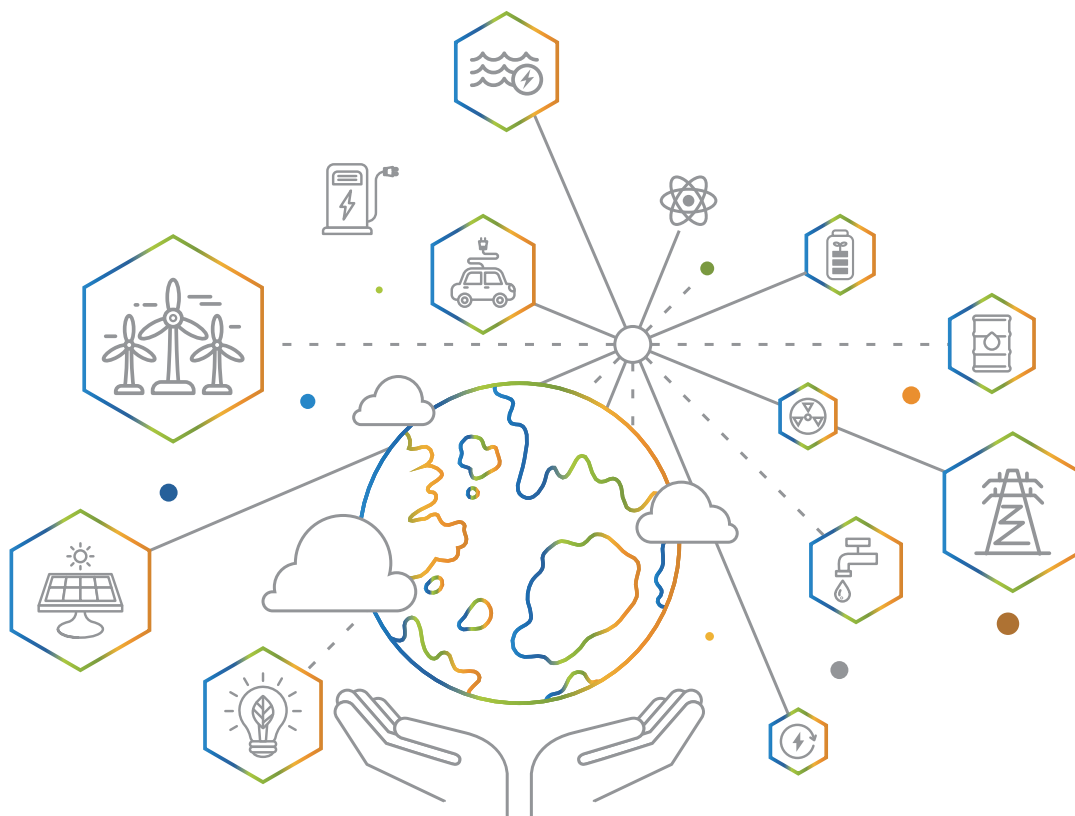


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# KEEI Korea Energy Demand Outlook

K O R E A   E N E R G Y   E C O N O M I C S   I N S T I T U T E



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 Demand and Supply Division of the Center for Energy Information and Statistics in cooperation with the Energy Statistics Research Division of KEEI and other related research divisions.

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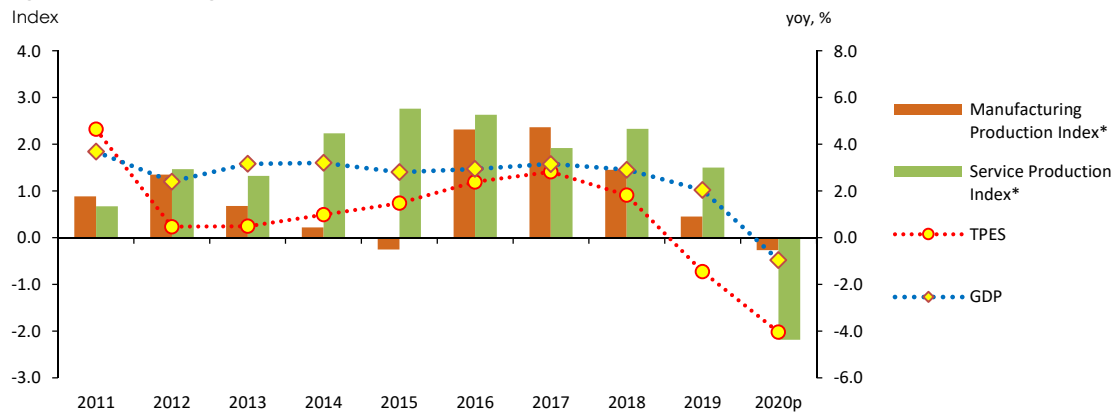
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## 1. Total Primary Energy Supply and Total Final Consumption

### ☐ Total energy consumption reduced by 4.0% on a year-on-year basis to record 290.8 Mtoe in 2020

- Total energy consumption reduced for two consecutive years as production activities in the industrial and service sectors contracted by COVID-19 pandemic and the traffic in the transport sector shrank due to Social Distancing restrictions

**Figure 1.1 The growth rates of GDP and TPES, production index**

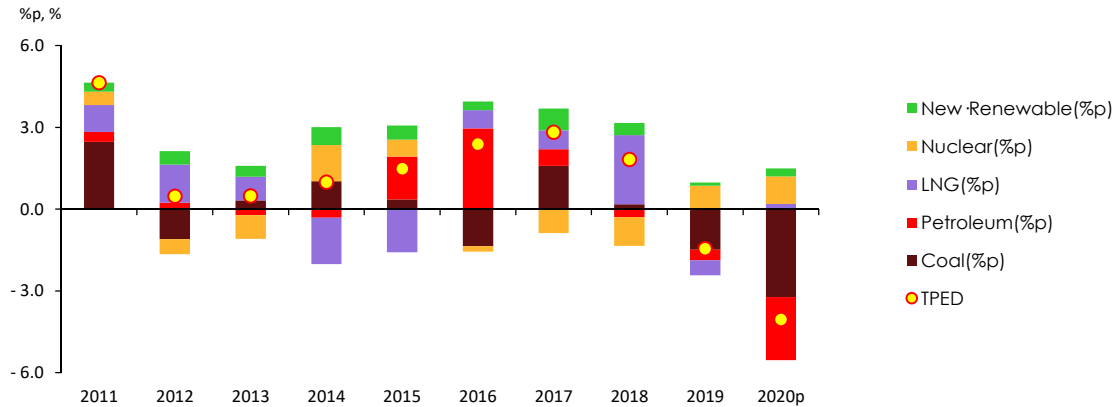


\* Production indexes show year-on-year differences

### ☐ Despite of increased consumption in nuclear, gas and renewables, a dramatic plunge in coal and petroleum consumption led to a decline in total energy consumption

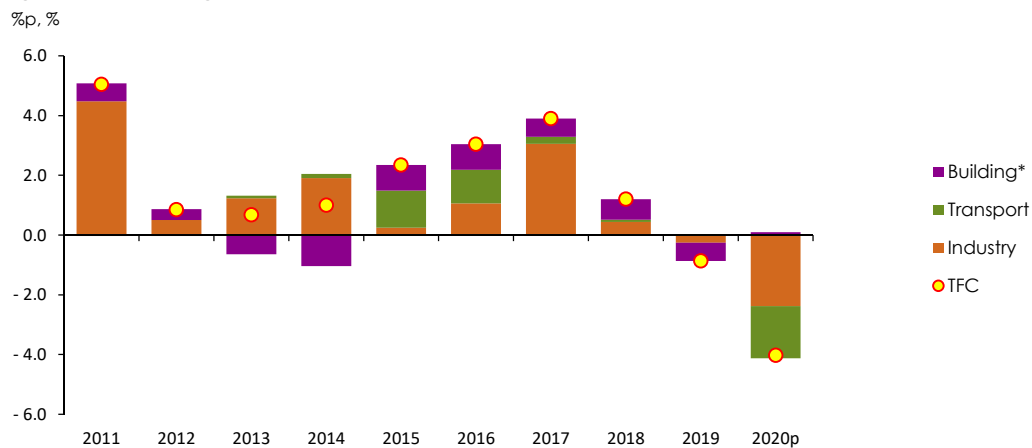
- Coal consumption showed a steep decrease in all sectors including power generation, industry and buildings, recording a year-on-year decrease of 12.4%
- Petroleum consumption dropped by 5.8% year-on-year mainly in transport and industrial sectors; the former experienced a significant plunge from decreased travel demand amid COVID-19 pandemic while the latter was affected by a huge decline in petrochemical feedstock naphtha consumption

