

2024 KOREA ENERGY DEMAND OUTLOOK

2024 First Half



Published by the Korea Energy Economics Institute (KEEI), Energy Demand Outlook takes a closer look at the global energy market and supply and demand trends in domestic energy and examines the outlook for short-term energy demand.

This report outlines the recent changes in the supply and demand of energy and provides important data and policy implications in an effort to contribute to the establishment and adjustment of a series of energy policies by the government.

This report is written by the Energy Outlook Research Team of the Center for Energy Information and Statistics in cooperation with the Energy Supply Statistics Research Team of KEEI and other related research divisions.

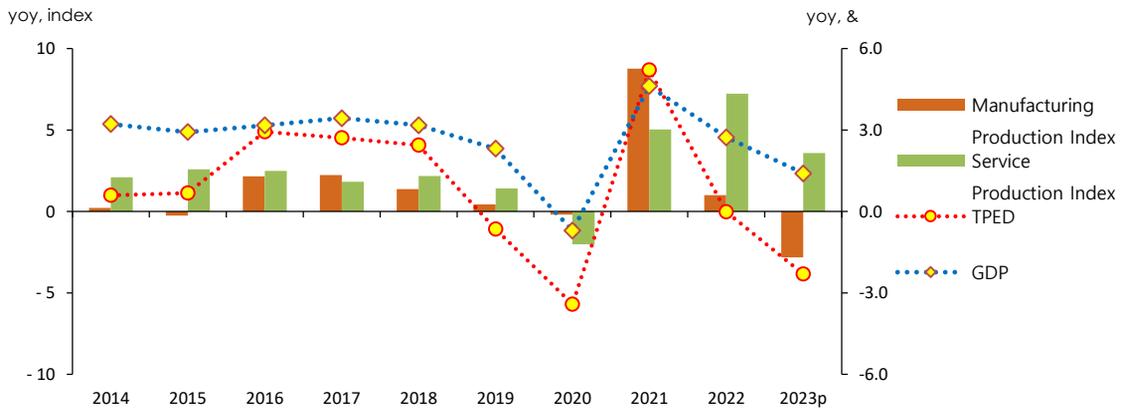
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1. Energy Consumption Trend

- **Total primary energy demand (TPED) in 2023 decreased by 2.3% y-o-y to 297.5 million toe due to a decline in manufacturing production activity.**
 - Despite the decline in manufacturing production, the economy grew by 1.4% y/y due to an increase in service sector production and lower international energy prices, but energy consumption declined mainly in the energy-intensive industrial sector.

Figure 1.1 The growth rates of GDP and TPED, production index

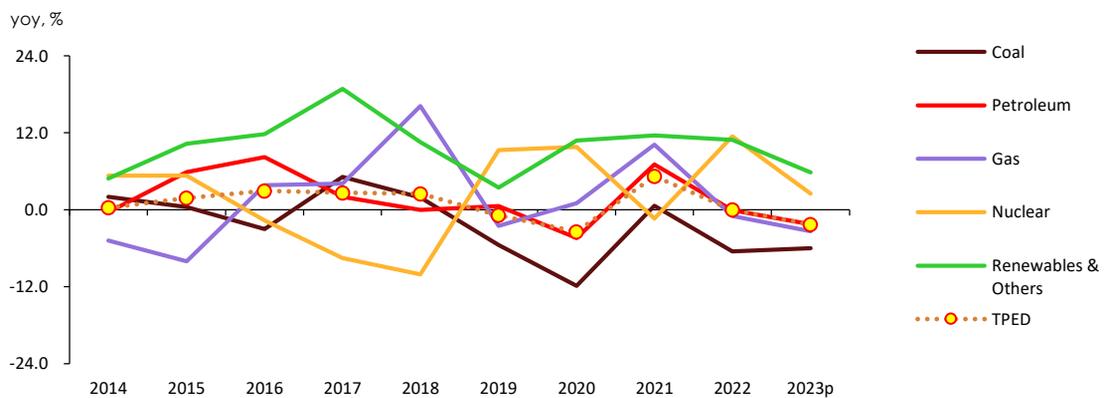


Note: Production indexes show year-on-year differences.

- Energy intensity (TOE/million KRW) improved (decreased) by 3.7% year-on-year as economic growth fell by 1.3 percentage points year-on-year, but total energy consumption fell more (2.3 percentage points).
- **In TPED, nuclear and renewable consumption increased, while coal, oil and gas consumption decreased year-on-year.**
 - Coal consumption decreased by 6.3% y/y, as the decline widened in the power generation sector due to grid constraints and increased nuclear and renewable generation, and continued to decline in the industrial sector due to stagnant consumption in the steel industry and contraction in petrochemicals and cement due to the slowdown in the economy.
 - Oil consumption decreased by 4.3% y-o-y, with the decline in industrial use widening to raw materials due to the slowdown in petrochemicals, and in transportation due to the decline in the quantity of goods transported as a result of the reduction in production activities, despite the increase in passenger travel demand.

- Gas (natural + city) consumption decreased by 3.3% YoY, with a faster decline in power generation due to lower electricity consumption, and a decline in both industrial and building use due to the slowdown in the economy, temperature and price effects.
- Nuclear power increased by 2.5% YoY due to reduced preventive maintenance and the entry of Shin-Hanul Unit 1 (2022.12), while renewables increased by 5.8% YoY, led by solar, bio and fuel cell power generation.
- TPED share was oil (39.8%), coal (22.0%), gas (19.3%), nuclear (12.9%), and renewable/other (6.0%), while the share of non-fossil energy continued to rise, reaching 18.9%.

Figure 1.2 The growth rates of energy use by major energy sources

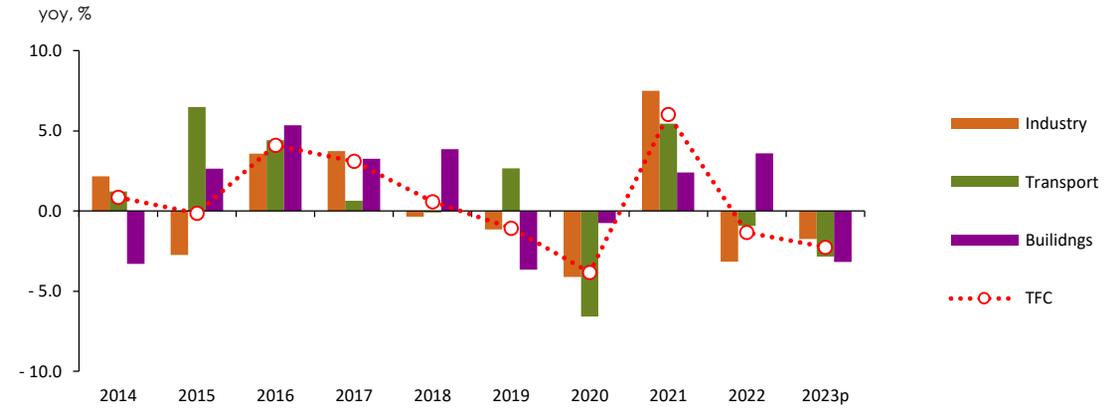


- Meanwhile, electricity consumption, a secondary energy, shifted to decline in industrial use due to the slowdown in the economy, while building use declined 0.1% year-on-year due to slower growth in service sector production, fewer heating and cooling degree days, and higher electricity prices.

