Global Energy Weekly

The grind of the oil bulls

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Commodities
Global

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We now project Brent crude to average $96/bbl in 4Q23...

The recent run up in refining margins is helping push Brent crude oil prices higher, together with deep production cuts from Saudi and Russia. With OPEC+ committed to curbing oil supply into year-end and China stimulus poised to expand into 4Q23, we expect global oil stocks to decline by 70mn over the coming 3 months. As such, we now see Brent averaging $91/bbl in 2H23, up from $81/bbl prior. Still, we keep our $90/bbl forecast for 2024 as non-OPEC oil supply expands by 1.2mn b/d driven by Guyana, Canada, US shale and Brazil. Also, if Venezuela and Iran sanctions were to ease further, that could add add 450k b/d to supply in 2024. Incremental volumes could help cap a further rise in oil prices, should OPEC+ politics and global geopolitics allow. Plus, positioning measured by CFTC data or our own CTA models suggests speculators are quite long oil already.

...but we keep our 2024 $90/bbl forecast on supply growth

For now, Russia and Saudi Arabia have shown a strong alignment in providing support to the oil market between $80 and $100/bbl Brent. Yet the political calculus could start to change above $100/bbl. With the US presidential election approaching, internal OPEC+ dynamics could make a big difference to the oil price outcome next year. On the one hand, another spike in energy prices risks reigniting inflation fears around the world, higher interest rates, and eventually financial turmoil. On the other, the downside to oil prices may be limited. In contrast to the lone historical "Saudi put" in the oil market, we believe Brent now benefits from three "puts" going forward at $70-75/bbl: the traditional OPEC+ cuts (now joined by Russia), a big increase in China coal production costs (pricier global energy), and the likely refill of the US Strategic Petroleum Reserve.

Still, downside is floored, while upside cap is less certain

Meanwhile, global oil demand growth may slow to 1.1mn b/d next year from 2mn b/d this year, with Asia leading as OECD shrinks. High interest rates will likely choke global GDP, while OPEC+ spare capacity could help cap a spike in oil prices if politics allow. Transportation should continue to lead oil demand going forward. We expect jet fuel, gasoline, and diesel to account for the bulk of the growth and believe demand for industrial fuels will remain weak. However, geopolitics could remain a real challenge. Russia may try to maximize oil price over volume, creating major upside risks to oil prices in 2024. Counterbalancing these upside risks, oil production correlations show "OPEC+ cohesion" has collapsed to near zero following the highest compliance rates in decades during the pandemic, a risk that could hurt the group next year.

Exhibit 1: BofA Commodity Research Themes and Outlook

Key takeaways

	View	Recent reports
Macro outlook	▪ Our economists see world GDP rising 3% in 2023 and expanding by 2.8% in 2024.	
WTI and Brent crude oil	▪ We project Brent and WTI to average $90/bbl and $86/bbl, respectively, in 2024. ▪ The global oil balance should stay tight in 2024, as OPEC+ withholds supply from the market as demand growth slows ▪ We forecast global demand growth to slow to 2mn b/d YoY in 2023 and 1.1mn b/d in 2024. ▪ Non-OPEC supply should grow roughly 2mn b/d YoY in 2023 and 1.2mn b/d in 2024. ▪ We project total US crude and NGL supply to rise 1.27mn b/d in 2023 and 540k b/d in 2024. ▪ OPEC crude oil supplies are set to fall 490k b/d in 2023 and 80k b/d in 2024 as OPEC+ actively manages balances.	• The grind of the oil bulls 26 September 2023 • Money breaks oil's back 08 May 2023 • OPEC+'s whatever it takes moment 05 April 2023 • Global Energy Paper: Medium-term oil outlook 26 February 2023 • $80 is the new $60 for oil 16 September 2022 • Oil demand has a supply problem 27 May 2022
Atlantic Basin oil products	▪ Refined product markets face risks from OPEC+ cuts, a looming recession, and rising global refining capacity. ▪ We forecast RBOB-Brent to average $20/bbl in 2023, 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 -$15/bbl this year.	• Oil takes a vacation 21 April 2023 • Gasoline still has fuel in the tank 06 March 2023 • Heat poised to cool down 10 January 2023
US natural gas	▪ US gas supply and demand growth should hit 4.5Bcf/d and 1.6Bcf/d YoY in 2023, pushing stocks to 3.81Tcf by October. ▪ We forecast $2.70/mmbtu US gas on average in 2023 and see a recovery to $4/mmbtu in 2024.	• US nat gas rollercoaster nears the bottom 17 February 2023
LNG	▪ LNG supply growth is manageable from historical view at 13MMT in 23, 4MMT in 24, leaving demand to dictate future price path ▪ Several factors may prevent a 2020 redux: warmer summer, revival of Asian spot demand, fuel switching, poor hydro/nuclear gen ▪ TTF to grind lower in 2Q/3Q unless demand shifts, but beyond summer storage worries, we see a tightening LNG balance this winter and into 2024	• LNG is now a buyer's market 17 April 2023
Thermal coal	▪ Thermal coal prices surged to record highs as Russia, the world's 3rd largest coal exporter, invaded Ukraine. ▪ We expect Newcastle coal to average $184/t in 2023 and $160/t in 2024.	• King coal loses its crown 31 March 2023

Source: BofA Global Research estimates

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Exhibit 2: BofA Commodity Price Forecasts

(period averages)

	units	1Q23F	2Q23F	3Q23F	4Q23F	2023F	1Q24F	2Q24F	3Q24F	4Q24F	2024F
WTI Crude Oil	($/bbl)	76.00	74.00	82.00	92.00	81.00	90.00	88.00	84.00	82.00	86.00
Brent Crude Oil	($/bbl)	82.00	78.00	86.00	96.00	85.00	94.00	92.00	88.00	86.00	90.00
US NY Harbor ULSD (HO) Cracks to Brent Crude Oil	($/bbl)	40.62	24.00	20.00	18.00	25.66	18.00	18.00	18.00	18.00	18.00
US RBOB Cracks to Brent Crude Oil	($/bbl)	23.13	28.00	20.00	10.00	20.28	12.00	17.00	13.00	6.00	12.00
NWE Low Sulphur Gasoil Cracks to Brent Crude Oil	($/bbl)	31.30	16.00	12.00	10.00	17.34	10.00	10.00	10.00	10.00	10.00
NWE Eurobob Cracks to Brent Crude Oil	($/bbl)	15.00	18.00	12.00	2.00	11.75	0.00	5.00	5.00	-1.00	2.25
NWE 1% Residual Cracks to Brent Crude Oil	($/bbl)	-13.40	-10.00	-7.00	-6.00	-9.10	-5.00	-5.00	-5.00	-5.00	-5.00
NWE 0.5% Residual Cracks to Brent Crude Oil	($/bbl)	2.50	0.00	2.00	2.00	1.62	2.00	2.00	2.00	2.00	2.00
NWE 3.5% Residual Cracks to Brent Crude Oil	($/bbl)	-23.20	-13.00	-12.00	-11.00	-14.79	-10.00	-10.00	-10.00	-10.00	-10.00
US Natural Gas	($/MMBtu)	2.65	2.25	2.75	3.25	2.73	3.75	3.50	4.25	4.50	4.00
Thermal coal, Newcastle FOB	($/t)	253	160	159	164	184	256	177	179	184	160
Aluminium	$/t	2,401	2,260	2,250	2,500	2,353	2,750	2,750	3,000	3,000	2,875
Copper	$/t	8,941	8,461	8,250	9,500	8,788	10,000	10,000	9,500	9,500	9,750
Lead	$/t	2,131	2,118	2,050	2,050	2,087	2,000	2,000	2,000	2,000	2,000
Nickel	$/t	25,973	22,277	20,000	20,000	22,063	22,500	22,500	20,000	20,000	21,250
Zinc	$/t	3,122	2,539	2,250	2,500	2,603	2,500	2,500	2,250	2,250	2,375
Gold	$/oz	1892	1977	1925	1900	1923	1900	1950	2000	2000	1963
Silver	$/oz	23	24	23	23	23	23	23	24	24	23
Platinum	$/oz	995	1,027	1,000	1,250	1,068	1,200	1,200	1,000	1,000	1,100
Palladium	$/oz	1,568	1,445	1,300	1,250	1,391	1,200	1,200	1,000	1,000	1,100

Source: BofA Global Research estimates

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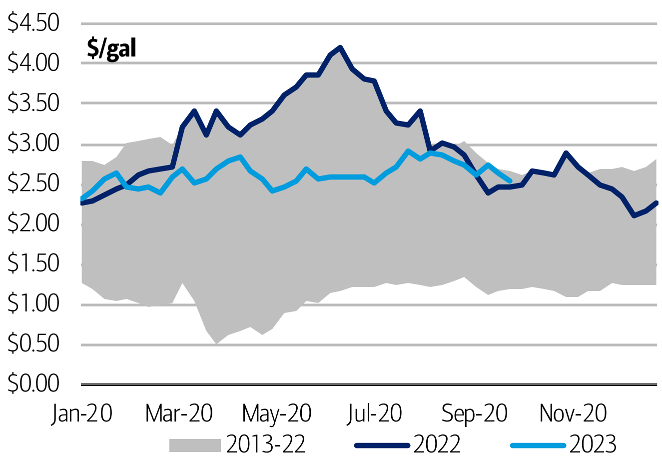
The grind of the oil bulls

Gasoline and heating oil near record seasonal highs…

The recent run up in crude oil and the high sustained margins in gasoline have left wholesale NYMEX RBOB (gasoline) prices at the highest seasonal levels in a decade (Exhibit 3) going into winter, a relatively rare event given Winter gasoline's higher Reid vapor pressure and thus lower cost economics. Meanwhile, turbocharged by a run up in crude oil prices and low inventories, diesel prices have raced to match last year's exceptionally high levels (Exhibit 4) despite the growing downside demand pressures on the industrial and manufacturing side (see Diesel weasels out of a cyclical downturn).

