Coal: Signs of decline despite record demand in Asia

28/04/2024

Key points

The key fuel in the Western industrial revolution of the 19th and 20th centuries, the market for coal has changed considerably in just a few years. Now considered to be one of the main causes of global warming, coal is being phased out rapidly in most developed countries.

In the United States, coal's share of the electricity mix has fallen from 50% to 20% in two decades, despite Donald Trump's attempts to engineer its return to favour.

In Europe too, the decline seems irrevocable, barely slowed down by the sanctions adopted against Russian gas in the wake of the invasion of Ukraine and Germany's decision to close its nuclear power plants. Even Poland, Europe's second biggest consumer and until recently the EU's most ardent supporter of coal, is now preparing to transition to more sustainable sources of energy.

The global coal market is now almost exclusively Asian: in 2022, the region consumed 80.8% of the world's coal. China accounts for 55% of global consumption, followed by India (13%). But the dynamics are different in these two countries. China is expected to reach its consumption peak soon, perhaps as early as 2024. Coal will increasingly be used as a back-up energy source to compensate for the intermittent nature of renewable energies. Consumption is therefore set to fall sharply. In India, on the other hand, it is set to continue rising until at least the mid-2030s, or even 2040, and coal will continue to provide most of the country's electricity.

Several other emerging Asian countries have seen their consumption increase, in particular Indonesia, which could soon overtake Japan to become the world's fourth largest consumer. Demand in Indonesia is driven by the nickel industry, the metal used in electric batteries and therefore essential to the energy transition.

In the rest of the world, a few countries with large coal reserves, particularly in southern Africa (South Africa, Zimbabwe, Zambia), are defending their right to exploit these resources in the name of energy sovereignty and economic development. While this stance may have caused some diplomatic tensions with their Western partners and lenders, it has very little impact on the global trend: African consumption represents just 2.5% of the world total, and has grown little in 20 years. Latin America, the Middle East and the countries of the former CIS account for just 4% of global consumption.

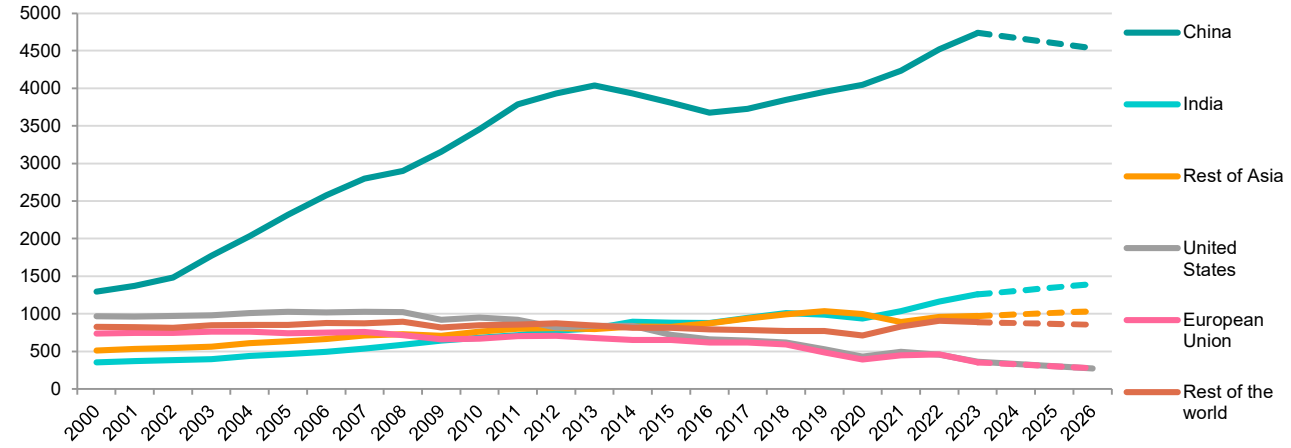
1. Record consumption, concentrated in Asia

1.1. Twenty years of sustained growth, driven by China and India

Global coal consumption has set new records for 2022, with consumption of between 8.42 billion tonnes according to the International Energy Agency (IEA)[1] and 8.7 billion tonnes according to the US Energy Information Administration (EIA)[2] .

While the sharp rise in natural gas prices in 2021-2022, amplified by the consequences of the war in Ukraine, helps to explain this historic record - many countries temporarily changed their energy mix - it is above all the result of a **long-term trend: global consumption increased by 78% between 2002 and 2022**. This tidal wave has been driven almost exclusively by Asia, and more specifically **China**, **whose consumption has more than tripled in two decades** and which, in 2022, consumed 55% of the world total (Chapter 2). **India** has also more than tripled its consumption between 2002 and 2022, overtaking the United States in 2015 to become the world's second largest consumer, with 13% of the total.

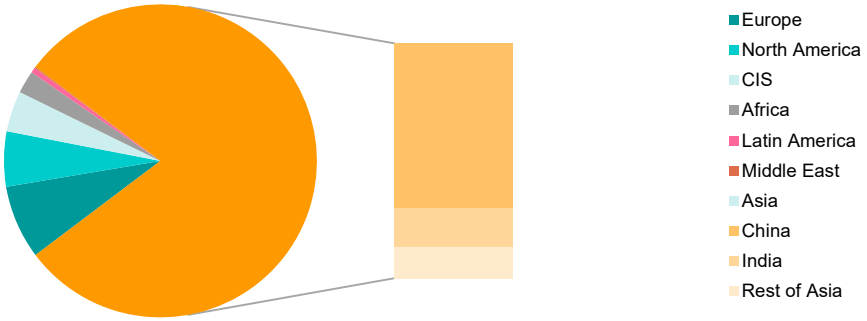
Graph 1: Coal consumption 2000-2022, and projection to 2026 (Mt)



Source: International Energy Agency

Despite spectacular increases in consumption in several Asian 'dragons' between 2002 and 2022 (+1054% in Vietnam, +587% in Indonesia, +363% in the Philippines...), Asia-Oceania, excluding China and India, **accounted for only 11% of global coal consumption in 2022**. Growth there is much more contained than in the continent's two giants, with "only" a 76% increase in two decades.

Graph 2: Coal consumption by region, 2022



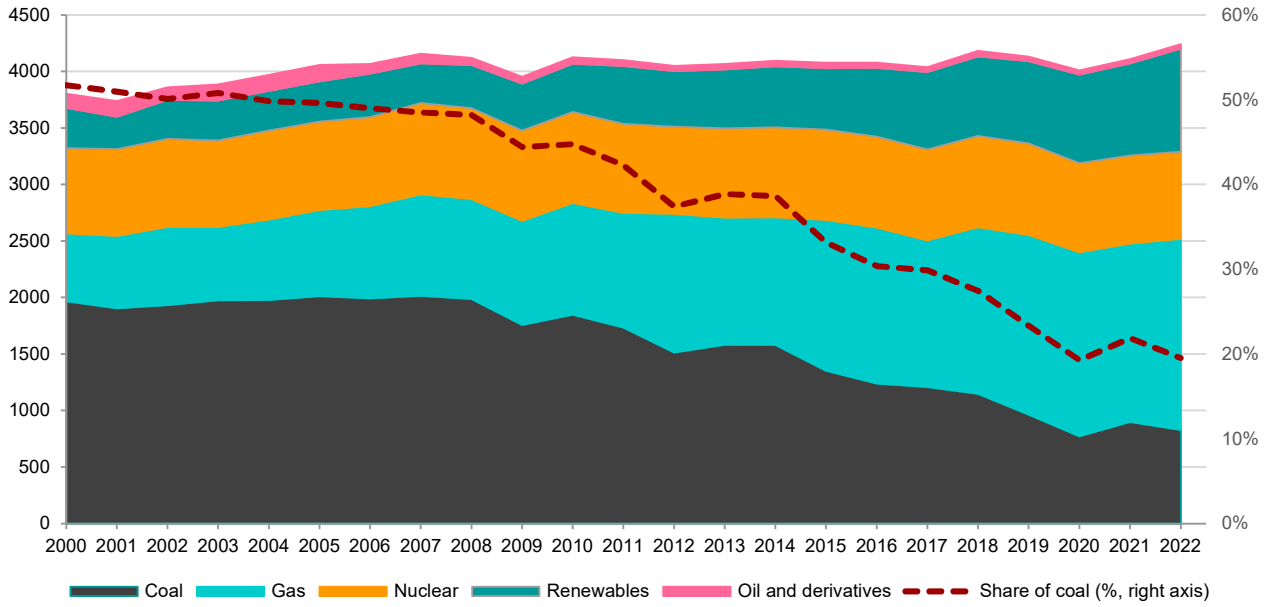
Source: US Energy Information Administration

