

KEEI

MONTHLY KOREA ENERGY TRENDS

2023/03

KOREA ENERGY ECONOMICS INSTITUTE

COAL	-5.3%
PETROLEUM	-6.3%
NATURAL GAS	10.1%
NUCLEAR	-7.9%
NEW & RENEWABLE	-14.2%
DECEMBER. 2022	

**This publication is derived from Energy Demand & Supply
Statistics and Energy Price Statistics issued until December 2022**



Table of Contents

1.	The Economy and the Industry.....	5
2.	Energy Prices	7
3.	Energy Supply	10
4.	Energy Consumption	11
5.	Coal	13
6.	Petroleum	14
7.	Gas	15
8.	Electricity	16
9.	Nuclear	17
10.	Heat and Renewable energy	18
11.	Industry	20
12.	Transport	21
13.	Building.....	22
14.	Power Generation	23
App.	Major Indicators & Statistics of Energy Supply and Demand	24



1. The Economy and the Industry

- **Gross domestic product (GDP) increased by 1.3% year-on-year in 4Q 2022, despite a drop in construction investment, as private spending and facility investment increased.**
 - Construction investment declined, as the total value of construction orders and the construction business survey index (CBSI) all declined. Meanwhile, private spending rose by 3.4% year-on-year, led by the service sector, and facility investment grew by 7.0%, especially in machinery.
- **The mining & manufacturing production index has been decreasing more rapidly for three consecutive months due to sluggish production mostly in large energy consuming industries.**
 - The semiconductor production index fell by 25.1% year-on-year, marking the 5th consecutive month of decline, as its export value decreased (-29.1%) amid the economic slowdown at home and globally, and the facility utilization rate declined (-32.2%, based on the index).
 - The production index of basic chemical materials fell by 12.9% year-on-year due to slow business and prolonged maintenance work at some petrochemical facilities, while the iron & steel production index dropped by 18.4%, which was affected by weak demand at domestic and global markets, the Typhoon Hinnamnor and a strike by the Cargo Truckers Solidarity Union.
 - The automobile production index was up 11.4%, marking the 8th consecutive month of growth, as the supply shortage of semiconductors eased.
- **The service production index went up by 6.7% year-on-year (in December) despite the economic slowdown, as outdoor activities and travel demand increased.**
 - The wholesale & retail production index rose by 1.1% year-on-year, as production increased, especially in cars & parts sales business. The production index of financial & insurance business jumped 19.5% year-on-year partly due to interest rate hikes.
 - The food & accommodation production index went up by 12.8% year-on-year, as outdoor activities including gatherings and travel demand increased during the first year-end holidays since the termination of social distancing restrictions.

► Major economic and industrial indicators

	2021p	2021p		2022p			
			M12		M10	M11	M12
GDP (trillion won)	1 915.8	1 915.8	505.6	1 964.8	-	-	512.2
	(4.1)	(4.1)	(4.2)	(2.6)	-	-	(1.3)
Total export (\$billion, customs clearance basis)	644.4	644.4	60.7	683.6	52.4	51.8	54.8
	(25.7)	(25.7)	(18.3)	(6.1)	(-5.8)	(-14.2)	(-9.7)
Industrial production index (2020=100)	108.2	108.2	121.5	109.7	105.8	106.8	108.7
	(8.2)	(8.2)	(8.7)	(1.4)	(-2.7)	(-5.5)	(-10.5)
Semi-conductors	126.8	126.8	153.1	136.5	123.8	108.3	114.7
	(26.8)	(26.8)	(28.3)	(7.7)	(-11.1)	(-22.6)	(-25.1)
Basic chemical products	105.9	105.9	111.1	99.1	92.0	87.2	96.8
	(5.9)	(5.9)	(6.7)	(-6.4)	(-11.5)	(-10.9)	(-12.9)
Iron&Steel	105.2	105.2	106.3	96.4	78.0	79.3	86.7
	(5.2)	(5.2)	(-0.3)	(-8.4)	(-25.1)	(-25.9)	(-18.4)
Cars	106.3	106.3	118.4	116.0	121.9	136.4	131.9

	(6.3)	(6.3)	(9.9)	(9.1)	(20.3)	(21.4)	(11.4)
Service production index (2020=100)	105.2	105.2	119.2	112.4	113.9	113.8	127.2
	(5.2)	(5.2)	(7.8)	(6.8)	(7.3)	(4.1)	(6.7)
Wholesale & Retail	105.3	105.3	112.0	108.0	110.1	110.1	113.2
	(5.3)	(5.3)	(4.1)	(2.6)	(1.9)	(0.1)	(1.1)
Food & Accommodation	101.9	101.9	115.2	119.1	127.7	120.1	129.9
	(1.9)	(1.9)	(35.1)	(16.9)	(12.8)	(3.9)	(12.8)

Note: Figures are based on the real price of 2015, P means provisional, () is year-on-year growth rates (%)

Source: Bank of Korea, Korea International Trade Association, Korea Statistical Information Service

2. Energy Prices¹

Global Energy Prices

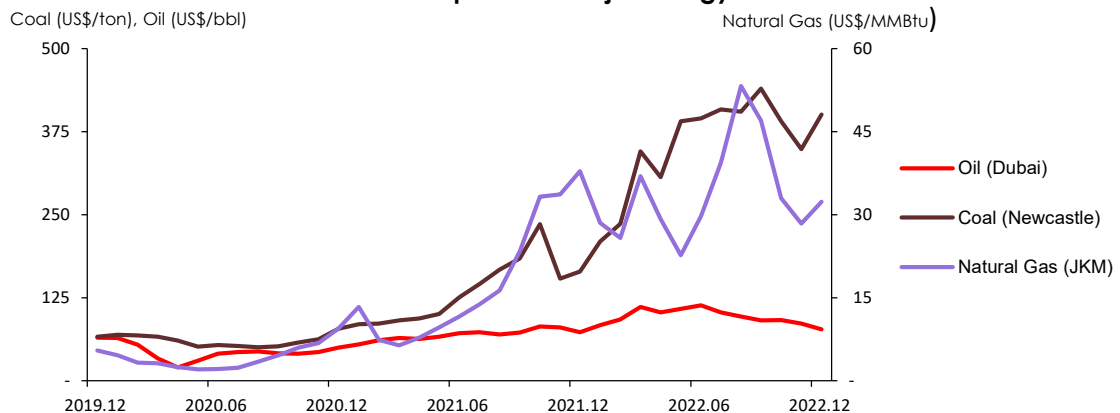
- **Global oil price fell by 10.5% from the previous month in December, as unfavorable global economic indicators raised concerns over weak petroleum demand.**
 - The US PMI index moved into the ‘economic contraction’ territory in November for the first time in 30 months, and the euro zone and China’s index also indicated economic contraction for five and four consecutive months, spurring more concerns about the economic slowdown.
 - The European Union (EU) agreed (Dec. 2) to impose a price cap on Russian oil from December 5, which was followed by the Group of Seven nations (G7) and Australia.
 - Global steam coal price jumped 15.0% in December from the previous month, as China’s Zero-COVID policy was relaxed, and demand for power generation increased during the winter season.
 - In December, natural gas price increased in Asia and Europe, while it declined in the US.

► Global energy prices

	2020	2021				2022			
			M10	M11	M12		M10	M11	M12
Crude oil (US\$/bbl)	42.2	69.3	81.6	80.3	73.2	91.2	86.3	77.2	
	(-33.6)	(64.2)	(12.4)	(-1.6)	(-8.8)	(0.2)	(-5.4)	(-10.5)	
Coal (US\$/ton)	60.2	136.4	235.4	153.7	164.6	390.4	348.6	400.9	
	(-22.8)	(126.5)	(27.9)	(-34.7)	(7.1)	(-11.1)	(-10.7)	(15.0)	
Natural gas (US\$/MMBtu)									
TTF	3.2	16.1	30.8	27.7	37.7	38.4	35.9	36.7	
	(-32.3)	(397.9)	(36.4)	(-10.2)	(36.0)	(-33.7)	(-6.5)	(2.2)	
JKM	4.2	17.9	33.2	33.6	37.8	33.0	28.4	32.3	
	(-24.9)	(325.7)	(42.3)	(1.2)	(12.5)	(-29.8)	(-13.9)	(14.0)	

Note: Oil and coal prices are based on Dubai oil and Newcastle thermal coal in Australia, respectively. () is month-on-month growth rates (%)
Source: Korea National Oil Corporation, World Bank, CME Group

► Global prices of major energy sources



¹ This report presents the energy price trend of the month for which energy consumption data is available. For more on the latest price trend, see *Energy Supply and Demand Brief*.

Domestic energy prices

□ The prices of gasoline and diesel at gas stations dropped by 5.2% and 5.1% respectively in December than the prior month in line with the downward trend in global prices.

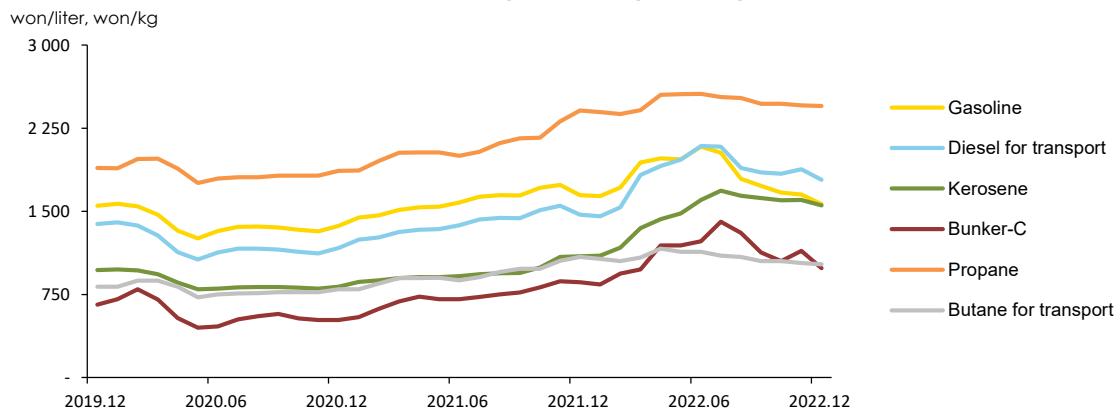
- The gap between diesel and gasoline prices stood at 219.5 won per liter, which was narrowed for the first time since June when diesel price surpassed gasoline price.
- The fuel tax cut, which was introduced in November 2021, was extended until April 2023, though the tax cut rate for gasoline is to be lowered (37% → 25%, 100 won per liter), while it remains the same for diesel (37%).
- The prices of propane and butane fell by 0.2% and 1.0% respectively from the previous month, as the domestic supply price of LPG was lowered.
- The relative price of propane in terms of city gas (propane/city gas) for industrial customers went down by 6.5% from the previous month to 0.79.

