Mixed Signals

Energy Fundamentals Update

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Sideways Markets Until Sentiment Changes

- **Brent to stay rangebound between $72 and $78 until recession is apparent or a catalyst pushes markets higher**
- **Diesel and gasoline demand have been robust, keeping crack spreads elevated**
- **Long term crude oil prices will be elevated due to supply growth constraints**
- **Henry Hub gas prices will continue recent strength as summer heat increases demand**
- **TTF and NBP prices remain bearish until EU industrial usage comes back**

Crude Oil & Refined Products

Brent crude saw recent strength up to $78/bbl from positive demand data, but we are not ready to make a full bullish call in the short term until the wider macro mess is resolved. Another bank failure could send Brent to retest the key $70/bbl mark, and financial contagion would push prices into the $65-$70/bbl range. OPEC+'s coalition has broken down somewhat, with different ideas espoused by the Russians and Saudis recently about the possibility of what to do over the next meeting in early June.

Right now, we see OPEC+ staying the course and continuing the April cuts of 1.6m bpd. The surprise April cut boosted prices by $5-$7 for about three weeks. A second cut would display their fears more openly and indicates greater weakness; we construe a second cut as a bearish signal unless the cuts are extremely substantive.

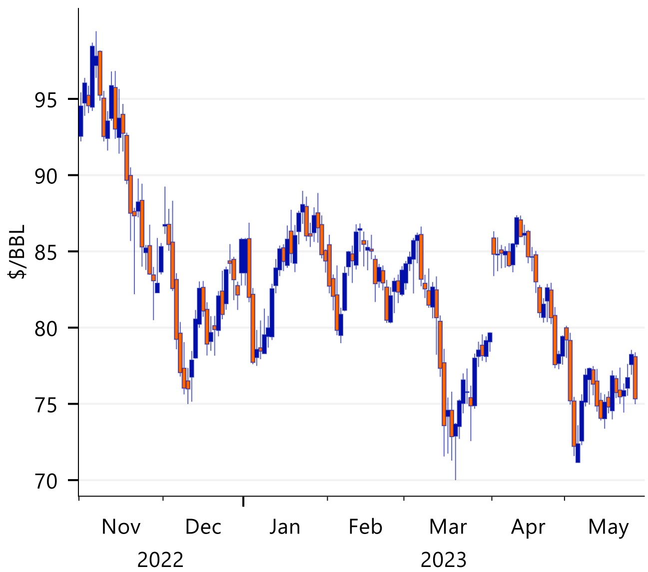
For now, Brent and WTI will continue their sideways trends. Refined products will follow their leader as the fears of more bank failures, weak EU and US economic data, weakening Chinese demand all reign supreme in speculators and investors' minds alike. Diesel demand has picked up in late spring after weakness earlier this year (figure 2), and inventories of all the middle distillates remain at multi-year lows (figure 3) though still higher than 2022's lows. Diesel is the primary engine of the industrial and agricultural economy, and weakness here is usually the predictor of a recession. We closely follow Dr. Diesel and Dr. Copper demand data, and we concur that things have gotten overly bearish of late but again, the stimulus is not yet present to send prices higher. We again reiterate that crude and products markets will be rangebound.

With the near future muddled, we would like to turn toward a longer-term discussion today.

Crude oil and refined products markets are at the beginning of a crisis, bolstered by an increasingly fractured supply and logistics chain. Our global economic system is predicated on the cheap and easy flow of energy across borders and oceans. When borders close (Russian sanctions), that chain begins to break down.

