



## Factsheets Series on China Energy Transition Updates

# FOSSIL FUELS' PRODUCTION, CONSUMPTION AND IMPORTS CONTINUE FLUCTUATING IN 2022

### Coal

- Domestic coal production grew 10.5%, hit a record high.
- Coal consumption grew 4.3%, slightly decreased.
- Coal generated 5080 TWh of electricity, accounting for 58.4% of the total.

Under the influence of international geopolitical conflicts and climate anomalies, the global energy crisis has intensified, and the coal prices increased significantly. In 2022, China's coal import amount was 293 million tonnes, down 9.2% y-o-y from 323 million tonnes in 2021, the first time decreasing in nearly seven years. However, coal imports spending was 285 billion CNY, up 22.2% from 234 billion CNY in 2021. To cope with the fluctuation of international coal prices, the Chinese government has relaxed the customs clearance procedures for imported coal, providing for a zero-tax rate on coal imports from May 1 2022 till March 31 2023, which has been extended to the end of 2023.

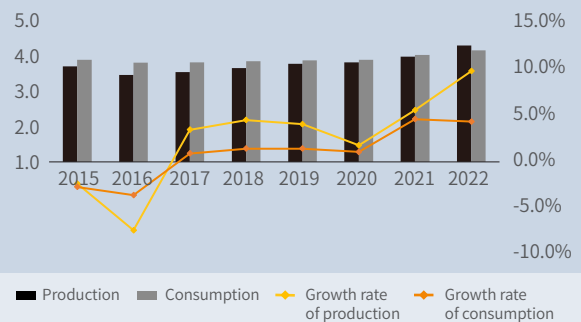
In 2022, China's coal production was 4.56 billion tonnes, a record high of 10.5% y-o-y. From 2014 to 2016, China's coal production growth rate was negative due to the Chinese government's strategy of promoting renewable energy development, and restriction of coal consumption to improve air pollution,<sup>1</sup> and then remained at around 4% till 2019. In 2020, the growth rate dropped to 1.4%. In the summer of 2021 and 2022, the drought in the southern region caused a shortage of hydropower, and the Chinese government

decided to increase coal production amount to maintain 12.6 million tonnes per day, and reach 620 million tonnes of reserves, which resulting in a significant increase in coal production in 2022.



### Coal production and consumption generally follow the same trend, with consumption slowing a bit in 2022

Billion Tonnes



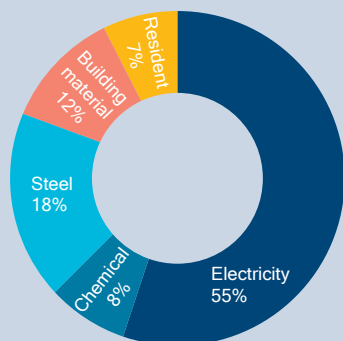
Source: China National Bureau of Statistics, 2023, and GIZ analysis, April 2023

China's coal consumption also increased from 4.19 billion tonnes in 2021 to 4.37 billion tonnes in 2022, although the growth rate was 0.3% lower than in 2021, which showed that coal consumption was slowing down, mainly due to the weakening demand for non-electricity coal. Due to the ongoing downturn in China's real estate market, in 2022, China's crude steel production decreased by 2.1% to 1.01 billion tonnes and cement production decreased by 10.8% to 2.12 billion tonnes.<sup>2</sup>

At the same time, the Chinese government eased the conditions for approving new coal mining projects. 22 coal mining projects were approved in 2022, adding 300 million tonnes per year of coal production capacity. Investment in the coal industry rose significantly, with fixed asset investment growth rate of 24.4% in 2022, compared to only 11.1% in 2021.<sup>3</sup>



**More than half of the coal consumption in China is used to produce electricity**



Source: Xueqiu internet, February 2023

From the estimation, China's electricity consumption will reach 9,150 TWh in 2023, increasing by 6% from 2022.<sup>4</sup> As China's economy recovers, both China's coal production and consumption will continue to grow in 2023.

