LAEDC

2025 REPORT

Oil & Gas In California

The Industry, It's Economic Contribution and Major User Industries

A look at the industry in 2022, the most recent year with complete data available.

OIL AND GAS IN CALIFORNIA:

THE INDUSTRY, ITS ECONOMIC CONTRIBUTION AND MAJOR USER INDUSTRIES

Los Angeles County Economic Development Corporation
633 W. 5th Street, Suite 3300 ◆ Los Angeles, CA 90071
(888) 4-LAEDC-1 ◆ www.LAEDC.org

Shannon M. Sedgwick
Justin Adams, Ph.D.
Dan Wei, Ph.D.
Matthew Skyberg

Research assistance provided by our intern Lizzy Chen

March 2025

This research was commissioned by the Western States Petroleum Association.

The LAEDC Institute for Applied Economics provides objective economic and policy research for public agencies and private firms. The group focuses on economic impact studies, regional industry analyses, economic forecasts and issue studies, particularly in workforce development, transportation, infrastructure and environmental policy.

Every reasonable effort has been made to ensure that the data contained herein reflect the most accurate and timely information possible and they are believed to be reliable.

Executive Summary

The California oil and gas industry remains a vital economic engine, supporting hundreds of thousands of jobs and contributing billions of dollars in tax revenues through its extensive upstream, midstream, downstream, and market activities. Despite facing significant challenges, including regulatory pressures, market fluctuations, and global geopolitical tensions, the industry has continued to provide critical economic, employment, and fiscal benefits across the state. Activities within the various segments of the industry drive investment, create jobs, and generate significant tax revenues that fund essential public services.

This report highlights key economic contributions, workforce dynamics, and policy considerations the oil and gas industry faces in California as the state seeks to balance their environmental goals with economic resiliency.

The oil and gas industry is typically divided into four primary segments: upstream, midstream, downstream, and market.

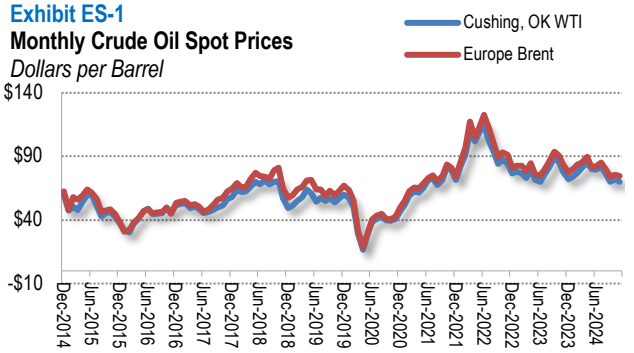
- **Upstream** operations focus on the extraction of oil and gas and its initial separation.
- **Midstream** operations include the processing and separation of natural gas and condensates, and the transportation (including pipelines), storage, and wholesale of crude oil, natural gas, natural gas liquids (NGLs), and other hydrocarbon products.
- **Downstream** operations involve refining crude oil and processing natural gas to prepare these resources for distribution and sale to end users.
- The **market** segment separates out the distribution and retail of oil and gas products to end users.

Industry Overview, Trends, and Current Issues

The California oil and gas industry faces an evolving landscape shaped by market volatility, geopolitical conflicts, and regulatory reforms (**Exhibit ES-1**). Due to limits placed on in-state production and since California has no interstate oil pipelines, California refineries import about 75 percent of the state's crude oil needs from Alaska and foreign sources, mostly through the San Pedro Bay port complex.

The industry has faced market volatility driven by international events such as the COVID-19 pandemic and geopolitical tensions like the Russian invasion of Ukraine.

Exhibit ES-1
Monthly Crude Oil Spot Prices
Dollars per Barrel



Source: EIA

Current legislation, while well intended, will have economic implications for the state economy, impacting the oil and gas industry workers, user industries, and end users/consumers. These include, but are not limited to:

- **Senate Bill (SB) 1137**: Establishing health protection zones around oil wells to reduce environmental and health risks.
- **Assembly Bill (AB) X2-1**: Regulating petroleum product inventories to stabilize gasoline prices.
- **Senate Bill (SB) 1322**: Requires all refiners of gasoline products to provide monthly data about various price and volume information, such as the gross gasoline refining margin and the volume and price of domestic and imported crude oil.
- **Senate Bill (SB) X1-2**: Expands the monthly refinery reports to require net gasoline refining information and authorized the California Energy Commission (CEC) to set a maximum gross gasoline refining margin with penalties for exceeding it.

Technological advancements such as artificial intelligence (AI) and digital twin systems have improved operational efficiency while reducing environmental impacts.

Looking ahead, embracing technology and regulatory modernization is essential to sustain the industry and meet California's energy needs.

Economic and Fiscal Contribution

In addition to the jobs it provides, the oil and gas industry is a tax revenue source that underpins public infrastructure, education, and healthcare.

Across the state, the industry supports 536,770 jobs, generating $53 billion in labor income, and $166 billion in value-added economic activity. It contributes $47.9 billion in state and local taxes and $16.3 billion in federal taxes (**Exhibit ES-2**).

Exhibit ES-2
Total Economic and Fiscal Contribution of Oil and Gas Industry California 2022*

Employment (jobs):		**536,770**
Direct	*148,150*	
Indirect and induced	388,620	
Percent of California Total Employment		2.1%
Labor income ($ millions):		**$ 53,366**
Direct	*23,045*	
Indirect and induced	*30,321*	
Percent of California Total Labor Income		2.5%
Value added ($ millions):		**$ 166,048**
Direct	*117,520*	
Indirect and induced	*48,527*	
Percent of California Total GDP		4.6%
Output ($ millions)**:**		**$ 337,995**
Direct	*257,750*	
Indirect and induced	*80,245*	
Percent of California Total Output		5.7%
Fiscal Impact ($ millions):		**$ 64,256**
State and local	*$47,940*	
Federal	*$16,316*	

Note: Includes royalty earners
Source: Estimates by LAEDC

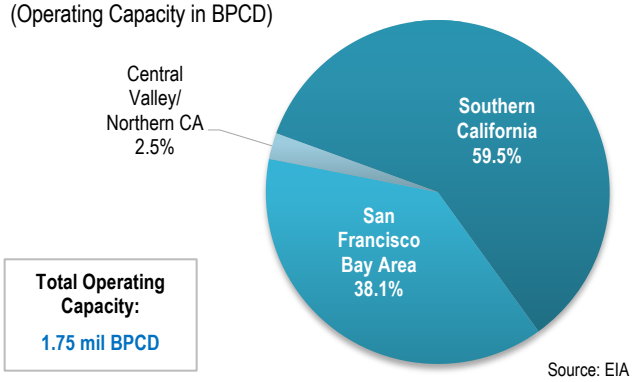
Economic Contribution by Sub-Region and County

This report divides the state of California into four key sub-regions: Southern California, the San Francisco Bay Area, Central Coast, and San Joaquin Valley. The contribution of the oil and gas industry across the state's 58 counties are also presented. Regional economic disparities exist across regions and counties.

Key findings of this section include:

- The workforce is diverse across the regions, across age groups, by race and ethnicity, and worker educational attainment.
- Just under half of all direct industry employment (48 percent) is in Southern California
- The Southern California region accounts for 28 percent of the oil and gas industry's total contribution to the California economy (Gross State Product)
- Refineries are located largely within two sub-regions: Southern California and the San Francisco Bay Area (**Exhibit ES-3**).
- Kern County accounts for nearly 80% of oil well activity.
- The three largest refineries in the state are located in Los Angeles County in the cities of El Segundo, Richmond and Carson.

Exhibit ES-3
Refining Capacity in CA by Sub-Region 2022
Atmospheric Crude Distillation Capacity
(Operating Capacity in BPCD)



Source: EIA

Industry Workforce

The oil and gas industry employed over 144,500 payroll employees in California in 2022,[1] and industry payroll employment is expected to grow moderately by close to 3 percent, reaching more than 148,500 jobs by 2027. This growth equates to a net gain of approximately 4,000 payroll jobs over five years, with mixed performance across the various segments of the industry (**Exhibit ES-4**).

Employment projections reflect stable commodity prices and assume continued recovery from prior downturns. Growth is expected to be led by the market and midstream segments, while upstream and downstream segments will likely face employment declines.

Exhibit ES-4
5-Year Oil and Gas Industry Workforce Needs
California 2022 to 2027

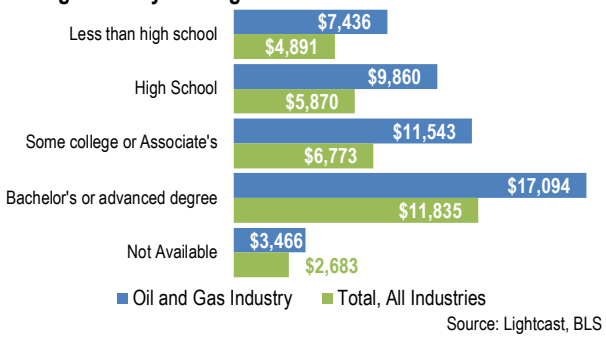
	2022 Payroll Jobs	2027f Payroll Jobs	2022-27f Change (%)
Upstream Segment	11,897	11,030	-7.3
Midstream Segment	20,805	21,850	5.0
Downstream Segment	9,643	8,650	-10.3
Market Segment	102,185	107,000	4.7
Total Oil and Gas Industry	144,531	148,530	2.8

Source: Lightcast; Estimates by LAEDC

The oil and gas industry continues to offer stable employment with competitive wages and benefits for those with lower levels of formal education. For example, gas plant operators earn a median annual wage of $105,000; petroleum pump system operators, refinery operators, and gaugers earn $95,610; and oil and gas service unit operators earn $64,430.

Oil and gas jobs offer premium wages at all educational levels (**Exhibit ES-5**), significantly higher than the average monthly earnings for all industries, reflecting the sector's strong worker earning potential.

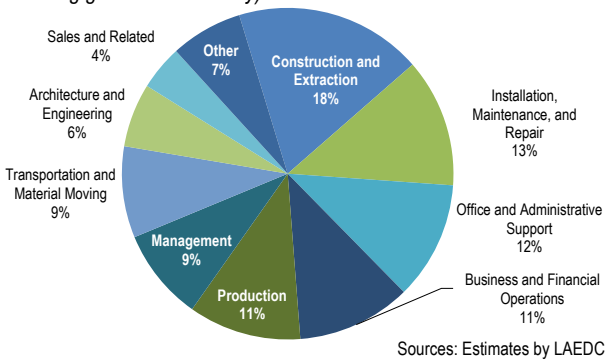
Exhibit ES-5
Average Monthly Earnings 2022



Source: Lightcast, BLS

The industry employs workers in occupations across the skills spectrum. Sales and related occupations account for 37 percent of employment, reflecting the large share of workers employed in retail gas stations. However, By excluding gas station workers, the focus shifts to the core activities of the oil and gas industry, such as exploration, extraction, production, and distribution (**Exhibit ES-6**). These roles require higher levels of skill and education and offer higher wages compared to retail jobs.

Exhibit ES-6
Occupational Distribution of Oil and Gas Industry
(Excluding gas station industry)



Sources: Estimates by LAEDC

This redistribution underscores the industry's reliance on specialized occupations to maintain operations and meet energy demands. Examples of these oil and gas specific occupations detailed in this report include:

- Petroleum Engineers (SOC 17-2171)
- Geological Technicians, Except Hydrologic Technicians (SOC 19-4043)
- Pipelayers (SOC 47-2151)

[1] Accounting for self-employed workers, proprietors, and contract workers, total employment in the oil and gas industry in 2022 was about 148,150 jobs.

- Derrick, Rotary Drill, and Service Unit Operators, Oil, Gas, and Mining
  - Derrick Operators, Oil and Gas (SOC 47-5011)
  - Rotary Drill Operators, Oil and Gas (SOC 47-5012)
  - Service Unit Operators, Oil, Gas, and Mining (SOC 47-5013)
- Other Extraction Workers
  - Roustabouts, Oil and Gas (SOC 47-5071)
  - Helpers – Extraction Workers (SOC 47-5081)
- Miscellaneous Plant System Operators
  - Gas Plant Operators (SOC 51-8092)
  - Petroleum Pump System Operators, Refinery Operators and Gaugers (SOC 51-8093)

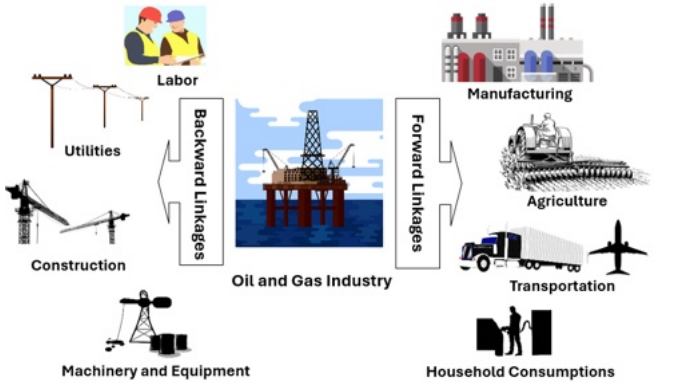
Investing in education and specialized training is essential to maintain a robust talent pipeline. Workforce development programs and apprenticeship pathways are ways to meet future industry workforce needs.

Forward Linkages of Petroleum Products

Petroleum products support a wide range of industries, including transportation, agriculture, and manufacturing. Supply chain disruptions could significantly impact these sectors.

The significance of forward linkages spans well beyond the immediate industries that directly utilize oil and gas products, extending to a vast network of downstream markets through the supply chains (**Exhibit ES-7**). For example, the manufacturing sector transforms petroleum-based chemicals into key products such as plastics, synthetic fibers, and industrial lubricants. The forward-linkages of the successive rounds of direct and indirect industries in the user chain of oil and gas industries are illustrated in the diagram.

Exhibit ES-7
Illustration of Backward and Forward Linkages of Oil and Gas Industry



Across all five subregions, industries such as petroleum refineries and natural gas distribution consistently appear as top affected user industries in upstream and midstream product disruptions. Construction, truck transportation, professional, scientific, and technical services, and real estate are also consistently identified as top affected industries by disruptions in the oil and gas industry.

In general, subregions with higher multipliers, like Southern California and the San Francisco Bay Area, tend to have larger, more interconnected economies supported by a diverse range of service and infrastructure industries. These industries extend the economic impacts of oil and gas disruptions into various sectors. In contrast, regions like the San Joaquin Valley and Central Coast experience more localized and specialized effects, such as in agriculture, food manufacturing, and transportation. These regions rely more heavily on specific oil-dependent industries, and disruptions tend to have more concentrated effects in these key sectors

Backward and Forward Linkages by County

The oil and gas industry's contributions extend beyond direct production sites, creating jobs and economic opportunities throughout California's counties. We provide data for backward (economic contribution) and forward (user industries) for all 58 counties in California.

This page intentionally left blank

Table of Contents

1 Introduction

The oil and gas industry plays a major role in California's economy, contributing significantly to the state's GDP and providing numerous employment opportunities. It supports a wide range of sectors, including manufacturing, transportation, and services. The industry employs thousands of workers and contributes to the states' economy through activities including investment in new infrastructure, purchases of supplies and equipment, local hiring, and sales of refined products. These activities circulate through the economy and generate additional economic activity, supporting hundreds of thousands of workers statewide and contributing billions of dollars in annual tax revenues to state and local governments, funding essential public services such as education, healthcare, and infrastructure development.

Additionally, California's oil and gas production helps ensure energy independence and meets the state's substantial energy needs. The industry also drives technological innovation, fostering advancements in areas such as drilling techniques, environmental monitoring, and sustainable practices. However, the global shift towards renewable energy sources presents challenges that necessitate balancing economic benefits with sustainability efforts.

Report Organization

In this report, the Institute for Applied Economics of the Los Angeles County Economic Development Corporation (LAEDC) estimates the economic and fiscal contribution of the oil and gas industry in California, explores the characteristics, skills, educational pathways, and workforce needs for the industry at the state, sub-regional and county level. Additionally, a supply-driven (user industry) impact analysis is conducted to evaluate how changes in the supply of petroleum products affect the broader economy through forward linkages at the state and sub-regional level. The report is presented in eight parts.

This introductory section provides a short description of the industry definition used in the contribution analysis. Additional details and methodology can be found in the appendix.

Section 2 provides a brief overview of the oil and gas industry in California, including the unique characteristics of upstream, midstream, downstream market segment activity. It also discusses key issues the industry faces that can impact industry operations and its employment

Section 3 provides an estimation of the total economic contribution of the oil and gas industry, including extraction, drilling, pipelines, refining and gasoline wholesale and retail activities. The economic contribution of each industry segment (upstream, midstream, downstream, and market) is also estimated separately. This section also includes a discussion of the public revenues attributed to the industry and the consumption of its products.

Section 4 provides analysis at the sub-regional and county levels and provides contributions for each of the 58 counties within the state.

Section 5 examines the demographic characteristics, including the racial, ethnic and educational attainment, of the oil and gas workforce and recent hires at the sub-regional level. A workforce needs assessment is also provided.

Section 6 traces oil and gas industry products through the industry user chain for each segment of the industry. The top primary user industries most vulnerable to potential supply disruptions are identified for each oil and gas industry segment. Jobs at risk for the top primary user industries are also identified at the county level and the senate and congressional district level. In addition, a supply-driven (forward-linkage) I-O analysis is conducted to assess the impact of production activities in the oil and gas industries on their downstream customer sectors (user industries) at both the state level and for the five subregions.

Section 7 includes detailed sheets for each county in California for the economic contribution of the oil and gas industry, and the number of jobs in industries identified as most at risk from potential refinery supply disruptions. For context, the economic base for each county is provided to illustrate how the oil and gas industry relates to the county economy.

Methodology, detailed industry descriptions, and detailed tables as referenced in the text can be found in the Appendix.

Oil and Gas Industry Definition

The North American Industry Classification System (NAICS) was created to track economic activity for businesses at the establishment level. Each establishment is grouped according to its primary activity. The thirteen NAICS codes included in the definition of the oil and gas industry used in this report are listed in **Exhibit 1-1**. These are described in detail in the Appendix.

Throughout this report, the thirteen industry codes included in the oil and gas industry definition have been grouped into the following categories: upstream, midstream, downstream, and market.

The oil and gas industry is typically divided into four primary segments: upstream, midstream, downstream, and market.

- **Upstream operations** focus on the extraction of oil and gas, including the separation of oil, natural gas, and water at the production stage.
- **Downstream operations** involve refining crude oil and processing natural gas to prepare these resources for distribution and sale to end users.
- **Midstream operations** serve as the bridge between upstream and downstream activities. These include the processing and separation of natural gas and condensates, utilizing heaters and scrubbers to produce pipeline-quality gas, as well as the transportation (including pipelines), storage, and wholesale of crude oil, natural gas, natural gas liquids (NGLs), and other hydrocarbon products.
- Although the retail and distribution of oil and gas products are often considered part of the downstream segment, this report separates industries involved in marketing oil and gas products to end users into a distinct "**market**" category for clarity.

Exhibit 1-1
Oil and Gas Industry Definition

NAICS Code	Industry
Upstream Industries	
(Extraction and Initial Processing)	
211	Oil and gas extraction
213111	Drilling oil and gas wells
213112	Support activities for oil and gas operations
333132	Oil and gas field machinery and equipment manufacturing
Midstream Industries	
(Transportation and Wholesale)	
23712	Oil and gas pipeline and related structures construction
4247	Petroleum and petroleum products merchant wholesalers
486	Pipeline transportation
Downstream Industries	
(Refining and Petroleum and Petrochemical Products Manufacturing)	
32411	Petroleum refineries
324191	Petroleum lubricating oil and grease manufacturing
32511	Petrochemical manufacturing
Market Industries	
(Distribution and Retail)	
2212	Natural gas distribution
4571	Gasoline stations
45721	Fuel dealers

Source: LAEDC

2 Industry Overview, Trends and Current Issues

California's oil and gas industry is an important producer of energy, one that helps to satisfy the energy needs of residents and businesses in the state and across the nation. The state's oil and gas industry remains significant despite a number of headwinds, including geopolitical unrest involving oil producers; high interest rates affecting economic growth and demand for oil; and decarbonization-related regulatory issues. New technologies have helped the industry modernize, though, and mitigate some of these headwinds.

The Oil and Gas Industry Today

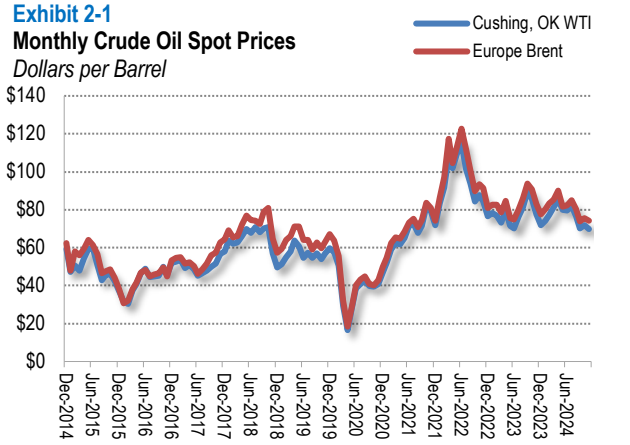
This report examines the current state of activity in the oil and gas industry. Due to data limitations, much of the underlying data captures activity that occurred as of 2022. Where possible, this report provides more recent figures and also compares this activity to historical data.

Supply and Demand

The last ten years of oil price data show a tumultuous decade for the oil and gas industry. From 2015 to 2019, the Brent crude and the West Texas Intermediate (WTI) average monthly spot prices (**Exhibit 2-1**) generally vacillated between $30 and $80 a barrel, reflecting the overall recovery and growth of the global economy in the aftermath of the Great Recession in the late 2000s. In early 2020, however, oil prices dropped precipitously as a result of the COVID-19 pandemic that shutdown economic activity worldwide. At their low points in April 2020, the Brent Crude and WTI spot prices hit $18 and $17, respectively. Prices recovered steadily through 2021 as economies across the globe reopened and business and travel increased, even in the face of ongoing outbreaks of the COVID-19 virus.

Then in 2022, the oil and gas industry experienced another shock with the Russian invasion of Ukraine. Crude oil prices skyrocketed to near-record highs by June 2022—Brent crude touched $123 while WTI reached $115—given that Russia is one of the top three oil producers and a large natural gas exporter, and because Europe and the United States moved to ban imports of Russian crude and refined products. Russian hostilities have continued to this day, but prices have come down particularly since Europe has taken steps to transition its oil and natural gas imports away from Russia and as the United States has increased production. By the end of 2024, oil prices have fallen back below $80, effectively returning to the trend seen ten years earlier.

Exhibit 2-1
Monthly Crude Oil Spot Prices
Dollars per Barrel



Source: EIA

What is notable about the oil and gas industry particularly in the last few years is its relative stability in spite of global tensions. Beyond the ongoing Russian invasion of Ukraine, October 2023 saw the start of Middle East hostilities after Hamas attacked Israel from the Gaza Strip (and later Hezbollah from Lebanon) and Israel retaliated through extended military activity. This conflagration spread to include Iran as well as Houthi rebels based in Yemen, who harassed not only Israel with missiles but also global shipping through the Red Sea. Even so, the U.S. Energy Information Administration (EIA) forecast that average annual crude oil prices in 2024 and 2025 would remain near their 2023 average

because of relatively balanced global supply and demand for petroleum liquids.[2]

This balance stems partly from the OPEC+ countries—the members of the Organization of the Petroleum Exporting Countries and ten other countries that have coordinated their crude oil production with OPEC since late 2016—reducing their production in step with slowing global economic growth and oil demand in a high interest-rate environment. Relative to 2022 production levels, OPEC+ members are currently cutting output by a total of 5.86 million barrels per day (bpd), representing about 5.7 percent of global demand. This includes 3.66 million bpd of cuts that will take place until the end of 2025 and voluntary cuts by eight members of 2.2 million bpd, that will be phased out beginning in October 2024.[3]

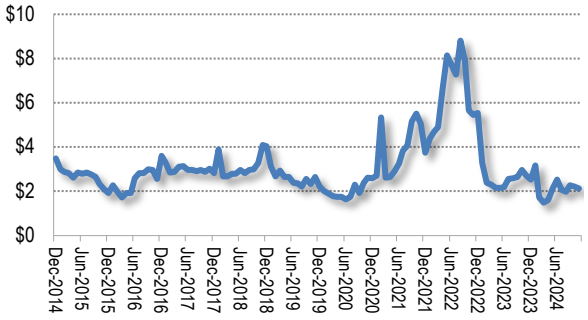
Blunting some of these OPEC+ production cuts is increased production primarily by the United States. The EIA forecast that global supply of petroleum and other liquids would increase by about 0.4 million bpd in 2024 and 2.0 million bpd in 2025 because of the United States, but also thanks to Guyana, Canada, and Brazil. This increase in production is expected to help keep oil prices relatively flat.[4]

California has benefitted to a lesser extent from this price stability relative to the United States as a whole. Having no interstate pipelines for crude oil or refined products, California is effectively an energy island and relies almost exclusively on supertankers for its oil imports. As a result, California competes with Asian and European economies for oil exports from the Middle East, Latin America, and Alaska, and in turn is exposed to Brent international waterborne crude oil prices instead of WTI spot prices like most of the lower 48 states. Brent spot prices have historically been higher than WTI spot prices, and as of November 2024 this difference was $4 per barrel on average.

The United States is also increasing production of liquefied natural gas (LNG) and natural gas liquids (NGLs). The United States first began exporting LNG in 2016, and after several years of growing LNG capacity, the United States became the world's largest LNG exporter during the first half of 2022. At that time, U.S. LNG exports averaged nearly 11.2 billion cubic feet per day, or about 12 percent of the dry natural gas produced in the country. The EIA projects that by the early 2030s, total U.S. natural gas exports will become larger than any domestic end-use sector, including residential, commercial, industrial, and electric generation.[5]

The increased production of natural gas by the United States as well as increased inventories has also helped to keep the price of natural gas in check domestically. The Henry Hub average monthly spot price (**Exhibit 2-2**) mostly remained below $4 from the end of 2014 through 2021, and falling below $2 following the onset of the COVID-19 pandemic. Prices spiked in 2022 as a result of the Russian invasion of Ukraine coupled with greater demand from Europe for U.S. LNG. Additionally, the shutdown of Freeport LNG's natural gas liquefaction plant in South Texas in June 2022 because of a fire reduced total U.S. LNG export capacity by about 17 percent, putting upward pressure on prices. Even so, natural gas spot prices came down significantly in 2023 and are now around $2.

Exhibit 2-2
Monthly Henry Hub Natural Gas Spot Price
Dollars per Million BTU



Source: EIA

Regulatory Environment

Beyond economic dislocations from the COVID-19 pandemic and the conflicts in Ukraine and the Middle East, the oil and gas industry has been subject to climate-related legislative and regulatory pressures in the United States and Europe. In the United States, for example, passage of the Bipartisan Infrastructure Bill in 2021 created large incentives to decarbonize the energy and transportation sectors, including $73 billion for electric grid and power infrastructure upgrades and $7.5 billion

[2] French, M. (2024, January 10). EIA expects relatively flat crude oil prices in 2024 and 2025. *In-Brief Analysis*. U.S. Energy Information Administration.
3 Ghaddar A., A. Lawler & M. El Dahan. (2024, June 2). OPEC+ extends deep oil production cuts into 2025. *Reuters*.

[4] Hill, S. (2024, March 14). Four countries could account for most near-term petroleum liquids supply growth. *In-Depth Analysis*. U.S. Energy Information Administration.
[5] U.S. Energy Information Administration. (2023, May). *AEO2023 Issues in Focus: Effects of Liquefied Natural Gas Exports on the U.S. Natural Gas Market*.

for electric vehicle charging stations.[6] The Inflation Reduction Act also contains $370 billion in spending and tax credits for low-emission forms of energy to help the United States cut greenhouse gas emissions by an estimated 40 percent below 2005 levels by 2030.[7]

Much of the increasing regulatory pressures comes from a recent series of actions taken by the State of California. These initiatives will make it more difficult to produce oil in the state as well as increase the cost to refine it. Some of the major legislation of particular relevance are Senate Bill (SB) 1137 and Assembly Bill (AB) X2-1:

In September 2022, Governor Gavin Newsom signed SB 1137 into law, which will significantly impact oil production in the state. SB 1137—which was suspended temporarily pending a potential referendum but is now in effect—prohibits the issuance of well permits and the construction and operation of new production facilities within a health protection zone (HPZ) of 3,200 feet from a sensitive receptor such as a school or business. Additionally, all operators must submit an inventory and map of sensitive receptors, and a determination as to whether their existing wellheads and production facilities are located in a HPZ, and all wells and facilities within a HPZ must comply with specific health, safety, and environmental requirements.

