

Outlook and Challenges for International Coal Market in 2022

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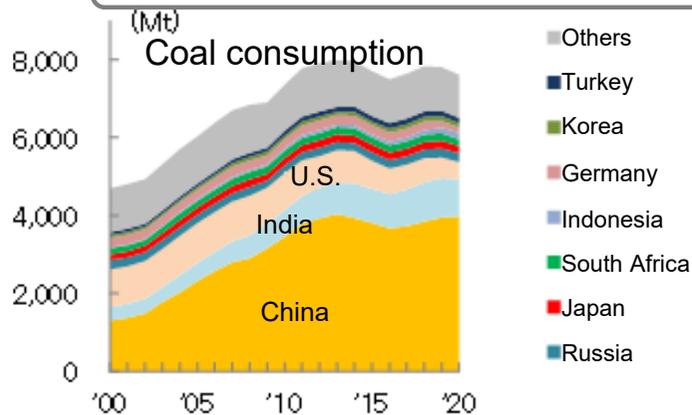
Institute of Energy Economic, Japan

- ✓ While coal phaseout has become a dominant policy, Asia as the center of the international coal market will maintain coal consumption and imports, including India and Southeast Asia.
- ✓ Benchmark coals spot prices* staged the sharpest ever spike in 2021. Steam and coking coal prices will follow a downtrend in 2022. The benchmark steam coal price will drop below \$130/ton in the second half of 2022 (while fluctuating on seasonal factors) from the present range of \$155-160/ton. The benchmark coking coal price will fall below \$235/ton from the current range of \$340-345/ton.
* The spot steam coal price is the FOB price at New Castle Port in Australia. The spot coking coal price is the FOB price for Australian premium hard coal.
- ✓ Coal phaseout initiatives will be implemented along with energy supply stabilization measures. A rapid coal phaseout policy may be implemented to sharply suppress coal demand or coal supply will be remarkably restricted, risking wild fluctuations in coal prices.
- ✓ An important challenge is whether the world could establish technology and economic efficiency for mixing ammonia with coal for combustion and other low-carbonization measures for coal-fired power generation to demonstrate coal-fired plants' role in smooth transition to carbon neutrality.

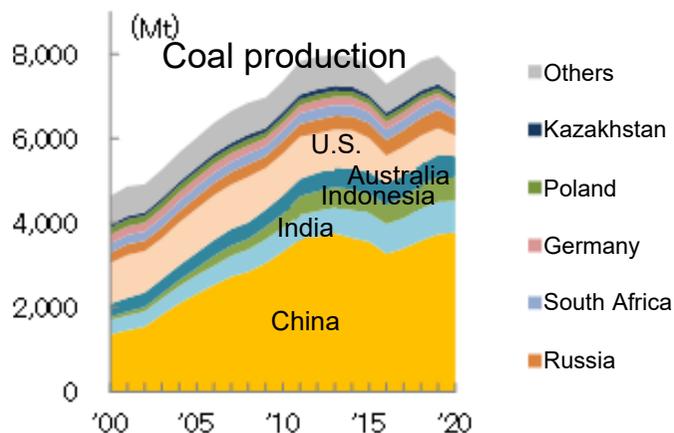
Global Coal Supply and Demand Trends

- Consumption: Global coal consumption has increased at the annual average rate of 0.2% since 2010. Consumption continued to **expand** on growing **Chinese and Indian** demand from 2017, before posting an annual **decline of 3.8%** in 2020 under the COVID-19 pandemic.
- **U.S.** consumption and production have declined rapidly in recent years, while **Indonesia** has expanded production.
- Import volume: Global coal import volume began to increase in 2016 and hit a record high in 2019 before **falling by 7.2%** from the previous year to 1.34 billion tons in 2020.