Exhibit 3: NYMEX RBOB prices

The recent run up in crude oil and the high sustained margins in gasoline have left wholesale NYMEX RBOB prices near the highest seasonal levels in a decade…



Source: Bloomberg

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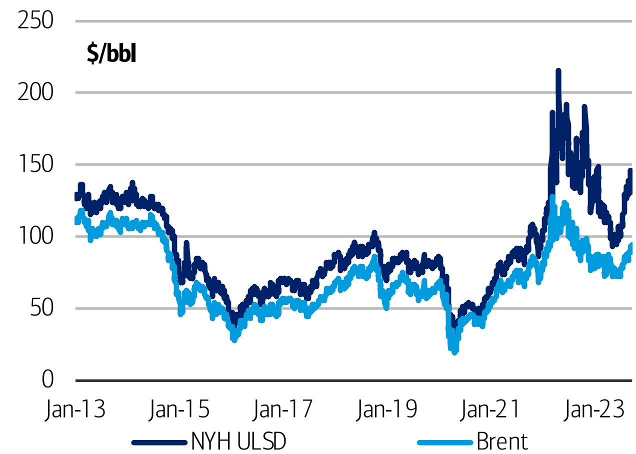
Exhibit 4: ULSD and Brent crude oil prices

…while diesel prices, turbocharged by a run up in crude oil prices and low inventories, have raced to match last year's exceptionally high levels



ULSD: Ultra low sulfur diesel **Source:** Bloomberg

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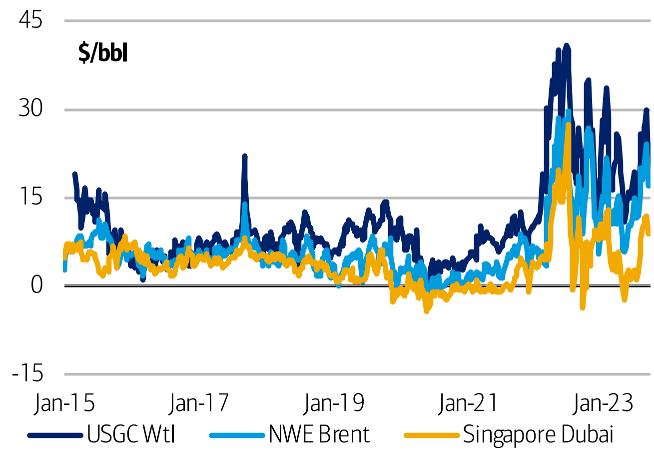
…are helping push Brent crude oil prices higher…

Beyond Russia's decision to ban diesel exports in the past few days, an aggravating factor, the strength in petroleum product margins has been triggered by a combination of refinery bottlenecks, low Chinese refined product export quotas, and OPEC+ medium and heavy crude oil production cuts (Exhibit 5). In particular, the reduction in Saudi and Russian oil production has contributed to drive the prices of certain crude oil grades a lot higher in recent weeks, in some cases past the $100/bbl threshold (Exhibit 6). It is worth noting that these four grades that range from light to heavy (Bach Ho, Labuan, Kikeh, and Vincent) have two main things in common: they are very sweet and trade in Asia.

Exhibit 5: Regional cracking margins
The strength in petroleum product margins has been triggered by a combination of refinery bottlenecks and OPEC+ heavy oil crude cuts and...



Source: Bloomberg

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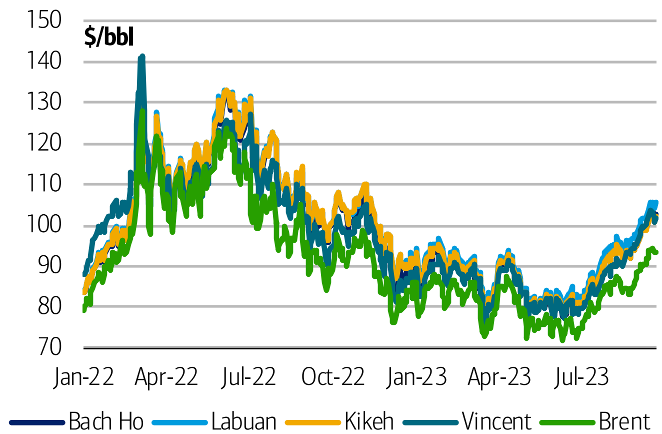
Exhibit 6: Regional crude oil prices
...has contributed to drive the prices of certain crude oil grades a lot higher in recent weeks, in some cases past the $100/bbl threshold



Source: Platts

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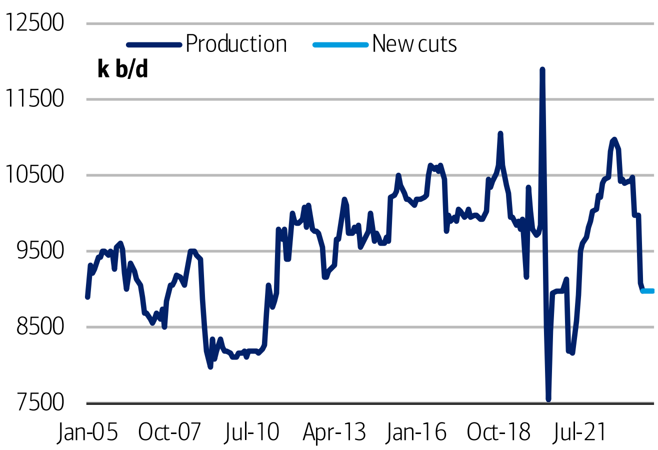
...together with deep cuts from Saudi and Russia

Demand for these ultra-sweet oil grades points to growing desulphurization capacity bottlenecks, although the strength in crude prices is also the result of deep production cuts by Saudi Arabia, where production is at the lowest levels in a decade outside the exceptional Covid period (Exhibit 7). In August, Saudi Arabia produced 9mn b/d down from a high of 11mn b/d in September 2022 and has pledged to keep production at around this lower level into December. And even though Russian oil production and exports were on the rise for much of the past 12 months, there is a clear change in pattern in the past 3 months, with Moscow joining Riyadh in the cuts (Exhibit 8). Plus, last week Russia announced a ban on diesel exports.

Exhibit 7: Saudi Arabia crude oil production
The strength in crude prices is partly the result of deep production cuts by Saudi Arabia, where production is at the lowest levels in a decade, except for the Covid period



Source: IEA, Bloomberg, BofA Global Research estimates

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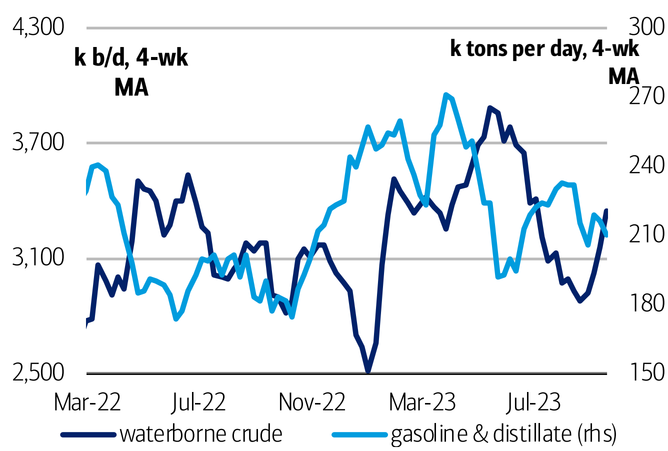
Exhibit 8: Estimated waterborne crude oil and gasoline and diesel exports
While Russian oil production and exports were on the rise for much of the past 12 months, there is a clear change in pattern in the past 3 months, with Moscow joining Riyadh in the cuts



Source: Bloomberg, BofA Global Research estimates

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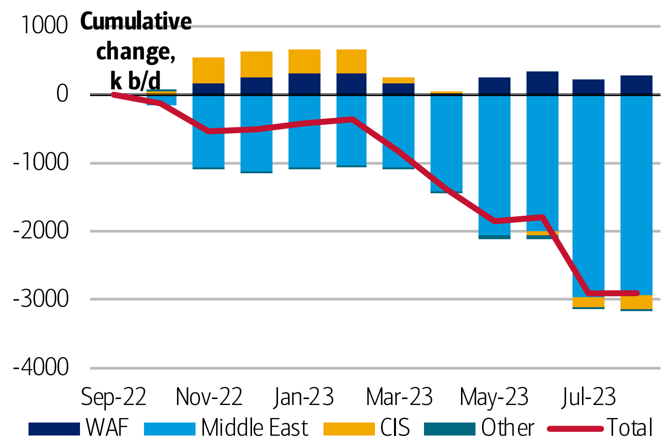
With OPEC+ committed to curb oil into year-end...

While Saudi Arabia and Russia have delivered the bulk of the adjustment on output, OPEC+ has collectively brought crude oil production down in recent months, partly reversing the expansion in output that the group did into the end of 2022 (Exhibit 9). Even then, OPEC+ has historically faced the challenge that members that do not cut benefit from those that do, also known as the "free riding" problem. Looking at correlations across the group, we note that OPEC+ cohesion has collapsed to near zero following the highest compliance rates in decades during the pandemic (Exhibit 10), a risk that could hurt the group next year. Put differently, Saudi Arabia is carrying the entire weight of the recent cuts on its shoulders.

Exhibit 9: Cumulative change in OPEC+ supply

While Russian oil production and exports were on the rise for much of the past 12 months, there is a clear change in pattern in the past 3 months, with Moscow joining Riyadh in the cuts



Source: IEA, BofA Global Research estimates

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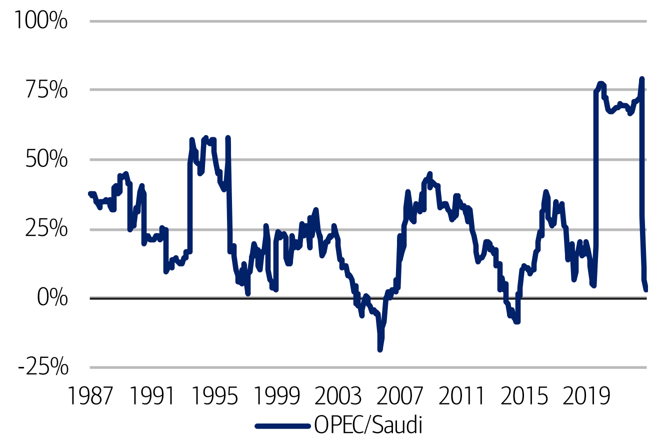
Exhibit 10: OPEC cohesion (correlation between Saudi supply changes and other OPEC supply changes)

Looking at correlations across the group, we note that OPEC+ cohesion is not particularly high when looked at on a quantitative basis



Source: IEA, BofA Global Research estimates

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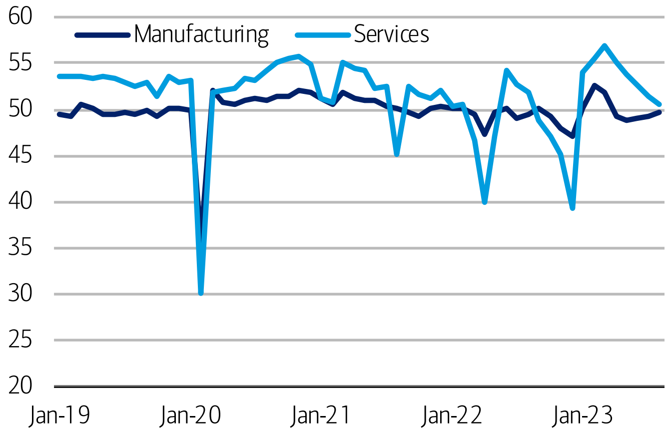
...and China stimulus poised to expand in 4Q23...

With the supply side tightly controlled by OPEC+, the other major factor that determines price direction is demand. We recently put out our views on a note (Asia energy in the green despite Red China blues) where we explained that the Chinese economy has suffered on the back of a weak manufacturing and real estate sector, with GDP growth expectations slowing down to 5.1% this year (Exhibit 11). However, we also note that our economists now believe that momentum is improving at the margin on the back of stimulus and see the economy delivering growth of 4.8% next year (Exhibit 12). While China is no longer delivering double levels of GDP growth, these rates are still enough to support oil consumption.

