Crude Projections

Why “oil” forecasts do not directly translate to crude oil profiles

- It is critical to distinguish between crude oil, oil and liquids projections within financial analysis, irrespective of your view of the pace of the energy transition.
- Using projections from one point in the overall liquids balance to forecast another risks overestimating required investment, project economics and valuations.
- To 2030, growth in natural gas liquids (NGLs) and biofuels supply sees the annual difference between changes in oil production excluding NGLs and liquids demand exceeds 0.5 pp, over 10% of natural decline from oil fields.
- Headline “oil” demand forecasts must be treated with care: the definition of “oil” between OPEC, the IEA and corporates varies, with some including biofuels.
- Investors and financiers must ensure that forecasts that underpin project economics use the relevant measure, and that scenarios and projections used to construct ranges are comparable.
- Peak crude precedes both peak oil production and peak liquids demand, creating a further risk for investors waiting for “oil” figures to peak.

Regardless of your view on the pace of the energy transition, changes in the composition of liquids supply alter the relationships between different parts of the overall liquids balance, with significant implications for prices, project economics and valuations.

Yet, headline “oil” projections from different organisations can refer to materially different points within that balance, with forecasts and scenarios often conflating the measures they describe. This note examines where those differences arise, how they can affect investment analysis, and what they mean for engagement with corporates.

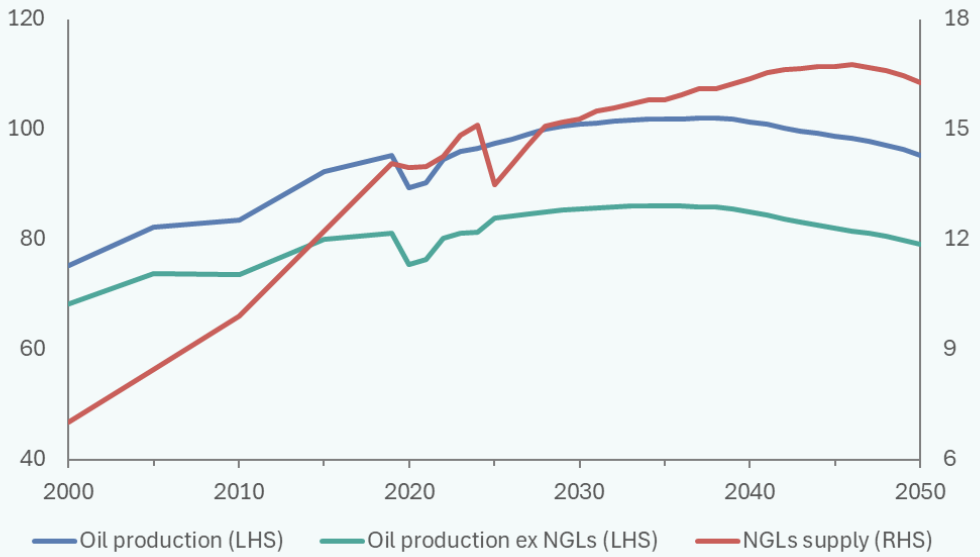
Natural gas liquids (NGLs) production cannibalises demand for crude oil

NGLs are produced from gas and gas-condensate fields and used either as a refinery input in place of crude oil or directly as fuels (e.g. liquefied petroleum gas, LPG) or chemical feedstocks. Since 2000, NGLs production has grown significantly faster than overall oil production, increasing NGLs’ share of total production (Figure 1).

This trend, primarily driven by gas demand outstripping liquids demand growth, is set to continue over the medium and long term under a range of scenarios, including in Shell’s central *Archipelagos* scenario.[1] We stress that this and other scenarios referenced in this paper are used to illustrate energy system dynamics and should not be interpreted as Transition Analysis’ central view of the future.

[1] This scenario is used because it provides annual data over the coming decades.

Figure 1. Oil production and NGLs supply under Shell's *Archipelagos* scenario (Mb/d).



Source: *The 2026 Energy Security Scenarios*, Shell (2026).

Notes: Five-year interval data from 2000; annual data from 2019. Oil production values in EJ/year are converted to Mb/d using Shell's conversion factor of 0.501; it is unclear how leap years are handled in Shell's analysis. Oil production includes NGLs.

The relationship holds true under a broad range of scenarios, including the IEA's reintroduced *Current Policies Scenario* (CPS) (Figure 2). A difference of up to 0.5 pp/yr to 2030 in the *Stated Policies Scenario* (STEPS) may appear inconsequential, yet with natural decline from oil fields at 5-6% a year,[2] growth in NGLs supply meets up to 10% of the decline, thus reducing the quantum of new developments needed to meet demand.

