

## Global Energy Weekly

## Coal: still dirty, but no longer cheap

**Thermal coal prices have stabilized on China output cuts**

In line with our expectations (see [Thermal coal looks for a floor](#)), Newcastle thermal coal prices have stabilised after a wild ride despite a collapse in both US and European gas, as well as tumbling European emission allowances. As we have previously noted, China and Saudi have set a floor for energy prices via rising domestic coal production costs (see [China coal floors global gas](#)) and higher government spending needs (see [Can \(geo\)politics Trump fundamentals?](#)). Expensive Chinese coal is likely helping floor JKM natural gas, just as calorific coal value diffs have stabilized at a high level. Looking into 2024, we see China cutting back output, but continuing to need imports for power generation. China's clean energy shift will hit oil first, coal second. In contrast, India coal supply should expand rapidly on increased investments, although demand growth rates could at times exceed them, as the subcontinent continues to rely heavily on coal.

**Limited exports (besides Indonesia) offset weak demand**

Broadly, EMs like India, Indonesia, China or South East Asia will keep burning coal as DMs cut back on a recovery in nuclear and renewable gen capacity and broad-based power demand destruction in Europe. Japan and South Korea coal demand should continue to cool off, as lower LNG prices are poised to keep displacing coal. On supply, the world's leader Indonesia should expand exports further as other suppliers such as Australia or the US retrench. Similarly, South Africa or Colombia could struggle to expand output for different reasons. It is also worth noting that Russian coal exports are down significantly on US/EU sanctions and we see little upside to volumes at this point. Thus, while a stagnant global thermal coal demand picture on the back of Net Zero commitments to fight rising global temperatures should be bad news for coal, this long list of supply challenges is unlikely to go away, supporting prices.

**Newcastle coal prices should hold firm this year and next**

With thermal coal prices now back to their 10y average relationship to Brent, the downside seems limited to us unless a global recession unfolds in the quarters ahead. Thus, we reiterate our view that Newcastle prices will average \$150/t in 2024 and \$125/t in 2025 compared to forward prices of \$134/t and \$136/t respectively. Beyond climate pressures to curb output among key suppliers, cash costs have also increased in recent years due to incremental safety regulations and a lack of mine developments. Some exporters are now facing coal production hurdles of \$100+/t. Meanwhile, shipping rates and distances have increased as a result of disruptions in both Panama and Suez. With global manufacturing PMIs poised to turn increasingly positive around the world on lower Fed and ECB interest rates, an upturn in energy demand should create a more supportive demand environment for thermal coal prices.

12 March 2024

Commodities  
Global

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**Exhibit 1: BofA Commodity Research Themes and Outlook**

Key takeaways

	View	Recent reports
<b>Macro outlook</b>	■ Our economists see world GDP rising 3% in 2023 and expanding by 2.8% in 2024.	
<b>WTI and Brent crude oil</b>	■ We project Brent and WTI to average \$80/bbl and \$75/bbl, respectively, in 2024. ■ The global oil balance should remain in a mild surplus during 2024, as OPEC+ withholds more supply from the market to counteract slowing demand growth ■ We forecast global demand growth of 2.3mn b/d YoY in 2023 and 1.2mn b/d in 2024. ■ Non-OPEC supply should grow roughly 2.24mn b/d YoY in 2023 and 1.35mn b/d in 2024. ■ We project total US crude and NGL supply to rise 1.5mn b/d in 2023 and 700k b/d in 2024. ■ OPEC crude oil supplies are set to fall 470k b/d in 2023 and 260k b/d in 2024 as OPEC+ actively manages balances	<ul style="list-style-type: none"> <li>• <a href="#">Can (geo)politics Trump fundamentals? 04 January 2024</a></li> <li>• <a href="#">The grind of the oil bulls 26 September 2023</a></li> <li>• <a href="#">Money breaks oil's back 08 May 2023</a></li> <li>• <a href="#">OPEC+'s whatever it takes moment 05 April 2023</a></li> <li>• <a href="#">Global Energy Paper: Medium-term oil outlook 26 February 2023</a></li> </ul>
<b>Atlantic Basin oil products</b>	■ Refined product markets face risks from OPEC+ cuts, a looming recession, and the pace of global refining capacity growth. ■ We forecast RBOB-Brent to average \$13/bbl in 2024, and we see ULSD-Brent cracks averaging \$26/bbl over the same period. ■ OPEC+ cuts, rising complex refining capacity, lower gasoline and diesel cracks create upside for 3.5% fuel oil cracks, which we see averaging -\$12/bbl in 2024.	<ul style="list-style-type: none"> <li>• <a href="#">Waiting for Dangot(e) 31 October 2023</a></li> <li>• <a href="#">Diesel weasels out of a cyclical downturn 29 August 2023</a></li> <li>• <a href="#">In the fuel oil market, high sulfur is king 31 July 2023</a></li> </ul>
<b>US natural gas</b>	■ US gas supply should shrink more than 500mmcf/d, while demand rises 2.1Bcf/d, helping cap storage at 4.1Tcf at end of October. ■ We forecast US Henry Hub natural gas prices will average \$2.40/mmbtu in 2024.	<ul style="list-style-type: none"> <li>• <a href="#">The gas fracker's dilemma 04 March 2024</a></li> <li>• <a href="#">US nat gas rollercoaster nears the bottom 17 February 2023</a></li> </ul>
<b>LNG</b>	■ Near term downside risk for global gas prices, but LNG supply to rise just 1.7% in 24, which counters softer demand growth ■ A rebound in global manufacturing, LNG delays/outages, and weather could tighten balances in 24, but China remains a wildcard	<ul style="list-style-type: none"> <li>• <a href="#">Winter weather melts global gas prices 13 February 2024</a></li> <li>• <a href="#">LNG is now a buyer's market 17 April 2023</a></li> </ul>
<b>Thermal coal</b>	■ Seaborne coal prices pulled back on softer balances. Yet, China has come back in earnest, more than doubling thermal coal imports ■ We are constructive in 2024 on strong Asian demand and declining Russian supply	<ul style="list-style-type: none"> <li>• <a href="#">China coal floors global gas 05 September 2023</a></li> <li>• <a href="#">King coal loses its crown 31 March 2023</a></li> </ul>

Source: BofA Global Research estimates

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**Exhibit 2: BofA Global Research Commodity Price Forecasts**

(period averages)

	units	1Q23F	2Q23F	3Q23F	4Q23F	2023F	1Q24F	2Q24F	3Q24F	4Q24F	2024F
WTI Crude Oil	(\$/bbl)	76	74	82	82	<b>78</b>	73	75	77	75	<b>75</b>
Brent Crude Oil	(\$/bbl)	82	78	86	86	<b>83</b>	78	80	82	80	<b>80</b>
US NY Harbor ULSD (HO) Cracks to Brent Crude Oil	(\$/bbl)	41	25	40	37	<b>36</b>	30	25	25	25	<b>26</b>
US RBOB Cracks to Brent Crude Oil	(\$/bbl)	23	31	29	7	<b>22</b>	11	21	14	7	<b>13</b>
NWE Low Sulphur Gasoil Cracks to Brent Crude Oil	(\$/bbl)	31	17	32	29	<b>27</b>	23	20	20	19	<b>21</b>
NWE Eurobob Cracks to Brent Crude Oil	(\$/bbl)	15	22	27	7	<b>18</b>	5	14	10	3	<b>8</b>
NWE 1% Residual Cracks to Brent Crude Oil	(\$/bbl)	-13	-8	-3	-7	<b>-8</b>	-6	-5	-5	-5	<b>-5</b>
NWE 0.5% Residual Cracks to Brent Crude Oil	(\$/bbl)	2	2	4	3	<b>3</b>	2	2	2	2	<b>2</b>
NWE 3.5% Residual Cracks to Brent Crude Oil	(\$/bbl)	-23	-11	-4	-14	<b>-13</b>	-13	-12	-12	-12	<b>-12</b>
US Natural Gas	(\$/MMBtu)	2.74	2.32	2.66	2.92	<b>2.66</b>	2.10	2.10	2.50	2.90	<b>2.40</b>
Thermal coal, Newcastle FOB	(\$/t)	253	160	147	145	<b>176</b>	148	148	151	153	<b>150</b>
Aluminium	\$/t	2,401	2,260	2,160	2,250	<b>2,268</b>	2,250	2,500	2,750	2,750	<b>2,563</b>
Copper	\$/t	8,941	8,461	8,367	8,000	<b>8,442</b>	8,000	8,500	8,750	9,250	<b>8,625</b>
Lead	\$/t	2,137	2,118	2,171	2,200	<b>2,156</b>	2,000	2,000	2,000	2,000	<b>2,000</b>
Nickel	\$/t	25,973	22,277	20,392	18,500	<b>21,786</b>	18,500	18,500	19,000	19,000	<b>18,750</b>
Zinc	\$/t	3,132	2,527	2,435	2,500	<b>2,648</b>	2,500	2,500	2,250	2,250	<b>2,375</b>
Gold	\$/oz	1892	1977	1927	1900	<b>1924</b>	1950	1950	2000	2000	<b>1975</b>
Silver	\$/oz	23	24	24	23	<b>23</b>	23	23	24	24	<b>23</b>
Platinum	\$/oz	995	1,027	932	950	<b>976</b>	1,000	1,000	1,100	1,100	<b>750</b>
Palladium	\$/oz	1,568	1,445	1,254	1,250	<b>1,379</b>	900	800	700	600	<b>750</b>

Source: BofA Global Research estimates

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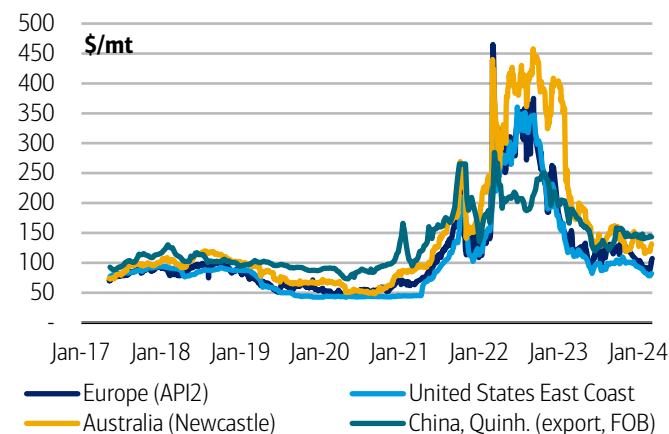
# Coal: still dirty, but no longer cheap

## Thermal coal prices have stabilised after a wild ride...

Newcastle thermal coal prices hit a high of \$458/t in 2022 as the Ukraine war resulted in a collapse in Russian gas supplies into Europe (Exhibit 3). With China already facing a tight domestic coal market and thermal supplies from around the world heading to Europe to fill the gap left by Russian energy, high calorific thermal coal prices from South Africa to Australia spiked dramatically in 3Q22. Yet, as we anticipated in November (see [Thermal coal looks for a floor](#)), after an enormous reshuffle in global energy flows aggravated by recent dislocations in Panama and Suez, prices have stabilized with higher quality Qinhuangdao coal finding support around CNY1000/t or about \$140/t (Exhibit 4).

