Oil Market Stress Scenarios

December 31, 2025

1 Oil Market Stress Scenarios and Price Sensitivity Analysis

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2 Executive Summary

At the moment, the oil market is experiencing a slow but steady decline in both spot and futures prices of oil benchmarks. In November, Spot Market of North Sea Dated and WTI first-month dropped by 1.01 USD/b and 70¢/b, respectively, to 63.63 USD/b and 59.47 USD/b. Dubai's first month dropped by 38¢/b, m-o-m, to 64.46 USD/b. Meanwhile for futures market, the ICE Brent front-month contract dropped in November by 29¢/b, m-o-m, to average 63.66 USD/b, and the NYMEX WTI front-month contract dropped by 59¢/b, m-o-m, to average 59.48 USD/b. The GME Oman front-month contract dropped by 41¢/b, m-o-m, in November to 64.53 USD/b. This movement is driven by a global oversupply of crude oil which happens during from the start of 2025. President Donald J. Trump has stated that the US plans to increase domestic production and expand crude oil storage capacity in order to limit the market influence of OPEC+ and China, which are considered strategic competitors under US foreign policy doctrine.

As a result, the US is becoming increasingly independent of crude oil imports, providing greater flexibility and strategic autonomy for the domestic oil market. In November, US crude oil imports slightly recovered to average 5.9 mb/d. Month-on-month, imports increased by 215 tb/d, or approximately 4%. On a year-on-year basis, crude imports were 681 tb/d, or around 10%, lower compared with the same period last year. On December 12, US crude oil net imports (including the SPR) declined by 719 tb/d to 1.8 mb/d. On a rolling four-week average basis, crude oil net imports averaged 2.4 mb/d, representing a year-on-year increase of approximately 6% compared with the same period last year.

At the same time, US crude exports fell back from an eight-month high to average 3.5 mb/d in November. Month-on-month, crude outflows declined by approximately 730 tb/d, or 17%, driven by weaker demand from Europe and Asia, particularly South Korea and Japan. Compared with the same month last year, crude exports were down by 743 tb/d, or about 17%. On December 12, US gross crude oil exports increased by 655 tb/d to 4.6 mb/d. On a rolling four-week average basis, gross crude oil exports averaged 3.9 mb/d, representing a year-on-year decline of approximately 6% compared with the same period last year.

As mentioned earlier, the oil market is gradually accumulating inventories, contributing to an emerging oversupply and continued downward pressure on prices. This dynamic is largely driven by expectations of subdued global economic growth in 2026, which limits demand expansion and helps contain price volatility.

In addition, recent geopolitical developments warrant attention, particularly the hijacking of three Chinese tankers carrying Venezuelan crude off Venezuelan waters. Following the third incident, oil futures prices rose by approximately 0.9% for Brent crude and 1.0% for WTI. While prices subsequently stabilized, the episode underscores persistent supply-side risks, as any disruption reinforces a broader geopolitical risk premium at a time when markets remain highly sensitive to potential shocks.

3 Primary Data Sources

This analysis is based on publicly available, high-frequency and institutional-grade data sources:

- **OPEC Monthly Oil Market Report (December 2025)**
Used for global supply-demand balance, OPEC vs non-OPEC production trends, and medium-term market outlook.

- **US Energy Information Administration (EIA) (17th December 2025)**
Weekly Petroleum Status Report data used for:

- US crude oil imports and exports
- Net imports (including SPR)
- Inventory dynamics and short-term market signals

- **Offshore Energies UK (OEUK)**

- UK and North Sea production outlook
- Regional supply risks and energy security assessment

- **Shipping & Trade Flow Data (Kpler, media reports)**
Used qualitatively to assess tanker disruptions, regional demand weakness, and geopolitical supply risks.