□ Final energy consumption in 2023 is down 2.3% y/y, with declines in the industrial, transportation and buildings sectors.

- Industrial sector energy consumption continues to decline, falling 1.7% y/y, with a slight increase in consumption in steel and machinery, but a significant decline in petrochemicals, amid a slowing economy.
- Transportation sector energy consumption decreased by 2.8% year-on-year, with declines in road, domestic aviation, domestic navigation, and rail, reflecting lower freight volumes due to the slowdown, despite lower petroleum product prices and higher travel demand.

Figure 1.3 The growth rates of TFC by end-use sectors



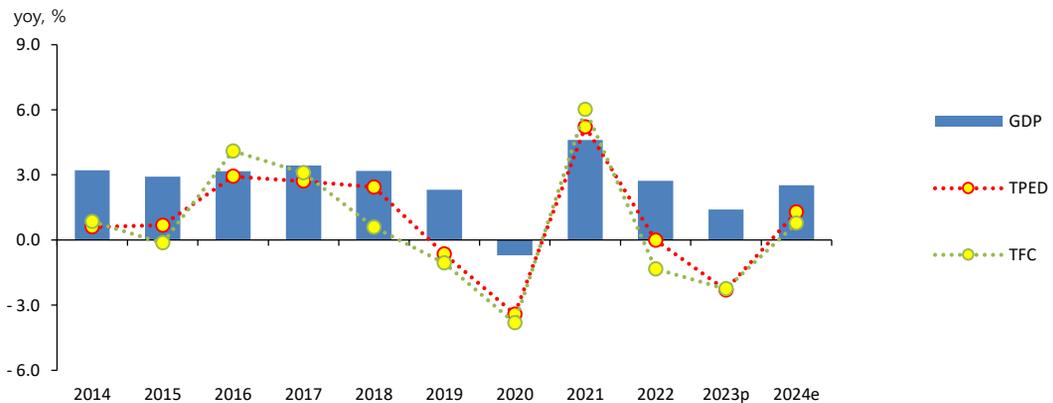
Note: The Building sector includes residential, commercial and public-etc usage.

- Energy consumption in the buildings sector decreased 3.2% year-over-year, with a decline in the residential sector and only a slight increase in the commercial sector due to higher energy prices, temperature effects, and slower service production.

2. Energy Demand Outlook

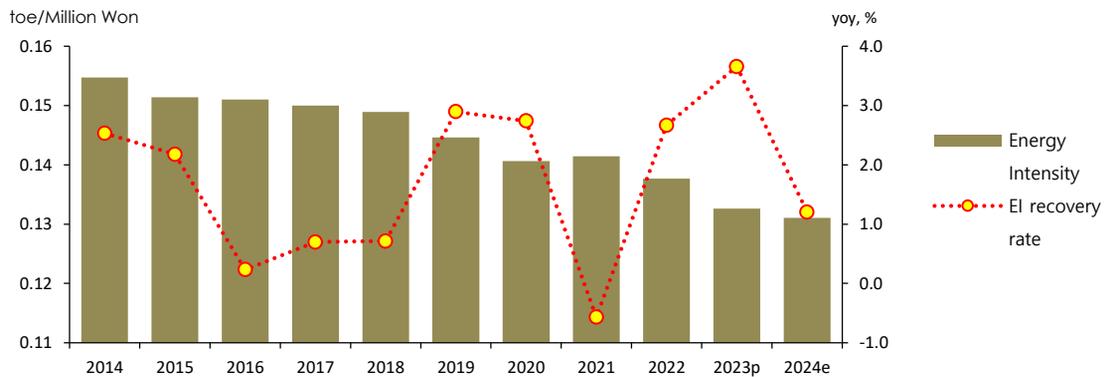
- **TPED is forecast to reach 301.4 million toe in 2024, an increase of 1.3% year-on-year.**
 - TPED, which has been declining since 2021 due to the slowdown in economic growth, is expected to turn to growth in 2024 as economic growth picks up somewhat.
 - As the economy is expected to grow by 2.5% in 2024, up from 1.4% in 2023 (BOK 2024.5), energy demand is expected to rebound from the previous year's decline, but the growth will not be fast due to the slow recovery of major energy-intensive industries.

Figure 2.1 The growth rates of GDP, TPED and TFC, trend and outlook



- Energy intensity (TOE/million) is expected to continue to improve in 2024, decreasing 1.2% year-over-year

Figure 2.2 Energy Intensity and EI Recovery Trends

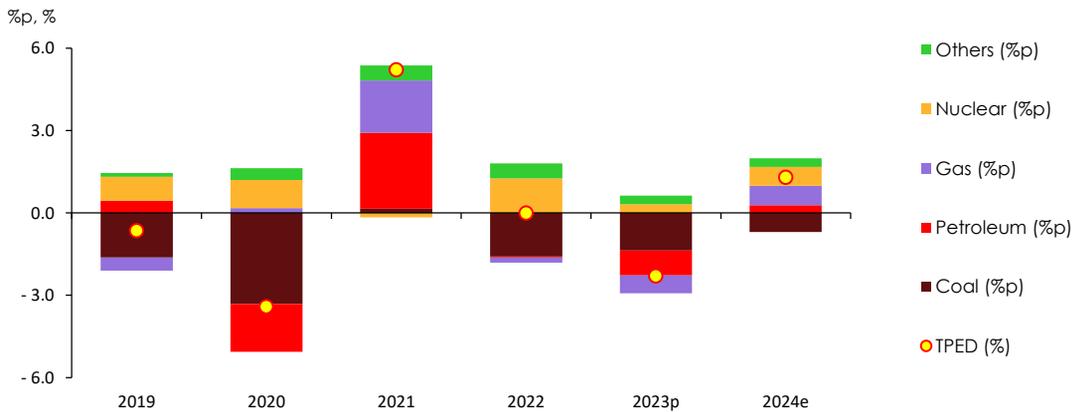


Note: Energy Intensity is calculated as the value of 'TPED/GDP', expressed in toe/million won, EI recovery rate multiplies EI increase rate by '-1'.