### Exhibit 3: Global coal prices

Newcastle thermal coal prices hit a high of \$458/t in 2022 as the Ukraine war resulted in a collapse in Russian gas supplies into Europe...

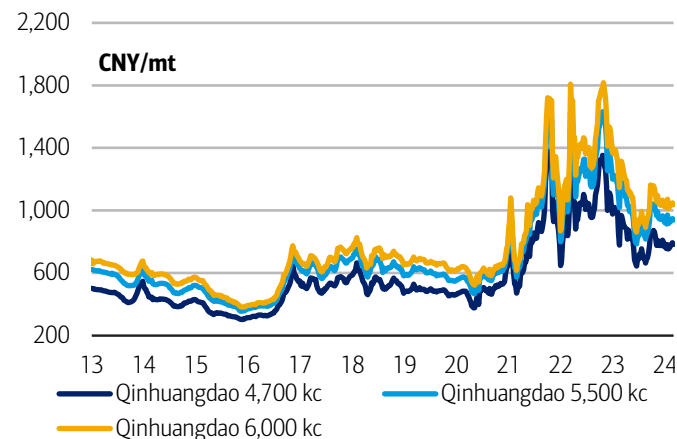


Source: Bloomberg, McCloskey

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### Exhibit 4: China domestic coal price

...but prices have stabilized more recently with high calorific value Qinhuangdao coal finding support around CNY1000/t or about \$140/t



Source: Bloomberg, McCloskey

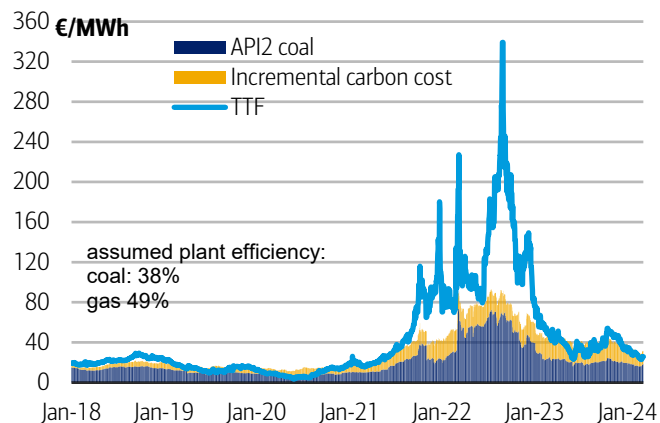
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## ...despite a collapse in both US and European gas...

Stabilization in thermal coal prices suggests the global economy is starting to find its footing. Steady prices in the Pacific Basin have come together despite the ongoing collapse in both European TTF and US Henry Hub natural gas prices (Exhibit 5), victims of warm winter weather (see [Winter weather melts global gas prices](#)) and excess supplies (see [The gas fracker's dilemma](#)) among other factors. Importantly, while we have seen nat gas prices in the Atlantic Basin dragging down electricity prices across both Europe and the US (Exhibit 6), China's thermal coal prices have held up firm on falling domestic supplies and strong power generation.

**Exhibit 5: European hard coal gas equivalent price and TTF**

Stabilization in thermal coal prices has occurred despite the ongoing collapse in both European TTF and US Henry Hub natural gas prices...

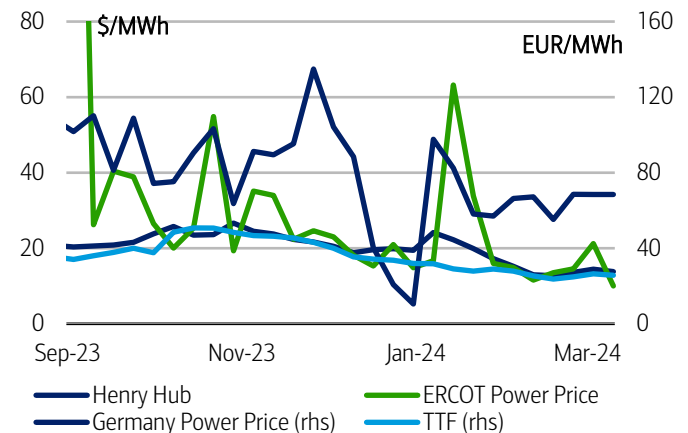


Source: Bloomberg, BofA Global Research estimates

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**Exhibit 6: Weekly gas and power prices**

...that have seen nat gas prices in the Atlantic Basin dragging down both carbon allowance and electricity prices across both Europe and the US



Note: ERCOT's RT North Hub and Germany's DA

Source: Bloomberg, EIA, BofA Global Research estimates

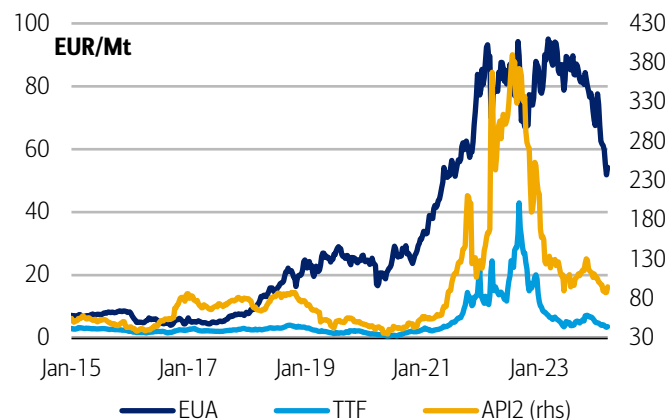
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**...as well as tumbling European emission allowances**

Another major market move linked with API2 European thermal coal prices but more dissociated from Australian Newcastle is the halving of European Union Allowance prices (Exhibit 7) from a high of €98/t in 2022 to a recent low of €51/t. Lower carbon allowances, other things being equal, should encourage more coal burn by reducing the tax faced by power generators across Europe. Yet, EUA prices have not come down enough to warrant a meaningful pick up in European coal demand. Despite the cheaper pollution costs in Europe, Asian prices have outperformed other markets in the Atlantic Basin since last summer (Exhibit 8).

**Exhibit 7: EUA, TTF and API2 prices**

Another major market that has impacted API2 European thermal coal prices but has yet to hit Australian Newcastle is the halving of EUA prices

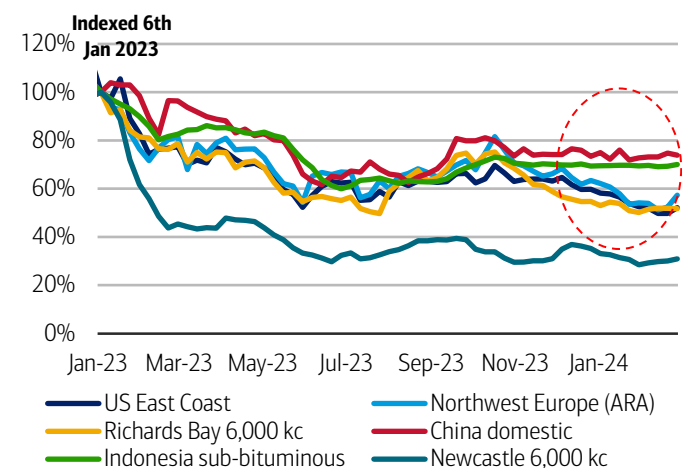


Source: McCloskey

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**Exhibit 8: Global thermal coal prices**

Zooming into thermal coal, we note that Asian prices have outperformed other markets in the Atlantic Basin since last summer



Source: McCloskey

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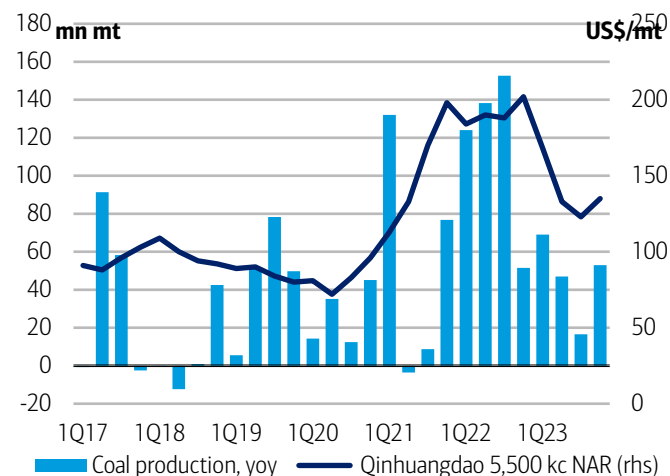
**China and Saudi have set a floor for energy prices via...**

So why is Asia holding firm while other regions languish in global coal markets? As we have explained in prior pieces, Chinese coal production has ramped up aggressively in recent years, increasing by 14% since 2021 (Exhibit 9). Last year alone, China produced around 3.8bn metric tons of thermal coal or about 50% of the world's total. However, higher Chinese production has come at a higher cost, pushing up the cost of energy

around the world. Meanwhile, the price of Brent crude oil, the world's most important energy benchmark, has stabilized on the back of Saudi production cuts in recent quarters (Exhibit 10).

#### Exhibit 9: China coal production and prices

As we have explained in prior pieces, Chinese coal production has ramped up aggressively in recent years, increasing by 14% since 2021



Source: McCloskey

Notes: Prices are quarterly averages

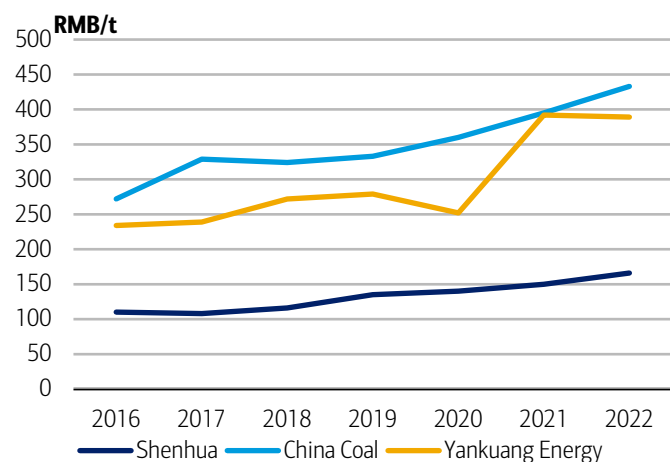
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#### ...rising domestic production costs and spending needs

While Saudi Arabia has been working hard to stabilize global crude oil prices, the steep increases in Chinese domestic coal production have naturally pushed local miners up the marginal cost curve, making energy more expensive in China ([China coal floors global gas](#)) but also around the world (Exhibit 11). In a similar vein, a sharp increase in government spending plans to meet Saudi Vision 2030 has elevated the oil budgeted break-evens for the world's swing oil exporter (Exhibit 12). In short, these two forces suggest global energy is simply poised to remain more expensive on average than it was in the five years before Covid hit.

