

Our Country's Energy: Renewable and Non-renewable Energy

I. Overview of the energy production and consumption in our country

- As of 2023, our country is the world's largest energy producer and consumer ([statista, 2024](#)). Its energy landscape is diverse, including non-renewable and renewable energy.
 - Non-renewable energy includes fossil fuels such as coal, oil, and natural gas. These resources are finite and have significant environmental impacts.
 - Renewable energy mainly includes hydropower, wind, solar, and biomass. These resources are replenishable and more environmentally friendly.
- As of 2021, our country's energy consumption is dominated by the industrial sector, followed by transportation, residential, commercial, and agricultural sectors ([National Bureau of Statistics of China, 2023](#)). The industrial sector's heavy reliance on energy-intensive processes makes it the largest consumer, while the transportation sector's growth contributes significantly to overall energy use. Residential and commercial energy consumption is driven by urbanisation and rising living standards, and agricultural production also plays a role, particularly in rural areas.
- In terms of electricity generation, as of 2022, the major energy sources are coal, hydropower, and wind ([International Energy Agency, 2023](#)).

Table 1 Electricity generation by energy resources in our country in 2022

Energy resource	Electricity generation (GWh)	Key regions
Coal	5,524,217	Nei Mongol Zizhiqu, Shaanxi, Shanxi
Hydropower	1,352,195	Southwestern regions in China
Wind power	762,671	Nei Mongol Zizhiqu, Xinjiang Uygur Zizhiqu, Gansu
Solar PV	427,270	Qinghai, Xizang Zizhiqu
Natural gas	266,669	Xinjiang Uygur Zizhiqu, Sichuan Basin
Biofuels	181,707	Nationwide
Oil	8,719	Northeastern regions in China, Bohai Sea

Source: [International Energy Agency \(2023\)](#)

II. Non-renewable energy

- Coal: As of 2023, our country is the largest coal producer in the world ([statista, 2024](#)). Coal is our country's primary energy resource, mainly used for electricity generation and industrial processes.
 - Reserves: In 2020, our country's proven coal reserves were estimated to be 143 billion tonnes, equivalent to 35 years of production at current levels. Our country has the world's fourth-largest coal reserves, after the United States, Russia, and Australia, accounting for approximately 13% of the global total ([BP, 2021](#)).
 - Distribution: Most coal reserves are located north of the Chang Jiang, with Shanxi, Shaanxi, and Nei Mongol Zizhiqu containing 64% of the reserves.
 - Types: Bituminous coal (75%), anthracite coal (12%), and lignite coal (13%).
- Oil and natural gas: Our country is a significant oil producer, though it imports a large portion to meet its demand. Besides, oil is used for transportation, industry, and as a feedstock for petrochemicals. Natural gas production is increasing rapidly in our country. It is used for electricity generation, heating, and industrial fuel.
 - Reserves: As of 2020, our country held approximately 26 billion barrels of proven oil reserves, ranking 14th globally ([BP, 2021](#)). Our country has transitioned from a net oil exporter to a net importer since the 1990s.
 - Distribution: Oil and gas resources are primarily located in the northeastern region (e.g., Daqing Oil Field), northern region (e.g., Shengli Oil Field), and northwestern region (e.g., Tarim Basin, Qaidam Basin, and Junggar Basin).

III. Renewable energy

- Our country leads globally in hydropower, wind, solar, and biomass generation capacity. China's renewable energy capacity has increased 90 times over the past decade, reaching 1.1 billion kilowatts in 2022 ([China Daily, 2022](#)).
- Our country has developed advanced renewable technologies, including megawatt-scale hydraulic turbines and 10 MW offshore wind turbines ([China Daily, 2022](#)).
- Hydropower: As of 2023, our country is the country with the largest hydropower generation in the world ([statista, 2024](#)). Hydropower is a major renewable energy source in our country, supplying a significant portion of the country's electricity.
 - Potential: Our country has considerable water resources. Our country leads the world in hydropower deployment, accounting for approximately 29% of global capacity. In 2021, our country accounted for roughly 80% of all new hydropower capacity added ([IRENA, 2022](#)).
 - Distribution: The country's topography, with its high western and low eastern regions, supports large hydropower reserves, especially in the upper and middle courses of major rivers like Chang Jiang (e.g., Three Gorges Dam, Xiluodu Dam, Baihetan, Wudongde, Xiangjiaba Dam, etc.), Huang He (e.g., Laxiwa Dam), and Zhujiang (e.g., Longtan Dam).
- Wind power: Wind energy is rapidly expanding in our country. Wind power contributes a growing share of our country's electricity supply.
 - Potential: Our country has abundant wind energy resources, both inland and offshore.

