

Summary of China's energy and power sector statistics in 2023

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Summary of China's Energy and Power Sector Statistics is one of the research products of the China Energy Transformation (CET) programme. It is published annually as the March special issue of the *China Energy Policy Newsletter*. The *Summary* summarises the annual statistical data on China's energy and electricity supply and consumption in the previous year, especially the development of wind power and solar PV. Starting from 2022, the *Summary* has added sections on new-type energy storage, hydrogen energy, and power market, describing the results of emerging technologies and market-based means that support the realisation of dual-carbon goals, aiming to present the progress of China's energy transition more comprehensively. The data in the *Summary* are all statistics based on the coal substitution method and released by government departments. The *Summary (2023 version)* adds new data on the development of the EV industry, as well as an outlook and analysis of the development of the wind power and solar PV industry in 2024. Please download the 2019-2022 *Summary* from the [CET website](#).



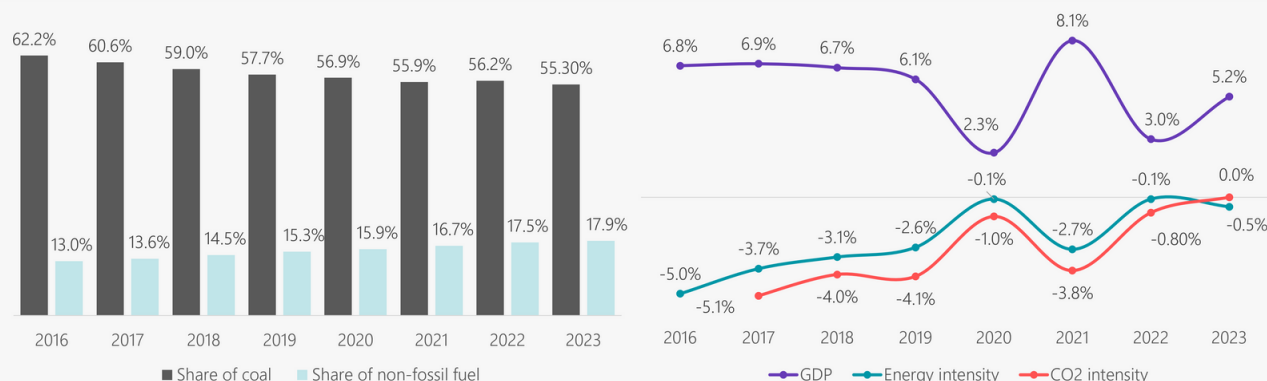
Steady increase of non-fossil energy consumption

In 2023, the GDP growth rate reached 5.2%, a year-on-year increase of 2.2 percentage points, and China's economy and society have fully resumed normal operation. The GDP growth rate of the secondary and tertiary industries increased significantly. The ratio of the three industries remained stable (7.1:38.3:54.6). The total primary energy consumption was 5.7 billion tons of standard coal equivalent (tce), a year-on-year increase of 5.7%, an increase of 2.8 percentage points from 2022, and slightly higher than the GDP growth rate. Energy consumption is growing faster than expected. **Raw coal consumption continued to increase**, with a year-on-year growth rate of 5.6%, a 1.3 percentage points increase from the previous year. The demand of coal for power generation and chemical industry was strong in 2023. Affected by insufficient hydropower output, thermal power coal consumption increased by 6% year-on-year, highlighting the role of coal in ensuring the power supply. The rising prices of coal chemical products drove chemical coal consumption, with the year-on-year growth rate reaching 4.6%. **Natural gas and crude oil consumption rebounded**, with year-on-year growth rates reaching 7.2% and 9.1% respectively.

Despite this, the proportion of non-fossil energy (+0.4 pct)¹ continued to increase, and energy intensity (-0.5%) maintained a downward trend. The proportion of coal in total primary energy consumption dropped by 0.9 percentage points to 55.3%, and the carbon dioxide intensity remained the same as in 2022. China's low-carbon energy transformation is progressing orderly, but it still faces challenges in continuously reducing fossil energy consumption. [1][5][10][19][20]

” Non-fossil fuel accounted for about **17.9%** of total primary energy consumption, a year-on-year increase of 0.4 percentage points.

2016-2023 The proportion of coal and non-fossil energy in total primary energy consumption (left);
2016-2023 The annual growth rate of GDP, energy consumption intensity and carbon intensity (right)



Note: Energy consumption intensity refers to energy consumption per RMB 10,000 GDP; carbon intensity refers to CO₂ emission per RMB 10,000 GDP.

Source: National Bureau of Statistics (NBS), accessed in March 2024

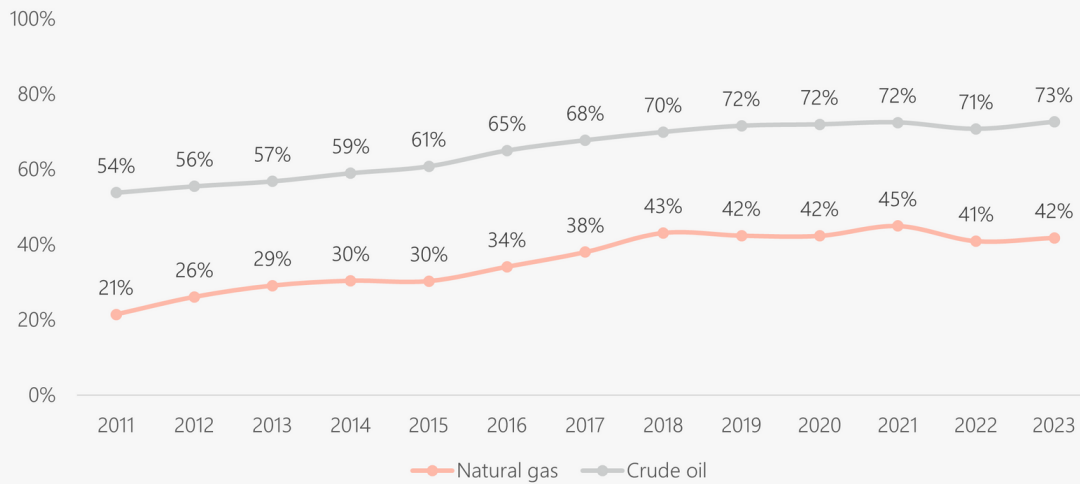
Enhancement of energy security and stable supply capabilities

China continues to increase energy production capacity and consolidate the foundation of energy security. In 2023, China's total primary energy production reached 4.8 billion tce, a year-on-year increase of 4.2%, a drop of 5 percentage points from 2022. **Coal supply and demand were generally loose, with adequate thermal coal stocks.** The growth rate of raw coal production was 3.4%, a year-on-year decrease of 7.1 percentage points. After two consecutive years of rapid production increases in 2021 (4.7%) and 2022 (10.5%), the growth rate of raw coal production has slowed down, and new production capacity has been further concentrated in Shanxi, Shaanxi, Inner Mongolia, and Xinjiang. At the same time, coal exports from Australia and other countries to China increased significantly, and coal imports increased by 61.8% year-on-year, of which nearly 80% were thermal coal. Increased imports have driven down domestic coal prices, with the average annual price of Bohai rim steam coal (5,500K) falling by 1/4 year-on-year. The number of days available for the national dispatchable thermal coal inventory reached a historical high of 26 days.