Exhibit 11: China manufacturing and services PMI

The Chinese economy has suffered on the back of a weak manufacturing and real estate sector, with GDP growth expectations slowing down to 5.1% this year...



Source: Bloomberg

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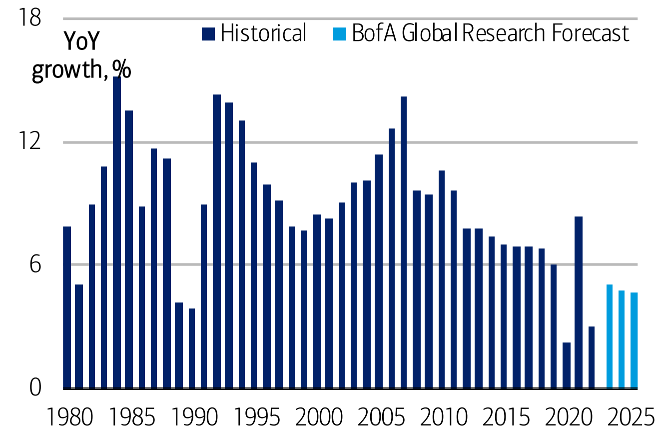
Exhibit 12: China GDP growth

...however, our economists now believe that momentum is improving at the margin on the back of stimulus and see the economy doing 4.8% next year



Source: IMF, BofA Global Research estimates

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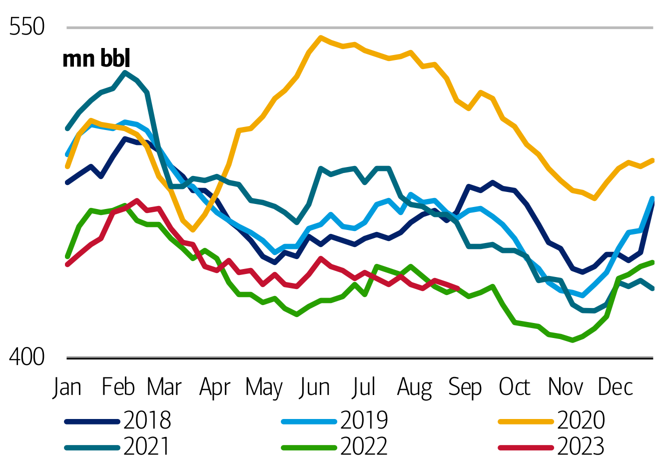
...we expect global oil stocks to decline by 170mn bbl in 2H23

With oil demand poised to expand further over the coming 15 months and crude supply on hold, global petroleum stocks are likely to continue declining in the months ahead. In fact, petroleum product inventories for key fuels such as gasoline and diesel are already very low (Exhibit 13) when looked at on a weekly basis, a factor that has lent a lot of support to petroleum product cracks and broad refining margins in recent months. Crude stocks are also on their way down on the back of Saudi and Russian output cuts. With OPEC+ maintaining low levels of production into year-end, we now believe that OECD total oil inventories should decline by nearly 1.1mn b/d in the third quarter and 770k b/d in the fourth quarter (Exhibit 14).

Exhibit 13: Gasoline, diesel, and jet fuel inventories in the US, ARA, and Singapore

Petroleum product inventories for key fuels such as gasoline and diesel are very low



Source: Bloomberg

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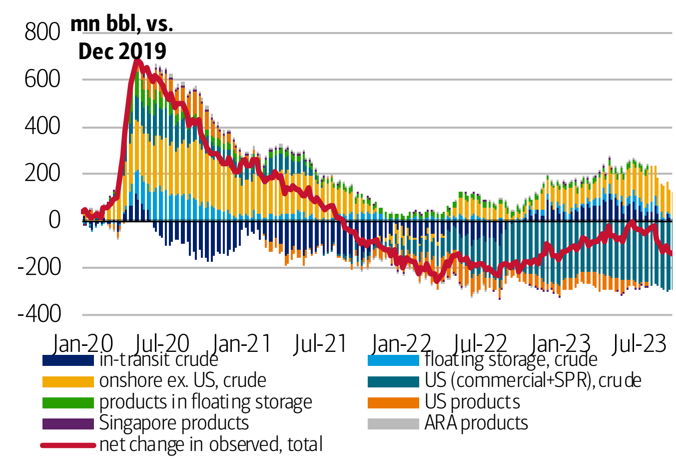
Exhibit 14: Observed change in petroleum inventories

With OPEC+ maintaining low levels of production into year-end, inventories should continue to draw at a fast pace



Source: Bloomberg, Clarksons, Kayrros, EIA, BofA Global Research

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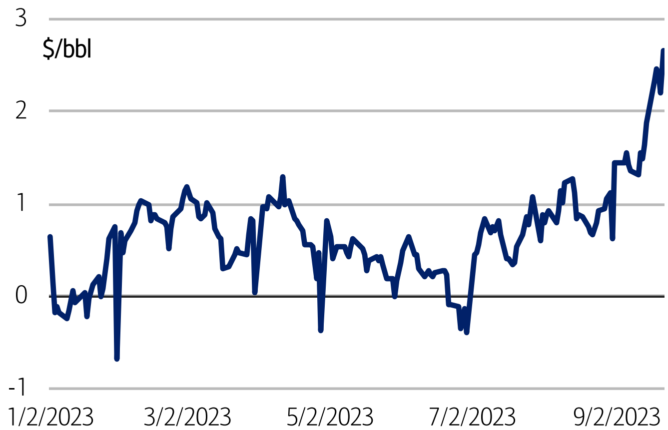
As such, we now see Brent averaging $91/ in 2H23

The ongoing and projected decline in inventories is quickly translating into a more backwardated term structure and tighter timespreads. No doubt, prompt and three-month forward prices have been shifting up and down for quite some time, but the market has remained mostly in backwardation this year and has rallied very substantially during the past month (Exhibit 15). As stock continue to decline into year end, we now expect Brent crude oil prices to average $96/bbl in 4Q23 after clocking in $86/bbl in 3Q23. As such, we now see a 2H23 average of $91/bbl for Brent crude oil and a full year 2023 average of $85/bbl for 2023 (Exhibit 16), up from $80/bbl prior.

Exhibit 15: Brent prompt versus 3 month spread
Prompt and three-month forward prices have been shifting up and down for quite some time, but the market has remained mostly in backwardation this year...



Source: Bloomberg

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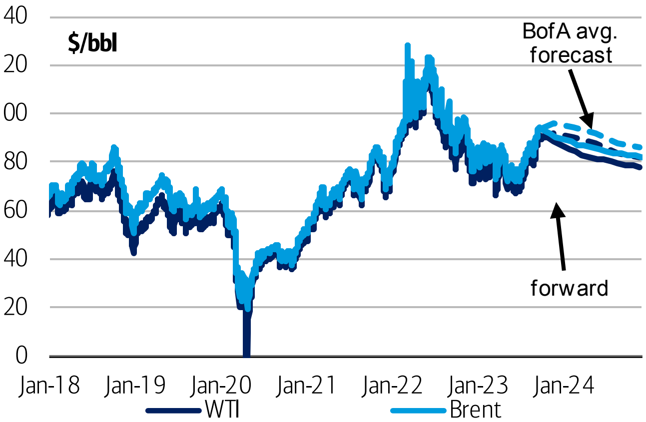
Exhibit 16: Brent and WTI crude oil price history, forecast, and forward curve
...and we expect Brent to average $96/bbl in 4Q23 after averaging $86 in 3Q23, delivering a 2H23 average of $91 and a full year 2023 average of $85



Source: Bloomberg, BofA Global Research estimates

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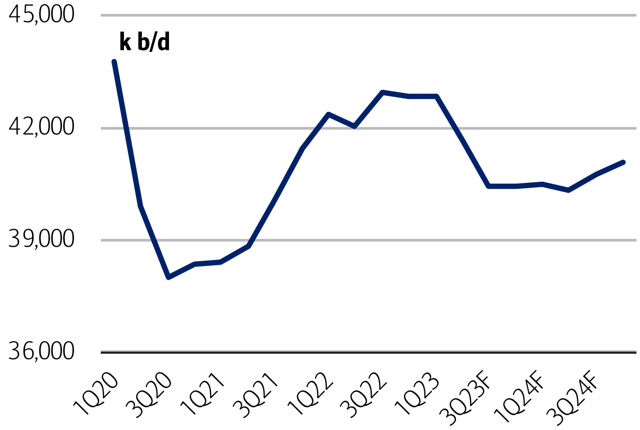
Still, we maintain our $90/bbl forecast for 2024...

How will these inventory declines impact oil prices next year? In our view, the main effect of the upcoming stock declines is that the price trajectory will likely shift, creating more upside pressure in the first half compared to the second half of 2024. In our projection that Brent prices will average about $93/bbl in 1H24, it is important to note that we assume OPEC+ will maintain production discipline (Exhibit 17) and deliver just 40.4mn b/d of production (OPEC crude plus non-OPEC liquids) over that period compared to 42.2mn b/d in 1H23. As such, our forward balances point to a deficit of more than 900k b/d in 2H23 and a relatively balanced market in 2024, but starting with a much lower level of inventories (Exhibit 18) and more spare capacity, two factors that could help support a backwardated oil market for much of next year.

Exhibit 17: OPEC+ supply*

Looking into next year, we assume that OPEC+ will maintain production discipline for the first six months of the year, lending support to Brent prices above $90/bbl



Note: includes other liquids production for non-OPEC+ members. **Source:** IEA, BofA Global Research estimates

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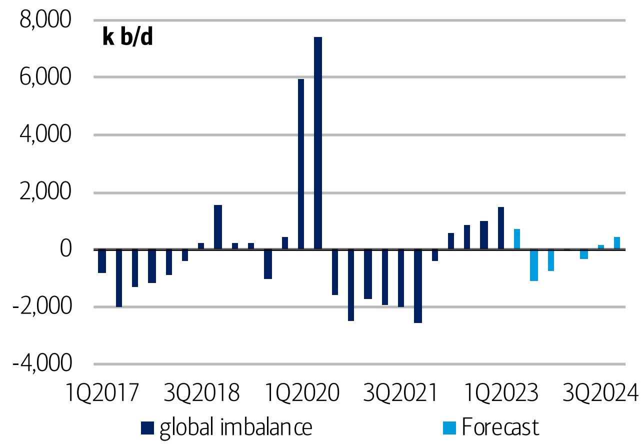
Exhibit 18: Global oil surplus

Our forward balances point to a deficit of 920k b/d in 2H23 and a relatively balanced market in 2024, but starting with a much lower level of inventories



Source: IEA, BofA Global Research estimates

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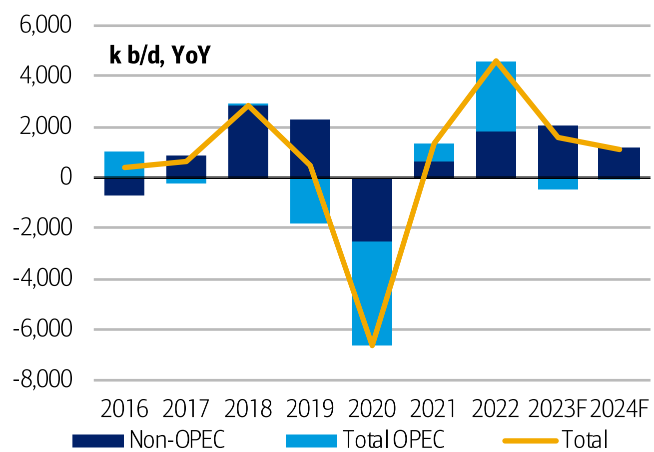
…as non-OPEC oil supply expands by 1.2mn b/d…

In part, we project relatively low volumes of OPEC+ crude because non-OPEC oil supply should continue to expand over the coming quarters, delivering an average growth rate of 1.2mn b/d in 2024, in our estimates (Exhibit 19). True, the 2024 non-OPEC supply growth figure is about two thirds the growth posted in 2022 and 2023, where this segment of the market grew by 1.9mn b/d on average, but it is also important to remember that demand is poised to slow down materially into next year. With Non-OPEC supply continuing to grow over the next five quarters, we see a shrinking market share for OPEC+ after the modest recovery of the past three years, a development that could create risks for the oil market in 2025 or 2026 (Exhibit 20).