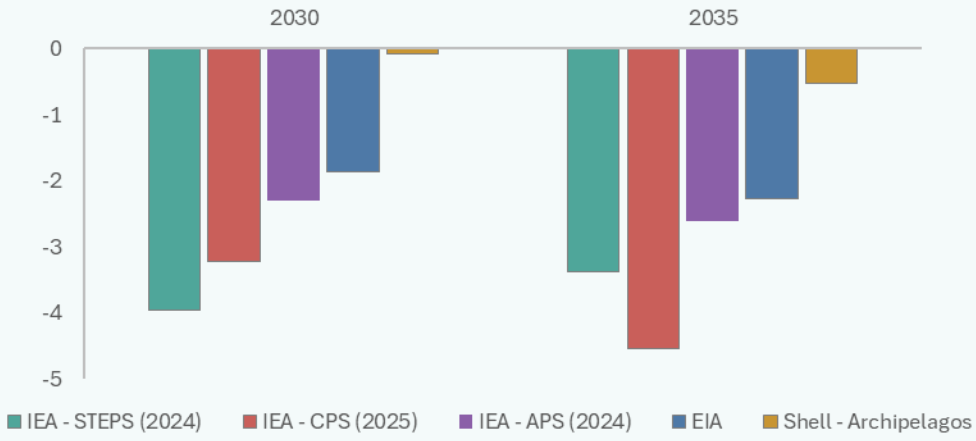
As NGLs' share of oil production increases, it reduces the demand for other oil, including crude.[3] The profile of an oil production forecast cannot therefore be reliably used to forecast the profile of required crude oil. Doing so could result in overinvestment in new developments or exploration activity compared with using a crude oil projection.

Peak crude likely precedes peak oil production

NGLs supply also affects the *timing* of a future demand peak: under *Archipelagos*, oil production ex NGLs peaks three years prior to oil production, with NGLs supply peaking a decade later. This dynamic holds true across a broad range of scenarios and forecasts with different outlooks on the pace of the energy transition.[4] The timing difference is likely greater under other scenarios given Shell's relative position in Figure 2, while scenarios with a heavy reliance on gas may see even greater separation in peak timing.

[2] Shell, *The 2026 Energy Security Scenarios*, p. 3.
[3] Shell's non-NGLs oil production classified as "conventional", "light tight oil", "heavy oil" and "others".
[4] Where oil production does not peak within the time horizon of the forecast or scenario, the relationship is likely to hold true except where gas demand peaks prior to demand for oil.

Figure 2. Difference between changes in oil production excluding NGLs and oil production from 2022, for selected scenarios from the IEA, the EIA and Shell (pp).



Sources: IEA, *World Energy Outlook 2024* and *World Energy Outlook 2025*; EIA, *International Energy Outlook 2023*; Shell, *The 2026 Energy Security Scenarios*.

Notes: STEPS = *Stated Policies Scenario*. CPS = *Current Policies Scenario*. STEPS values are from *World Energy Outlook 2024* because 2030 values are not published in the 2025 edition. The 2030 CPS value is linearly interpolated between published 2024 and 2035 values.

A weaker call on crude implies lower prices

Medium- and long-term crude oil price forecasts derived from bottom-up analyses that model the interaction between crude oil and NGLs production can account for these volume and timing effects. However, top-down price projections that follow the shape of projected oil production may overestimate long-term prices and the timing of future structural changes in the market. The realised commodity price is, of course, subject to future economic conditions including available supply, yet ignoring these relationships could introduce systematic bias into crude oil price forecasts and valuations derived from DCF analysis.

