

Future Cities

The Changing Outlook for U.S. Oil- & Gas-Producing Markets

VIEWPOINT

CBRE RESEARCH
APRIL 2022

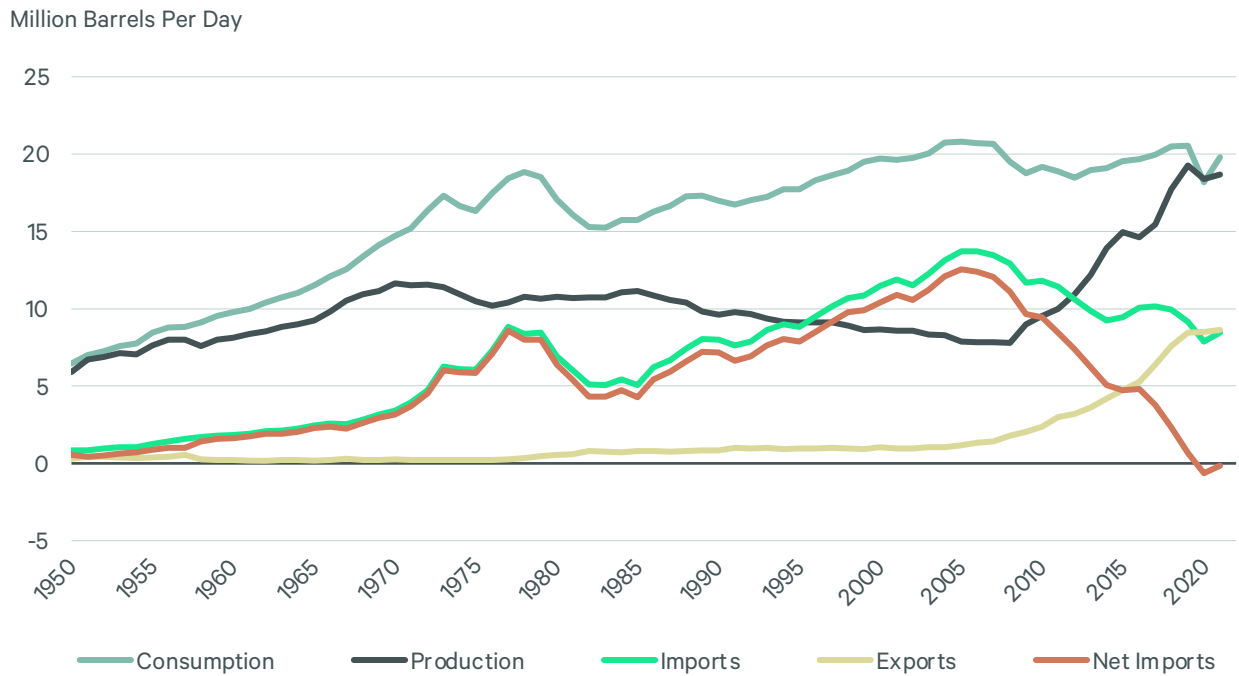


Executive Summary

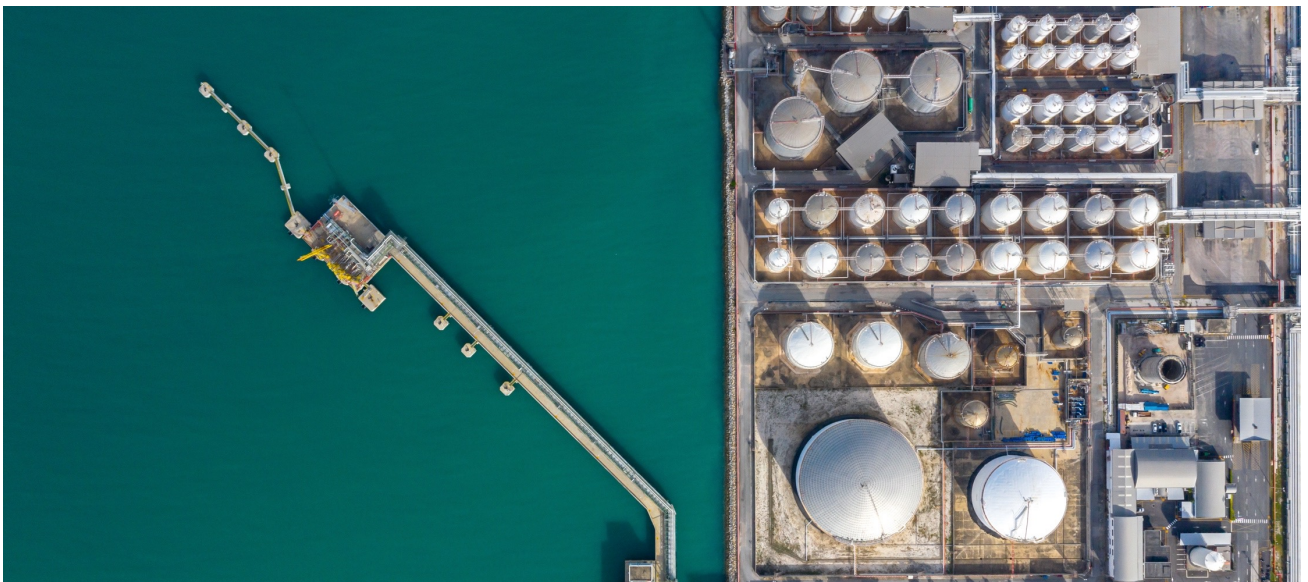
As a leading producer and exporter of petroleum and natural gas, the U.S. is positioned to help Europe reduce its dependence on Russia for its energy needs following the invasion of Ukraine. Potential commercial real estate impacts in major U.S. oil- and gas-producing markets include:

- Increased production activity driving oilfield services demand for warehouse and manufacturing space as companies build inventories.
- Limited supply of manufacturing facilities causing users to modify warehouse or distribution space for oilfield parts manufacturing, adding demand to an already booming industrial sector.
- Increased demand for liquefied natural gas (LNG) and planned production capacity increases need for additional back-office space.
- Big energy companies with long-term capital budgets for exploration/production maintaining their office footprint.
- Energy companies requiring more in-office workers for collaborative work, helping to stabilize the size of their office footprints.

Figure 1: U.S. Petroleum Consumption, Production, Imports, Exports & Net Imports, 1950-2021



Source: U.S. Energy Information Administration (EIA), Monthly Energy Review, March 2022; CBRE Research.



U.S. Capacity to Offset Russian Natural Gas Exports to Europe

There is an opportunity for the U.S. LNG industry to help offset any reduction in European imports of natural gas from Russia. Approximately 45% of total U.S. natural gas exports are in liquefied form. Top destinations are China, South Korea, Japan, Brazil and, in recent years, Europe.

Europe receives about 45% of its natural gas from Russia via pipeline or LNG. Europe’s largest source of LNG is the U.S. (26% of LNG imports), followed by Qatar (24%) and Russia (20%).

U.S. exports of LNG to Europe have increased dramatically in 2022. The U.S. Energy Information Administration (EIA) reports that the U.S. exported a record 6.5 billion cubic feet per day (bcfd) of LNG to Europe in January—accounting for more than half of Europe's LNG imports for the month. If 14 new federally approved LNG projects are built, the U.S. could roughly double its LNG exports to Europe by 2026.

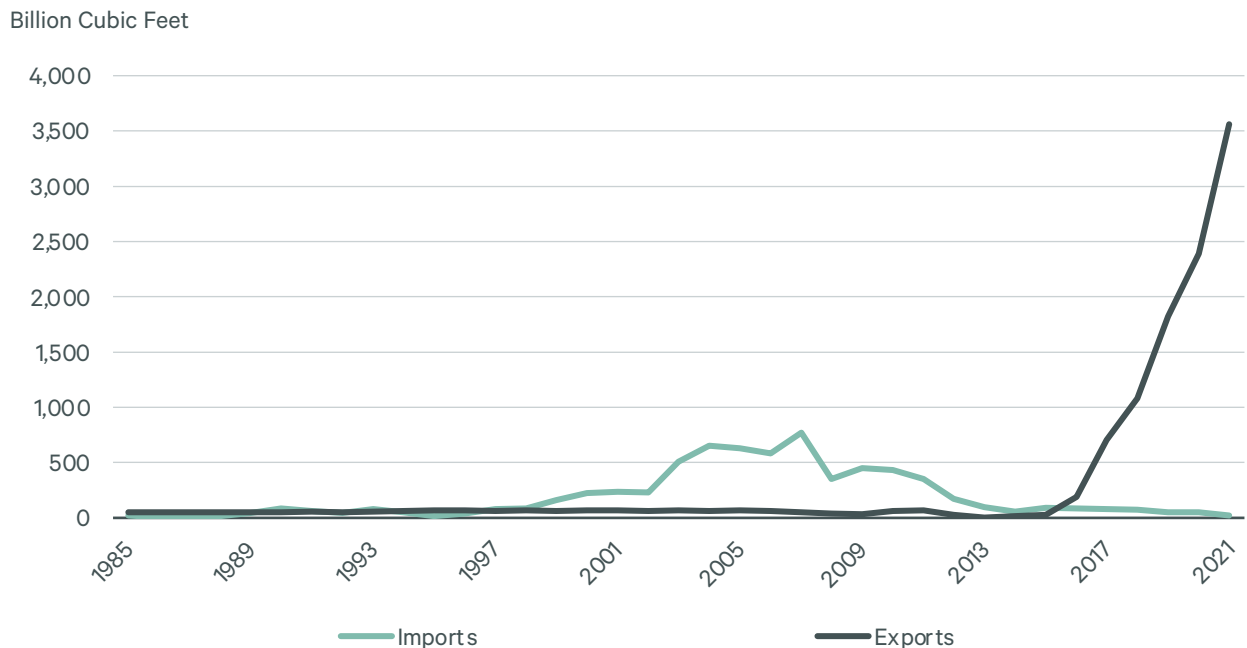
Share of Europe's natural gas supply from Russia

45%

Share of Europe's LNG imports from U.S.