In October 2024, Gov. Newsom signed AB X2-1 into law, empowering regulators to set and adjust minimum petroleum product inventory levels for refiners in California. The intent is to prevent gasoline price spikes in the state, which Gov. Newsom attributes to supply shortages deliberately created by refiners to maximize profits. This comes at a time when weak refinery margins have persisted on the West Coast and in the United States overall since the middle of this year.

These are just a few of the more significant regulatory efforts that will impact the oil and gas industry in the near future, both on the supply and demand side. Other efforts include SB 1314, signed in September 2022, which prohibits the use of captured carbon for enhanced oil recovery. The Advanced Clean Cars II regulations, which are intended to rapidly reduce light-duty passenger car, pickup truck and SUV emissions, mandate an increasing number of zero-emission vehicles on California roads. The Air Resources Board is currently developing a proposal to make the Advanced Clean Cars II regulations even more strict. Similarly, the Advanced Clean Trucks regulation is a sales requirement for manufacturers with respect to zero emission trucks. ZEV and a one-time reporting requirement for large entities and fleets.

New Technologies

Recent years have also seen the application of new technologies in the oil and gas industry. Most notable has been the use of artificial intelligence (AI).

Numerous use cases have been cited for AI in the oil and gas sector, beyond the traditional applications like procurement, inventory, back-office management, and cybersecurity applications that can be found across multiple industries. These include using AI tools to analyze geographical features and seismic data to uncover new sources of petroleum; using AI-powered robots to scour drilling sites; and using predictive analytics to reduce downtime at gas and oil wells, platforms, pipelines, refineries and other facilities.[8] AI can also enable the use of "digital twins," which are virtual representations of pieces of equipment or production processes while in operation, and can be composed of one or more underlying technologies such as machine learning models and dynamic process response models. Digital twins enable, among other things, the real-time simulation of equipment or processes, allowing for optimization of use and maintenance.[9]

Altogether, then, AI technologies have widespread applications in the upstream, midstream and

6 Sprunt, B. (2021, November 15). Here's what's included in the bipartisan infrastructure law *National Public Radio.*
7 Tankersley, J. (2022, August 16). Biden Signs Expansive Health, Climate and Tax Law. *New York Times.*
8 Sharma, G. (2023, August 15). How Multibillion Dollar Investments In AI Are Driving Oil And Gas Sector Innovation. *Forbes.*
9 Lasrado, V. (2020, May). *Essential Digital Twins in Upstream Oil & Gas Production Operations*. Honeywell.

downstream activities of the oil and gas industry. AI can reduce the time to find new deposits, generate efficiencies in equipment and processes that reduce downtime and optimize maintenance, create safety enhancements, reduce carbon footprints, and result in cost savings.

According to the Stanford Institute for Human-Centered Artificial Intelligence, the global energy, oil and gas sector attracted $9.8 billion in private investment in AI between 2020 and 2023. More than half of this private investment occurred in the United States.[10] These types of investments can be expected to increase as AI adoption expands across the broader economy.

Upstream Activity

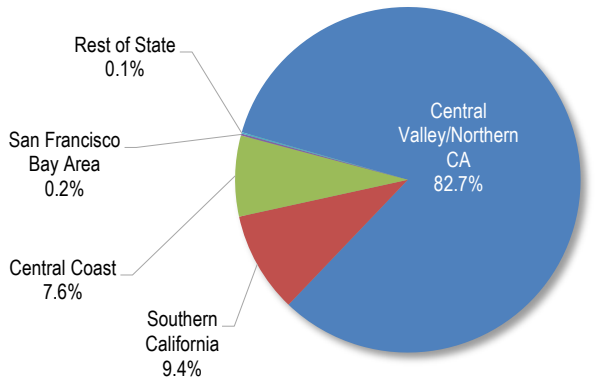
Upstream industries are those that are involved in the exploration and extraction of oil and gas. These industries include production, which involves the drilling of wells and pumping of crude oil and natural gas, and oilfield services. Oilfield services include the manufacturing of oil and gas field machinery used in production and support activities for oil and gas operations, such as exploration (except geophysical surveying and mapping); excavating well cellars, well surveying; running, cutting, and pulling casings, tubes, and rods; cementing wells, shooting wells; perforating well casings; well maintenance activities; and cleaning out, bailing, and swabbing wells. The upstream industry is capital-intensive and highly regulated.

California's Active Oil and Gas Wells

There were 58,463 active oil and gas wells in California in 2024. This represents a nearly 14 percent increase above the 51,390 active wells recorded in 2017, or an average annual growth of about 2 percent. A significant portion of this increase resulted from the reactivation of existing idle wells rather than the drilling of new ones.

Active wells are distributed across California, however the majority are located in the Central Valley/Northern California sub-region. This is shown in **Exhibit 2-3**. The Central Valley/Northern California subregion has nearly 83 percent of all active wells in the state. More than 45,000 of these wells are found in just one county, Kern County. Southern California has the second largest number of wells at 9.4 percent, followed by the Central Coast (7.6 percent), the San Francisco Bay Area (0.2 percent), and the Rest of State (0.1 percent).

Exhibit 2-3
Active Wells in CA by Sub-Region 2024



Source: CA Dept of Conservation, DOGGR

Since 2017, the distribution of active wells across California has changed slightly. The Central Valley/Northern California subregion now has relatively fewer active wells, down by 0.6 percentage points, while Southern California and the Central Coast registered relative increases of 1.0 and 1.3 percentage points, respectively.

Crude Oil in California

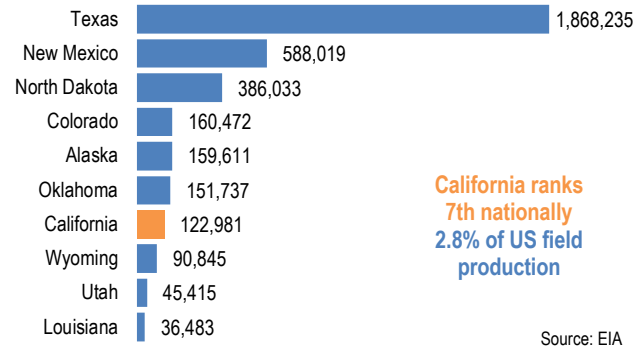
According to the Energy Information Administration (EIA), California in 2022 consumed more energy than any other state except Texas. With respect to transportation, Californians had more registered motor vehicles and traveled more vehicle miles than residents in any other state, which translated into California accounting for one-tenth of U.S. motor gasoline consumption and about one-seventh of the nation's jet fuel consumption that year.

California is highly dependent on imported energy, however. In 2023, foreign suppliers led by Iraq, Saudi Arabia, and Brazil provided three-fifths of the crude oil refined in California. California also imports more electricity than any other state, typically receiving between one-fifth and one-third of its electricity supply from outside of the state.

Oil field production in the United States totaled about 4.4 billion barrels in 2022. **Exhibit 2-4** shows the biggest oil producing states in the nation ranked according to their crude oil production that year. California produced 123 million barrels, representing 2.8 percent of total national production, which placed it 7th among all states.

10 Stanford Institute for Human-Centered Artificial Intelligence. (2024). *2024 AI Index Report.*

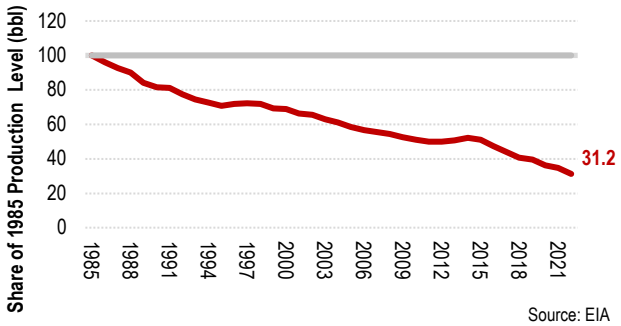
Exhibit 2-4
Crude Oil Production 2022
(Thousands of barrels)



While total U.S. oil production increased significantly between 2017 and 2022, growing from 3.4 billion barrels or just over 28 percent, California's oil production instead decreased significantly as a result of geopolitical issues and the regulatory environment. Over the same time period, California oil production dropped from 174 million barrels or more than 29 percent. It should be noted that in 2017, California was the 4th largest state in terms of production, coming behind only Texas, North Dakota and Alaska.

This is part of a long-term decline that began in the mid 1980s. In 1985, California's oil production reached its maximum at 394 million barrels, and it has declined steadily since then (**Exhibit 2-5**). California's 2022 production level of 123 million barrels was about 31 percent of its all-time high. This compares with roughly 44 percent just five years earlier.

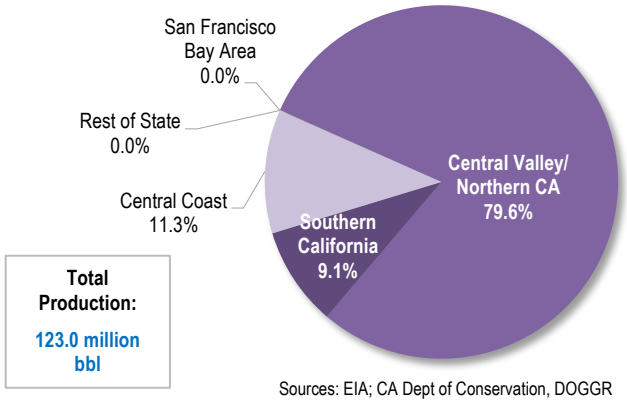
Exhibit 2-5
California Oilfiled Production 1985 to 2022
Indexed Growth (1985=100)



While crude oil production activity occurs throughout the state, the Central Valley/Northern California sub-region accounted for most of it. Nearly 80 percent of total California production in 2022 occurred in the Central Valley/Northern California sub-region. The second and third largest producing sub-regions were the Central Coast and Southern California, with 11 percent and 9 percent respectively.

The distribution of California crude oil production in 2022 according to sub-region is shown in **Exhibit 2-6**.

Exhibit 2-6
Distribution of Oil Production by Sub-Region 2022



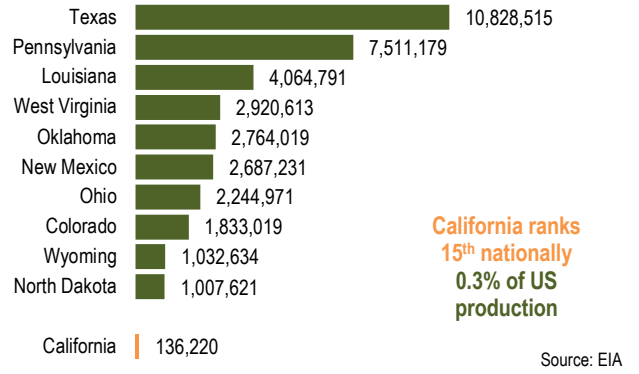
Crude oil reserves in California as of the end of 2022 were an estimated 1,492 million barrels. This represented 3.1 percent of total U.S. reserves.

Natural Gas in California

Natural gas production in the United States totaled 39.4 trillion cubic feet in 2022. This represents a 40 percent increase from the 28.1 trillion cubic feet produced in 2017. California's production of natural gas totaled 136.2 billion cubic feet in 2022, accounting for 0.3 percent of total U.S. production. California's 2022 production reflects a nearly 39 percent decrease from the 209.3 billion cubic feet it produced just five years earlier.

California's level of natural gas production places it as the fifteenth largest state. This was its same ranking in 2017. Texas, Pennsylvania and Louisiana were the three largest producers in 2022. Notably, Texas produced nearly 80 times the level of California. **Exhibit 2-7** displays the highest ten ranking states and California according to their total natural gas production in 2022.

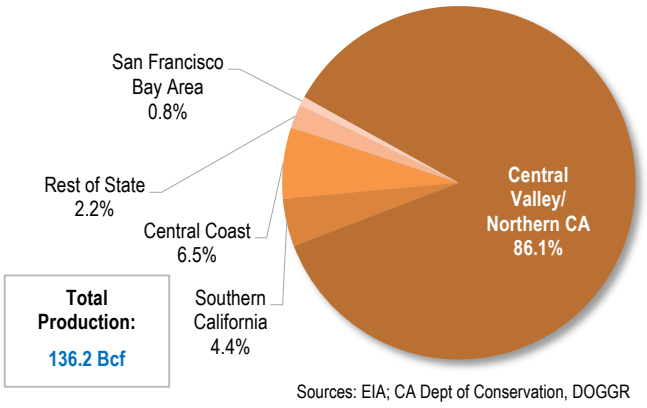
Exhibit 2-7
Natural Gas Production 2022
(Cubic feet in millions)



Source: EIA

Similar to crude oil production, the Central Valley/ Northern California sub-region accounted for just over 86 percent of total California natural gas production in 2022, followed by the Central Coast and Southern California and, producing close to 7 percent and 4 percent respectively. The distribution of California natural gas production in 2022 by sub-region is shown in **Exhibit 2-8**.

Exhibit 2-8
Distribution of Gas Production by Sub-Region 2022



Sources: EIA; CA Dept of Conservation, DOGGR

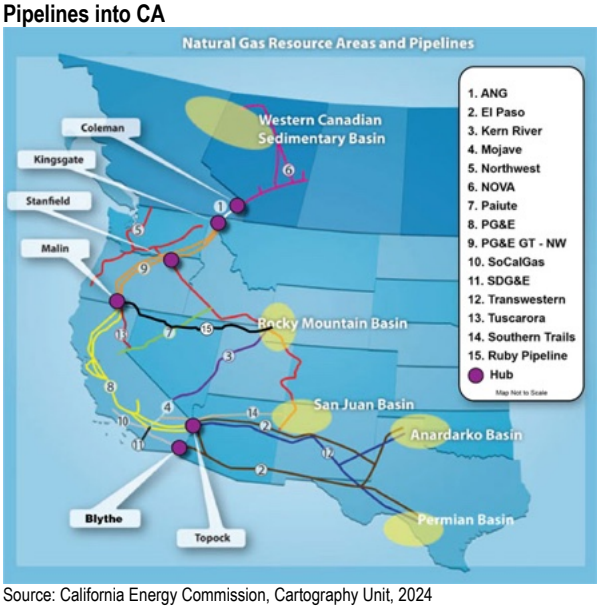
Expected future production of dry natural gas as of the end of 2022 is estimated at 1,070 billion cubic feet.

Midstream Activity

The midstream segment of the oil and gas industry is a highly integrated transmission and distribution system that exists across the United States to link upstream producers with downstream operations. Midstream operations move oil and gas from the wellhead in upstream operations to downstream refining and manufacturing operations and include processing, storage and logistics (pipeline, rail, truck, tanker, and export terminals). These same companies also move finished product from downstream operations to the market segment which includes gasoline stations and fuel dealers. Their services are fee-based

Exhibit 2-9 illustrates some of the major interstate midstream infrastructure that exists in California pertaining to natural gas transmission. This includes natural gas resource areas and interstate natural gas pipelines into California. As noted earlier, there are no interstate pipelines for crude oil or refined products into California.

Exhibit 2-9
Natural Gas Resource Areas and Interstate Natural Gas Pipelines into CA



Source: California Energy Commission, Cartography Unit, 2024

A selection of companies operating in the midstream segment in California is presented in **Exhibit 2-10**.

Exhibit 2-10
Selected Midstream Companies in California

- CALNEV Pipe Line, LLC
- Central Valley Pipeline
- Chevron Pipe Line Co
- Crimson Midstream Services, LLC
- Gas Pipeline Services, Inc.
- Gill Ranch Storage, LLC
- Kern River Gas Transmission Co.
- New Fortress, Inc.
- Phillips 66 Pipeline
- Pipe In Pipe Pacific, Inc.
- Roca Pipeline, Inc.
- Seaport Refining & Environmental, LLC
- Shell Pipeline Co.
- Wespac Midstream, LLC
- Wild Goose Storage, LLC

Downstream Activity

Downstream operations include refineries, petrochemicals and the manufacturing of petroleum lubricating oil and grease.

The refining of crude oil produces highly tradable products consumed domestically almost entirely in California and exported to global markets. Refined petroleum products include gasoline and diesel, liquefied petroleum gas (LPG), kerosene, jet fuel and fuel oils. Other products of the refining process include petrochemicals, which are used to manufacture a wide variety of different goods, including medical and personal products, fuel and lubricants, chemical products (adhesives, detergents, solvents) synthetic fabrics and materials, plastics and resins and more (see **Exhibit 2-11** for a more comprehensive listing).

Market conditions for refined petroleum products and byproducts produced in-state continue to change as a result of regulatory mandates issued to meet increasingly ambitious emissions goals. California's Cap and Trade program, Low Carbon Fuel Standard and other climate programs create requirements that collectively cost the industry and/or consumers hundreds of millions of dollars annually. Refining operations also heavily rely upon the supply of reliable electricity and recycled water in their production process. These operations are threatened when California refiners cannot ensure the future supply of each.

Recently, there have been additional efforts to restrict the amount of profit that refiners in California are allowed. SB 1322 enacted in 2022 requires all refiners of gasoline products in the state to provide monthly data about various price and volume information, such as the gross gasoline refining margin for each refinery with two or more refining facilities in the state; and the volume and price of domestic and imported crude oil. The California Energy Commission (CEC) must publish aggregated, volume weighted reports of this data, within 45 days of the end of each calendar month. Additionally, SB X1-2, which took effect June 2023, expands the monthly reports to require refinery operators to provide net gasoline refining information. It authorized the CEC to set a maximum gross gasoline refining margin and to levy penalties for exceeding it.[11]

Exhibit 2-11
Petroleum-Based Consumer Products

Medical and Personal		
antihistamines	inhalers	makeup
anesthetics	band aids	perfume
aspirin	latex gloves	contact lenses
cough syrup	syringes	lotion
vitamins	artificial limbs	diapers
Fuel and Lubricant		
gasoline	heating fuel	motor oil
diesel fuel	propane	electricity generation
Chemical Products		
pesticides	fabric softeners	brake fluid
fertilizers	cleaning chemicals	coolant
preservatives	solvents	antifreeze
Teflon	paint	
Synthetic Fabrics and Materials		
polyester	elastic	carpeting
nylon, rayon	shoes	vinyl
	upholstery	Styrofoam
Other Products		
PVC pipe	electronics	toys
shingles	plastic containers	helmets
tires	plastic bags	guitar strings
asphalt/ tar	sponges	sports equipment

Compiled by LAEDC

In order to meet demand, California refineries operate at or near maximum capacity. When refineries in the state experience unplanned outages, the price of gas jumps in response to the reduced supply, and gasoline imports increase. Production issues also directly translate into

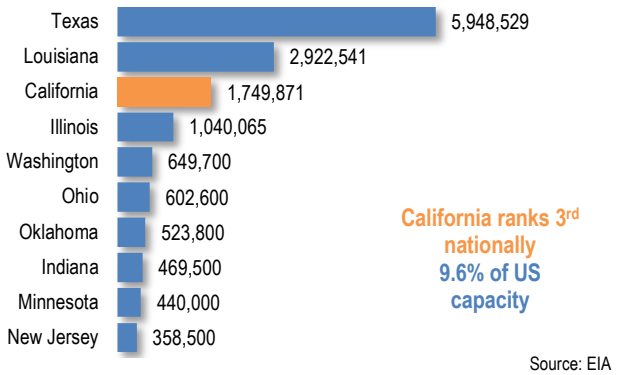
[11] https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/california-oil-refinery-cost-disclosure

price increases due to the high in-state demand for refined products and the lack of interstate pipelines into California.

California's Refineries

The petroleum refining industry has a large presence in California. In 2022, annual operable atmospheric crude oil distillation capacity in California was more than 1.7 million barrels per calendar day (bpcd.). This capacity represented about 10 percent of total U.S. capacity and placed California third among states (**Exhibit 2-12**).

Exhibit 2-12
Crude Oil Distillation Capacity 2022
Annual Operable Atmoshperic (BPCD)



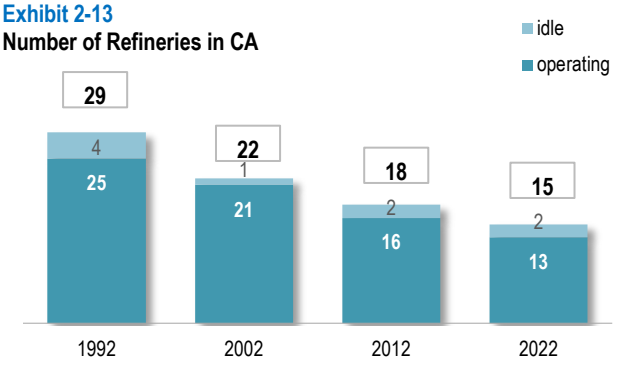
Source: EIA

From 2017 to 2022, crude oil distillation capacity in California decreased by nearly roughly 241,000 bpcd, or about 12 percent. Total distillation capacity in the United States also fell during the time period, but only by about 4 percent.

Despite the state's importance to the nation with respect to crude oil distillation capacity, the number of refineries in California has been decreasing over time. This is primarily due to the state's strict environmental regulations, which require refineries to make large expenditures on equipment, modifications and upgrades. Operations that are unable to fund these investments, especially older and smaller refining facilities, have ceased operations. These regulations also affect the permitting of new facilities, and therefore it is unlikely that the state will see any potential increase in oil refining capacity in the future to meet upcoming needs.

The decline in the number of refineries in California over the past 30 years is shown in **Exhibit 2-13**. In 1992, there were 29 refineries in the state, 25 of which were operable and 4 of which were idle. As of 2022, the number of refineries has effectively been halved. That year, there were 15 refineries, 13 of which were operational and two of which were idle.

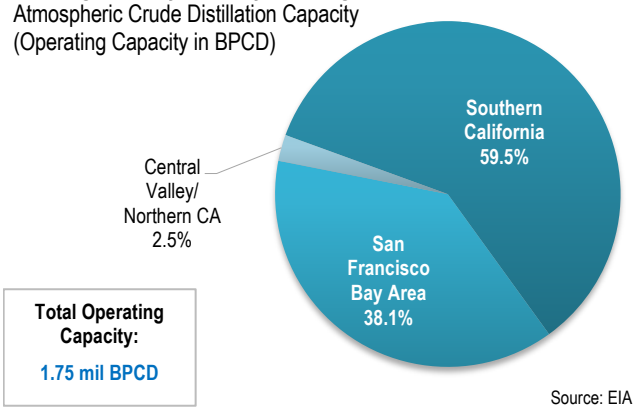
Exhibit 2-13
Number of Refineries in CA



Source: EIA

These refineries are located largely within two sub-regions: Southern California (primarily Los Angeles County) and the San Francisco Bay Area. The three largest refineries in the state are located in El Segundo, Richmond and Carson. **Exhibit 2-14** displays crude oil refining capacity in California by sub-region in 2022. Southern California accounts for more almost 60 percent of the state's refining capacity, and the San Francisco Bay Area accounts for another 38 percent. A small portion of refining occurs in the Central Valley/Northern California subregion.

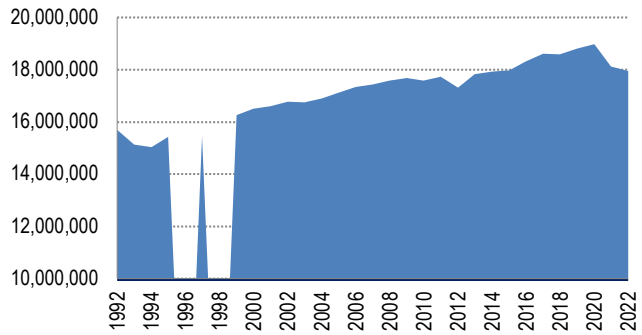
Exhibit 2-14
Refining Capacity in CA by Sub-Region 2022
Atmospheric Crude Distillation Capacity
(Operating Capacity in BPCD)



Source: EIA

While the number of refineries has been declining in both California and the nation as a whole, expansions of existing operations and increases in efficiencies have for the most part resulted in increased capacity nationwide (**Exhibit 2-15**). U.S. refining capacity increased relatively steadily over the past 30 years, with the notable exception coming in 2021 and 2022. Here refining capacity dropped in the aftermath of the COVID-19 pandemic.

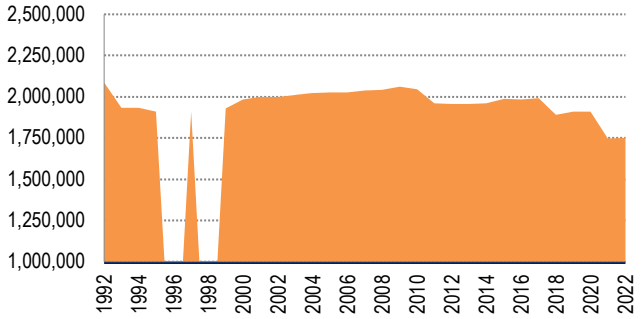
Exhibit 2-15
Annual Operating Refinery Capacity in U.S.
Atmospheric Crude Distillation Capacity (BPCD)



Note: Data unavailable for 1996 and
Source: EIA

However, unlike the national experience, total operating capacity in California did not see a similar increase over the past 30 years. Instead, the state's refining capacity essentially has been flat since around 2000, with occasional step reductions at different points. California also saw a noticeable drop in capacity after 2020. (**Exhibit 2-16**).

Exhibit 2-16
Annual Operating Refinery Capacity in California
Atmospheric Crude Distillation Capacity (BPCD)



Note: Data unavailable for 1996 and
Source: EIA

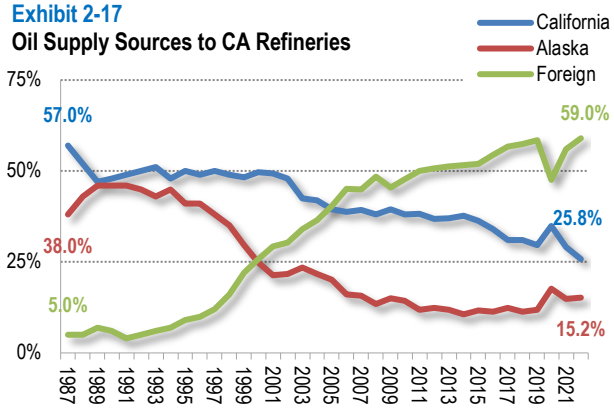
Further reductions of the in-state supply of crude oil and refined petroleum products and byproducts could impact thousands of businesses that depend on these products in their production processes. This could affect production costs and lead to higher prices of end products—which themselves may be used in other industries as inputs into production.

Oil Supply Sources

The requirements for fuel consumed in California are highly specific. Due to limits placed on in-state production and since California has no interstate oil pipelines, California refineries import about 75 percent of the state's crude oil needs from Alaska and outside the United States. Production volumes from Californian and Alaskan sources have been declining over the years, leading to increasing amounts of foreign crude being delivered to marine terminals in the San Pedro and San Francisco ports to augment the supply of crude which is constrained locally.

Exhibit 2-17 shows the percentage breakdown by source of the supply of crude oil to petroleum refineries in California from 1987 through 2022. In 2022, crude oil from foreign sources represented 59 percent of the oil supplied to refineries in the state. Foreign sources and out-of-state domestic sources combined account for 74 percent of the total supply of crude oil to petroleum refineries in California. Only 26 percent of what is refined in the state was locally sourced compared to 31 percent in 2017.

