

The Oil Paradox: Rising Consumption Amid Energy Transition



Executive Summary:

- **Greater efficiency in oil extraction and production may be stimulating higher consumption by lowering costs and increasing accessibility.**
- **The U.S. has surged to become the world's top oil consumer and producer, helped by fracking's advanced extraction techniques.**
- **U.S. feedstocks also support surging demand from China's burgeoning petrochemical industry, although this may be vulnerable to trade war pressures.**
- **The VanEck Oil Services UCITS ETF (Exchange-Traded Fund) "OIHV" provides investors with exposure to the largest and most liquid U.S. listed oil services companies¹, which play a critical role in maximizing the oil sector's efficiency. However, investors should be aware that the fund is subject to sector-specific risks, including sensitivity to energy prices, geopolitical influences, infrastructure lock-in effects, and industry-specific regulatory changes.**

Fueling the World: Why Oil Remains Indispensable in Global Markets

Global sustainability initiatives, from the Paris Agreement to national net-zero pledges, aim to curb fossil fuel use and promote cleaner energy. Yet, unexpectedly, world oil consumption continues to increase, recently reaching all-time highs. In 2023, global oil demand exceeded 100 million barrels per day (mbd) for the first time², even as renewable energy capacity and electric vehicle (EV) adoption surged. This trend highlights a complex reality: oil remains deeply embedded in the global economy, and current efforts have not yet reversed consumption growth.

Broadly speaking, the combination of economic dependence, geopolitics and locked-in infrastructure makes oil deeply embedded in the world economy. More surprising, though, is the fact that efficiency gains in exploration and production appear to be adding to oil's resilience.

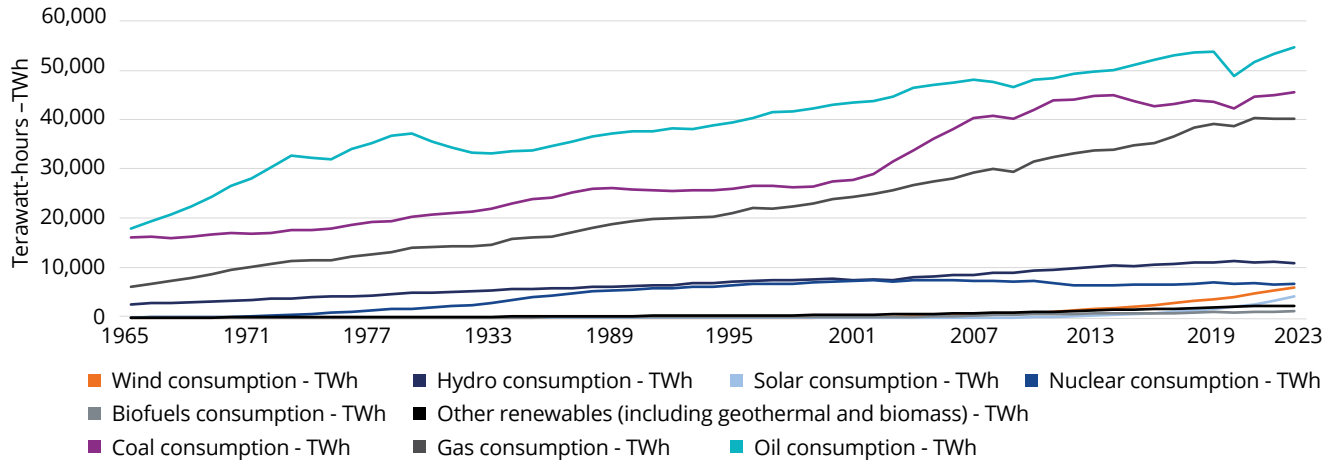
Chart 1 shows that oil consumption is growing and remains the world's primary source of energy.

¹ The index only includes companies with at least 50% (25% for current components) of their revenues from oil services to the upstream oil sector, including companies that are primarily engaged in: oil equipment, oil services, and/or oil drilling.