¹ Calculated based on the data issued in the 2023 *National Economic and Social Development Statistic Report of the People's Republic of China*.

Imports of natural gas and crude oil increased significantly, and costs decreased. Natural gas production increased by 5.6% year-on-year, 0.4 percentage points lower than in 2022. Coal-bed methane became an important supplement, accounting for 5% of natural gas production; import volume turned negative to positive, with a year-on-year growth of 9.9%, of which 60% was liquefied natural gas (LNG). Crude oil production reached the highest level since 2016, with a year-on-year increase of 2.1%; imports reached a record high, with a year-on-year increase of 11%. Both natural gas and crude oil import dependence hrebounded. However, as global fossil energy prices fell, natural gas and crude oil import expenditures decreased by 3.4% and 2.6% year-on-year, respectively. [2][3][4][5][6][19]

2011-2023 Import dependence on natural gas and crude oil



Note: The import dependence of a specific fuel is calculated by the formula of (annual fuel consumption – annual fuel production) / annual fuel consumption.

Source: NBS, accessed in March 2024

Total electricity consumption rebounds significantly

In 2023, China's total electricity consumption reached 9,224 TWh, a year-on-year increase of 6.7%, an increase of 3.1 percentage points from 2022. **In terms of industries**, the recovery of the national economy drove the growth rate of electricity consumption in the secondary industry to increase from 1.2% to 6.5% and the tertiary industry to increase from 4.4% to 12.2%. The growth rate of electricity consumption in the primary industry remained stable at more than 10%, and the electricity consumption of urban and rural residents remained the same as in 2022. The share of electricity in end-use energy consumption reached about 27%, slightly higher than in 2022. **In terms of regions**, electricity consumption in all 31 provinces across the country showed positive growth, with Western (8.1%), Eastern (6.9%), Northeast (5.1%) and Central China (4.3%) having the most significant year-on-year growth rates. [8][12][14]



Primary industry - The main driving forces were rural power grid retrofit and rural electrification. The electricity consumption of the livestock industry increased by 18.3% year-on-year.

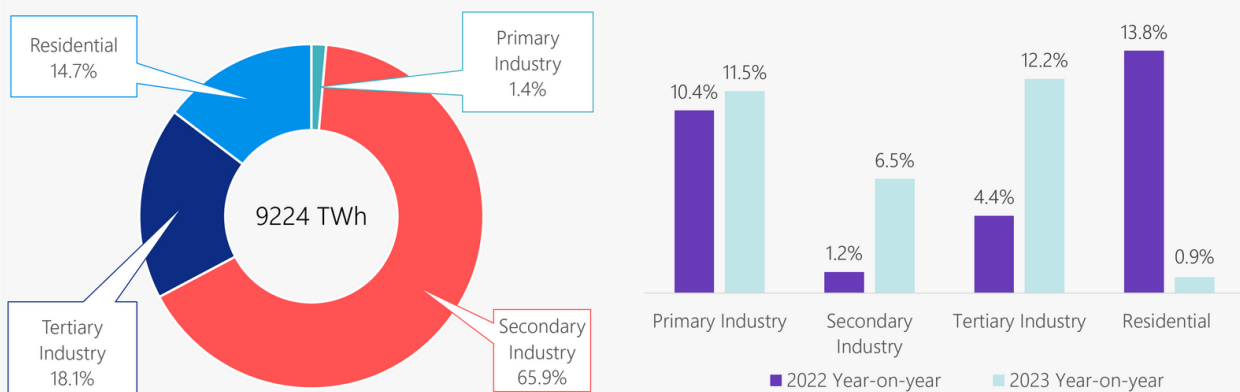


Secondary industry - The growth rate of electricity consumption in the high-tech and equipment manufacturing industry continued to lead, reaching 11.3%; the electricity consumption in the fuel processing industry increased by more than 10% year-on-year in each quarter; the end-use consumer goods market gradually recovered, making the electricity consumption growth in the consumer goods manufacturing industry reached 7% year-on-year.



Tertiary industry - The service industry recovered steadily, with electricity consumption in the four major industries² growing at a year-on-year rate of 14%-18%; the rapid development of EVs drove the growth rate of electricity consumption in the charging and swapping service industry to 78.1%, compared with 2022, an annual increase of 40 percentage points.

2023 The electricity consumption mix in China (left); 2022-2023 The year-on-year growth rate of electricity consumption by industry (right)



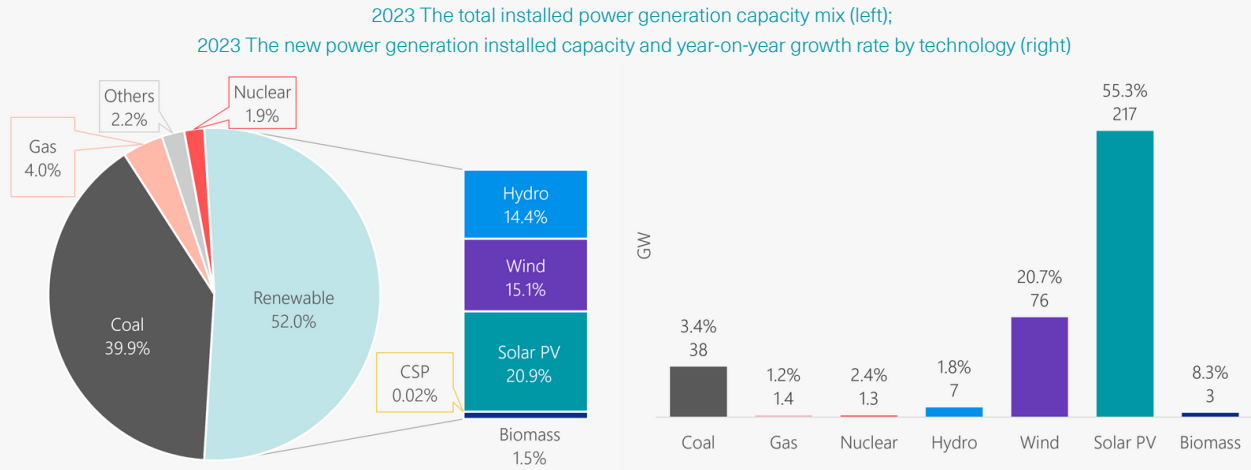
Source: China Electricity Council (CEC) and National Energy Administration (NEA), accessed in January 2024

² Wholesale and retail, accommodation and catering, leasing and business services, transportation/warehousing and postal services.