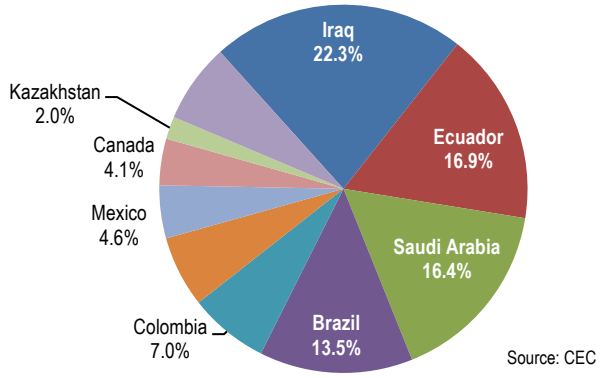
Exhibit 2-17
Oil Supply Sources to CA Refineries



* CA totals may also include minor amounts from Gulf Coast States
Source: CEC, aggregated from PIRRA data

The specificity of the requirements for fuel and the growing reliance upon foreign crude oil sources leave California vulnerable to exports from specific countries. **Exhibit 2-18** presents the distribution of foreign crude oil sources for 2022. Disruptions from these countries

Exhibit 2-18
California's Sources of Foreign Crude in 2022



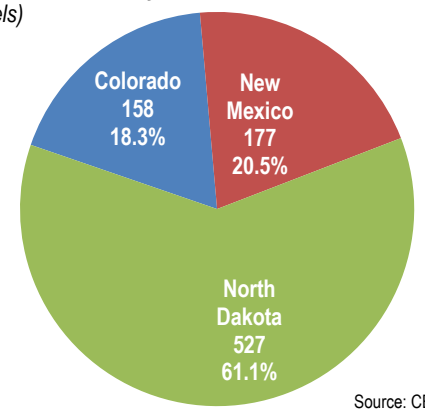
Source: CEC

could result in short-term fluctuations in oil prices and supply shocks.

In 2022, Iraq was the primary foreign supplier of crude oil to California, providing 22 percent of foreign imports. Ecuador was second at 17 percent, and Saudi Arabia third at 16 percent. This reflects a change since 2017, when Saudi Arabia was the primary supplier (29 percent), followed by Ecuador (20 percent) and Colombia (14 percent).

California imports a small portion (less than 1 percent) of its crude oil by rail. In 2022, California imported 862,000 barrels of oil from just three states: North Dakota, New Mexico and Colorado (**Exhibit 2-19**).

Exhibit 2-19
2022 Crude Imports to California by Rail
(Thousands of barrels)



Source: CEC

Crude-by-rail imports have decreased significantly from their high point of 8.2 million barrels in 2019. That year, Canada supplied 64 percent of the imports by rail. In 2017, Canada provided 59 percent of the 3.2 million barrels of crude oil was imported by rail.

Seasonal Supply Vulnerabilities

Each year, California transitions from winter-grade to spring-grade gasoline and from spring-grade to summer-grade gasoline. The cost to manufacture the warmer weather blends is higher than that to manufacture the winter-blend. Regardless of the blend, the cost of manufacturing gasoline to state specifications exceeds that of conventional gasoline used outside of California.

Blendstock transitions also reveal price volatility. Immediately preceding a transition from one seasonal gasoline blend to another, prices will either increase or decrease according to inventory levels; they will rise when inventory is low to delay a badly timed purchase or will drop to accelerate sales of the current blend if inventory is deemed high.

In the event that refining capacity is reduced further, and local production cannot meet local demand due to more aggressive restrictions, additional product must be imported into the area.

There are several refineries outside of the state that can produce California gasoline, they include the state of Washington and the U.S. Gulf Coast, and abroad sources include Eastern Canada, Finland, Germany, the U.S. Virgin Islands, the Middle East and Asia.

Costs for petroleum and petrochemical products produced out of state typically are higher due to increased shipping costs as well as costs associated with out-of-state producers reconfiguring and refitting facilities. Refitting facilities is a costly and labor-intensive undertaking that is required to accommodate California's specific blends of low sulfur gasoline and diesel.

These additional costs are passed on to end users, both industrial and consumer. Dependent industries that use petroleum and petrochemical products as inputs in production or are heavily reliant upon these products in the provision of a service, such as transportation industries, may not be able to absorb the cost increases. Consumers will feel cost increases that cannot be absorbed by the industry at the pump or when they purchase transportation services or petroleum-based end products.

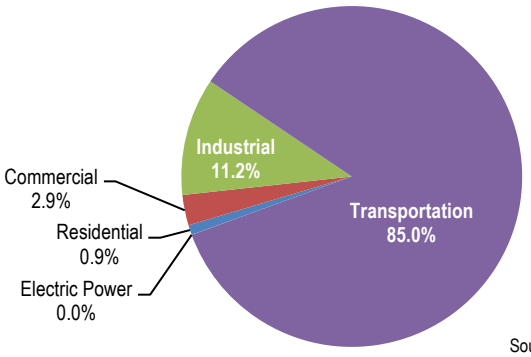
Market Activity

The market segment of the oil and gas industry includes industries that deliver petroleum and natural gas products to the end-user. This segment includes gasoline stations, natural gas distribution and fuel dealers, who retail liquefied petroleum gas (LPG). Industry trends in this segment are unique to each product sold; therefore, they are discussed separately.

Petroleum

Californians spent an estimated $123.8 billion on 628 million barrels of petroleum in 2022. About 85 percent of the expenditures on petroleum in the state go towards transportation, as shown in **Exhibit 2-20**. Approximately 11 percent goes to industrial uses, 3 percent to commercial uses, and 1 percent to residential. A very small percentage is used for electrical power.

Exhibit 2-20
2022 Distribution of CA Expenditures on Petroleum
By End-Use Sector



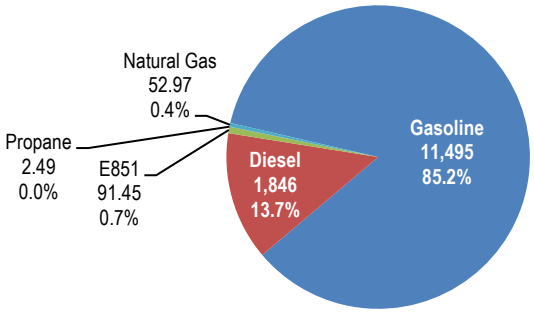
Source: EIA

The state accounted for 11.8 percent of U.S. expenditures and 8.6 percent of U.S. consumption of petroleum in 2022. California was ranked the second highest state with respect to the total barrels of petroleum consumed, behind Texas (1.5 billion barrels). It is followed by Louisiana (389 million barrels), Florida (356 million barrels) and New York (256 million barrels).

Fuel Stations

There were an estimated 10,742 retail fuel stations in California in 2022. These retail outlets are estimated to have sold 11.5 billion gallons of gasoline and 1.8 billion gallons of diesel (**Exhibit 2-21**). The demand for gasoline and has decreased significantly in the aftermath of the COVID-19 pandemic, however the demand for diesel fuel has increased. In 2022, the total number of vehicle miles travelled in California measured 315,244 million, down from the 343,862 million in 2017.

Exhibit 2-21
Retail Sales Volumes in California 2022
(Million gallons)

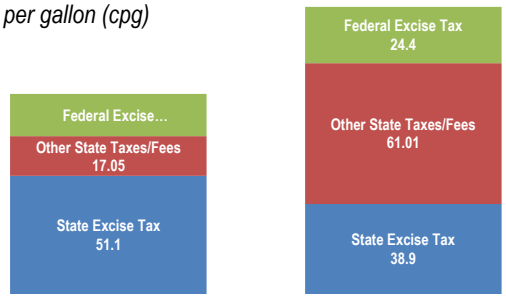


Source: CEC

Gasoline stations are affected by fluctuations in the price of oil and refined products; volatile prices can affect industry revenues and profits. Regulatory compliance for gasoline stations includes tank testing, soil analysis and remediation.

Taxes levied on the purchase of fuels and natural gas in California are significant. Taxes that apply to the purchase of fuel include sales and use, state and federal excise and an Underground Storage Tank (UST) fee of 2 cents per gallon (cpg.). According to the American Petroleum Institute, an estimated 86.55 cpg of gasoline and 124.31 cpg of diesel went towards fuel taxes in California in 2022 (**Exhibit 2-22**), placing California as the highest taxed state in the nation for gasoline and diesel fuel.[12]

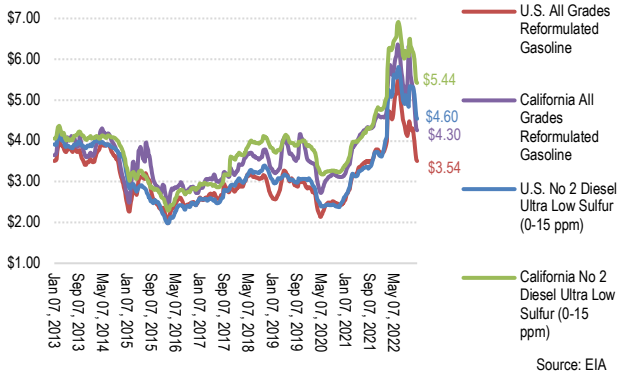
Exhibit 2-22
California Motor Fuel Taxes, 2022
Cents per gallon (cpg)



Source: API

Additional regulatory costs also exist in California (i.e. reformulation, Low Carbon Fuel Standard, and the Cap-and-Trade program limiting GHG emissions). The result is an increase in the price spread of motor fuels between California and the national average. **Exhibit 2-23**

Exhibit 2-23
Price of Gasoline and Diesel
California versus U.S. average



Source: EIA

[12] https://www.api.org/-/media/files/statistics/state-motor-fuel-taxes-charts-january-2022.pdf

demonstrates these differences for the ten years from 2013 through 2022.

Natural Gas

Natural gas distribution is included in the market segment of the industry as it markets natural gas to the end user. End-use sectors include not only residential users, but industrial and commercial users as well. Natural gas is also used in transportation and in electric power generation as the state completes its transition from coal to natural gas as a cleaner alternative. The EIA found that natural gas replacing the use of coal for electricity generation has resulted in significant reductions in sulfur dioxide (SO2) and carbon dioxide (CO2) emissions over the last decade.

Current natural gas utilities with service areas in California are listed in **Exhibit 2-24**.

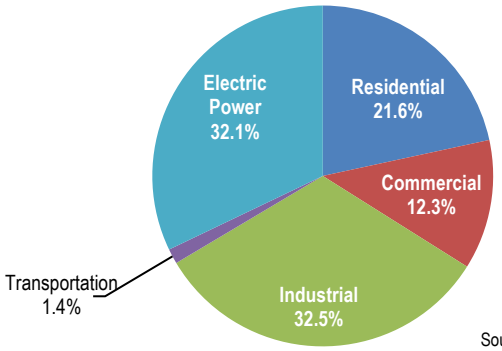
Exhibit 2-24
Natural Gas Utilities with Service Areas in California

- City of Long Beach Gas and Oil Department
- City of Palo Alto Gas Department
- Pacific Gas and Electric Company (PG&E)
- San Diego Gas & Electric (SDG&E)
- NV Energy
- Southern California Gas Company (SoCalGas)
- Southwest Gas Corporation

Source: California Energy Commission

Californians spent an estimated $26.5 billion on 2,059 billion cubic feet of natural gas in 2022. The largest expenditures were made by the industrial sector and the electric power sector, which together represented about two-thirds of all expenditures (**Exhibit 2-25**). Next was the residential sector (22 percent), followed by the commercial sector (12 percent) and vehicle fuel (1 percent).

Exhibit 2-25
2022 Distribution of CA Expenditures on Natural Gas
By End-Use Sector

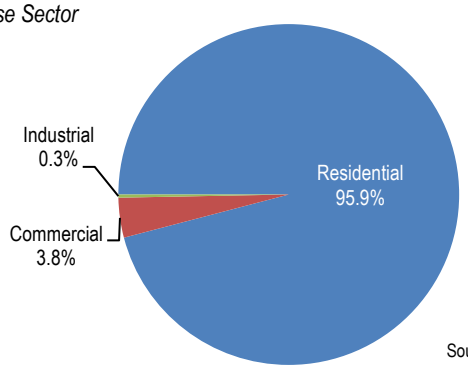


Source: EIA

In 2022, California accounted for 9.8 percent of U.S. expenditures on natural gas while only accounting for 6.4 percent of U.S. consumption. Some of this discrepancy is attributable to the residential side. Just over 60 percent of home heating in the state used natural gas, compared to 46 percent for the United States. Additionally, Californians paid a residential price for natural gas of $20.15 per thousand cubic feet compared to $14.75 for the United States.

The number of natural gas consumers in California was nearly 11.8 million in 2022, up from 11.5 million in 2017. Residential consumers accounted for nearly 96 percent of the total number of natural gas consumers in the state (**Exhibit 2-26**).

Exhibit 2-26
2022 Distribution of CA Natural Gas Consumers
By End-Use Sector



Source: EIA

Residential consumption includes natural gas used in private households for heating, air-conditioning, cooking, water heating, and other household uses. Commercial consumption includes establishments or agencies predominantly engaged in the sale of goods or services, such as hotels, restaurants, wholesale and retail stores and other service enterprises. This category also includes non-manufacturing activities of government agencies (local, state and federal). Industrial consumption includes establishments that use natural gas for heat, power, or chemical feedstock in manufacturing, mining or other mineral extraction, agriculture, forestry, and fisheries. Operations with generators that produce electricity and/or thermal output in support of these listed industrial activities are also included in industrial consumption.

While the number of residential consumers of natural gas far exceeds the number of commercial and industrial consumers, the average annual consumption per consumer for commercial and industrial establishments exceed that of an average household; the average annual consumption per commercial consumer and per

industrial consumer in California in 2022 was 555 Mcf and 18,683 Mcf respectively.

Taxes are imposed on the consumption of natural gas, through a natural gas surcharge paid by consumers to their utility service provider. The rate is determined by service territory and customer class (end-use).

In California, an excise tax also applies to compressed natural gas (CNG), liquefied natural gas (LNG) and propane used to operate a vehicle. The tax can be paid either through a flat rate fee based on vehicle weight, or on a per gasoline gallon equivalent. (GGE) for CNG or diesel gallon equivalent (DGE) for LNG and propane.

3 Economic and Fiscal Contribution of the Industry in California

The extraction, production, refining, and manufacturing of petroleum products generate highly tradable goods that are consumed domestically and exported globally, resulting in substantial revenues, well-paying jobs with benefits, and considerable fiscal contributions at all levels of government.

In California, the oil and gas industry plays an important role in the state economy. It contributes significantly to the state's GDP and supports a wide range of sectors, including manufacturing, transportation, and services. The industry's investments in infrastructure, equipment, local hiring, and refined product sales drive further economic activity, supporting hundreds of thousands of jobs statewide. This generates billions in annual tax revenues for state and local governments, funding essential public services such as education, healthcare, and infrastructure development.

As part of this study, a customized input-output model was developed for the state to estimate the economic contribution of the oil and gas industry in California. The models measure economic benefits through jobs, labor income, economic output, Gross State Product (or Gross Regional Product), and fiscal revenues paid to state and local, as well as federal governments. Additional details on the methodology used in this report can be found in the Appendix.

Direct Economic Activity

Direct activity associated with the oil and gas industry is the direct contribution to the economy of the industry in terms of employment, labor income and value added.

Direct employment of the oil and gas industry includes all individuals whose employment is directly related to business establishments with activities that fall within the NAICS codes included in the industry definition. Measured on a job-count basis regardless of the number of hours worked, it includes full-time, part-time, permanent and seasonal employees and the self-employed.[13]

Exhibit 3-1 displays the estimated direct employment associated with each component industry in the oil and gas industry in California in 2022. Direct employment estimates in this report represent activity which would be lost to the economy without the presence of the oil and gas industry in California.

Exhibit 3-1
Oil and Gas Industry Employment
California 2022

Industry Category	Direct Employment (jobs)
Upstream	22,750
Midstream	23,070
Downstream	10,100
Market	92,220
Oil and Gas Industry Employment	**148,140**
Percent of California Total Employment	*0.6%*

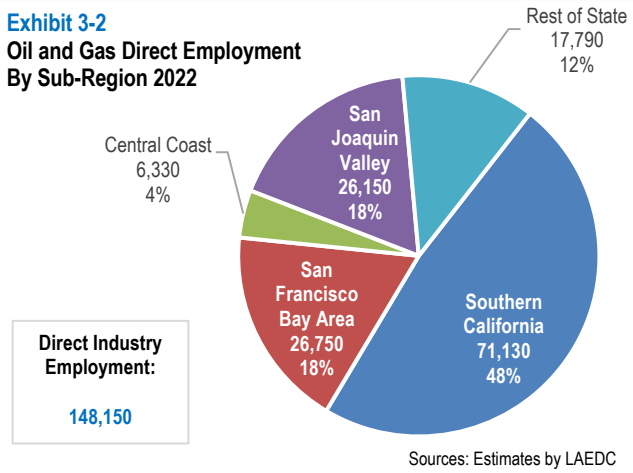
Note: Includes non-employers, independent contractors, and royalty earners
Source: Estimates by LAEDC

The oil and gas industry in California provided over 148,100 jobs in 2022, including independent contractors and payroll employees. Upstream industries, which include oil extraction, drilling, support activities, and oil and gas field machinery manufacturing, employed 22,750 people, making up 15.4% of total industry employment. Midstream industries, including pipeline construction, petroleum product wholesaling, and pipeline transportation, employed 23,070 workers, or 15.6% of total. Downstream industries, encompassing petroleum refining, lubricating oil and grease manufacturing, and petrochemical manufacturing, accounted for 10,100 jobs (or 6.8%). Market Industries, which include natural gas distribution, fuel dealers, and gasoline retail, employed 92,220 workers, making up the largest share (62.3%) of the industry workforce.

[13] The size of workforce in the oil and gas industry is hard to quantify, as there are a significant number of temporary and contingent, or contract, workers. These workers may live outside the area where they are performing their work duties. Data reported according to these workers' mailing address, such as nonemployer data, will attribute these workers not by where their work is taking place, but by their associated address, which leads to potential overcounting and undercounting of contingent workers at the county-level and sub-regions. A small labor leakage may take place in state-level data as well, due to work contracted with companies from outside of California.

Exhibit 3-2 shows the distribution of estimated direct oil and gas industry employment by sub-region in 2022. While the number of wells, and both oil and gas production levels are highest in the Central Valley/ Northern California region, over half of all industry employment is in Southern California.

Exhibit 3-2
Oil and Gas Direct Employment By Sub-Region 2022



Sources: Estimates by LAEDC

Labor income in the oil and gas industry is the value of all earnings received by payroll employees, contract workers and other proprietors, including benefits such as health insurance, pension plan contributions, and royalties. Total labor payments by component industry are presented in **Exhibit 3-3**.

Exhibit 3-3
Oil and Gas Industry Labor Income
California 2022

Industry Category	Direct Labor Income ($ millions)
Upstream	1,868
Midstream	2,559
Downstream	2,827
Market	15,791
Oil and Gas Industry Labor Income	**23,045**
Percent of California Total Labor Income	*1.1%*

Note: Includes non-employers, independent contractors, and royalty earners
Source: Estimates by LAEDC

Market industries were the largest contributors to labor income within California's oil and gas sector, generating $15.8 billion, or 68.5% of the industry's total labor income, reflecting their significant share of employment. Downstream and midstream industries contributed $2.8 billion (12.3%) and $2.6 billion (11.1%), respectively. Upstream industries added $1.9 billion, representing 8.1% of the total. In total, the oil and gas industry provided $23 billion in labor income, which is equivalent to 1.1% of California's overall labor income. ❖

Total Economic Contribution

The total economic contribution of the oil and gas industry in California includes indirect and induced activity in addition to the direct activity already identified. *Direct activity* includes the materials purchased and the employees hired by the industry itself. *Indirect effects* are those which stem from the employment and business revenues motivated by the purchases made by the industry and any of its suppliers. *Induced effects* are those generated by the spending of employees whose wages are sustained by both direct and indirect spending. These direct, indirect and induced effects combined result in a considerable contribution to the California economy, which is presented in **Exhibit 3-4**.

Exhibit 3-4
Total Economic Contribution of Oil and Gas Industry
California 2022*

Employment (jobs):		
Direct	148,150	
Indirect	223,850	
Induced	164,770	
TOTAL		**536,770**
Percent of California Total Employment		*2.1%*
Labor income ($ millions):		
Direct	23,045	
Indirect	19,122	
Induced	11,199	
TOTAL		**53,366**
Percent of California Total Labor Income		*2.5%*
Value added ($ millions):		
Direct	117,520	
Indirect	28,513	
Induced	20,014	
TOTAL		**166,048**
Percent of California Total GDP		*4.6%*
Output ($ millions):		
Direct	257,750	
Indirect	48,342	
Induced	31,903	
TOTAL*		**337,995**
Percent of California Total Output		*5.7%*

Note: Includes royalty earners
Source: Estimates by LAEDC

It is estimated that the activities related to the oil and gas industry in California in 2022 generated value added equaling $166 billion, approximately 4.6 percent of the state's GDP of $3.6 trillion. The industry contributed 536,770 jobs, or 2.1 percent of the state total, with labor income of over $53 billion, accounting for 2.5 percent of all labor income earned in the state.

Industry Distribution

The total economic contribution is achieved through activity occurring across a wide range of industry sectors via indirect and induced effects. These effects capture the economic activity created in other sectors through purchases of goods and services made in the industry's supply chain and through the purchases of goods and services made by employees.

The distribution of the total employment, labor income and value-added contribution among industry sectors is presented in **Exhibit 3-5**.

Exhibit 3-5
Total Economic Contribution of Oil and Gas Industry by Sector
California 2022

	Jobs	Labor Income ($ millions)	Output ($ millions)
Ag, forestry, fish & hunting	640	$34.6	$104.9
Mining	21,950	$1,789.6	$18,995.1
Utilities	38,060	$10,350.1	$56,575.8
Construction	19,180	$1,562.8	$4,122.1
Manufacturing	15,970	$3,342.5	$129,360.0
Wholesale trade	23,610	$2,727.2	$41,521.7
Retail trade	76,230	$6,790.0	$17,764.2
Transportation and warehousing	51,260	$3,656.7	$9,923.2
Information	5,490	$1,085.3	$4,537.7
Finance and insurance	27,750	$2,802.5	$9,265.4
Real estate and rental	23,960	$1,553.9	$10,866.6
Professional, scientific technical	51,090	$5,595.0	$11,076.9
Management of companies	9,910	$1,507.0	$2,694.3
Administrative and waste services	54,730	$3,243.3	$6,872.4
Educational services	7,150	$425.9	$648.9
Health and social services	35,030	$2,669.2	$4,507.4
Arts, entertainment and recreation	7,020	$364.6	$766.6
Accommodation and food services	31,280	$1,260.9	$3,287.0
Other services	29,490	$1,712.4	$2,988.1
Government	6,970	$892.0	$2,116.5
Total	**536,770**	**$53,365.5**	**$337,995.0**

Source: Estimates by LAEDC

Of the 536,770 jobs supported, over 14 percent were in retail trade (which includes gas stations and fuel dealers), over 9 percent in transportation and warehousing (which includes pipeline transportation), just over 7 percent were in the utilities sector (which includes natural gas distribution and electric power generation and transmission), and over 4 percent were in the wholesale sector (which includes petroleum bulk stations and terminals). However, virtually all industry sectors receive a positive economic impact from the oil and gas industry, including administrative and waste services, professional, scientific and technical services, health and social services, accommodation and food services, finance and insurance, mining, real estate, and construction.

A description of the industry sectors is provided in the Appendix. ❖

Public Revenues

The oil and gas industry faces a high tax burden, incurred by both businesses operating within the industry and by consumers. The production, refining, distribution, retail and consumption of oil and gas all face taxes levied by local, state and federal governments.

Ad Valorem:
In California, ad valorem taxes for the oil and gas industry are levied at the county level based on the fair market value of mineral properties, such as proved reserves, and are applied annually. While the base rate for property taxes across California is one percent of the assessed value, local counties may add additional rates to fund voter-approved debts. Unlike most other oil-producing states, California taxes oil and gas reserves while still in the ground, even if the resources are not being actively produced, which ensures counties receive consistent revenues. These funds are typically allocated to public services, including education and safety.

Production:
California applies a small statewide assessment on oil and gas production, which funds the Department of Conservation's Geologic Energy Management Division (CalGEM) and other state entities. Established each June, the assessment rate is based on CalGEM's budget projection for the upcoming fiscal year and the total oil and gas production in the previous calendar year. The rate is imposed per barrel of oil and per 10,000 cubic feet of natural gas. For the 2024/25 fiscal year, the assessment rate is $1.2156 per equivalent barrel, calculated from CalGEM's $153.8 million budget divided

by 126.5 million equivalent barrels produced. In 2023/24, the rate was $1.0107.[14]

State and Local Excise Taxes:
Excise taxes are levied on the purchase of certain goods and are paid by the end user at the time of sale. Excise taxes in California for oil and gas products are levied at multiple levels and vary by fuel type. For gasoline, the state excise tax has increased to 59.6 cents per gallon as of July 2024, while diesel fuel is taxed at 45.4 cents per gallon. Jet fuel and aviation gasoline are taxed at 2 cents and 18.6 cents per gallon, respectively. These rates are adjusted annually in line with the California Consumer Price Index to reflect inflation.[15]

Federal Excise Tax:
The federal government imposes an excise tax on consumption of various types of fuel, including gasoline, aviation gasoline, diesel, and jet fuel. This tax also applies to compressed natural gas (CNG) used in vehicles. The rates for these taxes vary based on the fuel type. For instance, as of July 1, 2024, the federal excise tax on gasoline is 18.4 cents per gallon, while diesel is taxed at 24.4 cents per gallon.[16]

Sales Tax:
Sales tax on fuel in California is applied differently for gasoline and diesel and is assessed by both state and local governments. Gasoline is subject to a 2.25% state sales tax, with additional local district taxes that vary by location, resulting in rate differences across counties and even within cities. Diesel fuel sales carry a higher state sales tax rate, which is set at 13% from October 1, 2023, to June 30, 2024, with additional district taxes also applied. Consumers pay the sales tax on fuel directly at the point of sale.[17]

Lease and Royalty Payments:
To extract oil and gas on federal lands, operators must secure leases from the federal government, often through competitive auctions where leases are awarded to the highest bidders. Winning bidders make an upfront "bonus" payment, followed by annual rental payments, and then pay royalties based on the amount of production. Recent reforms by the Bureau of Land Management (BLM) raised royalty rates on new leases from 12.5% to 16.67%. Additionally, minimum rental rates have been increased to $3 per acre for the first two years, with incremental increases in later years.[18]

The State Lands Commission's Mineral Resources Management Division is charged with the management and administration of oil and gas, geothermal and other mineral resources on state-owned public lands in California. In addition to initial bonus lease payments, lease rent and royalties apply. As of 2022, there are 11 active offshore oil-producing leases and 5 inactive leases. These state-managed leases contribute to royalty revenues, primarily from production occurring offshore near Long Beach.[19]

Other State and Local Taxes and Fees:
Additional taxes and fees relevant to the oil and gas industry in California include the following:

International Fuel Tax Agreement (IFTA)

As of July 1, 2024, California's International Fuel Tax Agreement (IFTA) diesel tax rate is set at $1.023 per gallon for diesel fuel. This figure represents a slight reduction from the previous rate of $1.089 per gallon in early 2024. The new rate includes both a diesel fuel tax of $0.454 per gallon and an excise tax of $0.569. Commercial carriers will continue to report their fuel usage and miles traveled by jurisdiction in quarterly filings under IFTA, which redistributes these tax revenues according to mileage reported across different jurisdictions.[20]

Underground Storage Tank Maintenance Fee

The Underground Storage Tank (UST) Maintenance Fee, administered by the California Department of Tax and Fee Administration (CDTFA), is charged to owners of USTs used for petroleum storage. Assessed on a per-gallon basis at a rate of $0.02 per gallon since January 1, 2015, this fee generates revenue for the Underground Storage Tank Cleanup Fund within the state's General Fund. The purpose of the fund is to provide financial assistance for remediating environmental damage caused by tank leaks,

[14] CA Department of Conservation. https://www.conservation.ca.gov/calgem/for_operators/Pages/Assessments.aspx#:~:text=There%20is%20no%20statewide%20severance%20tax%20on%20oil,assessor%20in%20the%20county%20you%20are%20interested%20in.
[15] California Department of Tax and Fee Administration (CDTFA). https://cdtfa.ca.gov/formspubs/L932.pdf.
[16] EIA. https://www.eia.gov/tools/faqs/faq.php?id=10&t=10
[17] EIA. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.eia.gov%2Fpetroleum%2Fmarketing%2Fmonthly%2Fxls%2Ffueltaxes.xlsx&wdOrigin=BROWSELINK
[18] U.S. Department of the Interior Bureau of Land Management. https://www.blm.gov/sites/default/files/docs/2024-04/BLM-Final-Onshore-Oil-and-Gas-Leasing-Rule-General-Fact-sheet.pdf.
[19] California State Land Commission. https://slcprdwordpressstorage.blob.core.windows.net/wordpressdata/2022/05/04-23-22_61-Presentation.pdf.
[20] CDTFA. https://www.cdtfa.ca.gov/formspubs/L945.pdf.

covering third-party damages and liabilities, and helping owners meet federal financial responsibility standards.[21]

Oil Spill Prevention and Administration Fees

There is a statewide oil spill prevention fee of 9.4 cents per barrel of crude oil and petroleum products as of July 2024, which supports California's environmental protection efforts. The OSPA fee must be paid by the owners of crude oil and petroleum products. Marine terminal operators and refinery operators are responsible for collecting the OSPA fee from the owners. Starting on July 1, 2023, the OSPA fees are updated annually in accordance with changes in the California Consumer Price Index.[22]

Oil Spill Response Fee

This fee, at the rate of $0.25 per barrel, applies to crude oil and petroleum products received at marine terminals, moving through marine pipelines, or received at California refineries. The fee is not collected currently as the fund has reached its $50 million maximum with January 1991 filing. The state would resume collecting this fee in the event that this fund is accessed.[23] ❖

Total Fiscal Contribution

Given this background, the economic activity associated with the oil and gas industry in California in 2022 is estimated to have generated $47.9 billion in state and local taxes and $16.3 billion in federal taxes. The disaggregation of taxes by type and level of government is shown in **Exhibit 3-6**.