² Energy Institute. (2024 edition). Statistical Review of World Energy.

Chart 1: Oil consumption continues to grow

Global primary energy consumption by source



Source: Energy Institute - Statistical Review of World Energy (1965-2024)

The three key reasons why oil and the oil industry are so deeply embedded in the global economy are explained in below.

Industrial and Economic Reliance



Oil drives economic growth by fueling industries like manufacturing and transportation. Research indicates that over 90%³ of global transport relies on petroleum-based fuels, making it essential for moving goods and people worldwide. This dependency ensures oil's role in keeping economies running, especially in sectors where alternatives are not yet widespread.

Geopolitical Influences



Large oil and gas producing states have a vested interest in maintaining the status quo, as they rely on fossil fuel revenues, and a rapid transition to net zero could harm their economies. For instance, some major oil and gas producing countries have been accused of trying to play down the transition, especially during climate negotiations, such as at COP29 in Azerbaijan⁴.

Infrastructure Lock-in Effect



Existing energy infrastructure comprising over 800 refineries⁵, 485 thousand kilometers of pipelines⁶, and global shipping fleets make the shift to renewable alternatives both costly and time intensive. Retrofitting or replacing these assets represents a multi-decade challenge.

³ Energy for transportation. (2025). Understand Energy Learning Hub. <https://understand-energy.stanford.edu/energy-services/energy-transportation>

⁴ Euronews. (2024b, November 16). "Azerbaijan cannot impose any kind of solution" COP29's host says. Euronews. <https://www.euronews.com/my-europe/2024/11/16/azerbaijan-cannot-impose-any-kind-of-solution-cop29s-host-says>

⁵ Statista. (2025b, January 3). Global number of oil refineries 2023-2024. <https://www.statista.com/statistics/1445314/number-of-oil-refineries-worldwide/>

⁶ Global Energy Monitor. (2025b, May 15). Category: Global Oil Infrastructure Tracker - Global Energy Monitor. https://www.gem.wiki/Category:Global_Oil_Infrastructure_Tracker

Efficiency, Oil, and the Jevons Paradox: When Less Becomes More

If the inertia of being deeply embedded in the global economy was to be expected, the effect of greater efficiency on the resilience of oil was not. Paradoxically, efficiency doesn't always equate to reduced consumption – it can, in fact, stimulate greater use. This is what's called the Jevons paradox: a situation where technological progress, or policy aimed at increasing efficiency in resource use, inadvertently leads to an increase in consumption as lower costs and expanded access drive demand.

Named after William Stanley Jevons, a British economist, this paradox was originally observed in the 19th century coal industry but has significant implications for oil today. Just as in 19th century coal, oil is seeing improvements in efficiency leading to an increase in overall consumption rather than a decrease. Advances in oil extraction, refining, and its use, are reducing the cost per unit of energy, making oil more accessible and driving higher consumption. For instance, innovations like fracking (short for hydraulic fracturing) reduce extraction costs, enabling expanded production and, ultimately, greater oil use.

Notably, oil services companies are key to progress in making energy extraction more efficient. For example, they're using various techniques to maximize the

recovery of oil and gas from new and existing fields, which may have the effect of increasing oil consumption.

It's not only improvements in production that are affecting the industry. Economists have noticed that people travel more when their cars are more fuel efficient. For instance, in the case of elastic demand (demand that changes more than proportionally to price changes) a 20% rise in efficiency by lower prices may lead to a 40% increase in travel (see chart 2). Fuel consumption increases and the Jevons paradox occurs.