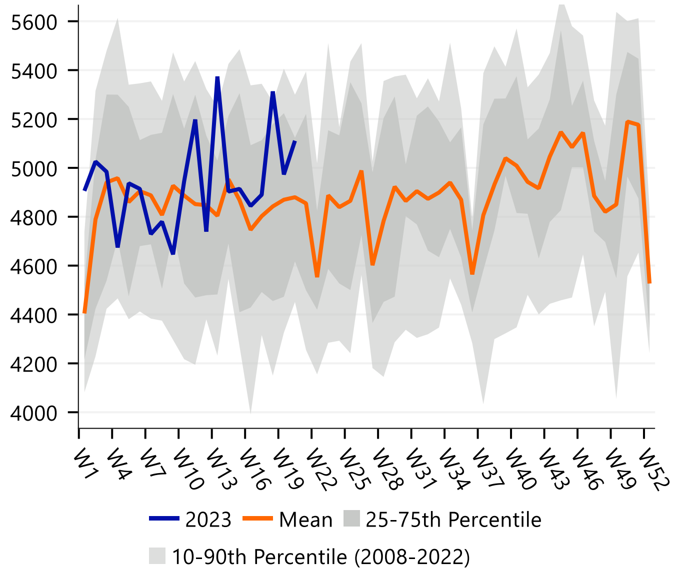
Take the 2010s as a warning. Low interest rates and healthy capital expenditures by oil and gas producers led to an oversupplied crude market. The high prices of the early

Figure 1: Brent continues to trade in the $72-$86 range, with little reason to break either way until the macro fears are alleviated or a recession kicks off



Source: Bloomberg, RaboResearch

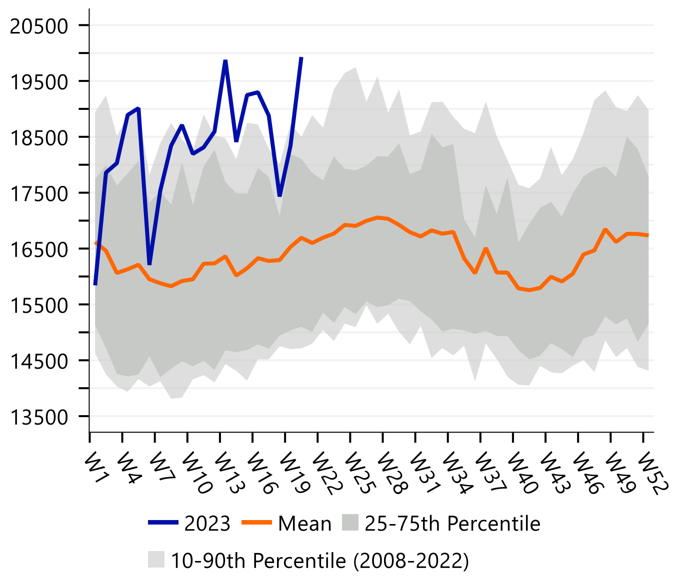
Figure 2: Diesel implied demand has picked up after January and February weakness,



Source: Bloomberg, EIA, RaboResearch

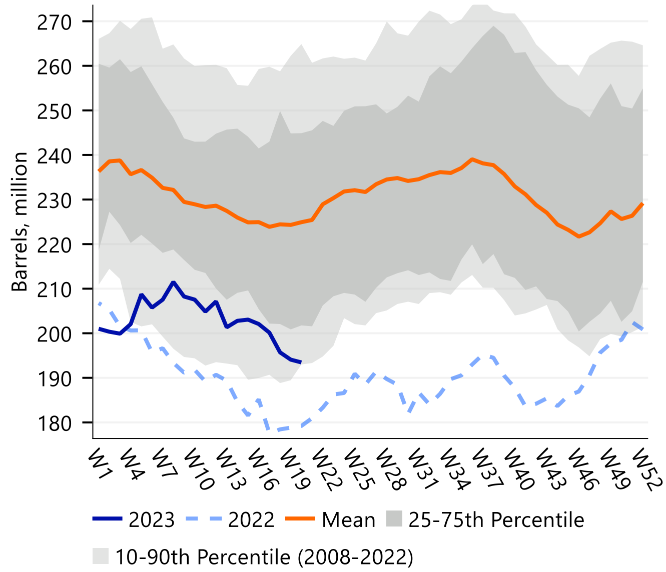
years of the decade, well above $100/bbl, saw investment. The United States grew crude oil production from 6m bpd in 2012 to 10m bpd by the end of 2014. OPEC production was rising as well, and international sanctions against Iran were lifted. 2014 set off the the supply war, and prices crashed from $100/bbl in the summer to $30/bbl by January 2016 and stayed muted until 2021. The corresponding prices for natural gas, crude oil, gasoline, diesel during this energy boom…became fixed in our heads as "normal."