Exhibit 19: Total global oil supply growth

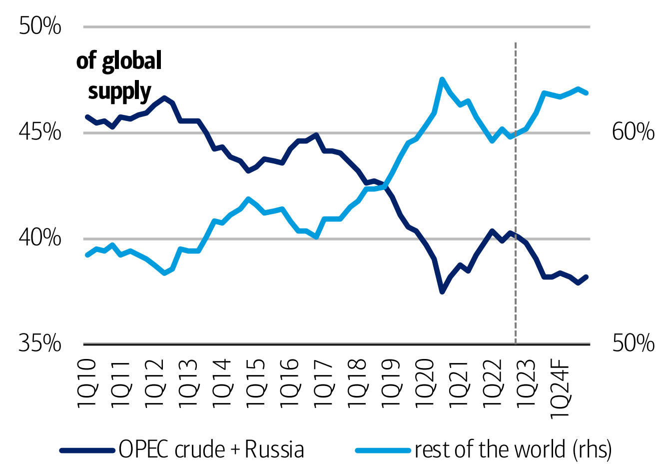
Non-OPEC oil supply will continue to expand over the coming quarters, delivering an average growth rate of 2mn b/d in 2023 and 1.2mn b/d in 2024, in our projection



Source: IEA, BofA Global Research estimates BofA GLOBAL RESEARCH

Exhibit 20: Oil market share split

With Non-OPEC supply continuing to grow, we see a shrinking market share for OPEC+, a development that could create risks for the oil market in 2025 or 2026



Source: IEA, BofA Global Research estimates

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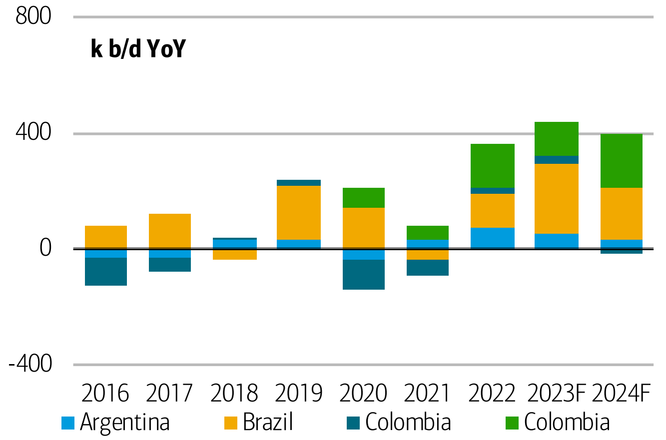
…driven by Guyana, Canada, US shale and Brazil

Where is all this supply growth coming from? It really boils down to one single continent (or two if you split the North and the South): America. We expect the American continent to deliver 87% of non-OPEC+ supply growth, as production in other regions stagnates or continues to decline. Specifically, we expect growth in South America, particularly from Brazil and Guyana, to contribute to approximately 31% of non-OPEC supply output increases over the course of the next five quarters (Exhibit 21). In North America, we see US crude oil production growth slowing down to 350k b/d next year from 860k b/d this year, with Canada adding 150k in 2024 (Exhibit 22) after wildfires disrupted production growth in 2023.

Exhibit 21: Major South American non-OPEC total oil supply growth
We expect growth in South America (Brazil, Guyana) to contribute to approximately 30% of non-OPEC supply output increases over the course of the next five quarters



Source: IEA, BofA Global Research estimates

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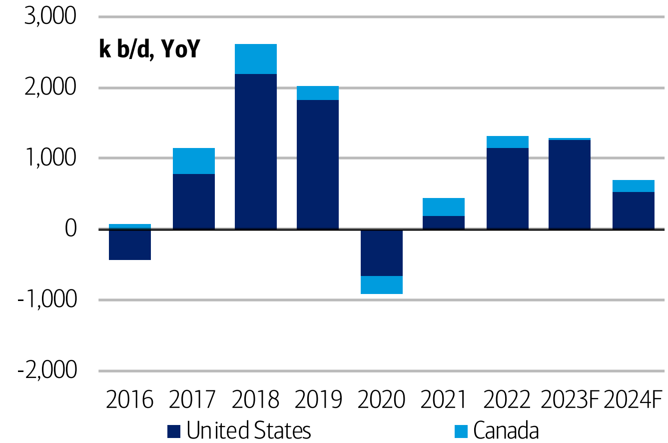
Exhibit 22: US and Canada total oil supply growth
In North America, we see US crude oil production growth slowing down to 350k b/d next year from 860k b/d this year, with Canada adding 150k in 2024



Source: IEA, BofA Global Research estimates

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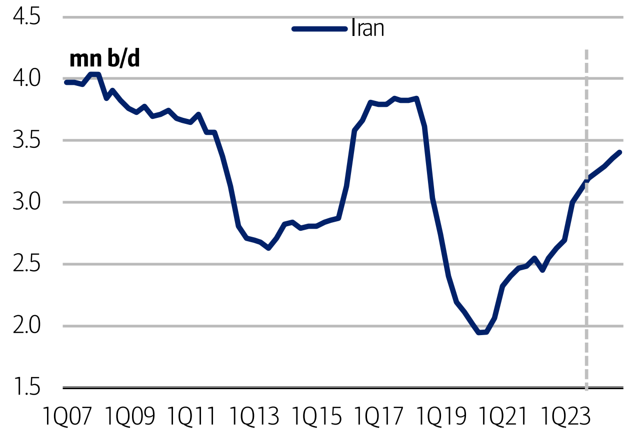
If Venezuela and Iran sanctions were to ease further

A key factor that could create some tensions within OPEC+ is a possible more meaningful return of the two players that account for the deepest production declines within the group during the past few years: Iran and Venezuela. For starters, Iranian production has increased substantially during the past few months as the West has relaxed sanctions enforcement to 3.14mn b/d at present and should grow further to 3.4mn b/d next year after the recent deal with the US (Exhibit 23). We also see some growth in Venezuela, although we are not as positive on developments there, with production growth rates accelerating from 90k b/d year on year in 2023, to a slightly faster pace of 125k b/d next year (Exhibit 24).

Exhibit 23: Iran crude oil production

Iranian production has increased substantially during the past few months to 3.14mn b/d at present and should grow further to 3.4mn b/d by the end of next year after the recent deal with the US



Source: IEA, BofA Global Research estimates

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Exhibit 24: Venezuela crude oil production

In contrast, we are less optimistic on Venezuela, with production growth of 90k b/d year on year in 2023 and only expanding another 125k b/d next year

Source: IEA, BofA Global Research estimates

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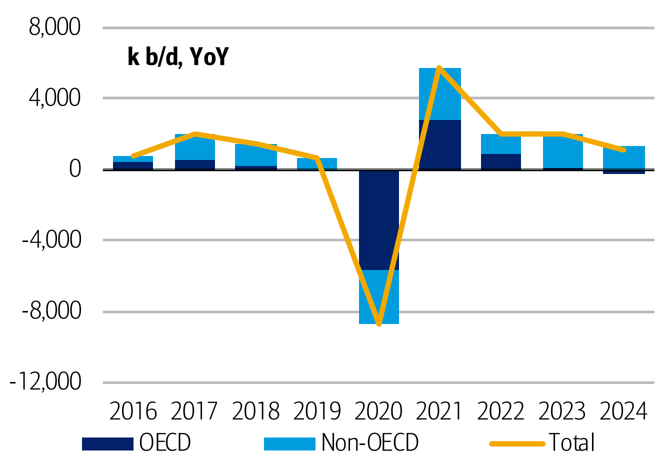
Global oil demand growth may slow to 1.1mn b/d…

If OPEC+ does not deepen production declines from the current levels, our supply outlook does not point to a substantial lack of crude in 2024 given how we see consumption evolving. Globally, we believe demand growth trends will slow down materially from 2mn b/d this year to just 1.1mn b/d next year as the post-Covid recovery fades (Exhibit 25). True, global oil demand will be at a record 102.7mn b/d in 2024, but the demand expansion will likely roughly match the non-OPEC+ supply growth rate discussed above. Looking at different fuels, we continue to believe that transportation will lead oil demand going forward, and expect jet fuel, gasoline, and diesel to account for the bulk of the growth. Industrial fuels will likely remain weak, although the low base will help improve YoY comparables in 2024 (Exhibit 26).