#### Exhibit 11: China, unit production costs (major producers)

The steep increases in Chinese domestic coal production have quickly pushed local miners up the marginal cost curve, making energy more expensive in China

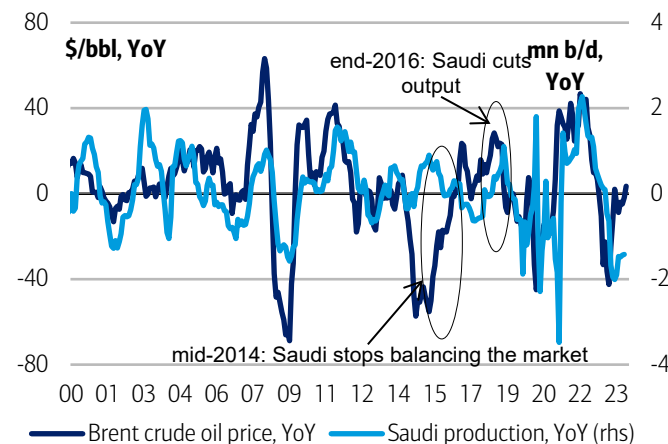


Source: Company reports, BofA Global Research estimates

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#### Exhibit 10: Brent crude oil price and Saudi production changes

Meanwhile, the price of Brent crude oil, the world's most important energy benchmark, has stabilized on the back of Saudi production cuts in recent quarters

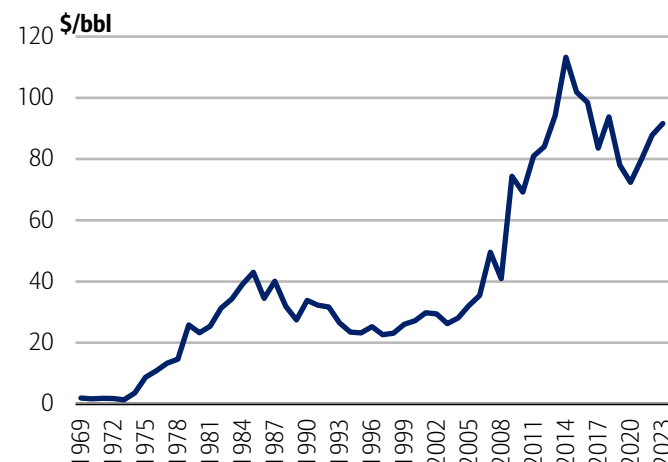


Source: Bloomberg, IEA, OPEC, BofA Global Research

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#### Exhibit 12: Saudi breakeven oil price

In a similar vein, a sharp increase in government spending plans to meet Saudi Vision 2030 has elevated the oil budgeted break-evens for the world's swing oil exporter



Source: Haver, Saudi Central Bank (SAMA), Ministry of Finance, BofA Global Research

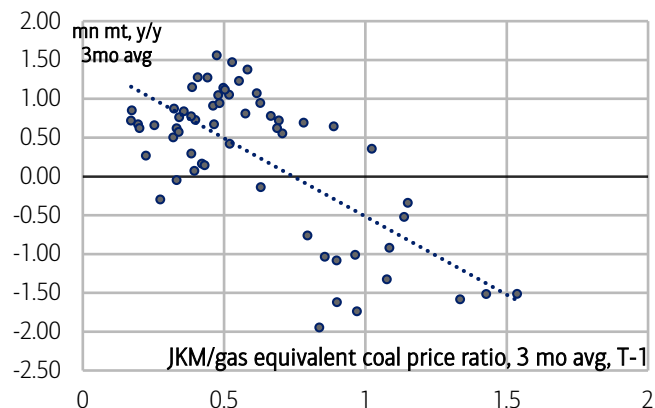
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### Expensive Chinese coal is also helping floor global gas...

There is a strong linkage between the relative prices of thermal coal and natural gas, and Chinese liquid natural gas import volumes (Exhibit 13). When the price of natural gas increases relative to thermal coal, natural gas imports tend to drop in China. But one could make a similar argument in absolute terms: China avoids buying expensive energy, if it can avoid it. Europe acts, on the other hand, as a price taker in global energy markets. With thermal coal prices in Asia holding firm, Asian JKM natural gas prices have also found a floor and are in turn supporting European TTF prices (Exhibit 14).

#### Exhibit 13: JKM/gas equivalent coal price ratio versus Y/Y Chinese LNG import change

There is a strong linkage between the relative prices of thermal coal and natural gas, and Chinese liquid natural gas import volumes

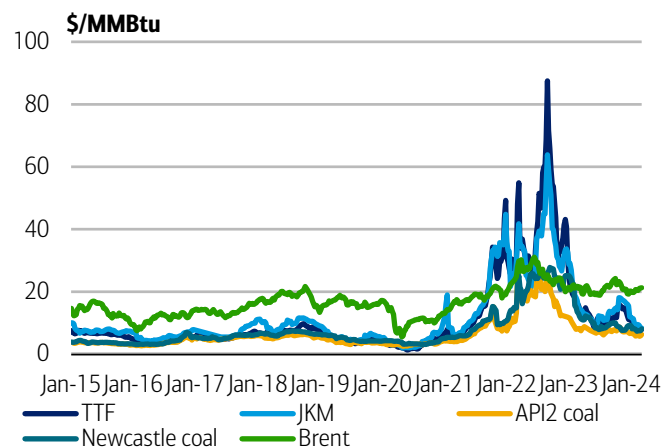


Source: Bloomberg, BofA Global Research

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#### Exhibit 14: Gas and gas equivalent prices of coal and oil

With thermal coal prices in Asia holding firm, Asian JKM natural gas prices have also found a floor and are in turn supporting European TTF prices



Source: Bloomberg

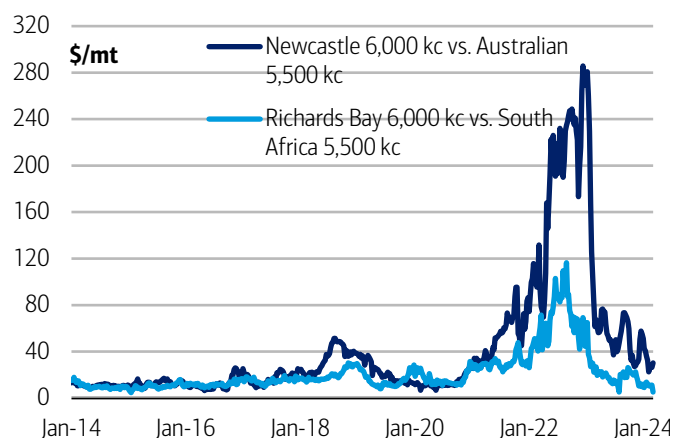
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### ...as calorific value (CV) diffs have stabilized at a high level

Another factor that has played a major role in thermal coal markets is that quality differential across different grades have remained very volatile, as regulatory hurdles have reduced the use of lower quality coals in key markets in recent years. Still, the premium on 6000 over 5500kcal/kg thermal coal in Australia and South Africa has finally stabilized and reverted back to the levels of 2019/2020 (Exhibit 15) as tightness in the high CV market eased. After two years of much turbulence, Chinese thermal coal prices are trading at an average premium of \$33/t over Australian 5500kcal/kg, roughly in line with historical averages (Exhibit 16).

**Exhibit 15: Coal spreads**

The premium on 6000 over 5500kcal/kg thermal coal in Australia and South Africa has finally stabilized and reverted back to the levels of 2019/2020

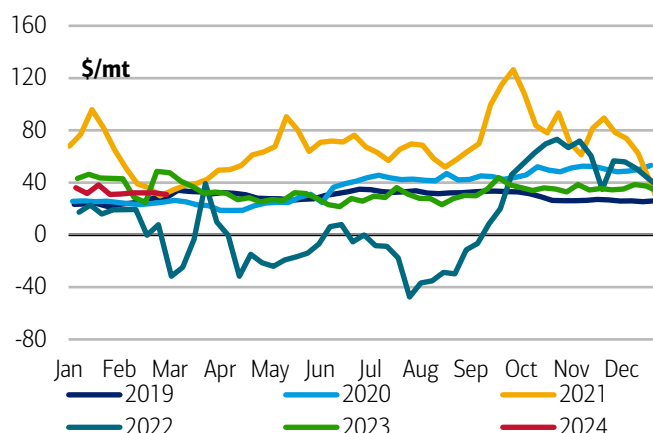


Source: McCloskey

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**Exhibit 16: Average Chinese coal prices vs. Australia 5,500 kcal/kg**

Chinese thermal coal prices are trading at an average premium of \$33/t over Australian 5500kcal/kg, roughly in line with historical averages



Source: McCloskey

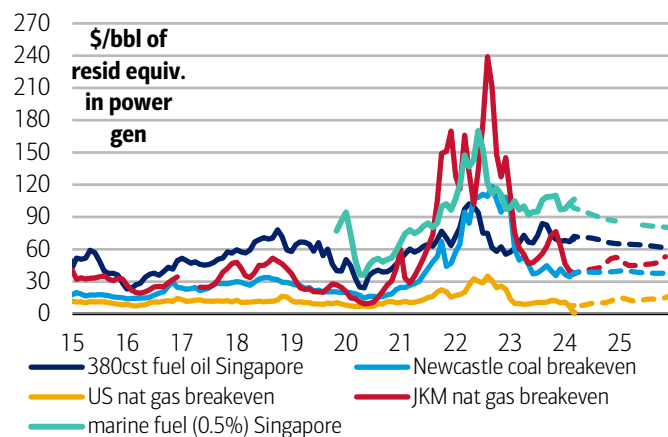
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**Forward coal prices have also steadied in recent months**

Despite all the volatility across different segments of the global thermal coal market, we would note that certain price relationships remain firm. Specifically, we would highlight the tight links between JKM nat gas and Newcastle coal prices on a forward basis (Exhibit 17). Ultimately, the data suggests that there is a strong connectivity between API2 and TTF prices as well as between Newcastle and JKM prices (Exhibit 18), as utilities in Europe and Asia constantly optimize their generation mix based on the relative prices of both fuels in the Atlantic and the Pacific, respectively.

**Exhibit 17: Asia resid fuel oil prices and breakevens with coal and gas in power generation**

Across the energy complex, we would also note the tight relationship between JKM nat gas and Newcastle coal prices on a forward basis

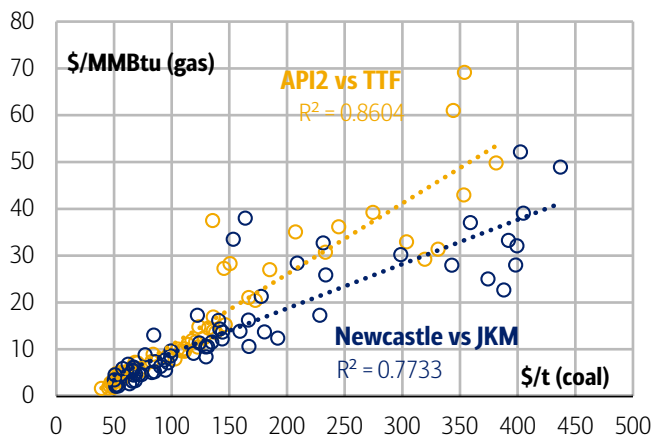


Source: Bloomberg

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**Exhibit 18: Thermal coal vs natural gas (monthly averages, 2020 to date)**

Ultimately, we note that there is a strong relationship between API2 and TTF prices as well as between Newcastle and JKM prices



Source: Bloomberg, BofA Global Research

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**Looking into 2024, we see China cutting back output...**

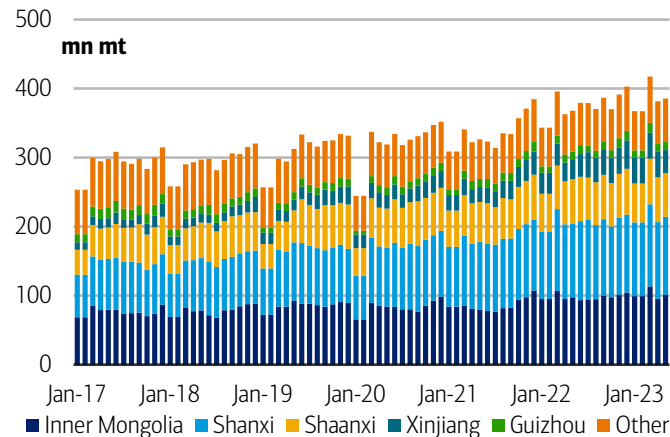
We have previously highlighted how Chinese coal production has been increasing sharply in recent years from a monthly average of 293mn tons in 2018 to a peak of 417mn tons last year (Exhibit 19), as the net supply shortfall left by Russian gas in 2022 was largely filled with incremental tons of coal (see [The coal that is saving the world... and sinking the planet](#)). Yet China's domestic coal production growth has recently struggled and has clearly not been enough to keep up with demand, as the 117% or 103mn t YoY sharp increase in thermal coal imports in 2023 suggests (Exhibit 20). As an example, China's



largest coal producer, Shenhua, has said it will scale back coal production, projecting volumes of 316.1 mt in 2024, down 2.59% from 324.4 mt in 2023. Similarly, coal mining province Shandong, home to coal producer Yancoal, underscored the need to stabilise its coal production at 85 mt, down from 87.06 mt in 2023 and 97.53 mt in 2022.