► Domestic petroleum product prices

	2020	2021	2022			2022	2022	2022
			M10	M11	M12	M10	M11	M12
Gasoline (won/liter)	1 381.3 (-6.2)	1 591.2 (15.2)	1 712.4 (4.2)	1 737.5 (1.5)	1 646.4 (-5.2)	1 666.7 (-3.7)	1 650.3 (-1.0)	1 563.8 (-5.2)
Diesel for transport (won/liter)	1 189.5 (-11.3)	1 392.0 (17.0)	1 509.3 (5.0)	1 549.7 (2.7)	1 468.9 (-5.2)	1 838.4 (-0.6)	1 879.2 (2.2)	1 783.3 (-5.1)
Bunker-C (won/liter)	572.9 (-23.0)	732.2 (27.8)	813.4 (5.9)	867.4 (6.6)	859.0 (-1.0)	1 050.8 (-6.9)	1 142.2 (8.7)	986.7 (-13.6)
Propane (won/kg)	1 850.3 (-1.0)	2 093.4 (13.1)	2 163.4 (0.2)	2 312.3 (6.9)	2 410.1 (4.2)	2 469.8 (-0.1)	2 455.4 (-0.6)	2 449.7 (-0.2)
Butane for transport (won/liter)	790.8 (-1.9)	932.3 (17.9)	981.2 (0.1)	1 053.8 (7.4)	1 087.5 (3.2)	1 049.5 (-0.2)	1 032.2 (-1.6)	1 021.4 (-1.0)

Note: Gasoline, diesel and butane prices are based on charging station prices, Bunker-C oil price is based on dealership prices, propane price is based on sales shop prices. () is month-on-month growth rates (%)
Source: Korea National Oil Corporation

► Domestic petroleum product prices



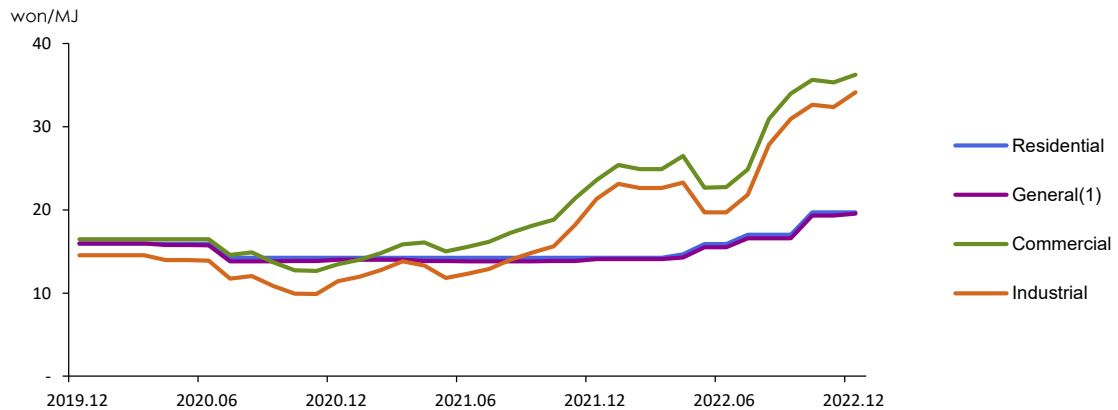
□ **City gas retail rates for general, office heating and industrial use rose by 1.1%, 2.6% and 5.4% respectively in December compared to the previous month.**

- The material cost of city gas for office heating and industrial customers rose by 3.0% respectively than the previous month, as the import price of LNG increased.
- The wholesale supply price of city gas, which changes by season, was adjusted for the winter season.

□ **Electric rates were kept unchanged in December. On a year-on-year basis, electric rates for residential and industrial customers increased by 13.1% and 26.2% respectively.**

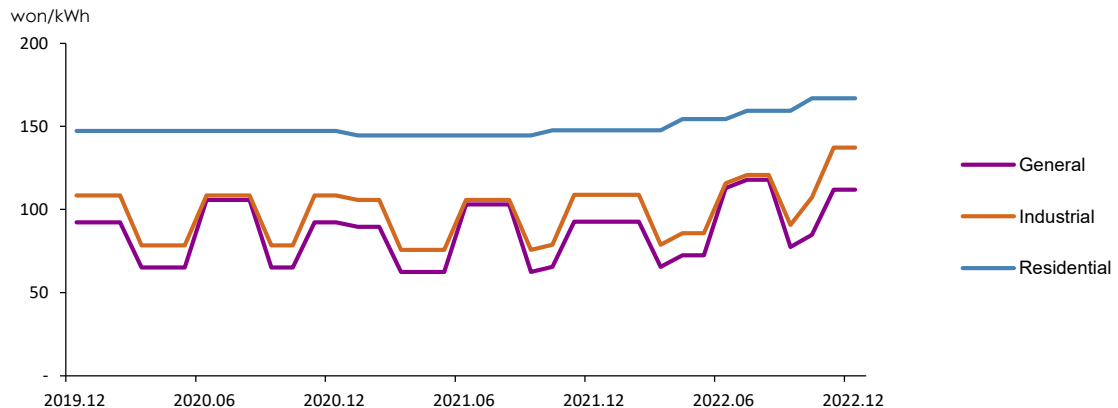
- In November, energy charge for general and industrial customers were raised by 37.4% and 31.6% respectively from the previous month through the rate adjustment for the winter season.
- Climate change & environmental charge and energy charge are to be raised by 1.7 won/kWh and 11.4 won/kWh from January 2023.
- The fuel cost pass-through adjustment rate will be fixed considering the upper and lower limits of the rate adjustment, although it was calculated to be 25.0 won/kWh for 1Q 2023.

► City gas rates by end-use sectors



Source: Seoul City Gas

► Electric rates by end-use sectors



Note: The electric rates by end-use sectors refer to the prices for residential use ([high voltage], the 2nd stage price), general use ([A], low voltage) and Industrial use ([B], high voltage B middle load), including Climate Environmental Price

Source: KEPCO

3. Energy Supply

- **The total energy import volume grew by 0.4% year-on-year in December, led by bituminous coal and natural gas, although the import of petroleum products declined.**
 - The import volume of crude oil rose by 0.7% year-on-year, as the import price of crude oil from the Middle East grew at slower pace, and crude oil input for domestic manufacturing of petroleum products slightly increased (1.1%).
 - The import volume of petroleum products fell by 19.4% year-on-year, among which naphtha import dropped the most.
 - The import volume of bituminous coal posted a year-on-year growth of 4.6% in December, as it rebounded following three consecutive months of decline. The total import volume grew by 0.5% in 2022 from the previous year, but it was 10.9% lower when compared to 2019, as it has not fully recovered to the pre-COVID19 level.
 - The import volume of natural gas rose by 16.9% year-on-year, as its final use and input for power generation increased in the domestic market amid falling prices.

► Import and domestic production of energy

	2021p	2021p		2022p			
			M12		M10	M11	M12
Import volume							
Crude oil (Mbbbl)	960.1	960.1	86.9	1 031.3	79.5	82.9	87.6
	(-2.1)	(-2.1)	(2.9)	(7.4)	(-6.6)	(3.2)	(0.7)
Petroleum product (Mbbbl)	392.4	392.4	37.9	367.1	31.1	31.5	30.5
	(13.0)	(13.0)	(33.9)	(-6.4)	(-8.4)	(-0.1)	(-19.4)
Bituminous coal (Mton)	119.6	119.6	10.1	120.2	8.0	10.1	10.5
	(1.7)	(1.7)	(-2.2)	(0.5)	(-9.6)	(-3.1)	(4.6)
Anthracite (Mton)	6.5	6.5	0.4	5.4	0.2	0.5	0.3
	(3.0)	(3.0)	(-41.7)	(-16.8)	(-63.1)	(-32.9)	(-31.5)
LNG (Mton)	45.9	45.9	3.9	46.4	4.1	3.8	4.5
	(14.9)	(14.9)	(-9.4)	(1.0)	(5.2)	(-2.1)	(16.9)
Import volume (Mtoe)	324.3	324.3	28.7	331.1	25.7	27.2	28.8
	(3.9)	(3.9)	(2.6)	(2.1)	(-6.2)	(-0.8)	(0.4)
Import value (billion US\$, CIF)	137.1	137.1	15.8	217.9	17.4	17.5	18.6
	(58.5)	(58.5)	(106.2)	(59.0)	(30.7)	(19.4)	(17.9)
Energy share of total import value (%)	22.1	22.1	25.9	29.8	29.4	29.8	31.3
Foreign energy dependence (%)	94.4	94.4	95.8	94.6	94.4	94.9	97.1
Domestic production							
Hydropower (TWh)	3.1	3.1	0.2	3.5	0.3	0.2	0.2
	(-21.2)	(-21.2)	(-6.7)	(15.9)	(17.4)	(19.6)	(9.4)
Anthracite (Mton)	0.9	0.9	0.1	0.8	0.1	0.1	0.1
	(-11.9)	(-11.9)	(-6.1)	(-8.7)	(-14.7)	(-13.8)	(-10.4)
Renewable energy (Mtoe)	14.4	14.4	1.3	14.5	1.2	1.1	1.2
	(13.9)	(13.9)	(9.4)	(0.6)	(10.9)	(0.3)	(-9.6)

Note: p means provisional, () is year-on-year growth rates (%), *Foreign energy dependence (%) including Nuclear energy
Source: Korea Energy Economics Institute

4. Energy Consumption

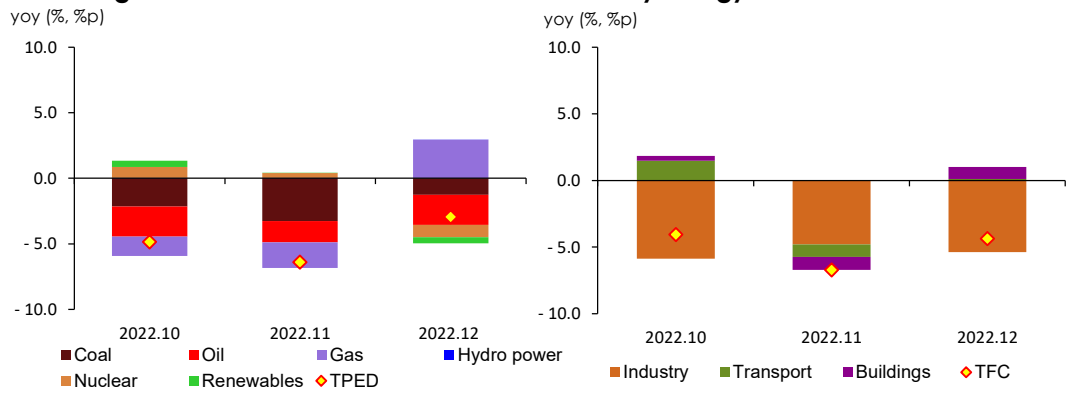
- **Total Primary Energy Demand (TPED) decreased by 3.0% year-on-year in December, despite the growth in gas use, as the use of other energy sources declined.**
 - Coal use declined by 5.7% year-on-year, as its industrial use steadily declined due to the economic slowdown and disruptions at steel plants, caused by Typhoon Hinnamnor in September, although coal use for power generation remained flat, as the decline in nuclear generation was partially offset by the growth in coal-fired generation.
 - Petroleum use dropped by 5.8% year-on-year, as its industrial use plunged due to slow petrochemical business and routine maintenance, although it slightly increased in the transport sector amid growing stockpiling demand at gas stations ahead of the tax benefit reduction for gasoline (Jan. 2023).
 - Gas use went up by 10.3% year-on-year, as its industrial use increased, driven by surging gas demand in the machinery and transport equipment sectors, and as it also increased in buildings along with the increased number of heating degree days (20.0%). In addition, gas use for power generation rapidly increased with gas-fired generation offsetting the decline in nuclear generation.
- **Total Final Consumption (TFC) was down 4.4% year-on-year in December, with the industrial sector leading the downward trend, although energy use increased in buildings due to changes in temperature.**
 - Industrial energy use went down by 9.3% year-on-year, as it declined in most of the sectors, affected by a slowdown in the overall manufacturing industry and a strike launched by the Cargo Truckers Solidarity Union (Nov.24-Dec.9), though energy use increased in the machinery and transport equipment sectors.
 - Transport energy use rose by 0.7% year-on-year, because gasoline demand surged (14.4%) as a result of growing stockpiling demand, even though the use of diesel and jet fuel declined due to the Cargo Truckers Solidarity Union's strike and growing overseas travel demand.
 - Energy use in buildings went up by 3.4% year-on-year, mostly city gas and heat energy, which was attributed to the increased number of heating degree days and stronger production in the service industry including food & accommodation.

