EURACOAL
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AISBL

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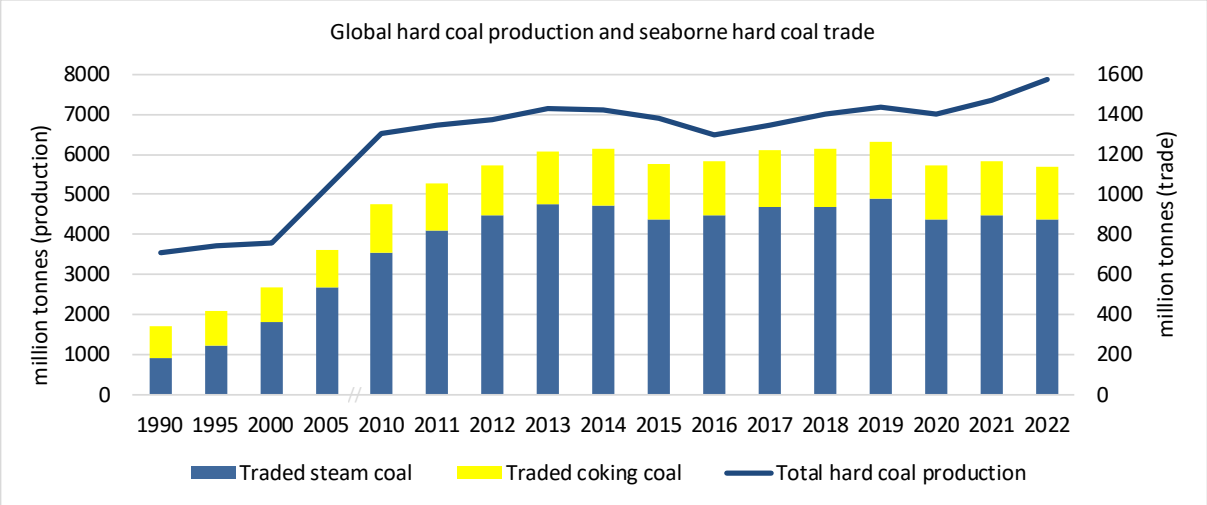
WORLD COAL MARKET DEVELOPMENTS

Global coal trade suffered a severe shock in 2022 following Russia's invasion of Ukraine on 24 February. This ongoing war has upended energy markets, especially in the EU where a ban on Russian coal imports and fast-changing energy policies have affected the market for all energy commodities. Coal prices reached record highs. Affordability and the security of energy supply have become top political objectives for many countries around the world, especially as concerns grow over protectionism. For the EU, this has meant a partial return to coal, but overwhelmingly it means a greater focus on renewable energy sources, whatever their cost. The REPowerEU initiative on energy independence from Russia led to legislative proposals and amended state-aid rules in favour of renewables and green hydrogen. EURACOAL has responded to this initiative, but more urgently calls for an end to the war in Ukraine which is destroying the hopes and dreams of millions of citizens. Efforts to rebuild the country – especially its energy infrastructure – can then begin.

Global Coal Trade



Sources: IEA; VDKi; McCloskey by OPIS

Global hard coal production increased by over 5% to a record 7.9 Gt in 2022 as economies continued to recover from the COVID-19 pandemic and pent-up demand was met. Coal power generation also reached a new high in 2022 of around 10 300 TWh, led by strong growth in India and the EU. The International Energy Agency (IEA) now expects a decade-long plateau, rather than any decline in coal supply and demand.

In the EU, coal supply grew by 8.3% to 476 Mt with lignite production increasing by 7.1% and coal imports by a massive 18.4%. The IEA predicts this growth in imports to be temporary. Despite the high demand, EU hard coal production fell by 4.5%. EU coal supply has rebounded strongly over the last two years, after collapsing 22.1% in 2020, but was still 6.0% below 2019 levels in 2022.

As in recent years, especially since 2001 when China joined the World Trade Organization (WTO), Asian coal production and consumption were again strong in 2022. Coal production in China grew by 463 Mt or 11.5% – roughly equivalent to the EU's *total coal consumption* – to 4 489 Mt as the government eased its strict lockdown policies following the COVID-19 pandemic.

Accounting for half of global coal production, China's demand for coal will remain buoyant: 94 GW of new coal power plants are under construction. To meet the growing demand from the power sector, the National Development and Reform Commission (NDRC) wants more steam coal production, with a target of 2.9 Gt in 2023. The largest coal producers are state owned and NDRC has appointed seven trading houses as brokers for smaller coal miners, so the government fully controls the market. Coal demand is also growing for other uses. Shaanxi Coal Group will begin phase one of a new coal-to-chemicals plant in 2023 which will consume 20 Mtpa of coal to yield 5.9 Mtpa of polyolefins. Exemptions from certain carbon emission and energy efficiency regulations facilitated the company's investment decision. At China's coal mines, safety continues to be an issue and state inspections are being increased in response to the 245 fatalities in 2022. Even so, in February 2023, six men were killed and 47 reported missing at an opencast coal mine in Inner Mongolia following a dramatic landslide.

Two years after imposing an unofficial ban on Australian coal, China resumed imports in early 2023 (see box below). China has also benefited from greater supplies of Mongolian coking coal imported by truck and increasingly by rail as new lines open. Pricing of Mongolian exports is likely to change from direct and sometimes corrupt contracting as Erdenes-Tavantolgoi JSC announced that future sales would be by auction on the Mongolian Stock Exchange.

India, the world's second-largest coal producer, reported output of 850 Mt in 2022 (+11.0%) as the government encouraged local production. The Indian government is again teasing coal markets by demanding Coal India Limited (CIL) produces 1 000 Mtpa to largely eliminate the need for imports. At the same time, the government has issued two orders under Section 11 of the Electricity Act 2003 to keep coal power plants that use imported coal running at full load between 16 March and 15 June 2023. With limited domestic resources of coking coal and fast-rising demand for steam coal, India is still expected to become the world's biggest coal importer by 2030.

Indonesian hard coal production rose to 539 Mt (+2.7%). Adding brown coal production, Indonesian output hit a record 669 Mt in 2022 and the government expects +5% production growth in 2023. Indonesia is the world's largest exporter, followed by Australia: together they have a share of more than 60% of world trade.

After growing strongly in 2021, US production added one million tonnes in 2022 to reach 482 Mt, meeting demand mainly for power generation and exports which were steady at 73.0 Mt (excluding to Canada). Exports to Europe were up over the winter period, by about 20%, but slumped in March 2023. Given that US coal has higher sulphur than Russian coal, the average sulphur content of EU imports has risen from below 1% to as much as 1.4%. On 7 February, President Biden's State of the Union address pushed oil companies to boost investment with a quadrupling of the tax on share buy-backs from 1% to 4%. This measure also affects coal.

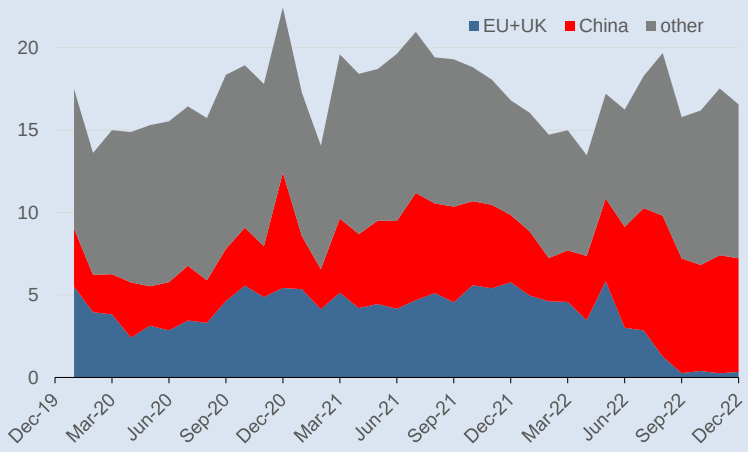
South Africa, benefitting from significantly higher sales to Europe, increased production by 3 Mt (+1.3%) to 232 Mt while exports rose by 5.3 Mt or 8.0% to 71.5 Mt. Infrastructure bottlenecks mean export capacity at ports remains underutilised. For example, Transnet has repeatedly declared *force majeure* on its Northern Corridor rail lines while the Richards Bay coal terminal has suffered from vandalism. Meanwhile, Andre Marinus de Ruyter, the former CEO of Eskom, was unable to deal with rampant corruption at the state-owned power utility (*e.g.* coal stolen off stock was resold back to Eskom). In December 2022, he survived an alleged cyanide poisoning while at work. After giving a press interview laying out his concerns, Energy Minister Gwede Mantashe accused him of treason, so he fled the country.