Figure 2: Crude refinery runs have been strong all year in the US…



Source: Bloomberg, EIA, RaboResearch

Figure 3: Global diesel, gasoil & fuel oil inventories still remain at a major deficit to averages

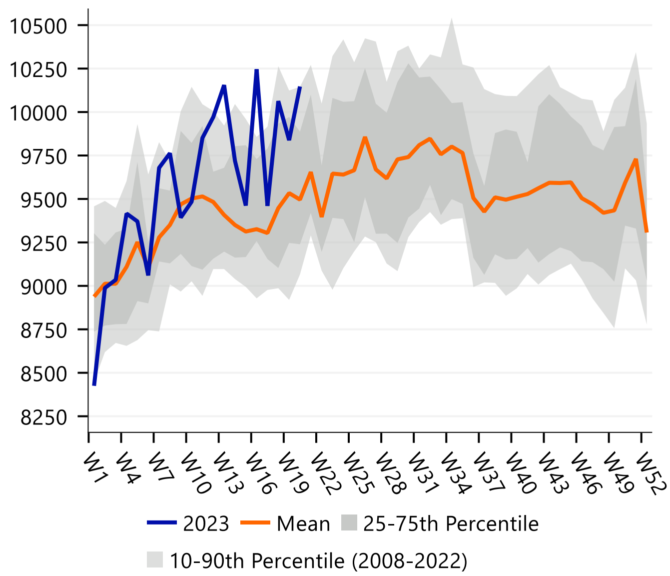


Source: Bloomberg, EIA,PJK International, Intl. Enterprise Singapore, Shangai Futures Exchange, RaboResearch

We are in a different world now. Crude oil and refined products for transportation are on their way out. New supply growth in the west is muted as the focus turns

toward green energy, renewable diesel, biodiesel, and hydrogen. Most of the supply growth in both crude oil production and natural gas has come from drilled-but-uncompleted wells (DUCs) that were finished out. Higher interest rates only further discourage speculative drilling and expensive capital expenditures. US oil production is likely to peak before 2030, which will further push the drive to renewables.

Figure 3: …due to gasoline demand (shown) leading the pack with jet fuel and petrochemical feedstocks strengthening!



Source: Bloomberg, EIA, RaboResearch

We are seeing the end of oil refinery capacity growth; most likely by 2030 global capacity will be on the decline. There are 3.9m bpd of new capacity expected to join the market in the next two years, with further projects completing out to 2028. The US has not built a major refinery since 1977 and has lost 1.1m bpd of capacity since 2020. The current incentives are present to convert regional refineries into biodiesel, sustainable aviation fuel (SAF) or renewable diesel plants.

If everyone is closing up shop and the end is on the horizon, however distant, then suppliers have little incentive to expand in a dying industry. Mark our words. Crude oil is on it's last legs, whether it is ten years or thirty. But creatures in their death throes spasm violently. We expect the same for fossil fuels, and volatility will reign.

This is the basis of our long-term forecasts until 2035. Supply growth will grow less slowly than demand, and the bottlenecks of refinery capacity and inter-nation rivalries with disciplined Chinese exports (why solve your rivals energy woes?) will keep crude and its constituents at higher prices. Until demand significantly decreases due to renewable fuels and green substitutes, the world is facing a tumultuous decade.