Exhibit 25: Global oil demand growth

Globally, we see demand growth trends slowing down materially from 2mn b/d this year to just 1.1mn b/d next year as the post-Covid recovery fades



Source: IEA, BofA Global Research estimates

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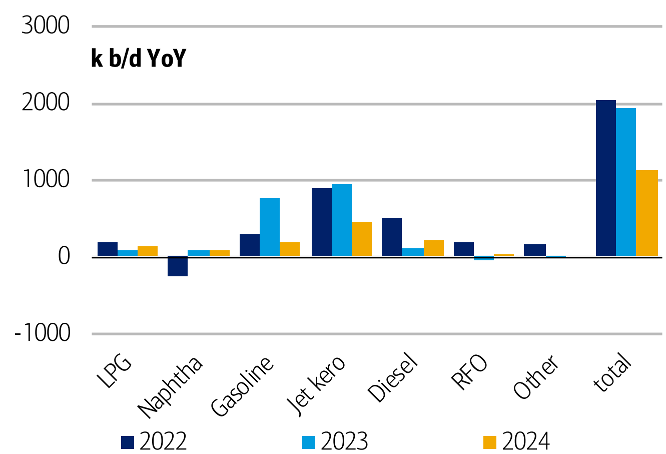
Exhibit 26: Global oil demand growth by product

Looking at different fuels, we continue to believe that transportation will lead oil demand going forward. Industrial fuels likely remaining weak although the low base will help improve YoY comparables in 2024



Source: IEA, BofA Global Research estimates

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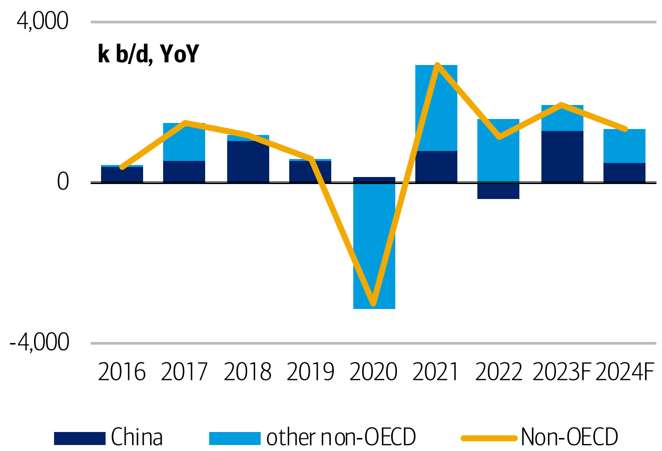
…with Asia leading growth as OECD burn shrinks

With OPEC+ production on the way down, China's oil demand has continued to lead non-OECD consumption and we expect it to grow by 1.9mn b/d this year and 1.36mn b/d next year (Exhibit 27), leading the global expansion. While EM demand growth rates likely will dominate the oil market in 2023 and 2024, the composition should change, and we see a more diversified base next year even if rates slow down materially after the China post-Covid reopening. In stern contrast, OECD oil consumption is quickly stagnating and will likely decelerate further from here as a combination of fuel efficiency and electric vehicles reduces demand (Exhibit 28), with rates poised to show a contraction of 240k b/d or 0.5% YoY in 2024.

Exhibit 27: Non-OECD demand growth

With OPEC+ production on the way down, China's oil demand has continued to lead non-OECD consumption and we expect it to grow by 1.9mn b/d this year and 1.36mn b/d next year



Source: IEA, BofA Global Research estimates

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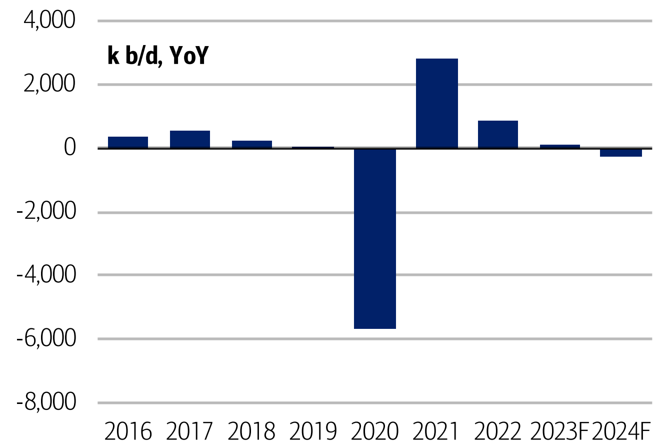
Exhibit 28: OECD demand growth

In stern contrast, OECD oil consumption is quickly stagnating and will likely decelerate further from here as a combination of fuel efficiency and electric vehicles reduces demand



Source: IEA, BofA Global Research estimates

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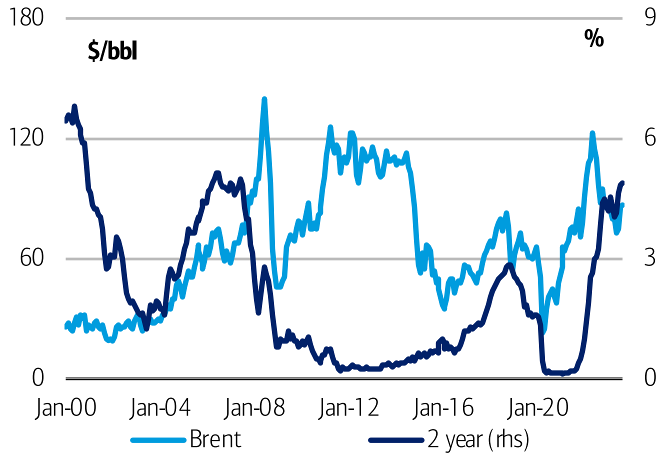
High interest rates will likely choke global GDP…

Of course, much of our demand projections rest on the ability of the global economy to deliver a soft landing after the fastest increase in interest rates in decades. Rising or falling US interest rates and oil prices have not had a strong direct and synchronous relationship historically when looking back at the last 20 years (Exhibit 29), but many recessions have been triggered in the past by excessive monetary policy tightening. In any case, if rates continue to push higher as they have in recent weeks, risks to global GDP growth will increase, limiting the ability of OPEC+ to keep pushing oil prices higher into triple digits. After all, oil price changes and GDP changes have moved in tandem most of the time for decades, as demand has generally been the main driver of oil prices (Exhibit 30).

Exhibit 29: US 2yr treasury yields and Brent oil prices
Rising or falling US interest rates and oil prices have not had a strong direct and synchronous relationship historically when looking back at the last 20 years...



Source: Bloomberg

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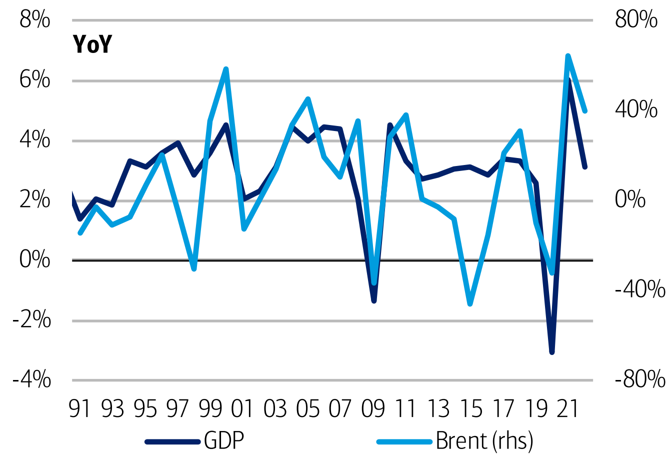
Exhibit 30: Global GDP and Brent crude oil prices (% YoY)
...but oil price changes and GDP changes have moved in tandem most of the time for decades, as demand has generally been the main driver of oil prices



Source: Bloomberg

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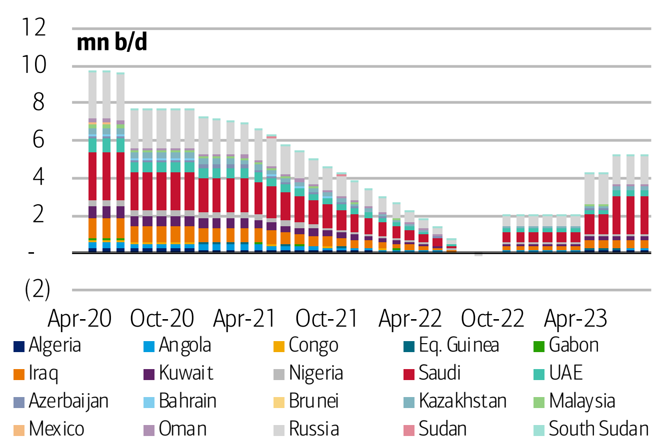
...while OPEC+ spare capacity could cap oil prices

A critical factor that should prevent oil prices from spiraling higher in 2024 is the amount of excess production capacity existing in the market today. As we discussed earlier, OPEC+ has cut production significantly during the last few months, led by Saudi Arabia mostly but also followed by some other members such as Algeria (Exhibit 31). Any voluntary and thus reversible production decline, by definition, increases the amount of existing spare production capacity in the market. So, a direct result of the OPEC+ is that crude oil spare production capacity across OPEC has increased quite rapidly to around 3.4mn b/d (ex-Iran), levels that the market had not seen since 2021 (Exhibit 32).

Exhibit 31: OPEC+ production cuts
OPEC+ has cut production significantly during the last few months, led by Saudi Arabia mostly but also followed by some other members such as Algeria



Source: OPEC, BofA Global Research

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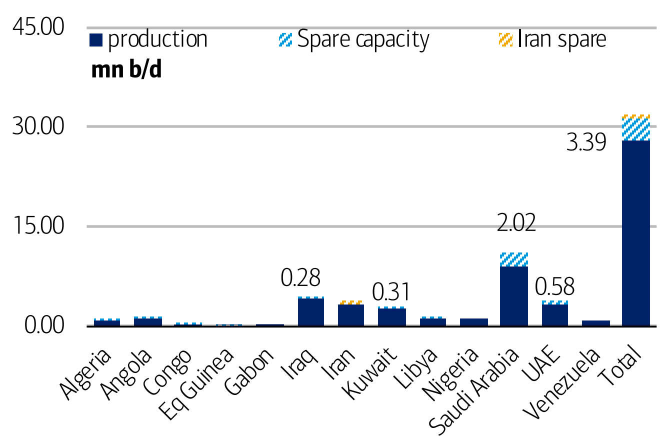
Exhibit 32: OPEC spare capacity (Aug'23)
As a result, crude oil spare production capacity across OPEC has increased quite rapidly to around 3.4mn b/d (ex-Iran), levels that the market had not seen since 2021



Source: IEA, BofA Global Research estimates

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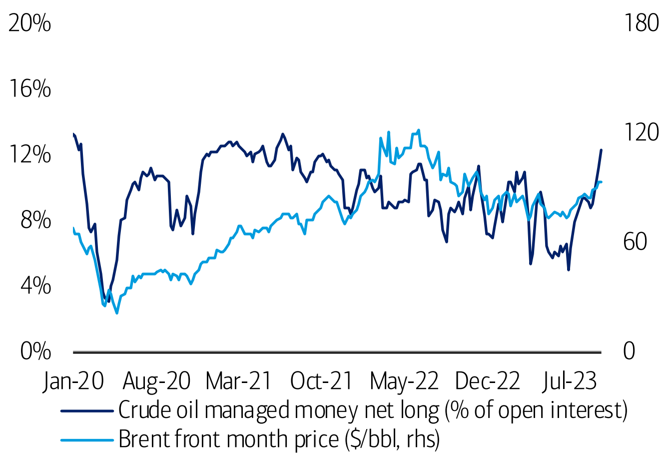
Stretched positioning could cap a further oil rally

On top of all these fundamental factors affecting the price of oil, we would also point to positioning indicators to highlight that any further sustained run up in prices above and beyond $100/bbl needs to be backed by continued inventory declines into 1Q24, something we do not see at the moment. Looking at CFTC data, we note that crude oil managed net long positions as a % of open interest are at the highest levels since 2021

(Exhibit 33), a level that has historically been met with some price reversion within a six month window. Moreover, the Z-score of position shown below along with the projection of how the position could evolve over the next 5 trading sessions suggests that trend followers are pretty long oil already relative to June (Exhibit 34). If stocks do not draw steeply in the weeks ahead, some of this length could unwind.