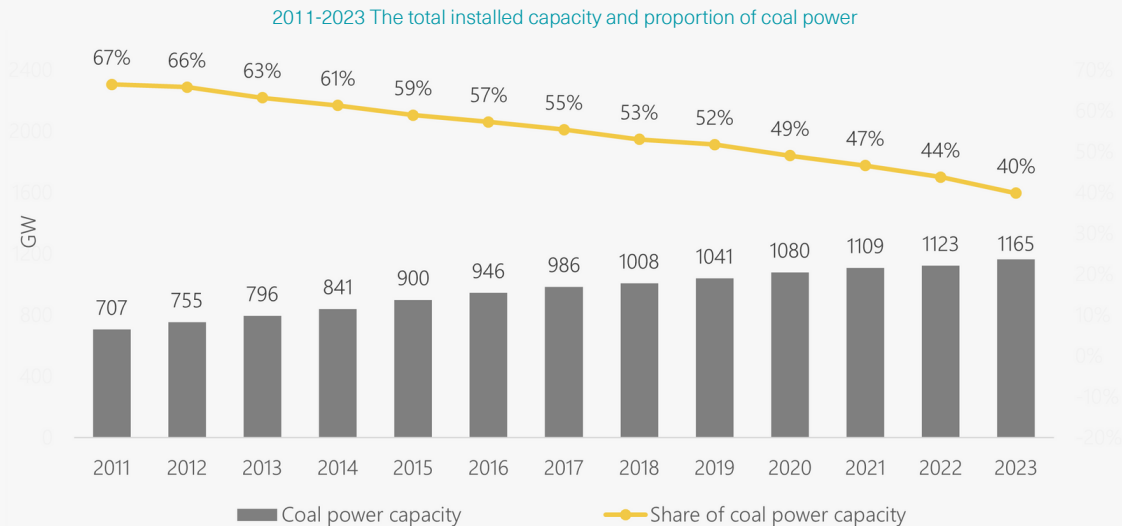
Newly installed wind power and solar PV capacity reaches nearly 300 GW

By the end of 2023, China's total installed power generation capacity reached 2,920 GW, a year-on-year increase of 13.9%. The growth rate was 6.1 percentage points higher than in 2022, offering a solid foundation of power supply security. **Renewable energy** accounted for 52% of the installed capacity and more than 77% of the annual power investment. The total installed capacity of wind power and solar PV exceeded 1,000 GW for the first time and continued to be the mainstay of newly installed capacity. In 2023, new **wind power and solar PV** installed capacity reached 293 GW, a year-on-year increase of 133%, accounting for more than 80% of the annual newly installed capacity. Investment in wind power and solar PV increased by 33.7% and 60.5% year-on-year, respectively. The newly installed **coal power** capacity reached 38 GW, an increase of 23 GW compared with 2022, and the total installed capacity of coal power reached 1,165 GW, but its proportion fell below 40% for the first time. Since the **14th Five-Year Plan** period (2021-2025), more than 80% of coal power units have completed energy-saving retrofit, more than 90% have completed ultra-low emission retrofit, and more than 50% have achieved in-depth flexible output. The clean and efficient transition of coal-fired power is accelerating. [7][11][12][14]

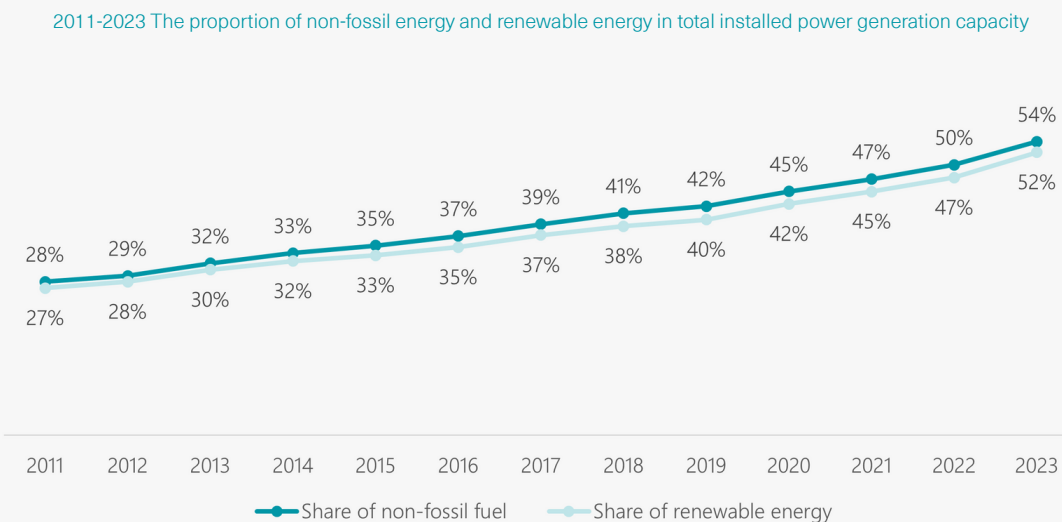
” Renewable energy power accounted for over 50% of the total installed capacity, historically exceeding coal power.