**Figure 1.2 The growth rate of TPES & contributions by sources**



- Natural gas consumption increased by 1.1% year-on-year, led by a decent increase for power generation as well as a fast growth in industrial direct imports despite the effects of decreased consumption for district heating and city gas production
- Nuclear generation grew by 9.8% year-on-year, with new large-capacity generators coming on line in the second half last year and increased facility utilization rate. Similarly, renewables and other energy consumption posted a 4.0% increase thanks to the government policy for supplying renewable power generation capacity
- Meanwhile, electricity consumption declined by 2.2% year-on-year mainly in the industrial sector as exports and domestic demand witnessed a rapid decrease amidst COVID-19 pandemic and overall activities became sluggish in the manufacturing sector

**Figure 1.3 The growth rate of TFC & contributions by sources**

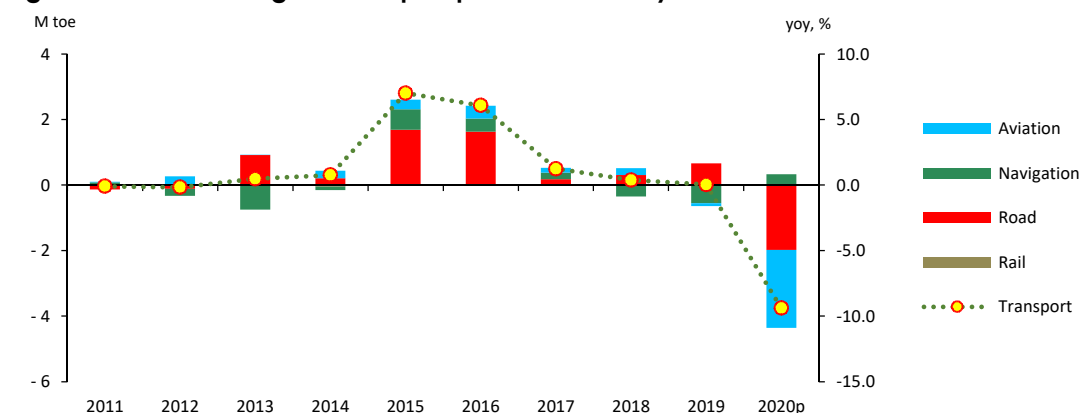


\* include residential, commercial, public-etc usage

□ Despite the decrease in the building sector, which stayed at the same level as last year, Total Final Consumption in 2020 reduced by 4.0% as energy consumption in industrial and transport sectors declined

- Industrial energy consumption went down by 3.8% year-on-year as production activities in some of the major stagnated, energy-intensive sectors were in the doldrums amid global economic slump due to COVID-19 pandemic

**Figure 1.4 The change of transport petroleum use by sub-sectors**



\* Each subsector graph shows yoy differences

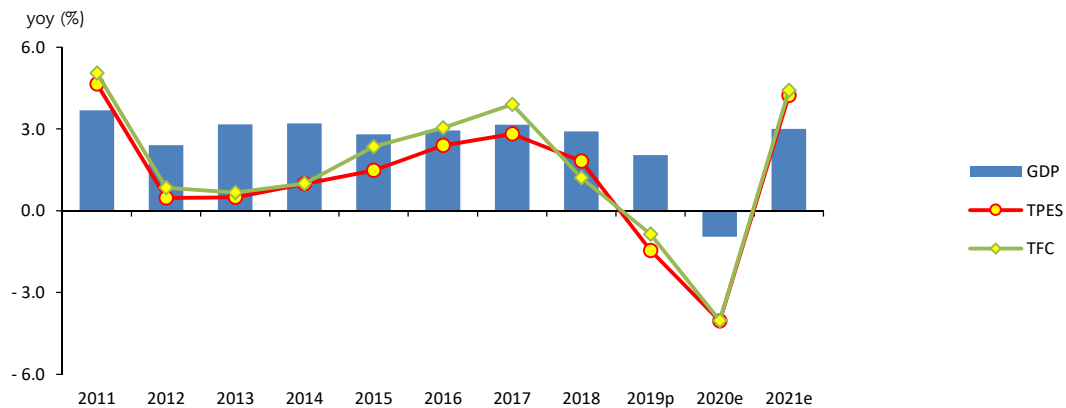
- As for the transport sector, the energy consumption increased from the base effect in the marine transportation. However, the energy consumption in the road and air transportation sectors showed a steep decline due to Social Distancing restrictions enforced as a COVID-19 protective measure and a dramatic fall in demand for international travel
- The effects of COVID-19 pandemic were offset as they went two opposite directions in the residential and commercial building sectors while heating degree days increased during cold winter at the end of the year, leading to a 0.5% increase in energy consumption in the building sector

## 2. TPES & TFC Outlook

□ **Total Primary Energy Supply (TPES), which decreased for two consecutive years from 2019 to 2020, is expected to turn around to record a 4.2 increase in 2021**

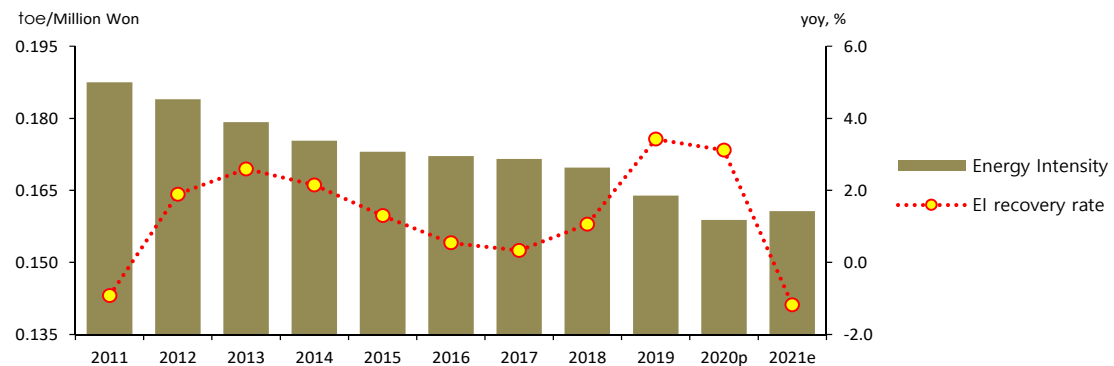
- TPES declined from the negative effects of COVID-19 in 2020, following the decrease in 2019 resulting from the sluggish trend in industrial activities and temperature effects. As a result, TPES showed a declining trend for two successive years for the first time since Energy Balance report started
- In 2021, however, Total energy demand is expected to rebound fast, as the base effect from two consecutive years of declines in TPES will come into play and the economy and society will slowly recover from the impact of COVID-19 pandemic thanks to increased vaccination rate

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



- Energy Intensity (toe/KRW 1million), which recovered fast in recent months with a decrease in energy consumption, is expected to slightly decrease in 2021 driven by the base effects