Coal production and consumption trends by country

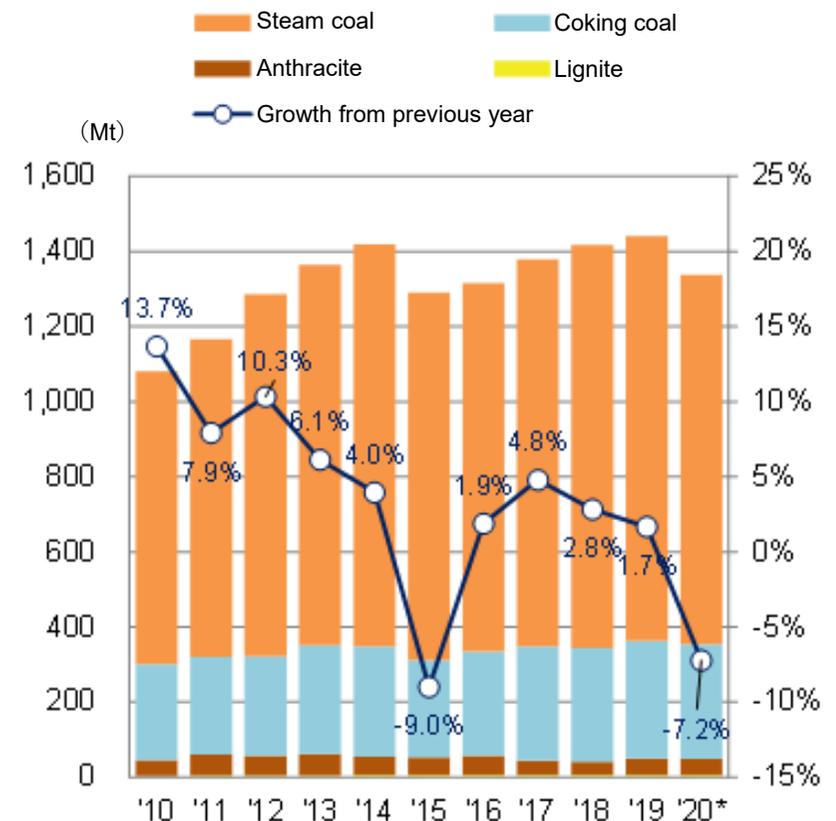


Top 5 consumers	2020-2020 CAGR
China	1.4%
India	3.6%
U.S.	▲7.5%
Russia	0.7%
Japan	▲0.2%
Total	0.2%



Top 5 producers	2010-2020 CAGR
China	1.3%
Indonesia	2.9%
Australia	5.7%
U.S.	▲6.9%
Total	0.3%

