What's Market: US Oil & Gas Sector 2022 in Review

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A review of the US oil & gas sector in 2022, including a discussion of pricing, production, and upstream financing trends and recent legal and regulatory developments. This Article also discusses trends and developments that may affect the US oil & gas sector in 2023.

Following a strong 2021, the US oil & gas sector had a rollercoaster year in 2022. Crude oil and natural gas prices skyrocketed following Russia's invasion of Ukraine in February, but pulled back in the later part of the year as the sector dealt with interest rate hikes, fears of a global recession, and uncertain demand from China. European demand, a major driver of the price increases, also fell amid rising crude oil and natural gas inventories and a warmer than expected winter.

The high prices led to record profits for US oil & gas producers, which enabled them to reduce their debt, strengthen their balance sheets, and increase shareholder returns. Despite enjoying record profits, upstream producers are at an inflection point. Russia's invasion of Ukraine and the resulting volatility in oil & gas prices are accelerating investments in clean energy technologies as countries seek more stable and less geopolitically sensitive sources of energy.

However, many governments now accept that the energy transition may be slower and more patchy than they had expected or envisioned and fossil fuels will remain part of the world's energy mix for some time as they try to balance energy security, affordability, and sustainability (the energy trilemma). But they also recognize that long term reliance on these sources may be problematic and are pursuing strategies to reduce this reliance.

In response to these trends and to be more attractive to more climate sensitive buyers and investors and remain commercially viable, some producers are implementing initiatives to reduce the carbon intensity of their operations. However, much remains to be done, especially in the private sector, to reduce greenhouse gas (GHG) emissions. Given the volatility and cyclical nature of oil & gas prices and the variability of demand, the failure to adapt to these trends may result in reduced financing options, stakeholder litigation, and stranded assets.

Despite the headwinds facing the industry in 2023, including uncertain demand, inflation, regulatory uncertainty, commodity price volatility, and the increase in clean energy investment, oil & gas producers' focus on capital discipline, debt repayment, and reinforcing their balance sheets since the price collapse of 2014 means that the sector is better placed to weather another price downturn and possibly avoid the hundreds of bankruptcies of 2015-2018.

This Article examines these challenges and other developments in the US upstream oil & gas segment in 2022, including:

- · Crude oil and natural gas pricing trends.
- US oil & gas production trends.
- Financing trends, including changes in loan terms generally and reserves-based loans (RBLs), specifically focusing on oil & gas hedges, sustainability-linked loans (SLLs), and the increased popularity of alternative financing sources, such as securitizations.
- Key legislative and regulatory developments, including actions taken by the Biden administration to reduce methane and other GHG emissions.

This Article does not discuss the impact of these developments on the midstream segment (notably natural gas pipelines and liquefied natural gas (LNG)),



which will be discussed in separate resources (see, for example, Article, US LNG Sector: 2022 in Review).

This Article also considers the outlook for this segment in the near and medium terms and analyzes how certain geopolitical developments, new regulations, and policy initiatives may shift priorities for oil & gas investment and development (see Looking Forward: High Level of Uncertainty for 2023).

2022 Overview

2022 was a tumultuous year for the US oil & gas sector, marked by price volatility, geopolitical tensions, and economic uncertainty. In response to Russia's invasion of Ukraine in February, the US and other G7 countries, the EU, and Australia imposed economic and trade sanctions on Russia to stifle its ability to finance the war. They excluded Russia from the Society for Worldwide Interbank Financial Telecommunication (SWIFT) bank messaging system and revoked Russia's most favored nation (MFN) import status, resulting in significantly higher tariffs on Russian exports. The US also banned the import of Russian crude oil, but given that Russian hydrocarbons and petroleum products represented about 7% to 8% of total US imports before 2022, this sanction was more symbolic than impactful (see Energy Information Administration (EIA): US Imports from Russia of Crude Oil and Petroleum Products and Practice Note, US Oil & Gas Industry: Overview).

The bans on Russian crude oil imports by the EU and the UK in December 2022 are expected to be more significant since before 2022, the EU and UK imported about 30% and 9%, respectively, of their crude oil from Russia. A price cap on seaborne Russian-origin crude oil also went into effect on December 5, 2022, and on Russian petroleum products on February 5, 2023. These caps, coupled with the restrictions on trading, brokering, financing, shipping, insuring and reinsuring, flagging, and customs brokering of these products sold in excess of the caps, are expected to have a more significant impact on Russian revenues.

Russia was able to replace the lost EU and UK exports in 2022 (which were falling even before the caps) with higher exports to China, India, and Turkey, but maintaining this may prove more difficult in 2023 and beyond. Although it has been reported that Russia is using a shadow fleet to circumvent the sanctions and bans, most oil cargo ships are owned by Greek shipping companies and insured and reinsured by European companies. Large parts of

the oil & gas value chain are also financed by European, American, and Japanese banks and the risk of liability and reputational harm is keeping many of them out of the Russian market. For more information on these sanctions, see Practice Notes, US Sanctions and Export Controls on Russia: Tracker, Biden Administration Energy and Climate Change Policies and Regulations: 2023 Tracker: Price Caps on Russian Crude Oil and Petroleum Products and Russia Sanctions and Related Considerations Toolkit.

The EU has not imposed a ban on Russian natural gas, but these volumes fell significantly following Russia's suspension of supplies to Europe in August because of the sanctions, the sabotage of the Nord Stream 1 pipeline between Russia and Germany, and voluntary reductions by European buyers. However, even before the sanctions, bans, and price caps, Russia had sought to gain geopolitical advantage by periodically curtailing the flow of pipeline gas to Europe (for example, Russia suspended flows of natural gas on the Yamal-Europe pipeline for several weeks between November 2021 and February 2022).

These developments reduced the amount of Russian oil & gas in the European market, leading to a spike in prices as European countries competed to replace these supplies from other sources. Europe offset the decline in Russian crude imports by increasing supplies from Norway, the Middle East, West Africa, and Brazil and the decline in gas imports with US LNG. US LNG imports in the first 11 months of 2022 were more than 137% higher than for the same period in 2021 (see Reuters, Column: U.S. LNG Exports Both a Lifeline and a Drain for Europe in 2023 (Dec. 21, 2022)). Russia was able to reroute much of its oil & gas to India, China, and Turkey, although at discounted prices and higher operational costs.

The realignment of the global oil & gas markets prevented major energy disruptions in Europe but at a significant cost. Brent crude prices and Henry Hub natural gas prices skyrocketed, rising to highs of \$139.13 per barrel in March and \$9.85 million British thermal unit (MMBtu) in August respectively (see Pricing Trends). US LNG prices also rose, although LNG spot prices were much higher in Europe and Asia. These prices averaged \$16.72 per MMBtu in August 2022, double the price in August 2021 (\$8.34 per MMBtu) (see EIA: Price of Liquefied U.S. Natural Gas Exports (Dollars per Thousand Cubic Feet)).