Natural Gas

Dutch TTF futures have cracked the €30/MWh level, continuing the long downtrend started in in mid-December. We expect prices to touch €20/MWh as supplies of LNG are abundant and inventories remain far higher than normal seasonally. There is consistent supply of LNG cargoes from Qatar and the US, and Asian LNG demand is not bidding up the price against Atlantic routres. Demand for power generation was muted with mild weather on both sides of the Atlantic, along with substantial contributions from renewables.

Henry Hub futures have started picking up recently. Last week futures broke through $2.50 and are poised to march up to $3 as the summer heat takes hold. In the short term, we expect some pullback in Henry Hub as weather volatility is always a concern, but an early or mid-June heat wave would confirm our price targets.

Inventories are near the 75th percentile in the US and well above the 90th percentile for Europe for the season, which takes the pressure off of European buyers as they aim to restock before the August 90% targets (see figures 5 & 6).

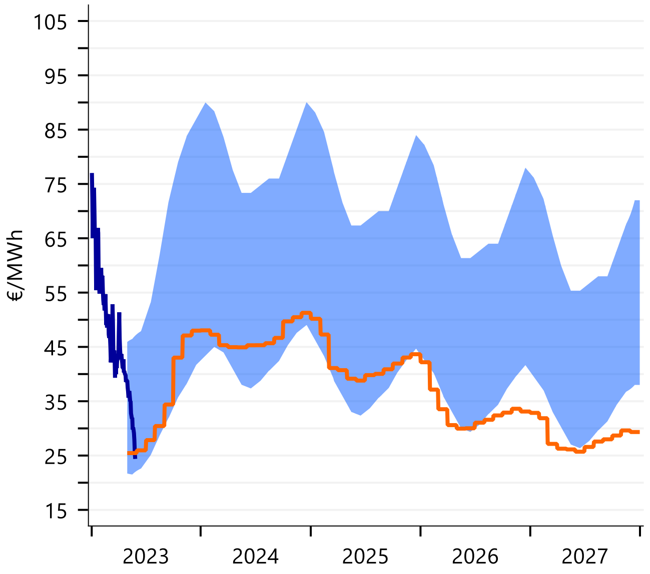
Despite the price selloff, industrial demand in the EU has not recovered. Many gas users are still subject to energy contracts set when prices were higher — meaning there will be a lag until they can reset their contracts and hedges, relieving the burden of skyrocketing power bills.

Regardless of industrial demand, we foresee higher demand for electric generation in the summer months. A mild winter with weak snowfall has affected the Alpine hydropower reservoirs. France, Germany and Austria are showing the largest seasonal deficit in water levels since 2013. Spanish stocks in the Pyrenees recently extended their decline below the seasonal average as well as the country experienced the warmest and driest April on record.

All of this leads to less electricity generation from hydropower plans and nuclear facilities. We are not yet at the stage where green energy can make up these shortfalls in full. Natural gas is seen as that transitionary stepping stone, and any heat waves will need to tap the fossil fuels market. Extreme heat days are increasing in number on both sides of the Atlantic.

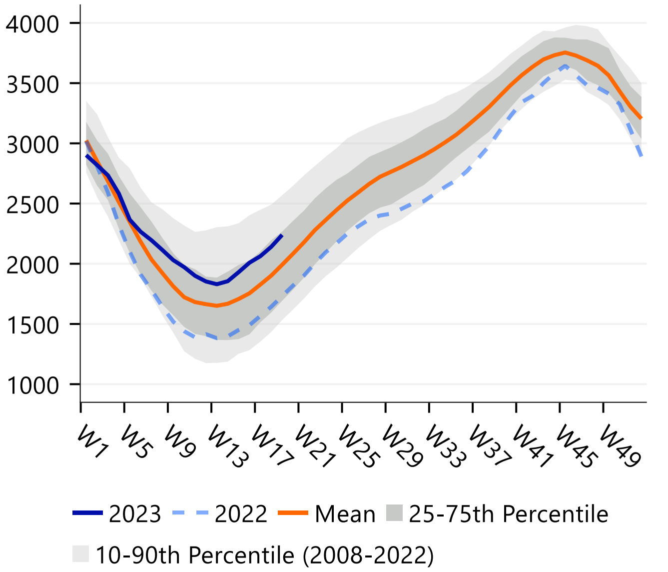
We are cautious on European natural gas prices as tepid demand is keeping the market subdued. China is notably absent from the LNG cargo market and is content to rely on inventories and the Power of Siberia I pipeline for the time being. Should China become an active LNG buyer this year, we expect price appreciation, but for now our most likely scenario involves TTF staying in the €20-35 until the winter season (figure 4).