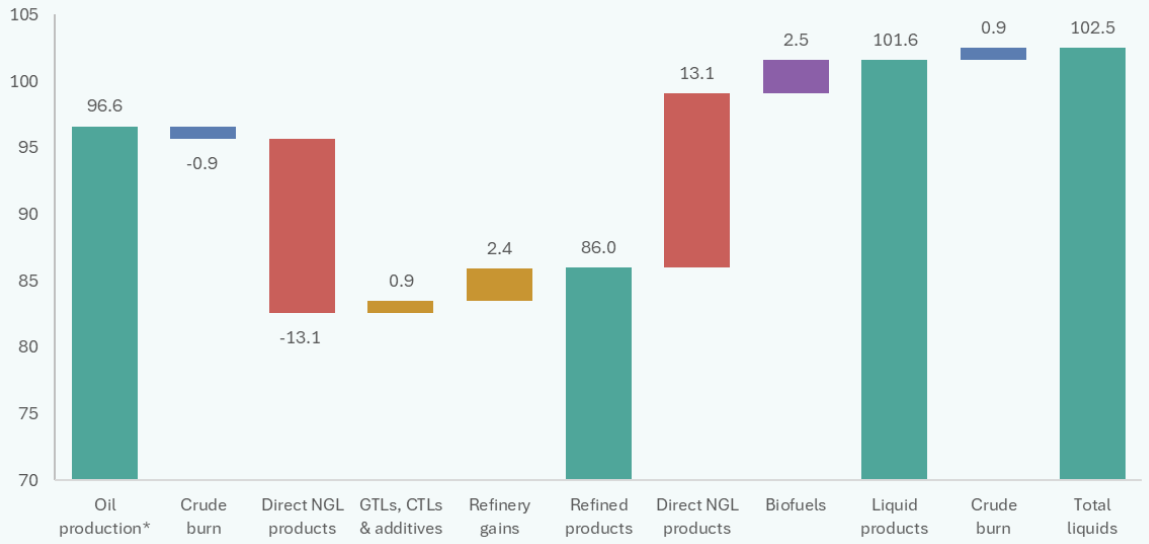
Investors must be clear what an "oil" demand forecast is describing

Liquids demand exceeds required oil production, with biofuels a key part of the difference (Figure 3). Whether blended with traditional fuels or not, growth in biofuels supply is expected under a broad range of scenarios and forecasts, including all those shown in Figure 2. "Oil demand" is deliberately not shown in Figure 3, as the term is used by different organisations to refer to varying points within the overall balance.

Increasing NGLs supply also has important implications for refiners as NGLs can be used directly as products (fuels or feedstocks) without the need to be refined. This reduces demand for refined products, reducing required capacity and putting pressure on margins unless capacity is rationalised.[5]

[5] For a broader discussion of the implications of demand for products shifting from fuels to chemical feedstocks, see Carbon Tracker, *Petrochemical Imbalance*, 2024.

Figure 3. From oil production to total liquids (Mb/d).



Source: IEA, *World Energy Outlook 2025*. 2024 data.

Notes: *GTLs, CTLs and additives included in IEA's "oil production" are excluded here as they are liquids not oil; NGLs are considered as oil as there is minimal processing post production. Crude burn is crude oil used without refining, e.g. for power generation. Refined oil products are not shown as data to apportion refinery gains are not available. Numbers do not sum due to rounding within source data.

The following examples show how different organisations' use of "oil demand" and related terms maps to the terms in Figure 3:

- **IEA (*Oil Market Report*):** "oil supply" = total liquids.[6]
- **IEA (*World Energy Outlook*)**: "oil demand" = oil production + GTLs, CTLs & additives + refinery gains.[7]
- **OPEC**: "oil demand" = total liquids.[8]
- **TotalEnergies:** "oil products" ≈ liquid products.[9]
- **ExxonMobil:** "oil demand" ≈ oil production + GTLs, CTLs & additives + refinery gains.[10]

A further example where "oil" demand appears to include biofuels is in Vitol's *Long term oil demand outlook*, where the jet fuel projections include sustainable aviation fuel (SAF), which is derived from plants and used cooking oil.[11]

[6] IEA, "Definition of Supply" in *Oil Market Report Glossary,* https://www.iea.org/articles/oil-market-report-glossary (accessed 25 August 2026). The definition includes biofuels and direct crude burn.
[7] IEA, *World Energy Outlook 2025*, Tables A8–A10.
[8] OPEC, *World Oil Outlook 2026*, p. 158 and Tables 3.1, 3.2, 4.1 and 4.2.
[9] TotalEnergies, *Energy Outlook 2025*, pp. 7 and 20. Biofuels are included.
[10] ExxonMobil, *2025 Global Outlook glossary*, https://corporate.exxonmobil.com/publications/global-outlook/global-outlook-glossary (accessed 25 August 2026). Derived liquids (e.g. GTLs) are included.
[11] Vitol, *Long term oil demand outlook*, 2026, pp. 16–17.

Apparently small differences can have significant financial consequences

These differences are not merely semantic. Applying growth rates at one point in the overall balance to another introduces errors where elements do not change proportionally. With combined NGLs and biofuels production approaching 25% of total liquids demand and continuing to increase, liquids demand increasingly decouples from crude oil or refining demand over the coming decade.