Russian coal exports under sanctions

Given the scale of sanctions, coal production in Russian remained remarkably stable during 2022 at 431 Mt, losing just 6 Mt or 1.4% compared with 2021. Global trade flows quickly adjusted to sanctions with China, India and South Korea (where sanctions apply only to new contracts) accepting more Russian coal, often with heavy discounts. Despite these discounts, prices are still reasonably attractive for Russian producers and money flows into the Russian economy. Rail costs are much higher to eastern ports, so net-back selling prices for producers are lower. If Russian coal – 197 Mt in 2022 – had not been exported, then the global coal market would have experienced a much greater shock.

Russian coal exports to the EU continued under pre-existing contracts, at least until the formal ban on Russian coal came into effect on 10 August 2022. The chart below, covering two years, shows how this ban resulted in a shift of exports from the EU to China. By September, EU imports were close to zero – as demanded under EU sanctions. However, total Russian coal exports were largely unchanged in 2022 because as the EU ramped down its Russian coal imports, China ramped up, paying heavily discounted prices of perhaps 50% below ARA (but still above historic prices). The outcome on prices would have been far more severe if all countries has banned Russian coal – trade over longer distances on the international market has damped the impact of the bans by the EU and others.

Russian coal exports, 2021-2022 (Mt/month)



The Russian government had previously announced plans to upgrade railway lines to the eastern ports, including the Baikal-Amur and Tran-Siberian lines, to increase coal freight capacity by 70 Mtpa to 180 Mtpa. Western sanctions have affected access to essential equipment and financing is scarce, so these upgrades will likely take longer than planned. Before then, coal exports will be challenged by a preference to ship higher-value cargoes along these capacity-limited rail corridors.

In Colombia, the government appears open to new coal developments, despite the tough anti-coal line taken by President Gustavo Petro during his 2022 election campaign. At an operational level, heavy rain blocked the Cerrejón and Fenoco rail lines, while protests by traditional landowners limited coal output to 65 Mt (+10%) in 2022. Several mines owned by CNR and Prodeco have been closed, but with prospects for some under new ownership. On the other hand, output at Cerrejón almost tripled in 2022 as sanctions against Russian coal helped Colombian miners compete in the European market.

Tables 2 and 3 show that international seaborne coal trade – steam and coking coal – fell to 1 144 Mt in 2022, a 1.6% decrease compared with 2021. As in 2021, steam coal accounted for 77% of trade. Since the commencement of its hostilities, Russia has not reported coal exports. Hence, these can only be inferred from import data reported by third countries. There is therefore considerable uncertainty in the trade data reported for 2022 as statistical balances cannot be performed.

China's unofficial ban on Australian coal

Australian coal production fell to 405 Mt in 2022, this being 15 Mt or 3.6% lower than in 2021 as exporters faced the headwinds of a Chinese ban on Australian coal imports. A severe drought in China in summer 2022 led to low hydro power output and a reassessment of the unofficial ban on Australian coal – in place since late 2020 and "unofficial" to comply with WTO rules. On 3 January 2023, China's National Development and Reform Commission decided to allow four state-owned companies – China Baowu Steel Group, China Datang, China Huaneng Group and China Energy Investment Corporation – to import Australian coal for their own use. An end to the ban reflects the gradual improvement in bilateral relations since the general election of May 2022 when the Labor Party was elected to office under PM Anthony Albanese. The previous Prime Minister, Scott Morrison, had called for more investigations into the source of COVID-19. Following the ban, China increased its coal imports from Indonesia, Russia, and Mongolia to fill the 80 Mtpa gap while higher coal prices mean the price difference between China's domestic coal and imported coal has closed, making imports less attractive.

In response to the ban, Australia has exported more coal to India, Japan, and South Korea, although not enough to fully replace the lost exports to China. Nevertheless, and despite lower tonnages, the surging price of coal in 2022 significantly increased Australia's export earnings: coal export revenues reached AUD 142 billion, more than double 2021 revenues (+124%).

Steam coal trade

Steam coal trade has shifted away from developed markets towards emerging markets in Asia. Russia's invasion of Ukraine disrupted this trend in countries dependent on Russian gas and coal, notably in Europe. The closure of nuclear power plants in Germany and low hydro generation have boosted coal demand: coal use in Europe has risen from 15% of the electricity generation mix in 2021 to 16% in 2022 as coal plants were put back into service. A warm winter helped avoid a worse crisis and has left both coal and gas stocks at healthy levels in March 2023.

The seaborne steam coal market is estimated to have shrunk by 4.1% to 877.1 Mt in 2022 compared with 2021. Australian steam coal exports fell by 10.2% to 178.3 Mt as Chinese buyers sought coal from elsewhere. Indonesian coal exports grew 4.3% to 360.3 Mt as importers sought alternatives to Russian and Australian coal. Coal imports into the EU, mostly via the ports of Amsterdam, Rotterdam and Antwerp (ARA), were again strong in 2022, rising 19.6 Mt or 18.3% to 126.8 Mt compared with 2021, almost equalling the pre-pandemic level of 127.5 Mt in 2019. Overall, international coal trade appears to have plateaued with longer shipping distances and little investment in new infrastructure.

Indonesia accounts for almost half of global steam coal exports, helped by its low costs. However, in response to shortages on the domestic market, the government stopped exports briefly in January 2022. Australian steam coal exports were disrupted by the COVID-19 pandemic, but environmental protests and court cases over land use, notably in the Hunter Valley where coal use competes with agriculture and tourism, also affect output.

Exports from Canada largely originate at the Vista mine and Coal Valley, both in Alberta. The latter was closed during the COVID-19 pandemic, but recommenced operations in late 2021 and ramped up in 2022. However, Canadian government policy mandates an end to thermal coal exports by 2030, and the government has announced that no new steam coal mines will be approved.

Looking ahead, demand for steam coal will be somewhat constrained by government policies:

- The Chinese government has placed a priority on reducing coal import dependence with various measures: more domestic coal production, more LNG imports, more nuclear power and more renewables. Coal imports could end by the 2030s. Similarly in Hong Kong where the Lamma and Castle Peak coal power plants are being converted to gas-fired units.
- Taiwanese coal imports declined by around 8% in 2022 and plans to expand its coal fleet have been abandoned in favour of gas.

- In Japan, the government plans to close one hundred coal power plants over the next seven years, although some new builds are reaching completion. Of fifty-four nuclear plants that were in operation prior to the Fukushima accident in 2011, forty-four remain offline, so the country will continue to value the security of coal power at least in the short term.
- South Korea has announced a proposal to cut coal-fired power generation by around one half between 2018 and 2030 as nuclear generation is expanded. Nevertheless, there are several coal plants under construction.

A group of South Asian countries including Malaysia, The Philippines, Thailand and Vietnam imported around 150 Mt in 2022 and, alongside India, are expected to be the only region with growing steam coal demand. More generally, access to finance for new mines is scarce and, with few new coal power plants under construction, future coal demand growth is limited. Oddly enough, this situation is likely to support higher coal prices and benefit incumbent producers. Given that all types of electricity production face higher costs, coal is likely to remain competitive with higher margins.