Coal import volume trends by category

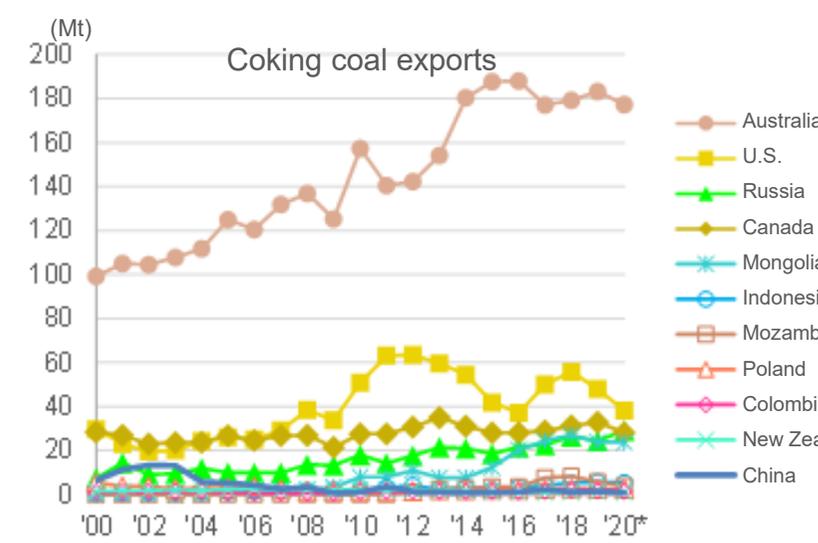
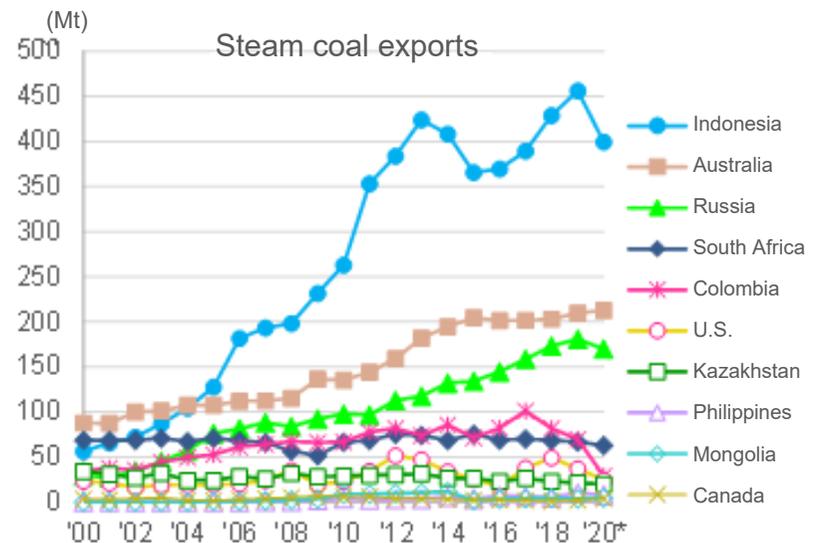
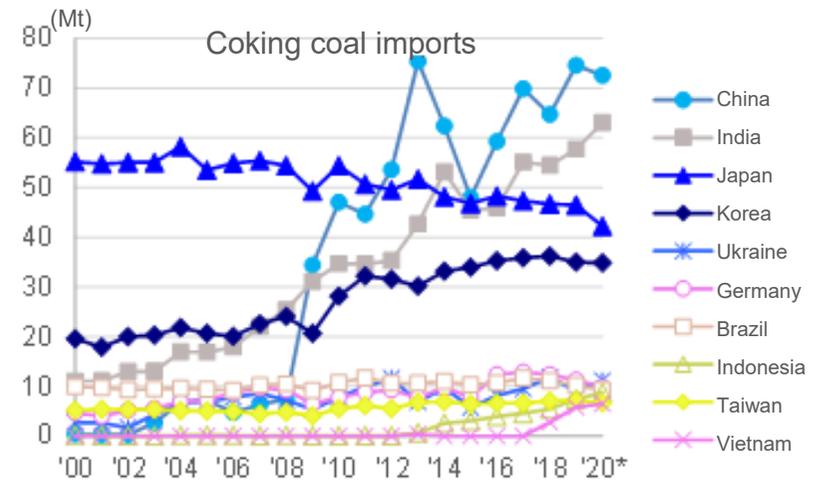
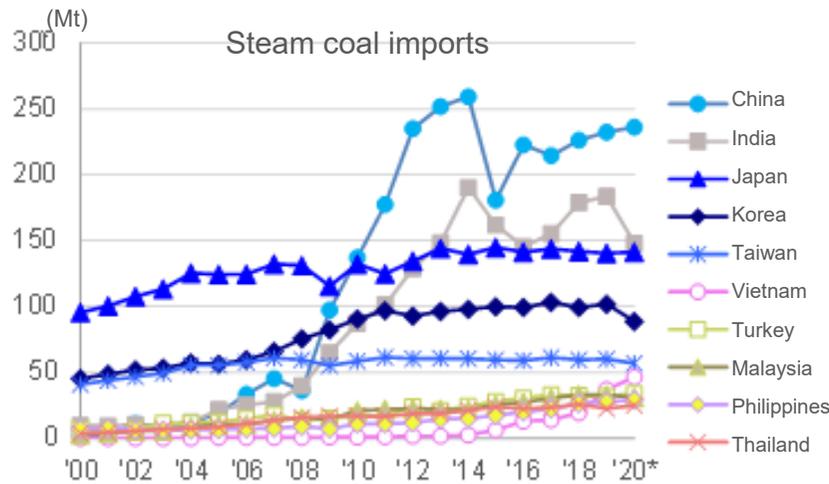


Note: Date for 2020 are preliminary.

Source: IEA, World Energy Statistics 2021 database

Global Coal Import/Export Trends

- **China, India, Japan and Korea** account for most of coal imports. Major exporters include **Indonesia** for steam coal and **Australia** for coking coal.
- Southeast Asia and Turkey have expanded steam coal imports (four Southeast Asian countries' imports in 2020 totaled about 130 million tons against 140 million tons for Japan). **India** has increased its presence in coking coal imports. Southeast Asia has also expanded coking coal imports.



Note: Date for 2020 are preliminary.