As these prices rose, countries that were unable to compete with European buyers increased their use of coal and other energy sources. Europe, which had historically received about 30% of its crude oil and 30% to 40% of its natural gas from Russia, was also forced to re-evaluate its reliance on Russian fossil fuels more generally and look for ways to diversify its energy sources. In May 2022, the European Commission presented the REPowerEU Plan which is intended to "accelerate [the] clean energy transition and increase Europe's energy independence from unreliable suppliers and volatile fossil fuels" (see Legal Update, REPowerEU: European Commission adopts package to end EU's reliance on Russian fossil fuels; see also Legal Update, European Commission publishes Communication: A Green Deal Industrial Plan for the net-zero age). Some countries, including South Korea and Japan, are also looking to increase their nuclear energy use to decrease their dependence on foreign sources of energy.

To mitigate the impact of the higher prices on US consumers, President Biden authorized significant releases from the Strategic Petroleum Reserve (SPR) and encouraged higher US and OPEC production. Neither group was receptive to this message. Although US production grew, it was not high enough to meet the higher demand. Chronic underinvestment in oil & gas drilling in recent years caused by fears of a return to the oversupplied market and low prices of 2014-2015, regulatory uncertainty, and investor focus on capital discipline limited the amount by which US production could be increased (see Production Trends). Even producers that may have wanted to increase production were limited by labor shortages, the high costs of equipment, and supply chain issues.

However, many industry groups and politicians blamed the Biden administration for the higher prices including the administration's commitment to reducing GHG emissions, its suspension of certain oil & gas leases, and its refusal to expand drilling in certain areas. They were also critical of the administration's policy directives to administrative agencies, including those that require financial institutions to prioritize or consider climate change in their credit decisions. It is worth noting that even if the Biden administration had proceeded with lease auctions under the oil & lease program as scheduled, they would not have produced oil & gas in time to impact the high prices given the time it takes to develop these acreages. However, future prices and concerns about oil & gas supplies can affect present transactions and participants' views of the sector. For more information on these issues, see Articles, Biden Administration Energy and Climate Change Policies and Regulations: 2022

Tracker: Oil and Gas Leasing on Federal and Tribal Lands and Biden Administration Energy and Climate Change Policies and Regulations: 2021 Tracker: Oil & Gas Leasing on Federal and Tribal Lands.

The high prices and resulting soaring profits led many producers to announce significant dividends and shareholder buybacks as they sought to repay their investors for the lean years of half a decade ago (see Capital Discipline and Stock Buybacks). The volatility in oil & gas prices limited M&A activity, however, as buyers and sellers found it difficult to price their deals and agree on asset valuations. However, larger producers with strong balance sheets and high stock valuations were able to close strategic deals that consolidated their presence in key basins. Many smaller producers, facing high costs and limited financing options, and under pressure from capital providers, also found it easier to sell. Feeling less pressure from stakeholders and seeing an opportunity for high returns at least in the next five to ten years, private equity investors continued to increase their presence in this sector by buying acreage in key basins (see M&A Activity).

Some commercial banks and institutional investors are pulling back from financing oil & gas operations and reducing their exposure to the upstream oil & gas segment in response to stakeholder and regulator concerns about climate change or to comply with or implement their sustainability strategies under their environmental, social, and governance (ESG) policies. Some commercial banks (especially large foreign ones) are committed to reducing their GHG emissions and have reduced their scope 1 and scope 2 emissions by, among other things, entering into renewable energy power purchase agreements, but their scope 3 emissions (GHG emissions from upstream and downstream activities in their value chains, which make up the bulk of the sector's emissions output) remain high with their financing operations representing the largest contributor of these emissions.

Lenders that are the most focused on energy transition and believe that oil & gas demand will decrease soon are also grappling with stranded asset risk and general uncertainty about the long-term viability of investments in the oil & gas sector as the energy transition moves forward and regulations that may require them to modify how they operate to address climate-related risks are adopted (see Bank Management of Climate-Related Financial Risks: Regulatory Tracker and Article, Glossary of Decarbonization Terms (October 2022)). To address these issues, some lenders are encouraging their clients to take advantage of sustainable financing products, but with limited success (see Box, SLLs in the Oil & Gas Industry).

These issues have limited many producers' access to the banking and capital markets. It is worth noting, however, that some producers with healthy balance sheets and diversified assets that could have accessed these markets elected to focus instead on debt repayment and shareholder returns. However, some private and smaller producers, shut out of the bank and capital markets, sought alternative sources of financing, including assetbacked securitizations (see Alternative Financing Sources).

Key Market Trends

Capital Discipline and Stock Buybacks

Soaring energy prices led many large oil & gas producers to enjoy record-breaking earnings in 2022. However, producers maintained tight control over their capital expenditures. Some analysts expect upstream capex to increase by 10% to 15% in 2023, but this is not significant when adjusted for inflation and are lower than prepandemic levels.

Instead of using their excess profits to invest in oil & gas development or increase shale production, many of these companies used the higher revenues to pay down debt and boost shareholder returns, in the form of dividends and stock buybacks. In the first half of 2022, five of the world's biggest oil companies (BP, Chevron, Exxon Mobil, Shell, and TotalEnergies) invested more than \$20 billion on buybacks (see Reuters, Exxon, Chevron post blowout earnings, oil majors bet on buybacks (Jul. 29, 2022)).

Despite criticism from the Biden administration, this trend continued in the second half of the year and into 2023, with several oil supermajors announcing plans to further expand their buyback programs (for example, ExxonMobil raised its share buyback program to \$50 billion through 2024 (previously \$30 billion through 2023), Shell pledged to buy back \$4 billion in shares and lifted its dividend by 15%, and Chevron released a plan to buy back \$75 billion in stock and hike its dividend) (see Reuters, Factbox: Bumper profits fuel surge in dividends, buybacks at oil firms (Jan. 31, 2023)).

Acceleration of Clean Energy

The fallout from Russia's invasion of Ukraine and the resulting volatility in oil & gas prices have forced

many countries to reconsider their reliance on these energy sources in the long term. Although fossil fuel use increased across the globe as countries sought to ensure access to sufficient energy to meet their needs, the volatility has resulted in increased investments in less geopolitically unstable sources, such as renewable, nuclear, and other clean energy technologies, as they seek to balance short-term energy needs with long-term energy affordability, security, and sustainability goals.