► Energy consumption

	2021p	2021p		2022p			
			M12		M10	M11	M12
TPED (Mtoe)	305.0	305.0	29.6	300.8	23.0	23.7	28.7
	(5.8)	(5.8)	(8.7)	(-1.4)	(-4.9)	(-6.4)	(-3.0)
TFC (Mtoe)	216.5	216.5	21.3	213.3	16.2	16.8	20.4
	(6.3)	(6.3)	(9.4)	(-1.5)	(-4.0)	(-6.7)	(-4.4)
- Feedstock exclude	141.4	141.4	14.3	141.2	10.7	11.1	14.3
	(4.4)	(4.4)	(4.5)	(-0.1)	(0.4)	(-6.3)	(0.2)

Note: p means provisional, () is year-on-year growth rates
Source: Korea Energy Economics Institute

► The growth rates of TPED & TFC and contribution by energy sources and end-use sectors



5. Coal

□ Coal use dropped by 5.3% year-on-year in December amid a steady decline in industrial coal use, although it slightly increased in the power generation sector.

- Industrial coal use has been decreasing since July, as it continuously declined in the iron & steel sector due to weak demand and logistical disruptions, and it grew more slowly in the cement sector where coal use has grown for three consecutive months.
- Coal use for power generation was flat, despite a drop in power use (-0.6%), as coal-fired generation posted a year-on-year growth for the first time since April, because nuclear generation, which had rapidly increased, fell sharply, and renewable generation grew at slower pace.

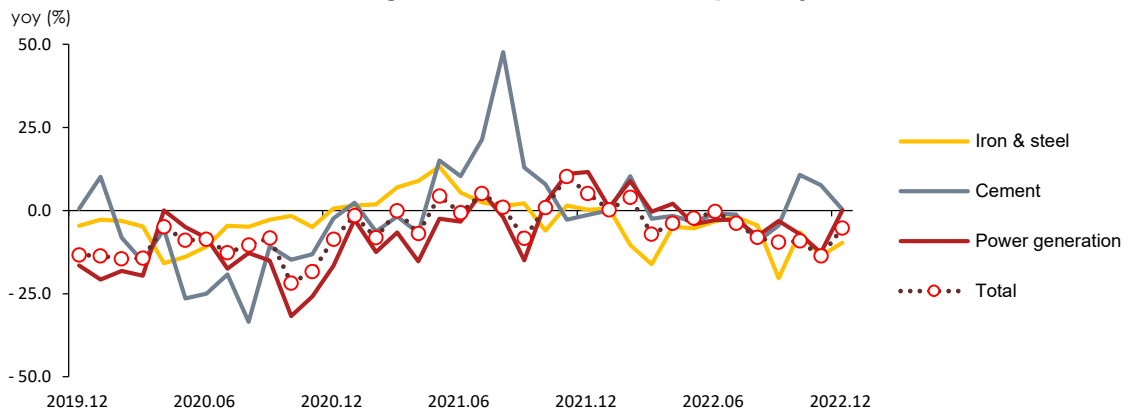
► Coal consumption

	2021p	2021p		2022p			
			M12		M10	M11	M12
Coal (Mton)	119.9	119.9	10.9	113.9	8.5	8.7	10.3
	(-0.0)	(-0.0)	(5.1)	(-5.0)	(-9.2)	(-13.7)	(-5.3)
Industry	50.5	50.5	4.4	46.3	3.6	3.7	3.8
	(3.8)	(3.8)	(-2.8)	(-8.3)	(-11.8)	(-15.3)	(-12.8)
-Coking-coal	25.5	25.5	2.2	23.3	1.9	1.8	2.0
	(3.0)	(3.0)	(-0.6)	(-8.8)	(-6.6)	(-13.5)	(-9.5)
Buildings	0.4	0.4	0.1	0.3	0.1	0.1	0.1
	(-11.8)	(-11.8)	(-7.1)	(-16.5)	(-7.9)	(-4.7)	(-14.8)
Power generation	68.9	68.9	6.4	67.1	4.8	4.9	6.4
	(-2.5)	(-2.5)	(11.6)	(-2.6)	(-7.1)	(-12.7)	(0.0)

Note: p means provisional, () is year-on-year growth rates (%)

Source: Korea Energy Economics Institute

► The growth rate of coal consumption by use



6. Petroleum

□ The final use of petroleum fell by 7.4% year-on-year in December owing to a sharp drop in industrial petroleum use as feedstock.

- Industrial petroleum use went down by 13.8% year-on-year, as its use as feedstock declined due to weak petrochemical business.
- Transport petroleum use went up by 1.3% year-on-year as a result of growing demand for mobility and stockpiling of gasoline.
- Petroleum use in buildings rose by 9.1% year-on-year, as it increased in all end-use sectors including the residential sector for heating purpose amid the increased number of heating degree days (20%).

► Petroleum product consumption by end-use sectors

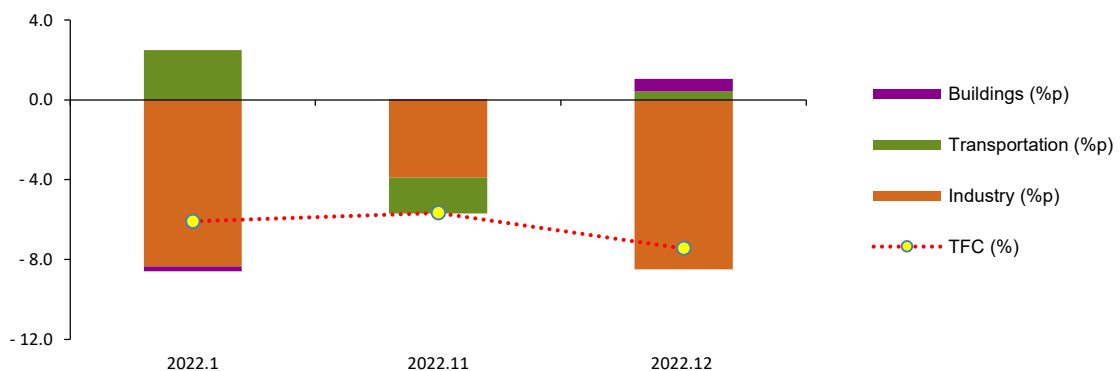
	2021p	2021p		2022p			
			M12		M10	M11	M12
TFC (Mbbbl)	815.3	815.3	79.1	795.6	62.6	63.1	73.2
	(8.4)	(8.4)	(20.7)	(-2.4)	(-6.1)	(-5.7)	(-7.4)
Industry	512.0	512.0	48.8	493.8	36.8	39.1	42.1
	(10.8)	(10.8)	(24.4)	(-3.5)	(-13.2)	(-6.3)	(-13.8)
- Naphtha	375.6	375.6	36.3	356.0	25.7	28.0	30.7
	(12.5)	(12.5)	(30.3)	(-5.2)	(-16.3)	(-8.8)	(-15.6)
Transport	259.0	259.0	24.7	257.7	22.3	20.1	25.1
	(5.6)	(5.6)	(21.0)	(-0.5)	(8.1)	(-5.6)	(1.3)
Buildings	44.2	44.2	5.6	44.1	3.6	3.9	6.1
	(-1.1)	(-1.1)	(-5.4)	(-0.3)	(-4.1)	(0.4)	(9.1)
Power generation (Mbbbl)	4.19	4.19	0.32	4.99	0.31	0.29	0.30
	(9.4)	(9.4)	(-38.1)	(19.2)	(-28.8)	(-24.4)	(-6.7)

Note: p means provisional, () is year-on-year growth rates (%)

Source: Korea Energy Economics Institute

► The growth rates of petroleum product consumption & contribution(%p) by end-use sectors

yoY(% , %p)



7. Gas

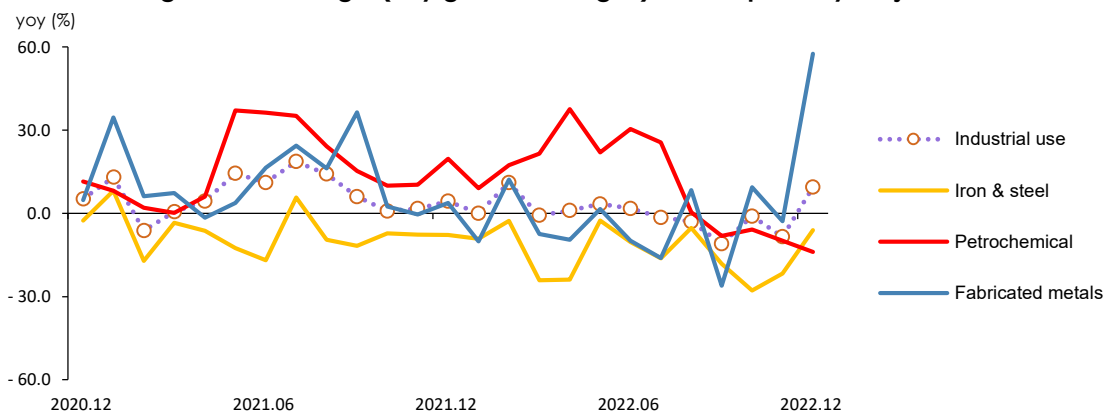
- **Natural gas use increased by 12.9% year-on-year in December, as it rebounded in the power generation and end-use sectors.**
 - Gas-fired power generation rebounded in eight months, despite a higher unit fuel cost, as nuclear generation fell and renewable & other energy generation grew more slowly.
- **The final use of gas increased by 8.0% year-on-year, led by the industrial and buildings sectors, which was affected by stronger production in some sectors and weather conditions.**
 - Industrial gas use grew by over 9% year-on-year, despite sluggish semiconductor production, as it grew fast in the machinery sector due to stronger production in metal processing business, and as it rebounded in the transport equipment sector, driven by the recovery of automobile production.
 - Gas use in buildings was up around 8% year-on-year, as commercial gas use rose by about 12% as a result of growing outdoor activities such as year-end gatherings, and as residential gas use rose by 7.0%, even at higher city gas rates, due to a surge in the number of heating degree days (20.0%).