Coking coal trade

Global seaborne coking coal trade increased by 0.5% to 267.2 Mt in 2022. Australian exports fell 3.8% to 160.6 Mt but with a still dominant 60% share of the market, while the US enjoyed higher coking coal exports of 43 Mt despite an explosion at the important Curtis Bay Piers in Baltimore. Canadian coking coal exports rose to 29 Mt and this upward trend will continue with the re-opening of the Grand Cache mine in H1 2023 which was idled in 2020 due to the COVID-19 pandemic.

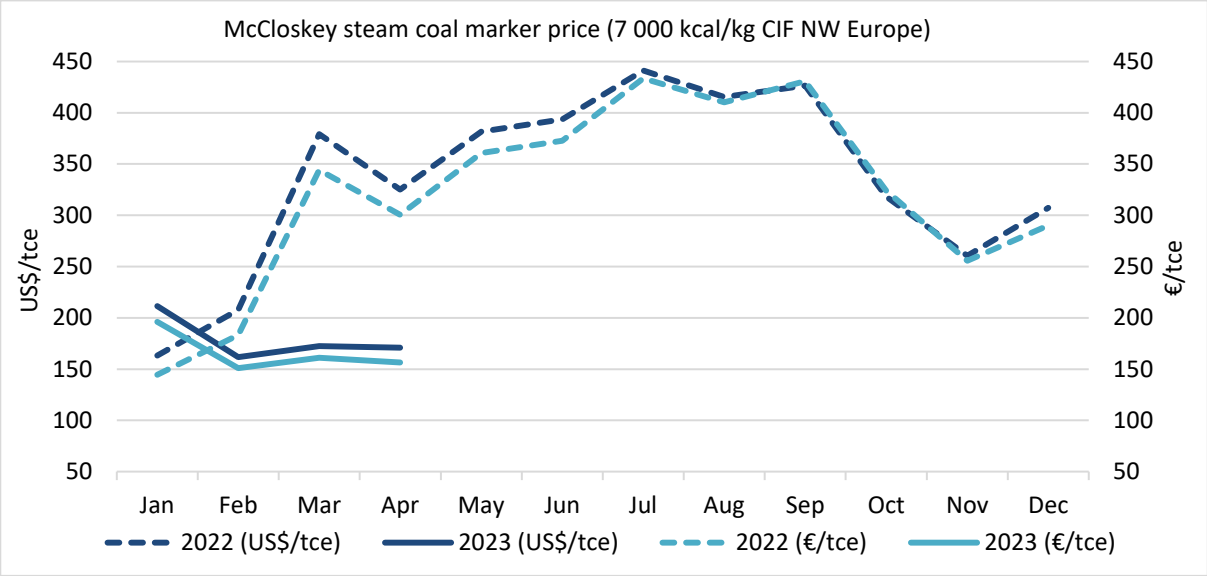
State aid in the EU and under the US Inflation Reduction Act should see more investment in infrastructure and a boost to steel and hence coking coal demand. However, no similar measures were announced at the 20th National Congress of the Chinese Communist Party: China imported 52 Mt of coking coal in 2022. India imported 60 Mt and, unlike China, its imports are expected to grow. Coking coal imports into South Korea (36 Mt in 2022) and Japan (43 Mt) are expected to stagnate or decline. The EU imported 38.3 Mt in 2022, an 11.9% increase compared with 2021.

Coal Prices

Since 2000, there have been only a few brief periods when the monthly average price of coal was above 100 US$/t. The two key coal price series – Qinhuangdao (QIN) in China and ARA in northwest Europe – were stable or even declining over the five years to 2021 when China's unofficial ban on Australian coal imports pushed the QIN index higher.

Beginning Q3 2021, Russia disrupted energy supplies to the EU as it prepared to invade Ukraine. For example, Gazprom did not refill its gas storage sites in Germany and randomly interrupted deliveries via the Nord Stream pipelines. Even so, markets began to return to normal, until 24 February 2022 when war changed everything. ARA steam coal prices quickly hit 400 US$/t and returned to those levels in summer 2022 when prices reached 426 US$/t on 23 June. On 5 April 2022, the European Commission announced its fifth sanctions package including a ban on Russian coal imports effective 10 August 2022. Markets have navigated that ban and begun to stabilise at more "normal" prices, but with a wide delta between ARA and QIN prices reflecting how China benefits from lower-priced coal imports from Russia. In 2022, the average price of steam coal imported into NW European ports (ARA) was 291.82 US$/t CIF, a 142% increase on 2021. Compare this also to the average price in 2020 which was a relatively low 50.28 US$/t due to the COVID-19 pandemic.

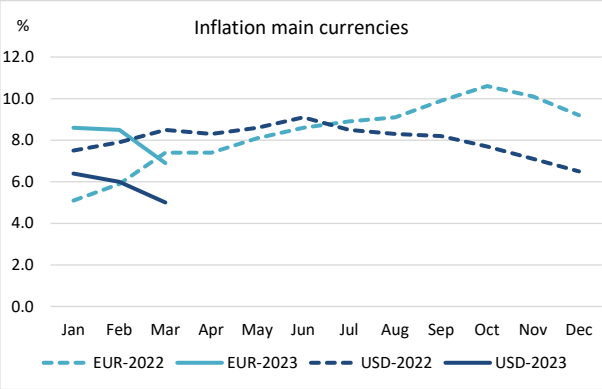
According to the *Resource Quarterly Report* of the Australian government, the price of 6 000 kcal/kg Newcastle coal is expected to decline from 371 US$/tonne in 2022 to around 90 $US/tonne by 2028 (FOB in real terms). A forecast for Australian coal prices by KPMG who surveyed eighteen research databases and broker reports shows a similar expectation that markets will return to normal with lower prices than today – an outcome already seen in Q1 2023 as prices halved. However, such forecasts never predict the unpredictable – no one forecast COVID-19, no one forecast war in Europe, and problems in the banking sector may mean more unpredictable outcomes.

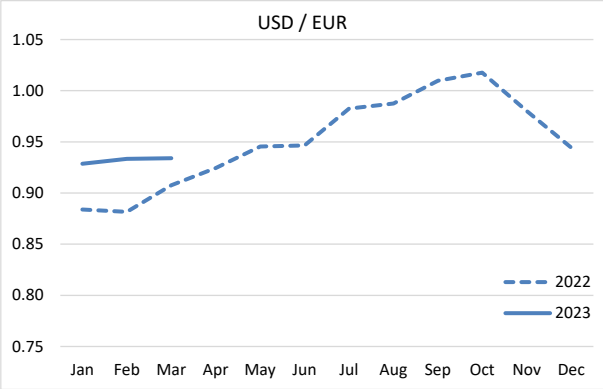


Source: IHS Markit (McCloskey first week quotation of the month, basis 6 000 kcal/kg converted to 7 000 kcal/kg)

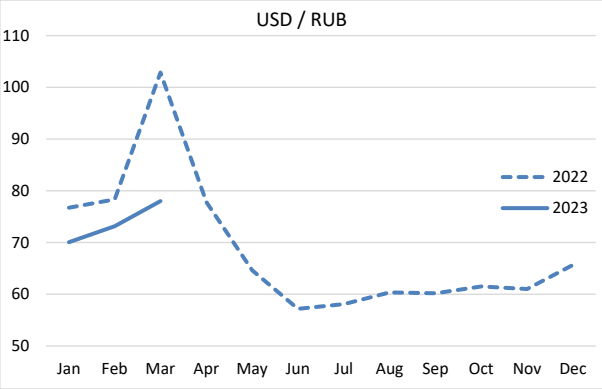
For coking coal, it is trade between Australia and Japan that sets price benchmarks. Coking coal also hit record prices, reaching 654 US$/t on 18 March 2022 (Australian low-vol premium hard coal coking coal, FOB, weekly basis). Recently, coking coal prices have at times been lower than thermal coal prices which may reflect a preference by Japanese utilities to pay more for in-specification steam coal rather than risk any technical problems in their mills or burners with out-of-spec coking coal. In its *Resource Quarterly Report*, the Australian government forecasts the premium hard coking coal price to fall from an average 377 US$/t in 2022, to around 160 US$/t by 2028 (FOB in real terms).