3.0.1 Data Frequency & Coverage

- Weekly data: EIA imports, exports, net imports (used for short-term stress signals)
- Monthly data: OPEC production, demand, and balances (used for structural trends)
- Time horizon: 2024-2026 (actuals, estimates, and projections where applicable)

3.0.2 Key Variables

The following variables are central to the analysis:

- **Crude oil net imports (incl. SPR)** for proxy for US market tightness
- **Gross crude oil exports** indicator of global demand absorption
- **Four-week rolling averages** for smoothing weekly volatility
- **OECD vs non-OECD inventories** structural buffer against supply shocks
- **OPEC+ production levels** supply-side control mechanism

4 Global Supply-Demand Balance

4.1 OECD Demand

Oil demand in OECD (Organisation for Economic Co-operation and Development) Americas surged by 726 tb/d y-o-y in September, up from an increase of 102 tb/d y-o-y in August. This growth was driven primarily by a significant increase of 535 tb/d in the US, alongside gains in Canada, which were marginally offset by minor y-o-y declines in Mexico and Chile. The rise in y-o-y oil demand was also supported by a lower comparison baseline.

4.2 US Demand

In September, US oil demand increased sharply by 535 tb/d y-o-y, up from a rise of 210 tb/d y-o-y in the previous month. The increase was generally led by NGLs/LPG, which expanded by 328 tb/d y-o-y, although this was below the 462 tb/d y-o-y increase recorded in August. Demand for other petroleum products rose marginally by an average of 0.07% y-o-y in September, with limited impact on refining margins or the US oil market. However, demand for products such as gasoline, lubricating oil and petroleum coke declined by an average of 0.04% y-o-y during the month.

As of 12 December, the cumulative daily average of products supplied showed that finished motor gasoline demand declined by 0.9% y-o-y to 8.7 mb/d, compared with 8.8 mb/d a year earlier. Over the same period, jet fuel/kerosene demand increased by 3.2% y-o-y to 1.7 mb/d, up from 1.6 mb/d last year. Meanwhile, demand for distillate fuel oil increased by 2.2%, residual fuel oil increased by 1.1%, propane/propylene increased by 0.6% and other oils, increased by 1.8% y-o-y, respectively.

Looking ahead to 2026, the US economy is expected to maintain its current growth momentum, supported by continued expansion in consumer spending and easing trade uncertainty. In particular, the easing of trade tensions following major agreements, including a one-year truce with China, is expected to underpin economic growth in 2026. These developments are likely to support job creation and stabilise the unemployment rate.

4.3 Europe Demand

Oil demand in OECD Europe rebounded in September, rising by 182 tb/d y-o-y after two consecutive months of decline. Combined increases in Germany, the UK, Italy and Spain more than offset y-o-y declines observed in France and several other countries in the region. Growth in demand for NGLs/LPG, gasoline and jet fuel/kerosene outweighed declines in the "other products" category, residual fuel oil and naphtha.

Within the region, the UK remains structurally dependent on oil and gas, which continue to account for approximately 74% of total primary energy consumption. Since 2004, the UK has relied on net imports to meet annual energy demand, with the import gap peaking in 2013, when indigenous production accounted for less than 53% of total primary energy demand. At that time, total fuel imports reached 181 mn tonnes of oil equivalent (mn toe), compared with domestic production of around 113 mn toe. In 2024, UK primary energy consumption stood at 164 mn toe, representing a marginal decline of less than 1% y-o-y, but a reduction of 26% compared with 2010 and 30% relative to 2000. This structural import reliance continues to shape the UK's sensitivity to changes in oil and gas market dynamics.