**Figure 2.2 Energy Intensity and EI Recovery Trends**

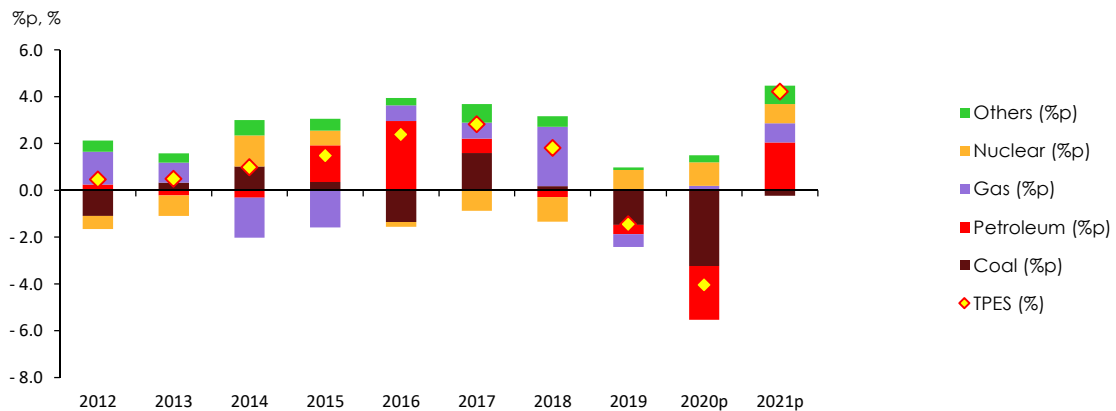


Note: Energy Intensity is calculated as the value of 'TPES/GDP', expressed in toe/million. EI recovery rate multiplies EI increase rate by '-1'

☐ **Demand for all energy sources except coal is expected to grow**

- Petroleum demand is anticipated to increase by 6% year-on-year as the demand for naphtha and LPG used as base material skyrocketed in the industrial sector and the transport sector also showed a decent increase in petroleum demand with signs of recovery for travel demand thanks to an increased number of vaccinated people
- Coal demand is expected to decrease by 0.5% year-on-year on the back of decreased consumption for power generation although final consumption of coal rebounded in the iron making sector
- Nuclear generation is forecasted to grow by 7% as capacity utilization factor increased and facility capacity rose with new generators coming to online
- Overall, natural gas demand is expected to rise by middle of 4% range on a year-on-year basis with a consistent upward trend in demand for power generation. The demand for city gas manufacturing rebounded, also contributing to the growing trend
- Electricity demand is expected to rise by more than 3% year-on-year, driven by temperature effects and the impact of COVID-19 pandemic starting to subdue

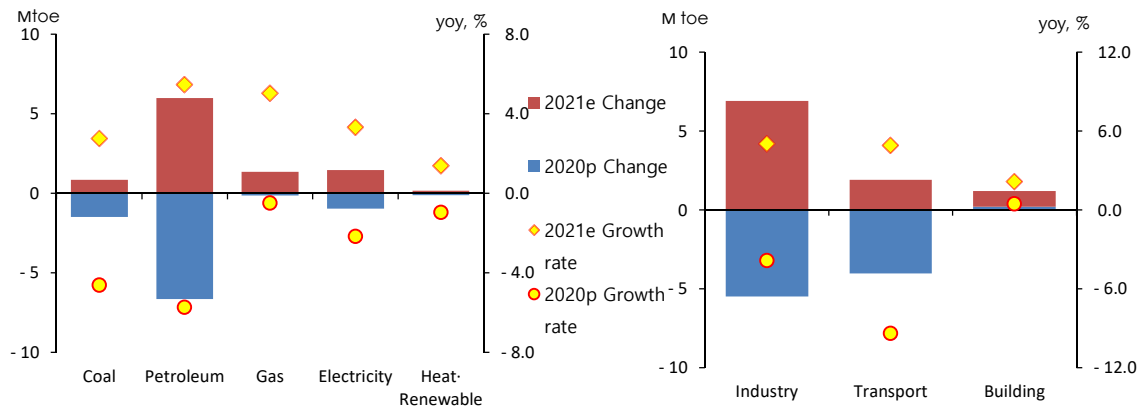
**Figure 2.3 The growth rate of TPES & contributions by sources**



☐ **Final energy demand is forecasted to grow by 4.4 in all sectors**

- Energy demand in the industrial sector is expected to increase by 5% year-on-year as the economy, sluggish over COVID-19 pandemic, started to recover. Capacity expansion and increased capacity utilization in energy-intensive industries such as iron making and petrochemical also played a role in energy demand growth

**Figure 2.4 The change and growth rate of TFC by energy sources and end-use sectors, 2020 and 2021**



- With travel demand recovering mainly in the second half of the year, energy demand in the transport sector is anticipated to grow by 5% driven by the base effect from previous year's plunge of -9.4%
- Energy demand in the building sector is expected to rise by 2% year-on-year on the back of the temperature effect, resulted from the cold events in the beginning of the year and more cooling degree days, as well as a growth in energy consumption in the commercial sector thanks to the mitigated impact of COVID-19 pandemic



### 3. Key Features and Implications

#### COVID-19 and Energy Demand

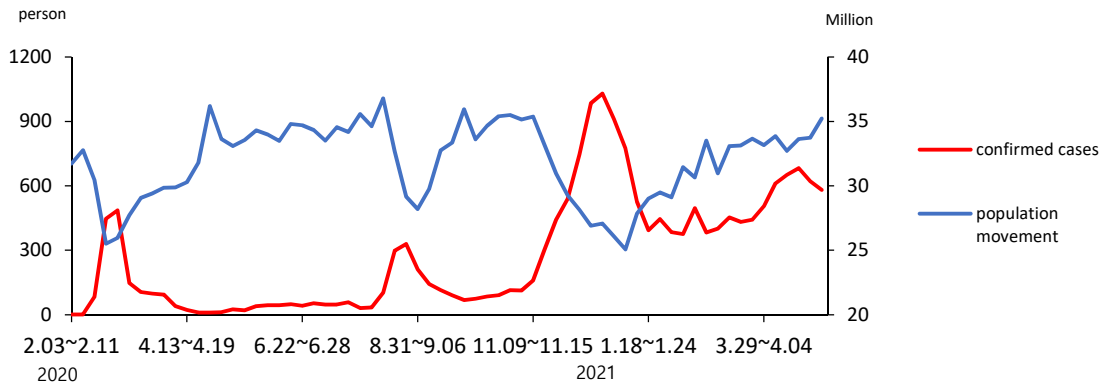
- ☐ **Due to COVID-19 pandemic and Social Distancing restrictions, the growth in TPES showed a faster YoY decline than GDP growth in 2020.**
  - In the face of serious COVID-19 crisis, GDP recorded a mere 1.0% decrease while Total Energy Consumption declined by 4.0% year-on-year as energy consumption in energy-intensive sectors and the service sector as well as the transport sector with the dramatic fall in travel demand
  - The commercial sector decreased especially in the 'face-to-face' sector negatively impacted by Social Distancing restrictions while energy consumption in the residential sector slightly increased with more work time from home
- ☐ **Recently, as more and more people feel fatigue about COVID-19 pandemic, they have become less sensitive to the spread of COVID-19**
  - Considering the movement of population during the pandemic and the ratio of 'confirmed cases VS population movement,' less people are willing to comply with Social Distancing measures with increased sense of fatigue from extended COVID-19 pandemic

**Figure 3.1 Population movement during COVID-19 pandemic phases**



Source: [http://it.chosun.com/site/data/html\\_dir/2021/02/06/2021020600333.html](http://it.chosun.com/site/data/html_dir/2021/02/06/2021020600333.html) (2021.2.7)

