewable sources worldwide in 2023, by source(in terawatt hours)>



* Source: Statista, Latest data as of June 2024

Domestic Market Size/Forecast

- ▶ **(DOMESTIC TRENDS AND OUTLOOK)** In 2023, South Korea's renewable energy generation totaled 53,146 GWh, accounting for 8.4% of the total electricity generation.
- The government's 11th Basic Plan for Power Supply and Demand, confirmed in February 2025, forecasts that renewable energy generation will reach 120,900 GWh by 2030, contributing 18.8% of the total generation.

<The 11th Electricity Generation and Generation Share Forecast(Unit: TWh, %)>

Year	Division	Nuclear	Coal	LNG	Renewable Energy	New Energy	Clean Hydrogen, Ammonia	Others	Total	Carbon	Carbon-Free
2023	Power Generation	180.5	184.9	157.7	49.4	7.2	-	8.3	588.0	358.2	229.9
	Share	30.7	31.4	26.8	8.4	1.2	-	1.4	100.0	60.9	39.1
2030	Power Generation	204.2	110.5	161.0	120.9	18.7	15.5	11.8	642.6	302.0	340.6
	Share	31.8	17.2	25.1	18.8	2.9	2.4	1.8	100.0	47.0	53.0
2038	Power Generation	248.3	70.9	74.3	205.7	26.4	43.9	34.9	704.5	206.7	497.8
	Share	35.2	10.1	10.6	29.2	3.8	6.2	5.0	100.0	29.3	70.7

※ Carbon-Free Power Generation: Nuclear + Renewable + Clean Hydrogen, Ammonia


※ The "carbon-free competitive" portion of new facilities reflected in hydrogen generation and ESS-linked solar power

※ Changes may occur depending on the market conditions for carbon-free competition, handling of reserved volumes, etc.

* Source: Ministry of Industry

- ▶ **(GENERATION BY SOURCE)** In 2023, South Korea's renewable energy generation by source was as follows: solar > bioenergy > hydro > wind > other (marine and waste).

<2023 South Korea Renewable Energy Generation by Source(Unit: GWh, %)>

Categorize		2021		2022			2023		
		power generation	proportion	power generation	proportion	percentage change	power generation	proportion	percentage change
Total power generation		611,015		626,448			624,883		
New & Renewable Energy		50,657	100.0	57,780	100.0	14.1	60,400	100.0	4.5
	Renewable Energy	43,669	86.2	50,406	87.2	15.4	60,400	88.0	5.4
	New Energy	6,989	13.8	7,374	12.8	5.5	53,146	12.0	▲1.6
Renewable Energy	Solar	24,718	48.8	30,726	53.2	24.3	7,254	55.0	8.2
	Wind	3,180	6.3	3,369	5.8	6.0	33,236	5.6	0.7
	Hydroelectric	3,057	6.0	3,545	6.1	16.0	3,392	6.2	4.9
	Marine	455	0.9	424	0.7	▲6.8	438	0.7	3.2
	Bio	11,788	23.3	11,928	20.6	1.2	11,918	19.7	▲0.1
	Waste	471	0.9	414	0.7	▲12.1	444	0.7	7.3
New Energy	Fuel Cell	4,798	9.5	5,410	9.4	12.7	6,257	10.4	15.7
	IGCC	2,191	4.3	1,965	3.4	▲10.3	997	1.6	▲49.3

* Source: Korea Energy Agency, Latest data as of December 2024

Sales/Exports/Production Volume

▶ **(WIND POWER)** In 2023, the newly installed wind power capacity was 219 MW, a 7.8% decrease from the previous year, due to delays in the approval process.

- **Reference:** Cumulative installed wind power capacity in 2023 was 2,165 MW.

▶ **(SOLAR POWER)** In 2023, the newly installed solar power capacity increased by 12.3% to 3,682 MW compared to the previous year.

- **Reference:** Cumulative installed solar power capacity in 2023 was 28,033 MW.