Among product categories, NGLs/LPG recorded the strongest growth, increasing by 117 tb/d y-o-y, compared with a slight decline observed in August. Gasoline demand rose by 119 tb/d y-o-y,

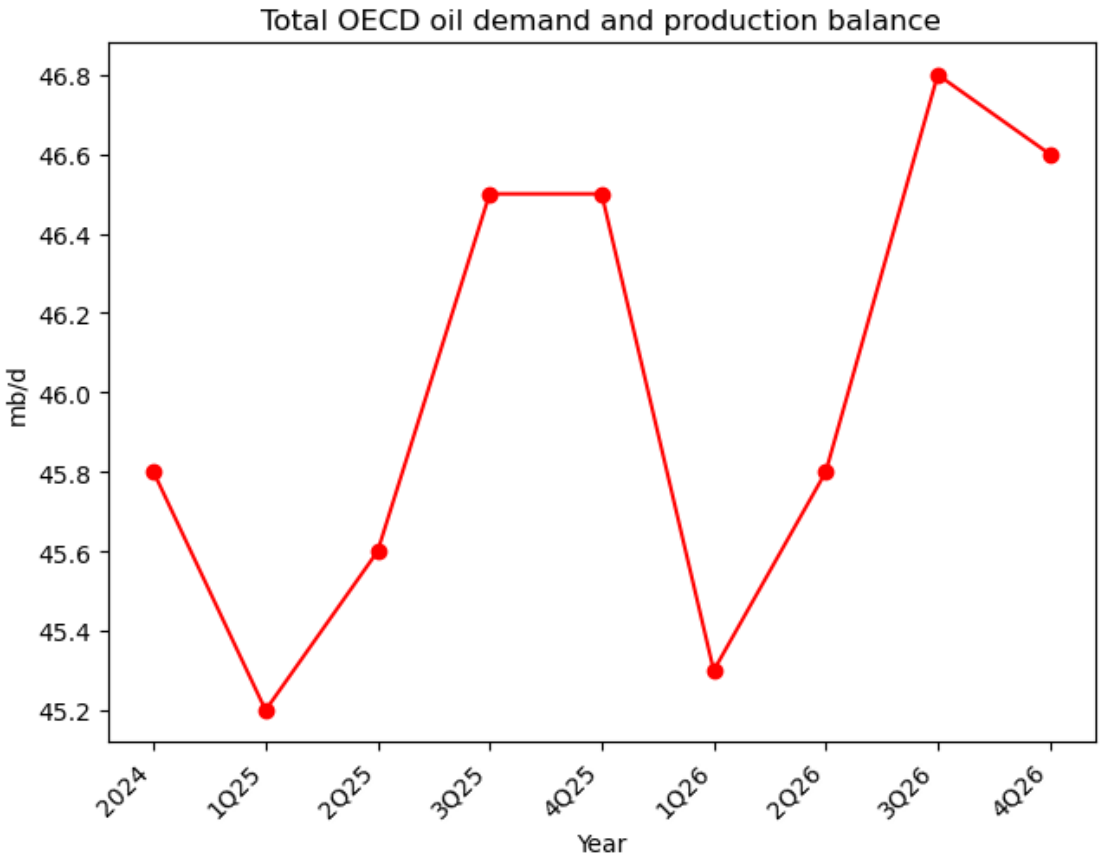
reversing a decline of 23 tb/d y-o-y in the previous month. Jet fuel/kerosene demand increased by 105 tb/d y-o-y, slightly above the 87 tb/d y-o-y growth recorded in August. Diesel demand also rebounded, increasing by 96 tb/d y-o-y, compared with a sharp decline of 324 tb/d y-o-y in August.

By contrast, demand for the "other products" category, including bitumen, lubricating oil and petroleum coke, recorded the largest contraction, declining by 137 tb/d y-o-y, compared with a marginal increase of 5 tb/d y-o-y in August. Residual fuel oil demand fell by 52 tb/d y-o-y, although this represented an improvement from the 86 tb/d y-o-y decline seen in August. Naphtha demand contracted by 65 tb/d y-o-y for the second consecutive month.