**Figure 3.2 Average weekly newly-confirmed cases (Left) and average population movement (Right)**



Source: KOSIS (2021.5.4)

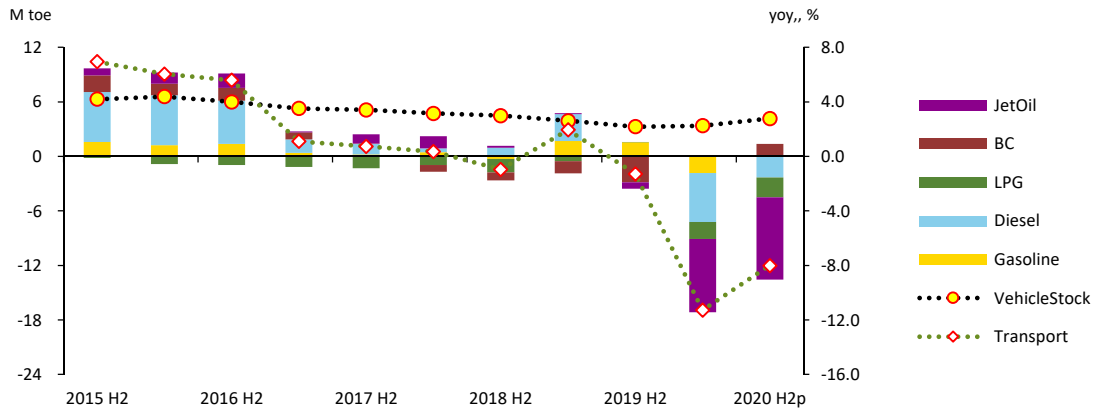
☐ **In 2021, energy consumption is expected to rise mainly in industrial and transport sectors with weaker impact of COVID-19 pandemic**

- Recently, exports increased in energy-intensive sectors such as semiconductor, petrochemical and automobile industries, leading to recovery of industrial production activities. As a result, energy consumption in these sectors is likely to increase
- As for the transport sector, overall consumption is expected to grow with base effects and less people complying with Social Distancing measures. However, the recovery of energy consumption in the air transport sector seems some way off as global recovery stayed sluggish due to new strands of COVID-19 being discovered in India and other countries
- Energy consumption in the commercial and public building sector is likely to switch from the downfall to an upward trend as more and more people become insensitive to COVID-19 pandemic. As long as there is no abrupt rise in the number of newly-confirmed cases, the pattern of increase in energy consumption in residential buildings is expected to gradually slow down

☐ **Energy consumption in the transport sector, affected the most by COVID-19 pandemic, reduced by 9.4% year-on-year in 2020**

- COVID-19 preventive measures significantly cut down travel demand, causing energy consumption in road and air transport sectors to free-fall

**Figure 3.3 Change in volume and rate of petroleum product consumption in transport sector (YoY)**



☐ **In 2021, with business and travel demand recovering, the demand for energy in the transport sector is expected to rebound fast mainly in the second half of the year**

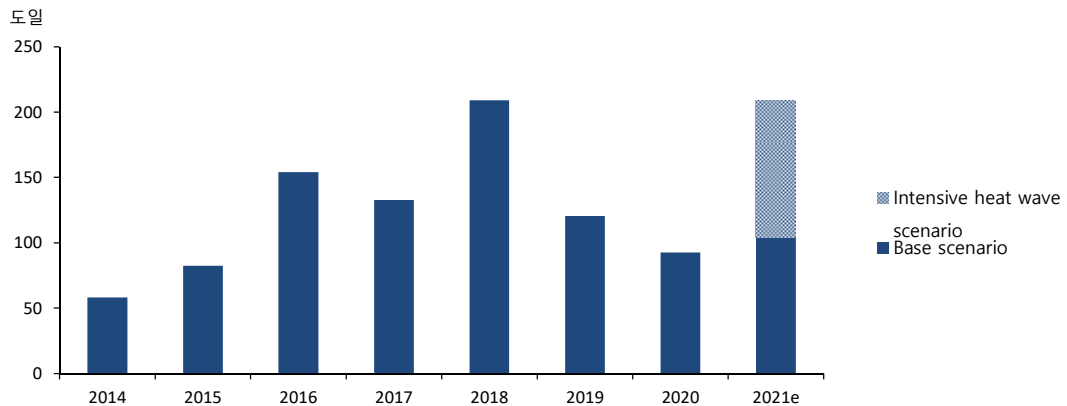
- As more people get vaccinated and activities in the manufacturing and commercial sectors take off in the second half of this year, energy demand is likely to increase in road transport sector, excepting air transport sector, with increased travel demand

### Heat Wave Scenario and Electricity Demand

☐ **If heat waves hit this summer as in 2018, electricity demand is expected to grow by 0.7%p compared to the base demand**

- After the intense heat waves in 2016 and 2018, concerns about possible heat waves and increase in electricity demand emerge as a social issue with summer approaching
- According to the forecast issued by the Korea Meteorological Administration (KMA), there is a 50-70% chance the temperature this summer will be higher than the average year this summer

**Figure 3.4 Recent trends of cooling degree days and assumptions per scenario**



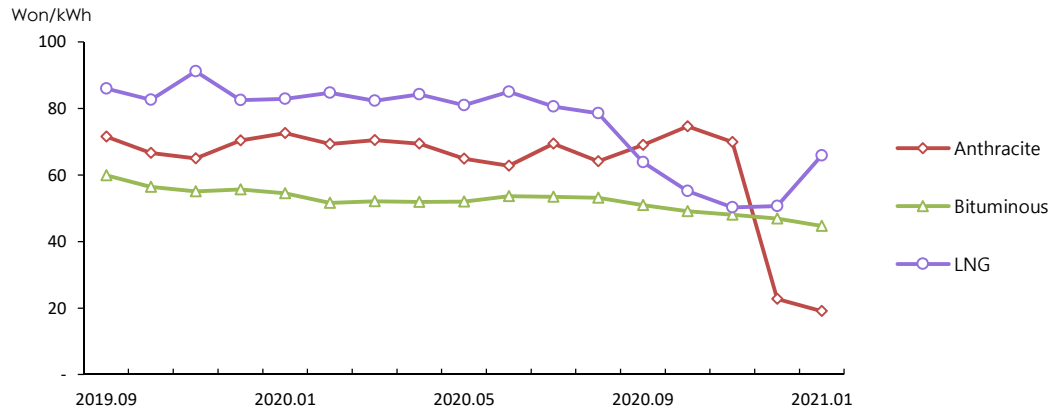
Note: The bottom of the cooling degree day bar of 2021 represents the number of possible cooling degree days assuming the average temperature of last ten years for this summer ('Base scenario') while the whole bar graph shows the value assuming that this summer will have the same number of cooling degree days as in 2018 ('Intensive heat wave scenario')

- In the intensive heat wave scenario, if we make the assumption that 2021 has the same number of cooling degree days as in 2018 (209 cooling degree days), the cooling degree days this year will increase by 125.9% year-on-year
- In the intensive heat wave scenario, the electricity demand growth is expected to be 4.0%, 0.7%p higher than the base scenario with the residential sector being the most affected by possible intensive heat waves