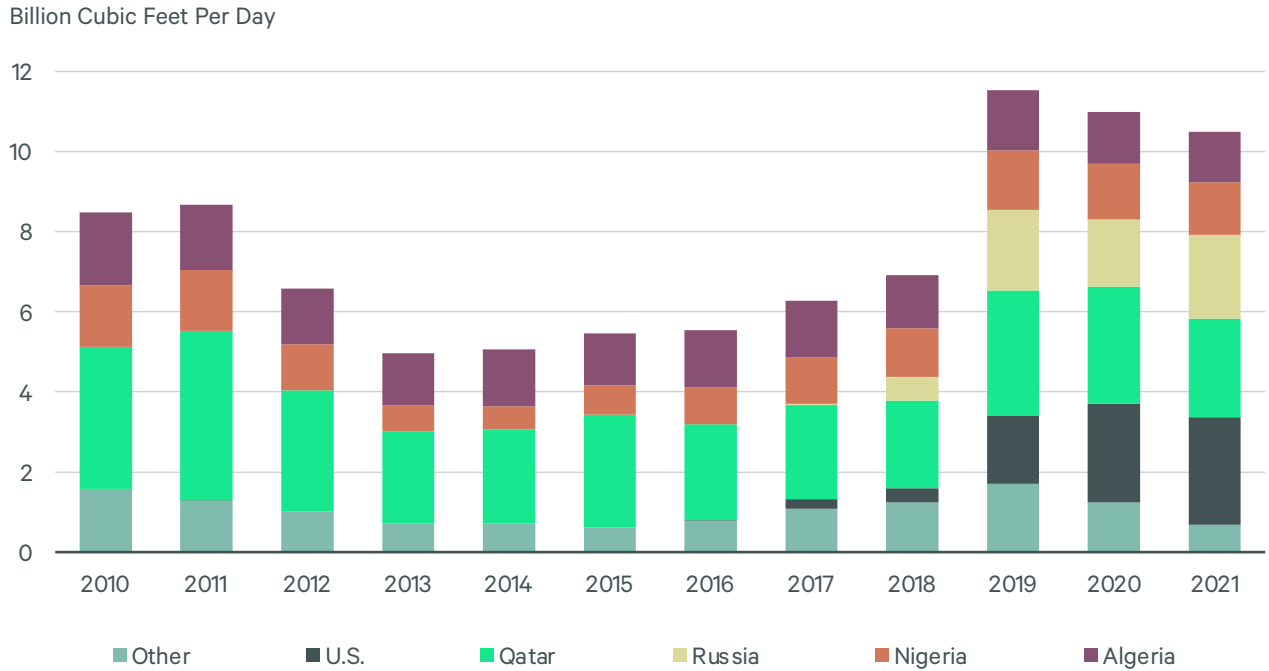
26%

Figure 2: Total U.S. LNG Exports Set Record in 2021

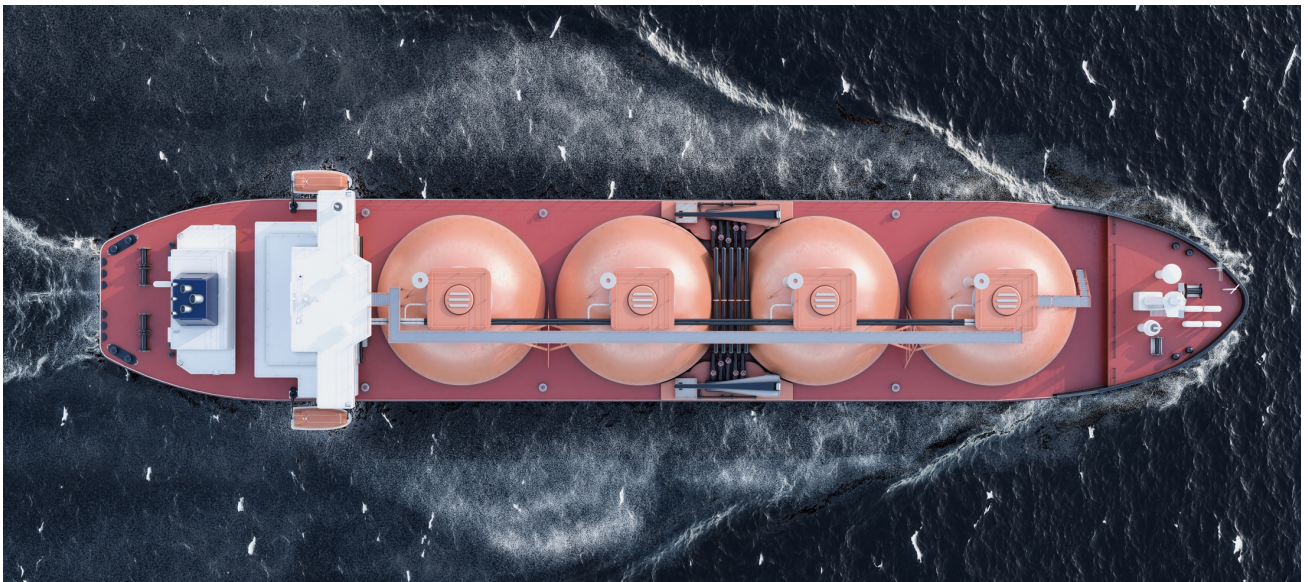


Source: U.S. Energy Information Administration (EIA), Natural Gas Annual, March 2022; CBRE Research.

Figure 3: Europe LNG Imports by Source Country (2010-2021)



Source: Graph by CBRE Research, based on data from the International Group of Liquefied Natural Gas Importers (GIIGNL) annual liquefied natural gas trade reports and CEDIGAZ.



Economic Impacts of Rising Energy Prices

West Texas Intermediate (WTI) crude oil prices increased by 65% year-over-year as of April 13 and remain volatile, while the average price of gasoline rose by 43% over the same time frame.