Of state and local government revenues, nearly over $21 billion was received from sales and excise taxes (including those paid on the consumption of oil and gas products), about $17 billion was received from property taxes paid by households and businesses and ad valorem taxes about $5 billion was received from personal and corporate income taxes.

Of federal taxes, $0.9 billion in taxes was earned in excise taxes, $6.3 billion from personal income taxes, $2.8 billion in taxes on corporate income and $5.3 billion in social insurance payments. ❖

Exhibit 3-6
Detailed Fiscal Contribution of O&G Industry

By Type of Tax ($ millions):	
Personal income taxes	$8,466.1
Social insurance	5,534.4
Sales and excise taxes	21,734.1
Property taxes	17,081.2
Corporate profits taxes	5,685.8
Special Assessments	784.9
Other taxes	3,456.6
Fees, fines and permits	1,512.7
TOTAL	**$64,255.8**
By Type of Government ($ millions):	
Federal	$16,315.5
State	24,130.2
County	6,574.9
Cities	17,235.2
TOTAL	**$64,255.8**

Sources: IMPLAN; estimates by LAEDC

Economic Contribution by Segment

The total economic impact of the oil and gas industry in California in 2022 was just presented; however, each segment of the industry (upstream, midstream, downstream and market industry) is associated with its own distinct set of activities. These direct activities extend throughout the California economy with different magnitudes.

Exhibit 3-7 identifies the total economic contribution (direct, indirect and induced) of each segment of the industry as defined in the first section of this report. The industry segment with the largest impacts for employment, labor income, and value-added is the market segment, which includes natural gas distribution, fuel dealers, and gasoline stations. The downstream industry segment has the largest impacts for output, this segment includes refineries and petrochemical manufacturing.

[21] CDTFA. https://www.cdtfa.ca.gov/taxes-and-fees/ust-maint-fee-faq.htm
[22] CDTFA. https://cdtfa.ca.gov/formspubs/L936.pdf
[23] CDTFA. https://www.cdtfa.ca.gov/taxes-and-fees/special-taxes-and-fees-tax-rates/#oilspillfee.

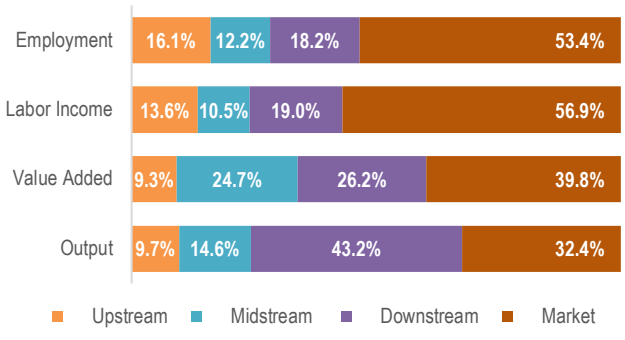
Exhibit 3-7
Total Economic Contribution by Industry in California 2022

Total Employment Impact (jobs):		
Upstream	86,680	
Midstream	65,440	
Downstream	97,820	
Market	286,830	
TOTAL		**536,770**
Total Labor Income ($ billions):		
Upstream	$7.2	
Midstream	$5.6	
Downstream	$10.1	
Market	$30.4	
TOTAL		**$53.4**
Total Value Added ($ billions):		
Upstream	$15.4	
Midstream	$41.1	
Downstream	$43.6	
Market	$66.0	
TOTAL		**$166.0**
Total Output ($ billions):		
Upstream	$32.8	
Midstream	$49.5	
Downstream	$146.1	
Market	$109.6	
TOTAL		**$338.0**

Source: Estimates by LAEDC

Exhibit 3-8 shows the distribution of the total economic impact of each segment of the industry, allowing for the comparison of each segment's share of the larger oil and gas industry's total economic contribution.

Exhibit 3-8
Distribution of Total Impacts by Industry Segment California 2022



In terms of employment, associated labor income, and value added, market activity (retail and distribution) contributes a larger share compared to other segments, contributing 53 percent, 57 percent, and 40 percent each. When it comes to total output, downstream activity (refineries and petrochemicals) contributes a larger share, accounting for 43 percent.

Several factors may explain the variations in the individual segments' shares of the oil and gas industry's total economic contribution. These include, but are not limited to, the reliance of each segment on labor versus capital in the production process, pay scales, and the value added by their activities to the supply chain.

The market segment, which focuses on retail and distribution, is relatively more labor-intensive due to the demands of customer service, logistics, and sales. Consequently, this segment accounts for a larger share of employment (53 percent) and labor income (57 percent). In contrast, downstream production activities, such as refining and petrochemical manufacturing, are more capital-intensive. These activities rely heavily on specialized industrial machinery and advanced technology rather than labor, which is reflected in their lower share of employment contribution (18 percent) but the highest share of output contribution (43 percent).

Additionally, while upstream operations are vital for resource extraction and initial processing, much of the raw material's value is realized during later stages of refining, transformation, and distribution. As a result, the upstream segment's value-added contribution to the supply chain is relatively low (9 percent) compared to its share of employment contribution (16 percent). In contrast, the midstream and downstream segments contribute more significantly to value added (25 percent and 26 percent, respectively) as they involve transforming raw materials into finished products and facilitating their transportation to the market. ❖

4 Economic Contribution by Sub-Region and County

For purposes of exposition, California is divided into four sub-regions, which are shown in **Exhibit 4-1** and defined below.

Southern California
This sub-region includes the following six counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino and San Diego.

San Francisco Bay Area
This sub-region includes the following nine counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma.

Central Coast
This sub-region includes the following four counties: Monterey, San Luis Obispo, Santa Barbara and Ventura.

San Joaquin Valley
This sub-region includes the following eight counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare.

The oil and gas industry is widespread across the state. However, concentrations of activity are evident.

These four sub-regions account for 27 counties and about 88 percent of the direct employment in the industry. The remaining 31 counties are summarized in a Rest of State sub-region.

According to the Division of Oil, Gas and Geothermal Resources of the California Department of Conservation (DOGGR), well activity is similarly distributed among the sub-regions.

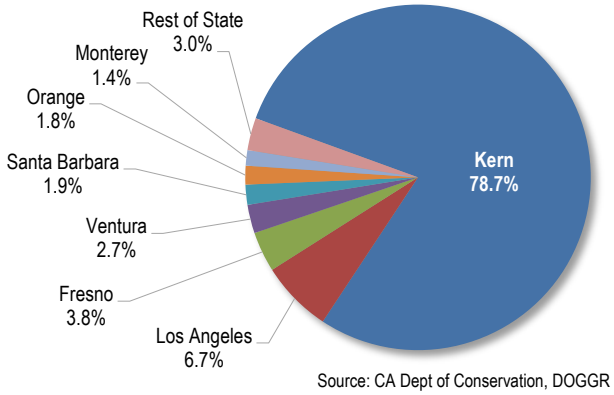
Active wells are distributed across the state, but the majority of them, nearly 80 percent, are located in Kern County in the San Joaquin Valley sub-region.[24] The distribution of active wells by county is shown in **Exhibit 4-2**.

Direct activity and economic and fiscal contributions of each sub-region are presented in the following pages. ❖

Exhibit 4-1
California Sub-Regions

Source: ESRI

Exhibit 4-2
Active Wells in CA by County 2021



Source: CA Dept of Conservation, DOGGR

[24] CA Dept of Conservation. 2021 Annual Oil and Gas Report. https://www.conservation.ca.gov/calgem/pubs_stats/annual_reports/Pages/annual_reports.aspx.

Southern California Sub-Region

The Southern California sub-region consists of the six counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino and San Diego.

Exhibit 4-3
Southern California Sub-Region

Source: ESRI

Exhibit 4-4
Direct Employment of Oil and Gas Industry -- Southern California Sub-Region 2022*

		Employment
Upstream		**8,340**
211	Oil and gas extraction	5,160
213111	Drilling oil and gas wells	910
213112	Support activities for oil and gas operations	1,920
333132	Oil and gas field machinery and eqpmt mfg.	350
Midstream		**11,110**
23712	Oil and gas pipeline construction	5,480
4247	Petroleum and petroleum prods wholesalers	4,160
486	Pipeline transportation	1,470
Downstream		**5,270**
32411	Petroleum refineries	4,620
324191	Petroleum lubricating oil and grease mfg.	630
32511	Petrochemical manufacturing	20
Market		**46,410**
2212	Natural gas distribution	18,810
4571	Gasoline stations	26,780
45721	Fuel dealers	820
TOTAL DIRECT EMPLOYMENT		**71,130**
Percent of California O&G Industry Employment		*48.0%*

* Includes royalty owners as proprietors

Exhibit 4-5
Backward Linkages: Oil and Gas Industry Total Economic and Fiscal Contribution -- Southern California Sub-Region 2022*

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	71,130	$10,955	$53,735	$123,375
Indirect	124,940	10,177	15,129	26,115
Induced	95,130	6,277	11,148	18,096
TOTAL CONTRIBUTION	**291,200**	**$27,410**	**$80,012**	**$167,586**
Percent of Total CA O&G Industry Contribution	*54.25%*	*51.36%*	*48.19%*	*49.58%*
Percent of Sub-Region Total	*2.12%*	*2.59%*	*4.51%*	*5.62%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)	Total ($ millions)
Personal income taxes	1,168	3,297	4,465
Social insurance	121	2,798	2,919
Sales and excise taxes	9,511	384	9,896
Property taxes	7,763	0	7,763
Corporate profits taxes	1,371	1,371	2,742
Special Assessments	264	0	264
Other taxes	1,309	0	1,309
Fees, fines and permits	216	428	644
TOTAL TAX REVENUES	**21,725**	**8,278**	**30,003**

* Estimates may differ from reports whose methodology includes royalty owners as proprietors.

Characteristics of the Industry Workforce in Southern California

Gender of Workforce

The oil and gas workforce in Southern California is predominantly male, with 66.5 percent being male, slightly lower than the statewide figure of 67.8 percent. Women account for 33.5 percent, showing a marginally higher representation compared to the state overall.

Age of Workforce

Workers in their prime working years (25–54) make up 66.9 percent of the workforce, consistent with statewide trends. Older workers aged 55 and above account for 25.2 percent, while younger workers under 25 make up 7.9 percent, slightly above the state average.

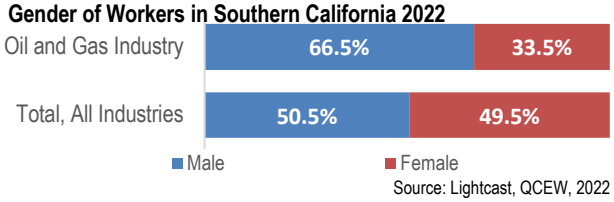
Race and Ethnicity in the Workforce

Hispanic or Latino workers dominate in this region, representing 43.6 percent of the workforce, higher than their share statewide. White workers comprise 35.9 percent, while Asians and Blacks make up 11.3 percent and 6.3 percent, respectively.

Educational Attainment of Workers

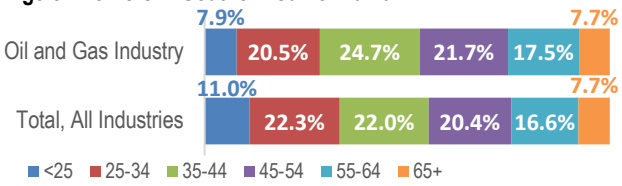
A significant portion of the workforce (41 percent) has a high school diploma or less, slightly above the statewide figure. About 28.3 percent have some college or an associate degree, and 24.3 percent hold a bachelor's degree or higher.

Exhibit 4-6
Gender of Workers in Southern California 2022



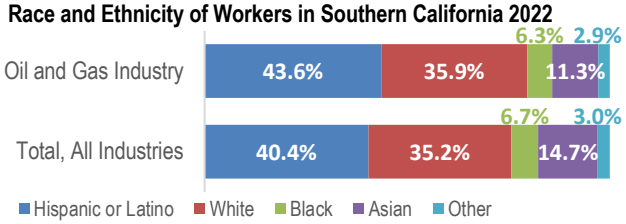
Source: Lightcast, QCEW, 2022

Exhibit 4-7
Age of Workers in Southern California 2022



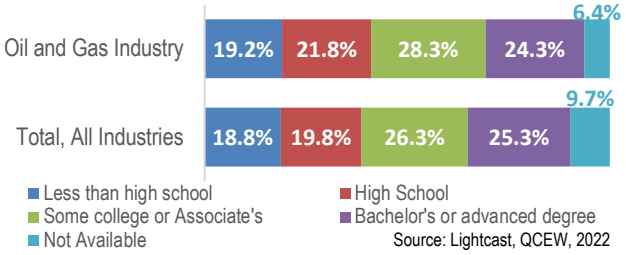
Source: Lightcast, QCEW, 2022

Exhibit 4-8
Race and Ethnicity of Workers in Southern California 2022



Source: Lightcast, QCEW, 2022

Exhibit 4-9
Educational Attainment of Workers in Southern California 2022

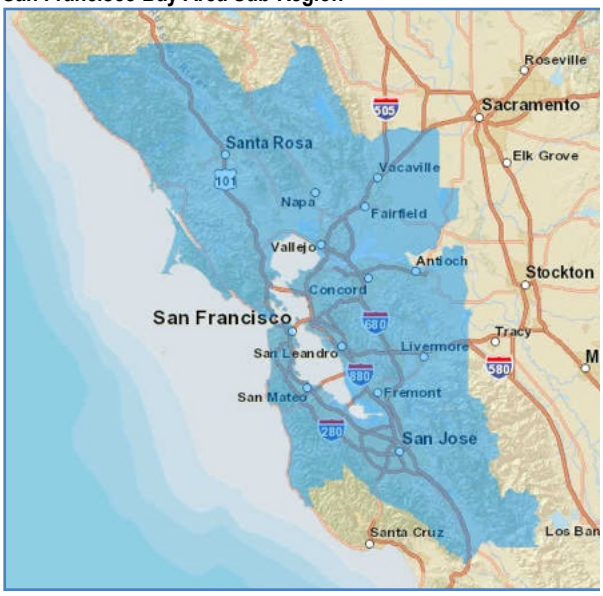


Source: Lightcast, QCEW, 2022

San Francisco Bay Area Sub-Region

The San Francisco Bay Area sub-region consists of the nine counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma.

Exhibit 4-10
San Francisco Bay Area Sub-Region



Source: ESRI

Exhibit 4-11
Direct Employment of Oil and Gas Industry -- San Francisco Bay Area Sub-Region 2022*

		Employment
Upstream		**2,390**
211	Oil and gas extraction	1,530
213111	Drilling oil and gas wells	250
213112	Support activities for oil and gas operations	610
333132	Oil and gas field machinery and eqpmt mfg.	0
Midstream		**3,700**
23712	Oil and gas pipeline construction	1,640
4247	Petroleum and petroleum prods wholesalers	1,720
486	Pipeline transportation	340
Downstream		**3,860**
32411	Petroleum refineries	3,690
324191	Petroleum lubricating oil and grease mfg.	130
32511	Petrochemical manufacturing	40
Market		**16,800**
2212	Natural gas distribution	8,330
4571	Gasoline stations	8,230
45721	Fuel dealers	240
TOTAL DIRECT EMPLOYMENT		**26,750**
Percent of California O&G Industry Employment		*18.1%*

* Includes royalty owners as proprietors

Exhibit 4-12
Backward Linkages: Oil and Gas Industry Total Economic and Fiscal Contribution -- San Francisco Bay Area Sub-Region 2022*

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	26,750	$5,619	$30,243	$76,588
Indirect	41,570	4,960	7,498	11,500
Induced	28,690	2,453	4,382	6,499
TOTAL CONTRIBUTION	**97,010**	**$13,032**	**$42,123**	**$94,587**
Percent of Total CA O&G Industry Contribution	*18.07%*	*24.42%*	*25.37%*	*27.98%*
Percent of Sub-Region Total	*1.72%*	*1.78%*	*3.44%*	*5.02%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)	Total ($ millions)
Personal income taxes	512	1,452	1,964
Social insurance	57	1,130	1,188
Sales and excise taxes	3,048	142	3,190
Property taxes	3,587	0	3,587
Corporate profits taxes	878	878	1,755
Special Assessments	96	0	96
Other taxes	1,000	0	1,000
Fees, fines and permits	109	158	267
TOTAL TAX REVENUES	**9,287**	**3,760**	**13,047**

* Estimates may differ from reports whose methodology includes royalty owners as proprietors.

Characteristics of the Industry Workforce in San Francisco Bay Area

Gender of Workforce

The Bay Area has the highest male representation among sub-regions, with 69 percent of the workforce being male. Women make up 31 percent, slightly below their statewide share.

Age of Workforce

The Bay Area workforce skews older, with 49.6 percent aged 45 and above. Workers under 25 represent 5.2 percent, the smallest share among all sub-regions.

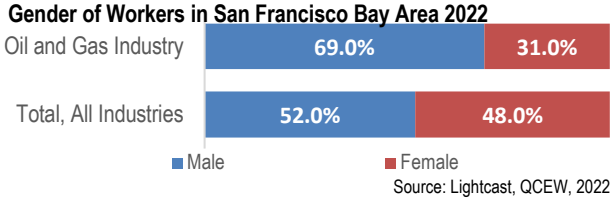
Race and Ethnicity in the Workforce

White workers (43.7 percent) and Asians (21.6 percent) dominate this sub-region's workforce, reflecting its unique demographics. Hispanic or Latino workers account for 23.3 percent, significantly lower than the statewide share.

Educational Attainment of Workers

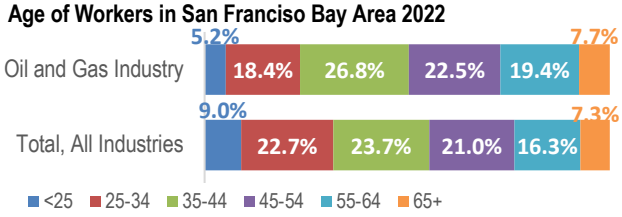
The Bay Area workforce is the most educated among the sub-regions, with 30.5 percent holding a bachelor's degree or higher, compared to 25.5 percent statewide. Workers with a high school diploma or less make up 36 percent of the workforce, slightly lower than the statewide average.

Exhibit 4-13
Gender of Workers in San Francisco Bay Area 2022



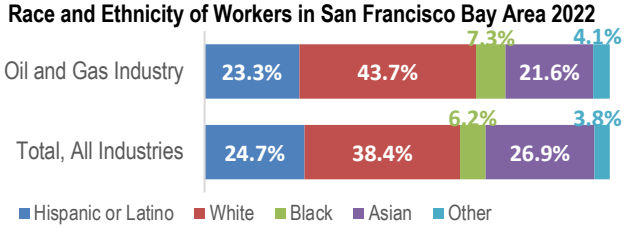
Source: Lightcast, QCEW, 2022

Exhibit 4-14
Age of Workers in San Franciso Bay Area 2022



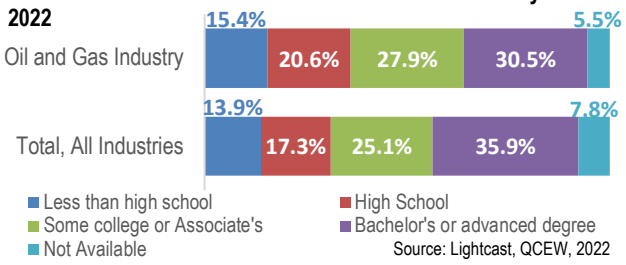
Source: Lightcast, QCEW, 2022

Exhibit 4-15
Race and Ethnicity of Workers in San Francisco Bay Area 2022



Source: Lightcast, QCEW, 2022

Exhibit 4-16
Educational Attainment of Workers in San Francisco Bay Area 2022



Source: Lightcast, QCEW, 2022

Central Coast Sub-Region

The Central Coast sub-region consists of the four counties of Monterey, San Luis Obispo, Santa Barbara and Ventura.

Exhibit 4-17
Central Coast Sub-Region

Source: ESRI

Exhibit 4-18
Direct Employment of Oil and Gas Industry – Central Coast Sub-Region 2022*

		Employment
Upstream		**2,020**
211	Oil and gas extraction	1,090
213111	Drilling oil and gas wells	200
213112	Support activities for oil and gas operations	570
333132	Oil and gas field machinery and eqpmt mfg.	160
Midstream		**690**
23712	Oil and gas pipeline construction	180
4247	Petroleum and petroleum prods wholesalers	450
486	Pipeline transportation	60
Downstream		**130**
32411	Petroleum refineries	110
324191	Petroleum lubricating oil and grease mfg.	20
32511	Petrochemical manufacturing	0
Market		**3,500**
2212	Natural gas distribution	950
4571	Gasoline stations	2,410
45721	Fuel dealers	140
TOTAL DIRECT EMPLOYMENT		**6,330**
Percent of California O&G Industry Employment		*4.3%*

* Includes royalty owners as proprietors

Exhibit 4-19
Backward Linkages: Oil and Gas Industry Total Economic and Fiscal Contribution – Central Coast Sub-Region 2022*

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	6,330	$957	$4,485	$7,740
Indirect	8,250	648	912	1,597
Induced	6,360	395	708	1,142
TOTAL CONTRIBUTION	**20,940**	**$2,000**	**$6,105**	**$10,478**
Percent of Total CA O&G Industry Contribution	*3.90%*	*3.75%*	*3.68%*	*3.10%*
Percent of Sub-Region Total	*1.71%*	*2.30%*	*4.31%*	*4.52%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)	Total ($ millions)
Personal income taxes	80	226	306
Social insurance	8	207	215
Sales and excise taxes	864	36	899
Property taxes	819	0	819
Corporate profits taxes	81	81	161
Special Assessments	27	0	27
Other taxes	120	0	120
Fees, fines and permits	20	40	60
TOTAL TAX REVENUES	**2,018**	**589**	**2,607**

* Includes royalty owners as proprietors

Characteristics of the Industry Workforce in Central Coast

Gender of Workforce

This region has the highest male representation, with 71.3 percent of workers being male and only 28.7 percent female, reflecting a more traditional workforce composition.

Age of Workforce

Workers aged 35–54 make up 45.8 percent of the workforce, while older workers (55 and above) represent 27.3 percent, higher than the statewide average. Younger workers under 25 make up 7.2 percent.

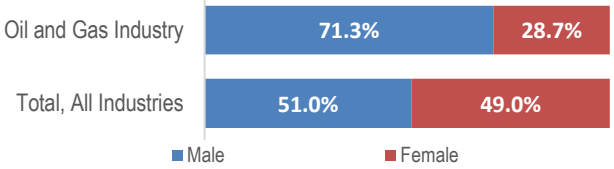
Race and Ethnicity in the Workforce

White workers dominate this region, making up 45 percent of the workforce. Hispanic or Latino workers represent 39.2 percent, while Asians and Blacks account for 8.6 percent and 3.7 percent, respectively.

Educational Attainment of Workers

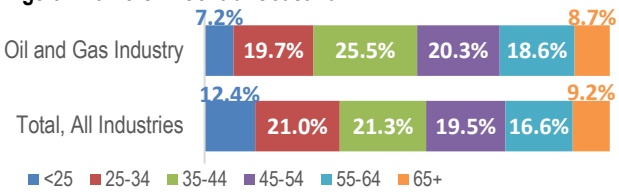
A higher proportion of workers have a high school diploma or less (43.2 percent), with fewer holding a bachelor's degree or higher (19.8 percent) compared to other sub-regions.

Exhibit 4-20
Gender of Workers in Central Coast 2022



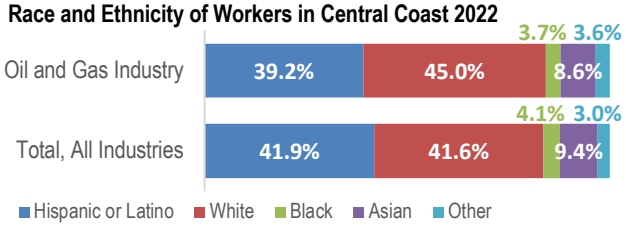
Source: Lightcast, QCEW, 2022

Exhibit 4-21
Age of Workers in Central Coast 2022



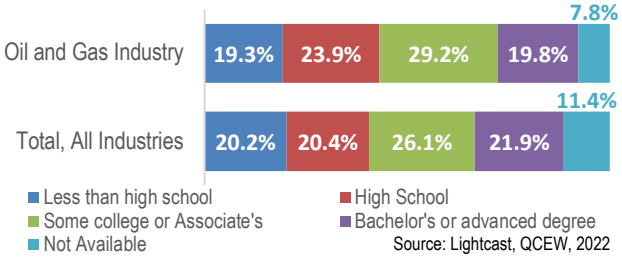
Source: Lightcast, QCEW, 2022

Exhibit 4-22
Race and Ethnicity of Workers in Central Coast 2022



Source: Lightcast, QCEW, 2022

Exhibit 4-23
Educational Attainment of Workers in Central Coast 2022



Source: Lightcast, QCEW, 2022

San Joaquin Valley Sub-Region

The San Joaquin Valley sub-region consists of the eight counties of Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare.

Exhibit 4-24
San Joaquin Valley Sub-Region

Source: ESRI

Exhibit 4-25
Direct Employment of Oil and Gas Industry -- San Joaquin Valley Sub-Region 2022*

		Employment
Upstream		**8,000**
211	Oil and gas extraction	2,270
213111	Drilling oil and gas wells	1490
213112	Support activities for oil and gas operations	3,890
333132	Oil and gas field machinery and eqpmt mfg.	350
Midstream		**4,530**
23712	Oil and gas pipeline construction	2,380
4247	Petroleum and petroleum prods wholesalers	1,850
486	Pipeline transportation	300
Downstream		**640**
32411	Petroleum refineries	590
324191	Petroleum lubricating oil and grease mfg.	50
32511	Petrochemical manufacturing	0
Market		**13,000**
2212	Natural gas distribution	4,490
4571	Gasoline stations	8,160
45721	Fuel dealers	350
TOTAL DIRECT EMPLOYMENT		**26,150**
Percent of California O&G Industry Employment		*17.7%*

* Includes royalty owners as proprietors

Exhibit 4-26
Backward Linkages: Oil and Gas Industry Total Economic and Fiscal Contribution – San Joaquin Valley Sub-Region 2022*

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	26,150	$3,382	$17,161	$30,809
Indirect	27,990	1,855	2,780	5,166
Induced	20,750	1,219	2,225	3,646
TOTAL CONTRIBUTION	**74,890**	**$6,456**	**$22,166**	**$39,622**
Percent of Total CA O&G Industry Contribution	*13.95%*	*12.10%*	*13.35%*	*11.72%*
Percent of Sub-Region Total	*3.56%*	*4.71%*	*9.57%*	*9.62%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)	Total ($ millions)
Personal income taxes	271	770	1,042
Social insurance	30	701	732
Sales and excise taxes	4,031	194	4,225
Property taxes	2,468	0	2,468
Corporate profits taxes	334	334	669
Special Assessments	210	0	210
Other taxes	528	0	528
Fees, fines and permits	82	216	298
TOTAL TAX REVENUES	**7,956**	**2,216**	**10,171**

* Includes royalty owners as proprietors

Characteristics of the Industry Workforce in San Joaquin Valley

Gender of Workforce

The workforce in the San Joaquin Valley is heavily male-dominated, with 70.2 percent male and 29.8 percent female.

