Coal

2021

Analysis and forecast to 2024

INTERNATIONAL ENERGY AGENCY

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Abstract

Coal 2021 is the world's most comprehensive forecast of coal demand, supply and trade, based on detailed analysis of the most recent data at country and sectoral level, broken down by coal grade (thermal coal, coking coal, pulverised coal injection and lignite). *Coal 2021* presents real data for 2019 and 2020, the most up-to-date estimates for 2021, and forecast for 2022, 2023 and 2024. Leveraging the IEA's inter-fuel and inter-regional expertise, *Coal 2021* report is consistent with the assumptions and forecasts for oil, gas, electricity, renewables and energy efficiency in other agency reports.

Coal 2021 places a special focus on China, whose dominance of coal markets – it is the largest consumer, producer and importer – has no parallel with any other country or any other fuel. India, the second-largest producer, consumer and importer, also receives a special attention. Whereas the current speed of policy and market changes is unprecedented, *Coal 2021* looks for the underlying indicators which will determine coal markets realities through 2024.

Given that coal is the largest source of electricity generation, the second-largest source of primary energy and the largest source of energy-related CO_2 emissions, *Coal 2021* is a must-read for anyone with an interest in energy or climate.

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Executive summary

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The 2020 collapse in coal demand turned out to be smaller than anticipated

Even before the pandemic, coal faced a difficult outlook for 2020. Demand was being squeezed by a mild winter in the Northern Hemisphere, low natural gas prices and strong renewables growth. When electricity demand and natural gas prices plummeted as the Covid-19 crisis escalated, coal-fired power generation bore the brunt of the impacts. Reduced industrial activity also hit coal demand, although in a more limited way. In the early months of the crisis, a double-digit annual decline in global coal demand looked plausible. But economic recovery in China came sooner and stronger than initially expected, with year-on-year growth resuming as early as in April. With economic recovery following elsewhere and a cold snap in December in Northeast Asia, global coal demand fell by 4.4% in 2020 – the largest decline in many decades but less than initially expected. The regional disparities were large. Coal demand grew by 1% in China in 2020 but dropped by nearly 20% in the United States and the European Union – and by 8% in India and South Africa.

Coal-fired power generation is set to reach an all-time high in 2021

The declines in global coal-fired power generation in 2019 and 2020 led to expectations that it might have peaked in 2018. But 2021 dashed those hopes. With electricity demand outpacing low-carbon supply, and with steeply rising natural gas prices, global coal power generation is on course to increase by 9% in 2021 to 10 350 terawatt-hours (TWh) – a new all-time high. However, coal's share of the global power mix in 2021 is expected to be 36% – 5 percentage points below its 2007 peak. In the United States and the European Union, coal power generation is forecast to increase by almost 20% in 2021 but will not reach 2019 levels. By contrast, estimated growth of 12% in India and 9% in China will push coal power generation to record levels in both countries. Taking into account the rebound in global industrial output, overall coal demand worldwide is expected to grow by 6% in 2021, bringing it close to the record levels it reached in 2013 and 2014.

China continues to dominate global coal trends

China's influence on coal markets is difficult to overstate. China's power generation, including district heating, accounts for one-third of global coal consumption. China's overall coal use is more than half of the global total. Coal demand in China is underpinned by fast growing electricity demand and the resilience of heavy industry.

This is despite a decade of strong and sustained efforts to diversify the country's power mix – during which China has expanded hydro, wind, solar and nuclear power capacity by more than any other country in the world – and intensive switching from coal to natural gas in the residential heating and light industrial sectors. China is also the world's largest coal producer and importer, with domestic price swings from supply-demand imbalances immediately impacting international markets.