Despite the backlash from certain states and investors, ESG issues continued to gain traction, especially among public oil & gas companies, which face increased pressure from lenders and investors to prioritize climate-related risks (see Article, Glossary of Decarbonization Terms (October 2022)). For more information on this backlash, see Practice Note, Key Developments in State ESG Law: 2022 Tracker.

According to the fall 2022 update from the Haynes and Boone and EnerCom Oil and Gas ESG tracker, 100% of the producers surveyed included some type of ESG policy in their corporate reports; in the spring 2021 report, this number was 70%. According to the report, an increasing number of the producers surveyed are now disclosing some type of GHG emissions data (83% compared to 53% from spring 2021) although less than 25% of these producers have incorporated net zero emissions targets. Only a few producers are including information on scope 3 emissions. Private oil & gas companies are not under the same pressure and have not experienced the same level of urgency, and have therefore been less focused on implementing ESG as a corporate policy.

US oil & gas producers (public and private) lag behind other sectors in decarbonizing their operations, but they must consider these long term trends as they develop their long term strategies and make adjustments to their operations to respond to these pressures. Recognizing and accepting this trend, a few oil & gas companies have entered into SLLs that have key performance targets tied to emission reductions (see Box, SLLs in the Oil & Gas Industry). Some producers are also incorporating carbon capture and sequestration (CCS) technology in their operations and investing in hydrogen technology.

According to the Global Status of CCS 2022 report, CCS, which can capture up to 90% of the carbon dioxide emissions produced from the use of fossil fuels, climbed by 44% during the past 12 months, reaching 244 million tonnes per annum, with 61 new facilities added to the pipeline. The Inflation Reduction Act (IRA) (P.L. 117-169) also expanded the tax credits for carbon capture projects, which is expected to further increase investment. For more information on CCS and Section 45Q credit, see Practice Notes, Understanding the Carbon Capture, Utilization, and Sequestration (CCUS) Value Chain, Regulatory and Real Property Considerations for Carbon Capture and Sequestration (CCS) Projects and Article, Biden Administration Energy and Climate Change Policies and Regulations: 2022 Tracker: Carbon Removal Technology Funding.

Interest in hydrogen has also increased during the past several years, rising 5% between 2020 and 2021, according to the International Energy Agency (IEA). While still in preliminary stages, there is significant federal support for hydrogen development including increased funding, which is expected to facilitate the development of this technology (see Practice Note, Biden Administration Energy and Climate Change Policies and Regulations: 2023 Tracker: Hydrogen Funding and Article, Biden Administration Energy and Climate Change Policies and Regulations: 2022 Tracker: Hydrogen Technology Development Funding).

Pricing Trends

Crude Oil Prices

The sector experienced significant volatility in 2022 as companies dealt with several factors, ranging from geopolitical disruptions to uneven demand.

Russia's invasion of Ukraine and the international response (sanctions and divestiture of Russian oil & gas assets) were significant drivers in pushing prices higher. According to the Energy Information Administration (EIA), Brent crude oil, the global benchmark, averaged roughly \$101 per barrel in 2022, up from an average of \$71 per barrel in 2021 (see EIA: Short-Term Energy Outlook (February 2023)).

In February 2022, Brent crude oil prices surpassed \$105/b for the first time since 2014. Prices continued to rise into March, when prices peaked at \$139.13/b, the highest level since 2008 (see EIA: Europe Brent Crude Spot Prices). While high, these prices were muted by soft demand in China because of its strict COVID-19 policy that limited economic activity in certain parts of the country.

Despite predictions that oil prices may climb even higher, prices began to fall in the second half of the year in

part because of higher global oil inventories that led to lower demand. Commercial inventories held in the countries of the Organization for Economic Co-operation and Development (OECD) rose to 2.74 billion barrels by November 2022, up from 2.6 billion barrels in March 2022. While still low compared to 2020 levels, it was an improvement, putting downward pressure on prices.

The Federal Reserve also adopted a more hawkish stance towards inflation in its monetary policy and issued numerous interest rate hikes throughout the year, including several set at 75 basis points, strengthening the US dollar. As a result, dollar-denominated commodities (such as crude oil) became more expensive for holders of foreign currencies.

The US benchmark, West Texas Intermediate (WTI), was also elevated during this period. WTI prices rose around 7% in 2022, averaging about \$95/b for the year. For more information, see EIA: Crude oil prices increased in first-half 2022 and declined in second-half 2022 and EIA: Short-Term Energy Outlook (February 2023).

Oil prices are expected to be lower in 2023. According to estimates from the EIA, Brent prices are expected to average about \$84/b in 2023 and \$78/b in 2024. WTI crude oil prices are likely to follow a similar trajectory, with the EIA forecasting \$78/b in 2023 and \$72/b in 2024 (see EIA: Short-Term Energy Outlooks (January 2023) and (February 2023)).

However, these prices depend on the development of the war in Ukraine and Russia's response to the sanctions and price bans. President Putin has already issued a decree banning the supply of crude oil for five months starting February 1, 2023, to countries that comply with the price cap (see Reuters, Putin Bans Russian Oil Exports to Countries that Implement Price Cap (Dec. 28, 2022)).

Russia also announced in February that starting in March, it is reducing oil production by 500,000 barrels per day, around 5% of its output, which led to a slight increase in prices (see Reuters, Russia to cut oil output by 500,000 bpd in March (Feb. 10, 2022)). China's lifting of its strict lockdown rules and the resumption of economic activity (despite the higher infection rates) and a material decline in crude oil inventories may also put upward pressure on prices.

For a chart depicting Brent crude oil prices during the past few years (and estimates as of February 2023), see:

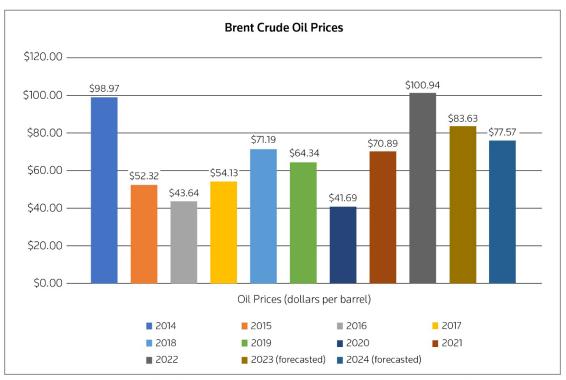
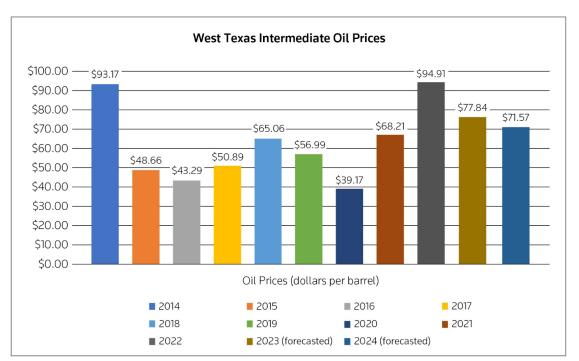


Figure 1: Price (dollars per barrel) of North Sea Brent crude oil, the international benchmark, since 2014 (Data from the Energy Information Administration as of February 2023).