[1] Coal 2023 - Analysis and forecast to 2026, Agence interanationale de l'énergie, December 2023
[2] Coal and coke data, US Energy Information Administration, consulted in April 2024

1.2. In the United States, gas and renewables dethroned "King Coal"

In the United States, coal dominated the national electricity mix for a long time, with **its share still exceeding 50% in 2000**. But this energy source was dethroned in 2016 by natural gas[3], of which the United States is now the world's leading producer. And since 2022, it has even been relegated to third place, due to the rise of renewable energies - solar and wind in particular[4] . Coal now accounts for just **20% of the country's electricity mix**.

Figure 3: US electricity mix, by source (TWh), and share of coal



Notably, **Donald Trump's four years in office** (2017-2020) have not halted this decline. After focusing his campaign on promoting "clean coal" and defending the industry - a major source of blue-collar jobs in several key States - the former president had taken concrete steps in its favour, relaxing federal environmental legislation[5] and reforming the wholesale electricity market in favour of coal and hydrocarbons[6] . But these measures were not enough to offset the fact that **the abundance of American natural gas means that generation costs can now be up to half** those of coal[7] .

The arrival in office of **Joe Biden** in January 2021, and the entry into force in 2022 of his **Inflation Reduction Act** (IRA), which provides massive support for renewable energies, have accelerated the trend towards the phasing out of coal. **The total installed capacity of coal-fired power stations, which stood at 198 GW in 2022, is expected to fall to 159 GW in 2026, and just 116 GW in 2030,** according to a study by the Institute for Energy Economics and Financial Analysis published in mid-2023[8] . **This pace of closures is considerably faster than that envisaged by the US administration less than a year earlier**[9]. With the closure of the last two power stations in New Hampshire in 2025 and 2028, New England (a region that also includes the states of Connecticut, Maine, Massachusetts, Rhode Island and Vermont) will be the second major American region to go completely coal-free, after the Pacific-Northwest[10] .

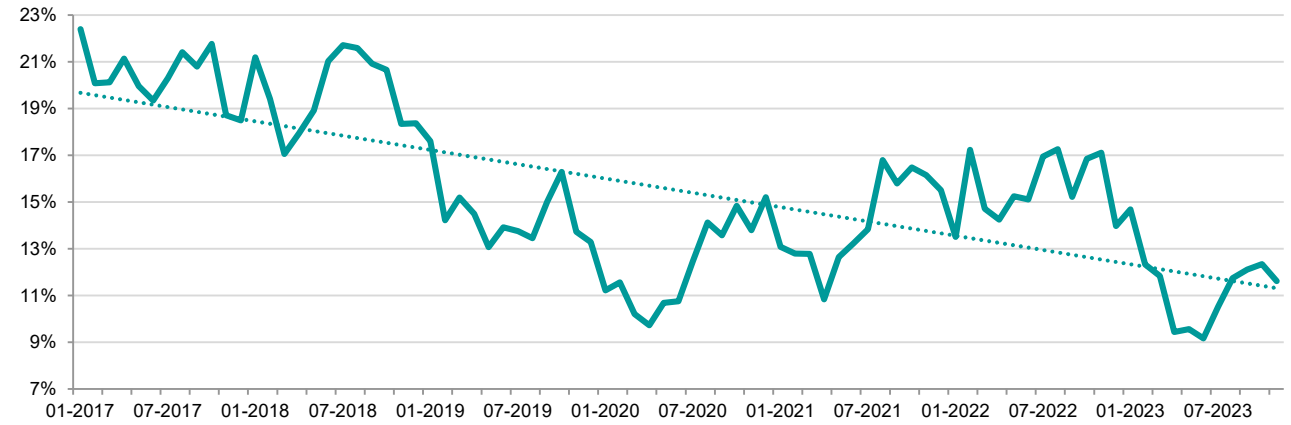
[3] Electricity generation, capacity, and sales in the United States, US Energy Information Administration
[4] Renewable generation surpassed coal and nuclear in the U.S. electric power sector in 2022, US Energy Information Administration, 27 March 2023
[5] Has Trump lived up to his promise to revive the US coal industry? NS Energy Business, 5 October 2020
[6] Trump's Best Shot at Saving Coal Is an Obscure Power Market, Bloomberg, 3 March 2020
[7] A new era: Coal usage and emissions in the global power sector to peak in 2023, Rystad Energy, 4 December 2023
[8] U.S. on track to close half of coal capacity by 2026, Institute for Energy Economics and Financial Analysis, 3 April 2023
[9] Nearly a quarter of the operating U.S. coal-fired fleet scheduled to retire by 2029, US Energy Information Administration, 7 November 2022
[10] New England to become the second coal-free region in the US, Electrek, 29 March 2024

1.3. In Europe, the war in Ukraine and the end of German nuclear did not reverse the trend

Coal consumption in the European Union is following the same basic trend as in the United States: this fuel, which still represented almost 40% of the European electricity mix in 1990[11], had seen its share fall to less than 30% ten years later[12]. And this trend has only intensified: between January 2017 and December 2023, **the share of coal in the European electricity mix fell from over 23% to just 12%** (Figure 4), **despite a succession of shocks to the European electricity market**.

Russia's invasion of Ukraine from February 2022 prompted the EU to **rapidly wean itself off Russian gas**, which accounted for more than 45% of its gas imports on the eve of the conflict. But Europe's response has been to import more liquefied natural gas (LNG) by sea from the United States and other suppliers. The occasional reopening of coal-fired power stations[13] has not led to any lasting increase in consumption. Moreover, **coal had a limited comparative advantage since its price is very closely correlated with that of gas**.

Figure 4: Share of coal in the European Union (EU27) electricity mix, 2017-2023



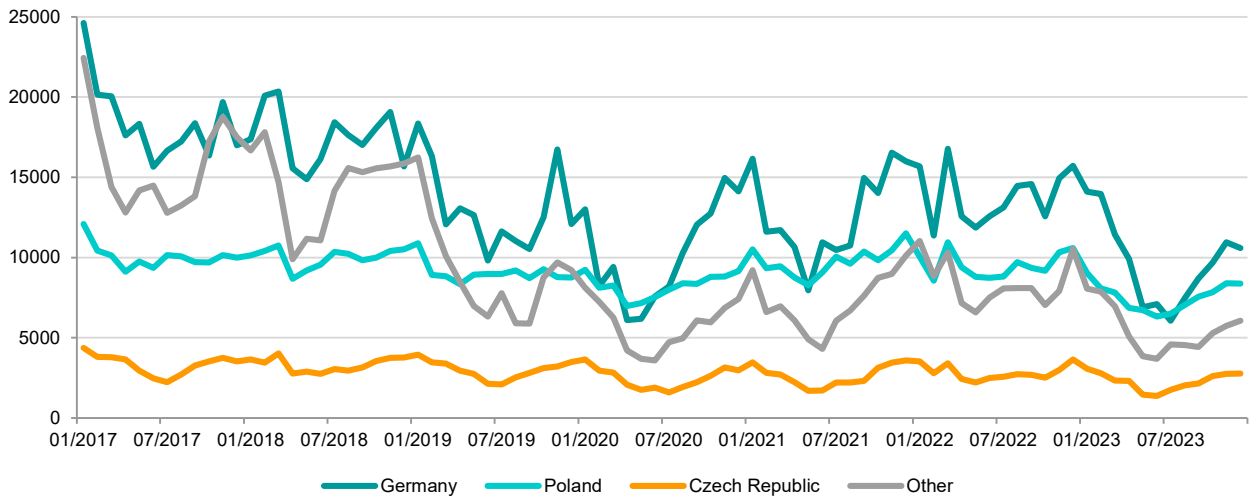
Source: Eurostat

Similarly, **the closure of Germany's last three nuclear power stations in April 2023 has not led to an increase in consumption** in that country - by far the largest consumer in Europe - although it has probably given the national coal industry a few years of respite.