The Unprecedented Surge in U.S. Oil Production

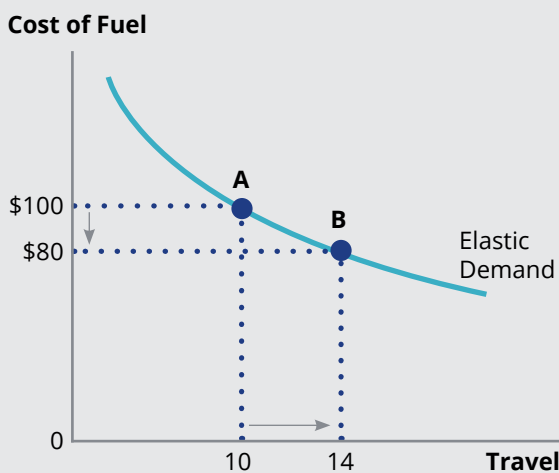
The U.S. exemplifies the Jevons paradox. Over the past decade, fracking (short for fracturing) and horizontal drilling have sparked an oil boom that made it the world's largest oil producer. By 2023 U.S. output (including crude, condensate, and liquids) reached roughly 22% of global oil production.⁷ Fracking unlocked vast reserves of previously inaccessible shale oil, particularly in key basins like the Permian (Texas & New Mexico), Bakken (North Dakota) and Eagle Ford (Texas).

Efficiency gains allowed producers to extract oil at lower costs, reversing the decline in U.S. oil output that began in the 1970s. U.S. crude production hit record highs (around 12–13 mbd of crude, and over 20 mbd including natural gas liquids and biofuels), overtaking Saudi Arabia and Russia. Simultaneously, the U.S. remains the world's largest oil consumer at about 20 mbd – roughly 20% of global consumption⁸. Chart 3 and 4 highlight U.S. field production of oil and oil energy consumption in terawatt hours (TWh).

Petrochemicals Demand Is Rising

Petrochemicals: the chemicals derived from oil and gas that form the building blocks for plastics, fertilizers, synthetic fibers, and countless consumer products, are experiencing rising global demand. These materials are integral to modern life, found in everything from packaging and construction materials to automotive parts and agricultural fertilizers. Global petrochemical feedstock already accounts for about 12% of world oil demand⁹, a share that is expected to grow as consumption of plastics, fertilizers, and other petrochemical-derived products increases. In fact, petrochemicals have become one of the largest drivers of oil demand growth: they are projected to represent over one-third of oil demand growth to 2030 and nearly half by 2050 (see chart 5).

Chart 2: The Rebound Effect in the Context of Elastic Demand



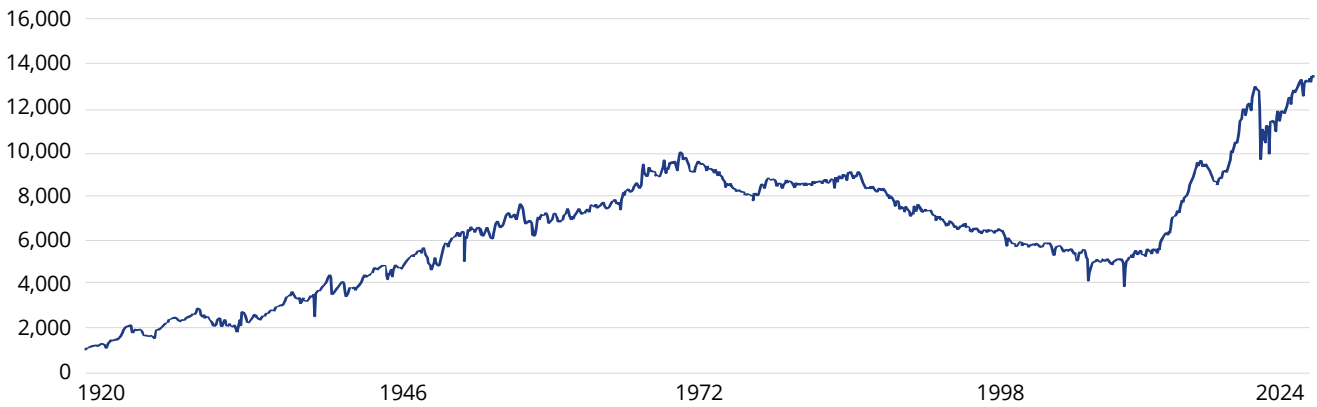
Source: Wikipedia. (2025, May 4). Jevons paradox.