Coal continues to decline, oil and gas rebound from two consecutive years of decline, nuclear and renewables continue to grow.

- Coal demand is forecast to decline by 3.4% y/y, with industrial rebounding, but power generation continuing to decline.
- Oil demand is forecast to increase 0.7% y/y, led by feedstock use, with a slight improvement in petrochemicals.
- Gas (natural + city) demand is expected to increase by 3.7% YoY, with both power generation and final consumption rebounding.
- Nuclear power generation is expected to increase by 5.3% year-on-year due to the entry of Shin-Hanul Unit 2 and Saeul Unit 3. Renewable energy is also expected to increase by 9.3% due to continued expansion of power generation facilities.

Figure 2.3 The growth rate of TPED & contributions by sources



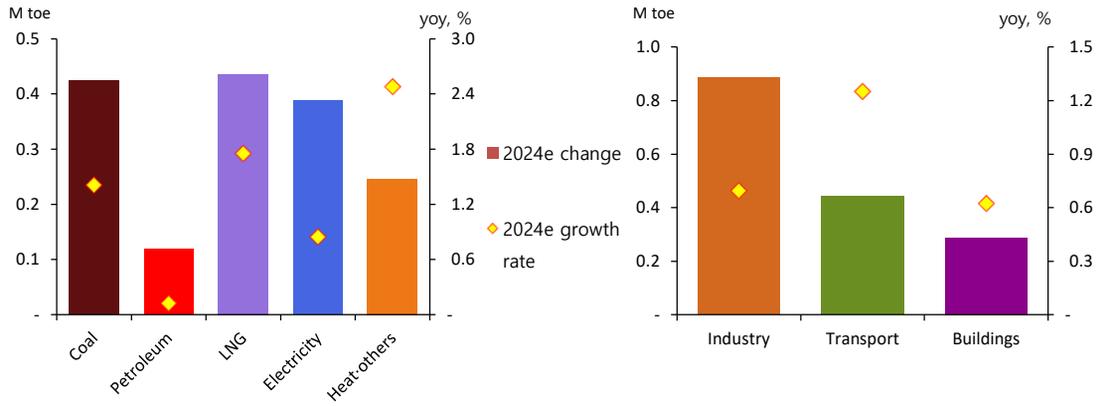
Note: TPED growth rate (%) is the sum of contributions (%p) by energy source.

- Electricity demand is forecast to increase 0.8% year-over-year, with growth in industrial, residential, and commercial use.

Final energy consumption is expected to increase by 0.8% y/y, with all sectors reversing the previous year's decline to increase.

- In the industrial sector, energy demand is forecast to increase by 0.7% y/y, driven by a slow recovery in petrochemicals and steel, but rebounding in feedstock due to the base effect of the previous year's decline.

Figure 2.4 The change and growth rate of TFC by energy sources and end-use sectors



- Transportation sector energy demand is forecast to increase 1.3% year-over-year, with gasoline growth sustained by higher passenger travel demand, and diesel demand rebounding as freight volumes recover partially.
- Energy demand in the buildings sector is forecast to increase slightly (0.6%) year-over-year, despite a decline in heating and cooling degree-days, due to a base effect from the previous year's rapid decline (-3.2%).

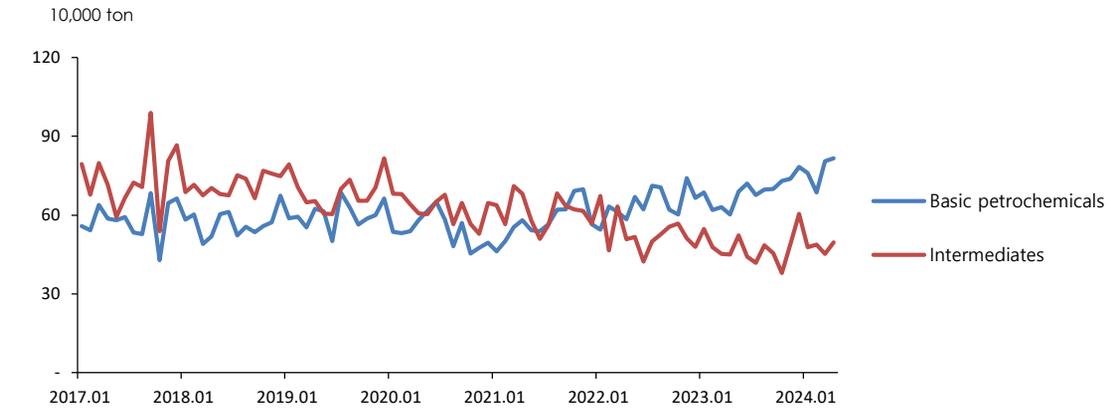
3. Key Features and Implications

The impact of China's petrochemical industry self-sufficiency improvement

The petrochemical industry is showing signs of improvement, led by exports, amid weak domestic demand, but the outlook is negative.

- In 2023, basic petrochemicals production decreased by 5.2% y-o-y, due to the downturn in the petrochemical industry that started in the second half of 2022, but increased by 5.5% y-o-y in the first quarter of 2024. Intermediate product output is still on a declining trend.

Figure 3.1 Monthly exports of basic petrochemicals, intermediates



Source: Korea Petrochemical Industry Association

Korea's petrochemical exports are likely to continue to decline due to China's policy of increasing self-sufficiency in the petrochemical industry.

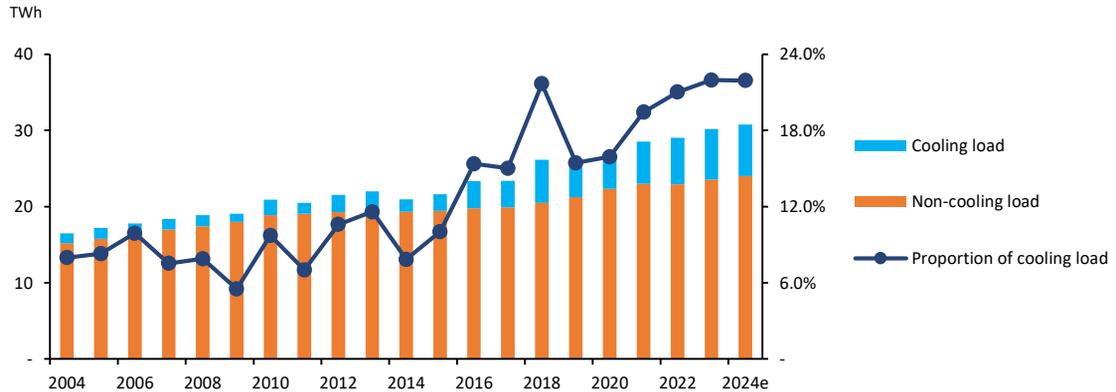
- The Chinese government has significantly increased petrochemical capacity investment since 2019 to increase the self-sufficiency rate of the petrochemical industry, and the self-sufficiency rate of most basic petrochemicals and intermediates is expected to exceed 100% by 2025.
- Exports to China, South Korea's largest importer of petrochemicals, are expected to continue to decline, resulting in only modest growth or stagnation in demand for naphtha and LPG, which are feedstocks for the petrochemical industry.