Despite the dramatic rise in gasoline prices, U.S. consumers have continued to spend on goods, services and travel. This could change in the summer vacation months if gasoline and jet fuel prices remain elevated. So far, with pent-up demand and consumer cash, the tourism and hospitality sectors have been resilient.

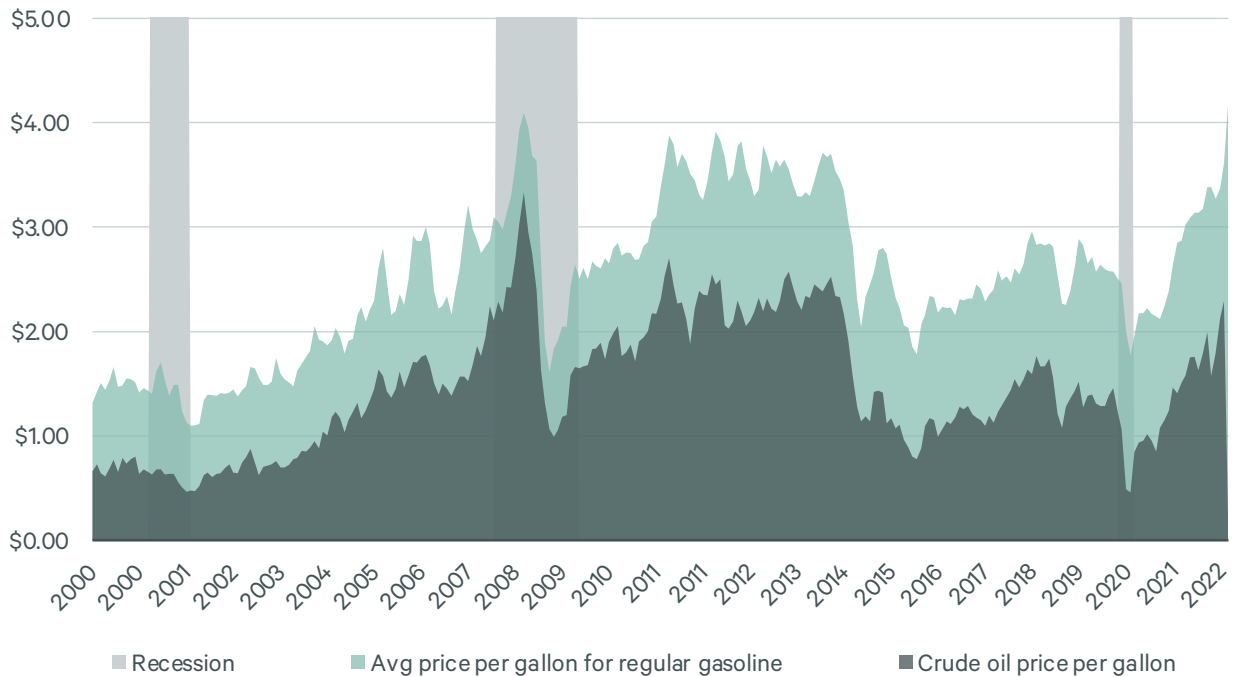
Year-over-year increase in WTI crude oil price