<2023 South Korea Renewable Energy New and Cumulative Installed Capacity (Unit: MW, %)>

- New Renewable Energy Facility Capacity -

Category		2021		2022			2023		
		Installed Capacity	Share	Installed Capacity	Share	Rate of Change	Installed Capacity	Share	Rate of Change
New & Renewable Energy		4,454	100.0	3,809	100.0	▲14.5	4,173	100.0	9.6
	Renewable Energy	4,275	96.0	3,689	96.9	▲13.7	4,002	95.9	8.5
	New Energy	179	4.0	120	3.1	▲33.2	171	4.1	43.0
Renewable Energy	Solar	3,915	87.9	3,278	86.1	▲16.3	3,682	88.4	12.3
	Wind	65	1.4	238	6.2	272.8	219	5.3	▲7.8
	Hydroelectric	18	0.4	0	0.0	▲98.8	5	0.1	2275.0
	Marine	0	0.0	-	-	Net decrease	-	-	-
	Bio	187	4.2	161	4.2	▲14.3	88	2.1	▲45.4
	Waste	90	2.0	13	0.3	▲86.0	8	0.2	▲35.4
New Energy	Fuel Cell	179	4.0	120	3.1	▲33.2	171	4.1	43.0
	IGCC	-	-	-	-	-	-	-	-

- Cumulative Renewable Energy Facility Capacity -

Category		2021		2022			2023		
		Installed Capacity	Share	Installed Capacity	Share	Rate of Change	Installed Capacity	Share	Rate of Change
Total power generation		142,458		147,200			154,617		
New & Renewable Energy		30,212	100.0	33,234	100.0	10.0	37,371	100.0	12.4
	Renewable Energy	29,072	96.2	31,996	96.3	10.1	35,962	96.2	12.4
	New Energy	1,140	3.8	1,238	3.7	8.6	1,409	3.8	13.8
Renewable Energy	Solar	21,199	70.2	24,370	73.3	15.0	28,033	75.0	15.0
	Wind	1,709	5.7	1,946	5.9	13.9	2,165	5.8	11.2
	Hydroelectric	1,821	6.0	1,813	5.5	▲0.4	1,817	4.9	0.2
	Marine	256	0.8	256	0.8	-	256	0.7	-
	Bio	3,579	11.8	3,138	9.4	▲12.3	3,220	8.6	2.6
	Waste	507	1.7	473	1.4	▲6.7	472	1.3	▲0.3
New Energy	Fuel Cell	794	2.6	892	2.7	12.4	1,063	2.8	19.2
	IGCC	346	1.1	346	1.0	-	346	0.9	-

* Source: Korea Energy Agency, Latest data as of December 2024

Trends in Foreign Investment in South Korea

- ▶ Investment in renewable energy generation continues to grow steadily, though it declined slightly in 2024. Over the past three years, large-scale investments have focused mainly on offshore wind projects.

<Investment Performance by Sector (3-Year Data)>

(Unit: Cases, Million USD)

Category	2022		2023		2024		'62~'24년	
	Case	Amount	Case	Amount	Case	Amount	Case	Amount
Electricity & Gas, Water Supply, Environmental remediation, Construction	155	1,388	158	2,932	99	2,176	1,850	21,296

* Source: Ministry of Industry, "2024 Foreign Direct Investment Trends"

Investment Strengths

- ▶ South Korean companies are leading global markets in wind power supply chains, with companies like SK Ocean Plant (substructures), CS Wind (towers), and LS Cable (cables).
- ▶ The government's commitment to expanding wind power: announcing government bidding for 7-8 GW over the next two years.
- ▶ Domestic conglomerates such as Samsung and LG are increasing their participation in RE100 (Renewable Energy 100%).

* (Note) Emphasized the strengths of the wind energy industry, as the majority of investments in the renewable energy sector are focused on offshore wind farm projects.