► Natural gas and city gas consumption

	2021p	2021p		2022p			
			M12		M10	M11	M12
Natural gas (Mton)	45.9	45.9	5.1	45.3	3.0	3.6	5.7
	(10.6)	(10.6)	(-5.6)	(-1.1)	(-8.4)	(-9.7)	(12.9)
Power generation	23.2	23.2	2.0	22.5	1.6	1.8	2.4
	(16.4)	(16.4)	(-12.4)	(-3.3)	(-11.8)	(-3.3)	(17.4)
Final consumption (Bm³)	24.9	24.9	3.1	25.8	1.5	2.0	3.4
	(3.4)	(3.4)	(0.1)	(3.6)	(3.1)	(-7.5)	(8.0)
Industry	9.8	9.8	1.0	9.8	0.7	0.8	1.1
	(6.4)	(6.4)	(4.3)	(0.3)	(-1.0)	(-8.5)	(9.4)
Buildings	14.1	14.1	2.1	15.0	0.7	1.2	2.2
	(2.0)	(2.0)	(-1.8)	(6.4)	(8.3)	(-7.1)	(7.9)

Note: p means provisional, () is year-on-year growth rates (%). Final consumption is the sum of Natural gas and City gas consumption
Source: Korea Energy Economics Institute

► The growth rate of gas(city gas+natural gas)consumption by major industries



8. Electricity

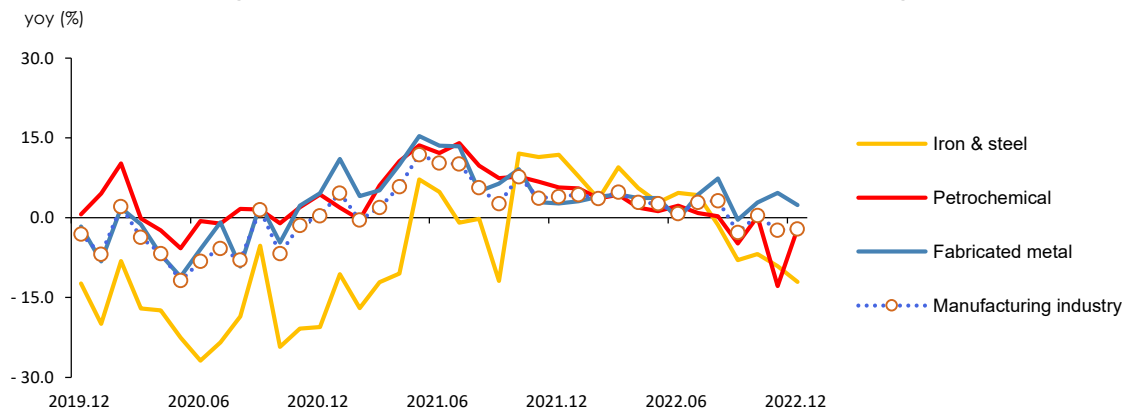
- Electricity use declined by 0.6% year-on-year in December, as it declined in some of the major industries such as petrochemical and iron & steel.
 - Industrial electricity use fell by 2.0% year-on-year, as it declined in the petrochemical and iron & steel sectors due to the economic slowdown and disrupted production in the aftermath of a typhoon, although it grew fast in the machinery and transport equipment sectors.
 - Growing heating demand drove up electricity use in buildings, although it was limited by the rise in electric rates.

► Electricity consumption by end-use sectors

	2021p	2021p		2022p			
			M12		M10	M11	M12
Electricity (TWh)	521.0	521.0	46.1	535.3	41.3	41.5	45.8
	(4.8)	(4.8)	(4.7)	(2.7)	(1.2)	(-0.8)	(-0.6)
Industry	269.6	269.6	23.6	274.1	22.0	21.8	23.1
	(5.8)	(5.8)	(4.0)	(1.7)	(0.3)	(-2.0)	(-2.0)
Transport	3.7	3.7	0.4	4.0	0.3	0.3	0.4
	(11.7)	(11.7)	(15.7)	(8.7)	(7.4)	(9.1)	(3.2)
Buildings	247.8	247.8	22.1	257.2	19.0	19.3	22.3
	(3.6)	(3.6)	(5.3)	(3.8)	(2.1)	(0.5)	(0.9)
Residential	77.6	77.6	6.2	78.6	5.9	5.9	6.3
	(4.7)	(4.7)	(0.4)	(1.3)	(-0.7)	(-1.1)	(1.3)
Commercial	139.5	139.5	13.1	147.0	10.8	10.9	13.0
	(2.5)	(2.5)	(8.6)	(5.4)	(4.0)	(1.2)	(-0.4)

Notes: p means provisional, () is year-on-year growth rates (%)
Source: Korea Energy Economics Institute

► The growth rate of electricity consumption in manufacturing industry

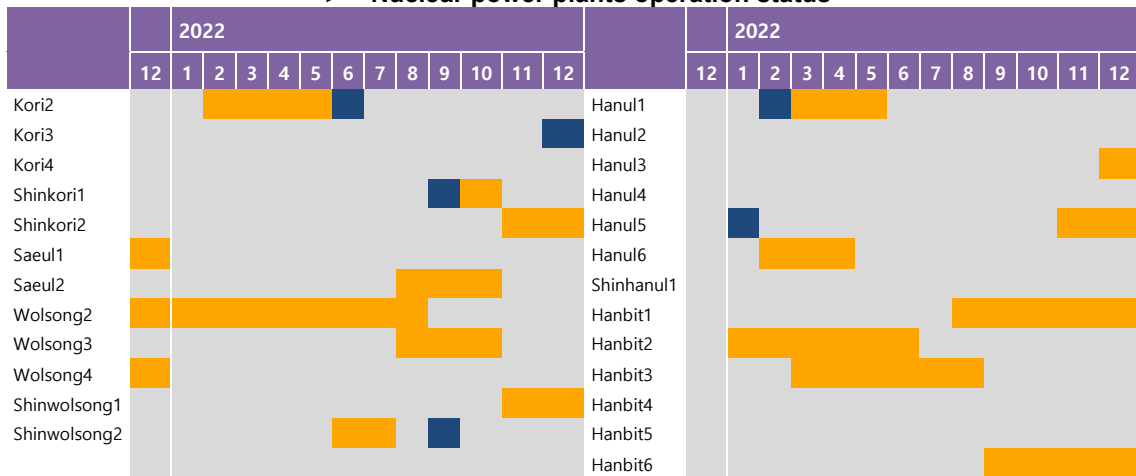


9. Nuclear

□ The total nuclear generation decreased in December (-7.9%, yoy) for the first time in 12 months, because the operations were suspended at more reactors.

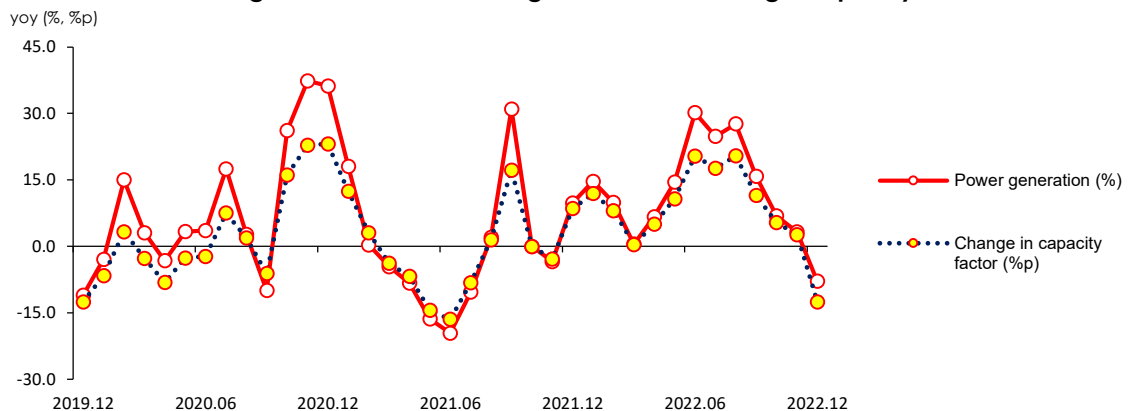
- The number of planned and unplanned shutdown cases increased by four compared to the same month last year, and accordingly, the daily average of preventive maintenance work more than doubled.
- Shinhanul unit 1 reactor advanced into the test operation phase in June and started commercial operation on December 7. Since the commissioning of Shinkori unit 4 (1.4GW, Aug.30, 2019), new installed capacity was added for the first time in 40 months, and the cumulative nuclear capacity reached 24.7GW.
- Nuclear energy's share of the total power generation dropped by 4%p year-on-year to 27.4%.

► Nuclear power plants operation status



Notes: ■ normal operation, ■ preventive maintenance, ■ unscheduled shutdown

► The growth rate of nuclear generation & average capacity factor

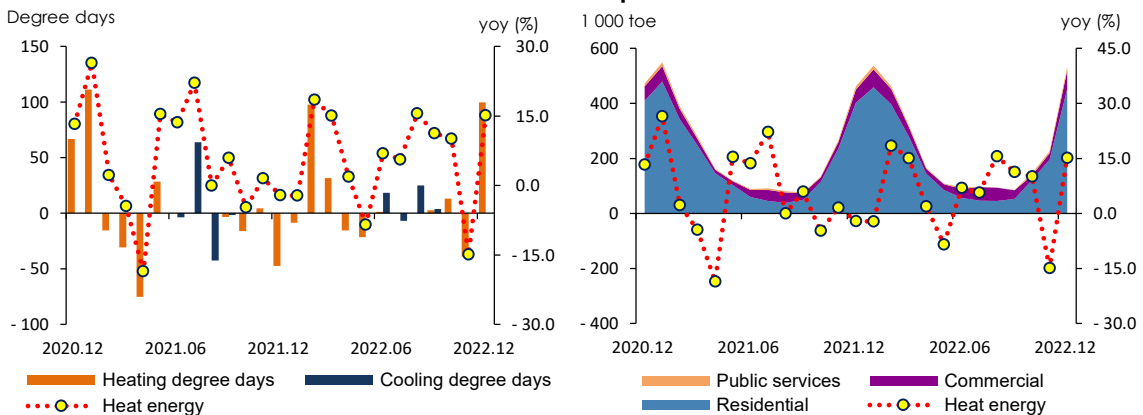


Note: Capacity factor = Ratio of actual power generated to possible power generation when utilizing 100% of available facility. Facility capacity values are based on end-of-the-month data

10. Heat and Renewable energy

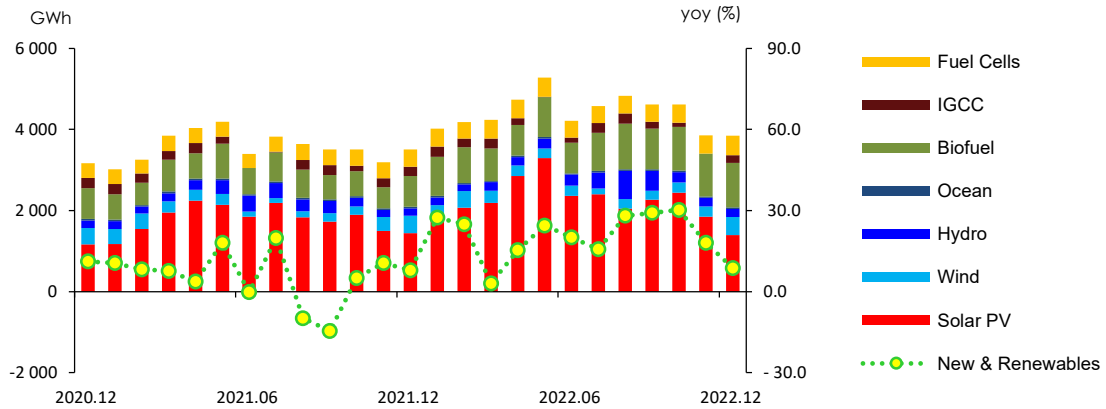
- **Heat energy use increased by 15.1% year-on-year in December, which was affected by temperature conditions and the recovery of service production.**
 - Heat energy use increased by 12.3% year-on-year in the residential sector due to temperature conditions (heating degree days -20.0%), and it jumped 44.3% year-on-year in the commercial sector owing to stronger service production as well as temperature change, despite higher heat energy rates (37.8%).
- **Renewable & other energy generation grew more slowly, and its final use also declined, and consequently, the total renewable & other energy use fell by 14.2% year-on-year in December.**
 - Renewable & other energy generation² grew at slower pace (8.7%), as solar PV generation decreased, although bioenergy and fuel cell generation increased.
 - Renewable & other energy use dropped in the industrial and building sectors but increased in the transport sector, and the total final use dropped by 15.2% year-on-year.