Source: CEC and NEA, accessed in February 2024



Source: CEC, accessed in January 2024



Source: Calculated based on CEC and NEA's data, accessed in January 2024



Solar PV - The newly installed solar PV capacity reached 217 GW, the same as the cumulative newly installed capacity in the past four years (2019-2022). Affected by the grid connection of large-scale solar PV bases, utility-scale PV accounted for more than 50%, reaching 119 GW; distributed PV also hit a record high, reaching 96 GW, with distributed industrial and commercial solar PV and household PV each accounting for about 50%. The total installed capacity of solar PV reached 609 GW, a year-on-year increase of 55.3%. Utility-scale PV and distributed PV reached 354 GW and 254 GW, respectively, including 116 GW of household PV. In 2023, China issued the *Notice on Supporting the Development of the Solar PV Power Generation Industry and Standardising Land Management* (CHN: 关于支持光伏发电产业发展规范用地管理有关工作的通知) and the *Notice on Matters Concerning Promoting the Large-scale Development of CSP* (CHN: 关于推动光热发电规模化发展有关事项的通知), aiming to standardise the land use for solar PV projects and promote the development of large-scale CSP projects. [7][11][17]

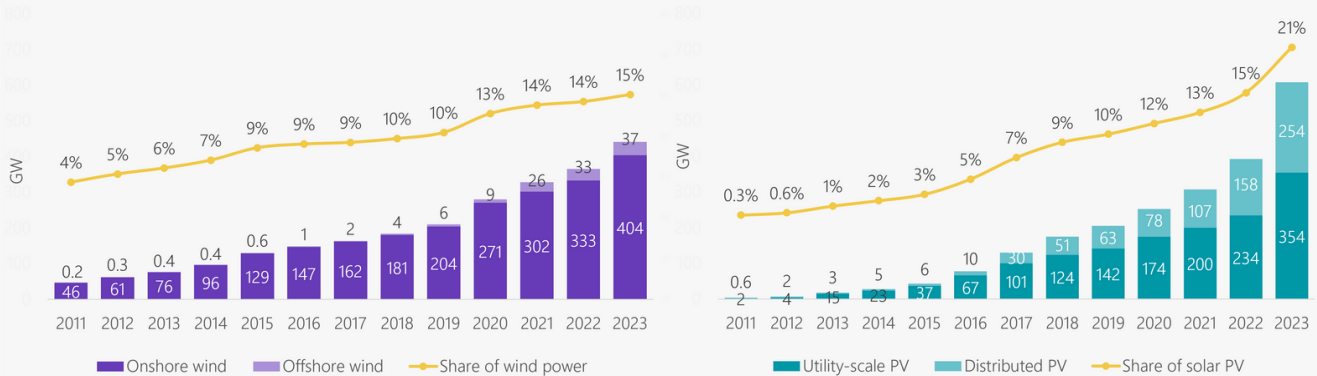


Wind power - The newly installed capacity of wind power reached 76 GW, double that of 2022 and exceeded the "rush to install" in 2020 (72 GW), reaching a historical high, with 69 GW of onshore wind power and 7 GW of offshore wind power. The total installed capacity of wind power reached 440 GW, a year-on-year increase of 20.7%. Onshore and offshore wind power were 404 GW and 37 GW respectively. In 2023, the government issued the *Management Measures for the Renovation, Upgrading, and Decommissioning of Wind Farms* (CHN: 风电场改造升级和退役管理办法) to encourage wind farms that have been in operation for more than 15 years or have a single unit of less than 1.5 MW to carry out retrofit and upgrades. [7][11]



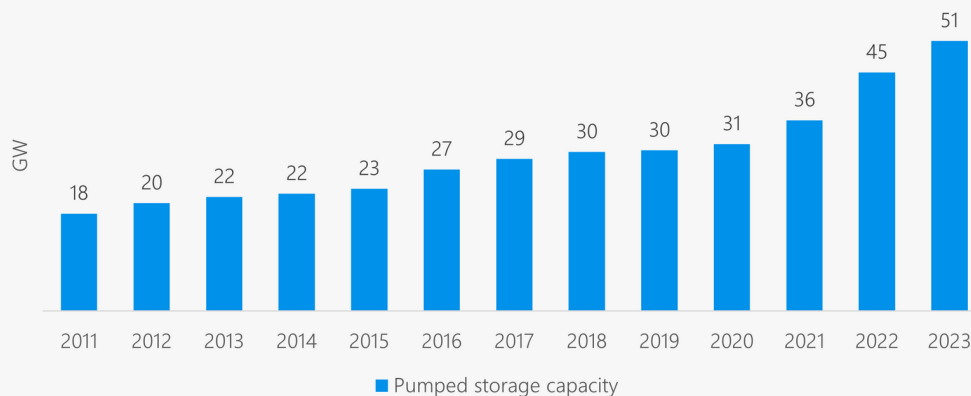
Pumped hydro - The newly installed capacity of pumped hydro was 6 GW, a year-on-year decrease of 2 GW, but the overall development of the industry accelerated. The government approved 50 new projects (65 GW) in 2023, reaching 1.3 times the total installed capacity in 2023 (51 GW). The *Notice on Capacity Electricity Prices and Related Matters of Pumped Storage Power Stations* (CHN: 关于抽水蓄能电站容量电价及有关事项的通知) issued by the government clarifies the capacity price mechanism for pumped hydro power stations, which is conducive to forming stable industry development expectations. [11]

2011-2023 The total installed capacity and share of wind power (left) and solar PV (right) by technology



Source: NEA, accessed in March 2024

2011-2023 The total installed capacity of pumped hydropower generation



Source: CEC and NEA, accessed in January 2024

Renewable energy generation steadily increases

In 2023, the total power generation reached 9,456 TWh, a year-on-year increase of 6.9%, an increase of 3.1 percentage points compared with 2022. In recent years, with the continuous expansion of distributed power sources, the power generation of residents and commercial and small industrial enterprises has continued to expand. The proportion of industrial power generation below the designated scale³ reached 5.8%, of which more than half was distributed PV, accounting for nearly 40% of the domestic rural residential electricity consumption in 2023. Affected by insufficient reservoir water storage and low precipitation, hydropower utilisation hours decreased by 282 in 2023. To make up for the shortage of hydropower output, the year-on-year growth rate of coal power (+11.8%), nuclear power (+4.1%), and renewable energy (+8.1%) power generation all increased. Coal power accounted for nearly 60% of total power generation and played an important role in power supply security. The combined power generation of wind power and solar PV had a year-on-year growth rate of 23.6%, significantly higher than the growth rate of the total power generation and the total electricity consumption, accounting for more than 15% of the total electricity consumption. The low-carbon transformation of the power sector is advancing steadily. [9][11][14][19][21]