### Continuous Reduction in Coal Power Generation

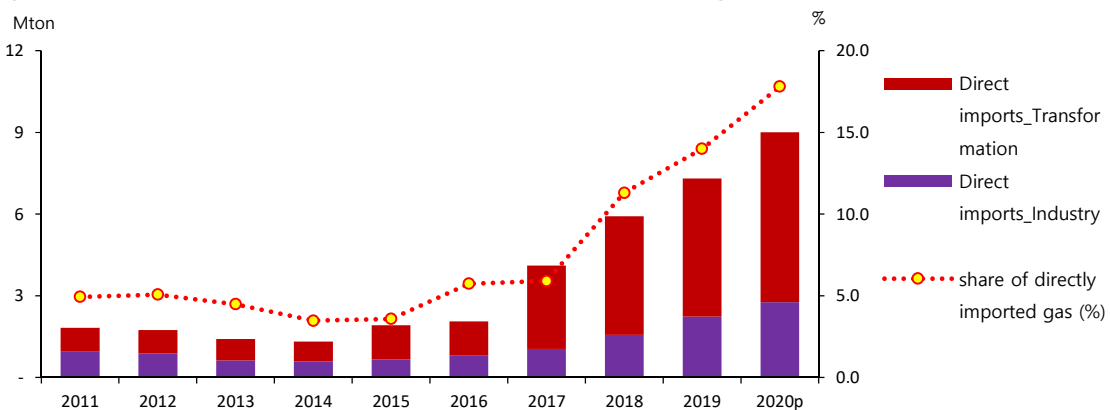
- **Driven by reduced fuel unit cost for natural gas generation and increased volume of renewable power generation, the share of coal generation is expected to continuously reduce**
  - With natural gas price fall and increased volume of direct imports, the gap between fuel unit costs for coal and gas power generation has narrowed greatly

**Figure 3.5 Fuel unit cost for major power sources**



- Direct imports of natural gas, which increased recently at a great speed, are likely to keep growing for a good while to become a factor in the decline of coal power generation, as LNG import price is anticipated to stay lower compared to the historical level

**Figure 3.6 Volume and share of directly imported natural gas (%)**



- Coal-fired power plant shutdown and generation ceiling measures for climate and environment presentation, as well as a rise in renewable power have been playing an important role in the decline of coal power generation

# The Main Indicator and Energy Outlook Result

## Main Economic and Energy Indicators

	2017	2018	2019			2020p			2021e		
			1H	2H		1H	2H		1H	2H	
Economy and Population											
GDP (2010 trillion won)	1 760.8	1 812.0	898.4	950.5	1 849.0	891.9	939.3	1 831.2	915.1	971.3	1 886.4
Industrial Production(2010=100)	104.8	106.4	103.9	109.5	106.7	103.0	109.6	106.3	105.1	111.4	108.3
Crude Oil Price (Dubai, USD/bbl)	53.2	69.4	65.5	61.6	63.5	40.7	43.8	42.2	60.0	60.8	60.4
Working Days	269.5	270.0	134.0	138.5	272.5	136.0	139.0	275.0	135.0	141.0	276.0
Population (million)	51.4	51.6	51.7	51.7	51.7	51.8	51.8	51.8	51.8	51.8	51.8
Average Temperature (°C)	13.1	13.0	10.4	16.7	13.5	11.0	15.5	13.3	10.8	16.1	13.4
Cooling Degree days	132.7	209.0	-	120.4	120.4	3.7	88.8	92.5	-	104.1	104.1
Heating Degree days	2 517.1	2 597.8	1 511.5	831.4	2 342.9	1 439.3	943.4	2 382.7	1 444.7	913.9	2 358.6
Energy Indicators											
Total Primary Energy Demand (Mtoe)	302.1	307.6	151.2	151.9	303.1	145.1	145.8	290.8	149.7	153.4	303.1
Energy Intensity (toe/million won)	0.172	0.170	0.169	0.160	0.164	0.163	0.155	0.159	0.164	0.158	0.161
TPED/capita (toe/capita)	5.881	5.960	2.924	2.938	5.862	2.802	2.815	5.617	2.889	2.961	5.850
Electricity Generation (TWh)	553.5	570.6	277.1	285.9	563.0	270.1	282.0	552.1	286.2	291.2	577.4
Electricity Generation/capita (MWh/capita)	10.8	11.1	5.4	5.5	10.9	5.2	5.4	10.7	5.5	5.6	11.1
Electricity Demand/capita (MWh/capita)	9.9	10.2	5.0	5.0	10.1	4.9	5.0	9.8	5.0	5.1	10.2

## Energy Demand

	2017	2018	2019			2020p			2021e		
			1H	2H		1H	2H		1H	2H	
Total Primary Energy Supply											
Coal (Mton)	139.8	141.1	63.0	70.0	133.0	55.9	60.7	116.6	56.0	60.0	116.0
Oil (Mbbl)	937.1	931.8	454.8	472.2	927.1	441.5	431.8	873.3	443.4	482.3	925.7
Gas (Bm³)	36.4	42.3	21.4	19.6	41.0	20.9	20.6	41.4	23.5	19.8	43.3
Hydro (TWh)	7.0	7.3	3.0	3.2	6.2	3.2	4.0	7.1	3.0	4.2	7.2
Nuclear (TWh)	148.4	133.5	79.8	66.1	145.9	82.1	78.1	160.2	83.1	88.3	171.4
Other Renewables (Mtoe)	15.8	17.1	8.9	8.8	17.7	9.2	9.2	18.4	10.4	10.2	20.6
Total (Mtoe)	302.1	307.6	151.2	151.9	303.1	145.1	145.8	290.8	149.7	153.4	303.1
Coal	86.2	86.7	39.0	43.2	82.1	34.7	37.6	72.4	34.6	37.1	71.7
Oil	119.4	118.5	57.7	59.6	117.3	55.7	54.6	110.3	55.7	60.6	116.3
Gas	47.5	55.2	28.0	25.6	53.5	27.3	26.8	54.1	30.7	25.9	56.5
Nuclear	1.5	1.5	0.6	0.7	1.3	0.7	0.8	1.5	0.6	0.9	1.5
Hydro	31.6	28.4	17.0	14.1	31.1	17.5	16.6	34.1	17.7	18.8	36.5
Other Renewables	15.8	17.1	8.9	8.8	17.7	9.2	9.2	18.4	10.4	10.2	20.6
Total Final Consumption											
Coal (Mton)	50.4	49.3	24.1	24.1	48.2	22.0	23.8	45.8	23.9	24.0	47.9
Oil (Mbbl)	926.6	920.0	449.8	468.7	918.5	438.9	428.2	867.1	441.2	478.7	919.8
Gas (Bm³)	22.6	24.3	13.6	9.6	23.3	12.7	9.8	22.5	13.3	9.8	23.1
Electricity (TWh)	507.7	526.1	259.9	260.6	520.5	252.3	257.0	509.3	261.1	265.1	526.2
Heat (Mtoe)	2.4	2.7	1.6	1.0	2.6	1.5	1.1	2.7	1.6	1.1	2.7
Other Renewables (Mtoe)	8.6	9.1	4.5	4.5	8.9	4.4	4.4	8.8	4.4	4.5	8.9
Total (Mtoe)	230.6	233.4	116.8	114.6	231.4	112.5	109.5	222.0	115.2	116.6	231.8
Coal	33.4	32.5	16.0	16.0	32.1	14.7	15.9	30.6	15.6	15.8	31.4
Oil	117.9	116.8	57.0	59.1	116.1	55.4	54.1	109.5	55.4	60.1	115.5
Gas	24.6	27.0	15.3	11.5	26.9	14.8	11.9	26.7	15.7	12.3	28.1
Electricity	43.7	45.2	22.3	22.4	44.8	21.7	22.1	43.8	22.5	22.8	45.3
Heat	2.4	2.7	1.6	1.0	2.6	1.5	1.1	2.7	1.6	1.1	2.7
Other Renewables	8.6	9.1	4.5	4.5	8.9	4.4	4.4	8.8	4.4	4.5	8.9
Industry	142.5	143.5	70.4	72.5	142.9	68.7	68.7	137.4	70.3	74.1	144.3
Transport	42.8	43.0	21.5	21.5	43.0	19.1	19.8	38.9	19.5	21.3	40.8
Buildings	45.3	46.9	24.9	20.5	45.5	24.7	21.0	45.7	25.5	21.2	46.7