At the beginning of 2022, the "14th Five-Year Plan for Modern Energy System" issued by the Chinese government clearly put forward the requirement of constructing advanced coal power, and promote the transformation of coal power from a subjective power source to a supportive and regulatory power source on the premise of maintaining the safe and stable operation of the power system.<sup>5</sup> Nevertheless, in the face of the energy crisis, the Chinese government has temporarily expanded coal power capacity. According to NEA's data, the total installed capacity of newly approved coal power projects from January to November 2022 was 65.24 GW, which is more than three times of the total amount in 2021.<sup>6</sup> Most of the newly approved coal power projects feature large units of 1 GW. Meanwhile, the Chinese government is continuing to shut down high-emission coal power units with a capacity below 0.3 GW. Some large coal power provinces have set quantitative targets for shutdowns. Shandong Province, for example, has already shut down 5.03 GW of outdated units since the beginning of the 14th FYP.<sup>7</sup> As of the first half of 2022, China's cumulative shutdown of outdated coal power units exceeds 100 GW.<sup>8</sup>

Most of China's in-service coal power units have a design life of 30 years and have the ability to run for another 10-15 years. But in fact, the overall operating life is relatively short, with the average service time being only 12 years, and less than 1.1% of coal power units are operating for more than 30 years.<sup>9</sup> It is predicted that the capacity of coal power units to be retired until 2030 is near to another 100 GW, accounting for 10% of the total installed coal power capacity. Coal power is to peak latest by 2030 and it is expected that more than 550 GW of coal power units will have to be retired before 2050, accounting for about 50% of the existing units.<sup>10</sup>

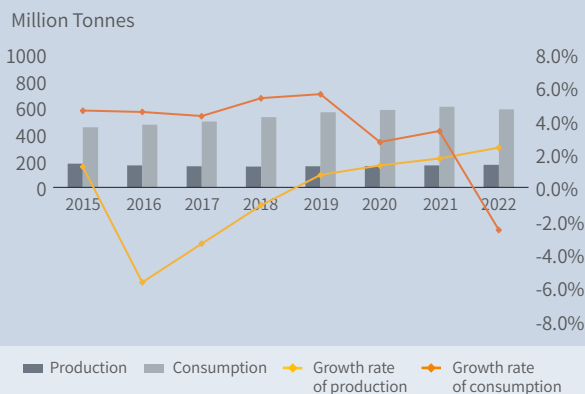
**Oil**

- **Domestic oil production grew 2.9%. NEA's 2022 annual work plan calls for maintaining investment in exploration and production to ensure energy security.**
- **Oil consumption decreased 3.1%, first time has fallen in a decade, in part due to lower driving during the pandemic.**

China's crude oil import was 508 million tonnes in 2022, the growth rate was -0.9%, which was the second decline seen in the last 20 years, the first decline was -5.4% in 2021. China's crude oil import have been above 500 million tonnes in the last five years, peaking at 542 million tonnes in 2020, afterwards, the import amount reduced due to the import quotas declining in 2021 to 2022 and the impact of high fluctuant of international oil prices.



**Crude oil production changed little, with the consumption declined a lots in 2022**



Source: China National Bureau of Statistics, 2023, and GIZ analysis, April 2023

Unlike the successive decline in imports, China's domestic crude oil production climbed y-o-y, producing 205 million tonnes in 2022 at a growth rate of 2.9%, exceeding the 2.1% growth rate in 2021. The crude oil consumption declined significantly y-o-y to 712 million tonnes in 2022, down 3.1% from 735 million tonnes in 2021, the first time declining in nearly two decades. This was mainly due to the impact of the epidemic, which has restricted industrial production and greatly reduced transportation. And the accelerated development of NEVs will further affect the oil consumption. According to the forecast, China will continue promoting the NEVs, the inventory expected to reach 10%, 50% and 80% in 2025, 2040 and 2050. This will drive oil consumption to peak at approximately 780 million tonnes by 2030.<sup>11</sup>

China is expected to continue to grow its domestic crude oil production in 2023.

## Gas

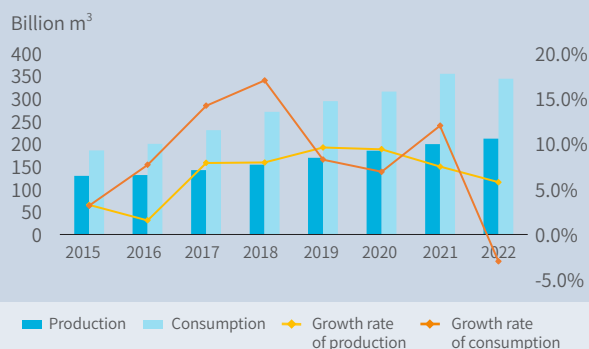
- Domestic gas production continues to rise, consumption has decreased.
- LNG imports have fallen sharply, pipeline gas rises to 42.7%.