Figure 4: The upper range of our TTF forecasts assumes strong Chinese demand, returning EU industrial capacity, and unfavorable weather leading to increased gas usage. The lower band of our TTF forecasts is our most likely scenario, assuming ample LNG supply and slowly returning demand



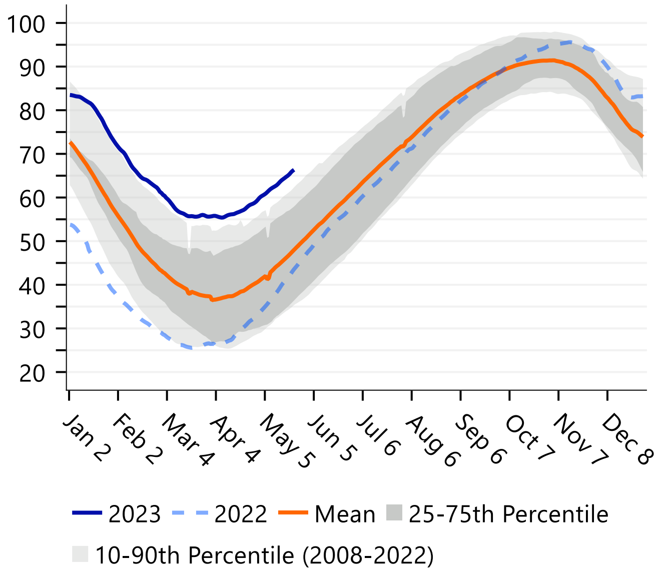
Source: Bloomberg, RaboResearch

Figure 5: US gas stockpiles are above normal, but summers are getting hotter, spiking power demand and air-conditioning demand, flattening the injection season curve



Source: Bloomberg, EIA, RaboResearch

Figure 6: European natural gas stockpiles are at levels where restocking can be done in a measured way, which will keep prices moderated