For a chart depicting WTI crude oil prices during the past few years (and estimates as of February 2023), see:

Figure 2: Price (dollars per barrel) of West Texas Intermediate oil, the US benchmark, since 2014 (Data from the Energy Information Administration as of February 2023).

Natural Gas Prices

Natural gas prices at the national benchmark Henry Hub averaged roughly \$6.42 per MMBtu in 2022, up 53% from 2021 and the highest average since 2008 (see EIA: Henry Hub Natural Gas Prices).

Prices were volatile throughout the year. In February and March, high demand from Europe and weather-related issues in the US caused prices to spike from \$4.03/MMBtu to \$6.70/MMBtu. Elevated levels remained throughout the spring, reaching more than \$9.00/MMBtu in early June. Prices fell in July but started climbing again throughout the next few weeks. On August 22, Henry Hub prices peaked at \$9.85/MMBtu, up 60% from the beginning of the year. Prices fell towards the end of the year amid increased production and greater storage injections, especially in Europe, bottoming out at \$3.46/MMBtu on November 9, 2022 (a drop of 65% from August 22).

According to a Reuters report, as of December 2022, EU member states had filled 84% of their gas storage capacity. However, prices picked up again in December as colder weather increased demand for natural gas (see EIA: Henry Hub Natural Gas Prices).

The EIA forecasts that Henry Hub natural gas spot prices are likely to decrease from the levels observed in 2022, averaging \$3.40/MMBtu in 2023 (a decrease of 30% from the EIA's January forecast due to mild winter temperatures) and \$4.04/MMBtu in 2024 (see EIA: Short-Term Energy Outlook (February 2023)).

For a chart depicting Henry Hub prices over the past few years (and estimates as of February 2023), see:

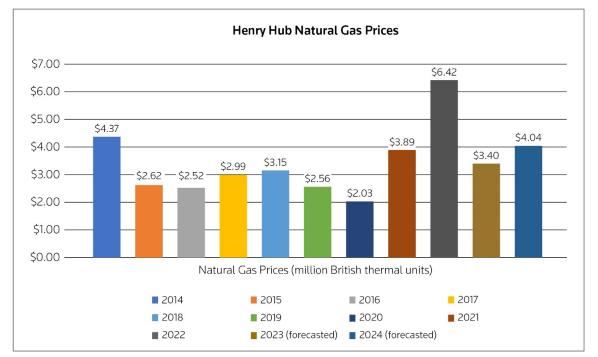


Figure 3: Natural Gas Prices (million British thermal units) at Henry Hub (the national benchmark) (Data from the Energy Information Administration as of February 2023).

Production Trends

US rig counts increased in 2022 from 601 in January 2022 to 780 in December, as production increased. Although higher than in 2021, these were considerably lower than the average of about 1100 rigs in 2018 and 2019 (see EIA: U.S. Crude Oil and Natural Gas Rotary Rigs in Operation).

Crude Oil Production

Despite OPEC production cuts, overall crude oil production increased in 2022 as production increased from non-OPEC sources.

OPEC+ Production

According to the EIA, OPEC+ accounted for roughly 34% of total petroleum liquid production in 2022. The group

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increased production throughout most of 2022 (with production increases generally ranging between 430,000 b/d to 650,000 b/d), but it had difficulty achieving its targets. With oil prices reaching record levels as a result of Russia's invasion of Ukraine, the Biden administration sought to convince OPEC to increase production. OPEC resisted this pressure and in August agreed to increase oil output by a modest 100,000 b/d. A few months later, OPEC announced its plan to cut production by 2 million b/d from November onward, its most significant supply cut since 2020.

Although OPEC argued that its production levels were motivated by fears of a recession, lower demand from China, and a desire to avoid the price collapse of 2014 to 2015, the Biden administration criticized the move, characterizing the cuts as a "shortsighted decision." OPEC reaffirmed this stance at the December meeting, with supply cuts expected to continue throughout 2023.

Despite these cuts, crude oil production from OPEC member countries averaged roughly 28.7 million b/d in 2022 (see EIA: Short-Term Energy Outlook (January 2023)). In November 2022, the Biden administration loosened sanctions on Venezuela through General License 41, which permitted Chevron to resume production of petroleum products in Venezuela for sale and export to the US (see Practice Note, US Sanctions Against Venezuela: Authorizations for Certain Transactions Related to Chevron's Joint Ventures in Venezuela). A bounce in Nigerian oil production also boosted OPEC's output.

US Production

The EIA forecasts that the US is to remain a significant driver of crude oil production in the near future. US crude oil production averaged 11.9 million b/d in 2022, its second highest year on record. The EIA estimates production to push even higher during the next two years, averaging 12.5 million b/d in 2023 and 12.7 million b/d in 2024 (see EIA: Short-Term Energy Outlook (February 2023)). These forecasts exceed the current record high of 12.3 million b/d reached in 2019.

For a chart depicting US production trends during the past few years (and estimates as of February 2023), see:

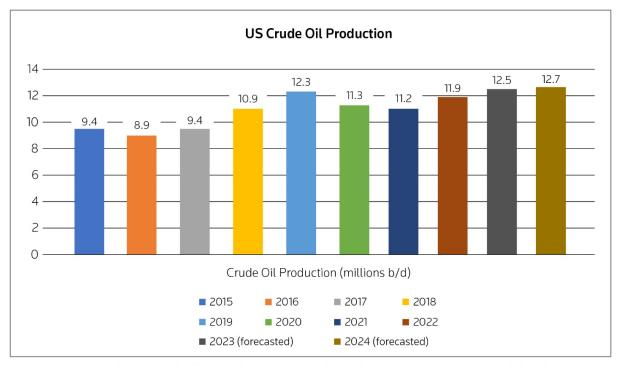


Figure 4: US Crude Oil Production (millions b/d) since 2015 (Data from the Energy Information Administration as of February 2023).