## Energy Demand

(yoy, %)

	2017	2018	2019			2020			2021e		
			1H	2H		1H	2H		1H	2H	
<b>Total Primary Energy Supply</b>											
Coal (Mton)	8.1	0.9	-8.6	-2.9	-5.7	-11.3	-13.3	-12.4	0.1	-1.1	-0.5
Oil (Mbbbl)	1.7	-0.6	-2.5	1.5	-0.5	-2.9	-8.6	-5.8	0.4	11.7	6.0
Gas (Bm <sup>3</sup> )	4.3	16.2	-5.2	-0.6	-3.1	-2.5	5.0	1.1	12.4	-3.6	4.5
Hydro (TWh)	5.5	3.9	-11.5	-16.3	-14.1	5.7	22.6	14.4	-5.9	7.3	1.4
Nuclear (TWh)	-8.4	-10.1	33.1	-10.2	9.3	2.8	18.2	9.8	1.3	13.0	7.0
Other Renewables (Mtoe)	16.7	8.0	5.4	1.3	3.3	4.0	3.9	4.0	12.8	11.3	12.1
<b>Total (Mtoe)</b>	<b>2.8</b>	<b>1.8</b>	<b>-1.3</b>	<b>-1.6</b>	<b>-1.5</b>	<b>-4.0</b>	<b>-4.0</b>	<b>-4.0</b>	<b>3.2</b>	<b>5.3</b>	<b>4.2</b>
Coal	5.7	0.6	-8.1	-2.6	-5.3	-10.9	-12.9	-11.9	-0.4	-1.5	-1.0
Oil	1.5	-0.7	-2.6	0.6	-1.0	-3.6	-8.3	-6.0	-0.0	10.9	5.4
Gas	4.4	16.2	-5.2	-0.6	-3.1	-2.5	5.0	1.1	12.4	-3.6	4.5
Nuclear	6.5	3.9	-11.5	-16.3	-14.1	5.7	22.6	14.4	-5.9	7.3	1.4
Hydro	-7.5	-10.1	33.1	-10.2	9.3	2.8	18.2	9.8	1.3	13.0	7.0
Other Renewables	16.7	8.0	5.4	1.3	3.3	4.0	3.9	4.0	12.8	11.3	12.1
<b>Total Final Consumption</b>											
Coal (Mton)	2.7	-2.1	-1.0	-3.4	-2.2	-8.9	-1.0	-4.9	8.6	0.8	4.5
Oil (Mbbbl)	3.0	-0.7	-2.1	1.7	-0.2	-2.4	-8.6	-5.6	0.5	11.8	6.1
Gas (Bm <sup>3</sup> )	6.3	7.4	-2.8	-6.0	-4.1	-6.7	1.2	-3.4	4.6	0.6	2.9
Electricity (TWh)	2.2	3.6	-0.7	-1.5	-1.1	-2.9	-1.4	-2.2	3.5	3.1	3.3
Heat (Mtoe)	11.8	9.9	-1.4	-1.3	-1.3	-4.3	7.6	0.4	2.9	-0.4	1.5
Other Renewables (Mtoe)	20.4	5.5	-1.5	-2.9	-2.2	-0.9	-1.8	-1.4	0.2	2.5	1.4
<b>Total (Mtoe)</b>	<b>3.9</b>	<b>1.2</b>	<b>-1.2</b>	<b>-0.6</b>	<b>-0.9</b>	<b>-3.7</b>	<b>-4.4</b>	<b>-4.0</b>	<b>2.4</b>	<b>6.5</b>	<b>4.4</b>
Coal	3.1	-2.6	-0.2	-2.4	-1.3	-8.2	-1.1	-4.6	6.3	-0.5	2.8
Oil	3.1	-0.9	-2.1	0.9	-0.6	-3.0	-8.4	-5.7	0.1	11.0	5.5
Gas	6.0	9.7	0.9	-2.5	-0.6	-3.7	3.8	-0.5	6.4	3.4	5.0
Electricity	2.2	3.6	-0.7	-1.5	-1.1	-2.9	-1.4	-2.2	3.5	3.1	3.3
Heat	11.8	9.9	-1.4	-1.3	-1.3	-4.3	7.6	0.4	2.9	-0.4	1.5
Other Renewables	20.4	5.5	-1.5	-2.9	-2.2	-0.9	-1.8	-1.4	0.2	2.5	1.4
Industry	5.0	0.7	-1.3	0.5	-0.4	-2.4	-5.3	-3.8	2.2	7.9	5.0
Transport	1.2	0.4	1.8	-1.7	0.0	-11.1	-7.7	-9.4	2.1	7.6	4.9
Buildings	3.1	3.5	-3.2	-2.9	-3.1	-1.1	2.3	0.5	3.2	0.9	2.1



## Energy Demand by Sector

(Mtoe)

	2017	2018	2019			2020p			2021e		
			1H	2H		1H	2H		1H	2H	
<b>Industry</b>	<b>142.5</b>	<b>143.5</b>	<b>70.4</b>	<b>72.5</b>	<b>142.9</b>	<b>68.7</b>	<b>68.7</b>	<b>137.4</b>	<b>70.3</b>	<b>74.1</b>	<b>144.3</b>
Coal	32.8	32.0	15.9	15.9	31.8	14.6	15.7	30.3	15.5	15.6	31.1
Oil	69.8	69.3	33.4	35.9	69.2	33.8	32.5	66.3	33.7	37.1	70.7
Gas	9.4	11.1	5.9	5.6	11.4	5.7	5.8	11.4	6.0	6.1	12.1
Electricity	23.8	24.4	12.1	12.0	24.1	11.4	11.7	23.1	11.9	12.2	24.1
Heat	-	-	-	-	-	-	-	-	-	-	-
Other Renewables	6.6	6.7	3.2	3.2	6.4	3.2	3.1	6.2	3.2	3.1	6.3
<b>Transport</b>	<b>42.8</b>	<b>43.0</b>	<b>21.5</b>	<b>21.5</b>	<b>43.0</b>	<b>19.1</b>	<b>19.8</b>	<b>38.9</b>	<b>19.5</b>	<b>21.3</b>	<b>40.8</b>
Coal	-	-	-	-	-	-	-	-	-	-	-
Oil	40.9	40.8	20.4	20.4	40.8	18.1	18.8	36.9	18.5	20.2	38.7
Gas	1.3	1.2	0.6	0.6	1.2	0.5	0.6	1.1	0.6	0.6	1.2
Electricity	0.2	0.3	0.1	0.1	0.3	0.1	0.1	0.2	0.1	0.1	0.2
Heat	-	-	-	-	-	-	-	-	-	-	-
Other Renewables	0.4	0.7	0.4	0.3	0.7	0.3	0.4	0.7	0.3	0.4	0.7
<b>Buildings*</b>	<b>45.3</b>	<b>46.9</b>	<b>24.9</b>	<b>20.5</b>	<b>45.5</b>	<b>24.7</b>	<b>21.0</b>	<b>45.7</b>	<b>25.5</b>	<b>21.2</b>	<b>46.7</b>
Coal	0.5	0.4	0.1	0.2	0.3	0.1	0.2	0.2	0.1	0.2	0.3
Oil	7.2	6.8	3.3	2.8	6.1	3.4	2.9	6.3	3.3	2.8	6.0
Gas	14.0	14.7	8.9	5.3	14.2	8.6	5.6	14.2	9.1	5.7	14.8
Electricity	19.6	20.6	10.2	10.3	20.5	10.1	10.3	20.5	10.5	10.5	20.9
Heat	2.4	2.7	1.6	1.0	2.6	1.5	1.1	2.7	1.6	1.1	2.7
Other Renewables	1.6	1.7	0.9	0.9	1.8	0.9	1.0	1.9	0.9	1.0	1.9
<b>Transform</b>	<b>140.8</b>	<b>147.1</b>	<b>72.4</b>	<b>70.7</b>	<b>143.1</b>	<b>68.9</b>	<b>69.5</b>	<b>138.4</b>	<b>72.2</b>	<b>70.8</b>	<b>143.0</b>
Coal	52.8	54.2	23.0	27.1	50.1	20.0	21.8	41.8	19.0	21.3	40.2
Oil	1.5	1.7	0.7	0.5	1.2	0.3	0.5	0.8	0.3	0.5	0.8
Gas	46.2	53.2	26.7	24.0	50.6	25.6	24.9	50.5	28.6	23.6	52.3
Nuclear	31.6	28.4	17.0	14.1	31.1	17.5	16.6	34.1	17.7	18.8	36.5
Hydro	1.5	1.5	0.6	0.7	1.3	0.7	0.8	1.5	0.6	0.9	1.5
Renewables	7.2	8.0	4.4	4.4	8.8	4.8	4.8	9.6	6.0	5.7	11.7