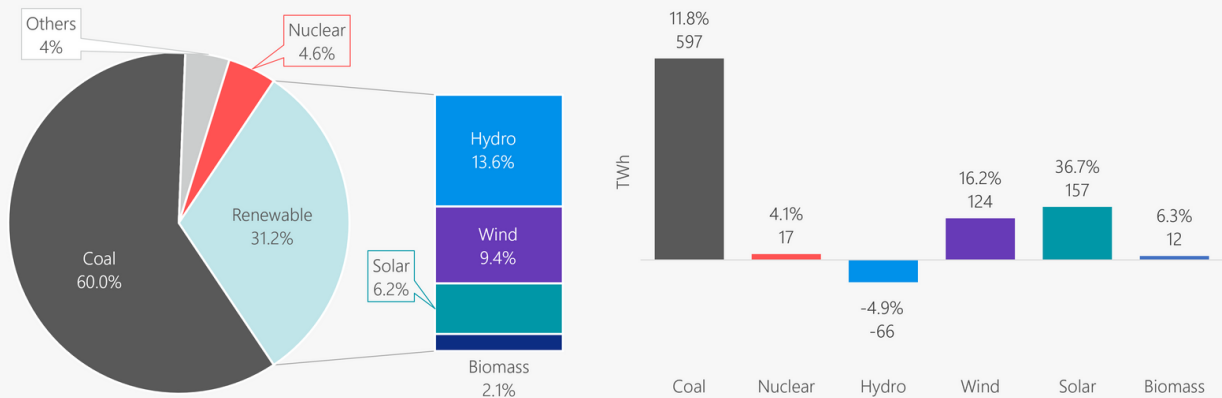


Renewable energy accounted for more than **30%** of total power generation and about **1/3** of total electricity consumption.

³ Industries below the designated scale refer to industrial enterprises with an annual primary business income of less than 20 million RMB.

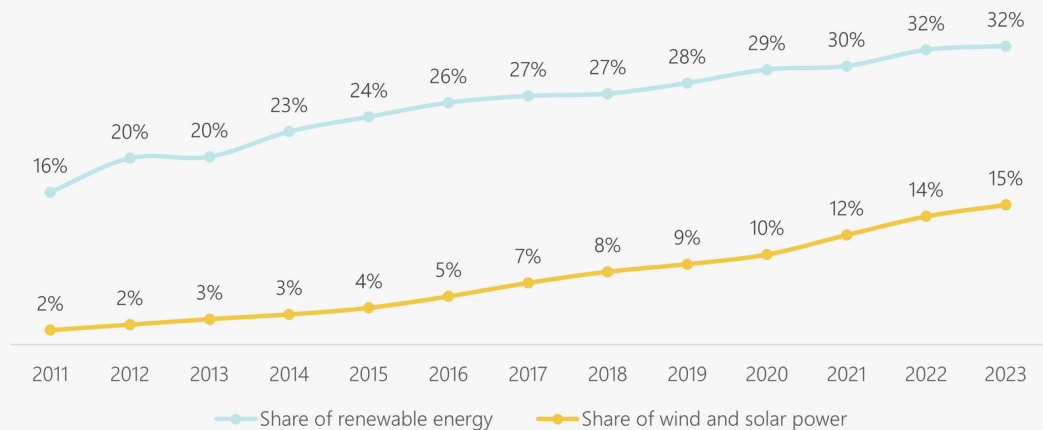
2023 The total power generation mix (left);

2022 The newly added power generation and year-on-year growth rate by technology (right)



Source: NBS, CEC, and NEA, accessed in March 2024

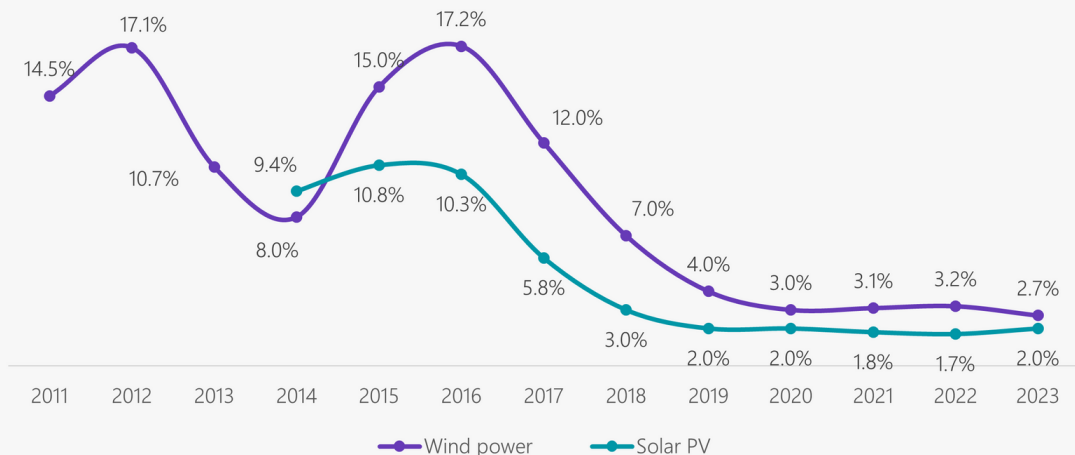
2011-2023 The proportion of renewable energy, and wind and solar PV in total electricity consumption



Source: Calculated based on CEC and NEA's data, accessed in January 2024

In 2023, power generation units' operational efficiency declined, and the average annual full load hours of 6 MW above power units dropped by 101. The full load hours of wind power and solar PV were basically the same as last year. The average utilisation rates of wind power and solar PV reached 97.3% and 98.0%, respectively, higher than the binding target of 95%. Among them, the wind power utilisation rates in Hebei, western Inner Mongolia, and Qinghai were lower than 95%, and the solar PV utilisation rates in Qinghai and Tibet were lower than 95%. The wind power utilisation rates in Gansu and eastern Mongolia increased significantly. Based on this results, the national wind curtailment rate in 2023 was 2.7%, and the solar curtailment rate was 2.0%. [15]

2011-2023 Wind and solar curtailment rates



Source: NEA and National New Energy Consumption Monitoring and Warning Centre (NECMWC), accessed in February 2024