⁷ United States produces more crude oil than any country, ever - U.S. Energy Information Administration (EIA). (2024). <https://www.eia.gov/todayinenergy/detail.php?id=61545>

⁸ Frequently asked questions (FAQs) - U.S. Energy Information Administration (EIA). (2024). <https://www.eia.gov/tools/faqs/faq.php?id=709&t=6>

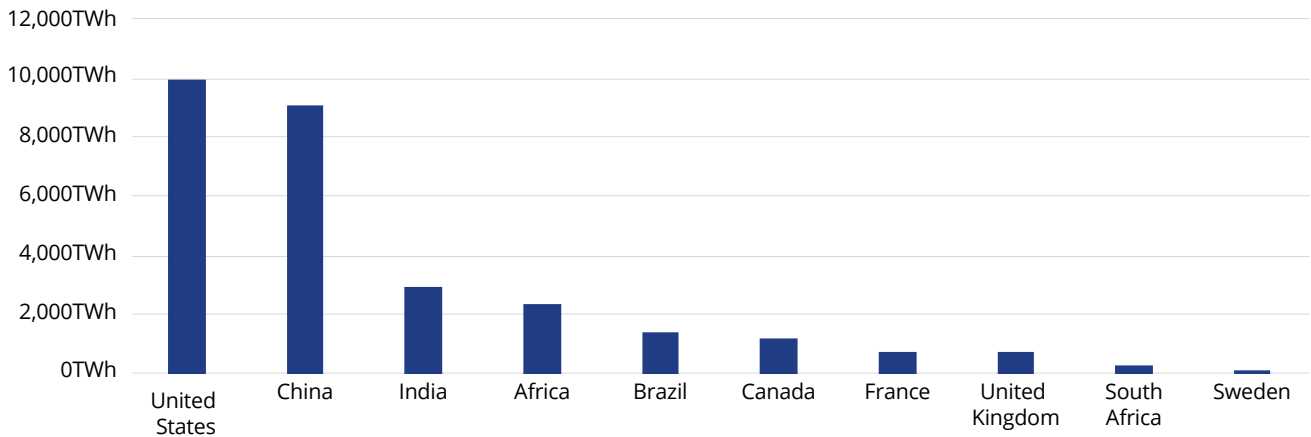
⁹ The Future of Petrochemicals – Analysis - IEA. (2018, October 1). IEA. <https://www.iea.org/reports/the-future-of-petrochemicals>

Chart 3: U.S. Field Production of Crude Oil (Thousand Barrels per Day)



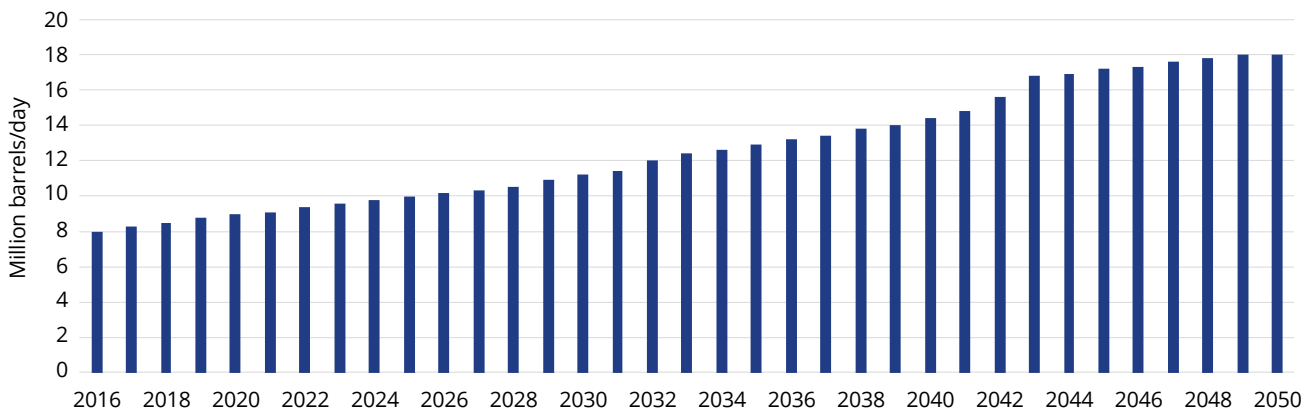
Source: U.S. Energy Information Administration(1920 - 2025)