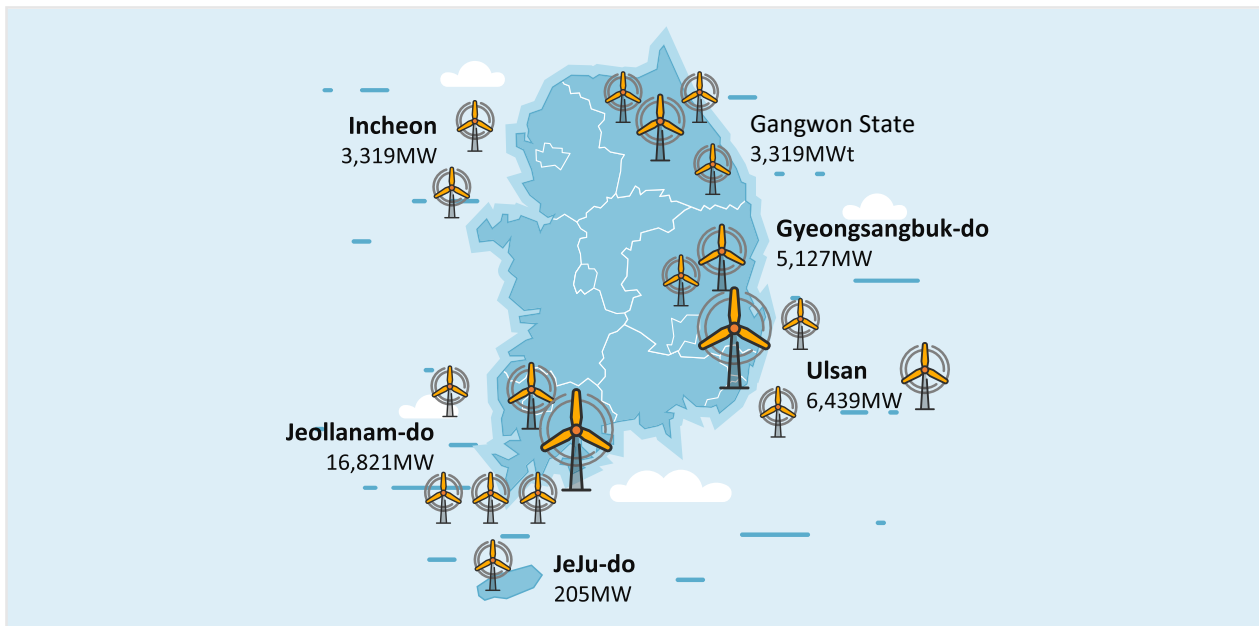
Incentives/Regulatory Status

- ▶ Foreign Investment Restrictions in Low-Carbon Energy Sectors
 - **Closed Sectors:** Nuclear power generation.
 - Sectors with less than 30% of the total domestic generation capacity allowed: Hydro, thermal, solar, and other power generation sectors.
 - * Renewable energy generation typically falls under "solar" or "other power generation" sectors.
 - ** "Other power generation" includes both onshore and offshore wind, as well as renewable energy production and sales, energy storage facility construction, etc.

Cluster Status

- ▶ As of 2024, wind power business licenses by region are as follows: Jeollanam-do > Ulsan = Gangwon-do > Gyeongsangbuk-do > Incheon.