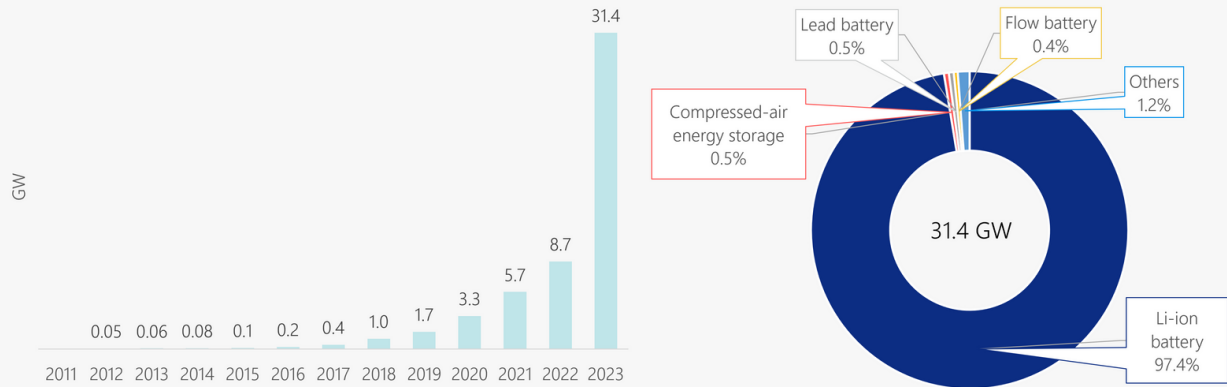
New-type energy storage becomes new driving forces

China's new-type energy storage is developing rapidly, with the year-on-year growth rate of installed capacity in operation exceeding 260% in 2023. The cumulative installed capacity in operation has climbed from 8.7 GW to 31.39 GW, ten times that at the end of the **13th Five-Year Plan** period (2020). The average energy storage time was 2.1 hours, the same as in 2022. Among them, 15.39 GW of independent energy storage and shared energy storage⁴ were installed, mainly used for power system regulation, and the proportion is increasing; 12.26 GW were energy storage supporting facilities for renewable power generation projects. **In terms of regions**, it's been developing rapidly in Northwest and North China, accounting for 29% and 27%, respectively. Among them, Shandong (3.98 GW), Inner Mongolia (3.54 GW), and Xinjiang (3.09 GW) ranked among the top three in the country. **Regarding technology**, new-type energy storage generally shows a diversified development trend. Lithium-ion battery energy storage dominated (97.4%), and new technologies such as gravity energy storage, liquid air energy storage, and carbon dioxide energy storage have been implemented.

⁴ Shared energy storage refers to integrating energy storage resources on the three sides of the power supply, users and the power grid, and optimal configuration with the power grid as the hub. It can provide services to the power supply and users and flexibly adjust the operating model to achieve energy storage resource sharing across the entire grid.

Since the 14th Five-Year Plan period, the newly installed capacity of new-type energy storage has driven economic investment of more than 100 billion RMB, becoming a new driving force for China's economic development. The government has issued the *Guidelines for the Standard Systems Construction of New Type of Energy Storage* (CHN: 新型储能标准体系建设指南) and *Technical Guidelines for New-type Energy Storage Planning for Power Transmission and Configuration in New Energy Bases* (CHN: 新能源基地送电配置新型储能规划技术导则), aiming to establish a standard system of commercial development of the industry and scientifically allocate supporting energy storage facilities for renewable power generation projects. [6]

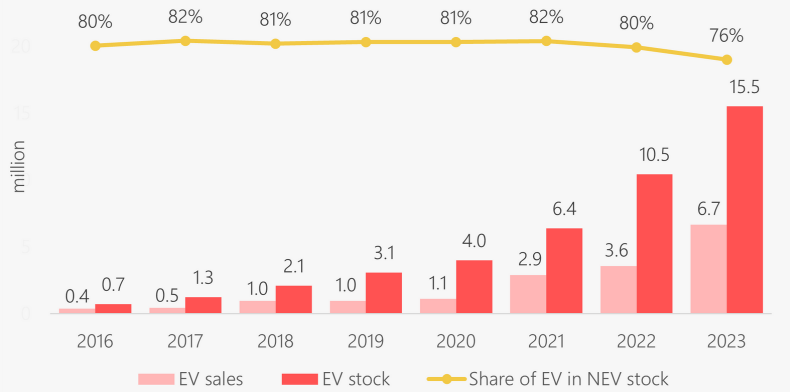
2011-2023 The total installed capacity of new-type energy storage put into operation (left);
2023 The installed new-type energy storage capacity in operation by technology (right)



Source: NEA and China Energy Storage Alliance (CESA), accessed in January 2024

By 2023, China has registered 7.43 million new energy vehicles (NEVs), and the number of NEVs exceeded 20 million, accounting for 6.1% of the national vehicle stock. Among them, pure **electric vehicles** (EVs) exceeded 15 million, accounting for 76% of NEVs. **Charging infrastructure** increased by 65% year-on-year to 8 million units, covering 95% of highway service areas nationwide. All localities are actively deploying charging facilities in rural areas to unleash the potential of NEVs. The *Implementation Opinions on Strengthening the Integration and Interaction between New Energy Vehicles and the Power Grid* (CHN: 关于加强新能源汽车与电网融合互动的实施意见) issued by the government aims to improve the flexibility capabilities of NEV as mobile energy storage. [6][11][13]

2016-2023 Pure EV sales, ownership, and proportion in NEV ownership



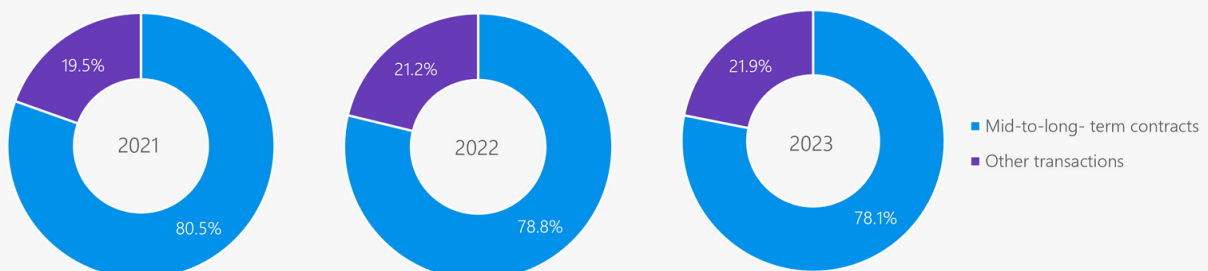
Source: Ministry of Public Security (MPS), accessed in January 2024