Chart 4: Oil Energy Consumption TWh



Source: Energy Institute - Statistical Review of World Energy (2024)

Chart 5: Global Oil demand for petrochemicals

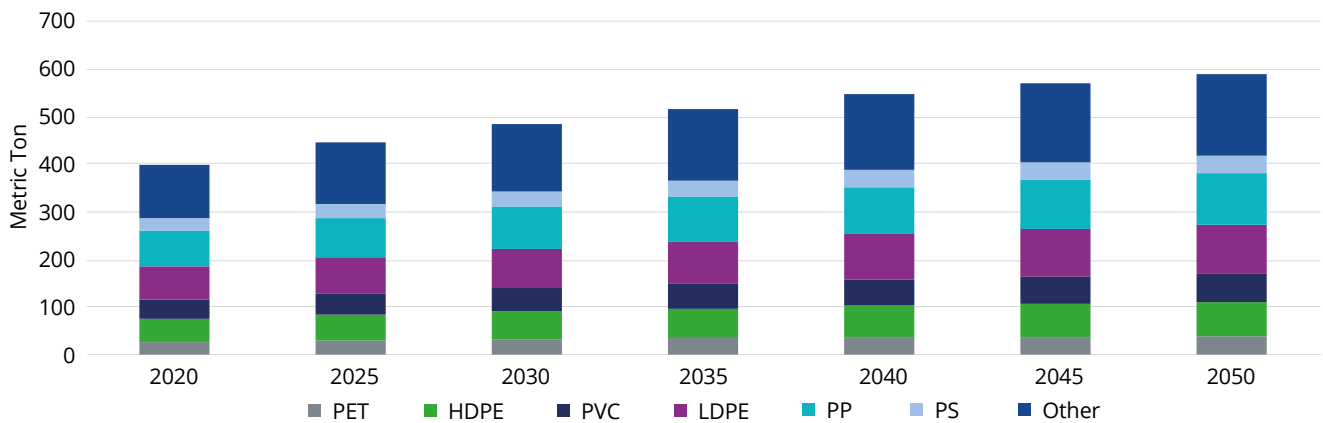


Source: BloombergNEF 2024 Petrochemical Feedstock Outlook Oil demand based on BNEF's Economic Transition Scenario
 The chart contains quantitative projections (2025-2050) that qualify as future performance. Forecasts and projections presented in this document are not a reliable indicator of future performance and may be subject to change without notice.

Chart 6 is showing the current and expected global production volumes of key thermoplastics, including polyethylene (PE), polypropylene (PP), polyvinyl chloride (PVC), polystyrene (PS), and polyethylene terephthalate (PET). These materials represent the most widely used classes of plastics, forming the backbone of applications in packaging, construction, automotive, and consumer goods. U.S. producers of petrochemicals feedstocks have substantially