To reduce oil prices, President Biden announced in early 2022 that his administration was allowing a drawdown of approximately 180 million barrels of oil from the SPR by the end of October. Following OPEC's decision in October

2022 to cut production, President Biden announced the release of an additional 10 million barrels from the SPR. The administration released more than 221 million barrels of oil from the reserve in 2022 (see EIA: Petroleum & Other

Liquids, Weekly U.S. Ending Stocks of Crude Oil in SPR (2022)). Inventories are at their lowest levels in almost 40 years. To replenish the SPR, mandated sales scheduled for fiscal years 2024-2027 have been cancelled, although the 2023 scheduled sales will proceed. The Biden administration has also announced that it intends to purchase more barrels. For more information on the SPR, see Article, Biden Administration Energy and Climate Change Policies and Regulations: 2022 Tracker: Release of Oil from the Strategic Petroleum Reserve and Practice Note, Biden Administration Energy and Climate Change Policies and Regulations: 2023 Tracker: Strategic Petroleum Reserve.

Many oil & gas industry groups and politicians blamed the high prices and the subsequent need to sell US oil reserves on President Biden's oil & gas policies, including its suspension of lease auctions in 2021 before judicial challenges and the IRA forced it to change course (see Legal Updates, Federal Judge Enjoins Biden Administration Pause of Fossil Fuel Leases and Permits on Public Lands and Inflation Reduction Act: Key Energy Provisions: Oil and Gas Provisions).

Russian and Non-OPEC Production

The EIA forecasts Russia's oil output will average 9.9 million b/d in 2023 and 9.8 million b/d in 2024, down from 10.9 million b/d in 2022 (see EIA: Short-Term Energy Outlook (February 2023)). The price cap and Putin's decree are expected to reduce flows of Russian oil to certain countries, although this may be muted by higher exports to China, India, and other Asian countries.

US oil production may help to replace some of the missing Russian barrels. Other non-OPEC countries, such as Canada, Brazil, Guyana, and Norway, also helped boost global oil inventories. According to the EIA, non-OPEC liquid fuels production averaged 65.8 million b/d in 2022. The EIA forecasts these numbers to increase slightly during the next two years, to 67 million b/d in 2023 and 67.9 million b/d in 2024 (see EIA: Short-Term Energy Outlook (February 2023)).

Natural Gas Production

US dry natural gas production increased throughout 2022, averaging approximately 98 billion cubic feet per day (Bcf/d), up from 93.4 Bcf/d in 2021. According to the EIA, pipeline infrastructure development in the Haynesville region in Louisiana and east Texas and in the Permian region in west Texas and southeast New Mexico led to an uptick in drilling.

The EIA forecasts production to increase during the next two years, averaging 100.3 Bcf/d in 2023 and 101.7 Bcf/d in 2024 (see EIA: Short-Term Energy Outlook (February 2023)). These production increases depend on the completion of the scheduled pipeline projects and domestic and global gas demand.

For a chart depicting US natural gas production during the past few years (and estimates as of February 2023), see:

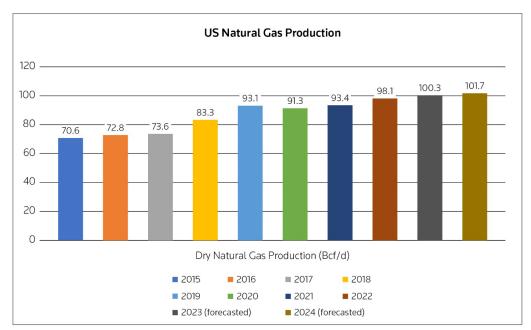


Figure 5: US Natural Gas Production (billion cubic feet per day) since 2015 (Data from the Energy Information Administration as of February 2023).

Oil & Gas Financing Trends

Several European banks have announced that they intend to reduce or suspend financing for new fossil fuel projects. For example, Credit Agricole announced its plans to eliminate new financing for oil extraction projects by 2025 and to reduce its oil exploration and production exposure by 25% while HSBC pledged to halt financing for new oil & gas field developments. Although many US lenders are limiting their exposure to the oil & gas industry, they have been more hesitant to announce a divestment from the sector. This may be due in part to their longstanding history financing fossil fuel projects and the current strength of the sector. Broad pronouncements may also be met with criticism from certain members of Congress and punitive actions from certain states.

According to data cited in a press release from several climate community groups, four US banks (JPMorgan Chase, Citibank, Wells Fargo, and Bank of America) comprise roughly 25% of the total global funding for the oil & gas industry and funneled more than \$1.2 trillion to the fossil fuel sector between 2016 and 2021. Lenders still continue to face shareholder pressure to prioritize clean energy in their financing decisions, which may lead many to take bolder steps in the years ahead. As a result of higher energy prices and healthier balance sheets, many in the industry proceeded to loosen their hedge requirements (see Hedging). Many oil & gas companies also increased their borrowing bases throughout the year (see Borrowing Base Redetermination). Other notable features observed in the market include amendments to pricing and negative covenants (see Other Financing Term Trends).

While no major divestment pronouncements have been made, many independent producers have found it difficult to secure bank lending and have turned to other sources, including securitizations and volumetric production payments (see Alternative Financing Sources). In turn, appetite for RBL loans appears to have shifted downward over the past several years:

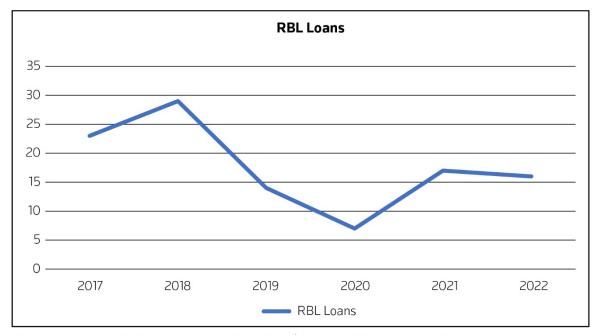


Figure 6: Number of RBL Loans from 2017 to 2022 (Data from What's Market, Credit Agreements: Comprehensive Deal Database)

Borrowing Base Redetermination

Most independent oil & gas producers rely on RBL facilities to finance their operations. The amount a borrower can borrow under an RBL facility is the lesser of the maximum credit amount and the borrowing base. Borrowing bases are not static; they may be increased or decreased depending on the value of a borrower's assets. To determine the borrowing base, the lenders look to the assets set out in the reserve report. Borrowing base redeterminations have fluctuated during the past several years. While 2020 was marked by mostly decreases and several postponements, 2021 saw a shift in sentiment as lenders issued more borrowing base increases and reaffirmations, as prices increased.

According to the Haynes & Boone Borrowing Base Spring 2022 survey, most participants were optimistic, estimating borrowing base availability was likely to increase, potentially by 20% or more. Only a few respondents predicted borrowing bases to decrease. Although respondents took a more cautious approach in the Haynes & Boone Borrowing Base Fall 2022 survey, forecasting borrowing capacity to remain relatively static and possibly even to decrease in some cases, some borrowing base increases were observed in the market during this period as well.