Effective operation of multi-level power markets

In 2023, the power market-oriented transaction volume reached 5,670 TWh, a year-on-year increase of 7.9%, accounting for 61.4% of the total electricity consumption, a year-on-year increase of 0.6 percentage points. The market mechanism has played a decisive role in allocating power resources. New energy has gradually entered the power market, and its market-oriented transaction volume reached 684.5 TWh, accounting for nearly half of the total new energy power generation. The multi-level power market operates effectively, with medium- and long-term contract transactions accounting for 78.1%, and the market size and transaction prices remained stable. Shanxi and Guangdong power spot markets have officially started operation, and the southern regional power spot market has implemented settlement trial operations; the ancillary service market tapped flexible resources by 117 GW and expanded clean energy power consumption by 120 TWh. The *Basic Rules for Electricity Market Operations (Revised Edition)* (CHN: 电力市场运营基本规则 (修订版)) and the *Basic Rules for Electricity Spot Market (Trial)* (CHN: 电力现货市场基本规则 (试行)) have been released one after another to provide further regulation and guidance for the operating power market. [6][14]

2011-2023 China's electricity trading volume mix



Source: CEC, accessed in January 2024

Power sector development outlook and policy trends in 2024 with focus of wind power and solar PV

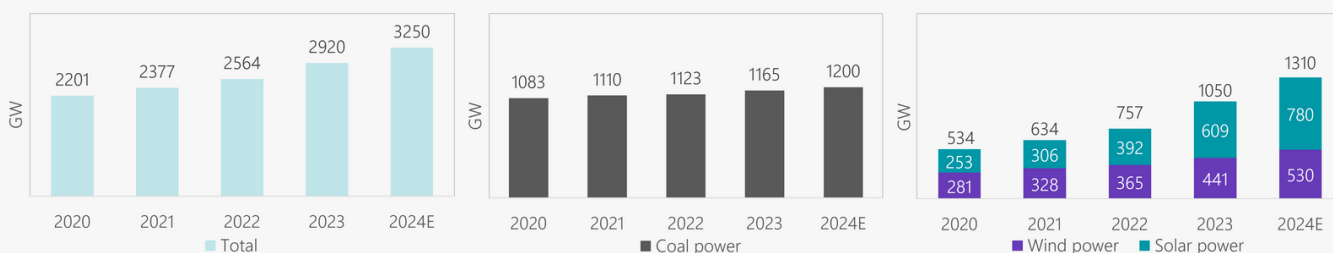


Power sector development outlook in 2024

Considering macroeconomy and electrification factors, the China Electricity Council (CEC) predicts that national electricity demand will increase by 6% in 2024, with total electricity consumption reaching 9,800 TWh. The peak load to increase by 100 GW, a year-on-year increase of approximately 7%. The overall supply and demand of electricity across the country will be in a tight balance, and demand-side response and other measures need to be taken during specific periods. The newly installed power generation capacity to exceed 300 GW, which is basically the same as in 2023. Among them, new coal power capacity will be around 35 GW.

Specifically for wind power and solar PV, the National Energy Administration (NEA) proposed at the *2024 National Energy Work Conference* that the target of adding about 200 GW of wind power and solar PV in 2024, which would be a 25% increase from the previous year's target. While based on the current project reserves and development inertia, the actual scale of new additions may exceed this target. In 2024, the second and third batches of large-scale wind and solar bases and supporting CSP projects will be connected to the grid successively; distributed solar PV will still maintain a high installed capacity; distributed wind power and deep-sea offshore wind power will see a certain increase. Based on these, the CEC predicts that the newly installed power generation capacity of wind power and solar PV will reach 90 GW and 170 GW, respectively. By the end of 2024, China's total installed power generation capacity is expected to reach 3,250 GW, with wind power and solar PV accounting for 40%, surpassing coal power for the first time. [14][20]

2020-2024E The total installed power generation capacity by technology



Source: CEC and NEA, accessed in January 2024



Multiple factors drive the installed capacity of wind power and solar PV to maintain a high level of growth

01 | Energy consumption is growing faster than expected

China's energy consumption is growing faster than expected, while hydropower generation has declined recently. To achieve the goal of non-fossil energy accounting for 20% (2025) and 25% (2030) of total primary energy consumption, wind power and solar PV are the main forces to fill the "gap" in renewable energy supply.

02 | Energy intensity and CO₂ intensity reduction lagged

The mid-term evaluation results of the *14th Five-Year Plan* show that the reduction of energy consumption per unit of GDP and the reduction of carbon dioxide emissions per unit of GDP need to catch up. Increasing renewable energy supply and taking effective substitute actions is particularly important.

03 | China's contribution to the global 2030 renewable capacity target

The China-US *Sunnylands Statement* proposed the goal of tripling global renewable energy installed capacity by 2030 and received support from COP28. Wind power and solar PV will be essential starting points for China to support the implementation of this goal.

04 | To stabilise domestic new energy manufacturing industry

Fierce market competition has resulted in lower prices for domestic solar PV products and wind turbines. Promoting wind and solar development will help stabilise the domestic new energy manufacturing industry.

Strengthen renewable power consumption from policy and market perspectives

In 2024, the power system will face more significant challenges in accommodating variable renewable energy (VRE), and the risk of wind and solar curtailment increases; it is necessary to promote the application of flexible resources through market-oriented means. For example, the government encourages renewable energy and flexible coal power to jointly sign medium- and long-term contracts with users and implement time-of-use electricity prices on both the grid and user sides. As the proportion of distributed power sources continues to increase, at the technical level, it's necessary to intensify distribution grid retrofit to improve its grid-connection capacity and technical control level; at the land level, to implement the rural land use regulation and business model; at the market level, to improve the proportion of household PV self-consumption, improving the time-of-use electricity price policy, and exploring participation in the power market through aggregators.

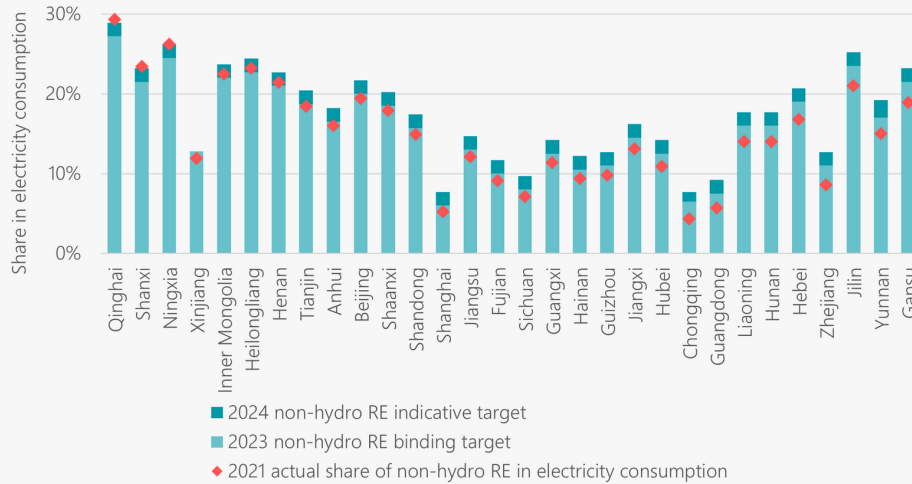
— Shi Jingli, Professor at the Energy Research Institute of the Chinese Academy of Macroeconomic Research [20]