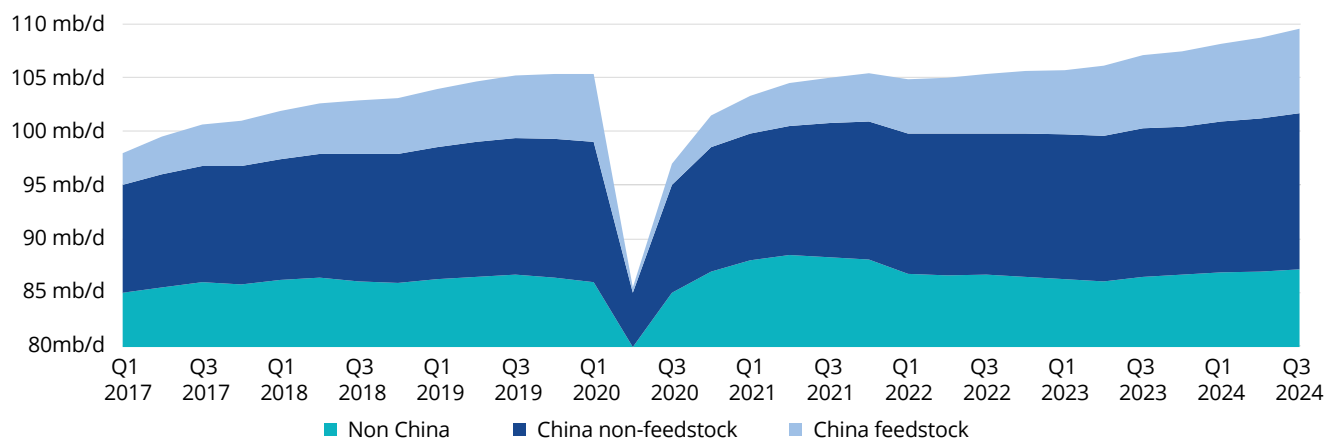
increased their exports in recent years, especially to China, where the petrochemical industry has been surging. Indeed, China's petrochemical surge is a major factor in global oil demand. Here, too, efficiency is increasing, with the country adding as much production capacity from 2019 to 2024¹⁰ as previously existed in Europe, Japan and Korea combined (see chart 7).

Chart 6: Production of key thermoplastics 2020-2050



Source: IEA (2020), Production of key thermoplastics, 1980-2050, IEA, Paris <https://www.iea.org/data-and-statistics/charts/production-of-key-thermoplastics-1980-2050>, Licence: CC BY 4.0
 The chart contains quantitative projections (2025-2050) that qualify as future performance. Forecasts and projections presented in this document are not a reliable indicator of future performance and may be subject to change without notice.

Chart 7: Global and Chinese quarterly oil demand



Source: IEA (2024), Global and Chinese quarterly oil demand, 2017-2024



¹⁰ "China's petrochemical surge is driving global oil demand growth", IEA (2023) <https://www.iea.org/commentaries/china-s-petrochemical-surge-is-driving-global-oil-demand-growth>

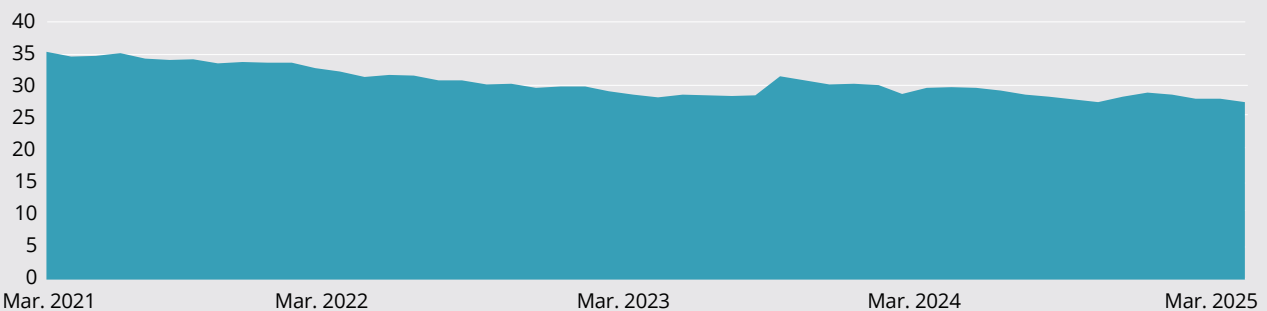
VanEck Oil Services UCITS ETF (OIHV)

Oil remains indispensable to economies worldwide, with its production being transformed by new extraction techniques. The VanEck Oil Services UCITS ETF (OIHV) offers investors exposure to companies at the forefront of this evolution, balancing innovation with the ongoing need for reliable energy production. However, the fund does not promote environmental or social characteristics and is not aligned with any specific sustainable investment objective. Oil services companies are critical enablers of the energy supply chain. They provide technology and expertise to optimize drilling, while maximizing the recovery of oil and gas. These innovations improve cost efficiency and extend the economic life of oil fields.