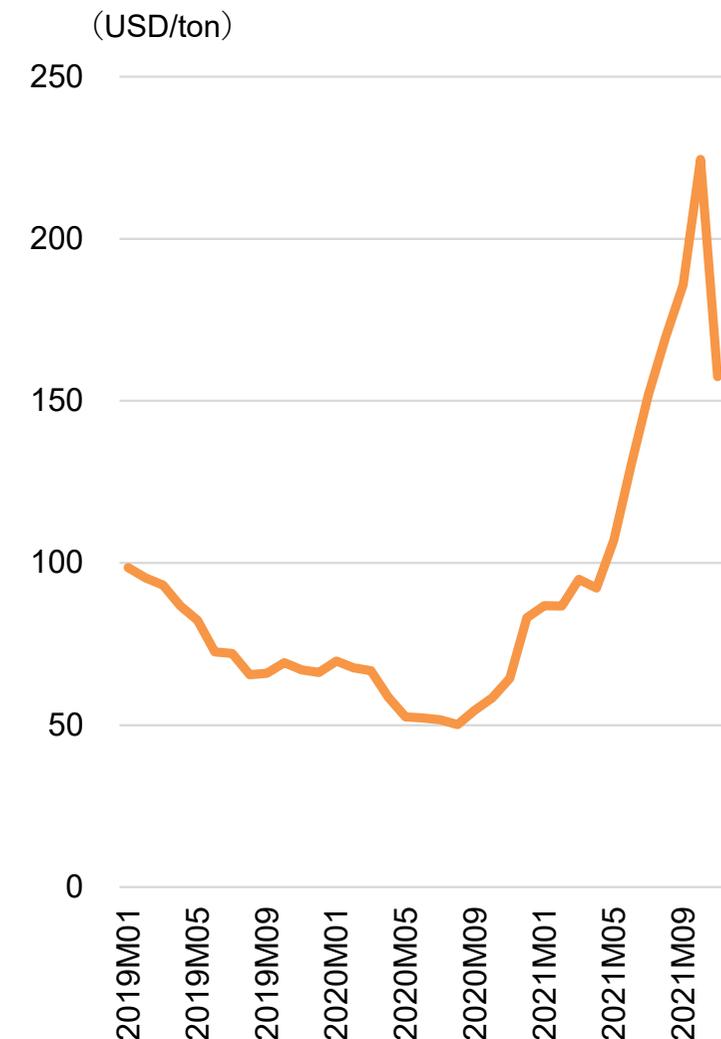
Source: IEA, World Energy Statistics 2021 database

Coal Price Trends

Overview of steam coal price trends:

- The benchmark spot coal price stood at around \$60-70/ton just before the COVID-19 pandemic, slipped **below \$60/ton** in the April-September 2020 period under the pandemic and began to rise back in autumn.
- The price, in a \$70-90/ton range in early 2021, topped **\$100/ton** in the second quarter of the year and continued an uptrend later.
- **China's domestic steam coal prices shot up** from around June due to remarkable **coal shortages**, leading to serious **electricity shortages**.
- Steam coal demand and imports increased rapidly in September in preparation for winter demand expansion, inviting international prices to soar. The benchmark price topped **\$200/ton** in October and surpassed even **\$250/ton** later.
- As the supply-demand balance has eased in response to the Chinese government's order to **increase** domestic coal production in September, the price has fallen back to around \$150/ton.

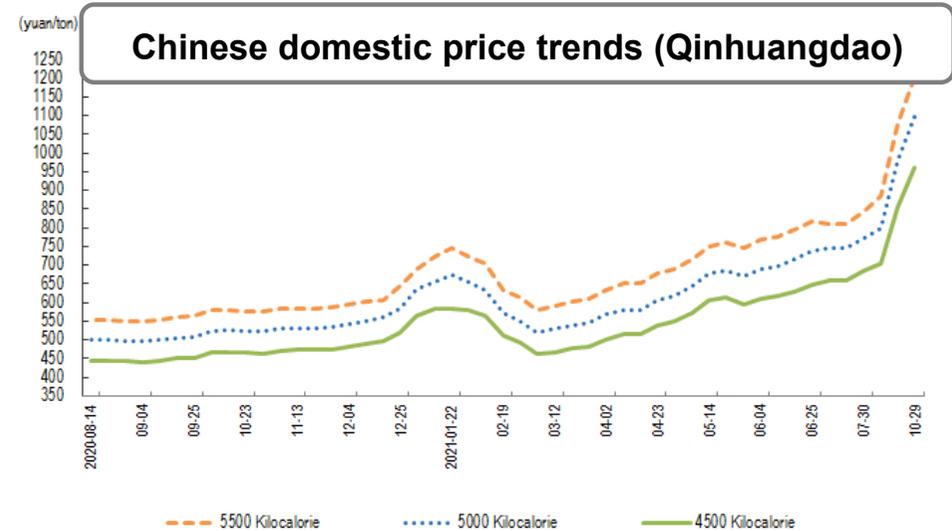
Coal price trends (monthly)