Residential electricity demand and electricity bill burden in summer 2024 due to heat wave

Estimated that even a spike in electricity use for cooling in the worst heat wave would only increase electricity bills by about KRW 30,000.

- To analyze changes in residential electricity consumption for summer temperature scenarios, we split residential electricity consumption into cooling and non-cooling consumption, using consumption in months when little cooling or heating occurs.

Figure 3.2 Summer (June-September) residential electricity consumption breakdown & Proportion of cooling Load



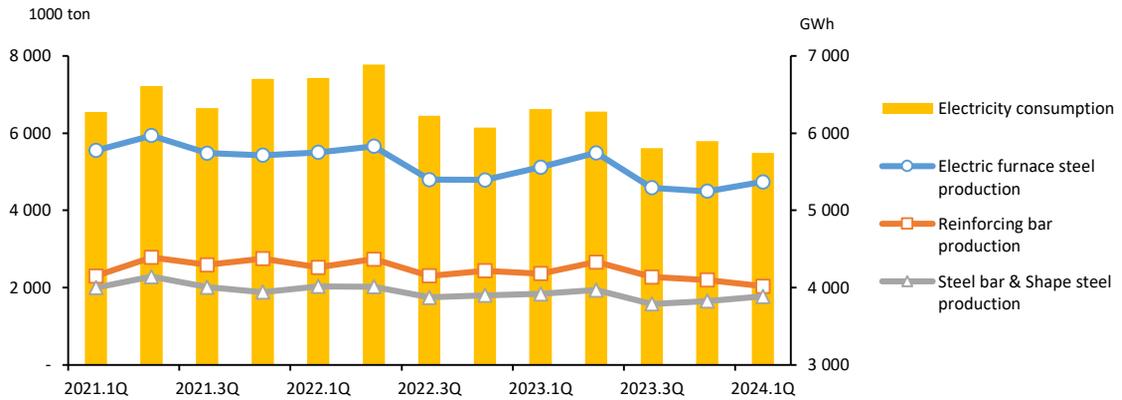
Notes: Estimated using methodology from Kim and Kang (2017); 2024 is a projection based on 10-year average cooling degree days.

- Assuming average heat over the past decade, summer (June-September) residential electricity consumption in 2024 is estimated to increase by 1.8% year-on-year, with midsummer (July-August) electricity bills rising by KRW 9,000 per month for a two-person household.
- Assuming a record-breaking heat wave, residential electricity consumption for the entire summer season (June-September) in 2024 is estimated to increase by 11.2% year-on-year, with midsummer electricity bills rising by KRW 26,000 per month year-on-year for a household of two.
- Considering that electricity for cooling accounts for less than 25 percent of total summer electricity consumption, it is unlikely that a spike in electricity consumption for cooling during a heatwave would lead to a bill bubble.

Electric steelmaking industry and electricity demand

- Production of electric furnace steel and construction steel products has been on a downward trend since 2022, reducing steel industry electricity consumption.**
 - Production of electric furnace steel in the steel industry fell 5.1% y/y in 2023 to 19.68 million tons, the second consecutive year of decline after 2022 (-7.4%) and the first time it fell below 20 million tons since 2010, when the relevant statistics began to be compiled. Production in the first quarter of 2024 continued to decline, down 7.4% y/y.

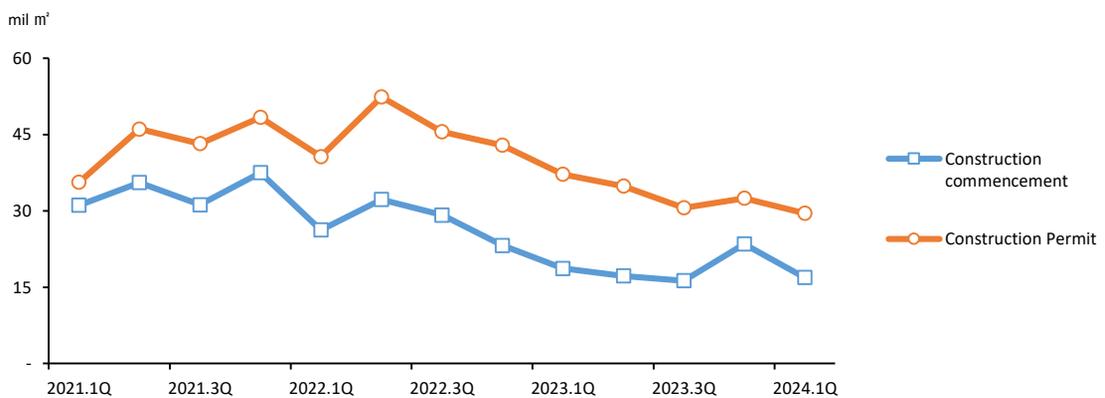
Figure 3.3 Production of major steel products in electric furnaces & Steel industry electricity consumption trends



Source: Korea Iron & Steel Association

- The decrease in production of electric furnace steel and steel products for construction was attributed to the excess supply of key steel products due to the slowdown in Korea's construction industry and China's economic slowdown.