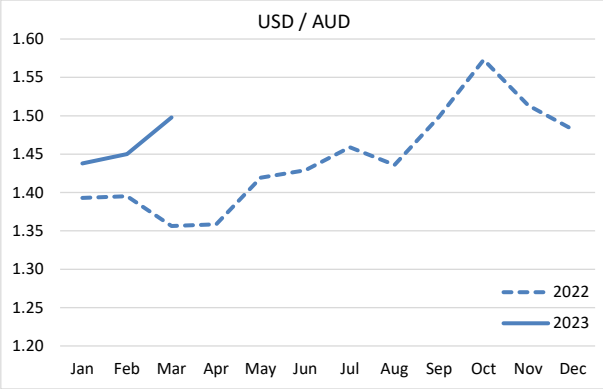
The above price forecasts will depend partly on inflation rates: the US consumer prices index (CPI) eased in H2 2022, but the annual inflation rate in the EU rose to 10.6% in October 2022 (Table 1 and chart below). Prior to November 2021, eurozone inflation had never been above 4.1%.





Sources for inflation: ECB; US Bureau of Labor Statistics



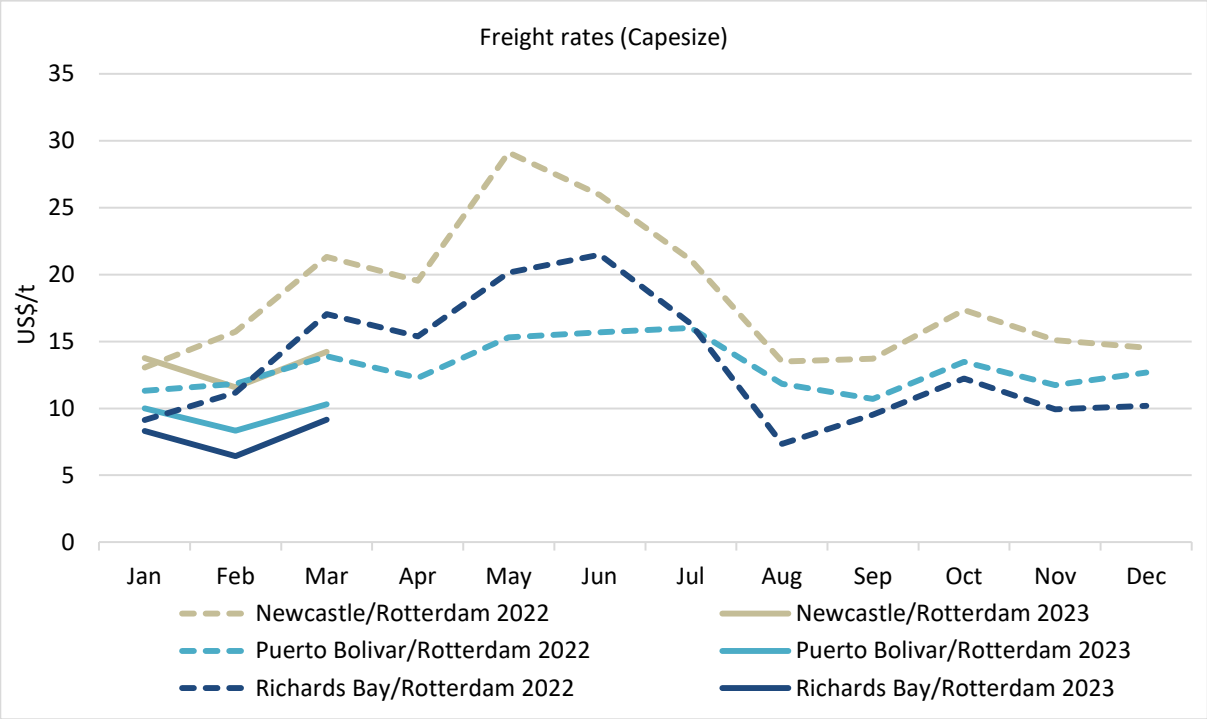


Sources for exchange rates: ECB, BoE and OECD

Freight Rates

Around 15% of seaborne coal trade finds its way to European or Mediterranean countries where Germany was once again the biggest importer in 2022 at 39.9 Mt (+3.1% compared with 2021) followed by Türkiye which saw imports fall by 4.1% to 34.7 Mt.

Freight rates, although volatile, have not seen the same high growth as coal prices. Shipping rates averaged 13 US$/tonne in 2022 for both the Bolivar-Rotterdam and Richards Bay-Rotterdam routes of interest to European buyers. Handysize vessels (<35 000 dwt) saw strong coal shipments in 2022. The changing dynamics of the freight market mean Handysize shipments are expected to reduce as most Russian coal exports to India and China rely on larger Capesize vessels.



Source: Clarksons

EU COAL MARKET[1]

	2022 (1-12) Mt	2021 (1-12) Mt
Hard coal imports	126.8	107.2
Hard coal production	54.6	57.2
Lignite production	294.3	274.7

Hard coal imports into the EU, at 126.8 Mt in 2022, were up 18.3% on 2021 but below the 127.5 Mt imported by the EU in 2019 (a figure which excludes the UK following the country's exit from the EU). Italy (+3.9 Mt or +49.3%), Poland (+6.7 Mt or +50.2%) and Spain (+4.6 Mt or +87.5%) saw the biggest absolute increases in 2022, but Germany was the biggest coal importer in Europe, at 39.9 Mt (+3.1%). EU coal buyers increased purchases from the US, Australia, Colombia, South Africa and Indonesia.

Turning to coal production, EU hard coal output fell by 4.5% in 2022 to 54.6 Mt compared with 2021. Lignite production in the EU rose 7.1% to 294.3 Mt in 2022. However, this was not a return to pre-pandemic levels as output in 2022 was 4.3% below the 2019 production level of 307.5 Mt.

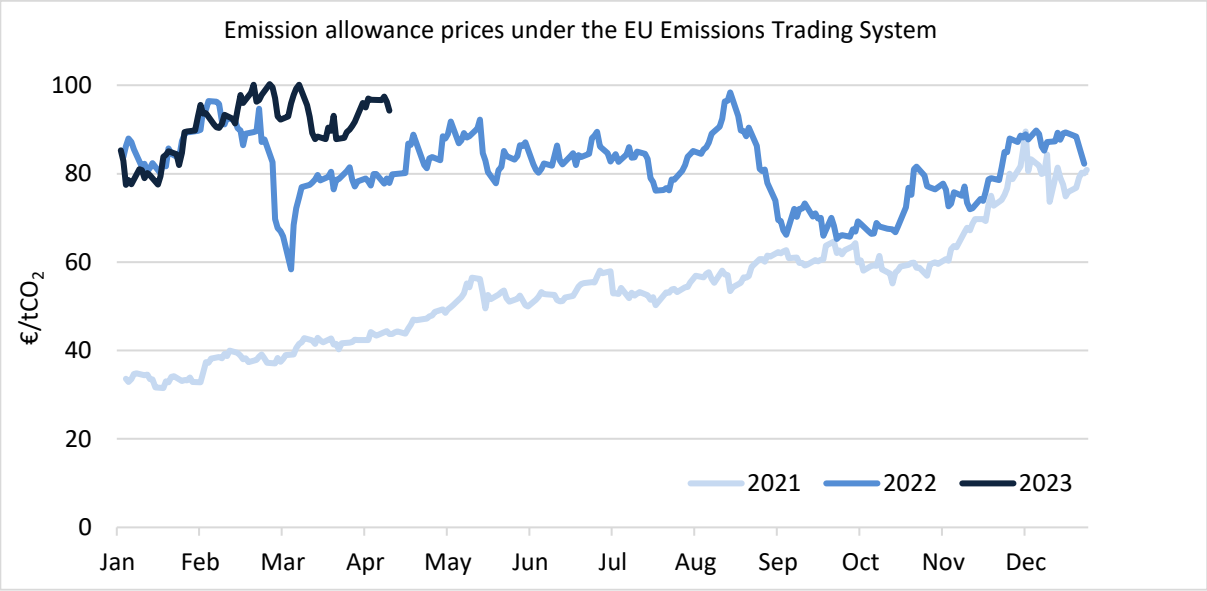
[1] All European coal production and trade data come from EURACOAL members or government sources.