► Heat energy consumption by sector and the growth rate of total heat energy consumption



² The power generation from and installed capacity of renewable & other energy sources are based on the data from KEPCO's 'The Monthly Report on Electric Power Statistics'. In the current Energy Balance report, renewable & other energy and hydropower (including pumped storage) data are collected in separate categories, and therefore, hydropower is not included in the renewable & other energy category.

► **New & renewable energy generation by source and the growth rate of total new & renewable energy generation**



11. Industry

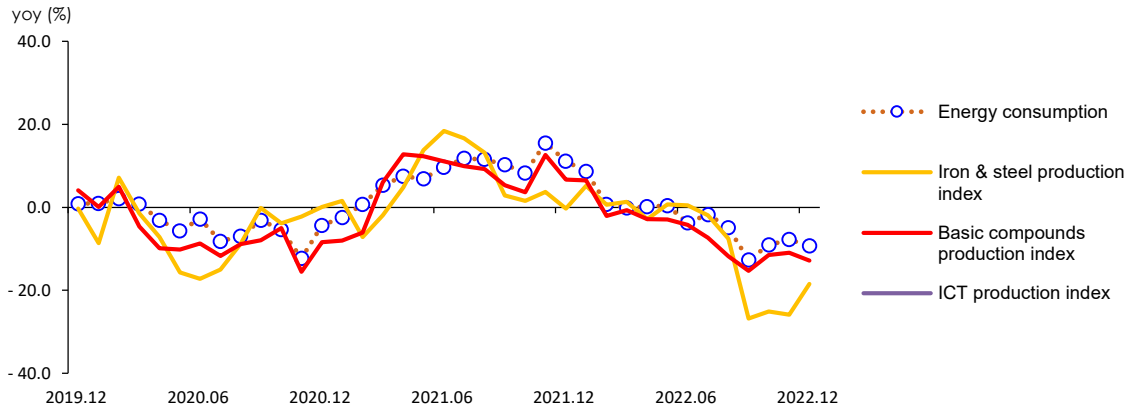
- Industrial energy use went down by 9.3% year-on-year in December due to output reductions in major industries amid the economic slowdown.
 - The total industrial energy use continued a downward trend, as energy use declined in most of the sectors including petrochemical and iron & steel due to the slowdown in overall manufacturing business, though it increased in the machinery and transport equipment sectors.

► Industrial energy consumption

	2021p	2021p	2022p				
			M12		M10	M11	M12
Industry (Mtoe)	133.8	133.8	12.3	129.3	9.9	10.3	11.2
	(7.9)	(7.9)	(11.1)	(-3.4)	(-9.0)	(-7.8)	(-9.3)
Petrochemical	67.8	67.8	6.5	65.2	4.8	5.0	5.5
	(12.2)	(12.2)	(25.9)	(-3.8)	(-13.1)	(-9.6)	(-14.2)
- Naphtha	46.0	46.0	4.5	43.6	3.2	3.4	3.8
	(12.5)	(12.5)	(30.3)	(-5.2)	(-16.3)	(-8.8)	(-15.6)
Iron & Steel	27.9	27.9	2.4	25.9	2.1	2.0	2.2
	(1.8)	(1.8)	(0.4)	(-7.4)	(-7.6)	(-13.4)	(-9.2)
- Coking coal	17.8	17.8	1.5	16.4	1.3	1.3	1.4
	(3.0)	(3.0)	(-0.6)	(-8.0)	(-5.8)	(-12.7)	(-8.8)
Machinery + Transport Equipment	12.5	12.5	1.1	13.2	1.1	1.1	1.3
	(6.0)	(6.0)	(0.7)	(5.7)	(6.8)	(6.3)	(16.7)
Share of feedstock (%)	56.1	56.1	57.1	55.7	54.5	55.4	54.3

Note: p means provisional, () is year-on-year growth rates (%)
Source: Korea Energy Economics Institute

► Industrial energy consumption & production index



12. Transport

□ Transport energy use posted a year-on-year growth of 0.7% in December, led by the road transport sector, though it declined in the aviation sector.

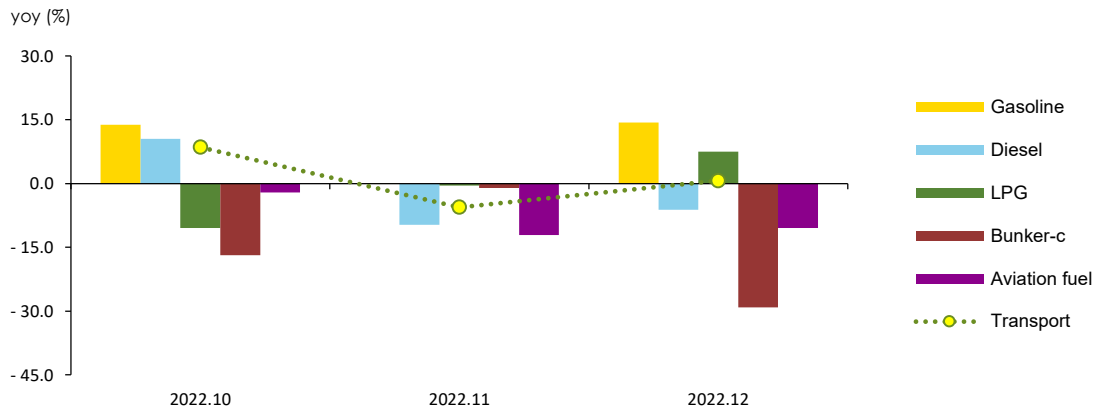
- In the road transport sector, energy use increased by 1.5% year-on-year as a result of growing stockpiling demand for gasoline ahead of the reduction of tax benefits.
- In the domestic aviation sector, energy use declined by 10.3%, as the number of domestic flights steadily decreased due to growing overseas travel.

► The growth rate of petroleum consumption in the transport sector

	2021p	2021p		2022p			
			M12		M10	M11	M12
Transport (Mtoe)	36.64	36.64	3.49	36.43	3.15	2.84	3.51
	(5.4)	(5.4)	(20.5)	(-0.6)	(8.5)	(-5.6)	(0.7)
Road	34.20	34.20	3.28	33.96	2.93	2.66	3.33
	(2.2)	(2.2)	(17.3)	(-0.7)	(9.8)	(-5.3)	(1.5)
Domestic navigation	0.43	0.43	0.04	0.50	0.04	0.03	0.03
	(27.2)	(27.2)	(36.9)	(16.7)	(-11.4)	(-2.0)	(-22.0)
Domestic aviation	1.68	1.68	0.13	1.67	0.15	0.12	0.12
	(168.3)	(168.3)	(274.8)	(-0.3)	(-2.1)	(-12.1)	(-10.3)
Rail	0.33	0.33	0.03	0.30	0.02	0.02	0.03
	(-0.3)	(-0.3)	(0.0)	(-9.9)	(-15.6)	(-7.5)	(-13.6)

Note: p means provisional, () is year-on-year growth rates (%)
Source: Korea Energy Economics Institute

► The growth rates of energy & major petroleum product consumption in the transport sector



13. Buildings

□ **Energy use in buildings rose by 3.4% year-on-year in December, as it grew in both of the residential and commercial sectors, affected by changes in temperature.**

- In the residential sector, energy use increased, mostly city gas and heat energy, as heating demand soared due to weather conditions.
- In the commercial sector, energy use has grown for 12 consecutive months with the recovery of production activities in the service industry, mostly food & accommodation businesses.
- As for the contribution by energy source to the growth in buildings' energy use (3.4%), city gas contributed 2.6%p, followed by heat energy (1.3%p), petroleum (1.0%p), electricity (0.3%p), coal (-0.1%p) and renewable energy (-1.7%p).

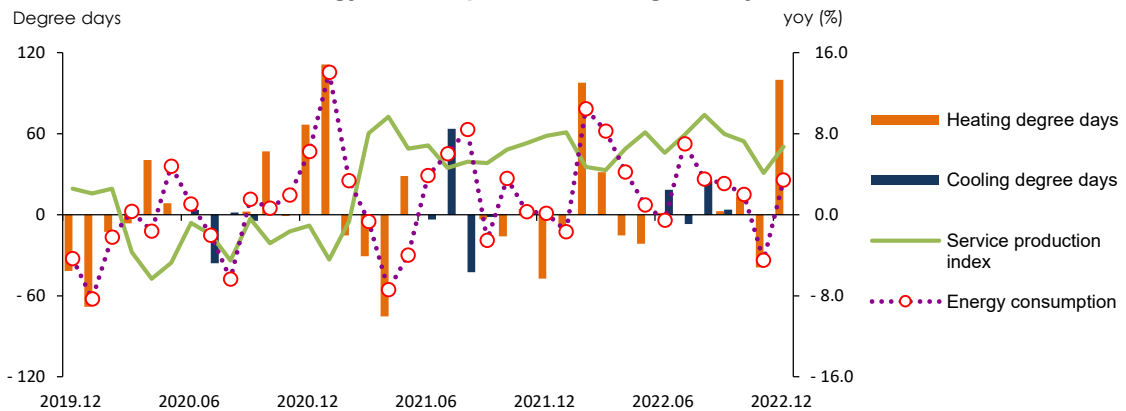
► Energy consumption in buildings

	2021p	2021p		2022p			
			M12		M10	M11	M12
Buildings (Mtoe)	46.1	46.1	5.5	47.6	3.1	3.7	5.7
	(2.5)	(2.5)	(0.2)	(3.1)	(2.0)	(-4.5)	(3.4)
Residential	22.9	22.9	3.1	23.3	1.3	1.9	3.3
	(2.6)	(2.6)	(-1.8)	(1.7)	(-0.4)	(-8.7)	(4.6)
Commercial	18.0	18.0	1.9	19.1	1.4	1.4	1.9
	(1.8)	(1.8)	(4.4)	(6.0)	(4.5)	(0.7)	(3.8)
Public-others	5.2	5.2	0.5	5.2	0.4	0.4	0.5
	(4.0)	(4.0)	(-2.0)	(-0.5)	(2.1)	(-1.4)	(-4.6)
Heating degree days	2 404.7	2 404.7	500.4	2 567.1	134.8	251.6	600.3
	(-1.8)	(-1.8)	(-8.6)	(6.8)	(11.0)	(-13.4)	(20.0)
Cooling degree days	101.3	101.3	-	141.9	-	-	-
	(18.9)	(18.9)	-	(40.1)	-	-	-
Service production index (2020=100)	105.2	105.2	119.2	112.4	113.9	113.8	127.2
	(5.2)	(5.2)	(7.8)	(6.8)	(7.3)	(4.1)	(6.7)

Note: p means provisional, () is year-on-year growth rates (%)

Source: Korea Energy Economics Institute, Korea Meteorological Administration, Korean Statistical Information Service

► Energy consumption in buildings & major indicators



14. Power Generation

□ Coal and gas-fired generation rebounded in December, while nuclear generation decreased, and the total power generation grew by 4.1% on a year-on-year basis.