Figure 3.4 Construction commencement and construction permit trends

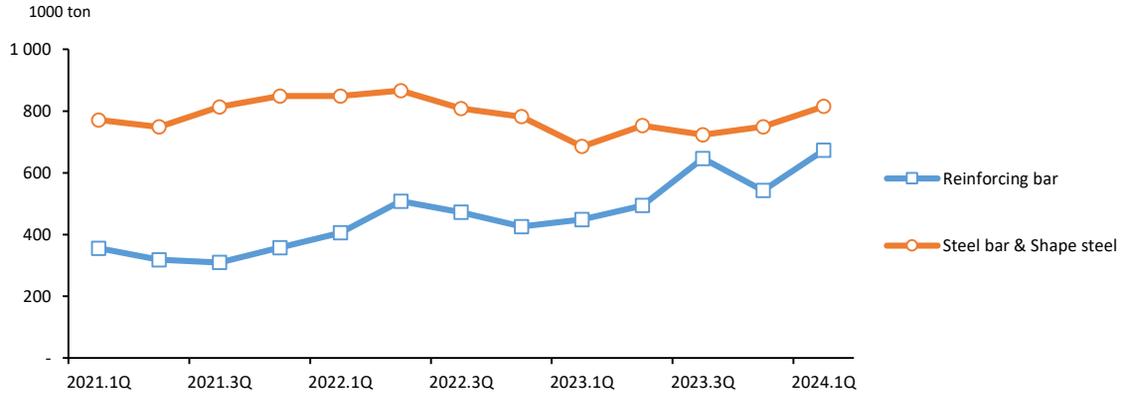


Source: Ministry of Land, Infrastructure, and Transport

- **Electricity consumption in the steel industry is expected to continue to decline in 2024 due to the contraction of electric furnace steel production due to the construction slowdown.**
- Inventories of rebar, a representative steel product, increased by 19.1% and 27.2% in 2022 and 2023, respectively, and surged by 49.9% year-on-year in the first quarter of 2024 (18.9% for steel bar and

shape steel) due to sluggish demand for construction steel products and excess supply due to the construction slowdown.¹

Figure 3.5 Rebar and steel bar & shape steel inventory trends



Source: Korea Iron & Steel Association

- Major electric blast furnace steel producers such as Hyundai Steel and Dongkuk Steel are planning to cut production in 2024 to counter rising inventories.
- Electricity consumption in the steel and non-ferrous metals industry is expected to decline by nearly 4 percent in 2024 as the downturn in the construction industry continues, leading to a decline in demand for steel products produced from electric furnace steel, such as rebar, steel bar & shape steel, and rising inventories, leading to production cuts in electric furnace steel.

¹ The distribution price of rebar reportedly fell from KRW 100.2 million per ton in December 2023 to KRW 70.5 million per ton in May 2024 due to an increase in rebar inventories (The Korea Economic Daily 2024.6.12)

The Main Indicator and Energy Outlook Result

Main Economic and Energy Indicators

	2020	2021	2022p		2023e			2024e			
			1H	2H	1H	2H	1H	2H			
Economy and Population											
GDP (trillion won)	2 058.5	2 153.4	1 080.2	1 131.9	2 212.2	1 091.5	1 151.7	2 243.2	1 122.9	1 177.0	2 299.9
Industrial Production (2020=100)	100.0	108.5	112.0	107.1	109.6	104.0	109.6	106.8	106.7	108.7	107.7
Crude Oil Price (Dubai, USD/bbl)	42.2	69.3	101.8	90.9	96.4	79.1	85.1	82.1	83.4	84.5	83.9
Working Days	275.5	273.5	133.5	139.0	272.5	136.5	137.0	273.5	134.5	138.0	272.5
Population (million)	51.8	51.8	51.7	51.7	51.7	51.7	51.7	51.7	51.8	51.8	51.8
Average Temperature (°C)	13.0	13.3	10.2	15.7	13.0	10.8	16.6	13.7	11.1	16.1	13.6
Cooling Degree days	85.2	101.3	18.5	123.4	141.9	2.6	131.0	133.6	2.3	99.6	101.9
Heating Degree days	2 448.0	2 404.7	1 577.8	989.3	2 567.1	1 458.0	889.8	2 347.8	1 402.7	911.5	2 314.2
Energy Indicators											
Total Primary Energy Demand (Mtoe)	289.5	304.6	153.6	151.0	304.6	147.5	150.0	297.5	150.5	150.9	301.4
Energy Intensity (toe/million won)	0.141	0.142	0.143	0.133	0.138	0.136	0.130	0.133	0.134	0.128	0.131
TPED/capita (toe/capita)	5.585	5.884	2.972	2.922	5.894	2.853	2.901	5.754	2.908	2.916	5.824
Electricity Generation (TWh)	548.7	572.7	289.6	300.9	590.5	284.6	299.8	584.4	286.5	306.0	592.4
Electricity Generation per capita (MWh)	10.6	11.1	5.6	5.8	11.4	5.5	5.8	11.3	5.5	5.9	11.4
Electricity Demand per capita (MWh)	9.6	10.1	5.1	5.2	10.4	5.1	5.2	10.3	5.1	5.3	10.4

Energy Demand

	2020	2021	2022p		2023e			2024e			
			1H	2H		1H	2H		1H	2H	
Total Primary Energy Demand											
Coal (Mton)	122.0	122.8	56.1	58.9	115.0	52.5	55.2	107.7	50.7	53.4	104.1
Oil (Mtbl)	775.7	830.7	407.2	407.3	814.5	386.0	393.7	779.7	394.6	390.2	784.9
Natural gas (Mton)	41.5	45.8	24.3	21.3	45.6	22.6	21.2	43.9	23.9	21.9	45.8
Nuclear (TWh)	160.2	158.0	86.7	89.4	176.1	86.7	93.8	180.5	90.1	100.0	190.1
Other Renewables (Mtoe)	13.5	15.0	8.5	8.2	16.7	8.6	9.0	17.6	9.1	9.5	18.6
Total (Mtoe)	289.5	304.6	153.6	151.0	304.6	147.5	150.0	297.5	150.5	150.9	301.4
Coal	74.0	74.5	34.0	35.6	69.6	31.9	33.5	65.5	30.9	32.5	63.4
Oil	113.3	121.3	60.3	60.8	121.1	58.2	60.1	118.4	60.0	59.2	119.2
Gas (Natural + City)	54.6	60.1	32.3	27.3	59.5	30.2	27.3	57.5	31.3	28.4	59.6
Nuclear	34.1	33.7	18.5	19.0	37.5	18.5	20.0	38.4	19.2	21.3	40.5
Renewables	13.5	15.0	8.5	8.2	16.7	8.6	9.0	17.6	9.1	9.5	18.6
Total Final Consumption											
Coal (Mton)	51.3	53.8	24.4	23.5	47.8	23.3	23.7	47.0	23.4	24.2	47.6
Oil (Mtbl)	752.3	809.1	399.7	399.2	798.9	379.2	387.2	766.4	391.1	387.6	778.7
Natural gas (Mton)	1.6	1.6	0.8	0.9	1.7	0.9	1.2	2.1	1.3	1.4	2.7
City gas (Bm ³)	22.0	22.7	13.8	9.6	23.4	12.6	9.1	21.7	12.4	9.0	21.4
Electricity (TWh)	496.9	520.3	265.9	269.5	535.4	264.3	270.4	534.7	264.2	275.0	539.2
Heat (Mtoe)	2.6	2.7	1.7	1.2	2.9	1.5	1.1	2.6	1.5	1.2	2.7
Renewables (Mtoe)	6.7	7.1	3.8	3.5	7.3	3.5	3.8	7.3	3.7	3.8	7.5
Total (Mtoe)	204.0	216.3	109.3	104.1	213.4	104.9	103.6	208.6	106.5	103.7	210.2
Coal	32.4	33.9	15.6	15.0	30.6	14.9	15.2	30.1	15.0	15.5	30.6
Oil	94.9	102.3	50.2	50.3	100.5	48.3	49.4	97.7	49.2	48.6	97.8
Gas (Natural + City)	24.8	25.5	15.1	11.0	26.1	14.0	10.8	24.9	14.3	11.0	25.3
Electricity	42.7	44.7	22.9	23.2	46.0	22.7	23.3	46.0	22.7	23.6	46.4
Heat	2.6	2.7	1.7	1.2	2.9	1.5	1.1	2.6	1.5	1.2	2.7
Renewables	6.7	7.1	3.8	3.5	7.3	3.5	3.8	7.3	3.7	3.8	7.5
Industry	124.3	133.6	66.0	63.4	129.4	62.9	64.2	127.1	64.2	63.8	128.0
Transport	34.7	36.6	17.2	19.1	36.3	17.4	17.9	35.3	17.6	18.1	35.7
Buildings	45.0	46.1	26.1	21.7	47.7	24.6	21.6	46.2	24.7	21.8	46.5