In its REPowerEU plan, the European Commission now expects the EU will use 41% more coal for power generation in 2030 than previously expected in its Fit-for-55 scenario, generating an additional 105 TWh from coal.

Carbon Prices

On 21 February 2023, the price of EU ETS allowances (EUAs) rose above 100 €/tCO_2e for the first time. Increased coal use during the energy crisis spurred buying in 2022, but February's rise was partly driven by utilities wishing to hedge their position as lower temperatures were forecast in northern Europe. In contrast, demand from energy-intensive industry was limited.

The 100 €/tCO_2e threshold is psychologically important for companies falling under the EU ETS and sets a ceiling above which there appears less willingness to buy allowances. Carbon prices have risen fivefold in the past three years, worrying EU steel and paper producers as well as other energy-intensive industries. The tightened rules under the Fit-for-55 package, agreed during trilogue in December 2022, may be a driver for even higher EUA prices.



Source: Intercontinental Exchange

Hard Coal

Producer	2022 (1-12) Mt	2021 (1-12) Mt
Czechia	1.8	2.2
Poland	52.8	55.0
Total	**54.6**	**57.2**

Czech Republic

In 2022, Czech hard coal output was 18.0% lower than in 2021 at 1.8 Mt of which 0.86 Mt were coking coal. This total was a small fraction of the *c.*30 Mtpa coal production of the 1960s and 1970s which has been only partially replaced by imports over the years. Hard coal imports fell 3.5% to 4.4 Mt of which 2.5 Mt were coking coal, two thirds from Poland. Coal exports which peaked back in 2011 fell 38% to 0.87 Mt compared with 2021. Consumption for electricity production was 1.1 Mt.

OKD is the only hard coal producer in the Czech Republic and mining will continue for three additional years until 2025 at the company's only mine. ČSM in the Karviná region, which had previously been scheduled for closure in 2022, will produce a final 3.6 Mt for which sales contracts have been largely agreed.

Germany

In Germany, high prices and political interventions have had a decisive impact on the energy sector: total energy consumption fell by 5.4% in 2022 compared with 2021, but gas fell by 16%. Even so, with a slightly lower share of 23.6%, gas remained the second most important energy source in Germany after oil. The consumption of nuclear energy fell by around one half as three nuclear power plants were closed at the end 2021. In response, consumption of hard coal (+4%) and lignite (+3.4%) increased in 2022 to each cover around 10% shares of total primary energy consumption. Indigenous energy production grew by 2.2% with renewables (55.6%) and lignite (32.7%) taking by far the largest shares. Taken together, domestic sources cover around one third of German demand.

In 2022, Germany imported 39.9 Mt of hard coal, a 3.1% increase on 2021 and comprising 28.4 Mt of steam coal and 11.5 Mt of coking coal. The main challenge for coal importers in 2022 was to diversify away from Russian coal which had accounted for the majority of imports in recent years.

Poland

Hard coal production in Poland decreased to 52.8 Mt in 2022, a 4.0% drop compared with 2021. Attempts to increase production – against a backdrop of mines closures and the social agreement of 2020 to end coal mining by 2049 – were hampered.

In total, 20.1 Mt of hard coal were imported in 2022: 17.1 Mt of steam coal and 3.0 Mt of coking coal – an overall increase of 50.2% compared with 2021 and above the previous peak back in 2018 when coal imports reached a record 19.7 Mt, including 16.2 Mt of steam coal.

As coal demand exceeded supply in 2022, coal stocks fell to a low level of just over one million tonnes as Poland was one of the first to ban Russian coal imports. By 31 May 2023, Polish utilities will have to hold more coal on stock to better ensure electricity supply security, +40% on top of the 2–2.5 Mt previous requirement. Hence, coal imports are expected to remain strong in H1 2023.

Lignite

Producer	2022 (1-12) Mt	2021 (1-12) Mt
Bulgaria	35.5	28.3
Czechia	33.4	29.3
Germany	130.8	126.3
Greece	13.7	12.1
Hungary	4.9	5.0
Poland	54.6	52.4
Romania	18.2	17.7
Slovakia	0.9	1.1
Slovenia	2.3	2.6
Total	**294.3**	**274.7**

Bulgaria

Lignite production in Bulgaria increased by 25.5% in 2022, compared with 2021, to 35.5 Mt. Mini Maritsa Iztok EAD (MMI), a subsidiary of the state-owned Bulgarian Energy Holdings EAD, is the country's largest lignite producer and has begun exporting lignite to two thermal power plants in

Serbia: 2 Mtpa under a two-year contract with options to extend. The company's coal mines in south-eastern Bulgaria sell their output mainly to three nearby thermal power plants: one owned by ContourGlobal, one by AES and the state-owned TPP Maritsa East 2. The total installed capacity of this complex is 3 422 MW and can consume 35 Mt of lignite per year. In its seventieth year, MMI set a production record of 34.65 Mt in 2022.

Gross electricity consumption in Bulgaria totalled 37.8 TWh in 2022, a decrease of 1.5% compared with 2021. However, electricity generation increased by 5.7% to 50.4 TWh according to data from the Electricity System Operator. The trend since 2021 of significant growth in lignite-fired generation has continued. Lignite increased its share in total electricity generation from 40.3% in 2021 to 46.5% in 2022, while electricity generation from other fossil fuels declined: hard coal by 4.0% and fossil gas by 5.4%. A total of 26.4 TWh were generated from fossil fuels in 2022, representing an increase of 18.7% over 2021 and 54.2% over 2020. The largest electricity exports were to Romania (3.7 TWh or +56.5%) and Serbia (>3.0 TWh). Exports to Turkey doubled to 2.3 TWh, while to Greece they were slightly lower compared with 2021 at 2.0 TWh (−0.5%).

On 12 January 2023, the Bulgarian parliament instructed the Council of Ministers to renegotiate the energy section of its National Recovery and Resilience Plan, specifically to change the commitment of the previous government to a 40% reduction in energy sector CO_2 emissions by 2026 (*c.f.* 2019).

Czech Republic

In 2022, brown coal production increased to 33.4 Mt in the Czech Republic (+14.0% compared with 2021) with insignificant imports or exports. Production had been close to 100 Mtpa in the mid-1980s. Consumption for electricity generation increased 10% to 27.3 Mt in 2022 and at an estimated 34.4% lignite was again the most important source of power in the Czech Republic – greater even than nuclear's 31.5% share. High gas prices led to a 41% fall in gas-fired generation to take a 4.1% share and a drought led to low hydro output for a share of 3.1%.

The Czech Coal Commission has recommended a coal phase-out by 2038. However, an updated government manifesto of 1 March 2023 suggests a 2033 phase-out: *"We will create the conditions for energy transition and development of the coal regions so that a phase-out of coal is possible by 2033"*. A draft update of the National Energy Policy to 2050 will be presented by the end of 2023 to set strategic targets and indicators, including the share of fossil fuels in total energy consumption.

Germany

At 130.8 Mt, German lignite production in 2022 was 3.6% above 2021. However, compared with the average of the previous five years, the trend was still downward. Growth in the individual mining districts varied: Rhineland (+4.3%), Lusatia (+3.6%), and Central Germany (+0.8%). These changes largely correspond to the development of deliveries to power plants which at 116.9 Mt (+4.8%) account for almost 90% of national lignite consumption. Despite power plant closures, the war in Ukraine led to a 6.3% higher output from lignite-fired plants in 2022 thanks to higher load factors.