Accordingly, a conservative outlook supports oil demand growth of around 25 tb/d y-o-y in OECD Europe in Q1 2026. In terms of product demand, transport fuels particularly gasoline and jet fuel/kerosene are expected to drive regional oil demand growth in 2026. Among petrochemical feedstocks, naphtha and LPG are projected to remain broadly flat y-o-y, while demand for diesel, fuel oil and the "other products" category is expected to decline. Overall, oil demand growth in the region is projected at approximately 40 tb/d y-o-y in 2026, with average demand reaching around 13.5 mb/d.

[22]:
```
import matplotlib.pyplot as plt

x_demand = ["2024", "1Q25", "2Q25", "3Q25", "4Q25", "1Q26", "2Q26", "3Q26",␣
 ↪"4Q26"]
y_demand = [45.8, 45.2,        45.6, 46.5,        46.5, 45.3,        45.8, 46.
 ↪8,        46.6]
plt.plot(x_demand, y_demand, color="red")
plt.xticks(rotation=45, ha="right")  # rotate signs
plt.tight_layout()  # auto-fit
plt.xlabel("Year")
plt.ylabel("mb/d")
plt.title("Total OECD oil demand and production balance")
plt.scatter(x_demand, y_demand, color="red")
plt.show()
```



4.4 OECD Supply

For 2025, OECD liquids production (excluding the DoC-participating country Mexico) is expected to increase by around 0.6 mb/d, averaging 32.3 mb/d. OECD Americas is projected to lead this growth, with output rising by approximately 0.6 mb/d to average 28.3 mb/d. Meanwhile, OECD Europe liquids production is forecast to expand by around 55 tb/d, averaging 3.6 mb/d over the year.

In 2026, OECD liquids production (excluding Mexico) is anticipated to increase more modestly by 0.2 mb/d, reaching an average of 32.4 mb/d. OECD Americas is again expected to be the primary growth driver, with production rising by 0.2 mb/d to average 28.5 mb/d, while liquids output in OECD Europe is projected to decline by around 45 tb/d, averaging 3.5 mb/d.

4.5 US Supply

US liquids production increased by 0.3 mb/d month-on-month in September, averaging 23.3 mb/d, which was approximately 1.3 mb/d higher year-on-year. Crude oil and condensate production rose by 44 tb/d m-o-m, reaching another record high of 13.8 mb/d, and stood around 0.7 mb/d higher y-o-y. The month-on-month increase was largely driven by higher output in New Mexico and Alaska, while declines in Texas and North Dakota partially offset these gains. Production from offshore platforms in the Gulf of Mexico remained broadly unchanged.

Natural gas liquids (NGLs) production also strengthened, increasing by 183 tb/d m-o-m to average 7.9 mb/d in September, around 0.7 mb/d higher y-o-y. According to the US Department of Energy (DoE), non-conventional liquids production-primarily ethanol-rose by 27 tb/d m-o-m to average 1.6 mb/d. Preliminary estimates indicate that non-conventional liquids output remained broadly stable at around 1.6 mb/d in October.

According to EIA data for the four weeks ending 12 December, cumulative daily average domestic crude oil production averaged around 13.5 mb/d, representing an increase of approximately 2.0% y-o-y. Over the same period, supplies of natural gasoline, condensate and unfinished oils rose by 8.7% y-o-y to around 481 tb/d, while Alaskan NGL production declined by 6.0% y-o-y to 47 tb/d. Crude oil inputs to refineries averaged approximately 16.2 mb/d, up 0.7% y-o-y, indicating continued strength in downstream absorption capacity.

In 2026, US liquids production, excluding processing gains, is expected to increase by around 0.1 mb/d, y-o-y, to average 22.3 mb/d. Crude oil and condensate production is set to drop by about 0.1 mb/d, y-o-y, to average 13.3 mb/d. Conversely, NGLs production is forecast to increase by 0.2 mb/d to average 7.4 mb/d. The 2026 forecast points to sustained caution in capital allocation and a moderation in drilling activity, while also reflecting gradual efficiency gains in drilling and completion and rising associated gas output across key shale oil regions.