Age of Workforce

The region has a younger workforce compared to other sub-regions, with 9.3 percent under 25 and 21.1 percent aged 25–34. Workers aged 35–54 dominate, comprising 48.2 percent.

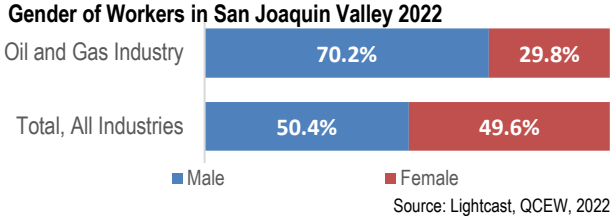
Race and Ethnicity in the Workforce

Hispanic or Latino workers are highly represented, making up 40.6 percent of the workforce, while White workers account for 42.2 percent. Asians (10.8 percent) and Blacks (3.8 percent) have smaller shares.

Educational Attainment of Workers

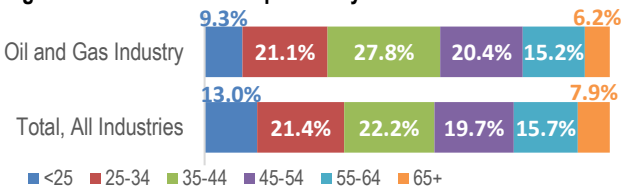
This sub-region has the highest share of workers with only a high school diploma (24.7 percent) or less than high school (19.9 percent). Workers with a bachelor's degree or higher make up 18.2 percent.

Exhibit 4-27
Gender of Workers in San Joaquin Valley 2022



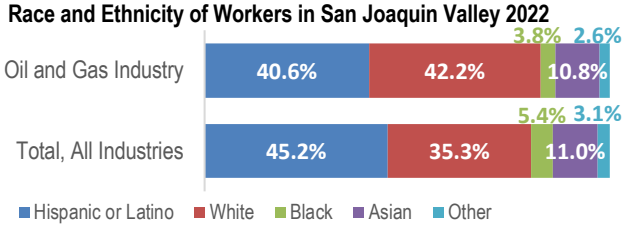
Source: Lightcast, QCEW, 2022

Exhibit 4-28
Age of Workers in San Joaquin Valley 2022



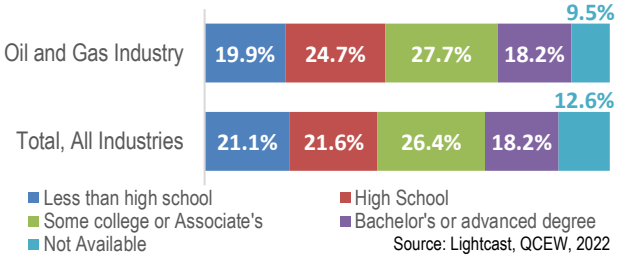
Source: Lightcast, QCEW, 2022

Exhibit 4-29
Race and Ethnicity of Workers in San Joaquin Valley 2022



Source: Lightcast, QCEW, 2022

Exhibit 4-30
Educational Attainment of Workers in San Joaquin Valley 2022



Source: Lightcast, QCEW, 2022

Rest of State

The Rest of State consists of the remaining thirty-one counties that have not been included in the four sub-regions above.

Exhibit 4-31
Rest of State

Source: ESR

Exhibit 4-32

Direct Employment of Oil and Gas Industry – Rest of State 2022*

		Employment
Upstream		**2,020**
211	Oil and gas extraction	1,360
213111	Drilling oil and gas wells	320
213112	Support activities for oil and gas operations	330
333132	Oil and gas field machinery and eqpmt mfg.	10
Midstream		**3,050**
23712	Oil and gas pipeline construction	1,090
4247	Petroleum and petroleum prods wholesalers	1,720
486	Pipeline transportation	240
Downstream		**210**
32411	Petroleum refineries	120
324191	Petroleum lubricating oil and grease mfg.	0
32511	Petrochemical manufacturing	90
Market		**12,510**
2212	Natural gas distribution	4,660
4571	Gasoline stations	6,940
45721	Fuel dealers	910
TOTAL DIRECT EMPLOYMENT		**17,790**
Percent of California O&G Industry Employment		*12.0%*

* Includes royalty owners as proprietors

Exhibit 4-33
Backward Linkages: Oil and Gas Industry Total Economic and Fiscal Contribution – Rest of State 2022*

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	17,790	$2,132	$11,896	$19,238
Indirect	21,100	1,481	2,194	3,964
Induced	13,840	856	1,552	2,520
TOTAL CONTRIBUTION	**52,730**	**$4,469**	**$15,642**	**$25,722**
Percent of Total CA O&G Industry Contribution	*9.82%*	*8.37%*	*9.42%*	*7.61%*
Percent of Sub-Region Total	*2.26%*	*2.69%*	*5.84%*	*5.78%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)	Total ($ millions)
Personal income taxes	178	511	689
Social insurance	20	460	480
Sales and excise taxes	3,373	152	3,525
Property taxes	2,444	0	2,444
Corporate profits taxes	179	179	358
Special Assessments	188	0	188
Other taxes	499	0	499
Fees, fines and permits	74	170	244
TOTAL TAX REVENUES	**6,955**	**1,473**	**8,427**

* Includes royalty owners as proprietors

Characteristics of the Industry Workforce in Rest of State

Gender of Workforce

The Rest of State sub-region has the most balanced gender composition, with males making up 64.3 percent and females 35.7 percent of the workforce.

Age of Workforce

The workforce is relatively evenly distributed across age groups, with 45.8 percent aged 35–54 and 24.8 percent aged 55 and above.

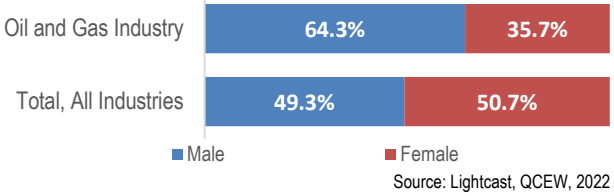
Race and Ethnicity in the Workforce

White workers dominate this sub-region, representing 54.5 percent, the highest among all sub-regions. Hispanic or Latino workers account for 20.9 percent, significantly below the statewide average.

Educational Attainment of Workers

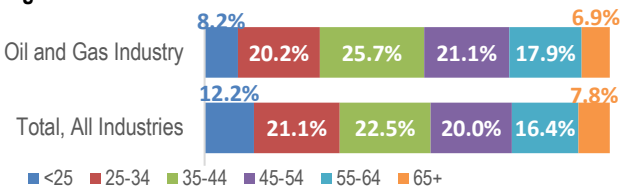
The Rest of State sub-region has a more balanced educational distribution, with 22.8 percent of workers holding a bachelor's degree or higher and 40 percent having a high school diploma or less.

Exhibit 4-34
Gender of Workers in Rest-of-State 2022



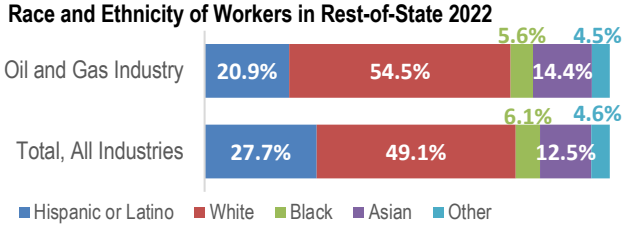
Source: Lightcast, QCEW, 2022

Exhibit 4-35
Age of Workers in Rest-of-State 2022



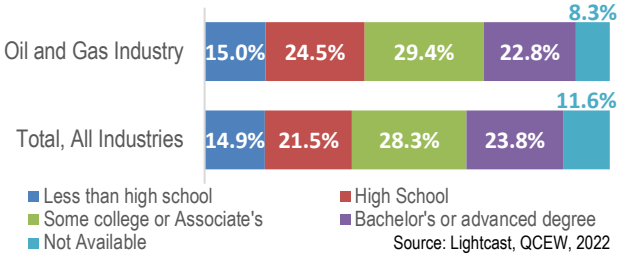
Source: Lightcast, QCEW, 2022

Exhibit 4-36
Race and Ethnicity of Workers in Rest-of-State 2022



Source: Lightcast, QCEW, 2022

Exhibit 4-37
Educational Attainment of Workers in Rest-of-State 2022



Source: Lightcast, QCEW, 2022

California's Oil and Gas Industry by County

California is comprised of 58 individual counties. Oil and gas industry activity varies from county to county. This section identifies the direct activity of the oil and gas industry in each county and then estimates the industry's total economic and fiscal contribution.

State-level and sub-regional and county-level impacts were estimated separately. This analysis used individual county data for estimation of sub-regional and county-level contributions of the oil and gas industry, using the economic contribution analysis approach based on output numbers estimated for oil and gas related industries.

Additional details on the methodology used in this report can be found in the Appendix.

Exhibit 4-38 identifies the direct industry employment, the total economic contribution and the total fiscal contribution of each county. Detailed results for each county are presented in Section 7, in alphabetical order. ❖

Exhibit 4-38
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution by County*
California 2022

County	Direct Employment	Total Economic Contribution*			Total Fiscal Contribution	
		Total Employment	Total Labor Income ($ millions)	Total Value Added ($ millions)	State and Local ($ millions)	Federal ($ millions)
Alameda County	5,008	17,214	2,010.1	4,857.3	1,068.4	491.5
Alpine County	1	2	0.0	0.2	0.1	0.0
Amador County	124	226	11.9	25.0	7.4	2.6
Butte County	482	1,113	79.9	322.4	197.3	29.1
Calaveras County	295	687	41.2	234.7	148.7	19.6
Colusa County	279	469	38.0	182.1	100.1	16.6
Contra Costa County	11,318	50,555	6,424.1	25,444.3	5,140.6	2,259.1
Del Norte County	116	171	8.1	24.0	6.4	2.3
El Dorado County	552	1,606	101.7	363.4	204.9	30.9
Fresno County	4,649	16,881	1,600.7	4,986.5	1,613.7	534.7
Glenn County	249	485	37.2	205.8	123.7	19.7
Humboldt County	645	1,468	108.9	437.7	240.9	43.5
Imperial County	712	1,323	84.9	546.7	394.5	47.2
Inyo County	144	289	21.7	143.2	106.8	12.5
Kern County	13,418	35,216	3,214.8	10,054.5	2,426.2	1,064.6
Kings County	570	1,092	73.5	369.4	207.5	29.2
Lake County	537	1,103	75.6	302.4	134.6	27.2
Lassen County	92	140	5.1	14.7	5.3	1.3
Los Angeles County	33,196	151,490	15,117.7	47,139.5	10,176.8	4,608.0
Madera County	816	1,779	155.6	619.9	290.9	54.3
Marin County	838	2,742	327.2	701.4	167.6	73.3
Mariposa County	75	172	10.8	23.2	7.1	2.9

Exhibit 4-38 (cont'd)

County	Direct Employment	Total Employment	Total Economic Contribution* Total Labor Income ($ millions)	Total Economic Contribution* Total Value Added ($ millions)	Total Fiscal Contribution State and Local ($ millions)	Total Fiscal Contribution Federal ($ millions)
Mendocino County	554	1,309	110.4	543.7	309.3	49.1
Merced County	995	2,097	124.8	513.1	304.4	46.6
Modoc County	57	96	5.7	63.6	50.7	6.3
Mono County	100	167	11.5	30.5	6.8	3.2
Monterey County	1,060	2,753	253.7	964.4	458.2	86.6
Napa County	707	2,309	177.5	402.9	122.3	45.5
Nevada County	549	1,742	102.8	470.6	292.6	41.9
Orange County	9,895	44,639	4,924.6	11,620.7	4,262.9	1,323.2
Placer County	2,839	10,674	1,105.8	3,219.1	1,021.5	313.8
Plumas County	105	203	9.8	45.6	29.6	3.9
Riverside County	6,654	21,218	1,374.0	3,745.2	1,506.5	385.9
Sacramento County	5,074	17,209	1,560.7	5,105.6	2,099.8	472.4
San Benito County	122	251	19.7	51.2	19.8	5.5
San Bernardino County	7,553	20,428	1,450.9	4,649.2	2,014.5	443.1
San Diego County	13,139	50,080	5,163.3	13,518.7	3,422.5	1,481.7
San Francisco County	737	3,544	604.2	1,046.7	96.5	105.8
San Joaquin County	2,165	7,393	566.9	2,432.3	1,428.7	222.1
San Luis Obispo County	1,318	4,729	424.7	1,443.5	540.7	134.4
San Mateo County	1,190	2,819	357.8	711.5	126.6	71.2
Santa Barbara County	1,402	5,061	518.6	1,270.3	331.2	133.6
Santa Clara County	3,363	9,017	1,283.4	3,619.2	1,345.3	317.8
Santa Cruz County	619	1,569	145.7	415.5	181.6	41.5
Shasta County	1,095	2,793	179.4	835.4	474.1	77.7
Sierra County	17	23	0.8	2.3	0.9	0.2
Siskiyou County	262	419	20.3	113.2	78.6	9.3
Solano County	2,520	7,602	720.0	2,926.4	503.3	248.3
Sonoma County	1,119	3,234	262.5	984.8	554.3	85.6
Stanislaus County	1,901	5,517	421.3	1,889.2	1,030.8	176.3
Sutter County	297	808	55.7	279.8	183.1	22.9
Tehama County	430	865	58.9	225.1	108.0	21.0
Trinity County	67	98	3.5	9.7	3.9	1.0
Tulare County	1,665	4,164	299.7	1,267.1	705.5	121.8
Tuolumne County	291	559	36.3	160.9	76.3	11.9
Ventura County	2,544	10,760	1,011.3	2,738.6	729.4	289.5
Yolo County	1,333	3,771	401.2	1,588.1	704.7	132.8
Yuba County	297	624	49.3	145.9	45.8	11.7
Total	148,150	536,770	53,365.5	166,047.7	47,940.2	16,315.5

* Estimates may differ from reports whose methodology includes royalty owners as proprietors.

Source: Estimates by LAEDC

5 California's Oil and Gas Industry Workforce

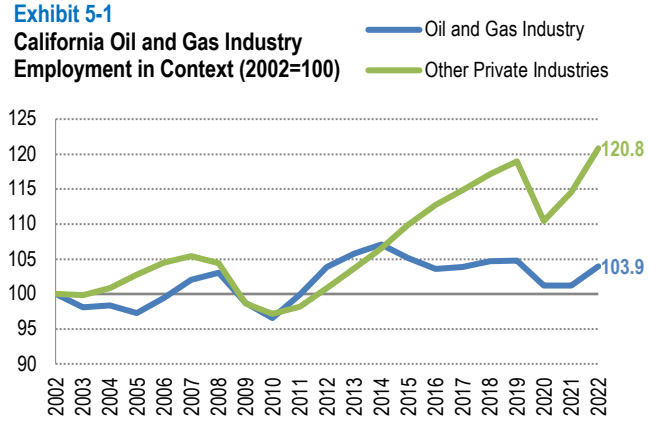
The oil and gas industry is a significant employer in California, offering a wide range of job opportunities to a diverse workforce across its various sectors. Job roles within the industry differ greatly, requiring varying levels of skills and education for entry. The industry is also known for its wage diversity, with many roles offering competitive, high salaries.

Oil and Gas Employment

The oil and gas industry continues to play a fundamental role in California's economy, offering employment opportunities across a wide range of skill levels, often with relatively high wages and benefits. The industry has demonstrated resilience in the face of economic fluctuations, with its employment levels reacting less severely to downturns compared to other private industries. While the broader private sector in California has shown stronger growth in recent years, the oil and gas industry continues to serve as a stable and essential employer.

Exhibit 5-1 illustrates employment trends in the oil and gas industry compared to other private industries in California, indexed to 2002 employment levels. The data shows that while employment in the oil and gas sector has grown steadily over the past two decades, other private industries have experienced more pronounced gains. By 2022, employment in other private industries had grown to 120.8% of 2002 levels, while the oil and gas industry reached 103.9%, reflecting a more measured growth trajectory.

Exhibit 5-1
California Oil and Gas Industry Employment in Context (2002=100)



Source: CA EDD; Estimates by LAEDC

The Great Recession caused significant declines in employment across California's private sector, with employment levels dropping below 2002 levels. Other private industries began a steady recovery from their lowest point in 2010, surpassing pre-recession employment levels and achieving consistent growth through 2022.

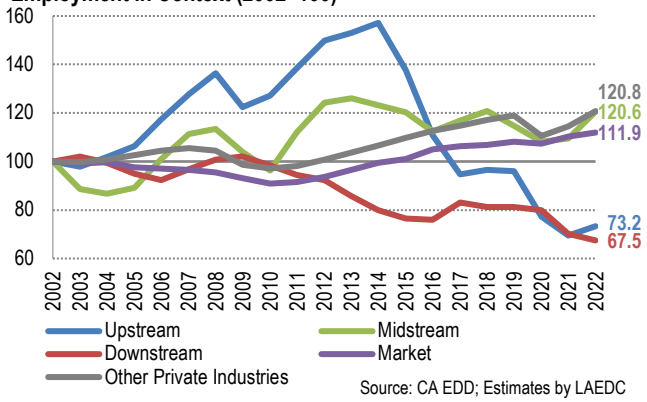
The oil and gas industry exhibited a quicker post-recession recovery. Employment in the industry returned to 2002 levels a year earlier than other private industries and exceeded its pre-recession peak by 2012. Although the industry faced a slight decline of approximately 2% in 2015 due to low crude oil prices and high inventories, it rebounded in subsequent years.

The Covid-19 pandemic, however, brought a new set of challenges. In 2020, employment in the oil and gas industry experienced a notable decline as energy demand plummeted due to economic shutdowns and reduced transportation activity. The pandemic highlighted the sector's vulnerability to sudden demand shocks, resulting in a steeper drop compared to the broader private sector. Despite these challenges, the industry demonstrated resilience by stabilizing employment levels in 2021 and returning to modest growth in 2022. By the end of the period, the oil and gas sector reached 103.9% of its 2002 employment level, reflecting a slow but steady recovery.

While the Covid-19 pandemic exposed some vulnerabilities, the oil and gas industry's ability to rebound underscores its importance as a steady contributor to California's economy. Its recovery, though slower than other private industries, highlights the sector's continued relevance and adaptability amidst evolving economic conditions.

Looking at the oil and gas industry by segment reveals several trends in employment (**Exhibit 5-2**).

Exhibit 5-2
California Oil and Gas Industry by Segment Employment in Context (2002=100)



The upstream, midstream, downstream, and market segments of California's oil and gas industry demonstrate distinct trends in employment and wages, reflecting the diverse dynamics of the industry. As shown in **Exhibit 5-2**, employment levels across these segments varied significantly between 2002 and 2022.

The upstream segment, which includes oil and gas extraction activities, experienced significant fluctuations over the period. Employment in this segment peaked in 2014 but declined sharply thereafter, largely due to falling crude oil prices and reduced demand. By 2022, upstream employment had dropped to 73.2% of its 2002 level, marking a notable decline. Despite this, upstream workers earned the highest average annual wages within the industry at over $137,000, underscoring the high skill levels and specialized expertise required in this segment.

The midstream segment, which encompasses activities such as pipeline transportation and natural gas distribution, exhibited greater stability. Employment in the midstream sector remained relatively constant after 2012, ending 2022 at 120.6% of its 2002 level. This consistency reflects the ongoing demand for infrastructure and transportation services in energy markets. Wages in midstream roles, such as pipeline transportation ($128,070) and oil and gas pipeline construction ($100,219), further highlight the value of these positions.

The market segment, responsible for delivering oil and gas products to consumers, closely mirrored the employment trend of other private industries in California. Employment in the market segment grew steadily, reaching 111.9% of its 2002 level by 2022. This growth aligns with broader economic trends, as consumer spending typically increases alongside economic recovery. However, wages in this segment, including gasoline stations ($35,101) and fuel dealers ($72,307), were significantly lower than those in upstream and midstream activities.

The downstream segment, which includes petroleum refining and petrochemical manufacturing, faced the most significant challenges. Employment in downstream operations steadily declined after 2014 due to regulatory pressures, unplanned refinery outages, and evolving energy markets. By 2022, employment in the downstream segment had dropped to just 67.5% of its 2002 level. Despite the decline in employment, wages in downstream roles, such as petroleum refineries ($191,277) and petrochemical manufacturing ($99,306), remained high, reflecting the capital-intensive and specialized nature of the work.

Overall, the average annual wage for the oil and gas industry was $72,918 in 2022, which was more than 13 percent below the statewide private industry average of $84,205. This figure is influenced by the inclusion of lower-wage roles in the retail and distribution sectors. However, many core oil and gas industry segments exceed the statewide wage average, showcasing the industry's role as a provider of high-paying, specialized jobs. These wage levels include benefits and compensation for overtime, further emphasizing the economic importance of the sector to California's workforce.

Opportunities for Upward Mobility

Upward mobility—the ability for individuals to enhance their economic status—is crucial for addressing challenges such as poverty, housing affordability, access to education, childcare, and transportation. Industries that offer pathways for advancement enable individuals with lower levels of education and skills to secure employment that meets or exceeds a living wage, thereby improving their quality of life.

According to the Massachusetts Institute of Technology's Living Wage Calculator, as of 2022, a single adult in California requires an hourly wage of $21.21, equating to an annual income of approximately $44,117, to support themselves. For a family of four, with two working adults and two children, each adult needs to earn $33.26 per hour, totaling about $69,181 annually per adult, to maintain a minimum standard of living.

Exhibit 5-3
Oil and Gas Industry Wages
California 2022

NAICS	Industry	Ave Annual Wage
211	Oil and gas extraction	$230,899
213111	Drilling oil and gas wells	115,715
213112	Support activities for oil and gas operations	90,070
2212	Natural gas distribution	79,157
23712	Oil and gas pipeline construction	100,219
32411	Petroleum refineries	191,277
324191	Petroleum lubricating oil and grease mfg	95,426
32511	Petrochemical manufacturing	99,306
333132	Oil and gas field machinery and eqmt mfg	83,025
4247	Petroleum and petroleum prods wholesalers	101,648
4571	Gasoline stations	35,101
45721	Fuel dealers	72,307
486	Pipeline transportation	128,070
Oil and Gas Industry		**$72,918**
All other private industries		84,284
All private industries in CA		$84,205

Note: Excludes non-employers and independent contractors
Source: CA EDD; Estimates by LAEDC

Historically, manufacturing provided substantial opportunities for individuals with lower educational attainment to achieve economic stability. However, the sector's long-term employment decline in California has diminished these prospects. In contrast, the oil and gas industry continues to offer stable employment with competitive wages and benefits for those with lower levels of formal education. For example, gas plant operators earn a median annual wage of $105,000; petroleum pump system operators, refinery operators, and gaugers earn $95,610; and oil and gas service unit operators earn $64,430.

The geographic presence of the oil and gas industry often aligns with rural areas where reserves are located. These regions may lack diverse economic bases, making it challenging to attract and sustain various industries. The oil and gas sector provides essential employment opportunities with above-average wages, generating significant indirect and induced economic effects that benefit the broader community.

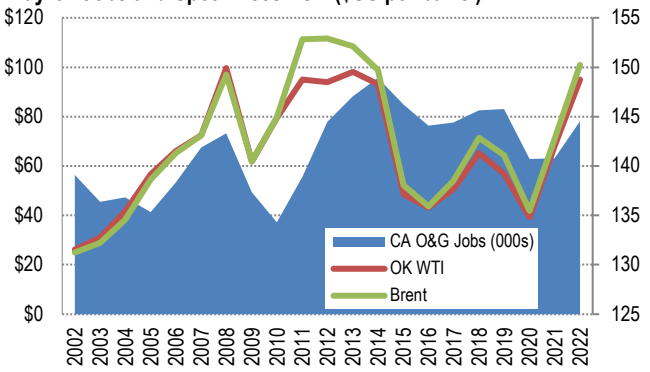
In summary, the oil and gas industry plays a pivotal role in promoting upward mobility by offering well-compensated employment opportunities to individuals across the educational spectrum, thereby contributing to economic stability and growth in various regions of California. ❖

The Employment and Price Relationship

The relationship between oil prices and employment in California's oil and gas industry is evident in the trends displayed in **Exhibit 5-4**. Changes in global oil prices, driven by factors such as domestic production and OPEC output levels, have a direct impact on employment within the industry. Increased domestic production, enabled by advancements in horizontal drilling and hydraulic fracturing, combined with sustained high output from OPEC, created a global supply glut in the mid-2010s. This surplus caused oil prices to plummet in the second half of 2014, initiating a significant downturn in the oil and gas industry.

The extended period of low oil prices that followed led to declines in both extraction and refinery activities, resulting in job losses across the sector. These losses were not confined to field operations; office administration, IT, finance, legal, and marketing roles were also affected. As prices dropped, companies delayed or canceled new drilling projects, which in turn impacted jobs in the energy supply chain, including equipment manufacturers, transportation, and construction. This slowdown also led to reduced in-state production, increasing California's reliance on imported energy.

Exhibit 5-4
Payroll Jobs and Spot Prices FOB ($US per barrel)



Source: CA EDD; Estimates by LAEDC

Exhibit 5-4 illustrates the annual payroll employment in California's oil and gas industry alongside annual average spot prices for West Texas Intermediate (WTI) and Brent crude oil from 2002 to 2022.

Oil prices reached historic highs in 2008 and 2012 before experiencing a sharp decline starting in mid-2014. By 2016, WTI and Brent spot prices had reached their lowest annual averages since 2005, falling to levels of approximately $40 per barrel. During this period, payroll employment in the oil and gas industry experienced

significant losses. From 2014 to 2016, the industry shed thousands of jobs as companies responded to sustained low commodity prices.

However, the recovery following the downturn demonstrated the industry's resilience. By 2017, payroll employment in California's oil and gas sector began to stabilize, supported by a gradual increase in oil prices. From 2020 onward, the impact of the Covid-19 pandemic created additional volatility, with oil prices and employment both experiencing sharp declines due to reduced global demand. Yet, as demand recovered in 2021 and 2022, oil prices rebounded sharply, reaching over $100 per barrel for both WTI and Brent benchmarks. Employment in the sector also showed signs of recovery, though not yet reaching pre-2014 levels.

This cyclical pattern highlights the critical connection between commodity prices and employment in the oil and gas industry. Price fluctuations have far-reaching effects not only on direct industry jobs but also on the broader energy supply chain and California's overall economic dependence on imported energy resources. ❖

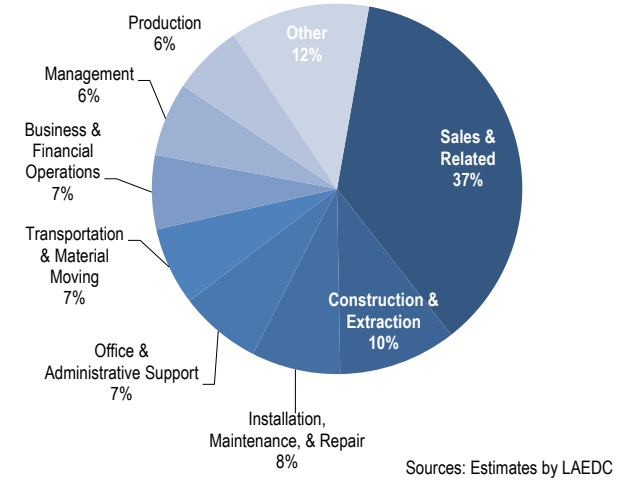
Industry Occupations

An occupation is classified according to the set of activities or tasks that an employee is paid to perform. Some occupations are specific to an industry, but others exist in a number of different industries, for example, customer service representatives, salespersons, accounting staff and receptionists.