The disappearance of Germany's nuclear power capacity has been partially offset by the continuing rise in renewable energies (particularly wind power) and a record level of electricity imports from neighbouring countries, particularly France. Like other European countries, Germany has also seen its demand for electricity weakened by the fall in industrial demand[14]. **The demise of coal therefore seems inevitable**. Its share of the electricity mix has fallen to 26.1% in 2023, compared with 33.2% in 2022, and fifteen coal-fired power stations (with a combined capacity of 4.4 GW) were closed at the beginning of April[15]. Above all, the *Energiewende* - Germany's energy transition policy - continues to forecast a **total phase-out of coal by 2038** - and even as early as 2030 if conditions allow. Several billion euros have been allocated to compensate electricity producers for closing their lignite-fired power stations, the most polluting type[16], with the approval of the European Commission[17].

[11] Within the current European Union (EU27)
[12] Share of electricity production by fuel type, 1990-2008 (%), EU-27, European Environment Agency, 2012
[13] Despite climate commitments, the EU is going back to coal, Le Monde, 2 September 2022
[14] Germany to use lowest amount of energy on record this year, Bloomberg, 2 November 2023
[15] Phasing out coal: Germany closes fifteen power stations, Euractiv, 2 April 2024
[16] Germany's cabinet approves accelerated coal exit by 2030 in western state, Reuters, 2 November 2022
[17] RWE secures $2.8bn support to phase out lignite-fired power plants, Rigzone, 13 December 2023

Graph 5: Monthly production of coal-fired electricity in EU27 countries (in GWh)

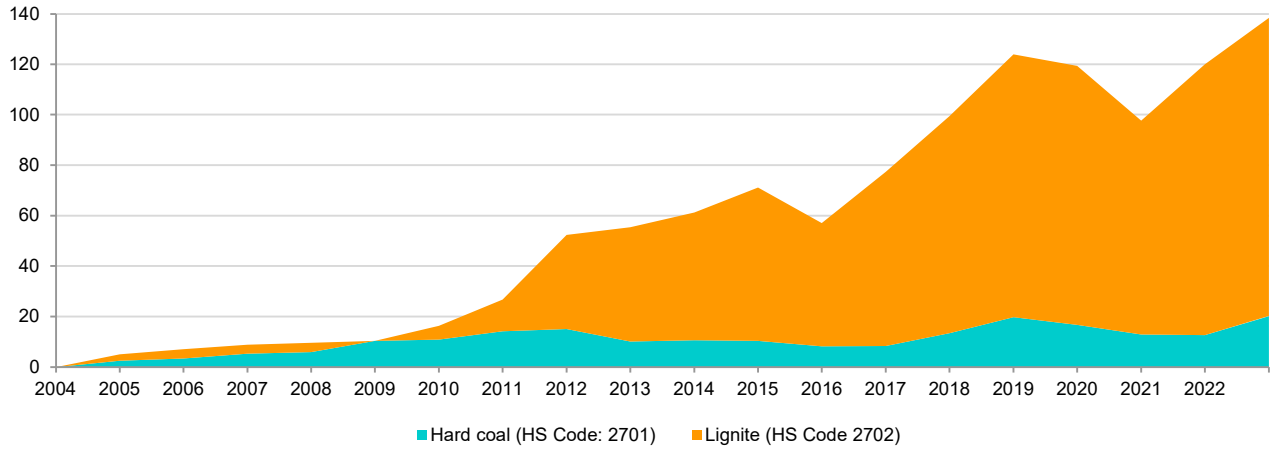


Source: Eurostat

In Poland, Europe's second largest consumer, the reduction in the use of coal is for the moment less marked than in Germany: the country **continues to generate almost 70% of its electricity** from this fuel, and a large number of households continue to heat with coal. In the name of energy security, the authorities have long defended the coal industry in European bodies and on the international stage, including against legal rulings by the Court of Justice of the European Union[18] .

But the political changeover could enable Warsaw to embark on the road to energy transition: the PiS party, in power for eight years and a great supporter of coal, handed over power in October 2023 to a centre-left coalition led by the former President of the European Council Donald Tusk. **The new national energy and climate action plan, presented in early 2024, aims to increase the share of renewables in the energy mix to 50% (and 30% of final energy consumption) by 2030. It also provides for the construction of a nuclear power plant and the lifting of certain constraints on wind power**[19] .

Graph 6: Poland's coal imports (in Mt)



Source : TradeMap

[18] A Turow, la Pologne s'accroche à son immense mine de charbon, Les Echos, 31 August 2023
[19] Departing from coal: Poland's new energy roadmap, Euractiv, 7 March 2024

Beyond political choices, another factor is driving Poland to reduce its dependence on coal: **since 2018, the country has become a net importer[20]. In addition to imports of hard coal - used for domestic heating - those of lignite (used to fuel thermal power stations) have soared since the early 2010s, exceeding 118 million tonnes (Mt) in 2022**, contributing to the doubling of the amount spent on fossil fuel imports that year (€42.9 billion)[21] . **Until the war in Ukraine, 80% of Polish hard coal imports came from Russia**[22] .

1.4. In Africa, a limited increase, with no impact on the global trend

Richly endowed with coal, several African countries such as South Africa (85% of the continent's consumption), Zimbabwe and Zambia have increased their use of this fuel in recent years, presenting it as essential to achieving their national electricity production targets. Pretoria, in particular, has become the spokesperson for African coal. This stance has led to tensions with certain partners and donors[23], while the G7 member states have pledged to stop funding any new coal projects[24]. Even so, **Africa's share of global consumption is very low: 2.5% of the total in 2022**, according to the Statistical Review of World Energy. And it will have grown by only 18% between 2002 and 2022.

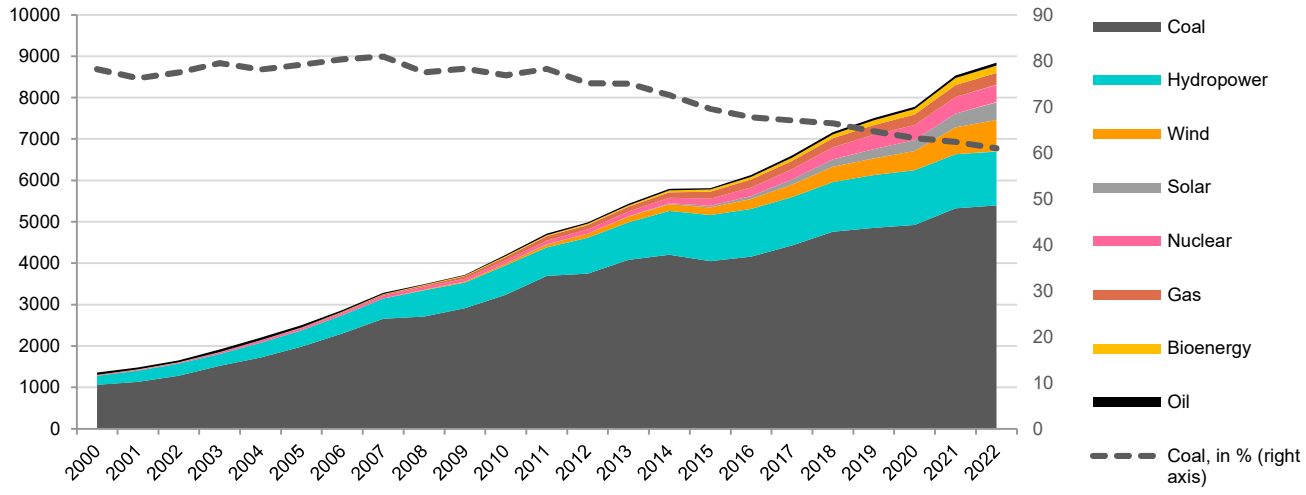
2. In China, the post-coal transition has begun, but will be slow in coming

2.1. The world's largest consumer and producer

China has opted for coal as its primary source of energy for power generation for **reasons** of **energy autonomy and strategic importance**: it does not want to be overly dependent on gas from the Middle East or the United States. **Its large reserves enable it to produce more than 90% of the coal it consumes** (4.37 billion tonnes produced in 2022, or around 51% of the world total[25]).