Exhibit 33: WTI and Brent crude oil managed money aggregate positioning (as % of open interest) and Brent crude price

Looking at CFTC data, we note that crude oil managed net long positions as a % of open interest are at the highest levels since 2021



Source: CFTC, ICE, BofA Global Research

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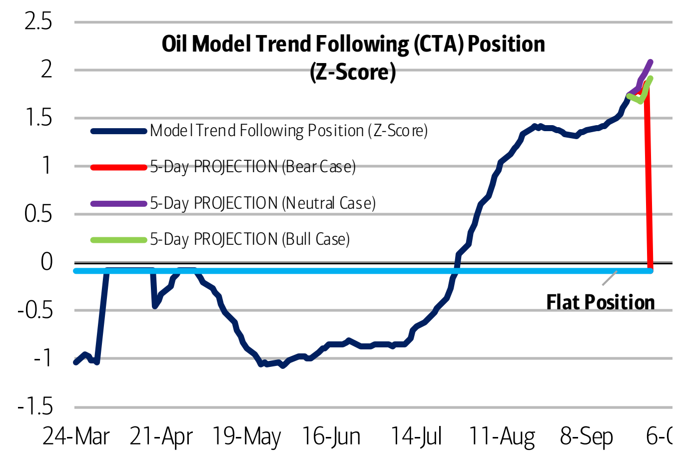
Exhibit 34: BofA Model Trend Following (CTA) Oil Position

The Z-score of CTA oil positioning shown below along with the projection of how the position could evolve over the next 5 trading sessions suggests that trend followers are pretty long oil already relative to June



Source: BofA Global Research. Data as of 22-Sep-2023.

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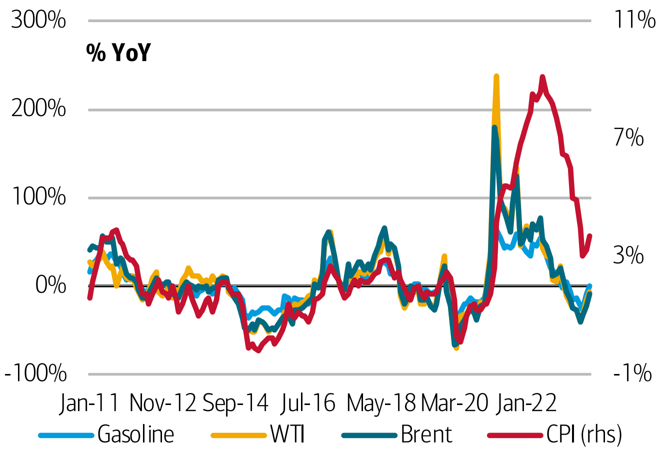
However, geopolitics remain a real challenge…

True, spare production capacity in itself does not mean much if OPEC+ continues to withhold it, so the broader geopolitical, macro, and inflation outlook also matters. After all, oil and inflation remain extremely interconnected despite the gap observed in recent months, and inflation is one of the biggest political issues across western democracies (Exhibit 35). With the US presidential election approaching as we head into 2H24, the political interest of Saudi Arabia and Russia matter a lot. For starters, another spike in energy prices risks reigniting inflation fears, interest rate hikes, and additional financial turmoil into 2H24 (Exhibit 36). Thus, Russia and Saudi Arabia's strong alignment between $85 and $95/bbl could start to change with the political calculus above $100/bbl.

Exhibit 35: US CPI and oil and gasoline prices
Oil and inflation remain extremely interconnected, and inflation is one of the biggest political issues across western democracies...



Source: Bloomberg

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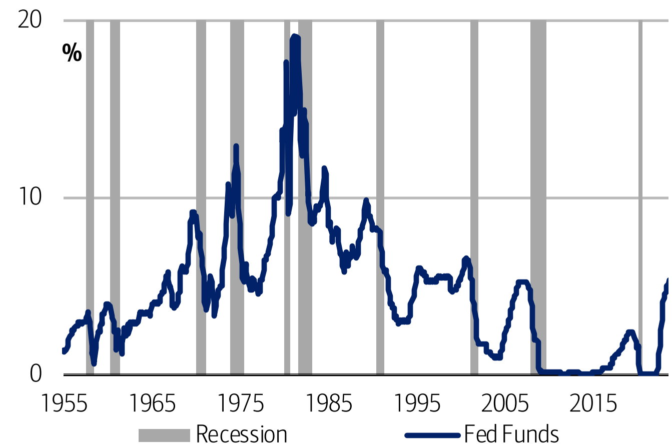
Exhibit 36: Fed funds rate and recessions
...suggesting that another spike in energy prices risks reigniting inflation fears, interest rate hikes, and additional financial turmoil into 2H24



Source: Bloomberg

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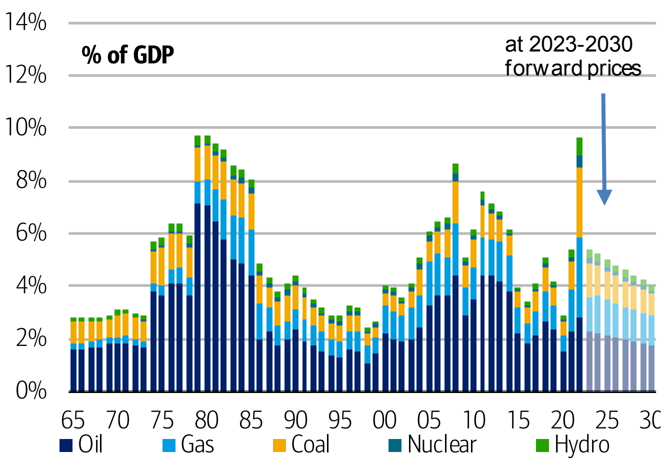
...even if energy affordability improved from '22

In any case, OPEC+ will also look at measures of energy affordability to decide when to increase production next. In that regard, total energy affordability has improved significantly from 2022 and now energy prices as a share of global income are back down to 5.4% from a level of around 9.6% last year as a result of the collapse in global gas and power prices (Exhibit 37) during the past 12 months. Looking at gasoline prices as a share of average wages in the US, we also note that prices are not particularly expensive as a result of the strong wage inflation of the last 24 months (Exhibit 38) and the decline in prices observed since last year.

Exhibit 37: Primary energy to nominal GDP ratio - World
Affordability has improved significantly from 2022 and now energy prices as a share of global income are back down to 5.4% because of the collapse in global gas prices



Source: Bloomberg, IMF, BP, IEA, Energy Institute, BofA Global Research estimates

BofA GLOBAL RESEARCH

Exhibit 38: Gasoline price as a share of hourly wages
Looking at gasoline prices as a share of average wages in the US, we also note that prices are not particularly expensive as a result of the strong wage inflation of the last 24 months

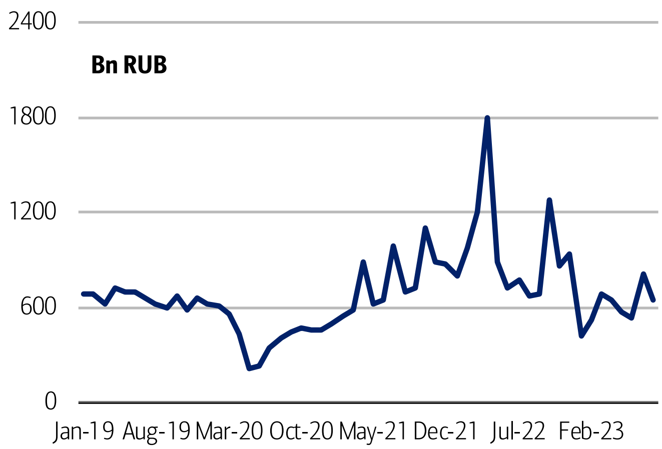
Source: Bloomberg, BofA Global Research

BofA GLOBAL RESEARCH

Russia may try to maximize oil price over volume...

While Saudi Arabia will likely keep demand destruction risks front-and-center in their production strategy, together with the risk of upsetting the US government by forcing too high prices on American consumers, Russia proved last year with natural gas that demand destruction risks are less of a concern when trying to meet geopolitical objectives. Even then, Russian government revenues have come down hard this year as a result of the price cap imposed by Europe and the US, a factor that encouraged volume maximization and also contributed to the decline in the rouble (Exhibit 39). Should Russia shift permanently to a strategy of oil price maximization, upside risks to crude prices crude could grow. For now, rising Urals prices should feed into a higher tax take for the Russian government (Exhibit 40).

Exhibit 39: Russia oil and gas revenues
Russian government revenues have come down hard this year as a result of the price cap imposed by Europe and the US, also contributing to the decline in the rouble



Source: Bloomberg

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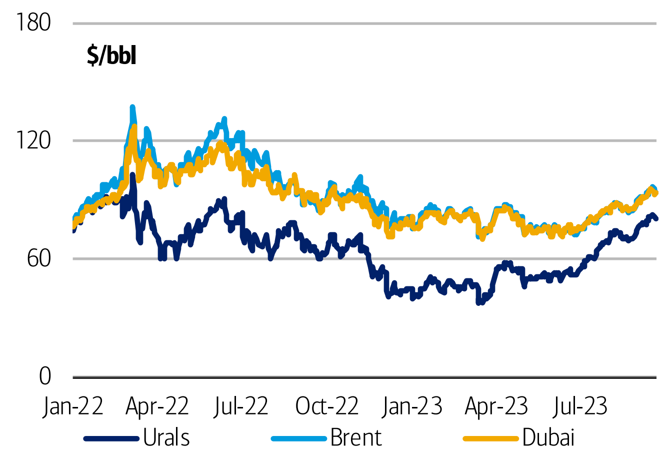
Exhibit 40: Urals, Brent, and Dubai crude oil prices
Rising Urals prices are quickly feeding into a higher tax take for the Russian government, a development that could encourage this behavior going forward



Source: Bloomberg

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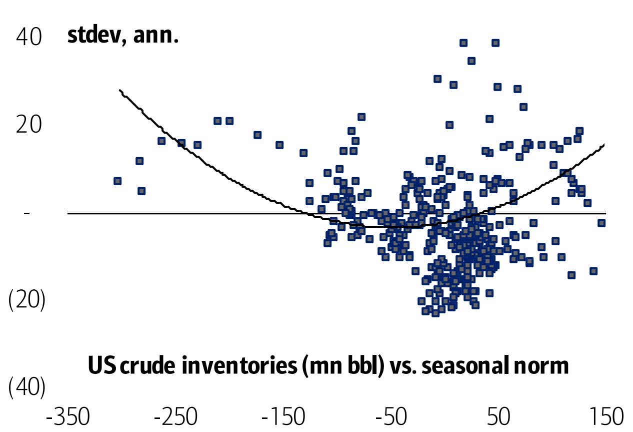
...creating major upside risks to oil prices in 2024

If Russia deems that its strategy of maximizing price over volume is working and extends oil production cuts into 2024, our current Former Soviet Union (FSU) supply projection of 13.7mn b/d (10.7mn b/d for Russia) could prove optimistic. In turn, any deep reduction in Russian supplies next year could lead to spike risks. Is the diesel export ban the start of a trend or just a temporary relief to Russian farmers facing expensive fuels as the harvest season kicks in? Oil volatility, like in every commodity, is mostly a function of inventories. As we expect oil stocks to fall substantially below the 5-year average, we see a risk that oil volatility could spike up together with prices (Exhibit 41) over the next six months. Thus, this recent period of low macro (equity/VIX) and commodity volatility could end abruptly if geopolitical tensions (Exhibit 42) flare up.