Occupations are classified by the Standard Occupational Classification (SOC) System. Workers fall into one of 867 detailed occupations, which are combined into 23 major groups. Each occupation requires its own skill set and education levels. The distribution of employment by major occupational group specific to the oil and gas industry in California is displayed in **Exhibit 5-5**.

Sales and related occupations dominate the industry, accounting for 37 percent of employment, reflecting the large share of workers employed in retail gas stations. Construction and extraction occupations comprise 10 percent, while installation, maintenance, and repair occupations make up 8 percent of the workforce. Management, business and financial operations, and other professional services account for another 20 percent of employment (combined). Other significant categories include transportation and material moving (7 percent), and production (6 percent).

Exhibit 5-5
Occupational Distribution of Oil and Gas Industry
(Including gas station industry)

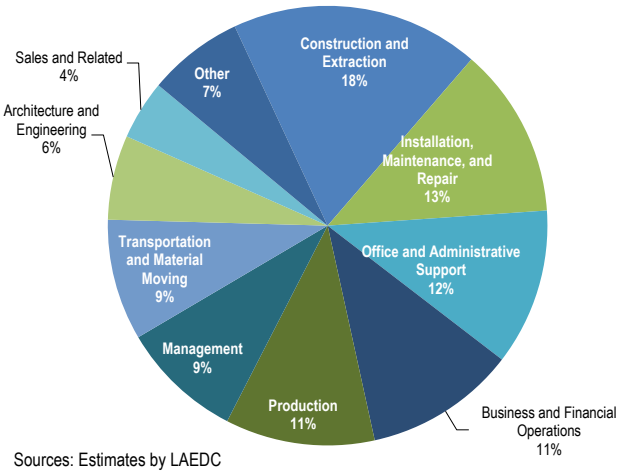


Sources: Estimates by LAEDC

It should be noted that this occupational distribution includes individuals employed at gas stations. Gas stations represent the retail side of the oil and gas industry and account for a significant portion of industry employment. The activities carried out at retail gas stations differ considerably from those in other segments of the oil and gas industry, which are more focused on production, distribution, and operational functions. Including gas stations in the analysis not only skews the occupational distribution but also lowers the average annual wages for the overall industry, as gas station jobs typically require lower skill levels and pay significantly less compared to other industry roles.

When gas station employment is excluded from the analysis, as shown in **Exhibit 5-6**, the occupational distribution shifts significantly. Construction and

Exhibit 5-6
Occupational Distribution of Oil and Gas Industry
(Excluding gas station industry)



Sources: Estimates by LAEDC

extraction occupations become the largest share of employment at 18 percent, followed by installation, maintenance, and repair at 13 percent. Production occupations account for 11 percent, and transportation and material moving and office and administrative support each represent 9 percent of the workforce. Business and financial operations, management, and architecture and engineering occupations together make up another 31 percent of employment (combined).

By excluding gas station workers, the focus shifts to the core activities of the oil and gas industry, such as exploration, extraction, production, and distribution. These roles require higher levels of skill and education and offer higher wages compared to retail jobs. This redistribution underscores the industry's reliance on specialized occupations to maintain operations and meet energy demands.

The wages of occupations in the oil and gas industry vary significantly depending on the job role and its associated skill and education requirements. **Exhibit 5-7** illustrates the average annual wages for key occupations in the California oil and gas industry, highlighting the diversity in earnings across the major occupational groups.

A wide variety of detailed occupations exist in each major occupational group. The top 20 detailed occupations by employment share in the oil and gas industry in California and their associated wages in 2022 are shown in **Exhibit 5-8**, followed by the top 20 by average annual wages in **Exhibit 5-9**.

The top twenty detailed occupations account for more than half of the industry's workforce. In contrast, the top twenty highest-paid occupations account for just under 6 percent of the workforce. ❖

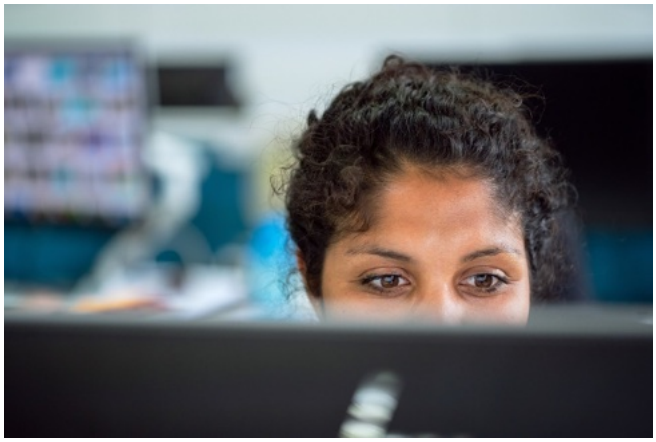
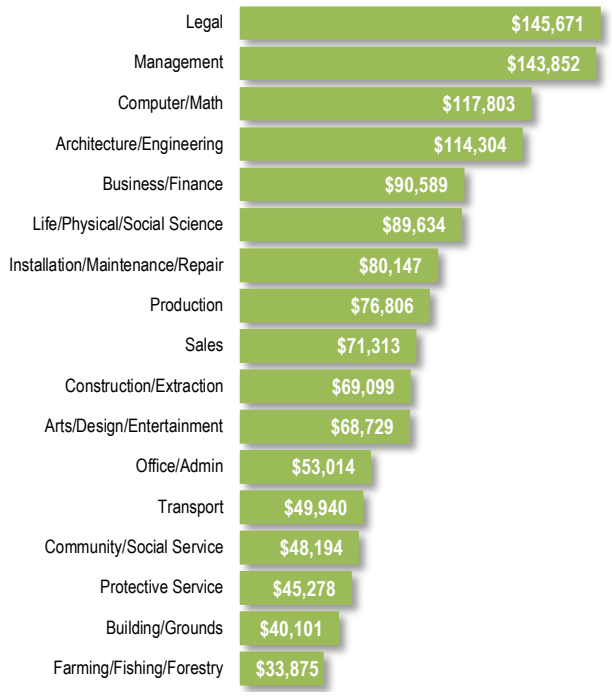


Exhibit 5-7
Average Wage by Major Occupational Group
California Industry in 2022
(Excludes gas station industry)



Source: Lightcast, BLS

Exhibit 5-8
Detail Industry Occupations by Employment Share *(Excluding Gas Station Industry)*
Largest Employment Share in California 2022

SOC	Detailed Occupation	Emp Share (%)	Ave Annual Wage
49-9012	Control and Valve Installers and Repairers, Except Mechanical Door	3.9%	$82,868
47-2061	Construction Laborers	3.4%	54,471
53-3032	Heavy and Tractor-Trailer Truck Drivers	3.4%	54,752
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	3.0%	95,609
47-2152	Plumbers, Pipefitters, and Steamfitters	2.9%	74,292
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	2.7%	92,452
47-5013	Service Unit Operators, Oil and Gas	2.4%	64,428
43-9061	Office Clerks, General	2.3%	45,560
43-4051	Customer Service Representatives	2.3%	46,205
11-1021	General and Operations Managers	2.1%	134,986
13-1199	Business Operations Specialists, All Other	2.1%	85,360
13-1082	Project Management Specialists	1.9%	112,238
47-2073	Operating Engineers and Other Construction Equipment Operators	1.9%	80,813
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	1.8%	39,848
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	1.8%	86,402
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	1.7%	81,039
49-9041	Industrial Machinery Mechanics	1.7%	67,885
51-1011	First-Line Supervisors of Production and Operating Workers	1.5%	73,355
43-1011	First-Line Supervisors of Office and Administrative Support Workers	1.2%	72,279
41-3091	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	1.2%	81,519
	Other Occupations	*54.7%*	

Source: CA EDD; Estimates by LAEDC

Exhibit 5-9
Detail Industry Occupations by Average Annual Wage *(Excluding Gas Station Industry)*
Highest Annual Wage in California Employment Share in California 2022

SOC	Detailed Occupation	Emp Share (%)	Ave Annual Wage
11-1011	Chief Executives	0.3%	$237,606
11-3021	Computer and Information Systems Managers	0.4%	199,266
11-9121	Natural Sciences Managers	0.0%	198,494
11-9041	Architectural and Engineering Managers	0.5%	193,365
23-1011	Lawyers	0.2%	182,966
11-2021	Marketing Managers	0.3%	180,369
17-2061	Computer Hardware Engineers	0.1%	176,087
11-3031	Financial Managers	0.6%	171,173
17-2171	Petroleum Engineers	0.6%	165,759
11-9199	Managers, All Other	0.9%	165,561
11-3121	Human Resources Managers	0.2%	159,032
15-1252	Software Developers	0.4%	152,052
11-3131	Training and Development Managers	0.1%	151,916
11-3061	Purchasing Managers	0.1%	149,722
11-2022	Sales Managers	0.8%	148,384
11-2032	Public Relations Managers	0.1%	146,973
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	0.1%	146,251
19-3011	Economists	0.0%	142,293
41-9031	Sales Engineers	0.0%	141,788
15-1212	Information Security Analysts	0.1%	140,066
	Other Occupations	*94.3%*	

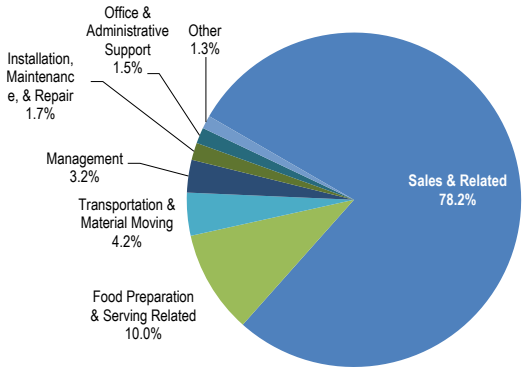
Source: CA EDD; Estimates by LAEDC

Gas Station Industry

Gasoline stations represent the retail side of the oil and gas industry, providing products directly to the end user.

The distribution of employment by major occupational group specific to gas stations in California is shown in **Exhibit 5-10**. The majority of individuals in this segment, nearly 80 percent, work in sales and related occupations, most commonly as cashiers. The second-largest category is food preparation and serving-related occupations, accounting for 10.0% of employment, followed by transportation and material moving occupations (4.2%). Other significant categories include management occupations (3.2%) and installation, maintenance, and repair occupations (1.7%). Smaller shares of workers are employed in office and administrative support (1.5%) and other roles (1.3%).

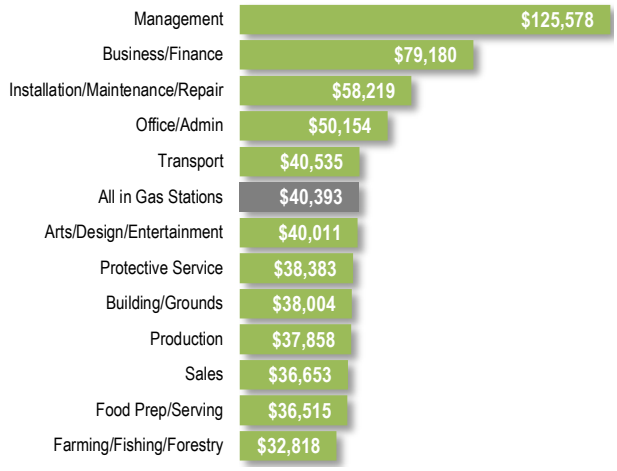
Exhibit 5-10
Occupational Distribution of Gas Station Industry



Sources: Estimates by LAEDC

The wages of these occupations vary substantially, as illustrated in **Exhibit 5-11**. The highest average annual wages are earned by workers in management occupations, who earn $125,578 annually. In contrast, sales occupations, which account for the majority of gas station employment, earn a more modest average wage of $40,393 per year. The industry-wide average wage is $40,011, reflecting the large share of lower-wage roles within this segment.

Exhibit 5-11
Average Wage by Major Occupational Group
Gas Station Industry in California 2022



Source: Lightcast, BLS

This distribution highlights the concentration of employment in sales roles at gas stations, which are critical for day-to-day operations but are typically lower-wage positions. However, higher-skilled roles, such as management and technical positions, offer significantly higher wages and represent opportunities for upward mobility within the industry. ❖

Future Scan of Workforce Needs

The oil and gas industry employed over 144,500 payroll employees in California in 2022,[25] and industry employment is expected to grow moderately by close to 3 percent, reaching more than 148,500 payroll jobs by 2027 (**Exhibit 5-12**). This growth equates to a net gain of approximately 4,000 payroll jobs over five years, with mixed performance across the various segments of the industry. Employment projections reflect stable commodity prices and assume continued recovery from prior downturns. Growth is expected to be led by the market and midstream segments, while upstream and downstream segments will likely face employment declines.

Exhibit 5-12
5-Year Oil and Gas Industry Workforce Needs
California 2022 to 2027*

	2022 Payroll Jobs	2027f Payroll Jobs	2022-27f Change (%)
Upstream Segment	**11,897**	**11,031**	**-7.3**
Oil and gas extraction	3,299	2,931	-11.2
Drilling oil and gas wells	2,083	1,796	-13.8
Support activities for oil and gas operations	5,638	5,631	-0.1
Oil and gas field machinery/equipment mfg	878	673	-23.3
Midstream Segment	**20,805**	**21,847**	**5.0**
Oil and gas pipeline construction	10,610	10,937	3.1
Petroleum and petroleum prods wholesalers	8,721	9,255	6.1
Pipeline transportation	1,474	1,655	12.3
Downstream Segment	**9,643**	**8,647**	**-10.3**
Petroleum refineries	8,691	7,971	-8.3
Petroleum lubricating oil and grease mfg	802	609	-24.0
Petrochemical manufacturing	150	66	-55.9
Market Segment	**102,185**	**107,000**	**4.7**
Natural gas distribution	36,563	37,849	3.5
Gasoline stations	63,155	66,692	5.6
Fuel dealers	2,467	2,459	-0.3
Total Oil and Gas Industry	**144,531**	**148,525**	**2.8**

Source: Lightcast; Estimates by LAEDC
* Workforce needs assessment is performed for payroll jobs, which do not include self-employed workers, proprietors, and contract workers.

It is important to note that this projection assumes flat commodity prices for crude oil, natural gas, and refined products through 2022.

California's position as an energy island that is highly dependent on waterborne imported crude oil from the Middle East and Latin America (and natural gas pipelines from Canada and other states) exposes its residents and businesses to risks of significant supply shortages and price spikes from international turmoil, competition from other large energy consumers like China and India, and transportation disruptions. Sustained increases in commodity prices would be expected to increase these employment projections significantly.

The highest number of openings will be found in the market segment, which includes industries that market oil and gas products to end users. This segment is forecast to add over 3,500 jobs by 2027, with most of this growth coming from gasoline stations, which are expected to add more than 3,500 jobs. Gasoline station growth is closely tied to population trends, particularly in more affordable regions of California where transportation needs are increasing. Growth is also expected in natural gas distribution, which is projected to add nearly 1,300 jobs, while fuel dealers are anticipated to experience a slight decline.

Midstream industries are forecast to provide the second-largest number of new jobs, adding over 1,000 positions by 2027. Growth in this segment will be led by pipeline transportation, which is projected to grow by over 180 jobs, followed by petroleum and petroleum products wholesalers, with an expected increase of over 530 jobs. Employment in oil and gas pipeline construction is expected to see modest growth of 3.1 percent, adding more than 325 jobs. The midstream segment's growth will likely be driven by new construction projects, deferred capital projects resuming, and ongoing upgrades to existing infrastructure.

In contrast, the upstream segment of the oil and gas industry is expected to experience a significant decline in payroll employment, losing nearly 1,500 jobs by 2027. The largest losses are anticipated in oil and gas

[25] Accounting for self-employed workers, proprietors, and contract workers, the total employment in the oil and gas industry in 2022 was about 148,150 jobs.

field machinery and equipment manufacturing, which is forecast to decline by more than 200 jobs. Employment in drilling oil and gas wells is projected to decline by nearly 290 jobs, while oil and gas extraction employment will decrease by almost 370 jobs. Producers remain cautious in the face of prior downturns and are expected to continue operating conservatively, which will likely delay any major rebound in upstream employment. Support activities for oil and gas operations are expected to remain stable, with only a marginal decline.

The downstream segment is projected to see significant job losses by 2027, with a total decline of nearly 2,000 jobs. The largest loss within this segment will occur in petroleum refineries, which are expected to shed approximately 720 jobs. Petroleum lubricating oil and grease manufacturing will see the next-largest decline, losing over 190 jobs, followed by petrochemical manufacturing, which is forecast to lose more than 80 jobs. These declines reflect the ongoing challenges facing downstream industries, including regulatory pressures, changing market dynamics, and reduced demand for certain products.

Over the next five years, job openings in California's oil and gas industry will largely stem from job churn and replacement needs, as workers retire, switch jobs, or separate from the industry, creating opportunities across various segments. Beyond payroll positions, the industry will continue to generate roles for independent contractors, particularly in high-paying union construction jobs with benefits, which are often tied to maintenance and infrastructure projects. These roles will remain critical to supporting the sector's operations despite projected declines in certain areas. Overall, the industry is expected to experience mixed employment trends. While the market and midstream segments are poised to drive modest growth, the upstream and downstream segments face continued challenges, reflecting cautious recovery and evolving industry dynamics. Sustained increases in commodity prices or significant market shifts could alter these projections substantially. ❖

The Talent Pipeline

The oil and gas industry continues to exhibit a bimodal distribution of educational attainment. On one end are highly skilled professionals such as petroleum and geophysical engineers, as well as finance and business managers, who often possess advanced degrees and extensive specialized training. On the other end are construction, extraction, and transportation workers—roles that typically require less formal education but demand high levels of technical skill and practical experience.

Current Training Programs

Entry-level and lower-skilled jobs in the oil and gas industry primarily rely on two tiers of training, much of which remains on-the-job. For instance, positions like derrick operators and roustabouts may require only a few days to a few months of hands-on training, while roles such as rotary drill operators or unit operators might require up to a year of training alongside experienced employees or participation in an apprenticeship program. Many California oil and gas companies maintain Project Labor Agreements with the State Building and Construction Trades Council of California (SBCTC), which represents nearly 500,000 construction workers statewide, including approximately 70,000 apprentices in skilled trades.

In these roles, educational attainment is often less critical than job-specific skills and experience. Employers frequently prioritize candidates with high school diplomas or equivalent qualifications and transferable skills over formal education. As a result, many entry-level roles in the oil and gas sector remain accessible to individuals with basic educational credentials.

In recent years, trade schools and technical programs have emerged near areas of extraction and refinery operations, aiming to streamline on-the-job training and develop a job-ready workforce. High school-level programs also play a vital role by equipping students with essential qualifications and competitive skills for entry-level positions.

Notable High School Programs in California:

- **Taft Union High School Oil Technology Academy (Taft, CA)**:
  - Provides foundational training in oil and gas technology, preparing students for entry-level roles in the industry.
- **Independence High School Energy and Utilities Career Academy (Bakersfield, CA)**:
  - Offers career-focused education in energy production, emphasizing skills applicable to the oil and gas sector.
- **Edison High School Green Energy Technology Academy (Fresno, CA):**
  - Although focused on broader energy topics, includes training relevant to fossil fuel extraction and operations.

Community Colleges and Vocational Schools

Community colleges and vocational schools across California provide associate degrees, certifications, and courses in manufacturing, industrial technology, and other fields. These programs often provide transferable skills that are applicable to the oil and gas industry, such as operating heavy machinery or maintaining industrial systems.

Coastline Community College (Fountain Valley, CA):

- Process Technology Certificate: Provides foundational education in process systems, safety, and technology, with an emphasis on petrochemical and wastewater treatment.

Laney College (Oakland, CA):

- Programs include certifications and associate degrees in Industrial Maintenance, Welding Technology, and Building Automation Systems, along with specialized training in Gas Transmission Pipe Welding.

Los Angeles Trade Technical College (Los Angeles, CA):

- Process Technology Certificate (PTEC): Prepares students to work as process operators in oil and gas, wastewater treatment, and related industries.

California Universities

California universities, including multiple California State University campuses, Stanford University, and the University of Southern California (USC), offer advanced degree programs and certifications tailored to the oil and gas industry. Notable programs include:

California State University Dominguez Hills (Dominguez Hills, CA):

- Refinery Safety Technician Certificate: Focuses on OSHA compliance and safety management for refinery operations.

University of Southern California (USC) (Los Angeles, CA):

- Undergraduate, graduate, and certificate programs in Petroleum Engineering, Systems Architecting, Engineering Management, and Smart Oilfield Technologies.

Stanford University (Palo Alto, CA):

- Programs in Energy Innovation and Emerging Technologies, Management Science and Engineering, and master's degrees in fields such as Chemical Engineering, Materials Science, and Mechanical Engineering.

Specialized Training Programs:

- Don Knabe Energy Pathway Program (DKEPP):
  - A partnership with major industry players, offering entry-level training for petrochemical, recycling, and wastewater systems.

Gaps in Training

- **Technological Skill Development**:
  - Insufficient training in advanced technologies like IoT systems for remote monitoring, automation in drilling, and data analytics for operations optimization.
- **Workforce Development in Aging Regions**:
  - Some oil-producing regions (e.g., Central Valley) lack accessible, modern training facilities, potentially leaving workforce needs unmet.
- **Bilingual Training**:
  - Limited programs designed to support non-English-speaking workers, particularly in regions with a high percentage of Hispanic and Latino workers.
- **Focus on New Regulatory Standards**:
  - Existing programs do not sufficiently address training needs related to CalOSHA's evolving safety requirements or environmental compliance.

Opportunities to Expand Workforce Development

- **Mobile Training Units**:
  - Bring hands-on training directly to remote oil and gas regions to improve access.
- **Upskilling Programs for Existing Workers**:
  - Focus on digital tools, automation, and advanced drilling techniques to maintain competitiveness.
- **Industry Collaboration**:
  - Strengthen partnerships between companies and educational institutions to develop highly customized training programs.

Characteristics of the Industry Workforce in California

The composition of the workforce in California's oil and gas industry varies significantly across gender, age, race and ethnicity, and educational attainment, reflecting the diverse nature of the sector.

Gender of Workforce

The workforce is predominantly male, with 67.8 percent of workers being male in 2022, compared to 50.9 percent in all industries (**Exhibit 5-13**). Women account for 32.2 percent of the workforce, a much smaller share than their nearly equal representation across all industries.

Age of Workforce

The majority of workers are in their prime working years, with 67.5 percent aged 25–54 (**Exhibit 5-14**). Older workers (55+) represent 39.2 percent of the workforce, higher than in all industries. Workers under 25 make up just 7.6 percent, less than the nearly 11 percent in all industries.

Race and Ethnicity in the Workforce

The workforce is diverse but differs from broader industry trends (**Exhibit 5-15**). White workers comprise 41.4 percent, followed by Hispanic or Latino workers at 36.2 percent. Asian workers make up 13.4 percent, while Black workers represent 5.8 percent.

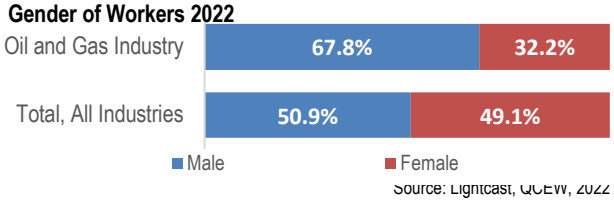
Educational Attainment of Workers

The oil and gas industry employs workers across all education levels (**Exhibit 5-16**). About 39.4 percent have a high school diploma or less, with 28.8 percent having some college or an associate degree, and 25.5 percent holding a bachelor's degree or higher. Despite lower educational attainment for many roles, workers in the industry earn higher wages than their counterparts in other industries.

Earnings by Education Level

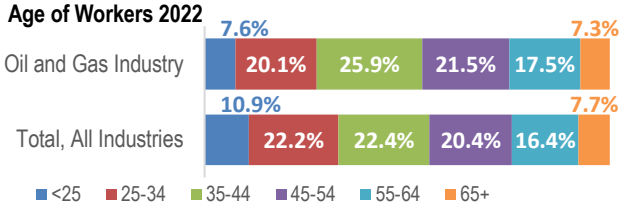
Oil and gas jobs offer premium wages at all educational levels (**Exhibit 5-17**). Workers with less than a high school education earn $3,466 monthly, compared to $2,633 across all industries. Bachelor's degree holders earn $17,094 per month, significantly higher than the $11,835 average for all industries, reflecting the sector's strong earning potential.

Exhibit 5-13
Gender of Workers 2022



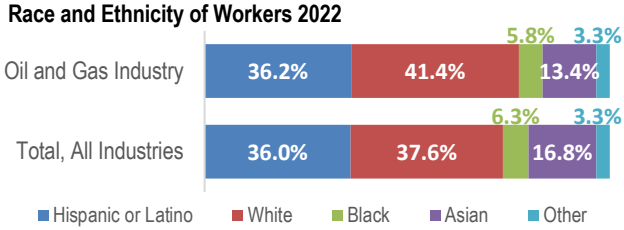
Source: Lightcast, QCEW, 2022

Exhibit 5-14
Age of Workers 2022



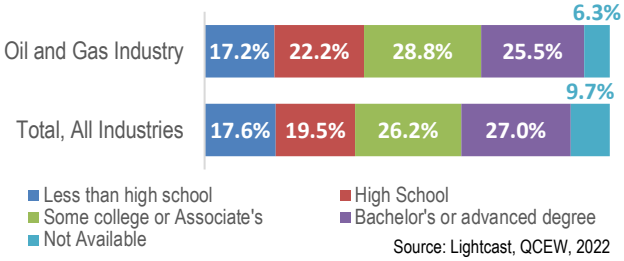
Source: Lightcast, QCEW, 2022

Exhibit 5-15
Race and Ethnicity of Workers 2022



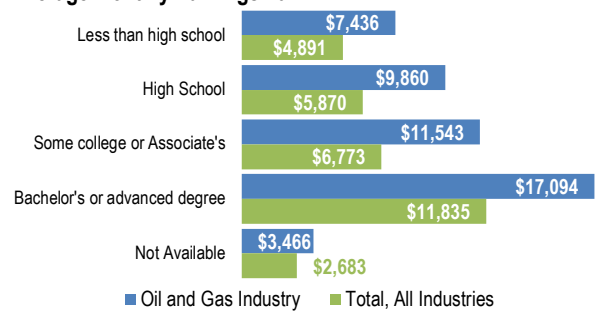
Source: Lightcast, QCEW, 2022

Exhibit 5-16
Educational Attainment of Workers 2022



Source: Lightcast, QCEW, 2022

Exhibit 5-17
Average Monthly Earnings 2022



Source: Lightcast, BLS

Changes in Workforce Characteristics in California Over Time

The composition of the oil and gas workforce in California continues to evolve, reflecting shifts in gender, age, race, ethnicity, and educational attainment.

Gender of Workforce

The share of women in the oil and gas workforce has steadily increased over the past decade. Women represented 28 percent of the workforce in 2012, growing to 32 percent in 2022 (**Exhibit 5-18**). While the industry remains predominantly male, this upward trend suggests gradual progress in gender diversity.

Age of Workforce

The workforce continues to be concentrated in prime working-age groups, but older workers now account for a larger share. Workers aged 35 to 54 years represented 68 percent of the workforce in 2012, increasing to 72 percent in 2022 (**Exhibit 5-19**). The share of workers aged 55 and older rose from 21 percent in 2012 to 25 percent in 2022. Meanwhile, younger workers (under 25) declined from 9 percent in 2012 to 8 percent in 2022, reflecting broader aging trends.

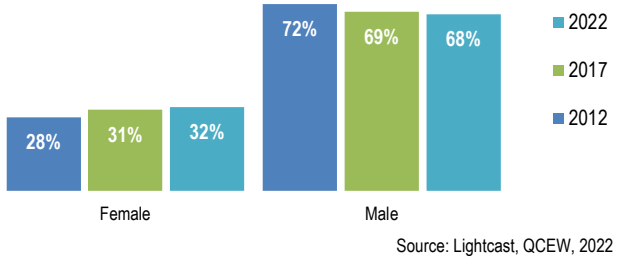
Race and Ethnicity in the Workforce

The racial and ethnic composition of the workforce has shifted slightly over the years (**Exhibit 5-20**). Workers identifying as Hispanic or Latino increased from 30 percent in 2012 to 36 percent in 2022, now representing the largest share of the workforce. The proportion of White workers declined from 49 percent in 2012 to 41 percent in 2022. Asian workers have remained stable at 13 to 14 percent, while Black workers consistently account for 5 to 6 percent of the workforce.