4.6 UK Supply

In October, UK liquids production rose by 18 tb/d, m-o-m, to average 0.6 mb/d. Crude oil production increased by 26 tb/d, m-o-m, to average 0.5 mb/d. The October crude level was lower by about 81 tb/d, y-o-y, according to official data. NGLs production fell by 8 tb/d, m-o-m, to average 59 tb/d. While fuel for electricity has decreased dramatically since 2000, total electricity consumption has seen as more gradual decline from 357 TWh in 2005 to 274 TWh in 2023.

Although, total UK electricity consumption rose last year to approximately 280 TWh, electricity demand has fallen by 22% over the past 20 years. UK electricity generation has fallen against the amount of electricity delivered to end-users (grid losses account for around 5-8% of lost generation to end-users during transmission and distribution) as net imports make a higher proportion of the total electricity supplied from around 2012 onwards.

In 2025, UK liquids production is forecast to rise by about 10 tb/d to average 0.7 mb/d. The volume increases, however, are expected to be largely offset by a continued decline in output from the UK's mature reservoirs over the year.

In 2026, UK liquids production is forecast to drop by approximately 13 tb/d, y-o-y, to average 0.7 mb/d. Nevertheless, declines from mature oil projects are again anticipated to balance out production growth in other segments.

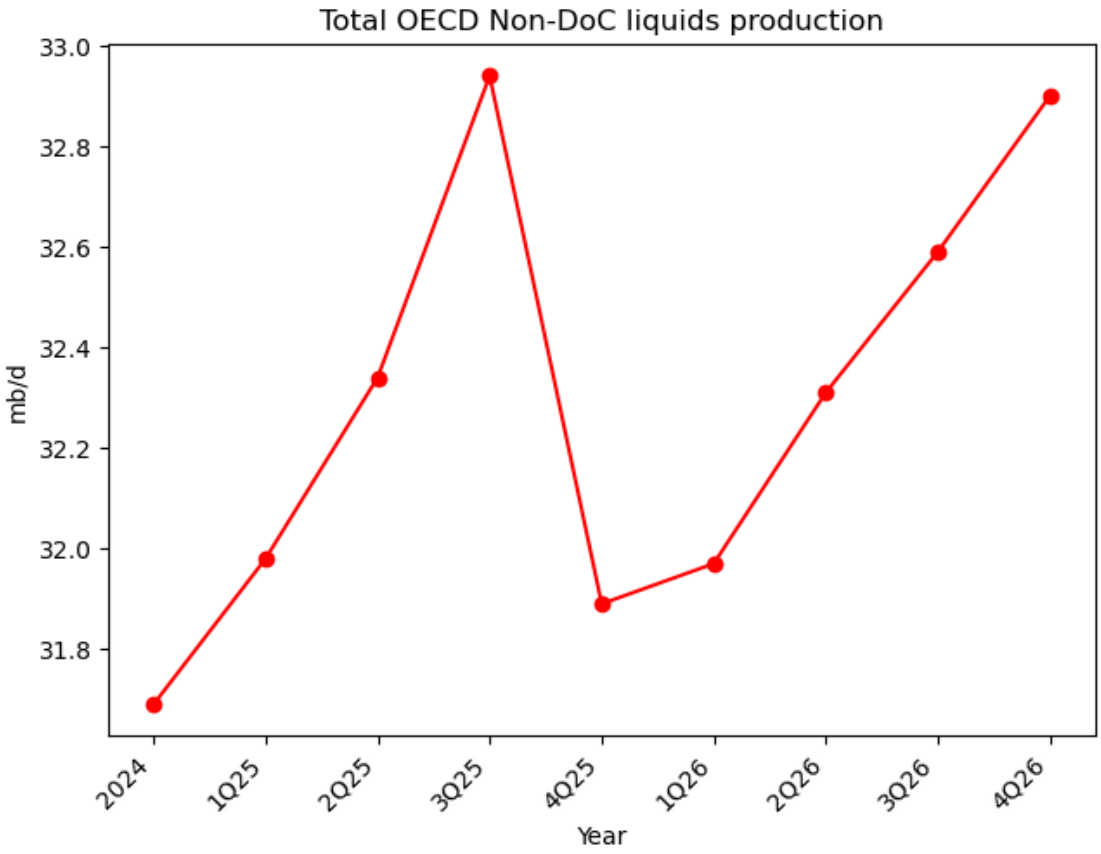
4.7 Demand for DoC Crude (Call on OPEC+)