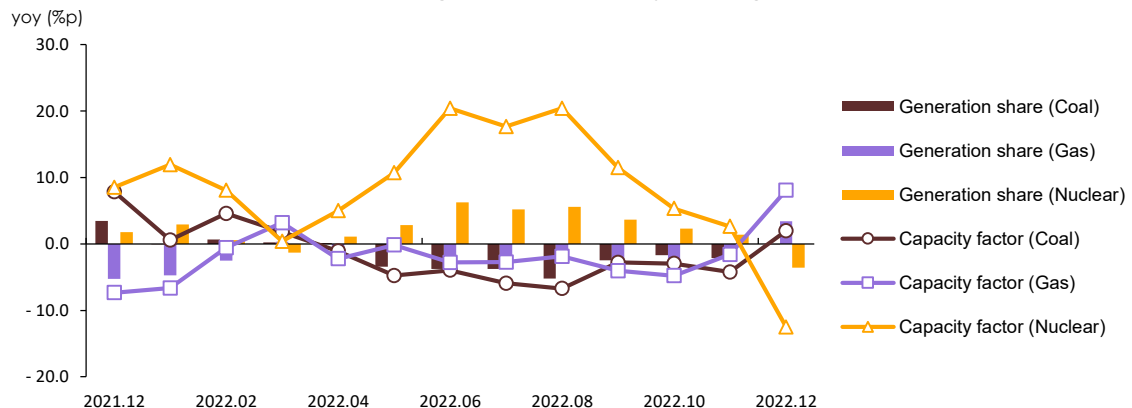
- With the commissioning of Shinhanul unit 1 (1.4GW, Dec. 7), the installed capacity of nuclear power grew by 6.0%. Meanwhile, nuclear generation dropped by 7.9%, as the number of planned and unplanned shutdown cases doubled(four eight reactors) from the same month last year.
- Coal-fired generation had previously continued a downward trend due to the growth in nuclear and renewable generation and grid constraints. In December, it rebounded in eight months since April, as nuclear generation plunged.
- Renewable & other energy generation went up by 7.4% year-on-year, despite a drop in solar PV generation (-3.4%), as power generation from bioenergy, fuel cell, wind and hydropower grew by 44.8%, 16.0%, 3.9% and 9.4% respectively.
- Gas-fired power generation increased by 17.2% year-on-year, while total power generation grew by 4%. This was due to a decline in baseload generation (nuclear + coal) by 1.7%, mostly nuclear energy.

► Power generation by energy sources

	2021p	2021p		2022p			
			M12		M10	M11	M12
Power Generation (TWh)	576.7	576.7	53.4	594.4	45.7	46.2	55.6
	(4.5)	(4.5)	(3.4)	(3.1)	(-0.9)	(-1.4)	(4.1)
Coal	198.0	198.0	18.2	193.2	14.5	15.0	18.9
	(0.8)	(0.8)	(15.1)	(-2.4)	(-5.9)	(-7.6)	(3.9)
Oil	2.4	2.4	0.2	2.0	0.1	0.1	0.2
	(4.4)	(4.4)	(-51.1)	(-16.5)	(-49.2)	(-39.7)	(9.0)
Gas	168.3	168.3	14.4	163.6	11.5	12.7	16.9
	(15.4)	(15.4)	(-13.5)	(-2.8)	(-11.2)	(-3.5)	(17.2)
Nuclear	158.0	158.0	16.5	176.1	14.4	14.0	15.2
	(-1.4)	(-1.4)	(9.8)	(11.4)	(6.8)	(3.2)	(-7.9)
Renewables	50.1	50.1	4.1	59.6	5.2	4.4	4.4
	(5.5)	(5.5)	(8.3)	(18.9)	(28.8)	(18.4)	(7.4)
Baseload	356.0	356.0	34.7	369.3	28.9	29.0	34.1
	(-0.2)	(-0.2)	(12.5)	(3.7)	(0.1)	(-2.6)	(-1.7)

Notes: p means provisional, () is year-on-year growth rates (%)
Source: Korea Electric Power Corporation

► Power generation by major energy sources



<Appendix> Major indicators & statistics of energy supply and demand

Major Statistics & Indicators of the Economy

	2019	2020	2021				2022			
				M10	M11	M12		M10	M11	M12
GDP (trillion won)	1 852.7 (2.2)	1 839.5 (-0.7)	1 915.8 (4.1)	-	-	505.6 (4.2)	1 964.8 (2.6)	-	-	512.2 (1.3)
Private consumption	894.1 (2.1)	851.0 (-4.8)	882.5 (3.7)	-	-	228.4 (6.2)	920.7 (4.3)	-	-	236.2 (3.4)
Facilities investment	155.3 (-6.6)	166.6 (7.2)	181.6 (9.0)	-	-	45.9 (4.2)	180.7 (-0.5)	-	-	49.2 (7.0)
Construction investment	265.2 (-1.7)	269.3 (1.5)	265.0 (-1.6)	-	-	71.8 (-1.6)	255.6 (-3.5)	-	-	69.6 (-3.1)
Consumer price index (2020=100)	99.5	100.0	102.5	103.4	103.9	104.0	107.7	109.2	109.1	109.3
USD to KRW exchange rate (won)	1 165.4	1 180.3	1 144.0	1 182.8	1 182.9	1 183.7	1 291.4	1 426.7	1 364.1	1 296.2
Benchmark rate (%)	1.6	0.7	0.6	0.8	1.0	1.0	2.1	3.0	3.3	3.3
Coincident composite index (2020=100)	99.7	100.0	104.1	105.1	105.6	106.5	108.6	109.6	109.2	108.7
Mining & manufacturing production index (2020=100)	100.3	100.0	108.2	108.7	113.0	121.5	109.7	105.8	106.8	108.7
Manufacturing operation ratio index (2020=100)	103.3	100.0	105.2	105.8	110.5	116.8	105.2	101.8	103.0	102.9
Average temperature	13.4	13.0	13.3	15.1	8.3	1.9	12.9	14.0	9.6	- 1.4
- year-on-year difference	0.4	- 0.4	0.3	1.5	- 0.1	1.5	- 0.4	- 1.2	1.3	- 3.2
Heating degree days	2 370.9 (-8.7)	2 448.0 (3.3)	2 404.7 (-1.8)	121.4 (-11.6)	290.6 (1.5)	500.4 (-8.6)	2 567.1 (6.8)	134.8 (11.0)	251.6 (-13.4)	600.3 (20.0)
Cooling degree days	120.4 (-42.4)	85.2 (-29.2)	101.3 (18.9)	-	-	-	141.9 (40.1)	-	-	-
Energy intensity	0.16 (-2.9)	0.16 (-2.8)	0.16 (1.6)	-	-	0.16 (3.4)	0.15 (-3.8)	-	-	0.15 (-5.9)
Per capita consumption										
Oil (bbl)	0.0 (-0.3)	0.0 (-4.2)	0.0 (7.9)	0.0 (11.7)	0.0 (10.3)	0.0 (21.9)	0.0 (-2.2)	0.0 (-5.9)	0.0 (-4.4)	0.0 (-6.0)
Electricity (MWh)	0.0 (-1.5)	0.0 (-2.2)	0.0 (5.0)	0.0 (7.5)	0.0 (4.2)	0.0 (4.9)	0.0 (3.0)	0.0 (1.4)	0.0 (-0.6)	0.0 (-0.3)
City gas (1 000 m3)	- (-3.4)	- (-2.1)	- (3.5)	- (-0.8)	- (2.0)	- (-1.2)	- (4.1)	- (1.4)	- (-7.2)	- (5.7)
Total energy (toe)	0.0 (-1.1)	0.0 (-3.6)	0.0 (5.9)	- (7.5)	- (7.2)	0.0 (8.9)	0.0 (-1.2)	- (-4.7)	- (-6.2)	0.0 (-2.7)

Note: Figures are based on the real price of 2015. p means provisional, () is year-on-year growth rates (%)

Source: Bank of Korea, Korea Statistical Information Service, Korea Meteorological Administration, Korea Energy Economics Institute

The Index of Production & Operating Ratio by Sectors

	2019	2020	2021			2022				
				M10	M11	M12		M10	M11	M12
Industrial production index										
All industry	101.1 (1.0)	100.0 (-1.1)	105.5 (5.5)	105.4 (5.9)	109.1 (6.3)	122.3 (8.0)	110.3 (4.6)	109.5 (3.9)	110.6 (1.4)	123.2 (0.7)
Mining & manufacturing	100.3 (0.3)	100.0 (-0.3)	108.2 (8.2)	108.7 (6.0)	113.0 (7.0)	121.5 (8.7)	109.7 (1.4)	105.8 (-2.7)	106.8 (-5.5)	108.7 (-10.5)
Semiconductor	81.5 (11.7)	100.0 (22.7)	126.8 (26.8)	139.3 (34.1)	140.0 (28.0)	153.1 (28.3)	136.5 (7.7)	123.8 (-11.1)	108.3 (-22.6)	114.7 (-25.1)
Iron & steel	106.7 (-2.2)	100.0 (-6.3)	105.2 (5.2)	104.1 (1.6)	107.0 (3.7)	106.3 (-0.3)	96.4 (-8.4)	78.0 (-25.1)	79.3 (-25.9)	86.7 (-18.4)
Cement	108.2 (-5.7)	100.0 (-7.5)	103.2 (3.1)	108.7 (-0.4)	113.8 (1.0)	112.4 (5.1)	100.1 (-2.9)	112.1 (3.1)	105.7 (-7.1)	92.7 (-17.5)
Basic compound	107.7 (-1.4)	100.0 (-7.1)	105.9 (5.9)	103.9 (3.6)	97.9 (12.7)	111.1 (6.7)	99.1 (-6.4)	92.0 (-11.5)	87.2 (-10.9)	96.8 (-12.9)
Transport equipment	110.5 (-0.7)	100.0 (-9.5)	106.3 (6.3)	101.3 (-11.3)	112.4 (-2.1)	118.4 (9.9)	116.0 (9.1)	121.9 (20.3)	136.4 (21.4)	131.9 (11.4)
Electric & electronic	101.0 (2.9)	100.0 (-1.0)	107.7 (7.7)	107.7 (3.5)	113.7 (5.0)	122.4 (6.3)	110.8 (2.9)	110.8 (2.9)	111.5 (-1.9)	118.1 (-3.5)
Service	102.0 (1.4)	100.0 (-2.0)	105.2 (5.2)	106.2 (6.4)	109.3 (7.1)	119.2 (7.8)	112.4 (6.8)	113.9 (7.3)	113.8 (4.1)	127.2 (6.7)
Wholesale and retail	102.7 (-0.4)	100.0 (-2.6)	105.3 (5.3)	108.0 (5.6)	110.0 (5.9)	112.0 (4.1)	108.0 (2.6)	110.1 (1.9)	110.1 (0.1)	113.2 (1.1)
Food & Accommodation	122.6 (-1.0)	100.0 (-18.4)	101.9 (1.9)	113.2 (8.2)	115.6 (14.1)	115.2 (35.1)	119.1 (16.9)	127.7 (12.8)	120.1 (3.9)	129.9 (12.8)
Production output										
Iron & steel - Pig iron	47 520.7 (0.8)	45 359.6 (-4.5)	46 440.5 (2.4)	3 754.5 (-4.8)	3 897.3 (0.8)	3 958.0 (-3.8)	42 658.2 (-8.1)	3 417.4 (-9.0)	3 231.9 (-17.1)	3 568.4 (-9.8)
Iron & steel - Crude steel	71 411.9 (-1.5)	67 078.8 (-6.1)	70 418.0 (5.0)	5 781.8 (-1.3)	5 834.0 (1.2)	5 935.3 (0.4)	65 855.8 (-6.5)	5 151.1 (-10.9)	4 811.1 (-17.5)	5 238.3 (-11.7)
Petrochemical - Basic petrochemicals	31 939.5 (2.4)	30 542.7 (-4.4)	34 434.5 (12.7)	2 939.8 (20.0)	2 833.3 (30.4)	3 115.8 (29.3)	32 854.1 (-4.6)	2 395.1 (-18.5)	2 484.2 (-12.3)	2 618.8 (-16.0)
Petrochemical - Intermediate raw material	16 361.8 (-5.6)	15 369.0 (-6.1)	15 764.6 (2.6)	1 250.4 (3.2)	1 246.3 (13.2)	1 322.2 (2.2)	13 852.5 (-12.1)	1 041.5 (-16.7)	1 077.1 (-13.6)	1 097.2 (-17.0)
Petrochemical - 3 major products	21 625.7 (-0.8)	21 268.9 (-1.7)	23 224.7 (9.2)	1 883.5 (6.4)	1 886.2 (14.0)	2 177.5 (21.6)	22 129.4 (-4.7)	1 542.5 (-18.1)	1 520.4 (-19.4)	1 754.8 (-19.4)
The number of cars	3 948.1 (-2.1)	3 506.8 (-11.2)	3 462.4 (-1.3)	263.7 (-21.6)	303.0 (-6.6)	319.1 (7.5)	3 756.5 (8.5)	327.5 (24.2)	379.8 (25.4)	353.4 (10.8)