65%

Year-over-year increase in average U.S. gasoline price

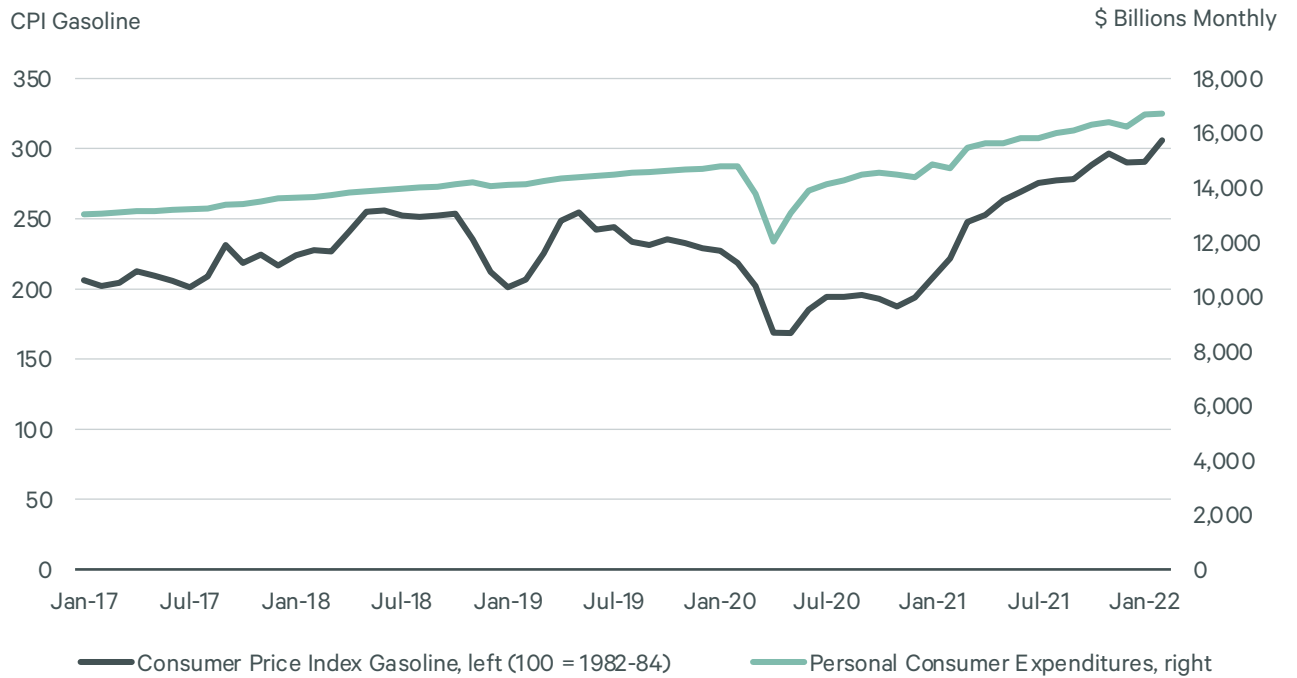
43%

Figure 4: Average U.S. Price per Gallon of Regular Gasoline and Crude Oil



Note: Crude oil is usually measured per barrel; one barrel = 42 gallons.
 Source: EIA, retrieved from FRED, prices are end of month period; CBRE Research.

Figure 5: U.S. Gasoline Costs & Consumer Expenditures



Source: U.S. Energy Information Administration, retrieved from FRED, Federal Reserve Bank of St. Louis; CBRE Research.



Despite the dramatic rise in gasoline prices, U.S. consumers have continued to spend.

Potential Impact to Jobs

Total U.S. nonfarm jobs have been rising since the dramatic COVID-induced drop in April 2020 and are nearing their pre-pandemic level. Oil & gas jobs are up by more than 16% year-over-year through February but were still 15% less than their pre-COVID level.

The U.S. oil industry has been producing more with less labor over the past five years due to technological advances and increased efficiencies. Crude oil production per worker has nearly tripled from 10 years ago.

Historically, there had been a consistent correlation between the price of oil and the number of rigs. But in the past two years, rig counts, while slowly increasing, have lagged skyrocketing oil prices. There are half as many active rigs than there were seven years ago coming out of the fracking boom.

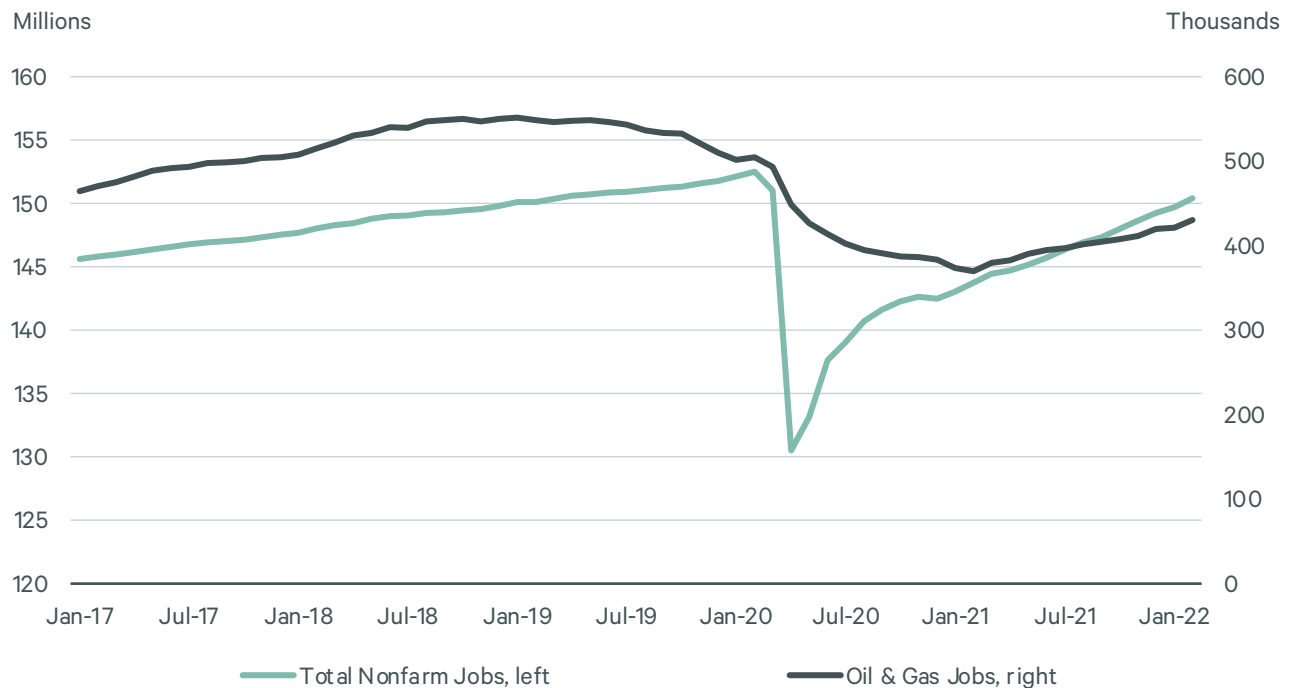
Year-over-year increase in oil & gas jobs through February

16%

Technology-driven increase in crude oil production per worker

300%

Figure 6: Total U.S. Nonfarm and Oil & Gas Jobs



Source: U.S. Bureau of Labor Statistics (Oil & Gas consists of Oil and Gas Extraction, Support Activities for Mining, and Pipeline Transportation), retrieved from FRED, Federal Reserve Bank of St. Louis; CBRE Research.