Demand for crude oil from countries participating in the Declaration of Cooperation (DoC) is estimated to average 42.4 mb/d in 2025, unchanged from the previous month's assessment. This represents an increase of approximately 0.3 mb/d compared with 2024, reflecting a gradual tightening in the call on OPEC+ crude amid continued non-OPEC supply growth.

Looking ahead, demand for DoC crude in 2026 is projected to rise further to 43.0 mb/d, also unchanged from the previous assessment and around 0.6 mb/d higher than the 2025 forecast.

The increase implies a growing reliance on OPEC+ supply to balance the market, reinforcing the group's role as the primary marginal supplier and strengthening its ability to influence price dynamics through policy decisions.

[23]:
```
x = ["2024", "1Q25", "2Q25", "3Q25", "4Q25", "1Q26", "2Q26", "3Q26", "4Q26"]
y = [31.69, 31.98, 32.34, 32.94, 31.89, 31.97, 32.31, 32.59, 32.90]
plt.plot(x, y, color="red")
plt.xticks(rotation=45, ha="right")  # rotate signs
plt.tight_layout()  # auto-fit
plt.xlabel("Year")
plt.ylabel("mb/d")
plt.title("Total OECD Non-DoC liquids production")
plt.scatter(x, y, color="red")
plt.show()
```



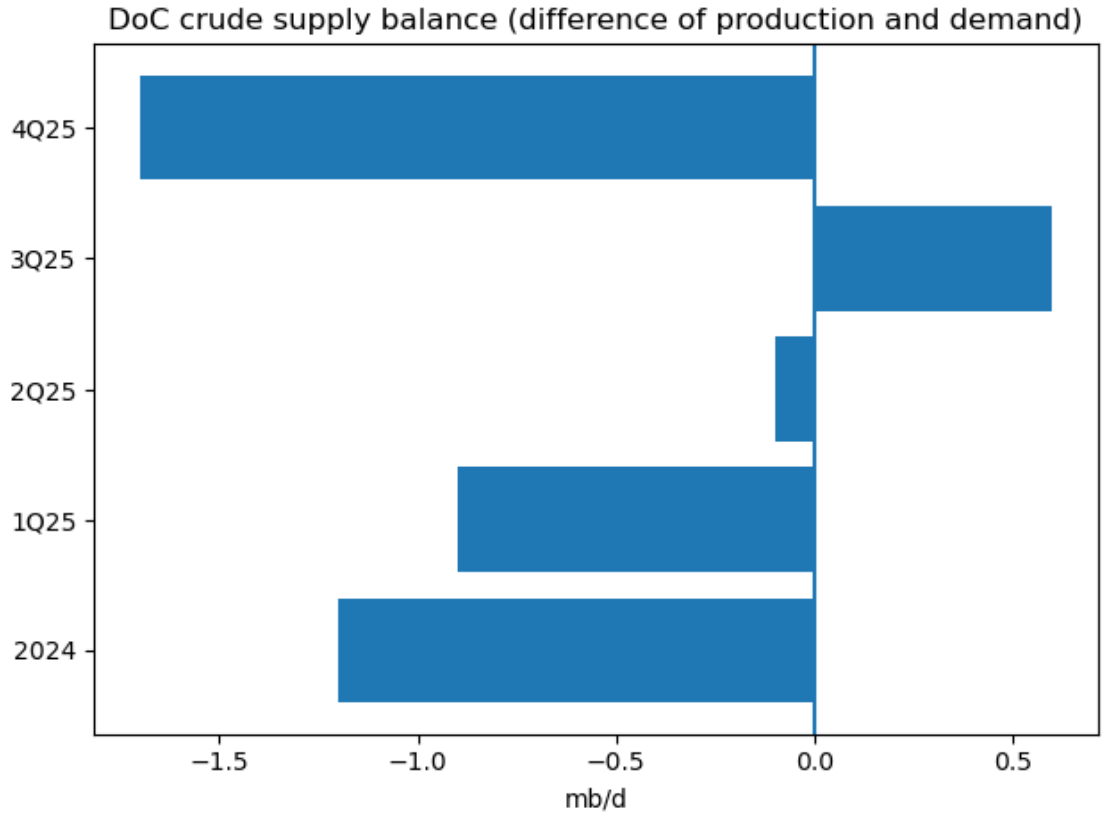
[24]:
```
periods = ["2024", "1Q25", "2Q25", "3Q25", "4Q25"]

call_on_doc = [42.1, 41.8, 41.4, 41.9, 44.2]
doc_production = [40.9, 40.9, 41.3, 42.5, 42.5]
```

```
balance = [p - d for p, d in zip(doc_production, call_on_doc)]

plt.barh(periods, balance)
plt.axvline(0)  # zero balance

plt.xlabel("mb/d")
plt.title("DoC crude supply balance (difference of production and demand)")
plt.tight_layout()
plt.show()
```