Agreement was reached in October 2022 on a faster coal phase-out in the Rhenish mining area – by 2030 rather than 2038. On the other hand, this would see the 600 MW Neurath D and E units operate temporarily for longer. LEAG and MIBRAG would continue operations in the Lusatian and Central Germany mining regions until 2038. In January 2023, police cleared the Lützerath site so houses could be demolished and overburden removal begun to expand the RWE Garzweiler mine. This police operation attracted much media attention as Greta Thunberg was briefly present before her arrest.

The manufacture of refined lignite products recorded an overall decline of 3.7% in 2022 with the closure of the RWE briquetting plant and demise of the Union brand after 120 years, leaving only the LEAG Schwarze Pumpe plant to meet ongoing demand.

To reduce electricity generation from gas-fired power plants, the German federal government passed an act to make replacement power plants available including 1 900 MW of power plant capacity from the Lignite Strategic Reserve. These units can return to the electricity market for limited periods until June 2023 at the latest. The transfer of lignite plants from strategic reserve to supply reserve will mean little change to the decommissioning schedule out to 2038, but leaves many unanswered questions about the coalition government's aim to phase out coal and lignite by 2030.

Total electricity generation in Germany fell by around 1.7% in 2022. Generation from lignite rose from 110 TWh in 2021 to 116 TWh in 2022 (+5.5%). Generation from hard coal increased by 18% to 64.7 TWh. Lignite and hard coal thus compensated for the reduced electricity generation from other sources. At 44.6%, RES accounted for the largest share of German electricity generation in 2022 while coal and lignite together took second place with a 31.9% share (20.4% lignite and 11.5% hard coal). However, renewables accounted for just 17.2% of German primary energy consumption.

In response to high profits, a statutory revenue cap is proposed. For lignite-fired generation the cap allows a 30 €/MWh fixed-cost contribution, a CO_2 reference cost of 1.236× EU ETS allowance price (*e.g.* 30 €/MWh at 70 €/tCO_2), and a 30 €/MWh safety margin to account for price volatility (and another 20 €/MWh for three RWE units with the earliest exit dates). 90% of revenues above the calculated cap will be taxed. Hard coal power plants are exempt from this revenue cap.

At the end of 2022, there were 17 216 employees in the lignite sector. This figure includes 1 046 trainees and 3 822 employees who work at lignite-fired power plants where the main activity is public electricity supply.

Greece

There are two lignite mining areas in Greece: Ptolemais mines in the north and the Megalopolis Lignite Center in the south. The plan to phase out lignite remains in place, although delayed to 2028. Preparations for post-mining activities are underway. However, the twenty-year trend of declining lignite production reversed in 2022 with an increase to 13.7 Mt or +13.3% compared with 2021 due to the energy crisis. PPC, the majority state-owned utility company, expects almost the same production in 2023.

Commissioning of the new 660 MW Ptolemais V lignite plant is complete. The plant is in test operation at full load and will be fully operational in April 2023. A study on the possible refuelling of this plant is ongoing. All old lignite-fired power plants were planned to close by 2023, but this might be delayed to 2025.

In 2022, more electricity was produced from lignite (5.6 TWh or a 11.0% share) and from renewables (19.7 TWh or 38.8% mainly wind but also solar PV), but less from natural gas (17.9 TWh or 35.5%). Total power demand was little changed at 50.6 TWh, with imports accounting for only 3.4 TWh (6.8%) – far below the levels seen over the 2014-20 period. Nevertheless, imported energy sources accounted for 42% of power generation, a share which is falling after a peak of 53% in 2020.

Hungary

Hungary saw lignite production fall by 1.2% in 2022 to 4.9 Mt. It is used mostly for power generation at the Mátrai Erömü power plant. For the future, several options are discussed, including conversion of the plant to use other fuels, but the current energy crisis has changed the policy priorities. Hungary imports only small volumes of coal: 0.8 Mt in 2022.

Poland

Lignite production in Poland reached a total of 54.6 Mt in 2022, this being 4.3% greater than in 2021.

The *Polish Energy Policy to 2040*, which is itself consistent with the *National Energy and Climate Plan to 2030*, defines a future path for the energy sector. Following an announcement in July 2022 that the State Treasury would acquire the coal and lignite assets of PGE, ENEA, Energa, Tauron Polska

Energia and their service companies, PGE GiEK will have a special role as the new National Energy Security Agency (NABE). After an internal reorganisation of the energy companies, the State Treasury will own all lignite- and hard coal-fired power plants and related lignite mines (except two small private mines), but not hard coal mines or heating assets.

NABE is expected to commence operation in the coming months and to account for 55% of Polish power generation capacity – a total of seventy coal- and lignite-fired units. This new concept will allow Poland to accelerate its energy transformation. Meanwhile, PGE will become a largely renewable energy company, better able to raise finance.

Romania

In 2022, lignite production increased by 2.4% to 18.2 Mt in Romania, almost all of which was delivered to power plants at the Oltenia Energy Complex (CEO) for electricity generation. Romania's National Recovery and Resilience Plan foresees the phasing out of coal and lignite-fired electricity production by 2032, with some flexibility in the short term to increase production as required. In 2022, the European Commission approved state aid of up to €2.66 billion to CEO for a restructuring plan to diversify its energy mix with eight solar PV parks of 725 MW total capacity and two gas-fired power plants: 475 MW at SE Turceni and 850 MW at SE Işalnița.

Slovakia

Production of lignite by Slovakia's only private coal mining company, Hornonitrianske Bane Prievidza (HBP), decreased by 19.1% to 869 kt in 2022 compared with 2021. Closure work at the company's two mines – Bane Handlová and Bane Nováky – is well advanced. Only the underground Nováky mine is producing but is scheduled to close. Bane Čáry closed in September 2022 as poor geological conditions forced HBP to abandon the mine and lay off 300 employees, leaving behind 40 million tonnes of lignite reserves. All lignite production was delivered to the Nováky power plant.

Coking coal imports in 2022 were 10.1% lower than in 2021, totalling 2.6 Mt for US Steel in Kosice and coming mostly from South Africa, Canada and Mozambique, but with 500-750 kt from Poland and the Czech Republic. The steel company has idled two of its three blast furnaces. An estimated 200-300 kt of brown coal were imported from the Czech Republic. In total, lignite accounts for around 5% of the country's electricity generation, including from the 200 MW Nováky coal power plant – jointly owned by EPH and ENEL – which is scheduled to close in December 2023.

Slovenia

Slovenia enjoys balanced shares of hydro, nuclear and fossil fuels for power generation. Lignite usually covers around one third of electricity production, but up to one half when annual precipitation and hence hydro output are low. In 2022, Slovenia's only lignite mine at Velenje produced 2.3 Mt, a decrease of 12.6% compared with 2021, mainly due to geotechnical problems in the mine. This decrease was partly compensated by imports from Indonesia which are set to continue through 2023 and are also used at Termoelektrarna Toplarna Ljubljana (TE-TOL) which supplies the capital city's district heating. Imports more than doubled in 2022 to 425 kt. This imported coal is mixed with domestic lignite before being used at the Termoelektrarna Šoštanj (TEŠ) power plant and TE-TOL. Increased production at Premogovnik Velenje is also being hampered by plans for mine closure in 2033 which has led to a decrease in employees and production. Despite the 2033 coal phase-out date, several open questions remain on the future of the new TEŠ 6 unit and construction of a new unit at the country's only nuclear power plant at Krško.

NON-EU COAL MARKET

Bosnia and Herzegovina

Lignite and brown coal extraction in Bosnia and Herzegovina increased to 13.3 Mt in 2022, 3.9% higher than the output in 2021. No decision was taken on the planned new Tuzla 7 unit which had attracted the attention of Chinese investors. Plans to build an additional coal-fired power plant in the town of Ugljevik have been halted by a verdict of the District Court of Banja Luka annulling the environmental permit previously granted by the Ministry of Energy and Mining.