China is still essentially dependent on coal, which accounted for more than 60% of its electricity and energy mix in 2021[26], which explains why, **with 4.5 and 4.8 billion tonnes of coal burned in 2022** (according to the IEA and EIA respectively)**, China accounted for around 55% of global consumption**.

Figure 7: China's electricity mix, by source (TWh) and share of coal (%)



Source: Ember / Our World In Data

[20] Poland Coal, IEA, consulted in April 2024
[21] Poland almost doubles its spending on fossil fuel imports, Energy Monitor, 18 May 2023
[22] Coal-rich Poland faces coal-less winter, Le Monde, 2 December 2022
[23] Germany and South Africa clash again over coal phase-out, Euractiv, 28 June 2023
[24] G7 Climate, Energy and Environment Ministers' Communiqué, G7, 27 May 2022
[25] Coal 2023 - Analysis and Forecast to 2026, International Energy Agency, December 2023
[26] China Coal, IEA, consulted in April 2024

And the development of other energy sources has not dethroned Chinese coal: while its relative share of electricity production has fallen sharply in two decades, its consumption in absolute terms has continued to grow.

China's appetite for coal is also explained by its predominant role in the manufacture of steel[27] and cement, **two materials for which it accounts for more than half the world's production**, and whose manufacturing processes are still largely based on the use of coal: thermal for cement, and metallurgical for steel. In **2022, these two activities alone accounted for around 918 Mt** (Graph 8) of the 4.52 billion tonnes of coal consumed by the country, while 773 Mt went to other uses (industry, home heating, etc.).

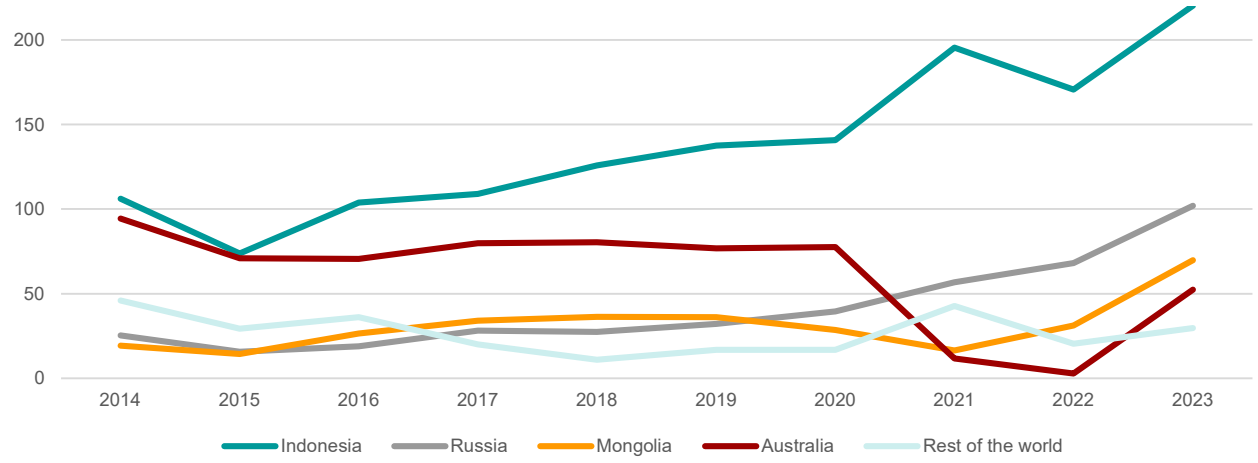
Graph 8: Coal consumption by type of activity in China (Mt)

Source : IEA

2.2. Low dependence on imports

Despite its strong domestic production capacity, the rapid rise in its consumption has caused China to switch **from being a net exporter to a net importer of coal since 2008**[28] . And with coal imports of between 150 and 200 Mt per year over the last decade[29], **China is now, depending on the year, between the world's largest and third largest importer, sharing the podium with India and Japan**. China is also the **world's biggest importer of lignite** (a lower grade of coal with a lower calorific value), with 130.4 Mt in 2022, or 92% of world exports. **Overall, coal imports have increased by 61.3% in volume terms between 2014 and 2023**, reaching a record level of 474.45 Mt**.**

Figure 9: Main sources of Chinese coal imports (Mt)



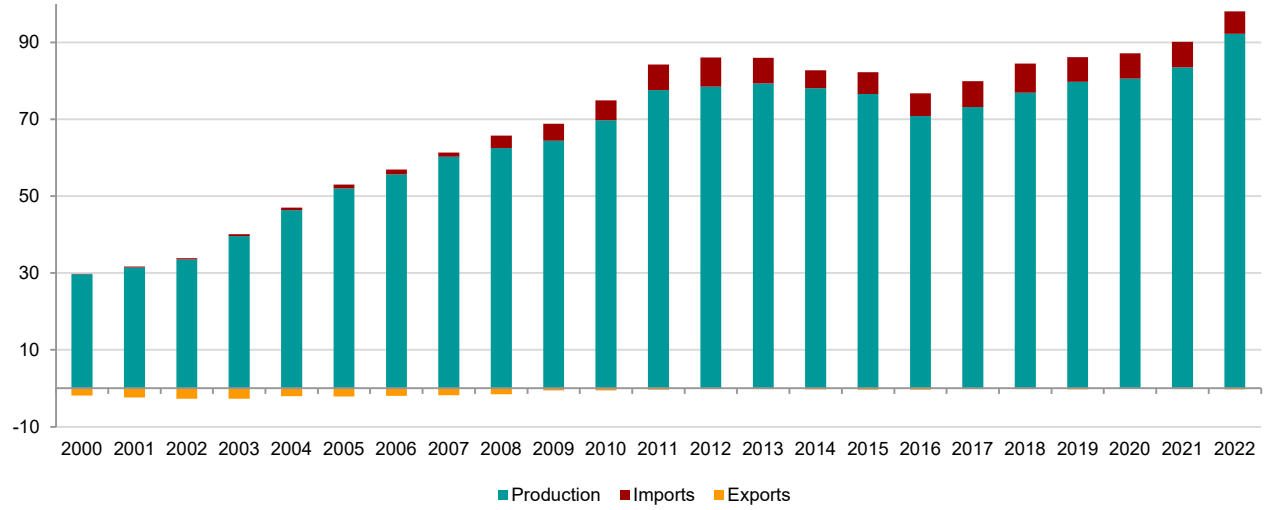
Source: TradeMap. Aggregation of codes HS 2701 (coal) and HS 2702 (lignite)

[27] China 2023 steel output set to rise despite property woes, Reuters, 12 December 2023
[28] China Coal, International Energy Agency
[29] Trademap data

The **share of imports in China's coal consumption remains limited**: just over 6.2% in 2022, with a record 9.1% in 2018. But this supply is not free from **geopolitical contingencies**. In the midst of an energy crisis linked to soaring world gas prices, Indonesia, China's leading coal supplier, announced in January 2022 that it would cease exports, driving up coal prices in China[30]. Jakarta reversed its decision after a few days, but the episode enabled China to gauge its **relative dependence on Indonesian coal**. And it may well have played a part in China's decision, a year later, to lift the ***de facto* embargo it had imposed on coal from Australia** - until then its second-largest supplier - from 2020, against a backdrop of trade disputes and growing geopolitical rivalry in the Indo-Pacific region.