Figure 7: Crude Oil Barrels per Oil & Gas Job



Source: EIA; U.S. Bureau of Labor Statistics (Oil & Gas consists of Oil and Gas Extraction, Support Activities for Mining, and Pipeline Transportation), retrieved from FRED, Federal Reserve Bank of St. Louis; CBRE Research.

Figure 8: WTI \$/Barrel and Rig Counts



Note: a 12-week lag applied to rig counts improves the statistical relationship with WTI oil price (i.e., $r^2 = 0.87$).
 Source: EIA.gov; Primary Vision; CBRE Research, April 2022.

Oil & Gas Employment Clusters

The U.S. oil and gas industry is concentrated in a handful of regions. More than a quarter of the nation's 100 largest oil fields are in Texas, which accounted for 43% of the nation's crude oil production in 2021. In addition, Texas has approximately 30% of the nation's total refining capacity. Texas oil and gas employment is concentrated in Houston, Dallas/Ft. Worth, San Antonio and Midland-Odessa. Additional employment clusters are in Denver, Oklahoma City, Tulsa, Pittsburgh and New Orleans. Combined, these markets employ nearly 80% of U.S. oil and gas workers.

Texas share of total U.S. crude oil production

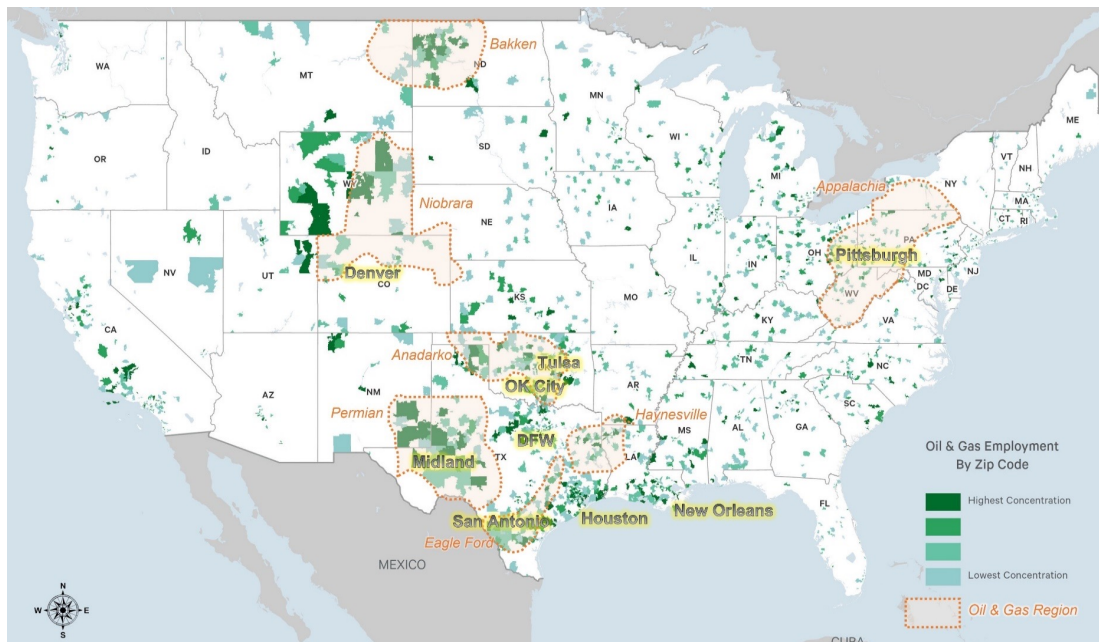
43%

Texas share of total U.S. refining capacity

30%

Texas oil and gas employment is concentrated in Houston, Dallas/Ft. Worth, San Antonio and Midland-Odessa. Additional employment clusters are in Denver, Oklahoma City, Tulsa, Pittsburgh and New Orleans.

Figure 9: U.S. Oil & Gas Labor by Zip Code and Primary Drilling Regions



Source: EIA; U.S. Bureau of Labor Statistics (Oil & Gas consists of Oil and Gas Extraction, Support Activities for Mining, and Pipeline Transportation), retrieved from ESRI; CBRE Location Analytics and Research.