Source: World Bank, Commodity Markets Monthly Prices, December 2021

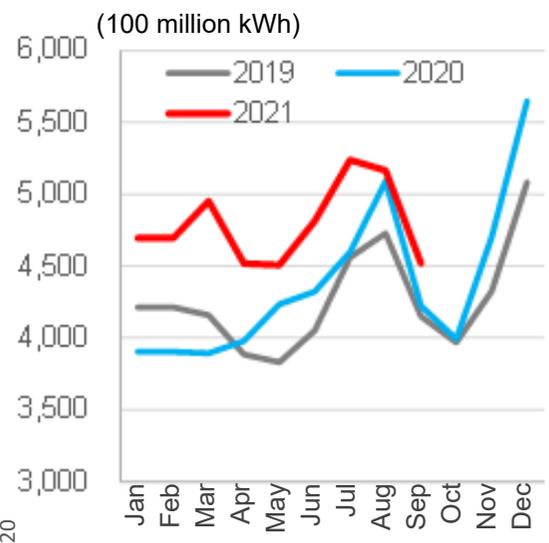
Background for Coal Price Spikes (Chinese Trends)

- Fossil-fired power generation (of which coal accounts for about 95%) **remained high** in 2021. **Raw coal production fell rapidly** due to government safety measures for coalmines in June-July.
- **Domestic coals prices shot up**, leading to electricity shortages.
 - * The industry sector suppressed electricity consumption (to cut greenhouse gas emissions), contributing to the deterioration of economic sentiment.
- Coal imports fell year on year in the first half of 2021 before increasing rapidly from June. Domestic production expanded.

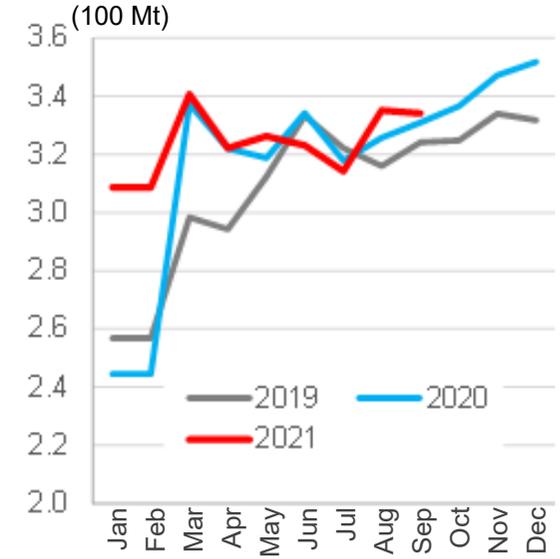


Source: Energy Production in October 2021, National Bureau of Statistics of China