Ukraine

In 2022, with ten months of full-scale war, Ukrainian hard coal production declined by an estimated 11.2% to 20.4 Mt of mostly steam coal. This figure hides the dramatic loss of production at state-owned mines (−63%) whereas DTEK production rose by 5% to 17.5 Mt. The war has taken a heavy toll on DTEK employees: 116 employees were killed in 2022 and 298 wounded. All mines in Luhansk and some in Donetsk have been forced to shut down and the risk now is that other coal mines will cease production due to their proximity to the front line and threat of missile attacks. Coal imports contracted dramatically in 2022, down to an estimated 4.7 Mt (−76.2%) with coking coal (2.8 Mt) accounting for the biggest share. 0.6 Mt were exported.

During 2022, the Ukrainian energy system was targeted by ten waves of missile and fourteeen UAV attacks. Power stations and grids were heavily damaged: almost all thermal and hydro power plants were damaged, as well as high-voltage substations. These attacks by Russia have led to an overall energy shortage and regularly leave millions of citizens without electricity, water or heat. As of 22 December 2022, half of the country's thermal power plant (TPP) capacity was out of service and 5.3 million consumers suffered from power outages.

The important 6 000 MW Zaporizhzhia nuclear power plant (NPP) is occupied by Russian troops and DTEK lost control of Luhanska thermal power plant (TPP) and Zaporizhzhya TPP located in the occupied territories while Kurakhivska TPP is damaged. Vuglegirska TPP (Centrenergo) and Trypilska TPP, also in the occupied territory, do not operate while Zmiivska TPP operates one unit. Repair work is continuous and often relies on donated equipment with key donors being CEZ (Czechia), EDF (France), Fortum (Finland), Schneider Electric (France), Hitachi (Japan) and Pfiffner (Switzerland).

The destruction of industrial facilities, population outflow and the deteriorating economic situation have led to a 28%-43% reduction of weekly electricity demand since the start of the Russian invasion on 24 February 2022: average electricity consumption in the first week of December was 12 GW compared with 20 GW for the same period in 2021. Consumption is covered by the remaining nuclear power plants (5.7 GW), coal-fired TPPs (4.2 GW) and hydro (1.4 GW). At 0.3 GW, less than half of the country's renewables capacity remains connected and operational. Despite the poor situation, Ukraine has been able to resume electricity exports to the EU in early 2023.

Türkiye

After Germany, Türkiye was Europe's second largest hard coal importer in 2022 as imports decreased 4.1% compared with 2021 to 34.7 Mt. Türkiye has also become a major hub for gas transport to the EU and intends to further increase that position in the future, according to statements by President Erdoğan. Nevertheless, Türkiye has not been spared from the global rise in gas prices and continues to rely heavily on domestic coal production. In 2022, Turkish lignite production rose to 80.9 Mt, an increase of 11.3% compared with 2021. The Turkish government's *Eleventh Development Plan 2019-2023* puts a strategic priority on expanding lignite production and lignite-fired power generation.

Hard coal extraction was 1.4 Mt, a 13.8% increase on 2021, entirely from the Zonguldak coal basin on the Black Sea coast. The terrible mining disaster at Amasra on 14 October 2022 reminds us all of the risks of coal mining and EURACOAL offers its sympathies to all those affected by this tragedy.

On 6 February 2023, Türkiye and Syria were hit badly by a major earthquake. The 1.2 GW Atlas Enerji coal power plant was damaged so coal imports via Iskenderun Port have fallen. However, coal demand is likely to grow as the country seeks 4 Mt of rebar for reconstruction efforts which will boost coking coal demand.

United Kingdom

UK coal imports increased markedly to 6.3 Mt (+36.2%) in 2022. Indigenous production was an insignificant 0.7 Mt, 90% of which came from the last remaining surface coal mines in Wales and Derbyshire. On 7 December 2022, in a 419-page letter and following lengthy delays and a public inquiry, the government finally gave its approval under the Town and Country Planning Act 1990 to the proposed West Cumbria Mining Ltd. coking coal mine known as Woodhouse Colliery. This decision was quickly challenged by Friends of the Earth, a challenge that was rejected in April 2023 by the UK High Court.

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TABLE 1

Evolution of world market prices for coal, freight and crude oil

McCloskey steam coal marker price (7 000 kcal/kg)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
steam coal	**2022**	163.33	207.74	379.31	325.20	381.49	393.75	441.15	415.40	426.62	318.48	260.75	307.29
(US$/tce CIF NW Europe)	**2023**	211.33	161.57	172.29	170.99								
steam coal	**2022**	144.37	183.16	344.26	300.64	360.66	372.72	433.43	410.21	430.75	324.12	255.61	290.20
(€/tce CIF NW Europe)	**2023**	196.24	150.79	160.94	156.45								

Source: McCloskey by OPIS (first week quotation of the month, basis 6 000 kcal/kg converted to 7 000 kcal/kg)

Freight rates (US$/t)

Richards Bay/Rotterdam	**2022**	9.13	11.18	17.06	15.38	20.15	21.50	16.31	7.34	9.53	12.23	9.94	10.18
(Capesize)	**2023**	8.31	6.43	9.15									
Queensland/Rotterdam	**2022**	13.05	15.73	21.33	19.53	29.13	25.96	21.09	13.50	13.72	17.36	15.10	14.53
(Capesize)	**2023**	13.75	11.58	14.22									
Puerto Bolivar/Rotterdam	**2022**	11.31	11.84	13.90	12.27	15.31	15.69	16.02	11.83	10.70	13.49	11.75	12.68
(Capesize)	**2023**	10.01	8.33	10.31									

Source: Clarksons (monthly averages from weekly data)

Currency rates

USD / EUR	**2022**	0.884	0.882	0.908	0.925	0.945	0.947	0.983	0.988	1.010	1.018	0.980	0.944
	2023	0.929	0.933	0.934									
USD / RUB	**2022**	76.7	78.3	102.9	77.8	64.6	57.2	58.1	60.3	60.2	61.5	61.0	65.6
	2023	70.1	73.1	78.0									
USD / AUD	**2022**	1.39	1.40	1.36	1.36	1.42	1.43	1.46	1.44	1.50	1.57	1.51	1.48
	2023	1.44	1.45	1.50									

Sources: ECB Euro foreign exchange reference rates; Bank of England database; OECD.Stat Monthly Monetary and Financial Statistics (MEI) dataset

Crude oil (US$/barrel)

crude oil	**2022**	85.24	93.95	113.48	105.64	113.87	117.72	108.55	101.90	95.32	93.62	89.73	79.68
	2023	81.62	81.88	83.25									