Energy Demand

(yoy, %)

	2020	2021	2022p		2023e			2024e			
			1H	2H		1H	2H		1H	2H	
Total Primary Energy Demand											
Coal (Mton)	-12.0	0.6	-3.0	-9.4	-6.3	-6.3	-6.3	-6.3	-3.5	-3.3	-3.4
Oil (Mbbbl)	-4.0	7.1	0.7	-4.4	-1.9	-5.2	-3.3	-4.3	2.2	-0.9	0.7
Natural gas (Mton)	1.2	10.4	0.8	-2.0	-0.5	-6.8	-0.2	-3.7	5.7	3.0	4.4
Nuclear (TWh)	9.8	-1.4	12.3	10.6	11.4	-0.0	5.0	2.5	4.0	6.6	5.3
Other Renewables (Mtoe)	10.8	11.7	11.2	10.6	10.9	1.8	10.0	5.8	5.2	6.0	5.6
Total (Mtoe)	-3.4	5.2	2.1	-2.1	-0.0	-4.0	-0.6	-2.3	2.0	0.6	1.3
Coal	-11.8	0.6	-3.2	-9.4	-6.5	-6.1	-5.9	-6.0	-3.3	-3.1	-3.2
Oil	-4.4	7.1	2.2	-2.2	-0.1	-3.5	-1.1	-2.3	3.1	-1.6	0.7
Gas (Natural + City)	1.0	10.1	0.4	-2.5	-1.0	-6.3	0.2	-3.3	3.5	3.8	3.7
Nuclear	9.8	-1.4	12.3	10.6	11.4	-0.0	5.0	2.5	4.0	6.6	5.3
Renewables	10.8	11.7	11.2	10.6	10.9	1.8	10.0	5.8	5.2	6.0	5.6
Total Final Consumption											
Coal (Mton)	-4.7	4.9	-7.3	-14.7	-11.1	-4.6	1.2	-1.7	0.7	1.9	1.3
Oil (Mbbbl)	-5.5	7.6	1.4	-3.8	-1.3	-5.1	-3.0	-4.1	3.1	0.1	1.6
Natural gas (Mton)	9.7	0.6	3.7	5.0	4.4	14.2	36.5	25.9	42.4	14.6	26.6
City gas (Bm³)	-2.0	3.3	4.6	0.7	2.9	-8.6	-5.6	-7.4	-1.7	-1.1	-1.4
Electricity (TWh)	-2.1	4.7	4.1	1.8	2.9	-0.6	0.3	-0.1	-0.0	1.7	0.8
Heat (Mtoe)	4.9	4.2	9.2	8.9	9.1	-13.0	-7.4	-10.7	-0.4	7.1	2.8
Renewables (Mtoe)	2.5	7.1	4.4	-1.0	1.7	-8.7	10.5	0.5	5.9	-0.9	2.4
Total (Mtoe)	-3.8	6.0	1.0	-3.7	-1.3	-3.9	-0.5	-2.3	1.5	0.1	0.8
Coal	-4.8	4.7	-6.4	-13.3	-9.9	-4.2	1.5	-1.4	0.8	2.0	1.4
Oil	-5.6	7.8	0.8	-4.1	-1.7	-3.8	-1.9	-2.8	1.9	-1.6	0.1
Gas (Natural + City)	-1.1	3.1	3.6	0.3	2.2	-7.0	-1.2	-4.5	2.1	1.2	1.8
Electricity	-2.1	4.7	4.1	1.8	2.9	-0.6	0.3	-0.1	-0.0	1.7	0.8
Heat	4.9	4.2	9.2	8.9	9.1	-13.0	-7.4	-10.7	-0.4	7.1	2.8
Renewables	2.5	7.1	4.4	-1.0	1.7	-8.7	10.5	0.5	5.9	-0.9	2.4
Industry	-4.1	7.5	1.1	-7.2	-3.1	-4.6	1.2	-1.7	2.0	-0.5	0.7
Transport	-6.6	5.4	-4.1	2.1	-0.9	1.0	-6.3	-2.8	1.4	1.2	1.3
Buildings	-0.8	2.4	4.3	2.7	3.6	-5.5	-0.4	-3.2	0.2	1.1	0.6

Energy Demand by Sector

(Mtoe)