But Australia did not regain its leading position: at the **same time, China sharply increased its coal imports from Mongolia and especially from Russia,** which, with 102 Mt[31], accounted for around 21% of its imports in 2023. This increase is mainly due to the sanctions adopted by the European Union on Russian coal from 2022, which interrupted exports to the EU and enabled China to obtain supplies at reduced prices[32].

Figure 10: Share of imports in Chinese coal consumption (exajoules)



Source: Statistical Review of World Energy 2023

2.3. Record installations of new coal-fired power stations

Coal-fired power generation in China broke all records in 2023: to compensate for the effect of droughts on hydroelectric dams, it reached a total of 5,760 TWh[33], an increase of 6.1% compared with 2022[34], reaching 62.1% of the Chinese electricity mix.

On the face of it, all the indicators point to **sustained growth over the next few years. 43.7 GW of net new coal-fired generation capacity was installed in 2023**, and the pipeline of new projects remains robust, with 114 GW of new capacity approved in 2023, up from 100 GW in 2022[35] . Taking into account previously launched projects, **at least 408 GW of additional capacity is under development**, according to the Global Energy Monitor[36], a figure that confirms the "Chinese exception" when it comes to coal, since only 170 GW is under development in the rest of the world.

[30] Indonesia secures more coal supplies ahead of export ban review, Reuters, 5 January 2022
[31] Trademap data
[32] China's 2023 coal imports from Australia rise, but below pre-ban era, Reuters, 22 January 2024
[33] China's 2023 coal imports from Australia rise, but below pre-ban era, Reuters, 22 January 2024
[34] Coal still accounted for nearly 60% of China's electricity supply in 2023: CEC, S&P Global Commodity Insights, 31 January 2024
[35] China 2023 coal power approvals rose, putting climate targets at risk, Reuters, 22 February 2024
[36] Boom and Bust: Coal 2024, Global Energy Monitor, April 2024

But these figures need to be qualified: of the 408 GW announced, **only 140 GW are actually under construction**; the others being at preliminary stages (design, permits, financing, etc.). This figure should also be set against the **601 GW of capacity previously announced, but cancelled in 2023**, to which should be added 55 GW of suspended projects.

This unprecedented increase is a consequence of the **serious electricity shortages that affected China in 2021**[37]. It is also partly explained by the decision taken by the central authorities in 2014 to transfer the approval of new power plants to the provinces, which are anxious to improve their industrial competitiveness through low electricity tariffs and, in some cases, to **preserve jobs in coal mines**[38]. But **this race for capacity may quickly come to an end**: Beijing, which remains officially committed to meeting its international climate commitments, has announced strict controls on coal-fired power stations[39]. And the fifteenth five-year development plan (2026-2030) could be the opportunity to restrict the permits granted to new power plants: the central executive had announced as early as 2021 its intention to reduce Chinese coal consumption from the 15th five-year plan.

2.4. Coal as a back-up for renewables: a profound transformation

This continuous addition of new capacity also masks a profound transformation of the Chinese electricity sector: **coal-fired power stations, historically used as "base load" power stations, are increasingly being used as peak load power stations**, to compensate for the intermittency of solar and wind power. **As a result, the average utilisation rate of Chinese coal-fired power stations, which was over 60% in 2000, is now close to 50%, and is expected to fall below 30% by 2040**[40].

This development has been planned: the 14th five-year plan (2021-2025) envisaged that at least 200 GW of the coal fleet (out of 1100 GW currently in operation) would undergo flexibility retrofits[41]. And mechanisms providing incentives to convert coal-fired units into peaker plants, which came into force in January 2024, could reduce the utilisation rate by 5% as early as this year[42]. This transition is comparable to the one that has already taken place in the United States, where the rate of use of coal-fired power stations has fallen from more than 70% before 2010[43] to 42% in 2022[44], and where the necessary technical adaptations are now well understood[45].

2.5. Renewables and nuclear power could depress coal consumption

The increase in China's coal-fired capacity has been totally eclipsed by the exponential growth in renewable energies (RE). In **2023 alone, China's solar capacity will have grown by 55% to 609 GW**, while its wind capacity will have increased by 21% to 441 GW. In total, **China's installed RE capacity stands at over 1.3 TW**, exceeding both the target of 1.2 TW set for 2030[46] and the installed capacity of coal (around 1.1 TW).

And **this trend is set to continue**, **driven by the collapse in the price of photovoltaic module**s (-43% in 2023) caused by the **overcapacity of Chinese producers**, who control more than 80% of this market. This oversupply, which looks set to last[47], should prompt the national and provincial authorities to encourage new solar installations to absorb some of this overproduction.

China is also the world leader in the installation battery energy storage systems (BESS), also known as grid batteries: 34.5 GW are already operational according to the trade association CNESA[48] **, which predicts that**

[37] China 2023 coal power approvals rose, putting climate targets at risk, Reuters, 22 February 2024
[38] Guide to Chinese Climate Policy, Oxford Institute of Energy Studies, 2022
[39] China 2023 coal power approvals rose, putting climate targets at risk, Reuters, 22 February 2024
[40] China's record coal capacity approvals in 2022: Will carbon targets still be met? S&P Global Commodity Insights, 27 April 2023
[41] Guide to Chinese Climate Policy, Oxford Institute of Energy Studies, 2022
[42] China's New Capacity Tariff Credit Positive for Coal-Fired Power Gencos, Fitch Ratings, November 2023
[43] Annual U.S. coal-fired electricity generation will increase for the first time since 2014, US Energy Information Administration, 18 October 2021
[44] Electric Power Monthly - capacity Factors for Utility Scale Generators Primarily Using Fossil Fuels, US Energy Information Administration
[45] Flexible Coal - Evolution from baseload to peaking plant, National Renewable Energies Laboratory, 2015
[46] China's Energy Revolution: Wind and Solar to Surpass Coal in 2024, Energy Central, 3 February 2024
[47] China solar industry faces shakeout, but rock-bottom prices to persist, Reuters, 3 April 2024
[48] Chinese PV Industry Brief: Stationary storage installations hit 21.5 GW in 2023, PV Magazine, 12 January 2024

this figure could reach almost 200 GW by 2030[49] **- the equivalent of almost 20% of the coal fleet currently in operation.** This figure could be an underestimate: **the continuing fall in the price of batteries, and the overcapacity of Chinese battery "gigafactories"**[50] should also encourage the large-scale installation of new BESS capacity. These systems, which enable the production of renewable energies[51] to be smoothed out over time, **compete directly with peak-load power plants**, as is already the case in Texas[52] .

Finally, China no fewer than 27 nuclear reactors are currently under construction at around fifteen sites, with delivery scheduled between 2024 and 2029[53]. These new units, with a combined capacity of 30.9 GW, will take the installed base to just over 84 GW by 2029 - more than the current French fleet (61 GW) and almost as much as the United States (95 GW). Although nuclear power in China is not expected to play a major role in the country's electricity mix (it currently accounts for only around 5%), the growth of this fleet will help erode the share of coal.

2.6. Will "peak coal" be reached as early as 2024?

While there is little doubt that China will soon reach its "peak coal", it is difficult to predict when it will do so. There are some encouraging signs: for the first time since September 2021, **coal production fell by 4.2%** in January-February 2024[54]. And demand from the electricity sector at the start of 2024 is relatively weak, according to the China Electricity Council, as evidenced by the falling price of coal for power stations[55]. **Some sources, such as the IEA, therefore believe that the decline in Chinese coal consumption could begin as early as 2024**[56] , stabilising until 2026, and falling more rapidly thereafter. However, Chinese energy giant **Sinopec is forecasting a decline from 2025**[57], while other sources predict that consumption will continue to rise until 2026, or even 2027[58] .