Global coal demand may well hit a new all-time high in the next two years

Beyond 2021, global coal consumption is set to revert to the pattern seen over the previous decade: declines in advanced economies offset by growth in some emerging and developing economies. After its brief rebound in the United States and the European Union in 2021, coal demand will resume its decline through 2024. This is mostly driven by the power sector where slow electricity demand growth and rapid expansion of wind and solar PV are eating into coal power generation. In addition, a big part of the recent switching from natural gas to coal will reverse as gas prices retreat from their highs. At the same time, countries such as Viet Nam, the Philippines and Bangladesh, where very strong growth in coal demand had been expected a few years ago, are now set to show more modest increases as they shift more towards sources of electricity that are less carbon intensive. However, global coal trends will be shaped largely by China and India, who account for two-thirds of global coal consumption, despite their efforts to increase renewables and other low-carbon energy sources. In China, coal demand growth is expected to average less than 1% per year between 2022 and 2024. In India, stronger economic growth and increasing electrification are forecast to drive coal demand growth of 4% per year. India's growing appetite for coal is set to add 130 million tonnes (Mt) to coal demand between 2021 and 2024. For most industrial purposes where coal is used, such as iron and steel production, there are not many technologies that can replace it in the short term. Based on current trends, global coal demand is set to rise to 8 025 Mt in 2022, the highest level ever seen, and to remain there through 2024.

Coal production is set to rise to its highest ever levels in 2022

Coal production failed to keep pace with rebounding coal demand in 2021, especially during the first half of the year, cutting into stock levels and pushing up prices. In China and India, where coal shortages led to power outages and idled factories, domestic policies to ramp up production and reduce coal shortages were soon implemented, facilitated by the large presence of state-owned companies in production. The main coal exporting countries were prevented from fully taking advantage of high prices by supply chain disruptions, such as flooding in Indonesian mines. Years of lower investment due to financing and bureaucratic restrictions also played a role. Outside China, most of the additional production in

2021 came from existing mines or reopened mines that had been idled during periods of low prices. Futures contracts for coal are trading well below spot prices, which is not conducive to investment. Coal production is forecast to reach an all-time high in 2022 and then plateau as demand flattens.

Coal prices reached record highs in 2021

Under pressure from low demand and low natural gas prices, spot-traded thermal coal prices had fallen to USD 50 per tonne in the second quarter of 2020, down by around 50% over an 18-month period. They stayed around the same level through the third quarter. Supply cutbacks then balanced the market before rebounds in economic activity and coal demand in China started pushing prices up. In 2021, the price of coal was further lifted by demand outstripping supply in China – the global coal price setter – as well as by supply disruptions and higher natural gas prices globally. Chinese coal demand rebounded by more than 10% in the first half of 2021, but production did not keep pace in part because many mines had closed in previous years amid government fears of oversupply. Coal prices reached all-time highs in early October 2021, with imported thermal coal in Europe, for example, hitting USD 298 per tonne. Quick policy intervention by the Chinese government to balance the market had a rapid effect on prices. As of mid-November, European prices were in the range of USD150 per tonne.

Momentum behind net zero has grown, but the era of declining emissions is moving further away

The pledges to reach net zero emissions made by many countries, including China and India, should have very strong implications for coal – but these are not yet visible in our near-term forecast, reflecting the major gap between ambitions and action. Japan, Korea and China have also committed to stop public funding for building new coal power projects abroad, severely limiting the possibilities for expanding coal-fired generation in many countries. New commitments during COP26, such as the Global Coal to Clean Power Transition Statement to accelerate the transition from unabated coal power generation, put additional pressure on coal. The coal power generation rebound in the United States and Europe in 2021 is a blip, and coal demand will resume its decline in both regions. However, Asia dominates the global coal market, with China accounting for more than half of global demand, or two-thirds if India is added. These two economies – dependent on coal and with a combined population of almost 3 billion people – hold the key to future coal demand. The fate of coal depends on how quickly and effectively countries move to implement their net zero commitments. And the level of coal demand in a net zero carbon economy will depend on how successful efforts are to deploy carbon capture, utilisation and storage (CCUS) technologies.