5 Stress Scenario Analysis

Here is introduced several stress scenarios of specific situations which could happened once one of the scenario below would happen.

5.1 Tanker disruptions

A tanker-related disruption on 29 December appears unlikely under current conditions, given the easing of US pressure on Venezuelan crude exports, including the suspension of measures targeting both supply flows and end buyers. In the absence of renewed restrictions, no material impact on spot or futures oil prices is expected, as supply risks in the region remain contained.

However, should US pressure on Venezuelan oil exports resume, several downside supply scenarios could emerge:

5.1.1 Scenario 1: Reinstatement of December-Level Restrictions

If US pressure returns at levels similar to those observed in December, spot and futures oil prices are expected to rise by approximately 1.5%, reflecting near-term supply disruptions. Price gains would likely be short-lived, with markets stabilising thereafter as the region is reassessed as moderately unstable. Under this scenario, global oil inventories could decline by around 2 million barrels, primarily driven by reduced export availability.

5.1.2 Scenario 2: Escalation of Restrictions and Tanker Disruptions

In a more severe scenario, involving stronger enforcement measures and increased tanker shutdowns, spot and futures oil prices could rise by approximately 3-5% from current levels due to tighter supply conditions. Similar to the first scenario, prices are expected to stabilise once the initial shock is absorbed, while the region would be classified as high-risk. In this case, oil inventories could be drawn down by approximately 5-10 million barrels, amplifying short-term market tightness.

5.2 Escalation of Geopolitical Tensions Related to Ukraine

As of 29 December, negotiations related to the conflict in Ukraine reached an impasse, increasing market uncertainty and reinforcing geopolitical risk sentiment. This development contributed to a rise in oil futures prices, with Brent crude increasing by approximately 1.8% to 61.34 USD/bbl, while WTI gained around 2.0% to 57.88 USD/bbl, reflecting a renewed geopolitical risk premium priced into the market.

On 30 December, oil prices extended gains modestly during European trading hours, rising by around 0.5%, with Brent trading at approximately 61.80 USD/bbl and WTI at around 58.39 USD/bbl. The relatively limited follow-through suggests that while geopolitical headlines supported prices, market participants remained cautious in the absence of immediate physical supply disruptions.

Under a scenario of further escalation, including increased military and financial support for Ukraine by Western countries, oil markets are likely to reprice geopolitical risk more aggressively. In such a scenario, spot and futures oil prices could rise by approximately 2-4%, driven primarily by an expansion of the geopolitical risk premium rather than an immediate increase in physical demand. Price reactions are expected to be front-loaded, with futures markets responding more rapidly than physical flows.