- Distribution: The northeastern, northern, and northwestern regions have the most abundant wind energy resources.

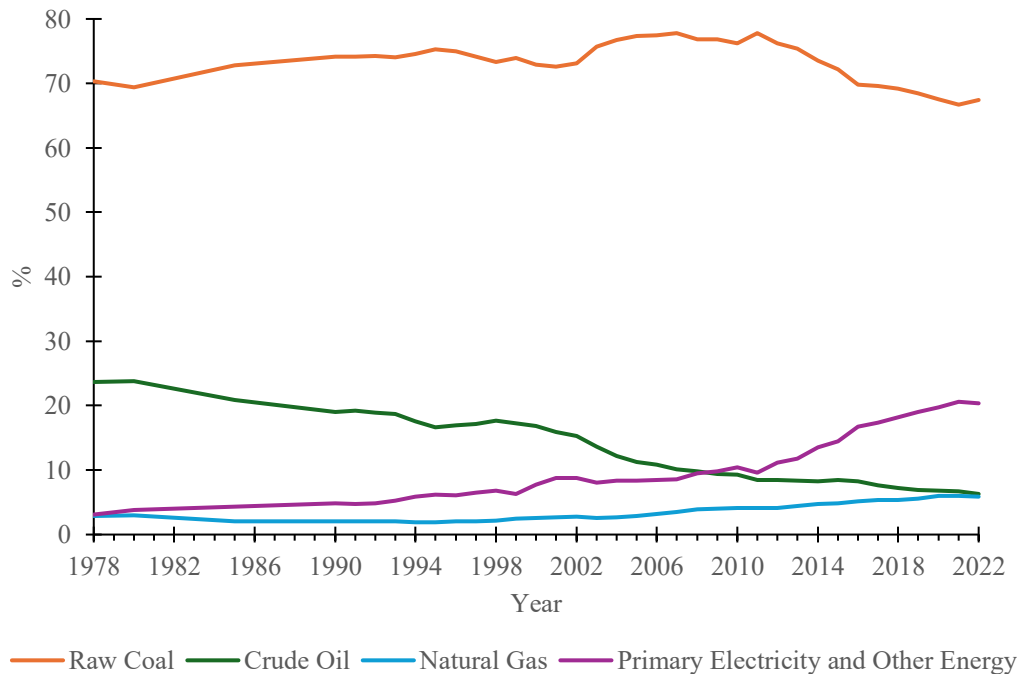


Wind farm near Chongming Island, Shanghai

- Solar energy: Solar energy production is growing quickly, making our country a leader in solar energy electricity generation. Solar energy is an increasingly important part of our country's energy mix.
 - Potential: Our country is rich in solar energy, with about two-thirds of it receiving over 2,000 hours of sunlight annually.
 - Distribution: The total solar radiation is the highest in Xizang Zizhiqu, Qinghai, Xinjiang Uygur Zizhiqu, Gansu, Ningxia Huizu Zizhiqu, and parts of Sichuan, having high potential for solar energy production.
- Biomass energy: Biomass energy is derived from organic materials such as plants, wood, crops, and animal waste. Biomass is used for electricity generation, heating, and biofuels production. Our country supports biomass energy to meet carbon reduction and energy efficiency goals.
 - Potential: China produces about 6.3 billion metric tons of organic waste annually. Processing 40% of this waste into energy could reduce carbon emissions by 20% ([The State Council, The People's Republic of China, 2021](#)).
 - Distribution: The sources of biomass energy are everywhere, and they have the potential for significant growth.

IV. Energy production trends

Figure 1 Proportion of different energy sources to total primary energy production (%) of China