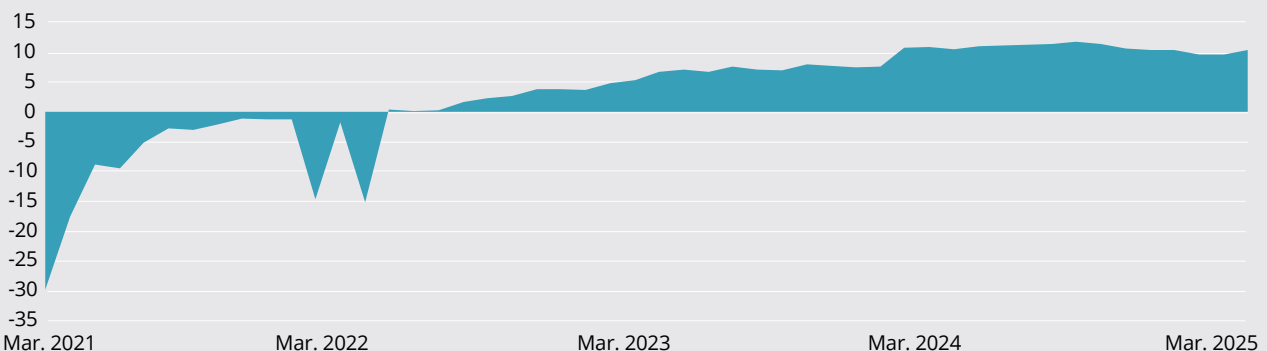
The oil services sector has historically shown periods of resilience, although future performance is not assured. While oil prices can be volatile, the demand for drilling, maintenance, and production optimization tends to persist, making it likely that service providers remain important through both industry booms and downturns, though it's important to note that demand can decline during prolonged periods of low prices. Risks remain significant in the oil services sector. Profitability often fluctuates in line with exploration budgets, which are highly sensitive to crude oil price changes. Environmental regulations continue to evolve, with the potential to alter the viability of long-term fossil fuel infrastructure projects. Furthermore, global geopolitical tensions and supply chain vulnerabilities may influence both production continuity and service demand.

Oil services companies listed on public equity markets appear to be improving their profitability and gradually reducing debt levels, as suggested by the graphs below. They have reduced their financial leverage in the past four years and have raised profit margins. The first chart below shows how leverage has fallen, depicting the debt-to-capital ratio, measuring a company's total debt as a percentage of its total capital (debt plus equity) over the trailing 12 months (TTM). Meanwhile, the net margin TTM shows how much net profit a company has generated for every unit of revenue, again over a trailing 12 months.

Debt to Capital TTM



Net Margin TTM



Source: Morningstar data as of 30/04/2025 (March 2021 – April 2025)

Conclusion

Improvements in oil extraction along with cars' greater fuel efficiency appears to be boosting consumption. Consequently, rising efficiency may play a part in delaying the day when oil consumption peaks. While some forecasters foresee oil demand peaking in just five years from now, others disagree.

The International Energy Agency's baseline scenario has peak oil happening by 2030, with British Petroleum presenting a similar estimate.¹¹ Meanwhile, the U.S. Energy Information Administration's reference case has demand growing steadily through to 2050¹².

Whichever of these estimates is correct, the Jevons paradox looks set to play a part in boosting consumption. And oil services companies, with their efficient practices, will play a part in that.

Author



Alessandro Valentino
Product Manager,
VanEck

Important Information

This is marketing communication. Please refer to the prospectus of the UCITS and to the KID/KIID before making any final investment decisions. These documents contain the complete description of the fund's risks.