Educational Attainment of Workers

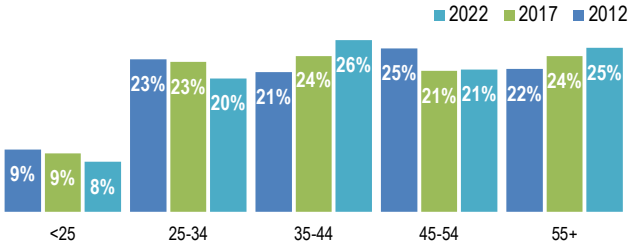
Educational attainment within the workforce has trended toward lower levels of education gaining a larger share over time (**Exhibit 5-21**). Workers with less than a high school diploma increased from 13 percent in 2012 to 17 percent in 2022. Similarly, those with only a high school diploma increased from 20 percent in 2012 to 22 percent in 2022. Workers with some college or an associate degree remained stable, accounting for 29 percent across all three years. The share of workers with a bachelor's degree or higher decreased slightly from 30 percent in 2012 to 27 percent in 2022.

Exhibit 5-18
Gender in the California Oil and Gas Industry



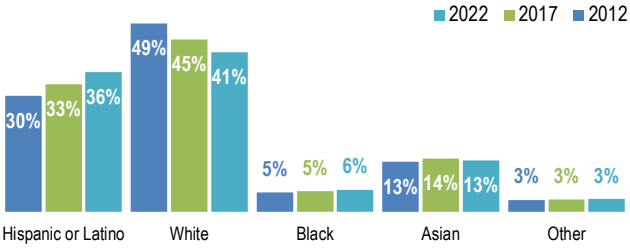
Source: Lightcast, QCEW, 2022

Exhibit 5-19
Age in the California Oil and Gas Industry



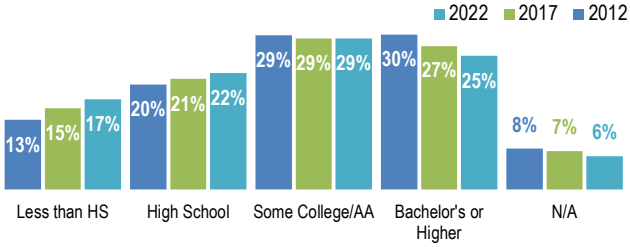
Source: Lightcast, QCEW, 2022

Exhibit 5-20
Race and Ethnicity in the California Oil and Gas Industry



Source: Lightcast, QCEW, 2022

Exhibit 5-21
Educational Attainment in the California Oil and Gas Industry



Source: Lightcast, QCEW, 2022

Occupations Specific to the Oil and Gas Industry

The oil and gas industry relies on a variety of occupations, some of which are rarely found in other sectors. These roles are highly specialized and essential for the industry's operations. In this report, we highlight these unique positions and examine the profiles of individuals employed in these jobs to gain a deeper understanding of the workforce.

We identified ten specific occupations that are distinctive to California's oil and gas sector. These roles span a range of skill levels, offer above average wages, and often require less than a bachelor's degree for entry. Our analysis includes detailed data on wages and worker characteristics for these occupations based on 2022 figures.

This employment, wage, and demographic data can support employers and educational institutions in designing targeted workforce development programs. It can also guide recruitment efforts by showcasing lucrative and accessible career opportunities within the oil and gas industry.

Each California occupational profile sheet contains metrics for the occupation including:

- Number of current jobs in 2022 and projected jobs in 2027
- Annual wages paid in 2022
- Worker characteristics, including:
  - Educational attainment
  - Age distribution
  - Race and ethnicity
  - Gender
  - Veteran status
  - A comparison of each with the average across all occupations in all industries (total workforce).

Oil and Gas Specific Occupations:

- Petroleum Engineers (SOC 17-2171)
- Geological Technicians, Except Hydrologic Technicians (SOC 19-4043)
- Pipelayers (SOC 47-2151)
- Derrick, Rotary Drill, and Service Unit Operators, Oil, Gas, and Mining
  - Derrick Operators, Oil and Gas (SOC 47-5011)
  - Rotary Drill Operators, Oil and Gas (SOC 47-5012)
  - Service Unit Operators, Oil, Gas, and Mining (SOC 47-5013)
- Other Extraction Workers
  - Roustabouts, Oil and Gas (SOC 47-5071)
  - Helpers – Extraction Workers (SOC 47-5081)
- Miscellaneous Plant System Operators
  - Gas Plant Operators (SOC 51-8092)
  - Petroleum Pump System Operators, Refinery Operators and Gaugers (SOC 51-8093)

Petroleum Engineers
(SOC 17-2171)

Petroleum engineers devise methods to improve oil and gas well production and determine the need for new or modified tool designs. Oversee drilling and offer technical advice to achieve economical and satisfactory progress.

Petroleum Engineers
1,860 jobs in 2022

Entry-level education:
Bachelor's degree

On-the-job-training:
None

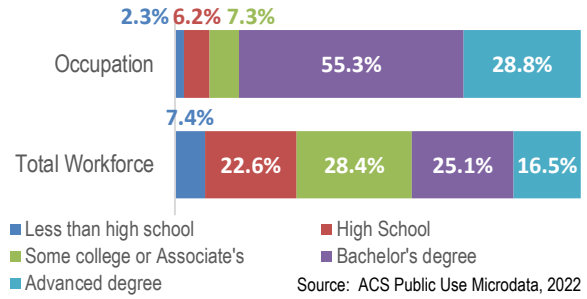
Work Experience:
None

Jobs in CA:
1,860
in 2022

1,610
Projected Jobs in 2027

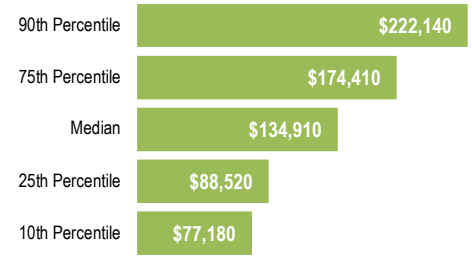
Worker Characteristics

Educational Attainment



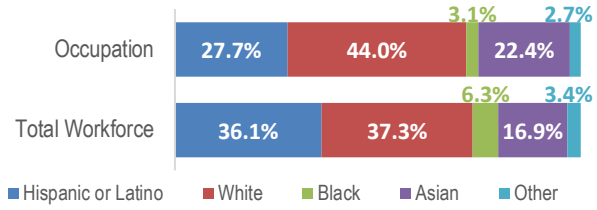
Source: ACS Public Use Microdata, 2022

Annual Wages in 2022



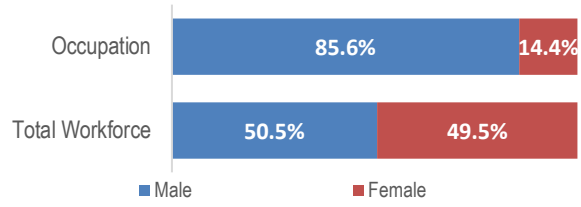
Source: BLS OEWS, 2022

Race and Ethnicity



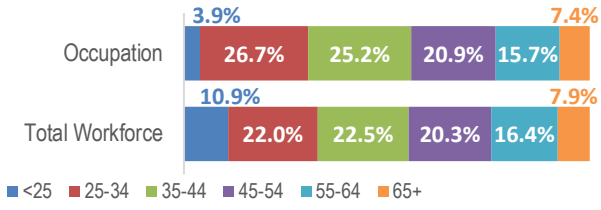
Source: Lightcast, 2022

Gender



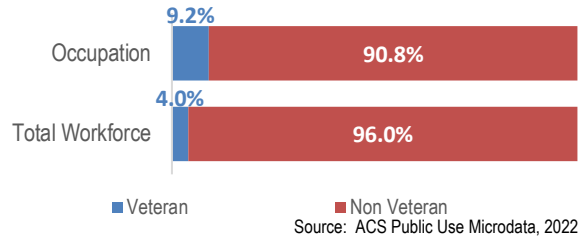
Source: Lightcast, 2022

Age



Source: Lightcast, 2022

Veteran Status



Source: ACS Public Use Microdata, 2022

Geological Technicians, Except Hydrologic Technicians

(SOC 19-4043)

Geological Technicians assist scientists in the use of electrical, sonic, or nuclear measuring instruments in both laboratory and production activities to obtain data indicating potential sources of metallic ore, gas, or petroleum. Analyze mud and drill cuttings. Chart pressure, temperature, and other characteristics of wells or bore holes. Investigate and collect information leading to the possible discovery of new oil fields.

Geological Technicians
815 jobs in 2022

Entry-level education:
Associate's degree

On-the-job-training:
Moderate-term

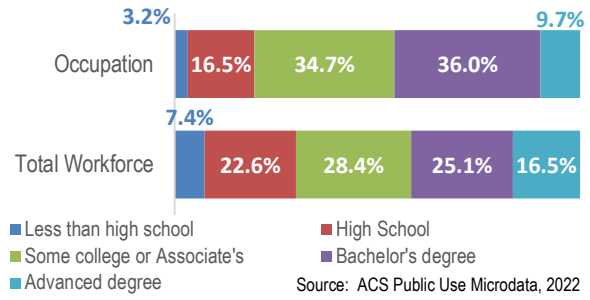
Work Experience:
None

Jobs in CA:
815
in 2022

885
Projected Jobs in 2027

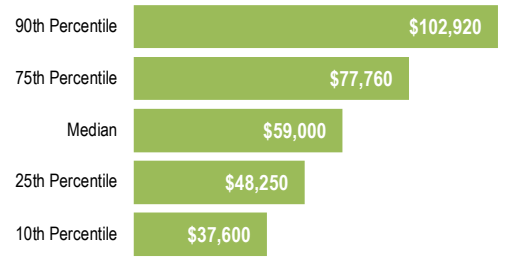
Worker Characteristics

Educational Attainment



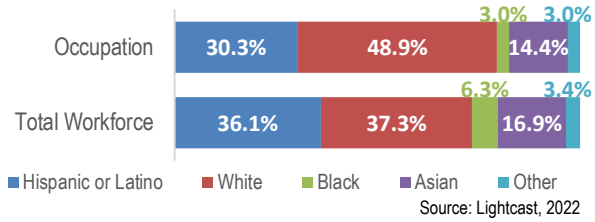
Source: ACS Public Use Microdata, 2022

Annual Wages in 2022



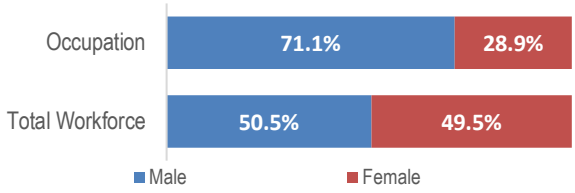
Source: BLS OEWS, 2022

Race and Ethnicity



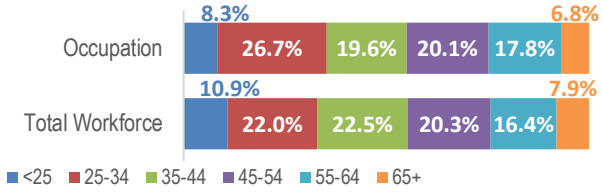
Source: Lightcast, 2022

Gender



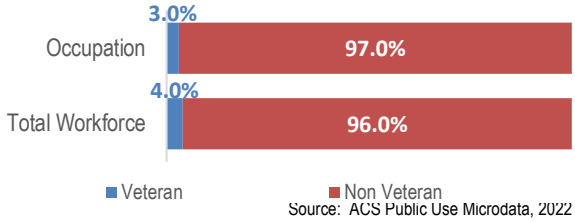
Source: Lightcast, 2022

Age



Source: Lightcast, 2022

Veteran Status



Source: ACS Public Use Microdata, 2022

Pipelayers
(SOC 47-2151)

Pipelayers lay pipe for oil and natural gas pipelines, utilities, storm or sanitation sewers, drains, and water mains. They perform any combination of the following tasks: grade trenches or culverts, position pipe, or seal joints.

Pipelayers
2,380 jobs in 2022

Entry-level education:
No Formal Education Credential

On-the-job-training:
Short-term

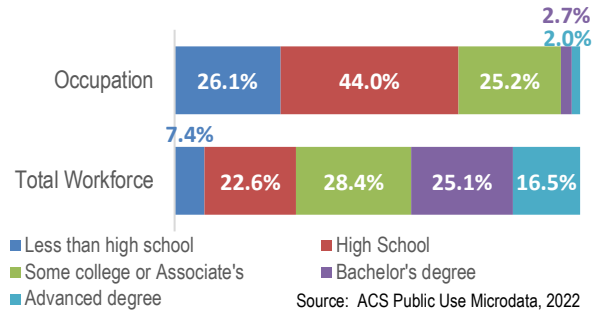
Work Experience:
None

Jobs in CA:
2,380
in 2022

2,540
Projected Jobs in 2027

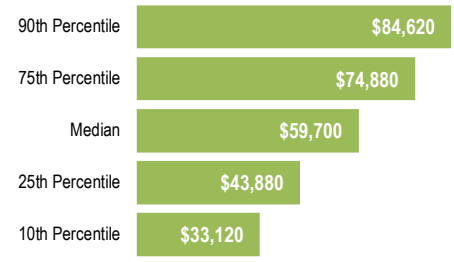
Worker Characteristics

Educational Attainment



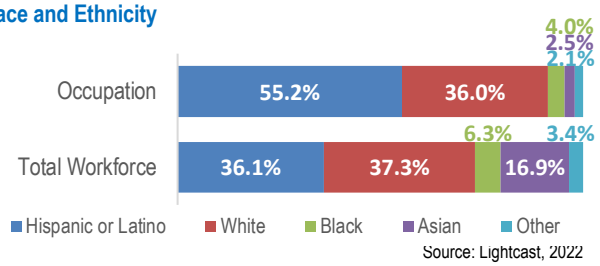
Source: ACS Public Use Microdata, 2022

Annual Wages in 2022



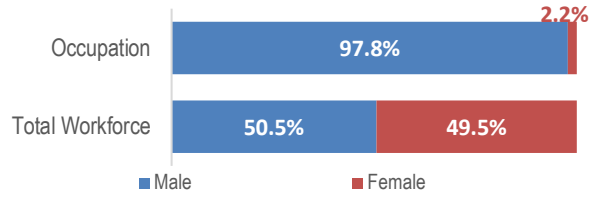
Source: BLS OEWS, 2022

Race and Ethnicity



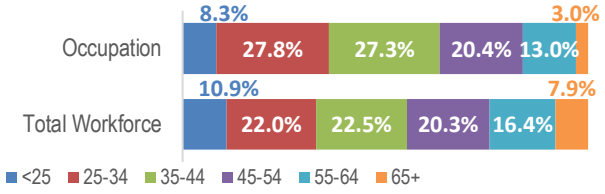
Source: Lightcast, 2022

Gender



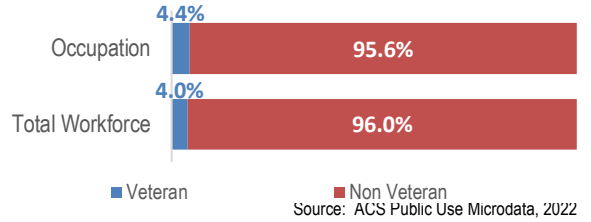
Source: Lightcast, 2022

Age



Source: Lightcast, 2022

Veteran Status



Source: ACS Public Use Microdata, 2022

Derrick, Rotary Drill, and Service Unit Operators, Oil and Gas

Derrick Operators, Oil and Gas (SOC 47-5011)

Oil and gas derrick operators rig derrick equipment and operate pumps to circulate mud or fluid through drill hole.

Rotary Drill Operators, Oil and Gas (SOC 47-5011)

Oil and gas rotary drill operators set up or operate a variety of drills to remove petroleum products from the earth and to find and remove core samples for testing during oil and gas exploration.

Service Unit Operators, Oil and Gas (SOC 47-5011)

Oil and gas service unit operators operate equipment to increase oil flow from producing wells or to remove stuck pipe, casing, tools, or other obstructions from drilling wells.

Derrick Operators
365 jobs in 2022
Entry-level education:
No Formal Education Credential
On-the-job-training:
Short-term
Work Experience:
None

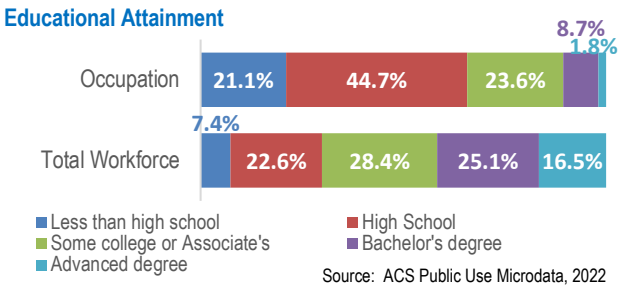
Rotary Drill Operators
475 jobs in 2022
Entry-level education:
No Formal Education Credential
On-the-job-training:
Moderate-term
Work Experience:
None

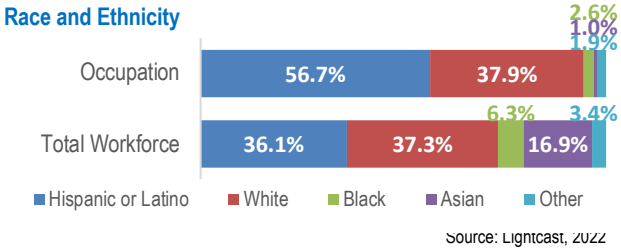
Service Unit Operators
2,870 jobs in 2022
Entry-level education:
No Formal Education Credential
On-the-job-training:
Moderate-term
Work Experience:
None

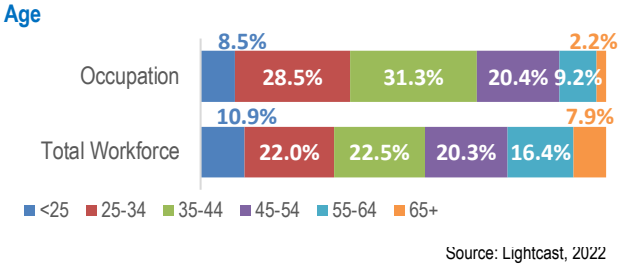
Jobs in CA:
3,710
in 2022

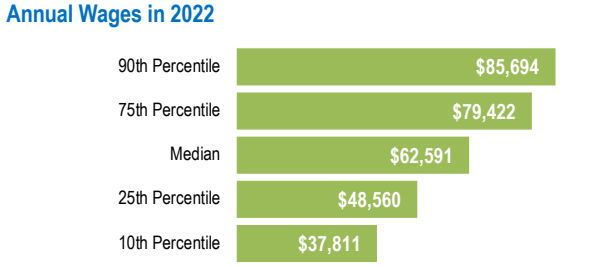
4,410
Projected Jobs in 2027

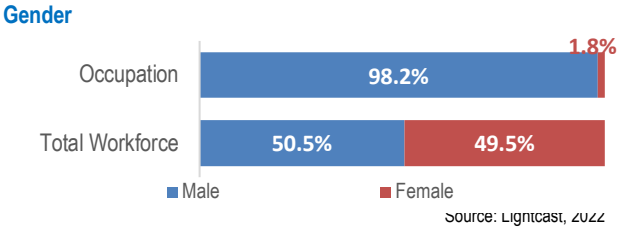
Worker Characteristics

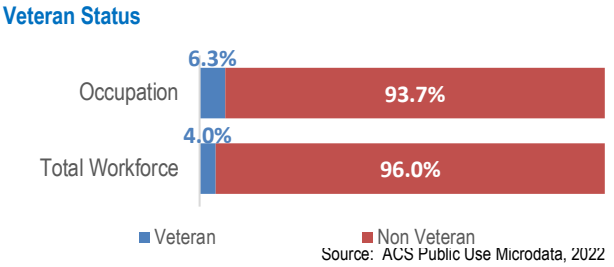












Other Extraction Workers

Roustabouts, Oil and Gas (SOC 47-5071)

Oil and gas roustabouts assemble or repairs oil field equipment using hand and power tools. Perform other tasks as needed.

Helpers – Extraction Workers (SOC 47-5081)

Help extraction craft workers, such as earth drillers, blasters and explosives workers, derrick operators, and mining machine operators, by performing duties of lesser skill. Duties include supplying equipment or cleaning work area.

Roustabouts, Oil and Gas
1,015 jobs in 2022
Entry-level education:
No formal education credential
On-the-job-training:
Moderate-term
Work Experience:
None

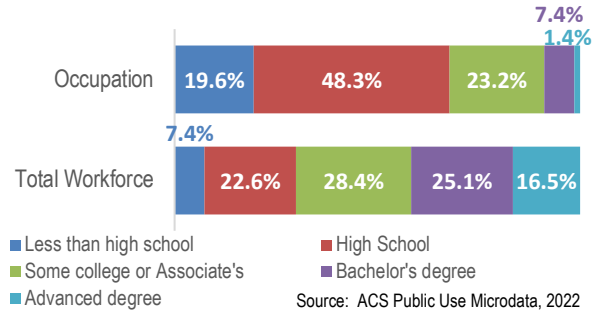
Jobs in CA:
1,495
in 2022

1,290
Projected Jobs in 2027

Helpers–Extraction Workers
480 jobs in 2022
Entry-level education:
High school diploma, or equivalent
On-the-job-training:
Moderate-term
Work Experience:
None

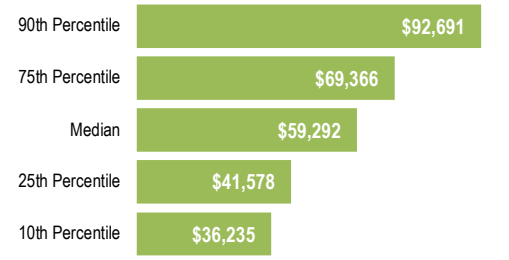
Worker Characteristics

Educational Attainment



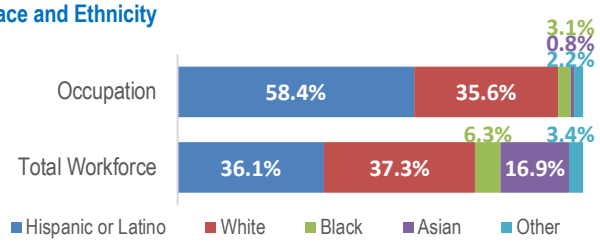
Source: ACS Public Use Microdata, 2022

Annual Wages in 2022



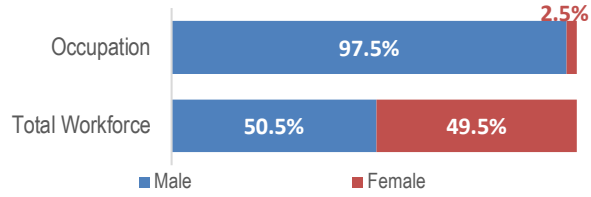
Source: BLS OEWS, 2022

Race and Ethnicity



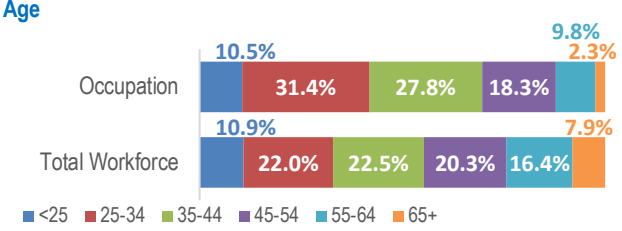
Source: Lightcast, 2022

Gender



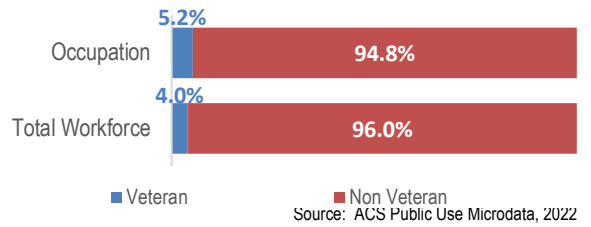
Source: Lightcast, 2022

Age



Source: Lightcast, 2022

Veteran Status



Source: ACS Public Use Microdata, 2022

Miscellaneous Plant System Operators

Gas Plant Operators (SOC 51-8092)

Gas plant operators distribute or process gas for utility companies and others by controlling compressors to maintain specified pressures on main pipelines.

Petroleum Pump System Operators, Refinery Operators, and Gaugers (SOC 51-8093)

Petroleum pump system operators, refinery operators, and gaugers control the operation of petroleum refining or processing units. May specialize in controlling manifold and pumping systems, gauging or testing oil in storage tanks, or regulating the flow of oil into pipelines.

Gas Plant Operators
975 jobs in 2022
Entry-level education:
High school diploma or equivalent
On-the-job-training:
Long-term
Work Experience:
None

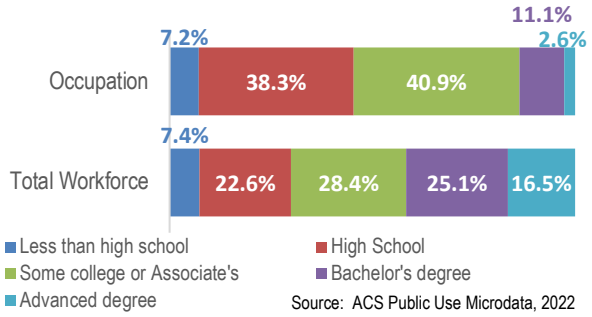
Jobs in CA:
4,605
in 2022

4,255
Projected Jobs in 2027

Petroleum Pump System Operators, Refinery Operators, and Gaugers
3,630 jobs in 2022
Entry-level education:
High school diploma or equivalent
On-the-job-training:
Long-term
Work Experience:
None

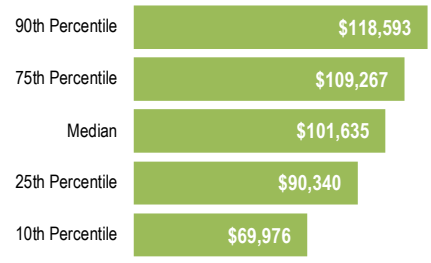
Worker Characteristics

Educational Attainment



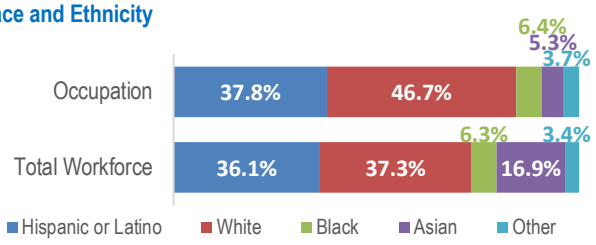
Source: ACS Public Use Microdata, 2022

Annual Wages in 2022



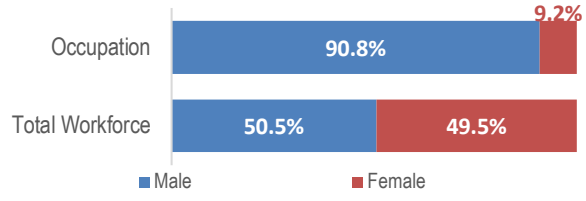
Source: BLS OEWS, 2022

Race and Ethnicity



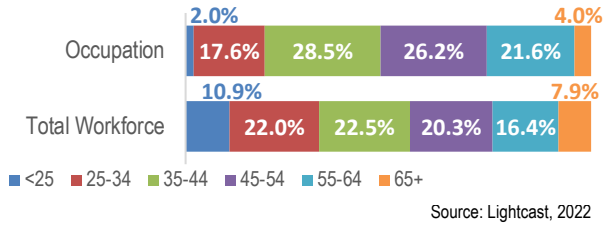
Source: Lightcast, 2022

Gender



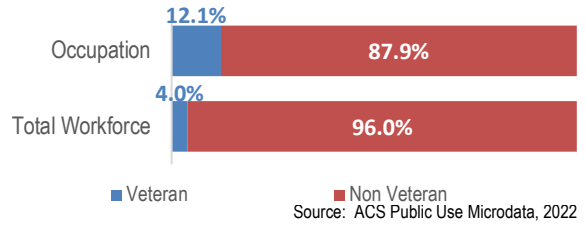
Source: Lightcast, 2022

Age



Source: Lightcast, 2022

Veteran Status



Source: ACS Public Use Microdata, 2022

Real Time Employer Demand

Job postings data represents real time employer demand. We can analyze job postings data to gain insights into the current job market, identify trends, and understand the demand for specific skills and qualifications currently in these roles in the oil and gas industry.