For examples of borrowing base redeterminations in both spring and fall 2022, see:

- Gulfport Energy Operating Corporation (May 2022), which had its borrowing base increased from \$850 million to \$1 billion.
- Penn Virginia Holdings, LLC (June 2022), which had its borrowing base increased from \$725 million to \$875 million.
- Amplify Energy Operating, LLC (June 2022), which had its borrowing base reaffirmed at \$225 million.
- Ranger Oil Corporation (September 2022), which had its borrowing base increased from \$875 million to \$950 million.
- Northern Oil and Gas, Inc. (November 2022), which had its borrowing base increased from \$1.3 billion to \$1.6 billion.
- Kimball Royalty Partners, LP (December 2022), which had its borrowing base increased from \$300 million to \$350 million.

For more information on borrowing base redeterminations, see Practice Note, Reserve Based Loans: Issues and Considerations: Re-Determining the Borrowing Base.

Hedging

Hedging can be a powerful financial management tool for oil & gas companies. A well-implemented oil & gas hedging strategy enables a producer to reduce price risk. The ability to lock in or establish a minimum price in advance that the oil & gas producer can receive in the marketplace for all or a portion of its expected oil & gas production gives the producer the advantage of predictable revenues in a future period and some measure of financial certainty. This certainty enables the oil & gas producer to:

- · Ensure steady and reliable revenue to service its debt.
- Budget for drilling operations under its existing oil & gas leases.
- Plan for and fund future exploration and production activities and growth opportunities, even during a period of declining or volatile prices.

For additional information on hedging, see Practice Note, Hedging Oil and Gas Production: Issues and Considerations.

Many oil & gas companies have historically had hedging measures in place. According to an Opportune LLP survey, which examined the 10-K filings for the 30 largest upstream public oil & gas companies, approximately 87% of the companies surveyed had hedge programs in place as of December 21, 2021 (see Opportune LLP: Article, **Oil & Gas Companies Continued To Hedge Before Price** Spikes). However, hedging practices shifted in 2022 in light of surging oil prices. According to the global trade organization Futures Industry Association (citing data from consulting firm Wood Mackenzie), in the second quarter, the companies surveyed hedged roughly 36% of their crude oil production (down 44% from the same period the year before) and 58% of their natural gas production (down 73% from the same period the year before).

Shale operators have sought to limit their exposure and mitigate potential losses by negotiating higher ceilings for their future hedges. Some companies cut their hedges or removed them altogether. For example, Pioneer Natural Resources, the biggest oil producer in the Permian Basin, announced in early January that it had closed out almost all of its hedges for 2022 (see 8-K, Pioneer Natural Resources Company (1/5/2022)), while shale producer Antero Resources Corp announced during an earnings call that it was the "least hedged" in its history and did not enter into any new hedges throughout 2022 (see Press Releases, 4/27/2022, 7/27/2022, 10/26/2022 and 2/15/2023). Similarly, Devon Energy Corp. hedged roughly 25% to 35% of its 2022 output (see 10-K, Devon Energy Corporation (2/16/2022)), significantly less than the 50% to 55% hedged for its 2021 production (see 10-K, Devon Energy Corporation (2/17/2021)).

For examples of credit agreement amendments that modified borrowers' hedging requirements, see:

- Energy 11 Operating Company, LLC (March 2022), which no longer required the company to enter into future hedging transactions provided the utilization rate was less than or equal to 35% of the borrowing base.
- Riley Exploration Permian, Inc. (April 2022), which amended the hedging requirements to be based on utilization of the borrowing base and the leverage ratio.
- HighPeak Energy, Inc. (June 2022), which modified the affirmative hedging covenant (decreased hedge from 60% to 25% and added a ratio requirement).

With prices pulling back in the second half of the year, hedging losses stabilized somewhat. According to data from Enverus (cited by Natural Gas Intelligence (NGI)), aggregate hedge losses fell from \$37 billion in the second quarter to \$16.3 billion during the third quarter. Still, the oil & gas sector appears under-hedged for 2023. According to data from Standard Chartered (cited by Natural Gas Intelligence), 2023's hedge ratio is only 16%, down from 39% the previous year and 81% in 2017, which could prove problematic if prices fall below some producers' expectations. Fewer hedges may impact cash flow, which could force some companies to scale back operations.

Other Financing Term Trends

A few key financing terms were also amended in 2022:

- Some lenders adjusted the margins on their RBL facilities during the spring and fall redetermination periods. Compare Crescent Energy Finance LLC (reduced the applicable margin by 50 basis points) to KLX Energy Services Holdings, Inc. (increased the applicable margin by 50 basis points).
- Some borrowers also negotiated exceptions to their negative covenant provisions. See SilverBow Resources, Inc. (added an investment basket to the investments negative covenant, allowing the company to provide deposits to third-party sellers up to the lesser of \$50 million and 10% of the borrowing base) and HighPeak Energy, Inc. (added a permitted lien basket related to the escrow account).

Alternative Financing Sources

With some larger banks exercising more restraint in lending to oil & gas producers, many energy companies have had to access capital using non-traditional financing structures. For a chart setting out the major differences between these types of financing and traditional financing sources, see Chart, Summary of Key Differences Among PDP Securitizations, RBLs, VPPs, and High Yield Debt.

Oil & Gas Securitizations

Securitizations of oil & gas assets have quickly become one of the most popular of these alternative financing structures to hit the market. In these transactions, the producer transfers proved, developed, and producing (PDP) wellbores with long production histories and low decline rates to a bankruptcy remote special purpose vehicle, which uses them to collateralize and generate principal and interest payments on publicly or privately offered debt securities that are issued to investors.

The first energy securitization hit the market in 2019 and they have become extremely popular during the past year. According to data from Guggenheim Securities (cited by Reuters), investors have sold more than \$3.9 billion of energy sector-related PDP securitizations in 2022, a significant increase compared to \$1.2 billion in 2021. Examples of 2022 securitizations include:

- Jonah Energy, which closed on a \$750 million securitized financing transaction, marking the largest PDP securitization to date.
- PureWest Energy, which finalized its second securitization in two years, a \$365 million ABS backed by certain natural gas assets.
- Diversified Energy Company PLC, which closed four securitizations in 2022:
 - a \$460 million ABS of certain co-owned producing natural gas and oil assets located in Oklahoma in October;
 - a \$445 million ABS of natural gas and oil assets in Appalachia in May; and
 - two transactions in February; a \$160 million ABS of Barnett Shale assets and a \$365 million ABS of Appalachian assets.