Jobs Added in Oil & Gas Markets

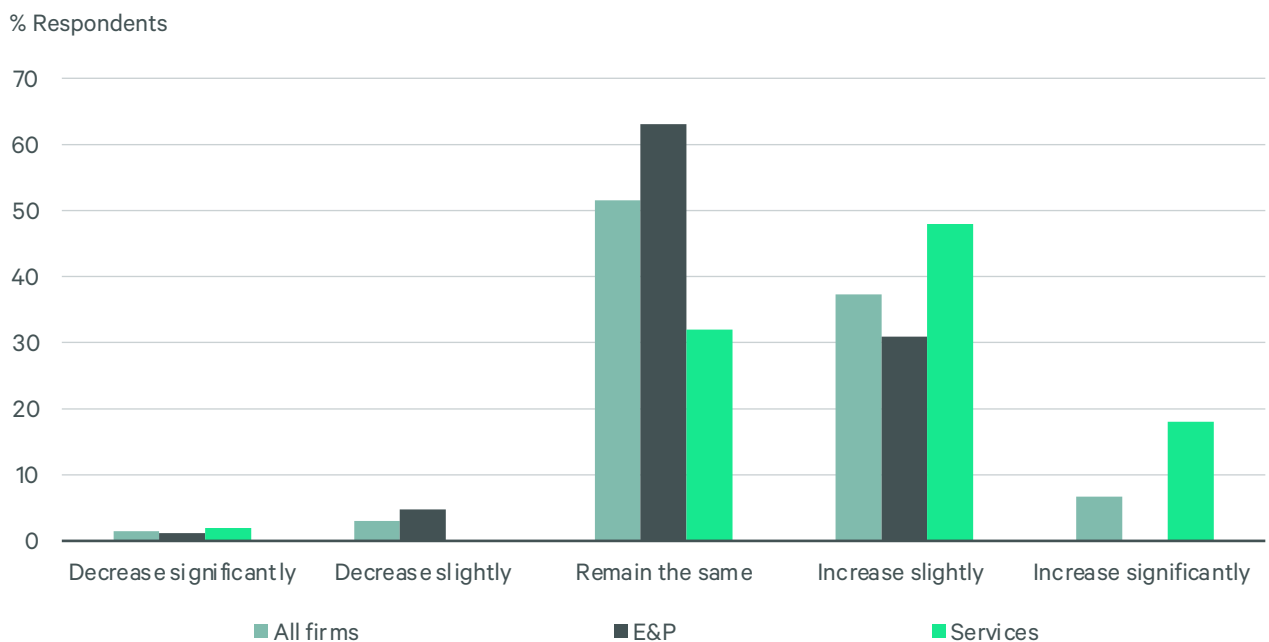
There has been a steady uptick in U.S. oil and gas jobs since 2021 due to increased demand. Texas alone added 20,700 oil and gas production jobs over the past year—a 12.8% increase. The biggest monthly increase in more than a decade occurred in February. In the near term, job growth likely will be concentrated in oil field servicing and manufacturing of parts to support drilling. A recent survey by the Federal Reserve Bank of Dallas found that 66% of support services companies will increase their workforce in 2022 versus 31% of exploration and production companies.

Although oil and gas companies likely will continue to maximize labor productivity, increased short-term exporting to Europe has already created hundreds of new jobs. Europe is very motivated to establish alternative channels for natural gas, lessen its dependence on Russia and improve its energy security. Therefore, the potential exists for a longer-term increase in U.S. exports that would support additional jobs.

Oxford Economics projects oil, tourism and tech metros will lead job growth over the medium term. Greeley, CO and Midland, TX are forecast to outperform the U.S. in GDP growth by the highest margin compared with other top oil and gas metros.

A recent survey found 66% of support services companies will increase their workforce in 2022 vs 31% of exploration and production companies.

Figure 10: How do you expect the number of employees at your company to change from December 2021 to December 2022?



Note: Executives from 134 oil and gas firms from the Eleventh Federal Reserve District.
 Source: Federal Reserve Bank of Dallas; Dallas Fed Energy Survey; March 8-17, 2022.

Impacts to Commercial Real Estate

There are some potential impacts to U.S. commercial real estate from global energy supply disruptions and price increases.

In Houston, oil service companies have started to inquire about warehouse space to ramp up their parts inventory for oil and gas drilling. Also, because manufacturing buildings are scarce, some parts manufacturers have shown interest in warehouse space that can be converted to handle their equipment requirements, such as increased power. These are early signs of increased production activity. This positive development is further supported by the Dallas Fed's most recent Energy Survey, which recorded its highest oil and gas activity reading in the survey's six-year history.

Big energy companies have long-range capital spending budgets that include exploration and production requiring office-using jobs and space. This has helped to stabilize oil & gas office real estate. In general, energy industry office usage has mirrored the national trend: some companies are staying in the same amount of space, some are downsizing and few are expanding. Recently in Houston, LNG companies have been in the market to establish or increase their office footprint. This trend should continue given the high demand for LNG, additional production facilities and more back-office space.

As for the retail sector, rising inflation may erode consumer purchasing power, which may negatively affect consumer spending and cause struggling retailers to seek rent relief. Conversely, some consumers may choose to accelerate their purchasing before inflation erodes the value of their cash. As a result, retailers may benefit in the short-term.

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Appendix: Background on Oil & Gas Supply Disruption

Petroleum & Gas Production by Country

The U.S. is the world’s leading producer of petroleum products and natural gas.