Price gains would be supported by heightened concerns over potential spillover effects on regional energy flows, prompting precautionary positioning in futures markets. In parallel, previously elevated oil inventories could experience modest drawdowns, as higher prices incentivise short-term destocking and tighter prompt balances. However, in the absence of direct disruptions to production or exports, inventory draws are expected to remain limited, reinforcing the view that price movements would be largely sentiment-driven rather than fundamentally driven by demand growth.

6 Price Sensitivity Analysis

6.0.1 Trigger

A continued build-up of global oversupply driven by sustained production growth from non-OPEC+ producers, prompting a stronger and more coordinated policy response from OPEC+.

6.0.2 Policy Response Assumption

OPEC+ implements deeper-than-expected production cuts and/or extends existing output restraint measures in order to stabilise market balances and reinforce price discipline.

6.0.3 Price Response

Under this scenario, oil markets are expected to undergo a material repricing, with spot and futures prices potentially rising by up to 8-10% from prevailing levels. Price gains would be driven primarily by a reassessment of medium-term supply availability, rather than an immediate physical shortage.

6.0.4 Transmission Mechanism

This will impact on stronger OPEC+ discipline tightens forward balances, improved confidence in supply management supports futures positioning and price response is policy-led rather than demand-led

6.0.5 Timing and Dynamics

Price increases are expected to materialise gradually, as market participants adjust positioning following clearer policy signals. The reaction is likely to be front-loaded in futures markets, with physical flows responding more slowly.

6.0.6 Constraints and Limits

Further upside beyond the initial repricing is expected to remain limited unless accompanied by additional demand-side surprises, or unplanned supply disruptions. In the absence of such catalysts, prices are likely to stabilise at higher levels, reflecting improved balance expectations rather than speculative excess.

7 Conclusion: Trading & Risk Implications

Current market conditions suggest a persistent oversupply bias, with non-OPEC+ production growth and inventory accumulation continuing to weigh on both spot and front-month futures benchmarks. While demand remains resilient across key OECD regions, expectations of subdued global growth into 2026 imply limited upside from the demand side and reinforce a market structure that is increasingly driven by supply policy and risk sentiment.

From a trading perspective, price risks remain asymmetric. The base case points to range-bound pricing with intermittent downside pressure, but upside tail risks are concentrated in policy-driven outcomes. The price sensitivity framework indicates that a stronger and more coordinated OPEC+ response through deeper than expected cuts or an extension of restraint could trigger a gradual

repricing of spot and futures levels by up to 8-10%, primarily via tighter forward balances and improved market confidence rather than an immediate physical shortage. This implies that monitoring OPEC+ signalling, compliance tone, and forward guidance is critical for positioning.

Geopolitical scenarios are expected to operate mainly through changes in the risk premium. Events such as heightened tensions related to Ukraine can generate front-loaded reactions in futures markets and lift prices by approximately 2-4%, but sustained upside is likely to remain constrained without direct disruptions to production or export flows. Similarly, tanker-related disruptions around Venezuelan exports present a short-term supply risk channel: a re-tightening of US pressure could lift prices by 1.5% under a mild enforcement scenario and by 3-5% under a more severe scenario, with associated inventory draws. These risks support a strategy focused on volatility capture and tactical positioning around headlines rather than long-duration directional exposure.

Overall, the most actionable trading signals remain: OPEC+ policy shifts and enforcement credibility, inventory trajectories and visible stock changes, and episodic geopolitical risk repricing. In this environment, futures markets are likely to respond faster than physical flows, making timing and risk management around front-month exposure and event windows especially important. Directional trades should be supported by confirmation from balances and inventories, while short-term dislocations may offer opportunities through curve dynamics and volatility rather than outright price trends.