Source: Bloomberg, GIE, RaboResearch

Table: Rabobank Energy Forecasts – Quarterly Averages

Crude Oil		2023 Q2	2023 Q3	2023 Q4	2024 Q1	2024 Q2	2024 Q3	2024 Q4	2025 Q1	2025 Q2	2025 Q3	2025 Q4
Brent	**Forecast**	**$75.3**	**$77.0**	**$86.0**	**$91.6**	**$96.8**	**$99.5**	**$101.9**	**$104.4**	**$106.7**	**$107.9**	**$108.8**
$/BBL	Forward	$78.1	$76.4	$75.3	$74.3	$73.5	$72.8	$72.2	$71.6	$71.0	$70.5	$70.0
WTI	**Forecast**	**$69.9**	**$73.3**	**$82.6**	**$87.9**	**$92.9**	**$95.5**	**$97.8**	**$100.0**	**$102.2**	**$103.2**	**$104.1**
$/BBL	Forward	$72.8	$72.7	$71.9	$70.7	$69.7	$68.8	$68.0	$67.2	$66.5	$65.8	$65.2
NY ULSD	**Forecast**	**$2.48**	**$2.48**	**$2.73**	**$2.88**	**$2.98**	**$3.05**	**$3.11**	**$3.19**	**$3.23**	**$3.27**	**$3.28**
$/GAL	Forward	$2.38	$2.38	$2.38	$2.36	$2.32	$2.31	$2.31	$2.30	$2.27	$2.26	$2.25
Gulf Coast Diesel	**Forecast**	**$2.43**	**$2.43**	**$2.65**	**$2.79**	**$2.89**	**$2.96**	**$3.03**	**$3.10**	**$3.14**	**$3.18**	**$3.18**
$/GAL	Forward	$2.33	$2.32	$2.30	$2.27	$2.23	$2.22	$2.22	$2.21	$2.18	$2.17	$2.14
DOE On-Highway Diesel	**Forecast**	**$4.12**	**$4.14**	**$4.38**	**$4.51**	**$4.61**	**$4.68**	**$4.75**	**$4.82**	**$4.86**	**$4.90**	**$4.90**
$/GAL	Forward	$4.01	$4.03	$4.03	$3.99	$3.95	$3.94	$3.94	$3.93	$3.90	$3.89	$3.86
ICE Gasoil	**Forecast**	**$700**	**$689**	**$762**	**$806**	**$845**	**$868**	**$888**	**$908**	**$923**	**$930**	**$937**
$/MT	Forward	$691	$688	$686	$681	$675	$672	$669	$666	$659	$653	$650
RBOB	**Forecast**	**$2.52**	**$2.53**	**$2.44**	**$2.52**	**$2.82**	**$2.83**	**$2.69**	**$2.73**	**$3.00**	**$2.99**	**$2.82**
$/GAL	Forward	$2.62	$2.40	$2.14	$2.17	$2.25	$2.13	$1.96	$2.02	$2.14	$2.04	$1.87
Natural Gas												
HH Natural Gas	**Forecast**	**$2.25**	**$2.72**	**$3.82**	**$3.95**	**$3.45**	**$3.65**	**$4.65**	**$4.73**	**$4.05**	**$4.20**	**$5.07**
$/MMBTU	Forward	$2.26	$2.52	$3.42	$3.37	$3.19	$3.37	$4.21	$4.06	$3.74	$3.89	$4.53
TTF Natural Gas	**Forecast**	**€ 29**	**€ 42**	**€ 61**	**€ 67**	**€ 56**	**€ 58**	**€ 67**	**€ 64**	**€ 50**	**€ 53**	**€ 61**
€/MWH	Forward	€ 31	€ 31	€ 46	€ 47	€ 45	€ 46	€ 50	€ 46	€ 40	€ 40	€ 43
NBP Natural Gas	**Forecast**	**61.52**	**65.79**	**95.42**	**112.10**	**89.28**	**97.71**	**117.28**	**107.37**	**78.54**	**87.66**	**108.96**
GBp/Therm	Forward	67.57	70.87	114.55	116.79	105.71	110.22	124.18	115.20	94.11	98.88	109.50
JKM Natural Gas	**Forecast**	**$10.55**	**$11.29**	**$15.76**	**$17.61**	**$15.94**	**$16.52**	**$17.44**	**$17.49**	**$13.57**	**$13.57**	**$15.43**
$/MMBTU	Forward	$10.23	$10.17	$14.20	$15.86	$14.36	$14.88	$15.71	$15.76	$12.22	$12.23	$13.90
Metals												
Aluminum	**Forecast**	**$2,138**	**$2,385**	**$2,439**	**$2,454**	**$2,477**	**$2,518**	**$2,544**	**$2,579**	**$2,595**	**$2,612**	**$2,637**
$/MT	Forward	$2,277	$2,248	$2,281	$2,317	$2,351	$2,379	$2,405	$2,438	$2,462	$2,481	$2,506
Copper	**Forecast**	**$7,682**	**$8,555**	**$8,641**	**$8,580**	**$8,553**	**$8,531**	**$8,534**	**$8,709**	**$8,692**	**$8,690**	**$8,695**
$/MT	Forward	$8,283	$8,141	$8,161	$8,180	$8,195	$8,213	$8,225	$8,235	$8,245	$8,254	$8,261

Source: Bloomberg, RaboResearch

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