In 2022, China's gas import fell for the first time, down from 167 billion m<sup>3</sup> in 2021 to 151 billion m<sup>3</sup> (-10.4%). LNG import was 88 billion m<sup>3</sup>, down 19.5% y-o-y, the first decline in nearly seven years. But LNG import costs rose 52.4% from 2021, with pipeline gas imports costing much less than LNG. Therefore, the share of pipeline gas imports in China increased significantly, from 35% in 2021 to 42.7%.<sup>12</sup>

China's gas production was 220 billion m<sup>3</sup>, up 6% from 208 billion m<sup>3</sup> in 2021. The growth rate of production has been above 8% since 2017, and even up to 10% in 2019 before the epidemic. Annual gas consumption in 2022 was 358 billion m<sup>3</sup>, a 3% decrease from 369 billion m<sup>3</sup> in 2021, while the growth rate remained at 12.5% in 2021.<sup>13</sup> This was mainly due to the ongoing epidemic restrictions hitting the economy. High import gas prices are also dampen the gas demand.



## The gas production growth rate stably increased while its consumption growth rate has declined drastically

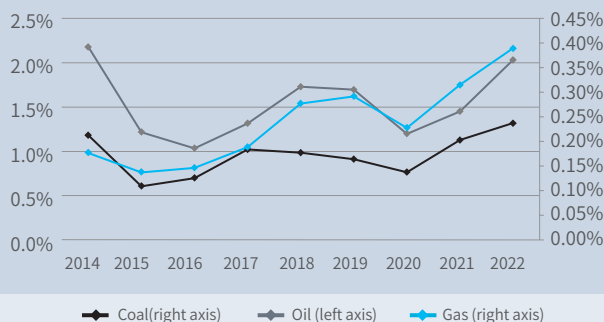


Source: China National Bureau of Statistics, 2023, and GIZ analysis, April 2023

In 2023, the Chinese government will continue to boost gas production and supply,<sup>14</sup> with domestic gas production expected to reach 226 billion m<sup>3</sup>.<sup>15</sup>



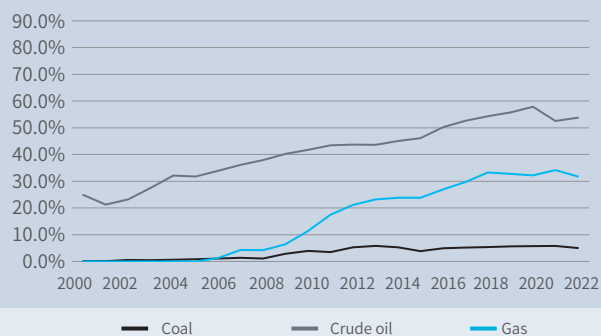
## As a share of GDP, fossil fuel import costs have risen faster than the economy as a whole



Source: General Administration of Customs of China, 2023, and GIZ analysis, April 2023



## China depends heavily on oil imports, and both oil and gas are with significant fluctuations in 2021~2022



Source: General Administration of Customs of China, 2023, and GIZ analysis, April 2023

China depends heavily on oil imports, and both oil and gas are with significant fluctuations in 2021~2022. As a share of GDP, fossil fuel import costs have risen faster than the economy as a whole. The unusual volatility seen in 2021-2022 stems from price fluctuations caused by the global energy shortages and economic

downturn caused by pandemic restrictions, which is not a typical trend. China's goal of reaching carbon peak and carbon neutrality will not change, and the share of fossil energy in the whole society will be gradually decreased in the coming years.