New energy policy trends in 2024

Regarding policy formulation, China will launch preliminary research work on the *15th Five-Year (2026-2030) and Medium- and long-term Power Planning* ahead of schedule, according to the NEA. Regarding renewable energy, the government will continue to amend the *Renewable Energy Law* and promote international mutual recognition of green certificates. By formulating the *2024 Mandatory Renewable Power Consumption Targets* (i.e. minimum consumption target) and the reasonable utilisation rates of wind power and solar PV (i.e. wind power and solar PV curtailment control target), the "lower limit" and "upper limit" of wind power and solar PV development will be clarified. Regarding distributed power sources, the energy authorities will issue the *Management Measures of Distributed Solar PV Power Generation Projects* (CHN: 分布式光伏发电项目管理办法) to further improve industry management. At the same time, to continue to promote the orderly development of flexible resources, the government will carry out specific layout research on the *Medium- and Long-term Plan for CSP* (CHN: 光热发电中长期规划) and complete the layout optimisation of the planned projects for 2024-2028 in the *Medium- and Long-term Plan for Pumped Hydropower Storage (2021-2035)* (CHN: 抽水蓄能中长期规划 (2021-2035)). [11][12]

2023-2024 The non-hydro renewable power consumption target and completion status in 2021



Note: This is ranked by the surplus amount of actual consumption in 2021 compared with the indicative target of 2024.

Source: NEA, accessed in July 2023

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Appendix - 2023 China Energy and Power Data Summary Table

	Amount	Year-on-year	Amount	Year-on-year
Energy consumption	Data		Reference	
Total (billion tce)	5.7	5.7%	[19]	[19]
Coal (billion tons)	4.7	5.6%	[19] calculated	[19]
Natural gas (billion m3)	400	7.2%	[19] calculated	[19]
Crude oil (million tons)	764	9.1%	[19] calculated	[19]
Share of coal	55.3%	-0.7 pct	[19]	[19]
Share of gas and non-fossil fuel	17.7%	0.2 pct	[19] calculated	[1]
Energy production				
Total (billion tce)	4.8	4.2%	[19]	[19]
Raw coal (billion tons)	4.7	3.4%	[19]	[19]
Natural gas (billion m3)	232	5.6%	[19]	[19]
Crude oil (million tons)	209	2.1%	[19]	[19]
Energy import (million tons)				
Coal	474	61.8%	[19]	[19]
Natural gas	120	9.9%	[19]	[19]
Crude oil	564	11.0%	[19]	[19]
Electricity consumption (TWh)				
Total	9224	6.7%	[8]	[8]
Primary Industry	128	11.5%	[8]	[8]
Secondary Industry	6075	6.5%	[8]	[8]
Tertiary Industry	1669	12.2%	[8]	[8]
Residential	1352	0.9%	[8]	[8]
Power installed capacity (GW)				
Total	2920	13.9%	[7]	[7]
Thermal *	1346	4.2%	[7][14] calculated	[7][14] calculated
of which coal	1165	3.4%	[14]	[14]
of which natural gas	117	1.2%	[7][16] calculated	[7][16] calculated
of which oil, exhaust heat, surplus pressure and gases	64	21.2%	[7][14][16] calculated	[7][14][16] calculated
Nuclear	57	2.4%	[7]	[7]
Hydro	422	1.8%	[7]	[7]
of which pumped storage	51	13.2%	[14]	[14] calculated
Wind	441	20.7%	[7]	[7]
of which onshore wind	404	20.6%	[14]	[14] calculated
of which offshore wind	37	22.2%	[14]	[14] calculated
Solar PV	609	55.3%	[17]	[17] calculated
of which utility-scale PV	354	51.2%	[17]	[17] calculated
of which distributed PV	254	61.4%	[17]	[17] calculated
CSP	0.6	0.0%	[18]	[18] calculated
Biomass	44	8.3%	[7][14] calculated	[7][14] calculated
New-type energy storage	31	260.0%	[6]	[6]
Non-fossil fuel	1574	23.7%	[14] calculated	[14] calculated
Renewable energy	1517	25.1%	[14] calculated	[14] calculated
Share of non-fossil fuel	53.9%	4.3pct	[14]	[14] calculated
Share of renewable energy	52.0%	4.7pct	[7][14] calculated	[7][14] calculated
Power generation (TWh)				
Total	9456	6.9%	[19]	[19]
Thermal *	6070	9.4%	[8][11][19] calculated	[8][11][19] calculated
of which coal	5674	11.8%	[14][19] calculated	[14][19] calculated
of which natural gas, oil, exhaust heat, surplus pressure and gases	396	-13.1%	[8][11][14][19] calculated	[8][11][14][19] calculated
Nuclear	435	4.1%	[19]	[19]
Hydro	1286	-4.9%	[19]	[19]
Wind	886	16.2%	[19]	[19]
Solar	584	36.7%	[19]	[19]
Biomass	196	6.3%	[8][11][19] calculated	[8][11][19] calculated
Non-fossil fuel	3386	7.6%	[8][11][19] calculated	[8][11][19] calculated
Renewable energy	2952	8.1%	[8][11] calculated	[8][11] calculated
Share of non-fossil fuel	35.8%	0.3pct	[8][11][19] calculated	[8][11][19] calculated
Share of renewable energy	31.2%	0.4pct	[8][11][19] calculated	[8][11][19] calculated
Utilization hours (hours)				
National	3592	-101	[14]	[14]
Thermal	4466	76	[14]	[14]
of which coal	4685	92	[14]	[14]
Nuclear	7670	54	[14]	[14]
Hydro	3133	-285	[14]	[14]
of which pumped storage	1175	-6	[14]	[14]
Wind	2225	7	[14]	[14]
Solar	1286	-54	[14]	[14]
Curtailement				
Wind	2.7%	-0.5 pct	[15]	[15] calculated
Solar PV	2.0%	0.3 pct	[15]	[15] calculated

* The figure of thermal power is revised as CEC's thermal power - biomass power because CEC's thermal power data includes biomass.