The divergence can be material: to 2030, the difference between changes in liquids demand and oil production excluding NGLs exceeds 0.5 pp/yr in both the STEPS and the CPS (Figure 4).[12] This difference exceeds 10% of Shell's annual decline figure. If liquids demand grew at 2% a year, it would still represent 7% of the annual growth in overall required liquids supply.

Other sources of liquids add to the timing dynamic described earlier: peak oil production will precede peak liquids demand, with crude oil demand peaking earlier still. Using a liquids forecast to inform the shape of a crude oil price forecast likely further widens the gap compared to one derived from a bottom-up model. As liquids demand shifts from transport fuels to chemicals, the direct use of NGL products will likely increase, adding further pressure to refiners even where overall liquids demand remains constant.

Investment decisions must be underpinned by the right profile

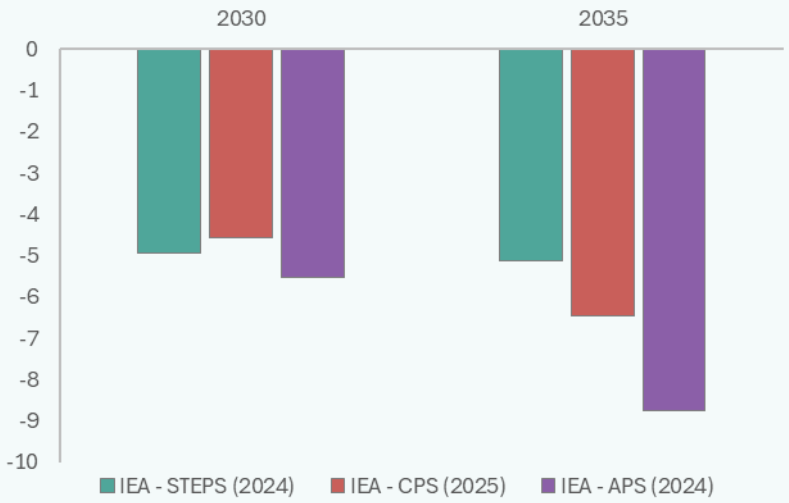
Those financing a new oil development or investing in a producer should seek clarity on the volume forecast used to underpin price forecasts and ultimately investment decisions. They should ensure they have seen the relevant projection and that it is not a liquids forecast masquerading as "oil". Those looking for peaking demand to inform investment decisions should ensure they are monitoring the relevant peak.

Using a range of forecasts does not necessarily reduce this risk. Many investors sensibly consider a range of projections to inform the range of potential economic outcomes, but may still face exposure to systematic bias if the underlying forecasts are inappropriate.

The industry is clearly aware of these dynamics. For example, bp explicitly notes that under its *Current Trajectory* scenario "the small increase in the demand for total liquid fuels out to 2035 is more than met by increasing supplies of NGLs and biofuels, such that refined products falls".[13] This illustrates why investors need to understand the composition of the overall liquids balance and the rates at which different components are changing and critically evaluate company projections. If investors are unable to reconstruct the overall balance from data provided by the company, they should proceed with caution when assessing related investment decisions.

[12] 2035 liquids demand is 89.3 Mb/d in the *Announced Pledges Scenario* (APS) and 108.9 Mb/d in the CPS.
[13] bp, *Energy Outlook: 2025 edition*, p. 37.

Figure 4. Difference between changes in oil production excluding NGLs and liquids demand from 2022, for selected IEA scenarios (pp).



Source: IEA's *World Energy Outlook 2025* and *World Energy Outlook 2024*.

Notes: Constructed in a similar way to Figure 2; comparable liquids data is not publicly available for the Shell and EIA scenarios. STEPS = *Stated Policies Scenario*; CPS = *Current Policies Scenario*; APS = *Announced Pledges Scenario*. STEPS values from *World Energy Outlook 2024* because 2030 values are not published in the 2025 edition. The 2030 CPS value is linearly interpolated between published 2024 and 2035 values. Liquids demand includes hydrogen fuels, which are not shown in Figure 3 because the 2024 value is nil.

About Transition Analysis

Transition Analysis produces independent research and analysis on the interaction between structural changes in the energy system, capital allocation, climate-related financial risks, and stewardship and sustainability considerations. Its work draws on previous research and engagement with investors, corporates, policymakers, and other financial market participants to provide practical insights for assessing corporate strategy to support long-term value creation.

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