## References

- 1 “2017 年中国煤炭行业发展趋势分析,” Zhiyan Consulting, 11 August 2017, at <https://www.chyxx.com/industry/201708/550061.html>.
- 2 “2022 年煤炭市场回顾及 2023 年展望,” Huaxia Energy, 17 February 2023, at <https://hxny.com/nd-85216-0-51.html>.
- 3 “政府工作报告中的能源视角,” China Energy News, 06 March 2023, at [https://www.cpnw.com.cn/news/nytt/202303/t20230306\\_1588536\\_wap.html](https://www.cpnw.com.cn/news/nytt/202303/t20230306_1588536_wap.html).
- 4 “局部省份或现电力缺口! 今年电力负荷增大, 如何保障供给迎峰度夏,” China Power, 10 May 2023, at <http://www.chinapower.com.cn/xw/pyq/20230510/199726.html>.
- 5 “关于印发《“十四五”现代能源体系规划》的通知,” NEA, 29 January 2023, at [http://zfxgk.nea.gov.cn/2022-01/29/c\\_1310524241.htm](http://zfxgk.nea.gov.cn/2022-01/29/c_1310524241.htm).
- 6 “煤电核准量增加推动产能升级,” NEA, 17 April 2023, at [http://www.nea.gov.cn/2023-04/17/c\\_1310711252.htm#:~:text=%E4%BD%86%E6%A0%B9%E6%8D%AE%E5%8C%97%E5%A4%A7%E8%83%BD%E6%BA%90%E7%A0%94.%E6%A0%B8%E5%87%86%E6%80%BB%E9%87%8F%E7%9A%84%3%E5%80%8D%E3%80%82](http://www.nea.gov.cn/2023-04/17/c_1310711252.htm#:~:text=%E4%BD%86%E6%A0%B9%E6%8D%AE%E5%8C%97%E5%A4%A7%E8%83%BD%E6%BA%90%E7%A0%94.%E6%A0%B8%E5%87%86%E6%80%BB%E9%87%8F%E7%9A%84%3%E5%80%8D%E3%80%82).
- 7 “十四五以来山东淘汰落后产能建设规模 502.5 万千瓦居全国第一位,” iqilu.com, 04 July 2023, at <http://news.iqilu.com/shandong/shandongge-di/20230704/5462941.shtml>.
- 8 “能源发展回顾与展望 (2022) —— 煤电篇,” Beijixing Thermal Power, 01 February 2023, at <https://news.bjx.com.cn/html/20230201/1285877.shtml>.
- 9 “我国煤电机组平均服役 12 年, 运行超过 30 年不足 1.1%,” China Energy News, 09 February 2023, at <https://news.bjx.com.cn/html/20210209/1135813.shtml>.
- 10 “到期煤电机组: 退役还是延寿,” Beijixing Thermal Power, 25 May 2022, at <https://news.bjx.com.cn/html/20220525/1227992.shtml>.
- 11 “中国石油 2022 年油气产量创历史新高 2023 石油天然气需求增长势头预测,” ChinaIRN, 26 February 2023, at <https://www.chinairn.com/hyxz/20221226/101215198.shtml>.
- 12 “去年我国 LNG 进口量 7 年首次下滑,” SINOPECNEWS.COM, 02 February 2023, at [http://www.sinopecnews.com.cn/xnews/content/2023-02/02/content\\_7057965.html](http://www.sinopecnews.com.cn/xnews/content/2023-02/02/content_7057965.html).
- 13 “中国天然气发展报告 (2022),” NEA, 19 August 2023, at [http://www.nea.gov.cn/2022-08/19/c\\_1310654101.htm](http://www.nea.gov.cn/2022-08/19/c_1310654101.htm).
- 14 “2022 年我国原油产量 2.04 亿吨, 今年将继续推动油气增产增供,” State Council, 08 February 2023, at [https://www.gov.cn/xinwen/2023-02/08/content\\_5740576.htm](https://www.gov.cn/xinwen/2023-02/08/content_5740576.htm).
- 15 “油气 2022 成绩单: 时隔六年, 国内原油产量重回 2 亿吨,” Huaxia Energy, 05 January 2023, at <https://www.36kr.com/p/2074521062789254>.

## About us

The Sino-German Energy Transition Project, as a component of the Sino-German Energy Partnership, commissioned by the German Federal Ministry of Economy and Climate Protection (BMWK) and supported by the National Energy Administration of China (NEA), focuses on sharing German experiences with the energy transition and providing advice to the Chinese government and associated energy policy think tanks. In addition, valuable input from the Chinese partners will refine German practices and offer a different perspective on current and future approaches. To carry out the project, The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, the German Energy Agency (dena) and Agora Energiewende collaborate with the China Electric Power Planning and Engineering Institute (EPPEI), China Southern Power Grid (CSG), and the Institute for Applied Ecology at the Chinese Academy of Sciences (IAE).

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