\* include residential, commercial, public-etc usage

## Coal

(Mton)

	2017	2018	2019			2020p			2021e		
			1H	2H		1H	2H		1H	2H	
<b>Total Coal Demand</b>	<b>139.8</b>	<b>141.1</b>	<b>63.0</b>	<b>70.0</b>	<b>133.0</b>	<b>55.9</b>	<b>60.7</b>	<b>116.6</b>	<b>56.0</b>	<b>60.0</b>	<b>116.0</b>
Transform	89.4	91.8	38.9	45.9	84.8	33.9	36.8	70.7	32.1	36.0	68.1
Power Generation	89.4	91.8	38.9	45.9	84.8	33.9	36.8	70.7	32.1	36.0	68.1
Heat	-	-	-	-	-	-	-	-	-	-	-
Gas Manufacture	-	-	-	-	-	-	-	-	-	-	-
<b>Total Final Consumption</b>	<b>50.4</b>	<b>49.3</b>	<b>24.1</b>	<b>24.1</b>	<b>48.2</b>	<b>22.0</b>	<b>23.8</b>	<b>45.8</b>	<b>23.9</b>	<b>24.0</b>	<b>47.9</b>
Industry	49.3	48.4	23.9	23.7	47.6	21.8	23.5	45.3	23.7	23.7	47.4
Transport	-	-	-	-	-	-	-	-	-	-	-
Buildings	1.1	0.9	0.2	0.4	0.6	0.2	0.3	0.5	0.2	0.3	0.5
<b>Consumption by products</b>											
Anthracite	8.3	9.3	4.2	3.7	7.9	3.3	3.9	7.2	3.7	4.0	7.7
Bituminous	131.5	131.8	58.8	66.3	125.1	52.6	56.8	109.4	52.3	56.0	108.3
Iron making	36.3	34.6	17.3	17.7	35.0	16.3	17.5	33.8	17.8	17.7	35.4
Cement	4.2	3.7	2.0	2.0	4.0	1.7	1.7	3.4	1.6	1.6	3.2
Power Generation	88.3	90.8	38.3	45.4	83.6	33.4	36.4	69.8	31.8	35.6	67.4

## Oil

(Mbbbl)

	2017	2018	2019			2020p			2021e		
			1H	2H		1H	2H		1H	2H	
<b>Total Oil Demand</b>	<b>937.1</b>	<b>931.8</b>	<b>454.8</b>	<b>472.2</b>	<b>927.1</b>	<b>441.5</b>	<b>431.8</b>	<b>873.3</b>	<b>443.4</b>	<b>482.3</b>	<b>925.7</b>
Transform	10.5	11.7	5.0	3.6	8.6	2.6	3.6	6.2	2.3	3.6	5.9
Power Generation	8.1	8.6	3.4	2.3	5.7	1.0	2.4	3.4	0.5	1.8	2.3
Heat	1.2	1.1	1.0	0.7	1.7	1.0	0.7	1.7	1.1	1.3	2.4
Gas Manufacture	1.2	2.0	0.6	0.6	1.2	0.6	0.6	1.1	0.6	0.6	1.2
<b>Total Final Consumption</b>	<b>926.6</b>	<b>920.0</b>	<b>449.8</b>	<b>468.7</b>	<b>918.5</b>	<b>438.9</b>	<b>428.2</b>	<b>867.1</b>	<b>441.2</b>	<b>478.7</b>	<b>919.8</b>
Industry	567.0	564.1	272.2	294.1	566.2	277.5	265.5	543.0	276.7	304.2	580.9
Transport	303.2	302.3	151.3	151.8	303.2	134.3	139.7	273.9	137.1	150.7	287.8
Buildings	56.4	53.7	26.3	22.8	49.1	27.1	22.9	50.1	27.3	23.7	51.1
<b>Consumption by products</b>											
Gasoline	79.6	79.7	40.6	42.1	82.7	38.8	42.2	81.0	40.1	44.1	84.2
Diesel (including Transformation)	165.9	164.1	83.1	83.8	166.9	77.5	81.5	159.0	80.2	85.7	165.9
Kerosene (including Transformation)	19.0	18.9	9.2	7.9	17.1	9.4	7.6	17.0	9.5	7.7	17.2
B-C (including Transformation)	35.8	33.7	13.8	10.2	24.0	11.9	11.9	23.7	11.4	10.3	21.7
Jet Oil	38.2	39.9	19.5	19.4	38.8	11.6	10.1	21.7	10.1	15.5	25.6
LPG (including Transformation)	105.1	109.4	55.9	66.2	122.1	60.9	61.5	122.4	64.2	69.5	133.8
Naphtha	458.4	451.2	215.3	223.3	438.6	210.7	194.6	405.3	210.8	228.4	439.2
Other Non-Energy	35.1	35.1	17.3	19.4	36.7	20.7	22.6	43.3	17.1	21.0	38.1

## Gas

	2017	2018	2019			2020p			2021e		
			1H	2H		1H	2H		1H	2H	
<b>Total Gas Demand (Mton)</b>	<b>36.4</b>	<b>42.3</b>	<b>21.4</b>	<b>19.6</b>	<b>41.0</b>	<b>20.9</b>	<b>20.6</b>	<b>41.4</b>	<b>23.5</b>	<b>19.8</b>	<b>43.3</b>
Transform	35.3	40.7	20.4	18.4	38.8	19.6	19.1	38.7	21.9	18.1	40.0
Power Generation	15.2	18.5	8.7	9.3	17.9	8.7	9.9	18.6	10.2	9.2	19.5
Heat	1.7	2.3	1.0	0.9	1.9	0.9	0.8	1.8	0.9	0.8	1.8
Gas Manufacture	18.5	20.0	10.7	8.2	18.9	9.9	8.4	18.3	10.8	8.0	18.8
Industry	1.0	1.6	1.0	1.2	2.2	1.3	1.5	2.8	1.6	1.7	3.3
<b>City Gas (Bm<sup>3</sup>)</b>	<b>22.6</b>	<b>24.3</b>	<b>13.6</b>	<b>9.6</b>	<b>23.3</b>	<b>12.7</b>	<b>9.8</b>	<b>22.5</b>	<b>13.3</b>	<b>9.8</b>	<b>23.1</b>
Industry*	7.8	8.8	4.4	3.9	8.3	3.9	3.7	7.6	3.9	3.7	7.6
Transport	1.2	1.2	0.6	0.6	1.2	0.5	0.6	1.1	0.6	0.6	1.1
Buildings	13.6	14.3	8.6	5.2	13.8	8.3	5.5	13.8	8.9	5.5	14.4

\* exclude industrial LNG usage

## Electricity

(TWh)