3. India: a growing dependence on coal

3.1. Dynamic consumption, boosted by the country's economic development

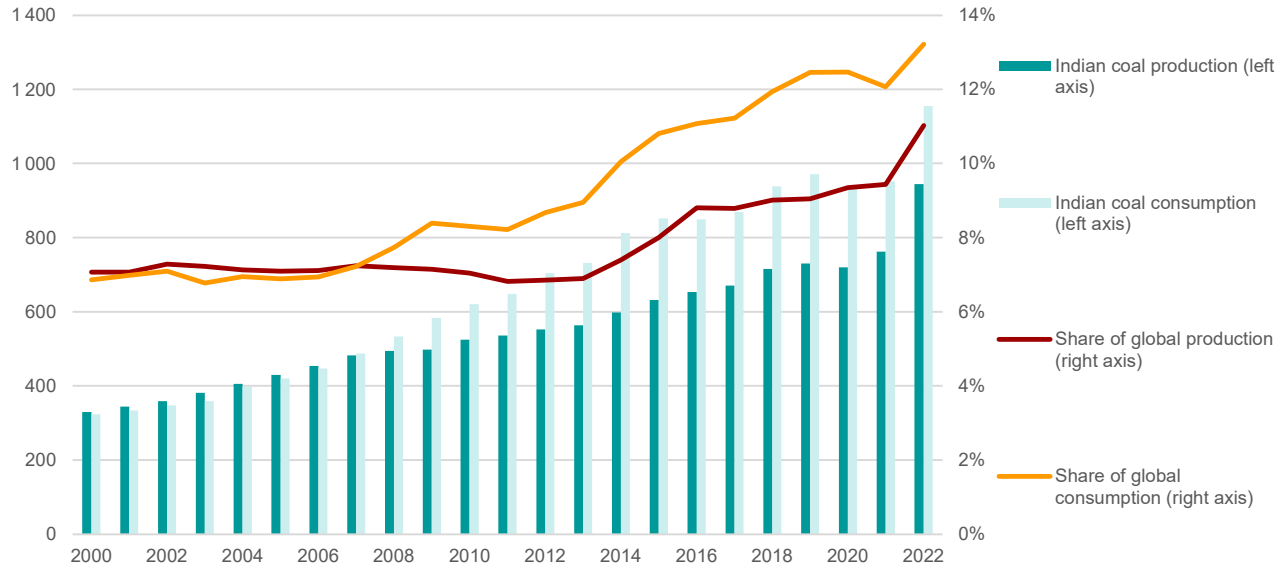
Although still a long way behind China, India is the **second largest consumer of coal**, accounting for 13% of global consumption[59], a share that is set to increase over the coming years, with **New Delhi becoming the main driver of growth in coal demand**. From **1.16 billion tonnes in 2022,** Indian coal consumption, estimated at **1.26 billion tonnes in 2023**, should reach **1.39 billion in 2026** according to the IEA[60]. The Indian government expects demand for coal to increase by 50% between now and 2030, when it should reach 1.5 billion tonnes[61] .

Contrary to the agreement reached at COP28, which provides for the gradual phasing out of coal, India - which did not sign the document - does not seem ready to abandon this fuel on which its economy remains highly dependent. **New Delhi believes that even a gradual phase-out of coal would jeopardise its economic growth** (+7.3% in 2023). And, like China, India favours a fuel that it produces in large quantities: **943 Mt in 2022**, +24% on the previous year (see below)[62]. Economic and energy security objectives therefore take

[49] Chinese PV Industry Brief: Stationary storage installations hit 21.5 GW in 2023, PV Magazine, 12 January 2024
[50] China Already Makes as Many Batteries as the Entire World Wants, Bloomberg, 12 April 2024
[51] Electricity storage: at the dawn of an energy revolution, Global Sovereign Advisory, September 2023
[52] Solar is beginning to sunset natural gas use in Texas, PV Magazine, 9 April 2024
[53] Nuclear Power in China, World Nuclear Association, February 2024
[54] China Coal Output Posts First Decline Since Beijing Ordered More, Bloomberg, 18 March 2024
[55] The thermal coal market has obvious off-season characteristics and market prices remain weak, China Electricity Council, 1 April 2024
[56] https://www.iea.org/news/global-coal-demand-expected-to-decline-in-coming-years
[57] https://www.reuters.com/markets/commodities/sinopec-forecasts-chinas-coal-consumption-peak-around-2025-2023-12-28/
[58] China's coal use set to rise until 2026, pushing world's top carbon emitter 'off track' from Paris Agreement: analysts, South China Morning Post, 20 September 2023
[59] Energy Information Administration
[60] IEA, *Coal 2023, Analysis and forecast to 2026*, December 2023
[61] Bloomberg, *Modi's fading renewables vision fires up India's coal sector*, March 2024
[62] Energy Information Administration

precedence over climate issues (India is now the world's third largest emitter of CO_2), especially as the country is in an electoral context, with legislative elections scheduled for April and May 2024.

Graph 11: Indian coal production and consumption (Mt) and share of global production and consumption (%)

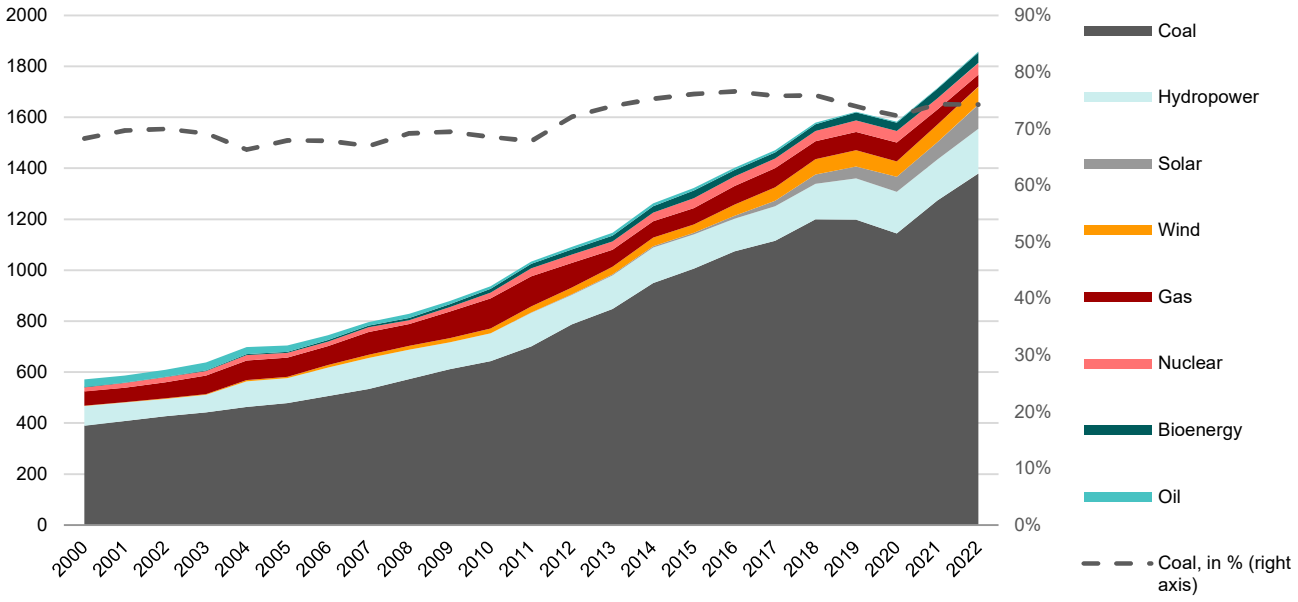


Source: Energy Information Administration

3.2. A central role in the country's electricity production

India's coal consumption is primarily for electricity generation. In 2022, 859 Mt of coal were used to produce electricity, i.e. **74%** of **total consumption.** Over the same period, **20% of coal was used for non-energy purposes** such as cement production, while **steel production accounted for 6% of total consumption**.