Figure 11: Top 10 Petroleum Producing Countries

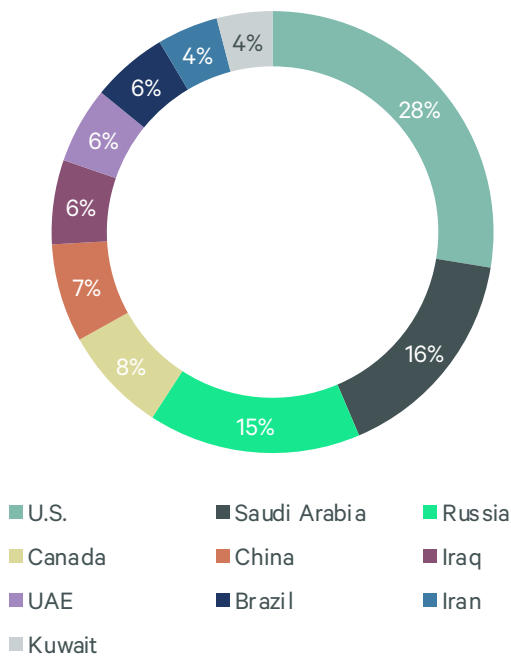
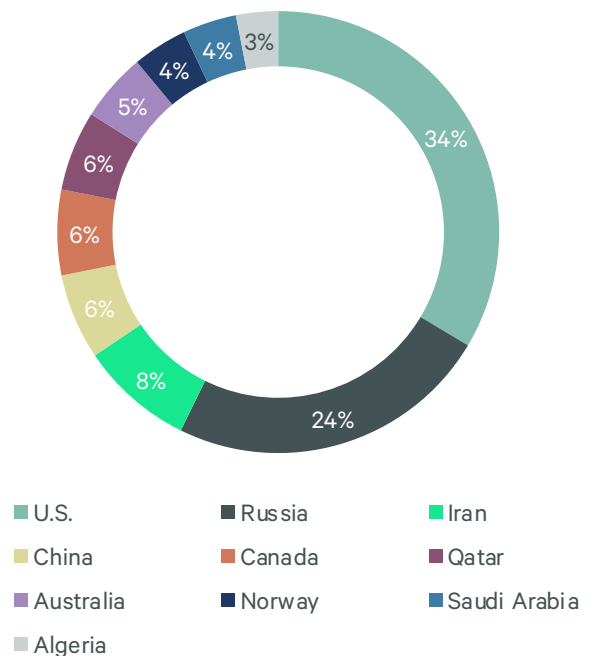


Figure 12: Top 10 Natural Gas Producing Countries % Share of Total Production



Source: EIA; International Energy Statistics, 2020 Total oil (petroleum and other liquids) production.

Source: EIA (Annual Dry Gas Production), 2019.

Russian Exports at Risk

Russia is one of the world’s largest oil and petroleum product exporters. According to the EIA, Russia exported 4.7 million barrels of crude oil and 2.8 million barrels of petroleum products per day last year, equating to a combined 7.5% share of global supply. Europe imports approximately 25% of its crude oil from Russia, representing around 50% of Russia’s total crude oil exports. In addition, Russia is the world’s largest exporter of natural gas and ships 84% of its exports by pipeline. Last year, Europe imported 45% of its natural gas from Russia, representing 75% of Russia’s total natural gas exports.

Due to sanctions imposed by many countries following the recent invasion of Ukraine, Russia's oil and gas export industry is at risk. Banks, insurers, refiners and shipping companies also are avoiding Russia's oil and gas industry to reduce legal or reputational risk. Consulting firm Energy Aspects recently reported that 70% of Russian crude oil exports were struggling to find buyers even at record discounts.

Figure 13: % Share of Total Crude Oil Exports from Russia (2021)

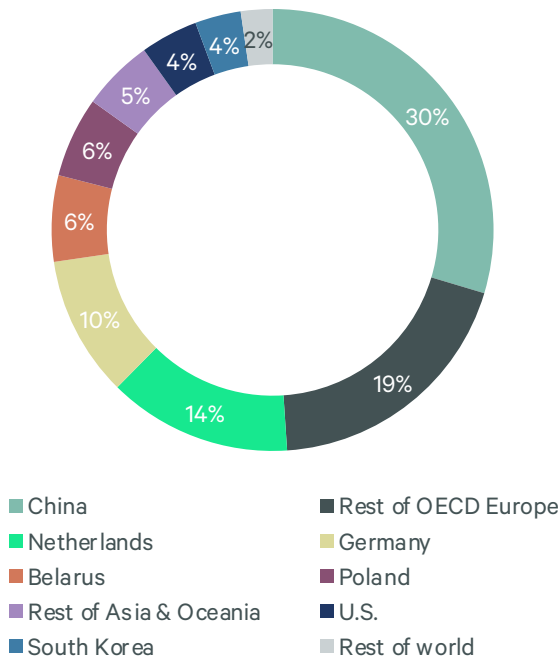
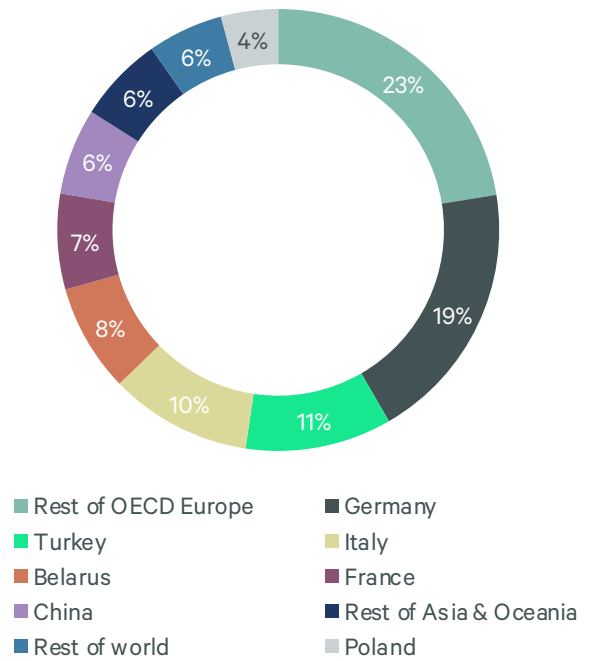


Figure 14: % Share of Total Natural Gas Exports from Russia (2021)



Source: EIA; International Energy Statistics, 2020 Total oil (petroleum and other liquids) production.

Source: EIA (Annual Dry Gas Production), 2019.

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