	2020	2021	2022p		2023e			2024e			
			1H	2H		1H	2H		1H	2H	
Industry	124.3	133.6	66.0	63.4	129.4	62.9	64.2	127.1	64.2	63.8	128.0
Coal	32.2	33.7	15.5	14.9	30.4	14.8	15.1	30.0	15.0	15.4	30.4
Oil	56.7	62.3	31.2	29.8	61.0	29.3	30.2	59.5	30.1	29.2	59.3
Gas*	9.5	10.0	5.2	4.8	10.0	5.0	5.0	10.0	5.3	5.0	10.3
Electricity	21.9	23.2	11.8	11.7	23.6	11.6	11.5	23.1	11.5	11.7	23.2
Heat	-	-	-	-	-	-	-	-	-	-	-
Renewables	4.0	4.4	2.3	2.2	4.5	2.2	2.4	4.6	2.3	2.4	4.8
Transport	34.7	36.6	17.2	19.1	36.3	17.4	17.9	35.3	17.6	18.1	35.7
Coal	-	-	-	-	-	-	-	-	-	-	-
Oil	32.7	34.6	16.2	18.0	34.2	16.4	16.8	33.2	16.6	17.0	33.6
Gas	1.1	1.1	0.5	0.5	1.0	0.5	0.5	1.0	0.5	0.5	0.9
Electricity	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.4	0.2	0.2	0.4
Heat	-	-	-	-	-	-	-	-	-	-	-
Renewables	0.7	0.7	0.3	0.4	0.7	0.3	0.4	0.7	0.4	0.4	0.7
Buildings**	45.0	46.1	26.1	21.7	47.7	24.6	21.6	46.2	24.7	21.8	46.5
Coal	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.2
Oil	5.5	5.4	2.8	2.5	5.3	2.6	2.4	5.0	2.5	2.4	4.9
Gas	14.2	14.5	9.4	5.6	15.0	8.6	5.3	13.9	8.6	5.5	14.1
Electricity	20.5	21.2	10.9	11.3	22.1	11.0	11.5	22.5	11.0	11.7	22.7
Heat	2.6	2.7	1.7	1.2	2.9	1.5	1.1	2.6	1.5	1.2	2.7
Renewables	1.9	2.0	1.2	0.9	2.1	0.9	1.1	2.0	0.9	1.0	1.9
Transformation***	296.3	302.2	157.6	160.7	318.3	154.4	158.2	312.6	158.6	157.6	316.2
Coal	41.6	40.6	18.4	20.6	39.1	17.0	18.3	35.3	15.9	17.0	32.8
Oil	164.1	164.8	86.4	90.5	177.0	86.6	90.0	176.6	90.3	88.6	178.9
Gas	49.7	55.3	29.6	25.8	55.4	27.2	24.7	51.9	27.9	24.9	52.8
Nuclear	34.1	33.7	18.5	19.0	37.5	18.5	20.0	38.4	19.2	21.3	40.5
Renewables	6.8	7.9	4.7	4.7	9.4	5.2	5.2	10.3	5.4	5.7	11.2

* Gas is the sum of natural gas and city gas. ** include residential, commercial, public-etc usage. *** Transformation is the sum of inputs from power generation, district heat, gas manufacture, and oil refinery processes.

Coal

(Mton)

	2020	2021	2022p			2023e			2024e		
			1H	2H		1H	2H		1H	2H	
Total Coal Demand	122.0	122.8	56.1	58.9	115.0	52.5	55.2	107.7	50.7	53.4	104.1
Transformation	70.7	68.9	31.7	35.4	67.1	29.2	31.5	60.7	27.2	29.2	56.4
Power Generation	70.7	68.9	31.7	35.4	67.1	29.2	31.5	60.7	27.2	29.2	56.4
Heat	-	-	-	-	-	-	-	-	-	-	-
Gas Manufacture	-	-	-	-	-	-	-	-	-	-	-
Oil Refinery	-	-	-	-	-	-	-	-	-	-	-
Total Final Consumption	51.3	53.8	24.4	23.5	47.8	23.3	23.7	47.0	23.4	24.2	47.6
Industry	50.8	53.4	24.2	23.2	47.4	23.1	23.5	46.6	23.3	24.0	47.3
Transport	-	-	-	-	-	-	-	-	-	-	-
Buildings	0.5	0.4	0.1	0.3	0.4	0.1	0.2	0.4	0.1	0.2	0.4
Consumption by products											
Anthracite	7.2	7.3	3.3	2.9	6.2	2.7	2.9	5.6	2.7	2.9	5.7
Bituminous	114.9	115.4	52.8	56.0	108.8	49.8	52.3	102.1	47.9	50.5	98.4
Iron making	32.8	34.1	15.8	15.6	31.4	15.5	16.2	31.6	15.7	16.6	32.3
Power Generation	69.8	68.0	31.4	34.8	66.2	28.8	31.0	59.8	26.8	28.8	55.6

Oil

(Mbbbl)

	2020	2021	2022p			2023e			2024e		
			1H	2H		1H	2H		1H	2H	
Total Oil Demand	775.7	830.7	407.2	407.3	814.5	386.0	393.7	779.7	394.6	390.2	784.9
Crude Oil & Refinery Feedstocks	1 089.3	1 089.1	564.7	591.2	1 155.9	565.8	584.2	1 150.1	587.0	575.9	1 163.0
Transformation	1 089.3	1 089.1	564.5	590.9	1 155.4	565.5	584.1	1 149.6	586.9	575.7	1 162.6
Oil Refinery	1 089.3	1 089.1	564.5	590.9	1 155.4	565.5	584.1	1 149.6	586.9	575.7	1 162.6
Petroleum products	- 313.6	- 258.4	- 157.5	- 183.9	- 341.4	- 179.8	- 190.5	- 370.4	- 192.4	- 185.7	- 378.1
Transformation	-1 107.2	-1 105.8	- 576.4	- 602.8	-1 179.2	- 578.4	- 597.6	-1 175.9	- 605.1	- 593.8	-1 198.9
Power Generation	3.8	4.2	2.8	2.2	5.0	1.7	1.3	3.0	1.2	1.0	2.2
Heat	1.6	1.8	1.0	0.6	1.7	0.8	0.5	1.4	0.6	0.6	1.3
Gas Manufacture	0.3	1.7	2.0	1.5	3.4	2.0	0.7	2.7	1.3	0.5	1.8
Oil Refinery*	-1 112.9	-1 113.4	- 582.3	- 607.1	-1 189.4	- 582.9	- 600.1	-1 183.0	- 608.2	- 595.9	-1 204.2
Total Final Consumption	752.3	809.1	399.7	399.2	798.9	379.2	387.2	766.4	391.1	387.6	778.7
Industry	462.2	505.8	254.5	242.5	496.9	234.0	240.3	474.3	245.0	240.1	485.1
Transport	245.4	259.0	122.2	135.8	258.0	123.4	126.9	250.3	124.8	128.0	252.8
Buildings	44.7	44.2	23.0	20.9	44.0	21.7	20.1	41.8	21.3	19.6	40.8
Consumption by products											
Gasoline	81.0	84.9	40.3	48.1	88.4	43.0	47.4	90.4	45.6	48.4	94.0
Diesel	155.0	156.3	73.3	78.4	151.8	74.6	75.9	150.5	74.8	76.8	151.6
Kerosene	16.8	16.5	8.1	7.3	15.4	6.8	6.4	13.2	6.5	6.0	12.5
B-C	6.8	6.4	3.6	3.1	6.7	3.7	3.3	7.0	3.2	3.5	6.6
Jet Oil	7.8	15.5	7.6	8.0	15.6	6.2	3.3	9.5	3.5	2.5	6.1
LPG	109.1	109.2	60.4	54.9	115.3	52.1	55.4	107.6	58.9	57.3	116.3
Petrochem feedstock	48.8	47.3	31.3	25.4	56.6	22.8	25.6	48.4	29.1	27.5	56.7
Naphtha	333.9	369.9	181.1	174.9	356.0	169.1	168.7	337.8	174.5	167.9	342.5
Refinery gas	8.5	9.0	4.4	4.8	9.3	4.3	4.8	9.0	3.6	4.3	7.9
Other Non-Energy	33.3	41.3	20.8	19.7	40.5	19.4	22.1	41.5	20.5	20.8	41.3