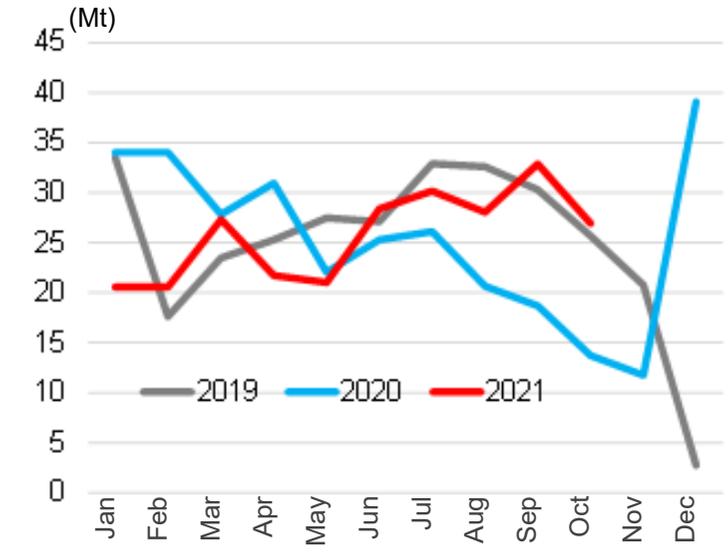
China's fossil-fired power generation



China's raw coal production



China's coal imports

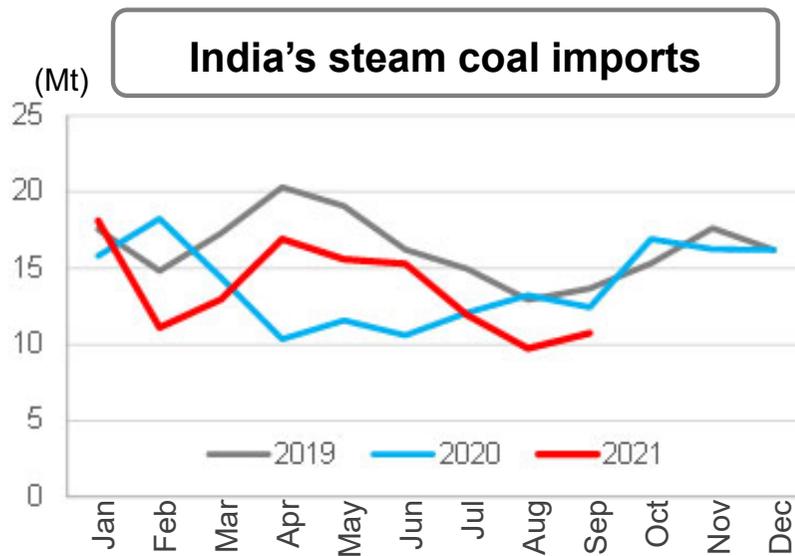


Note: As total raw coal production, power generation and coal imports (2019-2020 and 2020-2021) for January and February are given, the figures show monthly averages for the two months.

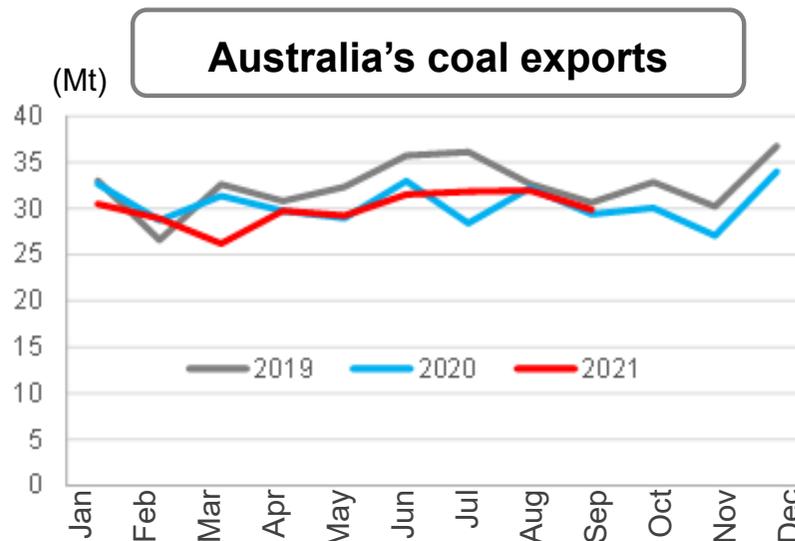
Source: National Bureau of Statistics of China

Background for Coal Price Spikes (Other Major Countries)

- In **India** as well, the supply-demand balance tightened due to heavy rains in the June-September 2021 period. Its steam coal imports in the first nine months of 2021 fell short of the 2019 level despite a recovery from April, **stagnating** due to price spikes. Japanese and Korean steam coal imports in the first nine months of 2021 increased slightly.
- Coal exports: **Supply disruptions** came in Australia and Russia. Australia's exports to China, which had accounted for 30% of its total coal exports, have been zero since January 2021, forcing its exports to remain **low**. Exports from Indonesia, Russia and the United States increased moderately.



Source: Indian trade statistics



Note: Australian exports cover shipments from major ports (excluding Port Kembla).

Source: Australian port websites.

【Summary: 2021 market trend】 As steam coal imports showed no major growth, supply was held down. China's domestic supply restriction made great contributions to international price spikes. The Chinese government's coal supply stabilization measures led prices to decline.

International Situation Surrounding Coal (World)

- As carbon neutrality initiatives gained momentum from the second half of 2020 to 2021, coal phaseout agreements made progress.
- Meanwhile, energy insecurity increased in 2021.
- In 2022, coal phaseout initiatives will be implemented along with energy supply stabilization measures.
 - Initiatives to cut energy consumption and hold down coal power generation will be promoted under international frameworks.
 - Coal production and imports will expand over the short term as Asian coal demand remains steady.