Market participants anticipate the market to continue to grow throughout 2023.

For more information on PDP securitizations, see Practice Note, Oil & Gas Asset-Backed Securitizations. For more information on RBLs, see Practice Note, Reserve Based Loans: Issues and Considerations: Categories of Reserves.

Volumetric Production Payments

While not a new structure, more producers are turning to VPPs to secure the necessary financing as the capital and credit markets remain tight for some independent producers. In these transactions, a company sells a fixed volume of its future production from a particular oil & gas lease during a specified period (daily or monthly) in exchange for an upfront payment. Once the buyer has received the agreed quantity of oil & gas, the VPP expires. The producer's obligations under the VPP are typically secured by its interest in the leases subject to the VPP. VPP transactions are appropriate for companies that cannot secure financing from bank lenders because of uncertainty regarding the company's reserves. Producers also receive favorable tax and accounting treatment.

For more information on VPPs, see Practice Note, An Overview of Volumetric Production Payments (VPPs): Issues and Considerations.

Other Market Developments

M&A Activity

Although market observers expected deal activity to continue strong at the beginning of the year, oil & gas M&A cooled in 2022 as the sector remained cautious in light of commodity price fluctuation due, in part, to increased geopolitical tensions and an uncertain economic climate. According to data from Enverus (also cited by Reuters), upstream oil & gas M&A deal value totaled roughly \$58 billion in 2022, dropping 13% compared to the same period last year (see Reuters, U.S. oil & gas M&A hit 17-year low; big firms dominate deals-report). Many oil & gas companies opted to use the increased cash flow from higher commodity prices to pay down debt and provide increased dividends to shareholders, instead of looking for opportunistic acquisitions.

Although acquisitions in the oil & gas sector were relatively low, consolidation remained a notable part of the industry's activity, with several larger players acquiring smaller companies. There were nine public oil & gas deals in 2022 (five in the first half and four in the second half) representing 7% of overall deal activity (see What's Market: 2022 Year-End Public M&A Wrap-Up). According to the WM Wrap-Up, M&A activity in the oil & gas sector has trended downward year-over-year from more than 14% in 2018.

Some notable public oil & gas deals in 2022 include:

 Chevron Corporation's acquisition of Renewable Energy Group, Inc, valued at \$3.15 billion (see What's Market, Chevron Corporation and Renewable Energy Group, Inc. merger summary). According to the press release, the transaction stepped up "progress toward Chevron's goal to grow renewable fuels production capacity to 100,000 barrels per day by 2030 and brings additional feedstock supplies and pre-treatment facilities."

- Oasis Petroleum Inc.'s combination with Whiting Petroleum Corporation, valued at \$6 billion (see What's Market, Oasis Petroleum Inc. and Whiting Petroleum Corporation merger summary). The newly combined company, named Chord Energy, created a scaled oil producer with assets across 972,000 net acres in the Williston Basin of North Dakota and Montana.
- The Hamm Family tender offer for Continental Resources, Inc., valued at \$4.308 billion (see What's Market, The Hamm Family tender offer for Continental Resources, Inc. summary). American oil entrepreneur Harold Hamm and family acquired the approximately 17% stake of Continental Resources it did not already own to take the shale company private.

Private equity has been active in the upstream oil & gas segment in recent years, making up the bulk of assets for sale, according to Enverus. There is also a lot of private equity capital waiting to be deployed in backing existing and new market entrants looking for assets to purchase. These investors have been opportunistic, buying acreage in key basins as other private equity-backed sellers exit the market, smaller independents look to divest for a variety of reasons, and some public companies look to consolidate their portfolios by selling assets located outside of their core areas of focus. We expect private equity to be a continued driver of activity in 2023, particularly if the commodity prices remain stable and at relatively high levels. As a result, oil and gas M&A activity is likely to remain strong in 2023.

One question is, as always, what will commodity prices do in 2023 as that has a direct impact on M&A activity. Volatility in commodity prices makes it difficult for buyers and sellers to narrow the bid/ask spread sufficient to transact. However, stable commodity prices create a more fertile environment for deal making. Commodity price volatility for both natural gas and crude oil in 2022 created an environment where sellers were unwilling to settle for less than their asking price (often calculated assuming a higher long term commodity price than was reflected by the markets) which may have chilled some activity and made it more difficult for smaller companies with less capital to tap into the market. Perhaps as a result, later in 2022, more transactions contained earn-outs and deferred payment mechanisms as part of the purchase price. If a volatile commodity pricing environment persists in 2023 then it is possible that the market will continue to see increased usage of earnouts and deferred payments as mechanisms to bridge the valuation gap between buyers and sellers in certain transactions (see Practice Note, What's Market: Earn-Outs and Negotiating Earn-outs Chart).

Although not representative of private oil & gas M&A activity overall, according to the What's Market, Private Acquisition Agreements database which covers publicly filed acquisitions of private US companies of at least \$25 million (see What's Market for a more detailed explanation of scope), oil & gas was the second most active industry in 2022, with 19 oil & gas deals representing roughly 12% of deal activity.

Energy and Environmental Legislative and Regulatory Developments

As President Biden moved into the second year of his term, he continued to take steps to implement his administration's agenda, with the oil & gas sector remaining a central focus. In addition to sanctions placed on Russia and increased LNG exports to Europe, the Biden administration took several steps to tackle climate change and reduce GHG emissions, including issuing several regulations to limit emissions from oil & gas operations (see Legal Updates, EPA Issues Supplemental Proposal to Regulate Methane Emissions from the Oil & Gas Industry and EPA Proposes Rule to Regulate and Reduce Methane Emissions from the Oil & Gas Sector).

One of the most notable actions of the past year was the passage of the IRA. Although the IRA provides significant funding for clean energy, it also includes several provisions related to the oil & gas industry, including modifying the federal oil & gas leasing program to increase royalty rates and implementing policies to discourage venting and flaring. Most importantly, however, it requires the Biden administration to hold several oil & gas lease auctions, including many that had been suspended or cancelled, and imposes a fee on oil & gas producers that exceed a certain level of methane gas emissions, marking the first time the federal government has directly placed a fee on GHG emissions. For more information on the IRA, see Legal Update, Inflation Reduction Act: Key Energy Provisions.

For more information on significant Biden administration actions and initiatives on climate, energy, and environmental issues in 2022, see Article, Biden Administration Energy and Climate Change Policies and Regulations: 2022 Tracker. For information on steps taken so far this year, see Practice Note, Biden Administration Energy and Climate Change Policies and Regulations: 2023 Tracker.