#### Exhibit 19: Mainland China coal production by region

Chinese coal production has been increasing sharply in recent years from a monthly average of 293mn tons in 2018 to a peak of 417mn tons last year...

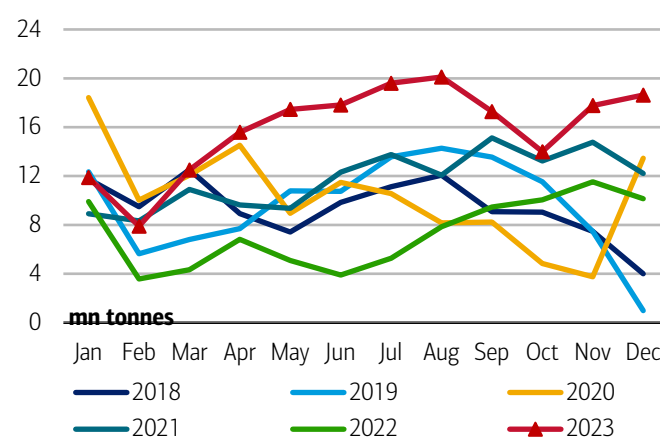


Source: McCloskey

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#### Exhibit 20: China monthly thermal coal imports

...but clearly not enough to keep up with demand, as the 117% or 103mn t YoY sharp increase in thermal coal imports in 2023 suggests



Source: McCloskey

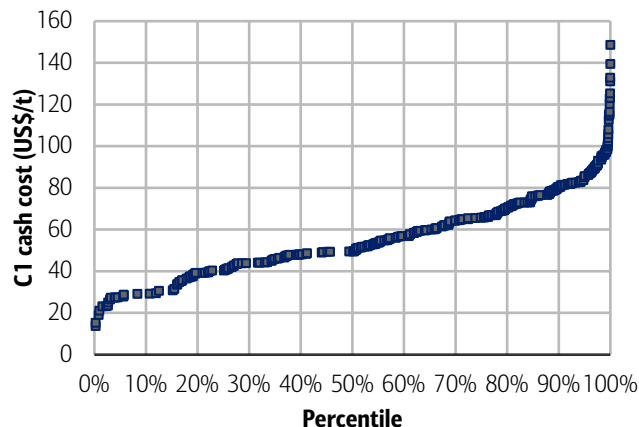
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#### ...but continuing to need imports for power generation

Due to a range of issues in China's coal sector including rising costs due to investments in safety and environmental protection, as well as sheer resources depletion, we expect China's activity in the international market to continue. The implication of this development in China is a higher global coal floor. In fact, the global seaborne thermal coal export curve suggests prices are floored at \$80-\$100/t as expensive producers are paring back output at that level (Exhibit 21). Indonesia offers most of the cheapest seaborne coal available from a cost perspective, but there is a broad range of fourth quartile suppliers (Exhibit 22).

#### Exhibit 21: Seaborne export thermal curve

The global seaborne thermal coal export curve suggests prices are floored at \$80-\$100/t as expensive producers pare back output at that level

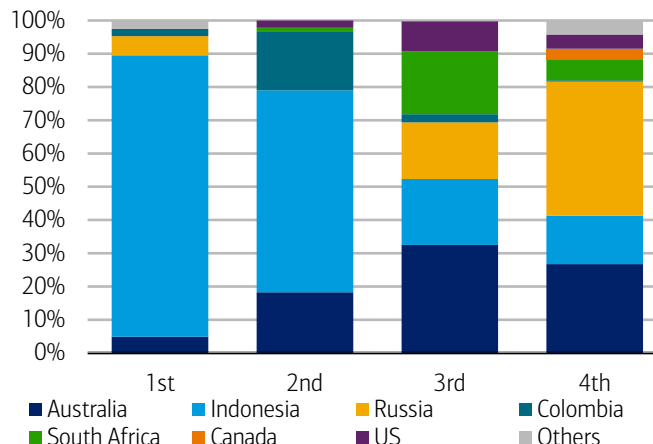


Source: Woodmac

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#### Exhibit 22: Seaborne thermal coal cost curve, by percentile and country

Indonesia offers most of the cheapest seaborne coal available from a cost perspective, but there is a broad range of fourth quartile suppliers



Source: Woodmac

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#### China's clean energy shift will hit oil first, coal second

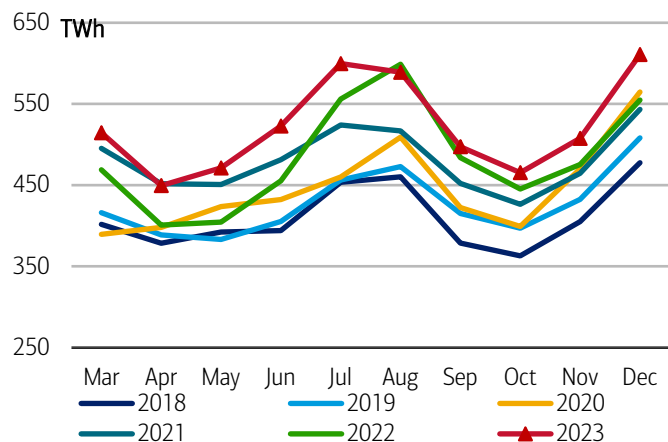
Contributing to a large jump in seaborne coal imports, thermal power generation in China increased sharply in 2023 compared to prior years (Exhibit 23) and will likely continue to expand at a firm pace this year and next as the ongoing global trade



recession reverts on the back of lower interest rates. Even then, we expect a lot of the incremental energy supply to come from non-fossil fuel sources, eventually capping domestic coal demand (Exhibit 24) in China and also setting a cap on the global price of this commodity. Notably, the next big user of coal in the world, India, has an income that is just one-fifth of China's.

#### Exhibit 23: China thermal power generation

Contributing to a large jump in seaborne coal imports Thermal power generation in China increased sharply in 2023 compared to prior years

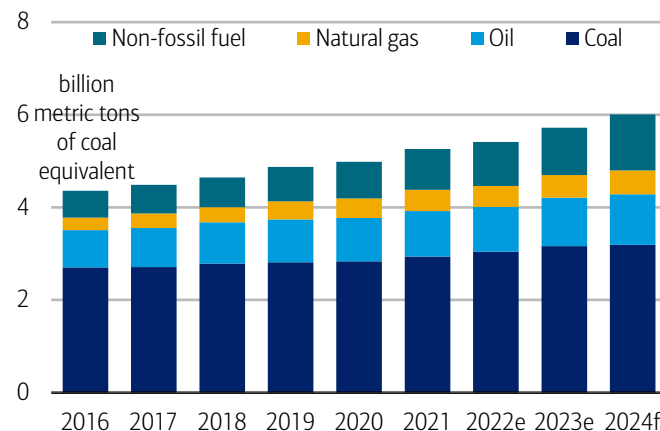


Source: Bloomberg

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#### Exhibit 24: China's primary energy consumption by source

...although we expect a lot of the incremental energy supply to come from non-fossil fuel sources, eventually capping domestic coal demand



Source: BloombergNEF

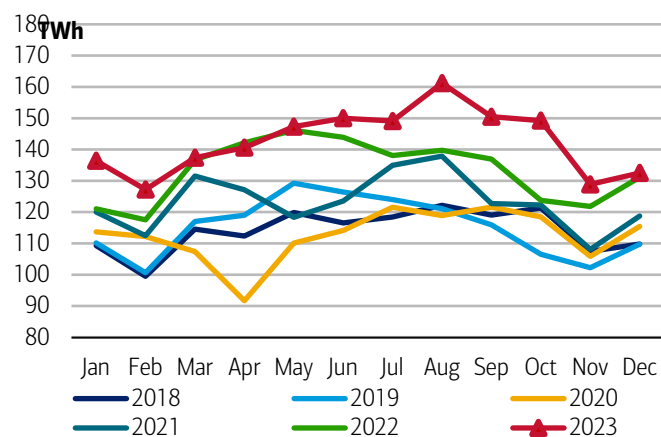
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#### In contrast, India coal supply should expand rapidly...

Should global seaborne thermal coal prices rise again sharply, affordability could quickly become a pressing issue for the market. True, India power generation has also increased very substantially in recent years and it took off sharply in 2023 to average 143TWh, 7% above prior year levels (Exhibit 25). Yet, in contrast to the issues facing China, much of the incremental electricity generation in India has been met with vast quantities of thermal coal produced domestically (Exhibit 26) at very low prices. Our equity analysts in India point to overall production costs of about INR1,300/t (\$16/t) in FY24 for Coal India, the nation's largest coal producer, which accounts for more than 70% of India's output.