Graph 11: India's energy mix, by source (TWh) and share of coal (%)



Source: Ember / Our World In Data

Graph 12: Coal consumption by type of activity in India (Mt, 2022)

Source: International Energy Agency

Coal's share of India's electricity mix even reached 77% at the beginning of April 2024[63], as a result of a sharp drop in hydroelectricity production due to insufficient rainfall. And coal is likely to remain dominant for a long time to come: with little recourse to nuclear power and gas, the country is gradually turning to **renewable energies** (primarily hydroelectricity), which accounted for **20% of its energy mix in 2022**, compared with 15% in 2012[64]. But **their development is still in its infancy**. There are a number of financial, logistical and regulatory hurdles to overcome: grids ill-equipped to integrate new energy sources, customs duties on solar panel components (imported from China, with which geopolitical tensions remain high)[65], difficulties in acquiring the necessary land[66], and so on. Added to this is the lack of investment and coherent policies, not to mention the length of time it takes to build hydroelectric power stations. **New Delhi's target of achieving 50% renewable energy in its energy mix by 2030 by developing 500 GW of wind, solar and hydro capacity[67] seems hard to achieve**.

Faced with a sustained increase in demand for electricity (+9.6% in 2023), New Delhi is continuing to rely on coal, which is seen as **a safe and reliable source of energy**, capable of avoiding power cuts. Far from declining, coal's share of the energy mix is set to grow further in the years ahead. According to S&P, coal should account for 77% of the mix in 2025, before falling back to 71% in 2030[68].

3.3. Growing industrial use

India's growth is also stimulating coal consumption for non-energy purposes, estimated at 324 Mt in 2023 (including 81 Mt for steel production alone). From 26% of total consumption in 2022, this should rise to 28% (391 Mt/year) in 2026. Driven by infrastructure, **industrial production is expected to grow by 6% a year between 2024 and 2026[69], accelerating the production of coal-based cement**. The country's leading producer, **UltraTech**, recently increased its production capacity to 146 Mt of cement per year with the commissioning of two new plants[70]. The **Adani** group, for its part, is aiming to double its cement production by 2028, and is targeting a 20% share of the Indian market by that date[71].

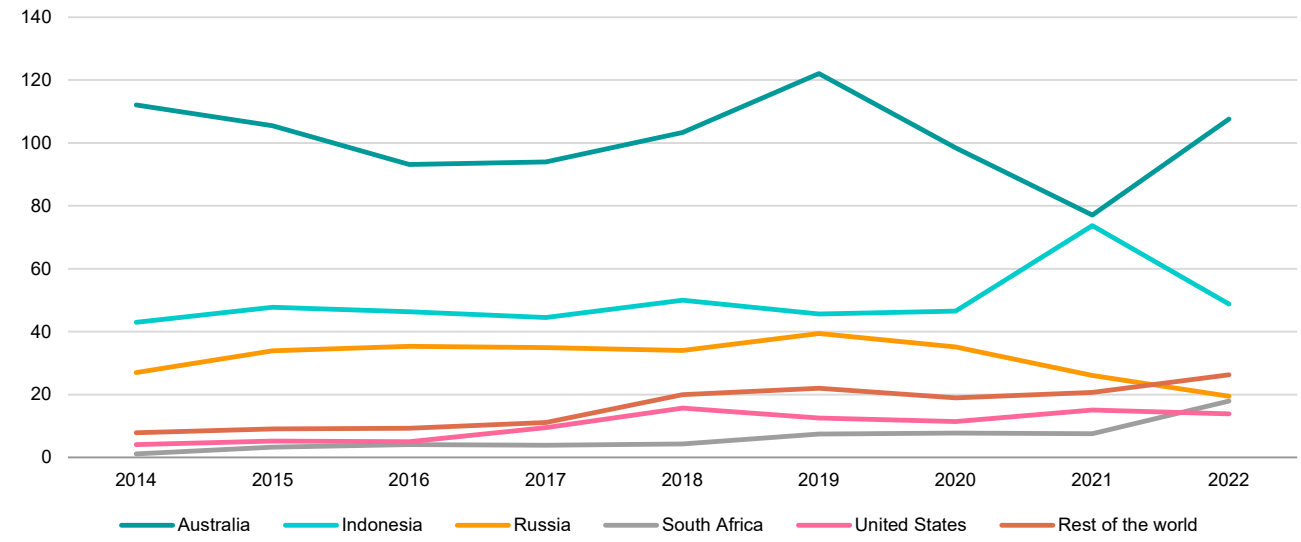
Demand for coal is also growing among steelmakers. After the country produced 140 Mt of steel in 2023, the Indian authorities are aiming to produce 300 Mt by 2030[72]. While this figure is optimistic, the increase in steel production will undoubtedly boost coal consumption.

[63] Bloomberg, *Flagging hydropower raises India's coal use as summer approaches*, April 2024
[64] Our World in Data, Ember, Electricity production by source, India
[65] Bloomberg, *Modi's fading renewables vision fires up India's coal sector*, March 2024
[66] Bloomberg, *India's plans to double coal production ignore climate threat*, January 2024
[67] Bloomberg, *Modi's fading renewables vision fires up India's coal sector*, March 2024
[68] S&P, *COP28: India doubles down on right to increase climate emissions*, November 2023
[69] IEA, *Coal 2023, Analysis and forecast to 2026*, December 2023
[70] Global Cement, *UltraTech Cement increases production capacity through debottlenecking*, March 2024
[71] The Economic Times, *Adani Group targets 20% share in Indian cement market by FY28*, April 2024
[72] Reuters, *India's coal sector sees huge leaps in output and demand*, February 2024

3.4. Despite rising imports, New Delhi is betting on boosting its production

Growing coal needs are fuelling India's imports, which have reached 234 Mt in 2022. **Australia, its leading supplier, exports mainly metallurgical coal (used for steel), while Indonesia is its leading supplier of thermal coal (used for power generation)**[73]. Unlike China, India has not capitalised on the sanctions targeting Russia to increase its imports from Moscow: on the contrary, Western sanctions on maritime transport, followed by the crisis in the Red Sea, have led New Delhi to **drastically reduce its supplies of Russian coal**.

Figure 13: Main sources of Indian coal imports (in Mt, 2014-2022)



Source: Trademap. Aggregation of codes HS 2701 (coal) and HS 2702 (lignite)

Imports, which only account for 20% of Indian consumption, are set to fall as local production rises. **Keen to strengthen its energy security, and also motivated by cost considerations, New Delhi is betting on boosting its own production**. Mainly driven by the state-owned **Coal India Ltd** (CIL, 80% of extraction), production has risen by 187% since the turn of the millennium, reaching 944 Mt in 2022. But in the face of growing demand, **the Indian government announced in December 2023 that it planned to increase coal production to 1.5 Mt/year by 2030**[74]. New Delhi is counting particularly on underground mines, where production is expected to triple by 2028 to compensate for the depletion of open-cast mines (95% of installations).

On the power plant side, **5.5 GW of net new coal-fired capacity was installed in 2023**, with a further 46 GW in pre-construction (announced or consented projects)[75] . In December 2023, the authorities announced their intention to add 88 GW of new capacity by 2032[76] .