Exhibit 41: Oil inventories and price volatility
Oil volatility, like in every commodity, is mostly a function of inventories. As we expect stocks to fall below the 5-year average, we believe volatility will remain high...



Source: Bloomberg, BofA Global Research

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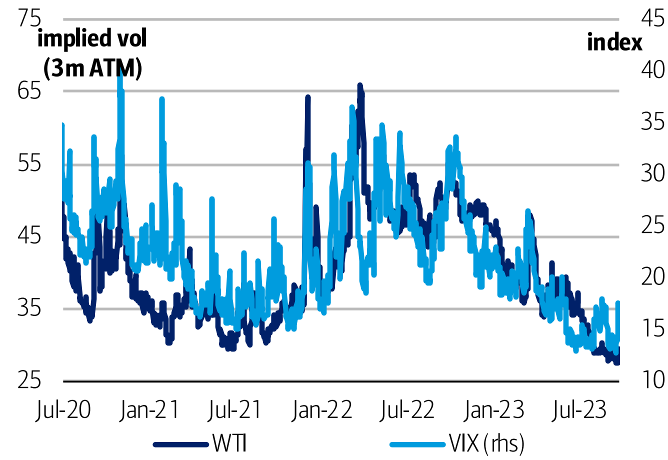
Exhibit 42: Crude oil implied volatility and the VIX
...suggesting that this recent period of low macro (equity/VIX) and commodity volatility could end abruptly if oil prices spike as a result of geopolitical tensions



Source: Bloomberg, BofA Global Research

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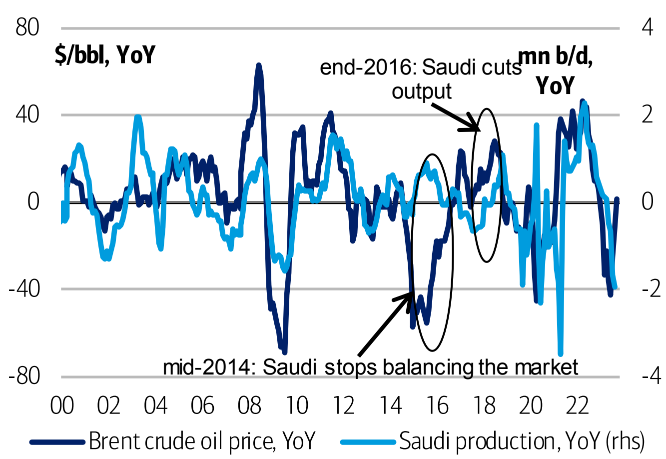
Brent may benefit from three "puts" at $75/bbl:

While we see spike risks to oil prices mostly arising from an increasingly polarized geopolitical backdrop, we also believe that several key forces are coming together to support Brent above $70/bbl over the next 18 months. True, the idea of an "oil put" is nothing new. In fact, Saudi oil production has historically moved up and down with Brent crude oil prices to deliver the "OPEC put" (Exhibit 43). What is different today is that all four major players in the global oil market (the US, Russia, Saudi Arabia and China) are all involved in this put in different ways. In the options markets, however, this skew on Brent crude is only reflected in near-dated options contracts and disappears again in longer dated maturities one year out (Exhibit 44).

Exhibit 43: Brent crude oil price and Saudi production changes
Saudi oil production has historically moved up and down with Brent crude oil prices, a situation often described as the "OPEC put"



Source: Bloomberg, BofA Global Research

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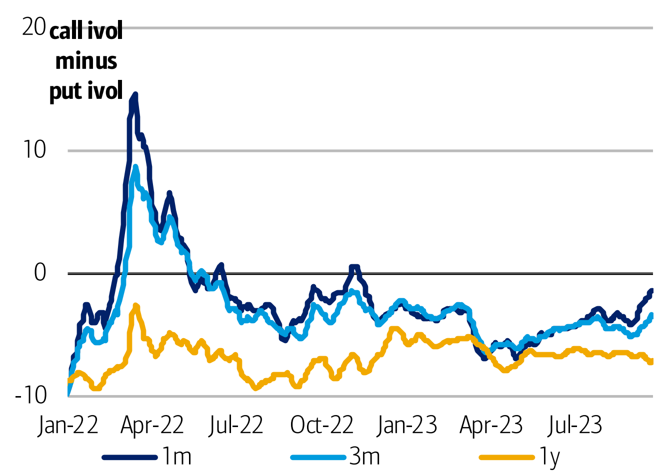
Exhibit 44: Brent skew (25D call ivol minus 25D put ivol)
In the options markets, this skew on Brent crude is only reflected in near dated options



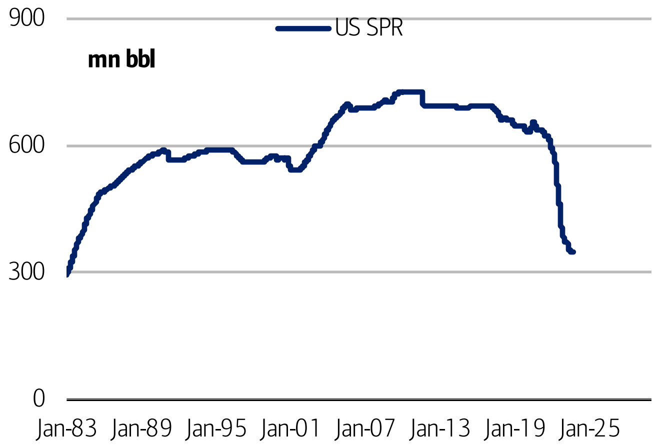
Source: Bloomberg

BofA GLOBAL RESEARCH

OPEC+ cuts, China coal, and the refill of the SPR

With the US Strategic Petroleum Reserve now depleted to 351mn barrels, down from nearly 600mn barrels when the Ukraine war started, the American government will likely buy oil aggressively should prices fall into the $70-75/bbl range (Exhibit 45) to rebuild strategic storage as well as to temporarily support the American oil industry. Truth be told, with the US becoming a net energy exporter in recent years, there is no technical need or international obligation for the US to rebuild this reserve back to 500 or 600mn barrels but preserving energy independence is probably an overarching policy goal as America embarks on decarbonization into 2050. In the case of China, the rapid increase in domestic coal production has pushed up economics for local miners up in the marginal cost curve (see China coal floors global gas), helping create a floor for global energy in the $60 to $70/boe range (Exhibit 46).

Exhibit 45: US Strategic Petroleum Reserve Inventories
With the US Strategic Petroleum Reserve now depleted to 351mn barrels, the American government will likely buy oil aggressively should prices fall into the $70-75/bbl range



Source: BloombergNEF

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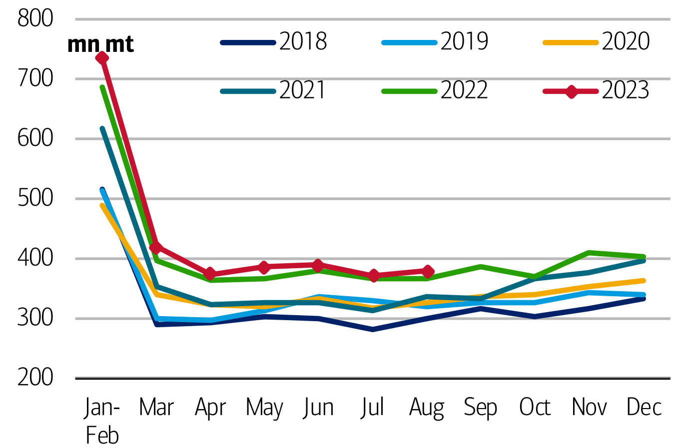
Exhibit 46: China crude coal production
Similarly, the rapid increase in Chinese coal production has pushed up economics for coal producers up in the marginal cost curve, helping create a floor for global energy



Source: CEIC

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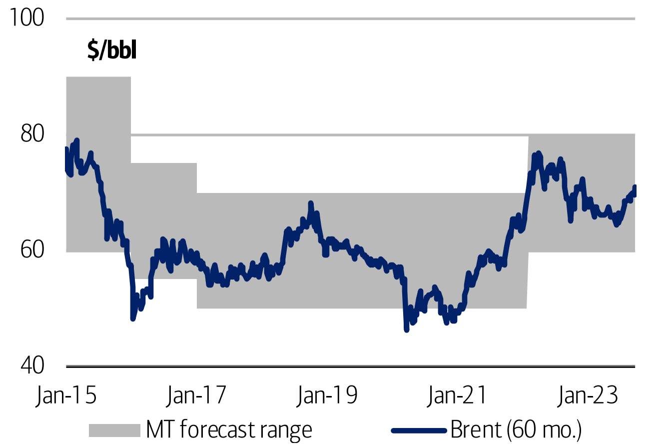
Longer term, oil should stay in $60-80/bbl range...

With the world's two largest energy consumers and two largest energy exporters supporting a put for Brent crude oil prices at around $70/bbl in the short run, it is perhaps not a surprise to see a modest uplift in the long-term price of crude. Looking into the end of this decade, we continue to maintain our long-term $60 to $80/bbl price range and note that 5y forward oil prices remain well anchored (Exhibit 47) within our band. We also note that global oil cost curves have not shifted meaningfully higher despite the fact that US shale supply is no longer swinging as flexibly as it used to in the past (Exhibit 48), although we acknowledge that price risks are more skewed to the upside as the swing supplier role moves away from market-driven US pricing.