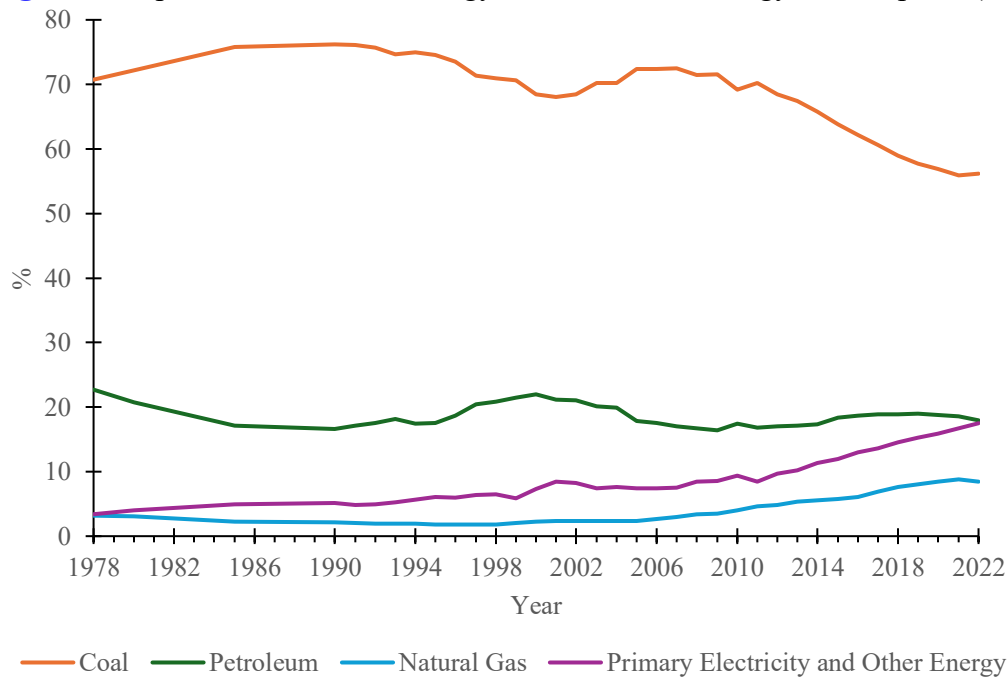
Note: Primary electricity is generated from natural sources without conversion, such as hydropower, wind, and solar power. Other energy sources include renewable energy sources like geothermal or biomass.

Source: [National Bureau of Statistics of China \(2023\)](#)

- According to the statistical figures ([Figure 1](#)), the trends of energy production in our country are:
 - **Decrease in coal production:** The share of raw coal in total primary energy production has declined from 69.6% in 2017 to 67.4% in 2022, reflecting efforts to reduce coal dependency.
 - **Increase in renewable energy production:** The proportion of primary electricity and other energy in total production has increased from 17.4% in 2017 to 20.4% in 2022, indicating significant investments in renewable energy infrastructure.
 - **Stable natural gas production:** The steady increase in natural gas production, from 5.4% in 2017 to 5.9% in 2022, aligns with the national strategy to promote cleaner energy resources.

V. Energy consumption trends

Figure 2 Proportion of different energy sources to total energy consumption (%) of China



Note: Primary electricity is generated from natural sources without conversion, such as hydropower, wind, and solar power. Other energy sources include renewable energy sources like geothermal or biomass.

Source: [National Bureau of Statistics of China \(2023\)](#)

- According to the statistical figures ([Figure 2](#)), the trends of energy consumption in our country are:
 - **Decline in coal consumption:** The proportion of coal in total energy consumption has decreased from 60.6% in 2017 to 56.2% in 2022, indicating a shift towards cleaner energy resources.
 - **Growth in renewable energy:** The share of primary electricity and other energy (including renewables) in total consumption has risen from 13.6% in 2017 to 17.5% in 2022, highlighting the rapid development of our country's renewable energy sector.
 - **Increase in natural gas consumption:** The rise in natural gas consumption from 6.9% in 2017 to 8.4% in 2022 shows its growing role in our country's energy strategy.

VI. Conclusion

- Reduced coal dependency: Our country has made notable progress in reducing its reliance on coal regarding production and consumption.
- Growth in renewable energy: Substantial growth has occurred in producing and consuming renewable energy resources, reflecting our country's commitment to sustainable development and reducing carbon emissions.
- Rising importance of natural gas: Natural gas has become increasingly significant in our country's energy mix, with steady growth in both production and consumption.
- Energy transition: The trends indicate a broader energy transition in our country, with a clear move towards cleaner and more sustainable energy sources.

References

1. BP. (2021). "BP Statistical Review of World Energy 2021 (70th edition)."
<https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2021-full-report.pdf>
2. China Daily. (2022). "China leads in renewable energy growth."
<https://global.chinadaily.com.cn/a/202207/12/WS62cccbb0a310fd2b29e6bc69.html>
3. International Energy Agency. (2023). "Energy Statistics Data Browser, IEA, Paris
<https://www.iea.org/data-and-statistics/data-tools/energy-statistics-data-browser>
4. IRENA. (2022). "Renewable Capacity Statistics 2022."
<https://www.irena.org/publications/2022/Apr/Renewable-Capacity-Statistics-2022>
5. National Bureau of Statistics of China. (2023). "China Statistical Yearbook 2023."
<https://www.stats.gov.cn/sj/ndsj/2023/indexeh.htm>
6. statista. (2024). "Energy." <https://www.statista.com/markets/408/topic/436/energy/#overview>
7. The State Council, The People's Republic of China. (2021). "Biomass energy to provide heat, fuel."
https://english.www.gov.cn/news/topnews/202104/15/content_WS60778ff2c6d0df57f98d7d92.html