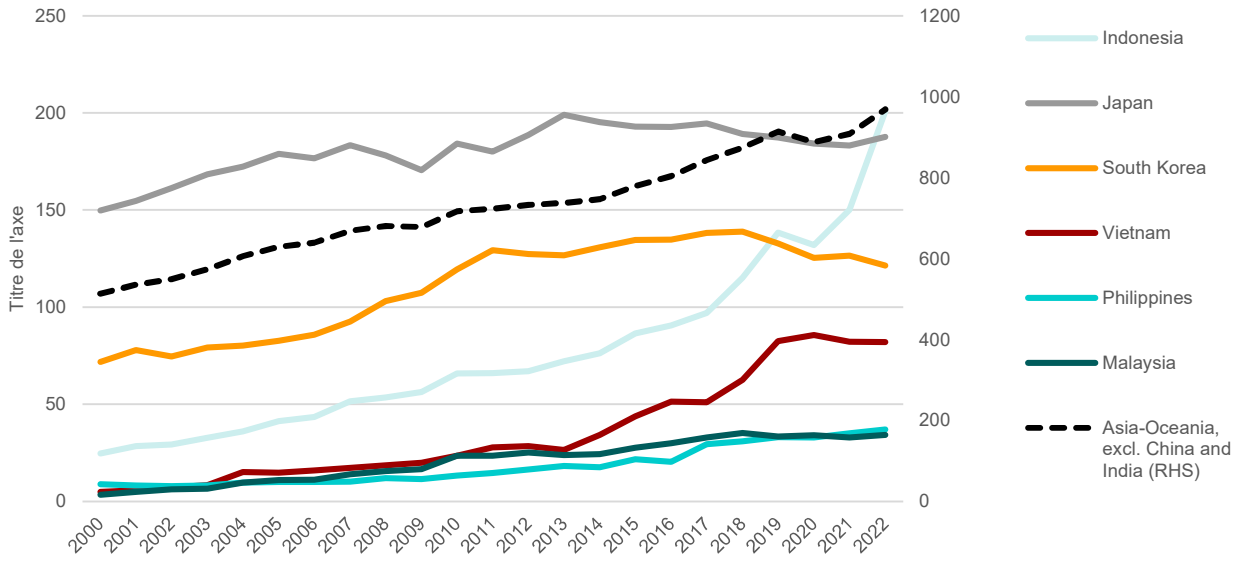
The Ministry of Coal estimates that peak consumption will occur between 2030 and 2035[77], with BloombergNEF even putting the date at 2040[78] .

[73] Reuters, *China, India boost seaborne thermal coal imports as power demand surges*, April 2024
[74] Indian Ministry of Coal, *1.5 Billion Tonne Coal Production Likely by 2029-30*, December 2023
[75] Global Energy Monitor, *Boom and Bust Coal 2024*, April 2024
[76] The Economic Times, *Almost 88 GW thermal capacity to be added to meet rising power demand: R K Singh*, December 2023
[77] Growth in coal production in India: Inching towards peak coal?, Observer Research Foundation, 30 March 2024
[78] India plans to double its coal production, but it ignores climate threat, The Economic Times, 9 January 2024

4. Divergent trends in the rest of Asia, as Indonesian consumption soars

Excluding China and India, **the rest of Asia is also increasing its demand for coal**, and accounted for **11% of global consumption in 2022**[79] . But **the trend in coal consumption varies greatly from one country to another**. While the most developed countries (Japan, South Korea, etc.), like the United States and Europe, have gradually reduced their consumption, it is rising sharply in the ASEAN member states, particularly Indonesia.

Graph 14: Coal consumption in the Asia-Oceania region (excluding China and India, in Mt)



Source: Energy Information Administration

4.1. In the most developed countries, a gradual emancipation from coal

The most developed Asian countries, which are committed to the energy transition, **have seen their coal consumption** (mainly used for electricity generation) **fall slightly in recent years.** In **Japan**, consumption has stagnated: after a peak in demand of 199 Mt in 2013, due to the suspension of several nuclear power plants following the Fukushima accident in 2011, it has gradually fallen to 187 Mt in 2022. Coal, which is mainly imported, still accounts for almost **a third of electricity production**. At COP28, however, Tokyo undertook to reduce its consumption and not to build any new coal-fired power stations[80]. A similar trend is at work in **South Korea**, which reached its consumption peak in 2018 (138 Mt) before falling back to 121 Mt in 2022. Coal still accounts for 40% of Korea's electricity generation, but Seoul has committed to reducing this share to less than 15% by 2036[81]. Despite this, **coal-fired power generation capacity in Japan and South Korea continues to grow**: by 2023, Tokyo and Seoul have added 2.5 GW and 1 GW of additional capacity respectively[82].

The same applies to **Australia**, which has reduced its coal consumption by 16% since 2002. This downward trend is set to continue, as the Australian electricity market expects the last coal-fired power stations to close by 2038[83]. Despite this fall in consumption, Australia's coal production - although declining in recent years - has nevertheless increased by 51% since the start of the millennium[84], driven by exports. The world's fourth largest coal producer, with 5% of the total, **Australia is** also **the world's largest coal exporter**, with 54% of

[79] *Energy Information Administration*
[80] The Japan Times, *Japan pledges to end construction of new unabated coal plants*, December 2023
[81] The Diplomat, *Even Without Sanctions, South Korea Significantly Reduced Fossil Fuel Imports From Russia*, March 2024
[82] Global Energy Monitor, *Boom and Bust Coasl 2024*, April 2024
[83] Bloomberg, *Australia Sees Renewables Boom Forcing Earlier Coal Plant Closures*, December 2023
[84] Source : TradeMap

the market[85]. These exports go mainly to Japan, South Korea and India, which became Australia's biggest customer after China restricted its imports of Australian coal.

4.2. ASEAN: rising consumption driven by Indonesian nickel

Demand is growing in the rest of Asia, starting with Pakistan, Bangladesh and Sri Lanka, which are stepping up their local production in response. **However, it is in the ASEAN region that the increase in consumption is most significant**: in 2022, the countries in the region consumed 413 Mt of coal, up 13% on the previous year[86] . For these countries, **the primary use of coal is to generate electricity**. Faced with economic growth and rising demand for electricity, **Vietnam** (20% of ASEAN consumption), the **Philippines** (9%) and **Malaysia** (9%) are stepping up their coal imports, as well as their domestic production.

But the rise in Asian demand is being driven mainly by **Indonesia,** which accounted for 49% of ASEAN consumption in 2022. Jakarta consumed **201 Mt of coal in 2022**, twice as much as in 2017 (97 Mt)[87]. This increase was primarily driven by the post-Covid economic recovery, against a backdrop of growing demand for electricity, while coal accounts for **61% of the country's energy mix**[88].

However, it is **the development of the nickel industry** that explains the explosion in Indonesian consumption. Jakarta has the largest reserves and is the **leading producer** (40% of the world total) of this metal, an essential component of batteries[89]. **Nickel production requires large quantities of coal**, which is used both as a reducing agent (mixed with ore, it reacts with nickel oxides to reduce it to a metallic state) and as a source of electricity, via captive power stations or through the electricity grid.

But beyond the rapid growth in nickel mining and production, Jakarta is now targeting the entire electric vehicle value chain by developing nickel refining and battery production[90]. Mining companies and manufacturers (CATL, BYD, Foxconn, etc.) are therefore stepping up their investments in Indonesia, **boosting the need for electricity, and therefore for coal.**

The International Energy Agency estimates that **the increase in demand for nickel should boost demand for coal to 284 Mt in 2026, an increase of 41% compared with 2022**. In response to this increase in domestic demand, the country's production capacity has risen from 461 Mt in 2017 to 659 Mt in 2022[91]. And Indonesia is continuing to build new facilities to support nickel production: in 2023, the Indonesian authorities are said to have **added 5.9 GW of additional** coal-fired power generation capacity[92] .

But despite the boom in the nickel industry, over 70% of Indonesian coal production is destined for export. The recent acceleration in demand from China and India partly explains the rise in Indonesian production and the surge in its exports: **+73% between 2021 and 2022**[93] , due to an increase in shipments of thermal coal to India (see part 3) and lignite to China. However, the energy transition, the forthcoming fall in Chinese consumption and New Delhi's desire to reduce its dependence on imports should, by reducing Jakarta's exports, reduce its coal production - **even though the nickel industry will continue to grow.** According to the International Energy Agency, the country's coal production should reach 661 Mt in 2026.

[85] PIMS Group, *Coal Mining in Australia*, October 2022
[86] AIE
[87] *Energy Information Administration*
[88] IEA, Energy system of Indonesia
[89] GSA, *Electric vehicles: opportunities for emerging countries*, May 2023
[90] GSA, *Indonesia: after the election, what future for Jokowi's economic development strategy*, February 2024
[91] *Energy Information Administration*
[92] Global Energy Monitor, *Boom and Bust Coal 2024*, April 2024
[93] TradeMap