* Oil refinery is a process of manufacturing petroleum products by refining crude oil, and a negative (-) value means the production of petroleum products.

Gas

	2020	2021	2022p			2023e			2024e		
			1H	2H		1H	2H		1H	2H	
Natural Gas Demand (Mton)	41.5	45.8	24.3	21.3	45.6	22.6	21.2	43.9	23.9	21.9	45.8
Transformation	38.0	42.4	22.6	19.7	42.4	20.8	18.9	39.7	21.3	19.1	40.4
Power Generation	20.0	23.2	11.5	11.2	22.7	10.9	10.7	21.6	11.0	11.3	22.2
Heat	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0
Gas Manufacture [*]	18.0	19.1	11.1	8.5	19.6	9.9	8.2	18.1	10.4	7.8	18.2
Oil Refinery	-	-	-	-	-	-	-	-	-	-	-
Total Final Consumption	1.6	1.6	0.8	0.9	1.7	0.9	1.2	2.1	1.3	1.4	2.7
Industry	1.6	1.6	0.8	0.9	1.7	0.9	1.2	2.1	1.3	1.4	2.7
City Gas Demand (Bm³)	22.0	22.7	13.8	9.6	23.4	12.6	9.1	21.7	12.4	9.0	21.4
Transformation	-22.1	-23.3	-13.7	-10.6	-24.3	-12.2	-9.9	-22.1	-12.7	-9.4	-22.1
Power Generation	0.4	0.3	0.2	0.1	0.3	0.1	0.1	0.3	0.2	0.1	0.3
Heat	0.2	0.3	0.2	0.2	0.4	0.2	0.1	0.3	0.1	0.1	0.3
Gas Manufacture [*]	-22.9	-24.4	-14.4	-11.1	-25.5	-12.9	-10.6	-23.5	-13.6	-10.6	-24.2
Oil Refinery	-	-	-	-	-	-	-	-	-	-	-
Total Final Consumption	22.0	22.7	13.8	9.6	23.4	12.6	9.1	21.7	12.4	9.0	21.4
Industry	7.1	7.6	4.1	3.6	7.6	3.7	3.4	7.0	3.5	3.1	6.6
Transport	1.1	1.0	0.5	0.5	1.0	0.5	0.5	1.0	0.5	0.5	0.9
Buildings	13.8	14.1	9.2	5.5	14.7	8.4	5.2	13.7	8.4	5.4	13.8

* Gas manufacture is the process of evaporating natural gas and controlling the amount of heat to supply city gas, and a negative (-) value means the production of city gas.

Electricity

	2020	2021	2022p			2023e			2024e		
			1H	2H		1H	2H		1H	2H	
Net Electricity Demand	548.7	572.7	289.6	300.9	590.5	284.6	299.8	584.4	286.5	306.0	592.4
Own use and Losses	51.8	52.4	23.7	31.4	55.1	20.3	29.4	49.7	22.2	31.0	53.2
Total Final Consumption	496.9	520.3	265.9	269.5	535.4	264.3	270.4	534.7	264.2	275.0	539.2
Industry	254.7	269.6	137.8	136.3	274.1	134.7	133.8	268.5	133.8	136.2	270.0
Transport	3.3	3.7	1.9	2.2	4.1	2.2	2.5	4.7	2.5	2.7	5.2
Buildings	238.8	247.1	126.2	131.0	257.2	127.4	134.1	261.5	128.0	136.1	264.1
Installed Electrical Capacity (GW)*	124.5	129.3	129.5	133.3	133.3	136.3	139.7	139.7	143.5	147.0	147.0
Coal	36.9	37.3	36.6	37.7	37.7	38.6	38.6	38.6	39.6	40.6	40.6
Oil	2.2	2.2	1.0	0.9	0.9	0.9	0.9	0.9	0.6	0.6	0.6
Gas	41.2	41.2	41.2	41.2	41.2	41.7	43.2	43.2	43.4	44.1	44.1
Nuclear	23.3	23.3	23.3	24.7	24.7	24.7	24.7	24.7	26.1	26.5	26.5
Renewables	21.0	25.4	27.5	28.9	28.9	30.5	32.4	32.4	33.9	35.1	35.1
Electricity Generation of Power Plants*	548.7	572.7	289.6	300.9	590.5	284.6	299.8	584.4	286.5	306.0	592.4
Coal	196.3	197.6	90.6	102.6	193.2	88.4	96.5	184.9	83.5	89.5	173.1
Oil	2.4	2.4	1.2	0.8	2.0	0.9	0.6	1.5	0.6	0.4	1.0
Gas	145.8	168.4	83.0	80.6	163.6	79.2	78.5	157.7	80.1	82.9	162.9
Nuclear	160.2	158.0	86.7	89.4	176.1	86.7	93.8	180.5	90.1	100.0	190.1
Renewables	44.0	46.4	28.0	27.6	55.7	29.4	30.3	59.7	32.1	33.1	65.3
Fuel Consumption of Power Plants (Mtoe)*	110.4	114.5	57.5	59.8	117.3	55.7	58.5	114.3	55.8	59.8	115.6
Coal	41.6	40.6	18.4	20.6	39.1	17.0	18.3	35.3	15.9	17.0	32.8
Oil	0.6	0.6	0.4	0.3	0.6	0.2	0.2	0.4	0.2	0.1	0.3
Gas	26.1	30.4	15.1	14.6	29.7	14.3	14.0	28.2	14.3	14.7	29.1
Nuclear	34.1	33.7	18.5	19.0	37.5	18.5	20.0	38.4	19.2	21.3	40.5
Renewables	8.0	9.3	5.2	5.2	10.4	5.8	6.1	11.8	6.3	6.6	12.9

* Exclude pumped storage. District Heat is classified by fuel type since 2014