#### Exhibit 25: India power generation

India power generation has also increased very substantially in recent years and it took off sharply in 2023 to average 143TWh, 7% above prior year levels

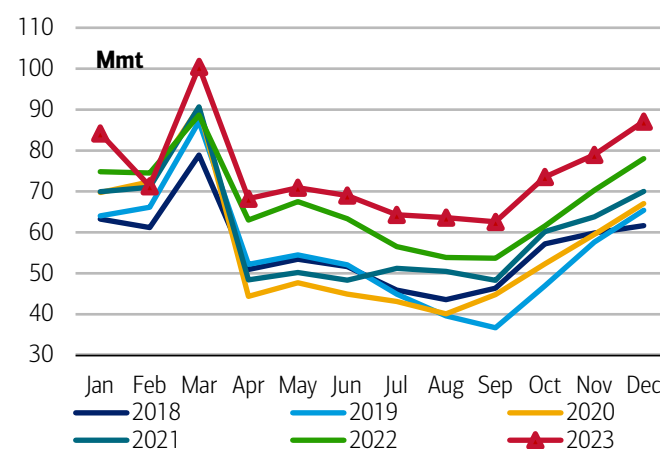


Source: McCloskey

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#### Exhibit 26: India coal production

Not surprisingly, much of this incremental electricity generation was met with vast quantities of thermal coal produced domestically



Source: McCloskey

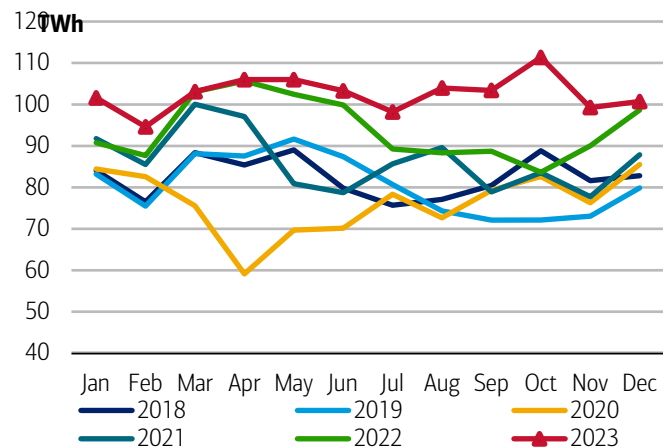
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### ...although demand growth rates should exceed them...

Still, coal-fired generation in India continues to grow at a breakneck pace, with 80GW of new coal capacity expected by 2032, mostly as a result of the roaring demand for electricity in the economy but also backed by ample domestic supply availability (Exhibit 27). Should internal coal production in India falter, it would be very difficult for local utilities to outcompete other countries for tight seaborne resources. In fact, despite the rapid increase in coal usage in India's power sector, imports have not increased meaningfully in recent years (Exhibit 28) as the economy is simply not productive enough to support paying for international thermal coal prices.

#### Exhibit 27: India coal-fired power generation

Coal-fired generation in India continues to grow at a breakneck pace, mostly as a result of ample domestic supply availability

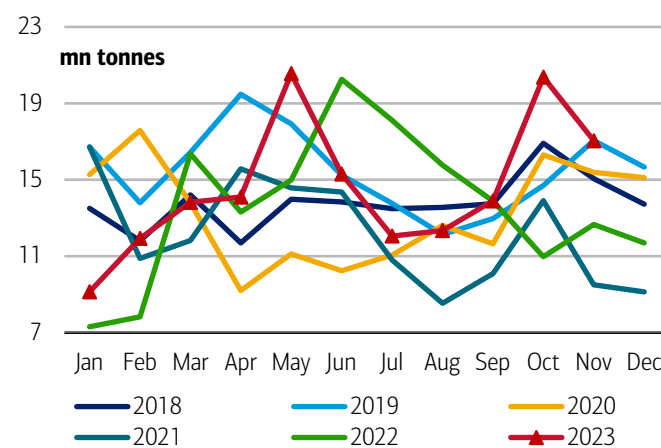


Source: McCloskey

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#### Exhibit 28: India monthly thermal coal imports

Despite the rapid increase in coal usage in India's power sector, exports have not increased meaningfully in recent years



Source: McCloskey

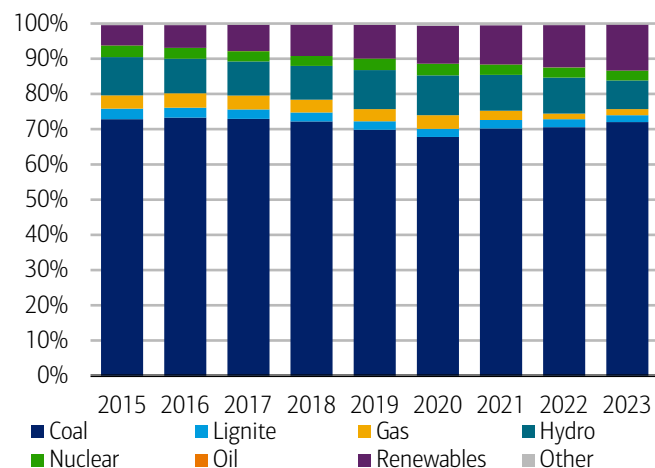
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### ...as the subcontinent continues to rely heavily on coal

Looking at India's power generation mix, we note that thermal coal plays a pivotal role in the energy economy of this fast growing nation (Exhibit 29). Just like the US, the UK or China at their early stages of economic development, India has opted to rely on the cheapest of thermal fuels to grow the economy from a low base, and the government has set an ambitious target to raise coal output to 1.5bnt by 2030 (compared to 967mnt in 2023) to meet increased demand and end import dependency. For now, to protect Indian consumers and businesses from the high prices in the international market, utilities have focused on rebuilding inventories. Across power stations in India, we note that stocks have increased substantially compared to prior years, although demand is also up a lot (Exhibit 30).

**Exhibit 29: India power generation, by energy source**

Looking at India's power generation mix, we note that thermal coal plays a pivotal role in the energy economy of this fast growing nation

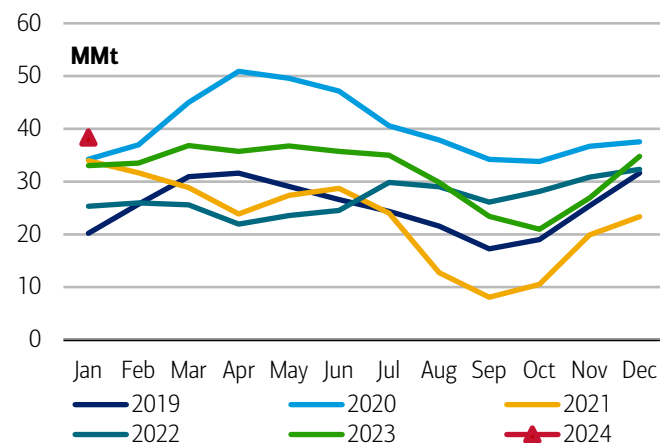


Source: McCloskey

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**Exhibit 30: Indian power stations: coal stocks**

Across power stations in India, we note that stocks have increased substantially compared to prior years, but demand is also up a lot



Source: McCloskey

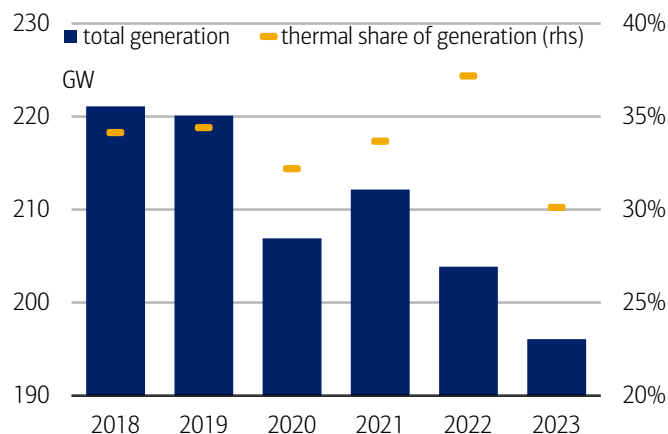
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**Broadly, EMs will keep burning coal as DMs cut back...**

While India and China continue to gobble up large volumes of thermal coal to keep the lights on, European power generation has come off sharply in 2023. In turn, the 5% reduction in electricity output across Europe has pushed down the use of thermal fuels in the electricity mix (Exhibit 31), a trend we expect to continue into the coming years as alternative sources of generation ramp up. Looking out, we expect demand for thermal coal in the developed markets to decline further on a structural basis while consumption across key players in the emerging markets increases (Exhibit 32), partly offset by China.

**Exhibit 31: NWE generation and thermal's share**

European power generation has come off sharply in 2023, driving down the use of thermal fuels in the electricity mix

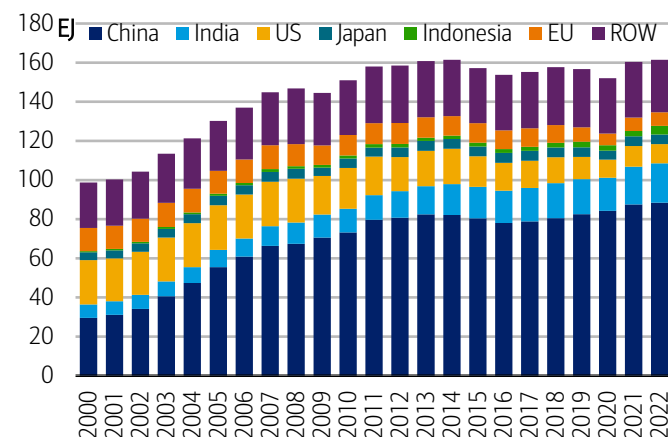


Source: Bloomberg, BofA Global Research

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**Exhibit 32: Global coal consumption**

Looking out, we expect DM demand for thermal coal to continue to decline structurally while EM consumption across key players increases



Source: Energy Institute

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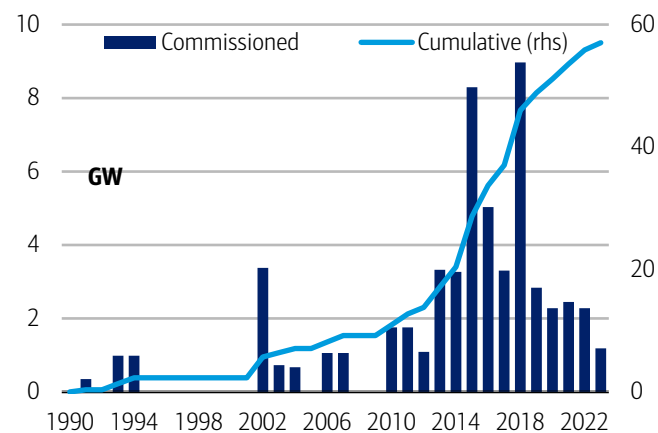
**...on a recovery in nuclear and renewable gen capacity...**

While China has relied increasingly on coal in recent years as LNG prices became exorbitantly expensive, it has also pledged to achieve Net Zero emissions by 2060 and expects a peak in domestic CO<sub>2</sub>e emissions by 2030. With this goal in mind, China is building nuclear power generation faster than in any other country in the world. The average age of a plant in China is just 9 years (Exhibit 33), compared to 40 or more in many developed economies. Meanwhile, photovoltaic installations are also taking off

very significantly on the back of falling production costs and rising domestic production capacity (Exhibit 34).

### Exhibit 33: China nuclear installation

China is building nuclear power generation faster than in any other country in the world, and the average age of a plant is just 9 years..."