Note: p means provisional

Source: Korea Statistical Information Service, Korea Iron & Steel Association, Korea Petrochemical Industry Association

International Energy Prices

	2019	2020	2021	2022			2022			
				M10	M11	M12		M10	M11	M12
Crude oil (USD/bbl)										
WTI	57.0 (-11.9)	39.4 (-30.9)	67.9 (72.4)	81.2 (105.3)	78.7 (90.2)	71.7 (52.3)	94.2 (38.7)	87.0 (7.2)	84.4 (7.3)	76.5 (6.7)
Dubai	63.5 (-8.5)	42.2 (-33.6)	69.3 (64.1)	81.6 (100.6)	80.3 (84.9)	73.2 (46.9)	96.4 (39.1)	91.2 (11.7)	86.3 (7.4)	77.2 (5.5)
Brent	64.2 (-10.3)	43.2 (-32.7)	70.8 (63.8)	83.7 (101.7)	80.8 (83.8)	74.8 (49.0)	98.9 (39.7)	93.6 (11.8)	90.9 (12.4)	81.3 (8.7)
Unit value of import (C&F)	65.5 (-8.2)	44.8 (-31.7)	70.2 (56.9)	79.0 (82.3)	82.7 (93.7)	79.5 (70.2)	102.3 (45.6)	100.9 (27.7)	94.8 (14.7)	89.5 (12.7)
LNG										
Henry Hub (USD/MMBTU)	2.5 (-17.6)	2.1 (-15.9)	3.7 (74.6)	5.6 (96.4)	5.1 (78.3)	3.9 (49.5)	6.5 (75.2)	6.1 (9.2)	6.4 (25.6)	5.8 (49.3)
TTF (USD/MMBTU)	4.8 (-37.6)	3.2 (-32.4)	16.0 (396.1)	30.8 (530.8)	27.7 (472.9)	37.7 (546.7)	40.1 (150.0)	38.4 (24.4)	35.9 (29.5)	36.7 (-2.6)
JKM (USD/MMBTU)	5.6 (-42.4)	4.2 (-25.1)	17.9 (324.7)	33.2 (456.1)	33.6 (394.7)	37.8 (300.0)	33.9 (89.5)	33.0 (-0.8)	28.4 (-15.6)	32.3 (-14.5)
Unit value of import (USD/ton, CIF)	505.4 (-4.0)	390.2 (-22.8)	550.8 (41.2)	668.8 (142.5)	805.4 (158.1)	892.6 (149.0)	1 053.5 (91.3)	1 247.3 (86.5)	1 259.0 (56.3)	1 255.2 (40.6)
Coal (USD/ton)										
Thermal coal (Newcastle)	78.1 (-27.1)	60.3 (-22.8)	136.0 (125.8)	235.4 (309.7)	153.7 (145.1)	164.6 (110.4)	356.3 (161.9)	390.4 (65.8)	348.6 (126.7)	400.9 (143.5)
Unit value of import (CIF)	100.7 (-11.3)	77.7 (-22.9)	115.1 (48.1)	142.3 (101.9)	176.4 (148.6)	187.5 (159.3)	226.3 (96.7)	230.1 (61.8)	204.0 (15.6)	204.6 (9.1)
Petroleum product (USD/bbl)										
Gasoline	72.5 (-9.3)	46.7 (-35.7)	80.3 (72.2)	98.7 (114.5)	94.9 (103.1)	87.9 (64.3)	115.2 (43.4)	94.9 (-3.8)	98.5 (3.7)	89.4 (1.7)
Kerosene	77.3 (-8.9)	44.7 (-42.1)	75.1 (67.9)	93.0 (123.5)	89.2 (95.2)	83.5 (55.0)	126.7 (68.6)	123.4 (32.6)	121.2 (35.9)	110.5 (32.3)
Diesel	78.2 (-7.9)	49.4 (-36.8)	77.6 (57.2)	95.5 (117.4)	91.6 (92.5)	85.9 (54.9)	135.3 (74.3)	137.3 (43.7)	127.8 (39.6)	114.0 (32.7)
Bunker-C	57.5 (-11.8)	39.2 (-31.9)	64.4 (64.3)	77.6 (88.1)	71.1 (62.9)	65.8 (38.8)	82.3 (27.8)	62.2 (-19.8)	65.5 (-7.9)	59.6 (-9.5)
Propane	434.6 (-19.8)	397.1 (-8.6)	647.9 (63.2)	800.0 (113.3)	870.0 (102.3)	795.0 (76.7)	737.1 (13.8)	590.0 (-26.3)	610.0 (-29.9)	650.0 (-18.2)
Butane	441.7 (-18.1)	403.8 (-8.6)	629.6 (55.9)	795.0 (109.2)	830.0 (88.6)	750.0 (63.0)	734.2 (16.6)	560.0 (-29.6)	610.0 (-26.5)	650.0 (-13.3)
Naphtha	56.9 (-15.1)	40.5 (-28.9)	70.6 (74.6)	84.3 (101.9)	84.0 (107.1)	77.6 (63.1)	83.1 (17.7)	71.4 (-15.3)	73.8 (-12.2)	65.7 (-15.4)

Note: 1. () is year-on-year growth rates(%)

2. Gasoline type is 95RON, diesel is 0.001%, Bunker-C is high-sulfur oil(180cst/3.5%), for propane and butane, CP is reference value
Source: Korea National Oil Corporation, World Bank, Korea Energy Economics Institute, CME Group, Korea International Trade Association

Domestic Energy Prices

	2019	2020	2021			2022				
			M10	M11	M12		M10	M11	M12	
Petroleum product										
Gasoline (won/liter)	1 471.9 (-6.9)	1 381.6 (-6.1)	1 590.5 (15.1)	1 712.4 (28.4)	1 737.5 (31.7)	1 646.4 (20.4)	1 812.4 (14.0)	1 666.7 (-2.7)	1 650.3 (-5.0)	1 563.8 (-5.0)
Diesel (won/liter)	1 340.1 (-3.7)	1 189.8 (-11.2)	1 391.3 (16.9)	1 509.3 (33.1)	1 549.7 (38.4)	1 468.9 (25.7)	1 841.8 (32.4)	1 838.4 (21.8)	1 879.2 (21.3)	1 783.3 (21.4)
Bunker-C (won/liter)	743.9 (1.2)	573.6 (-22.9)	731.7 (27.6)	813.4 (52.6)	867.4 (66.8)	859.0 (65.6)	1 115.2 (52.4)	1 050.8 (29.2)	1 142.2 (31.7)	986.7 (14.9)
Propane (won/kg)	1 869.7 (-2.6)	1 850.7 (-1.0)	2 092.6 (13.1)	2 163.4 (18.7)	2 312.3 (26.9)	2 410.1 (29.2)	2 479.6 (18.5)	2 469.8 (14.2)	2 455.4 (6.2)	2 449.7 (1.6)
Butane (won/liter)	806.2 (-7.8)	791.1 (-1.9)	931.8 (17.8)	981.2 (27.2)	1 053.8 (36.7)	1 087.5 (36.5)	1 081.7 (16.1)	1 049.5 (7.0)	1 032.2 (-2.0)	1 021.4 (-6.1)
City gas(won/MJ)										
Residential	15.6 (3.9)	15.1 (-3.6)	14.2 (-5.7)	14.2 -	14.2 -	14.2 -	16.6 (16.7)	19.7 (38.4)	19.7 (38.4)	19.7 (38.4)
General(1)	15.6 (4.9)	14.9 (-4.7)	13.9 (-6.5)	13.8 -	13.8 -	14.1 (0.6)	16.3 (17.3)	19.3 (39.7)	19.3 (39.7)	19.5 (38.6)
Commercial	16.1 (4.4)	15.1 (-6.4)	17.2 (14.2)	18.8 (47.8)	21.4 (68.9)	23.6 (75.0)	28.7 (66.6)	35.6 (89.4)	35.3 (65.3)	36.2 (53.8)
Industry	13.8 (6.0)	12.6 (-8.4)	14.4 (14.2)	15.6 (57.0)	18.2 (84.2)	21.3 (86.5)	25.9 (79.9)	32.6 (109.1)	32.4 (77.9)	34.1 (60.1)
Heat(won/Mcal)										
Residential	65.7 (1.8)	66.2 (0.7)	65.2 (-1.4)	65.2 -	65.2 -	65.2 -	74.1 (13.7)	89.9 (37.8)	89.9 (37.8)	89.9 (37.8)
Commercial	85.3 (1.8)	85.9 (0.7)	84.7 (-1.4)	84.7 -	84.7 -	84.7 -	96.3 (13.7)	116.7 (37.8)	116.7 (37.8)	116.7 (37.8)
Public	74.5 (1.9)	75.1 (0.7)	74.0 (-1.4)	74.0 -	74.0 -	74.0 -	84.1 (13.7)	101.9 (37.8)	101.9 (37.8)	101.9 (37.8)
Electricity(won/kWh)										
Residential	147.3 -	147.3 -	142.3 (-3.4)	142.3 (-3.4)	142.3 (-3.4)	142.3 (-3.4)	147.8 (3.9)	154.6 (8.6)	154.6 (8.6)	154.6 (8.6)
General	84.4 -	84.4 -	79.4 (-5.9)	60.2 (-7.7)	87.3 (-5.4)	87.3 (-5.4)	84.9 (7.0)	72.5 (20.4)	99.6 (14.1)	99.6 (14.1)
Industry	96.0 -	96.0 -	91.0 (-5.2)	73.5 (-6.4)	103.5 (-4.6)	103.5 (-4.6)	98.8 (8.6)	95.0 (29.3)	125.0 (20.8)	125.0 (20.8)

Note: 1.() is year-on-year growth rates(%)

2.Electricity prices are based on Residential(High-voltage, 201-400kWh), General((A) I , Low-voltage), Industry((B), High-voltageB, optionII mid-load)
Source: Korea National Oil Corporation, Seoul City Gas, Korean District Heating Corporation, Korea Electric Power Corporation

Total Primary Energy Demand (TPED)