These documents are available in English and the KIDs/KIIDs in local languages and can be obtained free of charge at www.vaneck.com, from VanEck Asset Management B.V. (the "Management Company") or, where applicable, from the relevant appointed facility agent for your country.

For investors in Switzerland: VanEck Switzerland AG, with registered office in Genferstrasse 21, 8002 Zurich, Switzerland, has been appointed as distributor of VanEck's products in Switzerland by the Management Company. A copy of the latest prospectus, the Articles, the Key Information Document, the annual report and semi-annual report can be found on our website www.vaneck.com or can be obtained free of charge from the representative in Switzerland: Zeidler Regulatory Services (Switzerland) AG, Neustadtgasse 1a, 8400 Winterthur, Switzerland. Swiss paying agent: Helvetische Bank AG, Seefeldstrasse 215, CH-8008 Zürich.

For investors in the UK: This is a marketing communication for professional investors only. Retail clients should not rely on any of the information provided and should seek assistance from an IFA for all investment guidance and advice. VanEck Securities UK Limited (FRN: 1002854) is an Appointed Representative of Sturgeon Ventures LLP (FRN: 452811), which is authorised and regulated by the Financial Conduct Authority (FCA) in the UK, to distribute VanEck's products to FCA regulated firms such as Independent Financial Advisors (IFAs) and Wealth Managers.

This information originates from VanEck (Europe) GmbH, which is authorized as an EEA investment firm under MiFID under the Markets in Financial Instruments Directive ("MiFID"). VanEck (Europe) GmbH has its registered address at Kreuznacher Str. 30, 60486 Frankfurt, Germany, and has been appointed as distributor of VanEck products in Europe by the Management Company. The Management Company is incorporated under Dutch law and registered with the Dutch Authority for the Financial Markets (AFM).

This material is only intended for general and preliminary information and shall not be construed as investment, legal or tax advice. VanEck (Europe) GmbH and its associated and affiliated companies (together "VanEck") assume no liability with regards to any investment, divestment or retention decision on the basis of this information. The views and opinions expressed are those of the author(s) but not necessarily those of VanEck. Opinions are current as of the publication date and are subject to change with market conditions. Information provided by third party sources is believed to be reliable and have not been independently verified for accuracy or completeness and cannot be guaranteed.

VanEck Oil Services UCITS ETF (the "ETF") is a sub-fund of VanEck UCITS ETFs plc, an open-ended variable capital umbrella investment company with limited liability between sub-funds. The ETF is registered with the Central Bank of Ireland, passively managed and tracks an equity index. Investing in the ETF should be interpreted as acquiring shares of the ETF and not the underlying assets.

Investing is subject to risk, including the possible loss of principal. Investors must buy and sell units of the UCITS on the secondary market via an intermediary (e.g. a broker) and cannot usually be sold directly back to the UCITS. Brokerage fees may incur. The buying price may exceed, or the selling price may be lower than the current net asset value. The indicative net asset value (iNAV) of the UCITS is available on Bloomberg. The Management Company may terminate the marketing of the UCITS in one or more jurisdictions. The summary of the investor rights is available in English at: complaints-procedure.pdf (vaneck.com). For any unfamiliar technical terms, please refer to ETF Glossary | VanEck.

No part of this material may be reproduced in any form, or referred to in any other publication, without express written permission of VanEck.

© VanEck (Europe) GmbH ©VanEck Switzerland AG © VanEck Securities UK Limited

¹¹ Matthew Higgins and Thomas Klitgaard, "Will Peak Demand Roil Global Oil Markets?," Federal Reserve Bank of New York Liberty Street Economics, April 14, 2025. IEA World Energy Outlook (2024) and BP Energy Outlook (2024)

¹² Venkatachalam, V. (2024, March 26). Oil and gas in the global economy through 2050. Canadian Energy Centre. <https://www.canadianenergycentre.ca/oil-and-gas-in-the-global-economy-through-2050/>