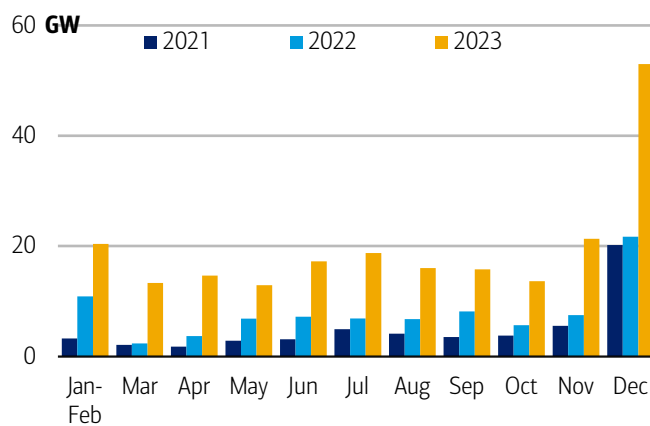


Source: BloombergNEF

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### Exhibit 34: Monthly PV installations in China

...while photovoltaic (PV) installations are also taking off very significantly on the back of falling production costs and rising domestic production capacity



Source: BloombergNEF

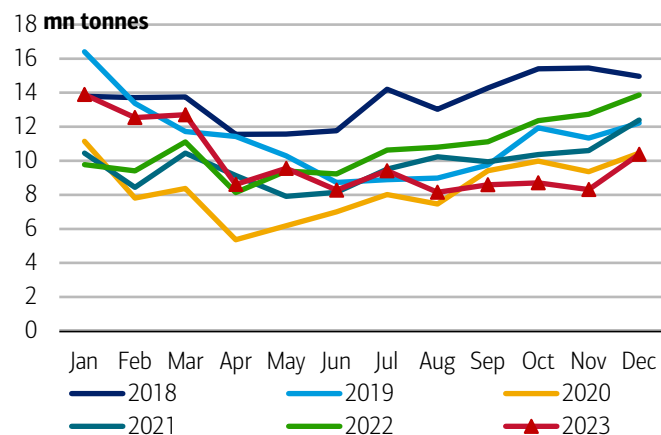
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### ...and broad-based power demand destruction in Europe

Put differently, China plans to transform its energy economy without necessarily destroying its industrial base. In stark contrast, following a surge in thermal coal imports to deal with a collapse in Russian natural gas supplies in 2022, European coal usage came off hard in 2023 (Exhibit 35). Warm weather, weak industrial activity and increased renewables generation have come together to create a big drop in coal use across advanced European economies. Even then, the use of natural gas in the power generation in Europe, which was closely connected to thermal coal historically until the relationship broke down in 2022, is normalizing again (Exhibit 36).

### Exhibit 35: Europe thermal coal imports

Following a surge in thermal coal imports to deal with a collapse in Russian natural gas supplies in 2022, European coal imports came off hard in 2023

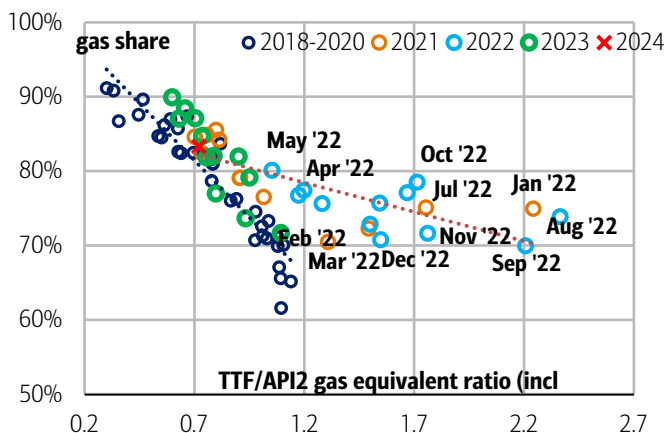


Source: McCloskey

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### Exhibit 36: Gas' share of thermal generation, Northwest Europe

The use of natural gas in the power generation in Europe was closely connected to thermal coal historically until the relationship broke down in 2022, but it is normalizing again



Source: Bloomberg

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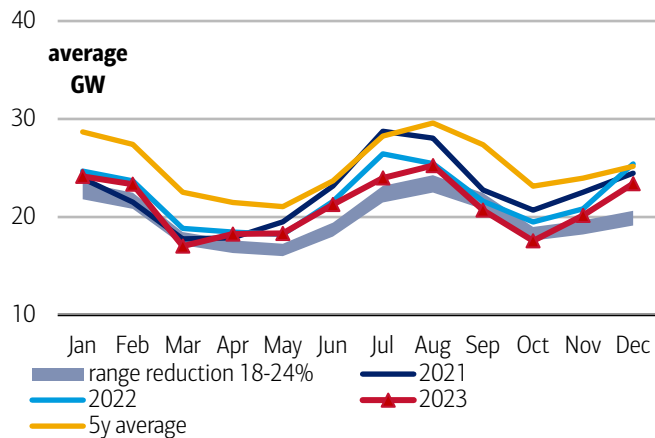
### Japan, Korea coal demand should continue to cool off...

Developed Asian economies are also poised to see a significant drop in their use of thermal fuels over time, with a specific focus on coal as the efforts to decarbonize speed up. For starters, South Korean thermal coal use in the power generation sectors came off by 6.5% last year compared to 2021 as global natural gas prices normalized

(Exhibit 37). The drop in coal usage across the South Korea power sector led to a reduction in thermal coal import levels of 5% compared to 2021 (Exhibit 38). Looking forward, Seoul will likely keep pushing into non-thermal power resources and pressure to reduce Russian coal imports will grow further, denting coal consumption at home.

#### Exhibit 37: South Korea coal-fired power generation

South Korean thermal coal use in the power generation sectors came off by 6.5% last year compared to 2021 as global natural gas prices normalized...

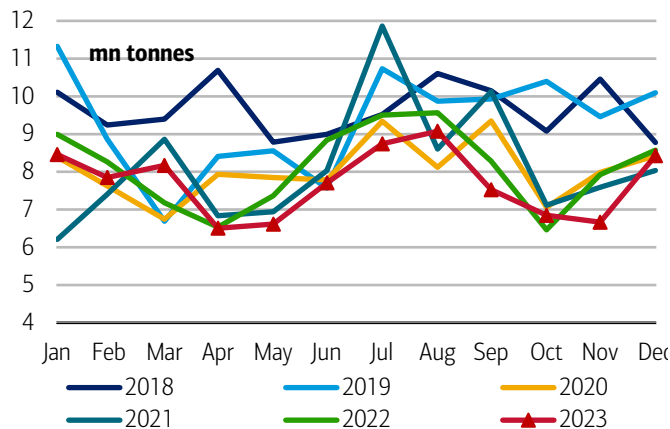


Source: Bloomberg, BofA Global Research

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#### Exhibit 38: South Korea thermal coal imports

...contributing to reduce thermal coal import levels by 5% compared to 2021, as Seoul pushes into non-thermal power resources



Source: McCloskey

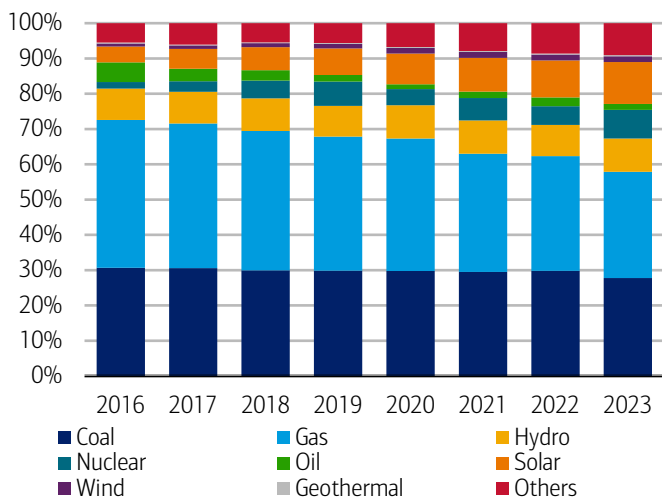
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#### ...as low LNG prices are poised to keep displacing coal

Having phased out Russian coal already, we expect a continued broad reduction in the use of thermal fuels in Japan as well, with thermal coal poised to decline over the coming years (Exhibit 39), although Japan's lack of domestic energy supplies has historically been met with a energy policy that emphasized diversification across various sources rather than cleaning up the environment. With nuclear capacity across the Asian nation steadily coming back after the Fukushima disaster, we still believe the use of natural gas in power generation in Japan could increase relative to coal as LNG prices finally normalize (Exhibit 40), while the same is true of South Korea.

#### Exhibit 39: Japan power generation, by energy source

We expect a continued reduction in the use of thermal fuels in Japan as well, with thermal coal poised to decline over the coming years

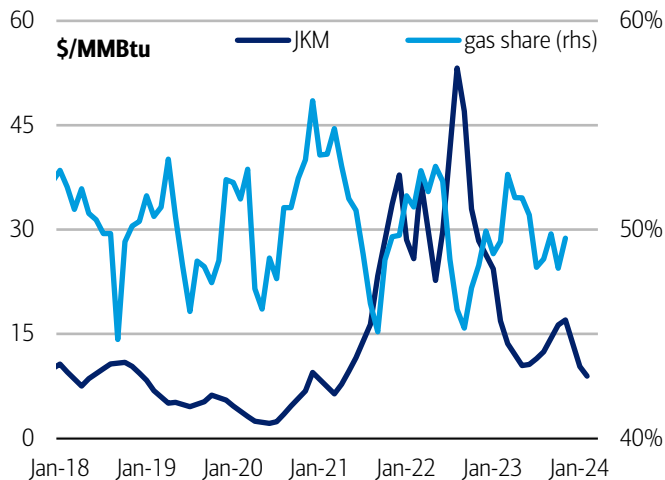


Source: McCloskey

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#### Exhibit 40: Gas' share of thermal generation, Japan & Korea

Importantly, the use of natural gas in power generation in both Korea and Japan could increase relative to coal as LNG prices finally normalize



Source: Bloomberg

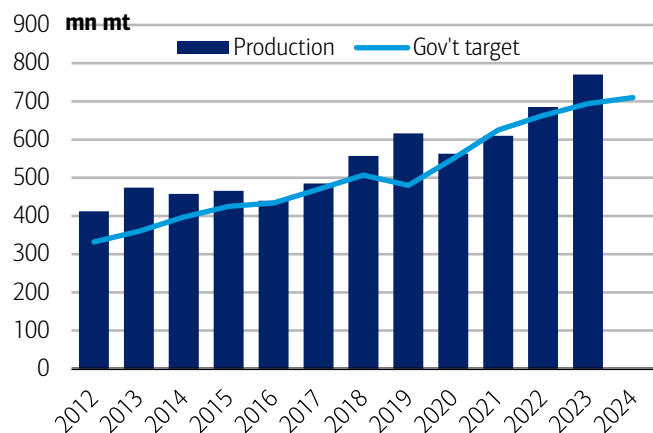
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### On supply, Indonesia should expand exports further as...

Moving away from demand into supply, it is worth noting that investment in coal mining has struggled around the world in recent years as financing risks have increased on the back of climate pressures. True, the world's largest thermal coal exporter, Indonesia, has continued to increase production to new records at a very fast rate to meet demand from India, China and South East Asia (Exhibit 41), but the appetite from lenders and investors to keep funding these expansions is likely to keep on fading going forward. Domestically, power generation growth in Indonesia is very focused on thermal coal too to support the industrial sector, with 34GW of new steam power plants in the pipeline (Exhibit 42). The IEA projects domestic demand to reach 284 million mt by 2026, up from less than 200 million mt in 2024. In that regard, nickel production has become a significant factor driving coal demand.