Sustainable Financing

Interest in sustainable financing products remained strong as companies continued to look for ways to

improve their ESG performance. Several diverse types of financial instruments are designed to promote sustainable investments and help companies meet their ESG goals, including green loans, SLLs, social loans, social impact bonds, green bonds, social bonds, and sustainabilitylinked bonds.

SLLs are the fastest growing category of sustainable debt and represent an increasingly large percentage of the sustainable financing market, in large part because they do not require loan proceeds to be used for a specific purpose. They instead incentivize a borrower to improve its ESG performance by linking the margin on the loans to pre-determined sustainability performance targets (SPTs) as measured by pre-defined key performance indicators (KPIs). The margin is either increased or decreased depending on whether the borrower meets the agreed SPTs. The SPTs that must be met are varied and range from environmental or energy-related targets to social or governance-related ones.

While SLLs have grown significantly in recent years, oil & gas producers are not well represented in this market, despite pressure from investors, environmental groups, and other stakeholders to prioritize ESG in their business decisions and reduce the carbon intensity of their operations. Only a few public companies in the sector have entered into SLLs.

Of this limited number, only one has significant GHGs emissions (see Occidental Petroleum Corporation credit agreement (In December 2021, Occidental Petroleum became the first US upstream oil & gas company to enter into an SLL that includes targets for reductions in its carbon dioxide equivalent emissions)). Although they produce the majority of US oil & gas, private E&P companies, which are not subject to the same pressure or litigation risk from investors, have been even less inclined to focus on ESG.

SLLs in the Oil & Gas Industry

Practical Law Finance analyzed publicly filed credit agreements in the oil & gas industry from 2021 and 2022 to survey market practice. The analysis included all industry segments as well as companies that provide key services to E&P companies.

Of the 87 credit agreements analyzed, only six deals (approximately 7%) were characterized

as SLLs. The SPTs were varied and reflected all three ESG pillars. Consistent with other SLL transactions, the margin adjustments for meeting or failing to comply with the agreed targets were also modest. For examples, see the summaries for:

- DCP Midstream, which included a target for reducing GHG emissions and exceeding midstream industry peers in safety.
- Kinetik Holdings LP, which included a target for achieving a certain percentage of female corporate officers.
- Select Energy Services LLC, which included a target for maintaining an employee health and safety threshold.

Looking Forward: High Level of Uncertainty for 2023

Oil & gas industry participants anticipate a high level of uncertainty in 2023. Oil & gas prices are once again likely to be impacted by developments in Russia and China.

As the world approaches the one-year anniversary of the start of the invasion, the economic sanctions placed on Russia have been showing their effects. While Russian energy exports increased in 2022, Russian companies were forced to sell their products at discounted prices and at higher costs given the longer distances the cargoes needed to travel. These discounts have continued into 2023. The price caps and related services bans are also affecting Russian oil & gas revenues, which fell by about 40% in January 2023.

Whether these bans continue to affect Russian revenues and global energy prices depend on Russia's response to the sanctions and bans, its ability to sell more products to China and India, its success at securing new buyers, and Chinese and Indian refining capacity. Russian crude oil shipped to India and China and refined in those countries are not affected by the bans on petroleum products. OPEC also announced that it:

- Does not intend to increase production to replace the 500,000 b/d that Russia is removing from the market.
- Intends to maintain the production volumes agreed to at the end of 2022 to avoid oversupply and a collapse in oil revenues.

Although it came at a high price, the EU was able to buttress its crude oil and natural gas inventories in 2022, staving off a serious gas crisis. However, gas shortages remain a significant threat for the EU in 2023 and beyond. While US LNG supplies were instrumental in helping Europe maintain its gas supplies, the EU may face more competition for LNG supplies if demand from China increases. Although Freeport LNG is expected to resume operations in March 2023 after being idled since June 2022 following an accident, no new US LNG export facilities are expected to reach commercial operations in 2023, limiting the amount of new US LNG coming to market (see Article, US LNG Sector: 2022 in Review).

China is one of the biggest wildcards in terms of prices and demand. With the termination of its zero-Covid policies and strict lockdowns, its demand for oil & gas may rise, putting upward pressure on prices. However, a surge in COVID cases may put any economic recovery on hold.

Market observers anticipate oil & gas producers to continue to prioritize shareholder distributions and debt repayments, but an increase in investment is expected. According to the Energy Intelligence 2023 outlook, global upstream capex may potentially reach \$485 billion in 2023, up 12% year-over-year.

Still, spending is expected to fall short of the more than \$700 billion level seen during the 2013-2014 boom. US shale production may remain muted because of economic constraints, such as higher drilling costs and general and administrative expenses, supply chain bottlenecks, and a tight labor market. The US inflation rate remains high and the Federal Reserve may continue to issue interest rate hikes throughout 2023.

The passage of the IRA gave some regulatory certainty to the sector as lease auctions were resumed and are expected to continue as part of the deal to increase renewable energy development. However, regulatory challenges remain, including insufficient pipeline infrastructure to transport added production, methane regulations, including the new methane fees, and potential climate-related disclosure rules. Banks are also under internal and external pressure to better manage their scope 3 emissions caused by their financing operations, which may affect their lending operations in the oil & gas sector.

The enormous profits earned by upstream producers in 2022 has also attracted potential legislative action. President Biden has proposed a windfall tax and several members of Congress have introduced legislation; Rhode Island Senator Sheldon Whitehouse introduced a bill in the Senate to tax the windfall profits of large oil & gas companies and give the proceeds as a consumer rebate, with California Representative Ro Khanna submitting a similar bill in the House. Oregon Senator Ron Wyden also proposed a 21% tax on profits of companies with an annual revenue exceeding \$1 billion. Market watchers do not expect this legislation to pass through Congress.

Investment in clean energy technologies is expected to continue as countries try to reduce their reliance on fossil fuels and companies try to meet their sustainability goals. US investment is also expected to increase as companies take advantage of the clean energy provisions of the IRA.

While many of these initiatives will take time to impact the market, as many of the technologies under consideration

are not yet commercially viable on a large scale (for example, hydrogen and direct air capture), a clear trend to reduce US GHG emissions seems to be emerging. Oil & gas producers may need to accelerate their efforts to reduce their emissions if they are to be part of the energy transition and continue to access key markets.

In addition to the RePowerEU Plan, EU officials announced in December 2022, the Carbon Border Adjustment Mechanism which imposes a tax on imports based on their GHG emissions. While this plan is likely to be challenged, it and other EU plans to reduce their emissions may have a significant impact on US oil & gas exports to that market. For more information, see Practice Note, EU Carbon Border Adjustment Mechanism (CBAM).

Practical Law is continuing to monitor these developments and produce content where appropriate.

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