Exhibit 47: Long dated Brent prices
Looking into the end of the decade, we continue to maintain our long-term $60 to $80/bbl price range and note that 5y forward oil prices remain well anchored



Source: Bloomberg, BofA Global Research estimates

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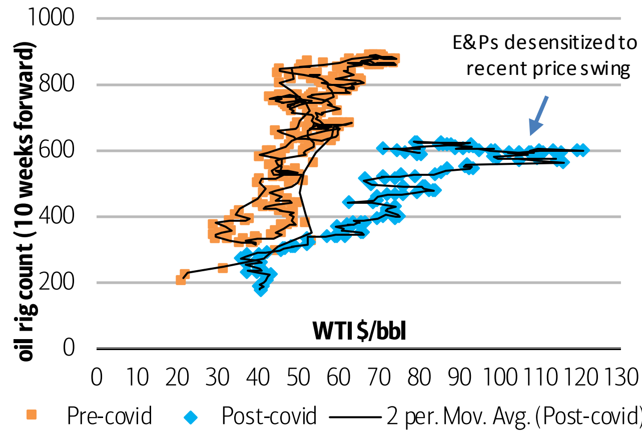
Exhibit 48: US oil rigs and front month WTI prices
Global oil cost curves have not shifted meaningfully higher despite the fact that US shale supply is no longer swinging as flexibly as it used to in the past



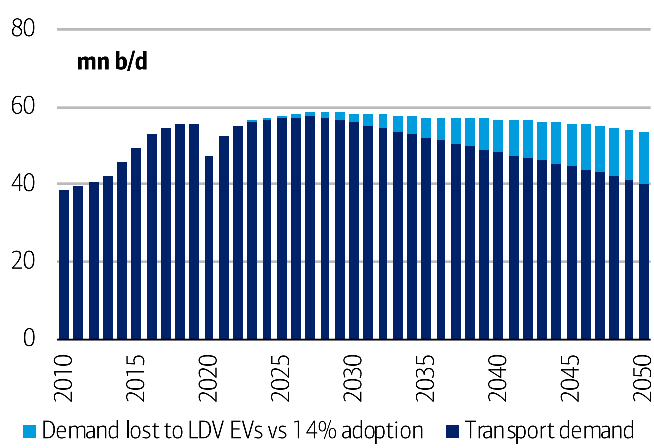
Source: Bloomberg, BofA Global Research

BofA GLOBAL RESEARCH

…as long as EV forecasts stay on an upward path

Ultimately, the fate of long-term oil prices depends heavily on the medium and longer term outlook for oil demand. In our forward balances, we continue to expect global oil demand to peak into the end of the decade as a combination of efficiency and substitution start to displace petroleum fuels in many areas of the world (Exhibit 49). This is not a theoretical exercise as often portrayed but rather a reality in the transportation sector, where EV sales are expanding at an alarming speed on a combination of cost reductions and government regulations (Exhibit 50). Crucially, the main car brands as well as original equipment manufacturers (OEMs) have focused all their research and development dollars on EVs and away from the internal combustion, suggesting electric cars will only get better from here.

Exhibit 49: Global oil demand lost to EVs
We continue to expect global oil demand to peak into the end of the decade as a combination of efficiency and substitution start to displace petroleum fuels in many areas…



Source: IEA, BofA Global Research estimates

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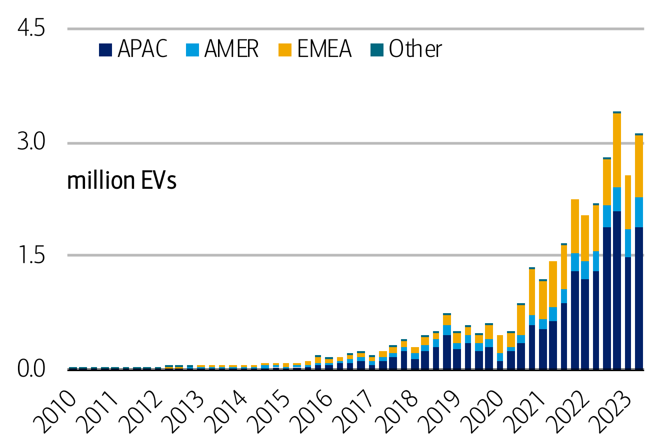
Exhibit 50: Quarterly global EV sales
…particularly in the transportation sector, where EV sales are expanding at an alarming speed on a combination of cost reductions and government regulations



Source: BloombergNEF

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Exhibit 51: BofA global oil supply forecast (in thousand b/d)
Quarterly forecast

	2022	1Q2023F	2Q2023F	3Q2023F	4Q2023F	2023F	1Q2024F	2Q2024F	3Q2024F	4Q2024F	2024F
OECD Americas	25,700	26,680	26,810	27,440	27,470	27,100	27,340	27,440	28,040	28,190	27,750
United States	17,920	18,720	19,210	19,450	19,380	19,190	19,280	19,580	20,060	19,980	19,730
-Crude	*11,910*	*12,630*	*12,710*	*12,810*	*12,940*	*12,770*	*12,990*	*12,950*	*13,190*	*13,330*	*13,120*
-NGL	*5,930*	*6,010*	*6,420*	*6,550*	*6,360*	*6,340*	*6,210*	*6,530*	*6,780*	*6,580*	*6,520*
Canada	5,760	5,840	5,440	5,880	5,980	5,780	5,950	5,800	5,880	6,100	5,930
Mexico	2,010	2,100	2,140	2,100	2,100	2,110	2,100	2,050	2,100	2,100	2,090
OECD Asia Oceania	480	460	460	440	460	460	470	470	450	450	460
Australia	410	390	380	380	400	390	400	400	390	390	390
OECD Europe	3160	3290	3240	3100	3310	3,240	3350	3220	3280	3360	3,300
Norway	1,900	2,020	2,020	1,950	2,080	2,020	2,130	2,030	2,080	2,130	2,090
United Kingdom	830	830	770	730	810	790	810	780	790	820	800
Non-OECD Europe	110	100	100	100	100	100	100	100	100	90	100
Former Soviet Union	13,900	14,150	13,790	13,560	13,610	13,780	13,650	13,550	13,700	13,740	13,660
Russia	11,090	11,200	10,910	10,700	10,700	10,880	10,700	10,700	10,700	10,700	10,700
Azerbaijan	670	640	620	640	640	630	640	630	630	630	630
Kazakhstan	1,820	1,990	1,950	1,900	1,950	1,950	2,000	1,900	2,050	2,100	2,010
Non-OPEC Africa	1,290	1,230	1,270	1,310	1,290	1,280	1,280	1,270	1,270	1,270	1,270
Egypt	600	590	600	600	590	600	590	590	590	590	590
Sudan	200	170	200	230	210	210	200	190	190	190	190
Non-OPEC Asia	6,880	7,030	6,990	6,950	6,950	6,980	6,950	6,940	6,940	6,930	6,940
India	700	680	690	690	700	690	700	710	710	710	710
Malaysia	560	580	550	560	550	560	550	550	540	540	550
China	4,180	4,340	4,340	4,300	4,300	4,320	4,310	4,310	4,320	4,320	4,320
Non-OPEC Latin America*	5,640	5,960	6,000	6,040	6,150	6,040	6,260	6,420	6,440	6,500	6,410
Argentina	710	750	760	760	770	760	780	790	800	810	790
Brazil	3,120	3,300	3,320	3,380	3,430	3,360	3,480	3,530	3,550	3,600	3,540
Colombia	760	780	790	790	790	790	780	770	770	760	770
Guyana	270	380	380	370	430	390	500	600	600	600	580
Non-OPEC Middle East	3,160	3,130	3,150	3,160	3,170	3,150	3,170	3,170	3,170	3,180	3,170
Oman	1,072	1,072	1,059	1,064	1,069	1,066	1,072	1,069	1,074	1,079	1,074
Qatar	1,801	1,813	1,812	1,810	1,810	1,811	1,810	1,810	1,810	1,810	1,810
Processing Gains	2,310	2,310	2,350	2,380	2,370	2,350	2,440	2,440	2,440	2,440	2,440
Global Biofuels	2,940	2,650	3,260	3,530	3,140	3,140	2,770	3,390	3,680	3,270	3,280
Non-OPEC** (incl. processing gains)	65,580	67,010	67,430	68,010	68,000	67,610	67,770	68,390	69,510	69,430	68,780
OPEC crude	29,080	29,360	28,860	28,020	28,120	28,590	28,230	28,300	28,610	28,920	28,510
Saudi Arabia crude	10,530	10,420	10,140	9,000	9,000	9,640	9,000	9,000	9,250	9,500	9,190
Kuwait	2,700	2,680	2,600	2,550	2,550	2,590	2,550	2,550	2,550	2,550	2,550
UAE	3,340	3,440	3,270	3,200	3,200	3,280	3,300	3,300	3,300	3,300	3,300
Iraq crude	4,440	4,390	4,140	4,300	4,300	4,280	4,300	4,300	4,300	4,300	4,300
Iran crude	2,550	2,700	3,000	3,100	3,200	3,000	3,250	3,300	3,350	3,400	3,330
Libya crude	990	1,150	1,160	1,160	1,160	1,160	1,150	1,150	1,150	1,150	1,150
Nigeria crude	1,150	1,270	1,150	1,300	1,300	1,250	1,300	1,300	1,300	1,300	1,300
Venezuela crude	700	710	790	800	850	790	880	900	930	950	910
other OPEC crude	2,680	2,590	2,610	2,620	2,570	2,590	2,510	2,500	2,480	2,470	2,490
Total OPEC NGLs + Non-conventional	5,430	5,490	5,510	5,450	5,450	5,470	5,500	5,500	5,500	5,500	5,500
Total OPEC	34,500	34,850	34,370	33,470	33,570	34,070	33,730	33,800	34,110	34,420	34,010
Total World Supply	100,090	101,850	101,800	101,480	101,570	101,680	101,500	102,190	103,620	103,850	102,790

Source: IEA, EIA, BofA Global Research estimates

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Exhibit 52: BofA global oil demand forecast (in thousand b/d)
Quarterly forecast

	2022	1Q2023F	2Q2023F	3Q2023F	4Q2023F	2023F	1Q2024F	2Q2024F	3Q2024F	4Q2024F	2024F
TOTAL OECD Demand	45,720	45,440	45,710	46,420	45,810	45,840	45,110	45,670	46,000	45,610	45,600
OECD Americas Demand	24,840	24,520	25,200	25,160	24,870	24,940	24,530	25,100	25,110	24,720	24,860
United States	20,160	19,920	20,500	20,360	20,130	20,230	19,860	20,330	20,250	19,920	20,090
Canada	2,380	2,340	2,460	2,450	2,380	2,410	2,370	2,490	2,490	2,420	2,440
Mexico	1,930	1,890	1,870	1,990	2,000	1,940	1,920	1,900	2,020	2,010	1,960
OECD Europe Demand	13,510	13,110	13,550	13,780	13,200	13,410	12,890	13,410	13,550	13,150	13,250
OECD Pacific Demand	7,380	7,810	6,960	7,480	7,740	7,500	7,700	7,170	7,340	7,740	7,490
TOTAL NON-OECD Demand	53,840	54,940	55,400	56,130	56,530	55,750	56,440	56,830	57,420	57,770	57,110
China	14,660	15,580	15,960	15,980	16,220	15,930	16,010	16,430	16,430	16,720	16,400
India	5,280	5,570	5,520	5,300	5,700	5,520	5,880	5,790	5,540	5,940	5,790
Other Asia (ex. China & India)	8,780	8,850	8,880	8,830	9,040	8,900	9,100	9,060	9,020	9,220	9,100
Middle East	8,910	8,770	8,870	9,530	8,990	9,040	9,070	9,240	9,710	9,130	9,290
Latin America	6,210	6,180	6,320	6,410	6,340	6,310	6,230	6,340	6,520	6,440	6,380
FSU	4,940	4,860	4,890	5,040	5,020	4,950	4,890	4,910	5,060	5,020	4,970
Africa	4,280	4,350	4,210	4,270	4,440	4,310	4,450	4,290	4,350	4,510	4,400
Non-OECD Europe	780	780	770	780	780	780	800	780	790	790	790
TOTAL Demand	99,570	100,390	101,110	102,550	102,340	101,600	101,550	102,500	103,430	103,370	102,710
Market imbalance (supply - demand)	520	1,460	690	-1,070	-770	80	-50	-310	190	480	80

Source: IEA, EIA, BofA Global Research estimates

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