<2024 Regional Wind Power Business License Status>

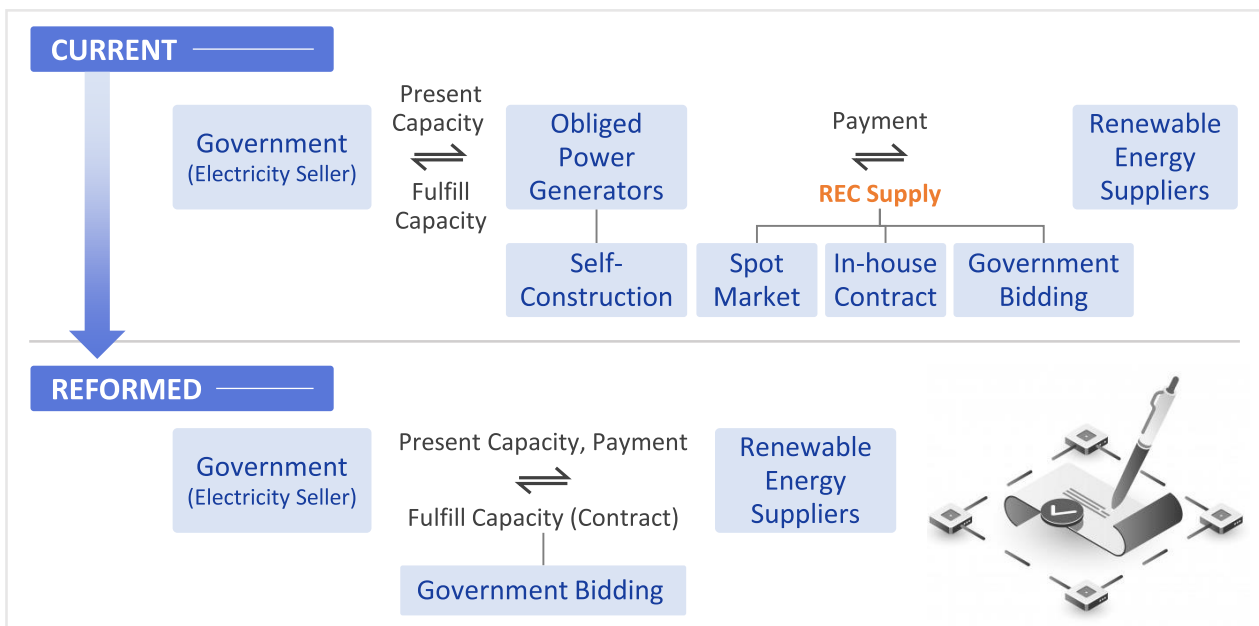


* Source: Korea Energy Agency, Invest KOREA

Industry Development Policies

- ▶ South Korea's renewable energy promotion system is guided by the "Energy Basic Plan" published every five years. According to Article 6 of the Renewable Energy Act, the MOTIE is expected to push for legislative amendments to shift the current RPS system towards a government bidding-based system. The details of the reform were announced in December 2024 as part of the "Renewable Energy Technology Development, Utilization, and Distribution Implementation Plan."

<RPS (Renewable Portfolio Standard) System Reform for Systematic Government-Led Distribution>



* Source: Ministry of Industry, "2024 Renewable Energy Technology Development and Utilization and Distribution Implementation Plan")

- **(OFFSHORE WIND POWER BIDDING ROADMAP)** In August 2024, the MOTIE announced the offshore wind power government bidding roadmap, outlining the upcoming bidding volumes for the next two years. A separate bidding market for floating offshore wind was newly established, considering the distinction between floating and fixed offshore wind.

<Domestic Offshore Wind Power Bidding Volumes (Draft)>

Category	2H 2024 (1 time)	1H 2025 (1 to 2 times)	1H 2026 (1 time)	Total (3 to 4 times)
Fixed	1~1.5GW	2~2.5GW	1~1.5GW	4.5~5GW
Floating	0.5~1GW	0.5~1GW	1~1.5GW	2.5~3GW
Total	1.5~2GW	3~3.5GW	2~3GW	7~8GW

* Source: MOTIE, Offshore Wind Competitive Bidding Roadmap)

Key Examples

EQUINOR / OFFSHORE WIND POWER DEVELOPER/ NORWAY

- **Company Overview:** A Norwegian state-owned integrated energy company with USD 107 billion in revenue, operating about 50% of the global floating offshore wind capacity. The Norwegian government is the largest shareholder, holding 67% of the company's shares.
- **Investment Overview:** Equinor is developing a 750 MW floating offshore wind farm off the coast of Ulsan, South Korea, about 60-70 km from shore in water depths of 150-300 meters. The project is expected to break ground in 2025 and will supply power to 440,000 households annually and reduce CO2 emissions by approximately 37.5 million tons.
- **Special Note:** Collaborating with leading domestic companies such as Samsung Heavy Industries, POSCO E&C, and Doosan Enerbility.

CIP / OFFSHORE WIND POWER DEVELOPER / DENMARK

- **Company Overview:** A leading global renewable energy investment company managing approximately KRW 40 trillion in assets, with 11 renewable energy funds focused on wind, solar, and bioenergy.
- **Investment Overview:** CIP is currently developing both floating and fixed offshore wind farms in Ulsan and Sinan, Jeonnam.
- **Special Note:** Joint venture with SK E&S for Phase 1 of Jeonnam Offshore Wind, expected to start commercial operation in 2025.