International coal phaseout initiatives that made progress in 2020 and 2021

- The United States, China and Japan declared their carbon neutrality goals.
- The Group of Seven summit in June 2021 produced a pact to end official support for constructing new coal-fired power plants
- COP26 in November 2021 focused on phasing out coal-fired power plants.



2022: International coal phaseout initiatives will be deepened while efforts are made to stabilize energy supply and secure fair energy transition.

- G7 summit (chaired by Germany)
- COP27 (Egypt): Enhancing support for developing countries



2021: Insecurity about stable energy supply

- Serious coal and electricity shortages came in China and India.
- In the United States and Europe, inflation and energy poverty became problems amid energy price spikes.

International Situation Surrounding Coal (China)

- Suppressing industry sector electricity consumption to enhance GHG emission cuts while focusing on easing the coal supply-demand balance over the short term

Field	Overview	Impact on 2022 coal demand
Economy	2022 GDP growth: 5.5% (ADB), 5.6% (IMF), etc.	→
Climate change goals	Emission peaking out in 2030 and reaching carbon neutrality by 2060 October 2021: Boosting non-fossil energy sources' share of primary energy supply to 80% or more by 2060 (carbon tax, enhanced emissions trading)	↓
Climate change policy measures	September 2021: The central government asks local governments to cut energy consumption July 16, 2021: An emissions trading system launched October 24, 2021: An action plan released to boost non-fossil energy sources' share to 80% by 2060 October 26, 2021: An action plan released to lead CO2 emissions to peak out	↓
Coal policy	March 2021: 14th 5-year program (2021-2025) • 2025 coal production target at 4.1 billion tons ➡ Tolerating production growth until 2025 • Increasing coal mining efficiency further and rationalizing coalmines	↗
	August-October 2021: Suspended coalmines ordered to resume and increase production with some mines instructed to expand capacity ➡ An easing supply-demand balance	↗
	October 2021: Coal price surveys launched ➡ Checking price hikes	↗
	October 2021: Electricity rate hikes tolerated ➡ Checking electricity consumption	↓
	October 2021: Coal-fired power plants' efficiency standards ➡ Phasing out inefficient plants	↓

International Situation Surrounding Coal (Other Major Countries)

Major importers (excluding China)

- **India:** India has offered to achieve carbon neutrality by 2070 and expand renewable energy. For the immediate future, it will expand coal production, giving priority to the use of domestic resources. (Coal production decline under the COVID-19 crisis in 2020 and supply shortages came on heavy rains in 2021.) Coal imports that had been rising before the COVID-19 pandemic will also increase in the immediate future. ➡
- **Major southeast Asian countries and Turkey:** These countries built new coal-fired power plants with total capacity of more than 40 million kW between 2015 and the first half of 2021*, expanding future demand due to their full operation. ➡