Source: OPEC Reference Basket (ORB) price

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International coal trade

TABLE 2

Steam coal				
exporting country	**2022 (1-12) Mt**	**YoY change *c.f.* 2021 Mt**	**%**	**2021 (1-12) Mt**
PACIFIC				
Australia	172.2	-23.1	-11.9%	195.3
Canada	7.5	2.2	40.6%	5.4
China	3.5	1.1	42.8%	2.5
Colombia	3.9	-4.1	-51.0%	8.0
Indonesia	354.1	9.6	2.8%	344.5
Russia	n.a.	:	:	93.5
South Africa	46.6	-13.6	-22.6%	60.2
USA (exc. to Canada)	14.7	-6.8	-31.5%	**21.5**
sub-total	602.6	-128.4	-17.6%	731.0
ATLANTIC				
Australia	6.1	2.9	93.2%	3.1
Canada	0.6	0.6	714.7%	0.1
Colombia	49.8	1.9	3.9%	47.9
Indonesia	6.2	5.2	546.9%	1.0
Russia	n.a.	:	:	84.1
South Africa	24.9	18.9	318.2%	6.0
USA (exc. to Canada)	18.8	4.9	35.6%	**13.9**
sub-total	100.3	-52.6	-34.4%	152.9
others	174.2			13.7
total	**877.1**	**-37.5**	**-4.2%**	**897.6**

revised 2021 figures shown in **bold**

steam coal data includes anthracite

TABLE 3

Coking coal				
exporting country	**2022 (1-12) Mt**	**YoY change *c.f.* 2021 Mt**	**%**	**2021 (1-12) Mt**
Australia	160.6	-6.0	-3.6%	166.6
Canada	28.1	1.8	6.7%	26.3
China	0.3	0.2	178.5%	0.1
Russia	n.a.	:	:	31.9
USA (exc. to Canada)	39.5	1.8	4.8%	**37.6**
others	38.9			3.4
total	**267.2**	**1.3**	**0.5%**	**265.9**

revised 2021 figure shown in **bold**

Source: McCloskey by OPIS and own calculations

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TABLE 4

European crude steel production

COUNTRY	2022 (1-12) Mt	YoY change *c.f.* 2021	2021 (1-12) Mt
Austria	7.5	-4.7%	7.9
Belgium	7.0	0.9%	6.9
Bulgaria	0.5	-12.0%	0.5
Croatia	0.2	-8.7%	0.2
Czechia	4.3	-11.0%	4.8
Finland	3.5	-18.5%	4.3
France	12.1	-13.1%	13.9
Germany	36.8	-8.4%	**40.2**
Greece	1.5	3.0%	1.5
Hungary	0.9	-22.1%	1.1
Italy	21.6	-11.6%	24.4
Luxembourg	1.9	-9.6%	2.1
Netherlands	6.1	-7.2%	6.6
Poland	7.4	-12.4%	8.5
Portugal	1.9	-5.0%	2.0
Romania	2.6	-22.2%	3.4
Slovakia	3.9	-20.4%	4.9
Slovenia	0.6	-9.2%	0.7
Spain	11.5	-19.2%	14.2
Sweden	4.4	-5.9%	4.7
unspecified			
EU-27	**136.2**	**-10.9%**	**152.8**
Belarus	2.1	-16.2%	**2.5**
Bosnia & Herzogovina	0.9	14.8%	**0.8**
Moldova	0.6	-1.8%	0.6
North Macedonia	0.2	-21.4%	0.3
Norway	0.7	13.1%	0.6
Serbia	1.7	0.4%	1.7
Switzerland	1.2	-7.0%	**1.3**
Türkiye	35.1	-12.9%	40.4
Ukraine	6.3	-70.7%	21.4
UK	6.1	-15.6%	7.2

Source: World Steel Association

revised 2021 figures shown in **bold**

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TABLE 5

Hard coal and lignite production and consumption

	Hard coal production			Hard coal deliveries for power generation	
COUNTRY	**2022 (1-12) Mt**	**YoY change *c.f.* 2021**	**2021 (1-12) Mt**	**2022 (1-12) Mt**	**2021 (1-12) Mt**
Czechia	1.8	-18.0%	2.2	1.1	**1.2**
Germany	0.0	:	0.0	21.8	18.3
Poland	52.8	-4.0%	55.0	37.8	34.9
other EU	0.0	:	0.0	23.2	19.0
EU-27	**54.6**	**-4.5%**	**57.2**	**83.9**	**73.4**
Norway	0.1	-3.0%	0.1	0.0	0.0
Türkiye	1.4	13.8%	1.2	21.2	19.7
Ukraine	20.4	-11.2%	23.0	n.a.	n.a.
UK	0.7	-38.2%	1.1	2.3	2.7

	Lignite production			Lignite deliveries for power generation	
COUNTRY	**2022 (1-12) Mt**	**YoY change *c.f.* 2021**	**2021 (1-12) Mt**	**2022 (1-12) Mt**	**2021 (1-12) Mt**
Bulgaria	35.5	25.5%	28.3	34.9	28.2
Czechia	33.4	14.0%	29.3	27.3	**24.8**
Germany	130.8	3.6%	126.3	116.9	111.5
Greece	13.7	13.3%	12.1	n.a.	n.a.
Hungary	4.9	-1.2%	5.0	4.8	4.9
Poland	54.6	4.3%	52.4	54.4	52.2
Romania	18.2	2.4%	17.7	17.6	17.5
Slovakia	0.9	-19.1%	1.1	1.3	1.3
Slovenia	2.3	-12.6%	2.6	2.4	2.9
EU-27	**294.3**	**7.1%**	**274.7**	**259.5**	**243.3**
Bosnia and Herzogovina	13.3	3.9%	12.8	10.8	10.9
Georgia	0.1	-1.0%	0.1	0.0	0.0
Kosovo	8.3	:	n.a.	8.1	n.a.
Montenegro	0.4	:	n.a.	0.3	n.a.
North Macedonia	4.6	9.0%	4.3	5.1	4.2
Serbia	35.1	-3.5%	36.4	35.7	35.4
Türkiye*	80.9	11.3%	**72.7**	66.1	60.2

* Asphaltite is included within lignite.

revised 2021 figures shown in **bold**

Sources: EURACOAL members and Eurostat

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TABLE 6

Hard coal imports

	Coking coal imports		Steam coal imports		Total hard coal imports		
COUNTRY	**2022 (1-12) Mt**	**2021 (1-12) Mt**	**2022 (1-12) Mt**	**2021 (1-12) Mt**	**2022 (1-12) Mt**	**YoY change *c.f.* 2021**	**2021 (1-12) Mt**
Austria	0.9	0.9	1.6	1.8	2.6	-6.8%	2.8
Belgium	2.3	1.7	1.6	1.8	3.9	11.2%	3.5
Bulgaria	0.0	0.0	1.3	0.7	1.3	70.7%	0.8
Croatia	-	-	0.7	0.7	0.7	-1.0%	0.7
Czechia	2.5	2.2	1.9	2.4	4.4	-3.5%	4.5
Denmark	-	-	1.9	0.8	1.9	143.4%	0.8
Finland	1.3	1.0	2.3	1.2	3.6	68.6%	2.2
France	3.5	2.3	5.6	6.4	9.1	4.9%	8.7
Germany	11.5	11.9	28.4	26.8	39.9	3.1%	38.7
Greece	-	-	0.1	0.3	0.1	-60.3%	0.3
Hungary	0.7	1.0	0.1	0.1	0.8	-32.9%	1.1
Ireland	-	-	1.6	1.6	1.6	0.6%	1.6
Italy	2.8	1.4	9.0	6.6	11.8	49.3%	7.9
Netherlands	4.2	4.0	4.8	4.7	9.0	3.6%	8.7
Poland	3.0	3.2	17.1	**10.2**	20.1	50.2%	**13.4**
Portugal	-	-	0.0	0.0	0.0	-19.4%	0.0
Romania	-	-	0.6	0.8	0.6	-19.2%	0.8
Slovakia	2.6	2.9	0.3	0.3	3.0	-8.7%	3.2
Slovenia	-	-	0.4	0.2	0.4	139.0%	0.2
Spain	1.7	1.4	8.2	3.9	9.9	87.5%	5.3
Sweden	1.1	0.3	0.6	1.4	1.7	3.7%	1.7
EU-27	**38.3**	**34.2**	**88.1**	**72.5**	**126.8**	**18.3%**	**107.2**
Bosnia and Herzogovina	1.3	1.4	-	-	1.3	-11.9%	1.4
Serbia	-	-	2.0	**0.5**	2.0	267.8%	**0.5**
Türkiye	5.2	5.3	29.5	30.9	34.7	-4.1%	36.2
Ukraine	2.8 e	11.5	1.8 e	8.1	4.7 e	-76.2%	19.6
UK	1.7	2.0	4.6	2.6	6.3	36.2%	4.6

revised 2021 figures shown in **bold**

Sources: EURACOAL members, McCloskey by OPIS, national government statistics, Eurostat, IEA