#### Exhibit 41: Indonesia production and government target

The world's largest thermal coal exporter, Indonesia, has continued to increase production at a very fast rate to meet global demand

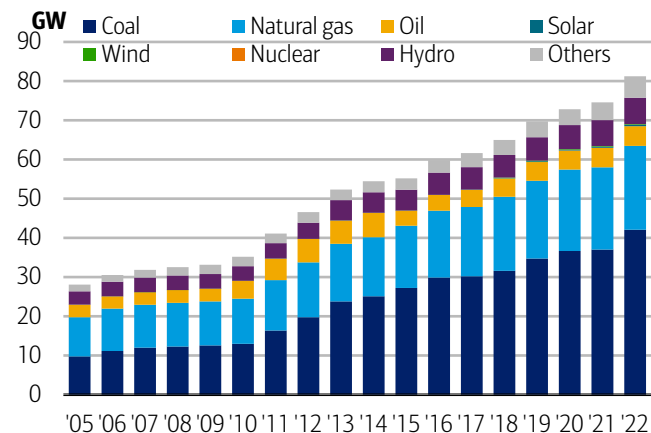


Source: McCloskey

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#### Exhibit 42: Indonesia cumulative installed capacity by technology

Domestically, power generation growth in Indonesia is very focused on thermal coal, with 34GW of new steam power plants in the pipeline



Source: BloombergNEF

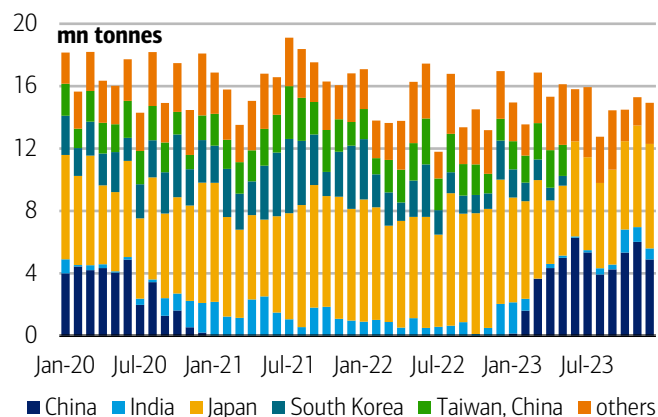
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### ...other exporters such as Australia or the US retrench...

While the Indonesian government may come in to support the coal mining sector if needed due to energy security of supply reasons, other large coal exporting countries have moved to reduce their coal trade. For instance, Australian thermal exports have been coming down for several years for a variety of reasons, and we do not see a big uplift ahead (Exhibit 43). Similarly, American thermal coal production is rolling off again with prices coming down from the elevated levels of prior years (Exhibit 44), suggesting that US volumes in global seaborne markets may not return unless prices spike again.

**Exhibit 43: Australia exports by country**

Australian thermal exports have been coming down for several years for a variety of reasons, and we do not see a big uplift ahead



Source: McCloskey

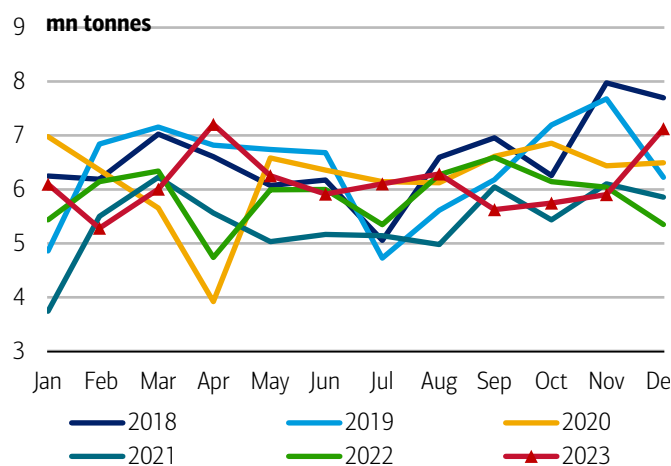
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**...and South Africa or Colombia struggle to expand output**

We previously showed how expensive seaborne coal exports have become at the margin for an array of major exporting countries. Beyond the US and Australia, South African thermal coal exports have remained relatively stagnant in recent years due to persisting logistical constraints at the nation's main rail operator, Transnet (Exhibit 45). Similarly, Colombian thermal coal export volumes have faltered due to a range of factors in recent years (Exhibit 46). In short, traditional coal exporters are not poised for a meaningful increase in export volumes in the years ahead, perhaps with the exception of Indonesia.

**Exhibit 45: Thermal coal exports ex. lignite: South Africa**

South African thermal coal exports have remained relatively stagnant in recent years due to persisting logistical constraints

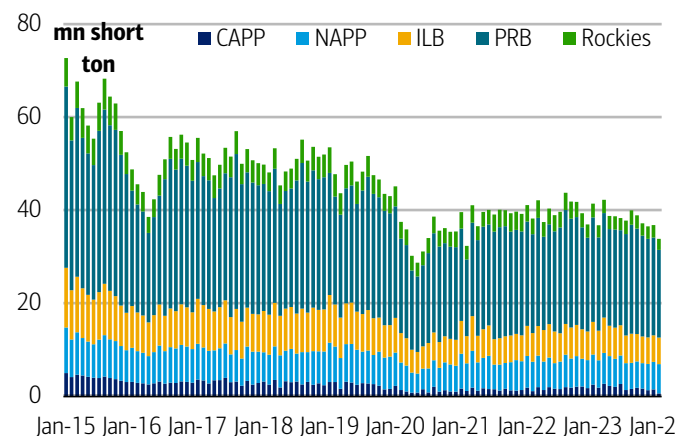


Source: McCloskey

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**Exhibit 44: United States coal production**

Similarly, American thermal coal production is rolling off again with prices coming down from the elevated levels of prior years

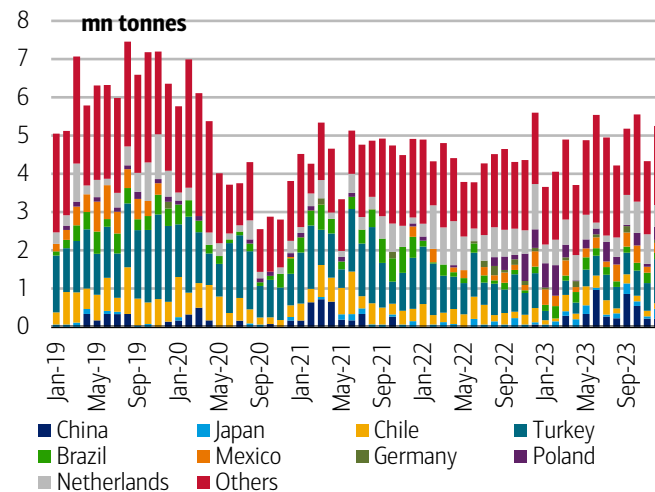


Source: McCloskey

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**Exhibit 46: Colombia thermal coal exports**

Similarly, Colombian thermal coal export volumes have faltered due to a range of factors in recent years



Source: McCloskey

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**Russian coal exports are down significantly on sanctions**

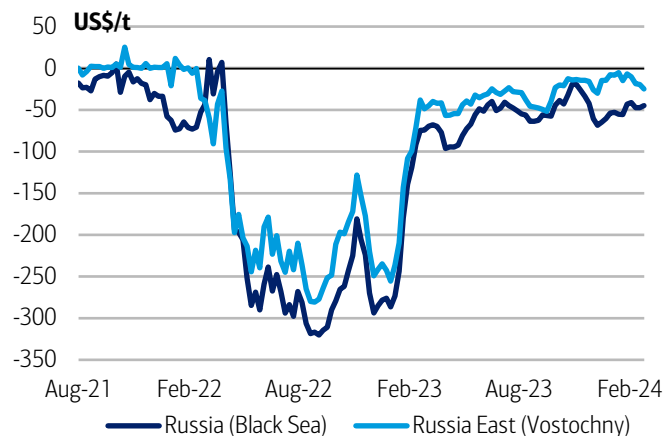
Beyond all the major coal exporting countries above, the lack of incremental coal volumes in global coal markets has been further exacerbated by the Ukraine conflict and European sanctions on Russian volumes starting on August 10, 2022. In fact, Russian coal price differentials to Australia remain relatively wide still as sanctions have made it harder to place these volumes (Exhibit 47). And with Europe pulling back on Russian coal demand, Russian exports have tumbled in recent years to the lowest levels since 2016 (Exhibit 48). Moreover, sanctions have already caused payment issues for Chinese banks



with USD exposure, suggesting Russian coal volumes in the market will likely continue to drop.

#### Exhibit 47: Russian coal price differentials vs Australian Newcastle

Russian coal price differentials to Australia remain relatively wide as sanctions have made it harder to place these volumes



Source: McCloskey

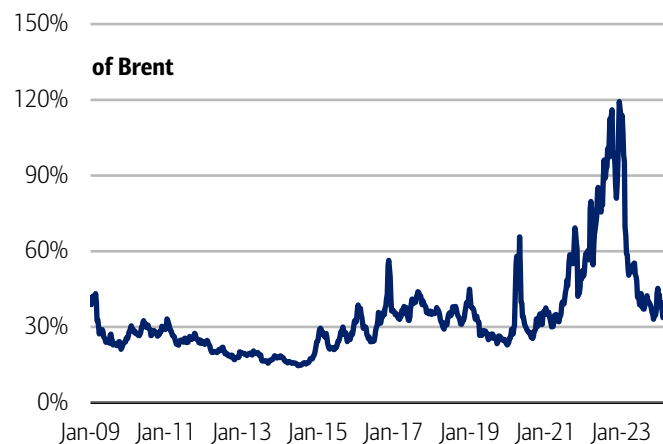
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#### In sum, Newcastle prices should hold firm this year with...

A stagnant global thermal coal demand picture on the back of Net Zero commitments to fight rising global temperatures should be bad news for coal prices. Yet, an array of supply issues has allowed coal prices to perform much better than expected in recent years. Newcastle coal spiked up dramatically in 2022 in both absolute and relative terms as a % of Brent as European sanctions on Russian coal hit the market. True, thermal coal prices are now back to their 10y average (Exhibit 49) relationship to Brent, but downside seems limited to us. We project Newcastle prices to average \$150/t in 2024 and \$125/t in 2025 compared to forward prices of \$134/t and \$136/t respectively (Exhibit 50).

#### Exhibit 49: Newcastle coal prices as a % of Brent crude oil prices

Newcastle prices spiked up dramatically in 2022 in both absolute and relative terms as a % of Brent, but prices are back to the 10y average



Source: Bloomberg

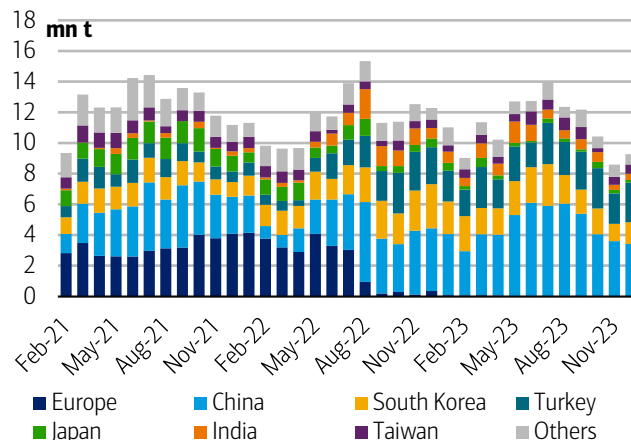
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#### ...help from higher cash costs and rising shipping costs and...