* Coal Plant Tracker, July 2021

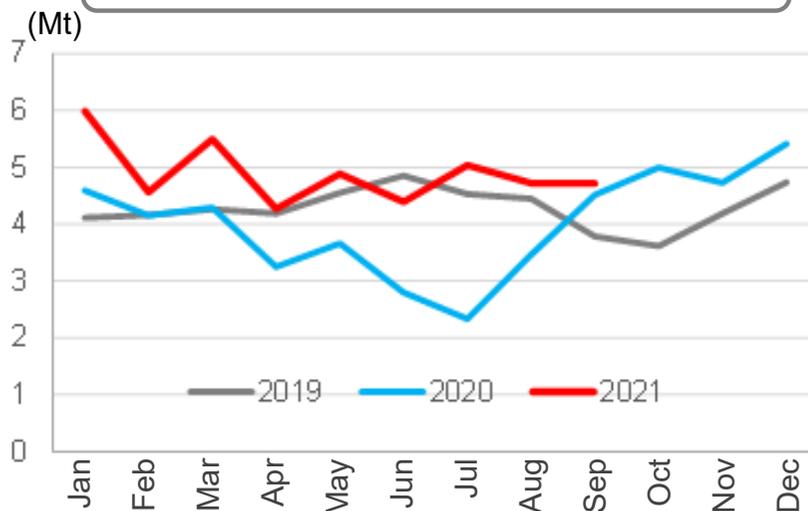
Suppliers

- **Australia:** Disputes with China and the declared goal of carbon neutrality by 2050 will make coalmine development difficult. ➡
- **Russia:** Russia has declared a goal of carbon neutrality by 2060. It may be willing to expand coal exports, but infrastructure development may be a challenge. ➡
- **Indonesia:** Indonesia has expanded coal exports against the backdrop of China's strong demand. In the future, it will give priority to domestic coal supply, willing to phase out coal-fired power plants. ↘
- **U.S.:** If coal prices remain high, the United States will expand and maintain coal exports. ➡
- **South Africa/Colombia:** Production will destabilize due to the European market's decline, the COVID-19 pandemic and walkouts. ↘

Coking Coal Trends

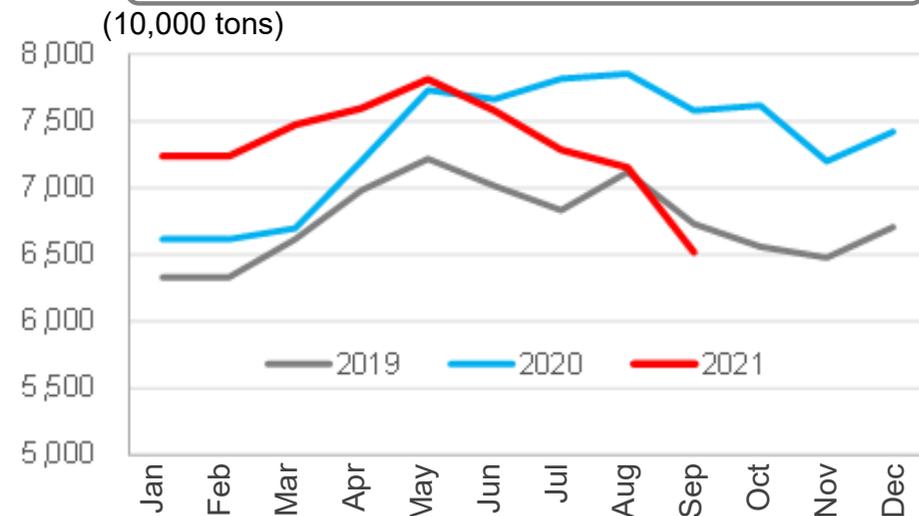
- Coking coal price trend: The benchmark spot coking coal price fell below \$100/ton in May 2020 and fluctuated before soaring from May 2021. In September, it shot up to a record high above \$400/ton.
- Background: India's sharp import expansion, China's domestic production cuts and price, China's ban on imports from Australia and increased procurement from other countries (including the United States), supply disruptions in some coal-exporting countries (labor shortages under the COVID-19 pandemic, infrastructure troubles, etc.) → International price spikes
- China : Coking coal imports' stagnation since late 2020 and excessive steelmaking capacity → Steelmakers restructured themselves, increased electric furnaces, held down new production capacity and suppressed crude steel production (to reduce energy consumption and greenhouse gas emissions).

India's coking coal imports



Source: Indian trade statistics

China's pig iron production trend



Source: National Bureau of Statistics of China

Outlook and Challenges in 2022

- As China eases the coal supply-demand balance after contributing much to coal price spikes in 2021, coal prices will fall back moderately in 2022. While coal phaseout initiatives are promoted, no substantial decline will emerge in coal demand. China will maintain imports. India and Southeast Asia will maintain or expand imports. As domestic demand increases in Indonesia, any substantial expansion in supply for exports will be difficult.
- The average spot price in 2022 will be \$132/ton for steam coal and \$299/ton for coking coal.
 - The average CIF price will be \$147/ton, or 2.5 cents per million calories.
The year's LNG import CIF price is predicted at \$11.5-12.5 per million Btu, or 4.6-5.0 cents per million kilocalories.

	2020 average	2021 average (estimated)	2022 average (projected)
Spot steam coal price	59	135	132
Spot coking coal price	121	225	299

- If a rapid coal phaseout policy is implemented to sharply suppress coal demand or coal supply is remarkably restricted, coal prices will fluctuate wildly.
- An important challenge is whether the world could quickly establish low-carbonization technology and economic efficiency for mixing ammonia with coal for combustion to demonstrate coal-fired power generation's role in smooth transition to carbon neutrality.