	2017	2018	2019			2020p			2021e		
			1H	2H		1H	2H		1H	2H	
<b>Net Electricity Demand</b>	<b>553.5</b>	<b>570.6</b>	<b>277.1</b>	<b>285.9</b>	<b>563.0</b>	<b>270.1</b>	<b>282.0</b>	<b>552.1</b>	<b>286.2</b>	<b>291.2</b>	<b>577.4</b>
Own use and Losses	45.8	44.5	17.3	25.3	42.5	17.9	25.0	42.8	25.0	26.1	51.2
<b>Total Final Consumption</b>	<b>507.7</b>	<b>526.1</b>	<b>259.9</b>	<b>260.6</b>	<b>520.5</b>	<b>252.3</b>	<b>257.0</b>	<b>509.3</b>	<b>261.1</b>	<b>265.1</b>	<b>526.2</b>
Industry	276.7	283.7	140.2	139.6	279.8	133.0	135.7	268.7	138.1	141.7	279.8
Transport	2.8	3.0	1.4	1.5	2.9	1.3	1.4	2.7	1.4	1.5	2.9
Buildings	228.3	239.5	118.2	119.6	237.8	117.9	119.9	237.8	121.6	121.9	243.5
<b>Installed Electrical Capacity (GW)*</b>	<b>450.1</b>	<b>470.1</b>	<b>239.8</b>	<b>246.8</b>	<b>486.6</b>	<b>252.5</b>	<b>256.7</b>	<b>509.2</b>	<b>260.6</b>	<b>269.5</b>	<b>530.1</b>
Coal	138.8	147.5	74.0	74.0	148.0	74.1	73.7	147.8	74.0	76.4	150.4
Oil	16.6	16.9	7.7	7.7	15.5	4.2	4.3	8.5	4.5	4.5	9.0
Gas	144.4	150.8	76.0	77.7	153.7	82.3	82.3	164.7	82.3	82.3	164.7
Nuclear	91.1	88.5	43.7	46.0	89.7	46.5	46.5	93.0	46.5	49.3	95.8
Hydro	25.9	26.0	13.0	13.0	26.0	13.0	13.0	26.0	13.0	13.0	26.0
Other Renewables	33.3	40.4	25.4	28.3	53.7	32.4	36.8	69.2	40.3	44.0	84.2
<b>Electricity Generation of Power Plants*</b>	<b>553.5</b>	<b>570.6</b>	<b>277.1</b>	<b>285.9</b>	<b>563.0</b>	<b>270.1</b>	<b>282.0</b>	<b>552.1</b>	<b>286.2</b>	<b>291.2</b>	<b>577.4</b>
Coal	238.8	238.4	104.2	123.2	227.4	94.1	102.1	196.3	90.3	102.4	192.7
Oil	5.3	5.7	1.8	1.4	3.3	0.8	1.4	2.3	0.5	1.1	1.6
Gas	126.0	153.5	70.2	74.1	144.4	69.5	76.6	146.1	84.0	71.7	155.6
Nuclear	148.4	133.5	79.8	66.1	145.9	82.1	78.1	160.2	83.1	88.3	171.4
Hydro	7.0	7.3	3.0	3.2	6.2	3.3	4.0	7.3	3.0	4.2	7.2
Other Renewables	28.0	32.2	18.0	17.9	35.9	20.3	19.8	40.1	25.2	23.6	48.8
<b>Fuel Consumption of Power Plants (Mtoe)*</b>	<b>114.1</b>	<b>117.7</b>	<b>56.8</b>	<b>58.7</b>	<b>115.6</b>	<b>54.5</b>	<b>57.3</b>	<b>111.8</b>	<b>56.7</b>	<b>59.0</b>	<b>115.8</b>
Coal	52.8	54.2	23.0	27.1	50.1	20.0	21.8	41.8	19.0	21.3	40.2
Oil	1.2	1.3	0.5	0.3	0.8	0.1	0.4	0.5	0.1	0.3	0.3
Gas	19.8	24.2	11.3	12.1	23.4	11.4	12.9	24.3	13.3	12.1	25.4
Nuclear	31.6	28.4	17.0	14.1	31.1	17.5	16.6	34.1	17.7	18.8	36.5
Hydro	1.5	1.5	0.6	0.7	1.3	0.7	0.8	1.5	0.6	0.9	1.5
Other Renewables	7.2	8.0	4.4	4.4	8.8	4.8	4.8	9.6	6.0	5.7	11.7

\* District Heat is classified by fuel type since 2014

## Heat and Other Renewables

(Mtoe)

	2017	2018	2019			2020p			2021e		
			1H	2H		1H	2H		1H	2H	
<b>Net Heat Demand</b>	<b>2.4</b>	<b>2.6</b>	<b>1.6</b>	<b>1.1</b>	<b>2.6</b>	<b>1.5</b>	<b>1.1</b>	<b>2.6</b>	<b>1.5</b>	<b>1.1</b>	<b>2.6</b>
Own use and Losses	0.0	- 0.0	- 0.0	0.0	0.0	- 0.0	- 0.0	- 0.1	- 0.1	- 0.0	- 0.1
<b>Total Final Consumption</b>	<b>2.4</b>	<b>2.7</b>	<b>1.6</b>	<b>1.0</b>	<b>2.6</b>	<b>1.5</b>	<b>1.1</b>	<b>2.7</b>	<b>1.6</b>	<b>1.1</b>	<b>2.7</b>
Industry	-	-	-	-	-	-	-	-	-	-	-
Transport	-	-	-	-	-	-	-	-	-	-	-
Buildings	2.4	2.7	1.6	1.0	2.6	1.5	1.1	2.7	1.6	1.1	2.7
<b>Heat Production by fuel</b>											
Coal	-	-	-	-	-	-	-	-	-	-	-
Oil	1.5	1.7	1.0	0.7	1.7	1.0	0.7	1.7	1.1	0.7	1.8
Gas	1.0	0.9	0.5	0.4	0.9	0.5	0.4	0.9	0.5	0.4	0.9
Nuclear	-	-	-	-	-	-	-	-	-	-	-
Hydro	-	-	-	-	-	-	-	-	-	-	-
Other Renewables	-	-	-	-	-	-	-	-	-	-	-
<b>Fuel Consumption of District Heat</b>											
Coal	-	-	-	-	-	-	-	-	-	-	-
Oil	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.3
Gas	2.2	2.9	1.3	1.2	2.5	1.2	1.1	2.3	1.2	1.1	2.3
Nuclear	-	-	-	-	-	-	-	-	-	-	-
Hydro	-	-	-	-	-	-	-	-	-	-	-
Other Renewables	-	-	-	-	-	-	-	-	-	-	-
<b>Other Renewables</b>	<b>17.3</b>	<b>18.7</b>	<b>9.5</b>	<b>9.5</b>	<b>19.0</b>	<b>9.9</b>	<b>10.0</b>	<b>19.9</b>	<b>11.0</b>	<b>11.1</b>	<b>22.2</b>
Hydro	1.5	1.5	0.6	0.7	1.3	0.7	0.8	1.5	0.6	0.9	1.5
Transform	7.2	8.0	4.4	4.4	8.8	4.8	4.8	9.6	6.0	5.7	11.7
<b>Total Final Consumption</b>	<b>8.6</b>	<b>9.1</b>	<b>4.5</b>	<b>4.5</b>	<b>8.9</b>	<b>4.4</b>	<b>4.4</b>	<b>8.8</b>	<b>4.4</b>	<b>4.5</b>	<b>8.9</b>
Industry	6.6	6.7	3.2	3.2	6.4	3.2	3.1	6.2	3.2	3.1	6.3
Transport	0.4	0.7	0.4	0.3	0.7	0.3	0.4	0.7	0.3	0.4	0.7
Buildings	1.6	1.7	0.9	0.9	1.8	0.9	1.0	1.9	0.9	1.0	1.9