	2019	2020	2021	2022p				2022p		
				M10	M11	M12		M10	M11	M12
Coal (Mton)	136.7 (-6.6)	119.9 (-12.3)	119.9 (-0.0)	9.4 (0.9)	10.1 (10.1)	10.9 (5.1)	113.9 (-5.0)	8.5 (-9.2)	8.7 (-13.7)	10.3 (-5.3)
- Coking coal excluded	110.6 (-8.2)	95.2 (-13.9)	94.4 (-0.8)	7.3 (3.0)	8.0 (13.0)	8.7 (6.7)	90.6 (-4.0)	6.6 (-9.9)	6.9 (-13.8)	8.3 (-4.2)
Oil (Mbbl)	808.2 (0.0)	775.7 (-4.0)	835.4 (7.7)	68.6 (11.5)	68.4 (10.1)	80.7 (21.7)	815.0 (-2.4)	64.4 (-6.2)	65.2 (-4.6)	75.7 (-6.3)
LNG (Mton)	41.0 (-2.0)	41.5 (1.2)	45.9 (10.6)	3.3 (7.6)	4.0 (4.2)	5.1 (-5.6)	45.3 (-1.1)	3.0 (-8.4)	3.6 (-9.7)	5.7 (12.9)
Hydro (TWh)	2.8 (-17.3)	3.9 (39.0)	3.1 (-21.2)	0.2 (-6.9)	0.2 (-12.4)	0.2 (-6.7)	3.5 (15.9)	0.3 (17.4)	0.2 (19.6)	0.2 (9.4)
Nuclear (TWh)	145.9 (9.3)	160.2 (9.8)	158.0 (-1.4)	13.5 (-0.0)	13.6 (-3.4)	16.5 (9.8)	176.1 (11.4)	14.4 (6.8)	14.0 (3.2)	15.2 (-7.9)
Others (Mtoe)	11.5 (4.8)	12.6 (9.4)	15.4 (21.8)	1.2 (14.7)	1.2 (15.9)	1.4 (16.2)	14.5 (-5.9)	1.2 (2.7)	1.1 (-7.7)	1.2 (-14.9)
TPED (Mtoe)	298.6 (-0.7)	288.4 (-3.4)	305.0 (5.8)	24.2 (7.3)	25.3 (7.0)	29.6 (8.7)	300.8 (-1.4)	23.0 (-4.9)	23.7 (-6.4)	28.7 (-3.0)

Note: p means provisional, () is year-on-year growth rates (%)
Source: Korea Energy Economics Institute

Share of TPED by Sources

(unit: %)

	2019	2020	2021	2022p				2022p		
				M10	M11	M12		M10	M11	M12
Coal	27.7	25.2	23.9	23.6	24.1	22.3	22.9	22.5	22.2	21.7
- Coking coal excluded	21.6	19.3	18.0	17.7	18.3	17.1	17.5	16.7	16.9	16.8
Oil	39.7	39.3	40.0	41.8	39.6	39.4	39.6	41.5	40.6	38.2
LNG	17.9	18.8	19.6	17.8	20.4	22.4	19.7	17.2	19.7	26.1
Hydro	0.2	0.3	0.2	0.2	0.1	0.1	0.3	0.2	0.2	0.1
Nuclear	10.4	11.8	11.0	11.9	11.4	11.9	12.5	13.3	12.6	11.3
Others	3.9	4.4	5.0	5.0	4.9	4.7	4.8	5.4	4.8	4.1
TPED	99.8	99.8	99.8	100.3	100.5	100.8	99.8	100.2	100.1	101.6

Note: p means provisional
Source: Korea Energy Economics Institute

Total Final Consumption (TFC)

(Unit: Mtoe)

	2019	2020	2021				2022p			
				M10	M11	M12		M10	M11	M12
Industry	129.2 (-1.2)	124.0 (-4.0)	133.8 (7.9)	10.9 (8.3)	11.1 (15.5)	12.3 (11.1)	129.3 (-3.4)	9.9 (-9.0)	10.3 (-7.8)	11.2 (-9.3)
Transport	37.2 (2.7)	34.7 (-6.6)	36.6 (5.4)	2.9 (2.5)	3.0 (-7.4)	3.5 (20.5)	36.4 (-0.6)	3.1 (8.5)	2.8 (-5.6)	3.5 (0.7)
Residential	21.5 (-3.0)	22.4 (4.1)	22.9 (2.6)	1.3 (0.3)	2.0 (0.5)	3.1 (-1.8)	23.3 (1.7)	1.3 (-0.4)	1.9 (-8.7)	3.3 (4.6)
commercial	18.7 (-4.1)	17.7 (-5.4)	18.0 (1.8)	1.3 (6.7)	1.4 (1.1)	1.9 (4.4)	19.1 (6.0)	1.4 (4.5)	1.4 (0.7)	1.9 (3.8)
Public	5.2 (-5.1)	5.0 (-3.5)	5.2 (4.0)	0.4 (5.1)	0.4 (-3.0)	0.5 (-2.0)	5.2 (-0.5)	0.4 (2.1)	0.4 (-1.4)	0.5 (-4.6)
TFC	211.7 (-1.1)	203.8 (-3.8)	216.5 (6.3)	16.8 (6.4)	18.0 (7.6)	21.3 (9.4)	213.3 (-1.5)	16.2 (-4.0)	16.8 (-6.7)	20.4 (-4.4)
Coal (Mton)	51.9 (-4.9)	49.2 (-5.2)	51.0 (3.6)	4.2 (-0.9)	4.5 (9.0)	4.5 (-2.9)	46.8 (-8.3)	3.7 (-11.8)	3.8 (-15.1)	3.9 (-12.9)
Oil (Mbbbl)	796.1 (1.0)	752.3 (-5.5)	815.3 (8.4)	66.7 (10.6)	66.9 (12.3)	79.1 (20.7)	795.6 (-2.4)	62.6 (-6.1)	63.1 (-5.7)	73.2 (-7.4)
- Non-energy oil excluded	355.0 (0.8)	336.2 (-5.3)	351.0 (4.4)	28.7 (5.4)	29.2 (-8.9)	34.4 (10.3)	343.0 (-2.3)	29.7 (3.3)	27.4 (-6.2)	35.4 (2.8)
Electricity (TWh)	507.5 (-1.1)	497.3 (-2.0)	521.0 (4.8)	40.8 (7.3)	41.8 (4.0)	46.1 (4.7)	535.3 (2.7)	41.3 (1.2)	41.5 (-0.8)	45.8 (-0.6)
City gas (Bm³)	22.4 (-3.0)	22.0 (-2.0)	22.7 (3.3)	1.3 (-1.0)	2.0 (1.9)	2.9 (-1.4)	23.6 (3.9)	1.4 (1.2)	1.9 (-7.4)	3.1 (5.5)
Heat-others (1 000 toe)	9.0 (-6.2)	9.3 (3.1)	9.8 (6.3)	0.7 (1.9)	0.8 (2.9)	1.2 (2.6)	9.9 (0.3)	0.7 (2.6)	0.8 (-8.6)	1.1 (-3.2)

Note: p means provisional, () is year-on-year growth rates (%)
Source: Korea Energy Economics Institute

Share of the Total Final Consumption by Sources

(unit: %)

	2019	2020	2021				2022p			
				M10	M11	M12		M10	M11	M12
Industry	61.0	60.9	61.8	64.8	61.8	57.9	60.6	61.4	61.1	54.9
Transport	17.6	17.1	16.9	17.2	16.7	16.3	17.1	19.5	16.9	17.2
Residential	10.1	11.0	10.6	8.0	11.3	14.7	10.9	8.3	11.1	16.0
Commercial	8.8	8.7	8.3	7.8	8.0	8.7	8.9	8.5	8.6	9.4
Public	2.4	2.4	2.4	2.2	2.3	2.5	2.4	2.3	2.4	2.5
TFC	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Coal	15.5	15.3	14.9	15.7	15.5	13.3	14.0	14.6	14.4	12.3
Oil	47.8	47.0	48.1	50.6	47.5	47.4	47.4	49.7	47.7	45.8
- Non-energy oil excluded	22.3	22.0	21.6	22.6	21.4	21.6	21.3	24.5	21.4	22.9
Electricity	20.6	21.0	20.7	20.9	19.9	18.6	21.6	22.0	21.2	19.3
City gas	11.8	12.1	11.8	8.9	12.4	15.2	12.3	9.5	12.2	17.0
Heat-others	4.2	4.5	4.5	3.9	4.7	5.5	4.6	4.2	4.6	5.6

Note: p means provisional
Source: Korea Energy Economics Institute

Statistics on Energy Production Facilities

	2020	2021				2022p			
			M10	M11	M12		M10	M11	M12
Total capacity (GW)	129.2 (32.4)	134.0 (3.7)	133.5 (4.1)	133.9 (4.1)	134.0 (3.7)	138.0 (3.0)	136.0 (1.9)	136.3 (1.8)	138.0 (3.0)
Nuclear	23.3 (7.1)	23.3 -	23.3 -	23.3 -	23.3 -	24.7 (6.0)	23.3 -	23.3 -	24.7 (6.0)
Bituminous coal	36.5 (0.1)	36.9 (1.3)	37.4 (2.7)	37.4 (2.7)	36.9 (1.3)	37.3 (1.0)	37.3 (-0.4)	37.3 (-0.4)	37.3 (1.0)
Gas	41.2	41.2 (0.1)	41.2 -	41.2 -	41.2 (0.1)	41.2 -	41.2 (0.1)	41.2 (0.1)	41.2 -
Refinery capacity (mil BPSD)	3.2 -	3.2 -	3.2 -	3.2 -	3.2 -	3.2 -	3.2 -	3.2 -	3.2 -

Note: () is year-on-year growth rates (%)

Source: Korea Electric Power Corporation, Korea National Oil Corporation

Statistics on Energy Consumption

	2020	2021				2022p			
			M10	M11	M12		M10	M11	M12
The number of household demanding city gas (mil)	20.1 (2.4)	20.5 (2.0)	20.3 (2.0)	20.4 (2.1)	20.5 (2.0)	20.9 (1.7)	20.7 (2.1)	20.9 (2.3)	20.9 (1.7)
Registered cars (mil)	24.4 (2.9)	24.9 (2.2)	24.8 (2.3)	24.9 (2.2)	24.9 (2.2)	25.5 (2.4)	25.4 (2.4)	25.5 (2.4)	25.5 (2.4)
- gasoline	11.4 (4.1)	11.8 (3.1)	11.7 (3.2)	11.7 (3.1)	11.8 (3.1)	12.1 (2.6)	12.0 (2.7)	12.0 (2.7)	12.1 (2.6)
- diesel	10.0 (0.3)	9.9 (-1.2)	9.9 (-1.0)	9.9 (-1.2)	9.9 (-1.2)	9.8 (-1.2)	9.8 (-1.1)	9.8 (-1.1)	9.8 (-1.2)
- LPG	2.0 (-1.3)	1.9 (-1.7)	2.0 (-1.9)	1.9 (-1.8)	1.9 (-1.7)	1.9 (-2.1)	1.9 (-1.9)	1.9 (-2.0)	1.9 (-2.1)
- hybrid	0.6 (33.1)	0.9 (34.0)	0.8 (36.9)	0.9 (35.4)	0.9 (34.0)	1.1 (28.5)	1.1 (29.1)	1.1 (28.8)	1.1 (28.5)

Note: () is year-on-year growth rates (%)

Source: Korea City Gas Association, Ministry of Land, Infrastructure and Transport