Again, it is not just climate risks that have deprived the coal sector from additional capital. Cash costs have also increased in recent years across the board due to incremental safety regulations and a lack of further resource developments. As such, some players are now facing coal production hurdles of \$100+/t (Exhibit 51), lending

#### Exhibit 48: Russia thermal coal exports, by destination

With Europe pulling back on Russian coal demand, Russian exports have tumbled in recent years to the lowest levels since 2016

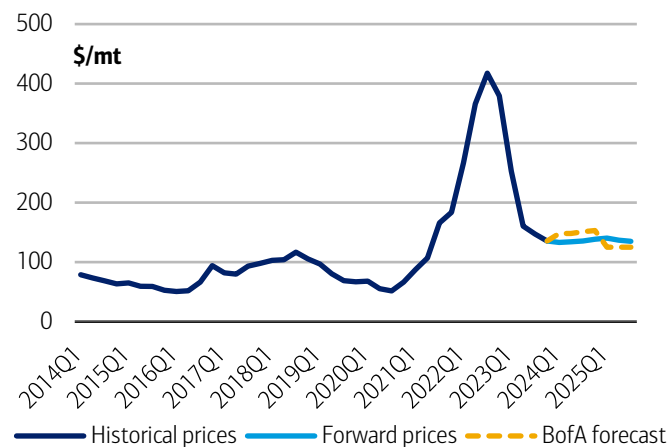


Source: McCloskey

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#### Exhibit 50: Newcastle coal prices and forecasts

We project Newcastle prices to average \$150/t in 2024 and \$125/t in 2025 compared to forward prices of \$134/t and \$136/t respectively



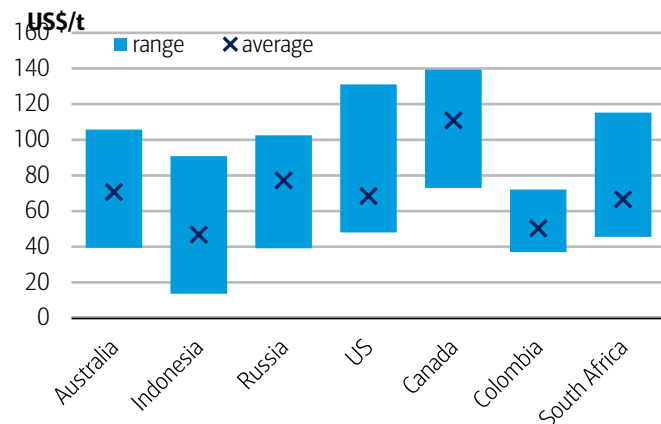
Source: Bloomberg, BofA Global Research estimates

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support to Newcastle prices at present and, we believe, going forward too. Meanwhile, shipping rates have increased as a result of disruptions in both Panama and Suez, and could support coal prices in Chinese ports (Exhibit 52).

#### Exhibit 51: Seaborne thermal coal C1 cash cost, by country exporter

Cash costs have increased in recent years across the board and some players are now facing coal production hurdles of \$100+/t

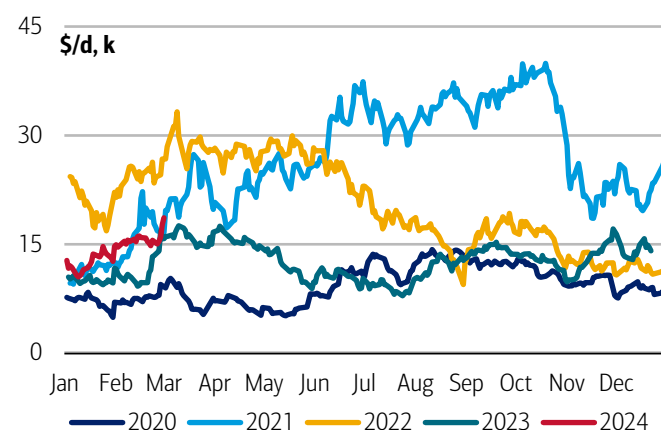


Source: Woodmac

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#### Exhibit 52: Panamax freight rates, \$/day (thousands)

Meanwhile, shipping rates have increased as a result of disruptions in both Panama and Suez, and could support coal prices in Chinese ports



Source: Bloomberg

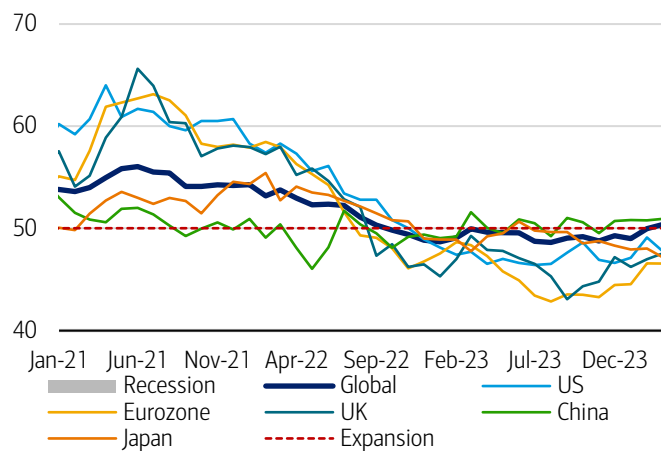
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#### ...could even benefit from an improvement in global PMIs

Beyond the supportive dynamics of supply and demand today, it is also key to look at macro to ascertain the future direction of coal prices. Global manufacturing PMIs have started to turn increasingly positive around the world, suggesting an upturn in energy demand ahead (Exhibit 53) and thus a more supportive demand environment for coal. With thermal coal stocks at Chinese ports at slightly below historical averages, we see support to seaborne thermal coal prices (Exhibit 54) over the course of this year and into 2025.

#### Exhibit 53: Global manufacturing PMIs

Global manufacturing PMIs have started to turn increasingly positive around the world, suggesting an upturn in energy demand ahead

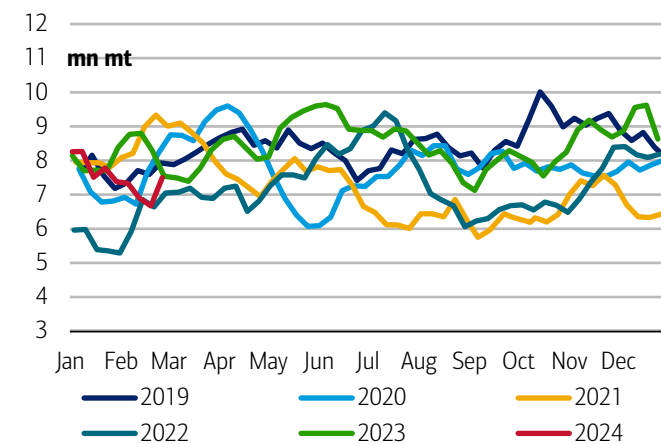


Source: Haver, ISM, Markit

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#### Exhibit 54: Coal stocks of Chinese ports

Thermal coal stocks at Chinese ports are slightly below historical averages, likely lending support to seaborne thermal coal prices



Source: McCloskey

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**Exhibit 55: Thermal coal balances**

Thermal coal supply and demand

**Exports**

Country	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024F	2025F
Indonesia	328	311	319	343	372	339	344	359	378	386	391
Australia	202	201	200	208	212	200	199	179	202	203	205
Russia	118	131	140	148	156	147	153	142	134	127	125
South Africa	78	77	82	79	77	73	65	71	73	73	74
Colombia	81	89	83	80	76	52	56	54	56	57	61
United States	25	17	39	51	37	24	36	35	43	38	37
Canada	2	2	2	1	2	5	5	8	8	7	7
China	1	4	4	2	3	1	1	2	2	2	2
Other	44	46	40	32	34	24	32	32	27	27	26
<b>Total</b>	<b>879</b>	<b>877</b>	<b>910</b>	<b>943</b>	<b>970</b>	<b>865</b>	<b>890</b>	<b>882</b>	<b>923</b>	<b>920</b>	<b>928</b>

**Imports**

Country	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024F	2025F
India	153	146	144	165	186	159	139	163	173	179	184
Japan	144	140	144	140	137	129	133	136	123	122	121
China	83	98	105	113	116	124	141	88	191	191	186
South Korea	101	101	116	116	112	96	98	98	93	91	90
Taiwan	67	65	69	69	67	63	69	63	59	59	58
Malaysia	20	24	34	33	32	33	33	32	35	34	34
Türkiye	28	31	33	32	31	34	30	31	34	35	37
Philippines	10	18	20	24	29	27	31	31	36	37	38
Vietnam	2	5	6	9	18	24	15	13	19	22	24
Brazil	4	4	4	4	4	4	3	2	2	2	2
Hong Kong	11	11	10	11	10	5	7	6	6	6	6
Thailand	22	22	22	25	21	24	24	21	18	19	20
Chile	9	11	10	11	10	10	11	8	6	6	6
United States	8	8	6	5	5	4	4	4	3	2	1
Canada	3	3	3	3	4	2	3	2	2	2	2
Europe	156	136	133	128	98	64	83	97	66	59	55
Other	57	56	50	56	89	64	69	87	59	56	65
<b>Total</b>	<b>879</b>	<b>877</b>	<b>910</b>	<b>943</b>	<b>970</b>	<b>865</b>	<b>890</b>	<b>882</b>	<b>923</b>	<b>920</b>	<b>928</b>

Source: McCloskey, Woodmac, company reports, BofA Global Research estimates

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**Exhibit 56: Acronym list**

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<b>Acronym</b>	<b>Definition</b>
\$/bbl	dollars per barrel
2H	Second half of the year
avg	average
API	All Publications Index
b/d	barrels per day
bbl	barrel
bn	billion
boe	barrel of oil equivalent
Btu	British thermal unit
CB	central bank
CPI	consumer price index
D&C	Drilling and completion
DM	developed market
E&P	Exploration and production
ECB	European Central Bank
EM	European market
EM	emerging market
ETS	Emissions Trading System
EUAs	European Union Allowances
EUR	Euro
EV	electric vehicle
FID	Final Investment Decision
FOB	Free on Board
FPSO	Floating production storage and offloading
GoM	Gulf of Mexico
GWh	gigawatt hours
Hz	Horizonntal
IEA	International Energy Agency
IMO	International Maritime Organization
JKM	Japan Korea Marker
JPY	Japanese Yen
LNG	liquified natural gas
MA	moving average
mcm	million cubic meters
ME	Middle East
Mfg	manufacturing
MMBtu	million British thermal units
mn	million
mt	metric ton
MWh	Megawatt hours
NBS	National Bureau of Statistics of China
NEV	New Electric Vehicle
ngl	natural gas liquids
NWE	North west Europe
OECD	Organisation for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
OPEC+	OPEC countries plus ten additional countries
PMI	purchasing managers index
rhs	righthand side
SPR	Strategic Petroleum Reserve
TMX	Trans Mountain Expansion
TTF	Dutch TTF
TWh	terawatt hours
VLSFO	very low sulfur fuel oil
WCS	Western Canadian Select
WTI	West Texas Intermediate
YoY	year over year
yr	year

Source: BofA Global Research

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# Disclosures

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