The five oil and gas employers with the most unique job postings in 2022 included: (1) Chevron; (2) ENGIE; (3) Hendrickson; (4) Shell; and (5) Booster Fuels.

Across all oil and gas job postings in California, customer service, communication, management, operations and sales were listed as the top five skills requested by employers.

Exhibit 5-22 displays the selected occupations in the oil and gas industry along with 2022 jobs in the industry, 2022 median earnings, and 2022-2027 forecasted change in jobs.

Oil and Gas Employers with the Most Job Postings in California

- Chevron
- ENGIE
- Hendrickson
- Shell
- Booster Fuels

Top-5 Skills Listed Across All Oil and Gas Job Postings in California

- Customer Service
- Communication
- Management
- Operations
- Sales

Exhibit 5-22

Detailed Selected Occupations in the Oil and Gas Industry in 2022

SOC	Occupations in Oil and Gas Industry	2022 jobs in Industry	2022 Median Earnings	2022-27 Forecast	
17-2171	Petroleum Engineers	460	$165,759	15	3.3%
19-4043	Geological Technicians, Except Hydrologic Technicians	55	$74,571	0	0.0%
47-2151	Pipelayers	390	59,609	40	10.3%
47-5011	Derrick Operators, Oil and Gas	360	57,999	110	30.6%
47-5012	Rotary Drill Operators, Oil and Gas	285	81,412	(20)	-7.0%
47-5013	Service Unit Operators, Oil and Gas	1,970	64,428	500	25.4%
47-5071	Roustabouts, Oil and Gas	545	59,506	(50)	-9.2%
47-5081	Helpers--Extraction Workers	225	50,777	(75)	-33.3%
51-8092	Gas Plant Operators	890	104,993	(85)	-9.6%
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	2,465	95,609	(85)	-3.4%

Exhibit 5-23 shows the three skills listed in job postings for these occupations.

Exhibit 5-23

Detailed Occupations in the Oil and Gas Industry in 2022

SOC	Occupations in Oil and Gas Industry	Skill 1	Skill 2	Skill 3
17-2171	Petroleum Engineers	Operations	Communication	Oil and Gas
19-4043	Geological Technicians, Except Hydrologic Technicians	Valid Driver's License	Management	Soil Science
47-2151	Pipelayers	Trenching	Pipe (Fluid Conveyance)	Valid Driver's License
47-5011	Derrick Operators, Oil and Gas	Oil and Gas	Well Services	Oil Well Workover
47-5012	Rotary Drill Operators, Oil and Gas	Valid Driver's License	CDL Class A License	Hazardous Waste Operations and Emergency Response Standard (HAZWOPER)
47-5013	Service Unit Operators, Oil and Gas	Valid Driver's License	Communication	Oil and Gas
47-5071	Roustabouts, Oil and Gas	Oil and Gas	Communication	Operations
47-5081	Helpers--Extraction Workers	Valid Driver's License	Lifting Ability	Construction
51-8092	Gas Plant Operators	Troubleshooting (Problem Solving)	Valid Driver's License	Operations
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	Oil and Gas	Accounting	Management

Technological and Regulatory Trends

Technological and regulatory changes are reshaping the oil and gas workforce, emphasizing the need for enhanced technical skills and compliance-focused training.

Technological Advancements

Automation and Digital Systems:

- Remote Monitoring and IoT:
  - Advanced pipeline monitoring and maintenance using IoT sensors are now standard, requiring training in data interpretation and remote control systems.
- Predictive Analytics:
  - Operators increasingly rely on data analytics for equipment maintenance and production forecasting.

Enhanced Drilling and Production Techniques:

- Hydraulic Fracturing Innovations:
  - New technologies reduce water usage and enhance extraction efficiency, requiring workers skilled in modern equipment and techniques.
- Horizontal Drilling:
  - Training for precision drilling tools is critical for improving recovery rates.

Process Optimization:

- Refinery Automation:
  - Refineries are adopting fully automated control systems, demanding workers skilled in programming and troubleshooting industrial systems.

Regulatory Changes

CalOSHA Standards:

- The California Occupational Safety and Health Administration has introduced stricter safety regulations for refineries and extraction sites, emphasizing worker training in:
  - Hazardous materials handling.
  - Industrial hygiene.
  - Emergency response protocols.

Environmental Compliance:

- SB 901 mandates enhanced environmental monitoring during oil and gas operations, requiring workers trained in air and water quality monitoring systems.

Labor Code Updates:

- Emphasis on safe working conditions and fair wages has increased the demand for compliance officers and HR personnel trained in labor standards.

Emissions Tracking:

- Companies are required to adopt technologies for real-time emissions tracking, creating demand for technicians with expertise in monitoring systems.

Highlighting Apprenticeship Pathways

Apprenticeship programs play a vital role in filling workforce gaps by providing hands-on training tailored to the oil and gas industry.

Key Apprenticeship Programs

California Building and Construction Trades Council:

- Represents over 300 local unions and provides apprenticeships in:
  - Welding for pipeline construction.
  - Pipefitting for refining operations.
  - Heavy equipment operation for drilling sites.

United Association of Plumbers and Pipefitters:

- Offers programs focused on pipeline construction and maintenance, key to midstream and downstream operations.

International Brotherhood of Boilermakers:

- Apprenticeships focus on refinery maintenance, including pressure vessel repair and construction.

SoCalGas Pipeline Training Academy:

- A specialized apprenticeship program training workers for pipeline safety, maintenance, and infrastructure upgrades.

Filling Workforce Gaps

Targeted Recruitment:

- Expand recruitment to underrepresented populations, including veterans and women.

Flexible Apprenticeships:

- Create modular apprenticeships that allow workers to specialize in areas like automation, safety compliance, or maintenance.

Industry Funding:

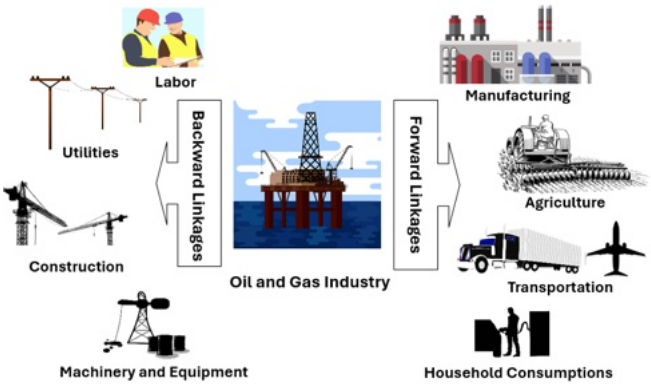
- Increase investments in apprenticeships to ensure a steady supply of skilled workers as experienced employees retire.

6 Forward Linkages of Petroleum Products

This section focuses on industries that use oil and gas products as an input in their production of goods and provision of services. We identify which industries are most at risk to potential price fluctuations, supply disruptions and other changes in the oil and gas industry that could impact their operations.

Both end-user consumers and user chain industries will be vulnerable to reductions of the supply of petroleum-based products. Response strategies may include: relocation; input substitution; temporary operational shut-down; price increases; and more. Each of these options will have its own impact on the state's economic activity. The overall potential impact is demonstrated in this section as well. ❖

Exhibit 6-1
Illustration of Backward and Forward Linkages of Oil and Gas Industry



Backward and Forward Linkages

In his influential book *The Strategy of Economic Development* (1958), Albert O. Hirschman developed the concepts of backward and forward linkages to describe how industries are interconnected within an economy. These linkages help explain how industries impact each other, serving either as providers of production inputs (backward linkages) or as key users of outputs (forward linkages). **Exhibit 6-1** provides an illustration of the backward and forward linkages of the oil and gas industry.

Backward Linkages

Backward linkages refer to the industries that supply the necessary inputs for the operation of a given industry. The oil and gas industry relies on a complex network of upstream suppliers that provide essential goods and services for exploration, extraction, processing, and distribution. These include, for example, manufacturers of highly specialized machinery and equipment, such as drilling rigs, pumps, and refinery technologies. The industry also depends on construction and engineering services for the development and maintenance of infrastructure, including drilling sites, offshore platforms, refining factories, pipelines, and storage facilities. Additionally, the industry depends heavily on utilities, such as electricity, water, and natural gas, to power its operations and maintain consistent production levels.

Economic contribution analysis provides a way to quantify these backward linkages. These are estimated for the oil and gas industry in Sections 3 and 4. Economic contribution quantifies the portion of a region's economy that can be attributed to an existing industry by tracing its purchases of goods and services in its supply chain, its payment of labor income to regional workers, and the tax revenues generated on its operations and their multiplier impacts. This analysis models what would happen if the industry did not exist in terms of those whose economic activity depends directly and indirectly on supplying the industry. A detailed description of our methodology of economic contribution analysis can be found in the Appendix.

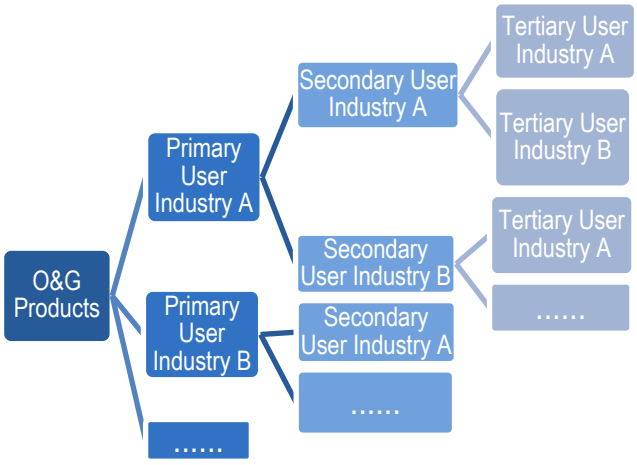
Forward Linkages

Hirschman also introduced the concept of forward linkages to industries. *Forward linkages* are those industries that use the output of a given industry in their own production. The oil and gas industry is a primary supplier to numerous important industries in the economy. One prominent example is the transportation sector. Air travel, freight shipping, and trucking are heavily reliant on various types of fuel products for their operations. Similarly, petroleum-based materials are used in manufacturing industry for producing plastics, synthetic fibers, pharmaceuticals, industrial lubricants, and many other manufactured products. Everyday activities of household consumers, including heating,

cooking, and personal transportation, also closely depend on petroleum-based products.

In this report, we refer to these first-tier user industries, as well as the first-tier users of the upstream, midstream downstream, and market segments, as *primary users.* This first tier of linkages is depicted in the diagram below. Oil and gas products are used as inputs into production of primary user industries A, B and etc. The dependence of these primary user industries is estimated using information about their business model and the market for their goods and services. These are direct forward linkages of the oil and gas industry.

The significance of forward linkages spans well beyond the immediate industries that directly utilize oil and gas products, extending to a vast network of downstream markets through the supply chains. For example, the manufacturing sector transforms petroleum-based chemicals into key products such as plastics, synthetic fibers, and industrial lubricants. These manufactured goods, many not in their final step in the production process, then enter downstream supply chains as critical production inputs of other industries. The forward-linkages of the successive rounds of direct and indirect industries in the user chain of oil and gas industries are illustrated in the diagram.



In this report, we use input-output tables to identify the primary tier of forward linkages of the oil and gas industry in California. Moreover, supply-driven I-O models are utilized to quantify the ripple or multiplier effects of the oil and gas industry through forward linkages.

Forward Linkages by Industry Segment

Primary User Industries by Industry Segment

We first look at identifying the primary user industries of the oil and gas industry products by segment.

Primary User Industries of O&G Upstream Industries

Upstream industries are related to oil and gas production and include the industries of oil and gas extraction (NAICS 211), drilling oil and gas wells (NAICS 213111), support activities for oil and gas operations (NAICS 213112) and oil and gas field machinery and equipment manufacturing (NAICS 333132).

Exhibit 6-2 summarizes the top 10 industries in California that directly purchase upstream products from the oil and gas industry.

Exhibit 6-2
Top 10 Primary User Industries of California Oil and Gas Industry Upstream Products*

NAICS	Industry Description	Purchases from Upstream Industries ($ millions)
32411	Petroleum Refineries	$7,708.0
2212	Natural Gas Distribution	$656.8
9A	Government Enterprises	$221.7
	O&G Upstream Industries	$129.2
2211 & 2213	Utilities (excluding NG Distribution)	$120.1
484	Truck Transportation	$65.4
481	Air Transportation	$37.6
23	Construction	$37.4
325	Chemical Manufacturing	$13.0
42	Wholesale Trade	$8.5
Top 10 Primary User Industries		*$8,997.7*
All Other Industries		*$115.5*
Purchases from Upstream Products		$9,113.2

* Oil and gas upstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
Source: IMPLAN Data for California; Analysis by LAEDC

As expected, petroleum refineries dominate the purchases, accounting for $7.7 billion or 84.6% of the total. Refineries process raw materials such as crude oil into a variety of petroleum products, including gasoline, diesel, jet fuel, and etc., that are critical inputs for other sectors of the economy. Natural gas distribution is the second-largest user of upstream products at $656.8 million (7.2%), followed by government enterprises at $221.7 million (2.4%). Collectively, the top 10 industries

account for nearly 99% of the $9.1 billion worth of products supplied by California's oil and gas upstream industries in 2022.

Primary User Industries of O&G Midstream Industries

Midstream operations are related to the transportation (includes pipeline), storage and wholesale of crude oil, natural gas, NGLs (natural gas liquids) and other hydrocarbon products. Industries included in this segment include oil and gas pipeline and related facilities construction (NAICS 23712), petroleum and petroleum products merchant wholesalers (NAICS 4247) and pipeline transportation (NAICS 486).

Data on purchases specific to oil and gas pipeline and related facilities construction (NAICS 23712) are not available; this industry is included in the broader industry classification of construction (NAICS 23), which includes significant activity not related to the oil and gas industry and, as such, this midstream industry was excluded from this analysis; purchases made from midstream industries refers to petroleum and petroleum products merchant wholesalers and pipeline transportation.

Exhibit 6-3 highlights the top 10 industries in California that directly purchase midstream products from the oil and gas industry. Petroleum refineries are the leading consumers, accounting for $5.32 billion or 35.2% of the total midstream purchases. This is followed by truck transportation, which spent $2.34 billion (15.5%), and the construction industry at $1.51 billion (10%). Other notable purchasers include government enterprises ($0.87 billion, 5.7%) and natural gas distribution ($0.83 billion, 5.5%). The top 10 industries combined accounted for $12.25 billion, representing 81% of the total midstream purchases of $15.12 billion in 2022. The remaining 19% was distributed across other industries.

Primary User Industries of O&G Downstream Industries

Downstream operations include the refining of crude into refined petroleum and petrochemicals, which are in turn used as inputs for a wide variety of consumer products including plastics, cosmetics, pharmaceuticals, wax-based products like packaging or crayons, paints, solvents, asphalt, pesticides and fertilizers. Industries included in this segment include petroleum refineries (NAICS 32411), petroleum lubricating oil and grease manufacturing (NAICS 324191), and petrochemical manufacturing (NAICS 32511).

Exhibit 6-4 shows the top 10 industries in California that directly purchase downstream products from the oil and gas industry. The truck transportation sector leads with $6.64 billion, or 16.9% of total purchases. This is followed by the downstream industry itself with $5.31 billion (13.6%), and construction sector at $3.90 billion (10%). Air transportation also accounts for a significant share, with $3.82 billion (9.7%). Other major purchasers include government enterprises ($3.05 billion, 7.8%), and chemical manufacturing ($2.54 billion, 6.5%). Together, the top 10 industries represent 72.3% of the total $39.2 billion purchases of downstream products, with the remaining 27.7% allocated to other industries.

Exhibit 6-3
Top 10 Primary User Industries of California Oil and Gas Industry Midstream Products*

NAICS	Industry Description	Purchases From Midstream Industries ($ millions)
32411	Petroleum Refineries	$5,321.9
484	Truck Transportation	$2,344.3
23	Construction	$1,514.8
9A	Government Enterprises	$869.4
2212	Natural Gas Distribution	$833.3
481	Air Transportation	$401.7
42	Wholesale Trade	$277.7
2211 & 2213	Utilities (excluding NG Distribution)	$261.0
531	Real Estate	$241.4
561	Administrative and Support Services	$182.6
Top 10 Primary User Industries		*$12,248.1*
All Other Industries		*$2,873.4*
Purchases from Midstream Products		$15,121.6

* Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit 6-4
Top 10 Primary User Industries of California Oil and Gas Industry Downstream Products*

NAICS	Industry Description	Purchases From Downstream Industries ($ millions)
484	Truck Transportation	$6,639.2
	Downstream	$5,313.5
23	Construction	$3,904.8
481	Air Transportation	$3,819.5
9A	Government Enterprises	$3,052.2
325	Chemical Manufacturing	$2,539.7
42	Wholesale Trade	$866.8
492	Couriers and Messengers	$768.0
2211 & 2213	Utilities (excluding NG Distribution)	$727.3
531	Real Estate	$717.1
Top 10 Primary User Industries		*$28,348.1*
All Other Industries		*$10,839.8*
Purchases from Downstream Products		$39,187.9

* Oil and gas downstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
Source: IMPLAN Data for California; Analysis by LAEDC

Primary User Industries of O&G Market Industries

Market industries are industries that are involved in bringing oil and gas products to the end user. These industries include natural gas distribution (NAICS 2212), fuel dealers (NAICS 45431) and gasoline stores (NAICS 447).

Data on purchases specific to fuel dealers (NAICS 45721) is not available; this industry is included in broader industry classifications for non-store retailers. This larger industry group includes significant activity not related to the oil and gas industry and, as such, it has been excluded from this analysis; purchases made from market industries refer to natural gas distribution and gasoline stores only.

Exhibit 6-5 presents the top 10 industries in California that directly purchase market products from the oil and gas industry. Real estate is the largest purchaser, accounting for $3.67 billion or 35.2% of the total, followed by truck transportation with $1.73 billion (16.6%). Petroleum refineries, chemical manufacturing, and food manufacturing also major user industries, purchasing $1.0 billion, $0.6 billion, and $0.3 billion, respectively. These top 10 industries together represent 79.2% of the $10.4 billion total in market product purchases, with the remaining 20.8% attributed to other industries.

The full list of purchases of inputs from the oil and gas industry by industry segment is provided in the Appendix. ❖

Exhibit 6-5
Top 10 Primary User Industries of California Oil and Gas Industry Market Products*

NAICS	Industry Description	Purchases From Market Industries ($ millions)
531	Real Estate	$3,673.1
484	Truck Transportation	$1,729.9
32411	Petroleum Refineries	$1,015.0
325	Chemical Manufacturing	$568.4
311	Food Manufacturing	$301.0
611	Educational Services	$252.0
9A	Government Enterprises	$240.0
327	Nonmetallic Mineral Product Manufacturing	$180.2
722	Food Services and Drinking Places	$163.0
525	Funds, Trusts, and Other Financial Vehicles	$143.8
Top 10 Primary User Industries		*$8,266.4*
All Other Industries		*$2,170.4*
Purchases from Market Products		$10,436.86

* Oil and gas market industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
Source: IMPLAN Data for California; Analysis by LAEDC

Total Forward-Linkage Effects by Industry Segment

Analysis Approach

Forward linkages describe how the output of one industry is used as input by others, capturing the interconnected nature of economic activities through downstream supply-chain. The previous section examines the primary or first-tier industries that directly rely on the upstream, midstream, downstream, and market segments of the oil and gas industry. However, the importance of forward linkages extends far beyond these immediate users. For example, petrochemical products, derived from petroleum-based resources, serve as critical intermediate inputs for the production of plastics, fertilizers, pharmaceuticals, and construction materials. These products are then utilized as inputs in many other industries. These linkages indicate that any disruption in oil and gas production can create widespread ripple effects, impacting industries both directly and indirectly.

In this section, we expand our analysis to the entire interconnected network of the downstream user chain of the oil and gas industry. Using IMPLAN input-output data, we can quantify the total forward-linkage effects and calculate supply-side multipliers to measure the broader economic impacts of disruptions in the oil and gas supply chain on successive layers of customer industries. This approach reveals how disruptions ripple across the economy, providing insight into the potential economic consequences of production shortfalls or price volatility.

Total Forward-Linkage Effects of O&G Upstream Industries

Exhibit 6-6 summarizes the forward-linkage economic ripple effects of a $1 billion disruption in the supply of California's oil and gas industry upstream products. Among the total forward-linkage effects of $2.543 billion, the top 10 affected industries account for $908.8 million in gross output. These include petroleum refineries ($424.3 million), professional, scientific, and technical services ($125.1 million), and construction ($59.8 million). The supply-side output multiplier of 2.543 indicates that for every $1 disruption in the supply of oil and gas industry upstream products, the total economic impact on the supply-side, including direct, indirect, and induced effects, amounts to $2.543 across all related user chain industries.

Exhibit 6-6
Forward-linkage Effects: Top 10 Industries Affected by $1 billion California Oil and Gas Industry Upstream Products Disruption[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
32411	Petroleum Refineries	$424.3
541	Professional, Scientific, and Technical Services	$125.1
23	Construction	$59.8
531	Real Estate	$52.9
42	Wholesale Trade	$51.0
561	Administrative and Support Services	$41.9
2212	Natural Gas Distribution	$40.0
9A	Government Enterprises	$39.7
484	Truck Transportation	$37.2
621	Ambulatory Health Care Services	$36.8
Top 10 Industries Affected		*$908.8*
All Other Industries		*$623.8*
Total Forward-linkage Effects[b]		$2,543.0
Supply-Side Output Multiplier		2.543

[a] Oil and gas upstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas upstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

However, it is important to note that these figures represent the potential upper-bound supply-side impacts of the supply distribution of oil and gas upstream products, as industries may implement coping strategies such as input substitution, conservation, use of inventories, or production technology adjustments to mitigate effects. The short-term impacts would likely be the most severe, as businesses have limited capacity to adapt production processes or find substitutes for disrupted supplies immediately.

Total Forward-Linkage Effects of O&G Midstream Industries

Exhibit 6-7 presents the forward-linkage economic ripple effects of a $1 billion disruption in the supply of midstream products from California's oil and gas industry. The top 10 affected industries together account for $793.1 million of the total $2.546 billion in forward-linkage impacts. Sectors most impacted include petroleum refineries ($151.4 million), professional, scientific, and technical services ($146.9 million), and construction ($97.8 million). The supply-side output multiplier of 2.546 highlights the broader economic impact, showing that each $1 disruption in the supply of oil and gas industry midstream product results in a $2.546 total economic effect across all industries in the user chain. However, once again, these figures reflect the upper-bound potential effects of the supply disruptions, as industries typically would engage in various measures to cope with supply shortages.

Exhibit 6-7
Forward-linkage Effects: Top 10 Industries Affected by $1 billion California Oil and Gas Industry Midstream Products Disruption[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
32411	Petroleum Refineries	$151.4
541	Professional, Scientific, and Technical Services	$146.9
23	Construction	$97.8
484	Truck Transportation	$81.6
531	Real Estate	$67.4
42	Wholesale Trade	$65.1
561	Administrative and Support Services	$51.5
9A	Government Enterprises	$47.8
621	Ambulatory Health Care Services	$42.9
722	Food Services and Drinking Places	$40.7
Top 10 Industries Affected		*$793.1*
All Other Industries		*$751.4*
Total Forward-linkage Effects[b]		$2,546.3
Supply-Side Output Multiplier		2.546

[a] Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas midstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Total Forward-Linkage Effects of O&G Downstream Industries

Exhibit 6-8 presents the forward-linkage economic ripple effects resulting from a $1 billion disruption in downstream products of California's oil and gas industry. The top 10 industries affected contribute $555.8 million to the total $2.212 billion in forward-linkage output effects. Top affected sectors include professional, scientific, and technical services ($116.3 million), construction ($77.1 million), and truck transportation ($66.8 million). The supply-side output multiplier of 2.212 reflects the broader economic impact, meaning that for every $1 disruption in the supply of downstream products from the oil and gas industry, $2.212 in total gross output across the user chain industries is affected.

Exhibit 6-8
Forward-linkage Effects: Top 10 Industries Affected by $1 billion California Oil and Gas Industry Downstream Products Disruption[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
541	Professional, Scientific, and Technical Services	$116.3
23	Construction	$77.1
484	Truck Transportation	$66.8
531	Real Estate	$53.5
42	Wholesale Trade	$53.5
9A	Government Enterprises	$43.0
561	Administrative and Support Services	$42.4
481	Air Transportation	$35.8
621	Ambulatory Health Care Services	$33.9
722	Food Services and Drinking Places	$33.6
Top 10 Industries Affected		*$555.8*
All Other Industries		*$603.0*
Total Forward-linkage Effects[b]		$2,211.7
Supply-Side Output Multiplier		2.212

[a] Oil and gas downstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas downstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Notably, the smaller supply-side multiplier for downstream industries, compared to upstream and midstream industries, is due to downstream products being closer to end users in the supply chain, which limits the ripple effects through the economy.

Total Forward-Linkage Effects of O&G Market Industries

Exhibit 6-9 presents the supply-side ripple effects of a $1 billion disruption in the supply of market products from California's oil and gas industry. The top 10 affected industries collectively account for $577 million of the total $2,123.9 million forward-linkage output effects. Top affected sectors include professional, scientific, and technical services ($130.5 million), real estate ($101.5 million), and wholesale trade ($49.6 million). The supply-side output multiplier of 2.124 indicates that for every $1 disruption in the supply of oil and gas market products, $2.124 in total gross output across the user chain industries is affected. Similar to the downstream industries, the market industries have a smaller multiplier compared to upstream and midstream industries, primarily because their products are closer to end users in the supply chain.

The results of the total forward-linkage effects by industry segment for each sub-region are provided in the Appendix.

Exhibit 6-9
Forward-linkage Effects: Top 10 Industries Affected by $1 billion California Oil and Gas Industry Market Products Disruption[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
541	Professional, Scientific, and Technical Services	$130.5
531	Real Estate	$101.5
42	Wholesale Trade	$49.6
23	Construction	$48.2
561	Administrative and Support Services	$41.4
621	Ambulatory Health Care Services	$38.8
484	Truck Transportation	$36.8
722	Food Services and Drinking Places	$34.5
334	Computer and Electronic Product Manufacturing	$33.0
519	Other Information Services	$24.1
Top 10 Industries Affected		*$538.4*
All Other Industries		*$577.0*
Total Forward-linkage Effects[b]		$2,123.9
Supply-Side Output Multiplier		2.124

[a] Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas market industries.
Source: IMPLAN Data for California; Analysis by LAEDC

In summary, the oil and gas industry is deeply connected to a wide range of industries in the economy. Disruptions to production, supply shortages, or price fluctuations of oil and gas products can have widespread economic consequences, reducing production and activity in industries that depend on these products, either directly or indirectly, as critical inputs. The forward linkage impact analysis in this section demonstrates that critical sectors such as transportation and construction are particularly vulnerable to such disruptions as primary users. However, the ripple effects extend far beyond these industries, affecting virtually every part of the economy, with sectors such as real estate, wholesale trade, and professional services also among the most impacted.

The total forward-linkage effects highlight the importance of maintaining a stable and reliable supply of oil and gas products to ensure the smooth functioning of the broader economy. Any disturbance in the oil and gas supply chain, whether from natural disasters, geopolitical instability, or market fluctuations, can lead to significant economic consequence that ripple through industries and communities well beyond the energy sector itself.


4GZ7883
M&Vbee
Trucking

7 Backward and Forward Linkages in California by County

Alameda County

Exhibit 7-1
Direct Activity of Oil and Gas Industry
Alameda County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	282	2.0
Mid-stream	379	56.7
Downstream	104	17.3
Market	4,243	801.0
Total Direct Activity	**5,008**	**876.9**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-2
Economic Base in Alameda County
(Employment by Industry)

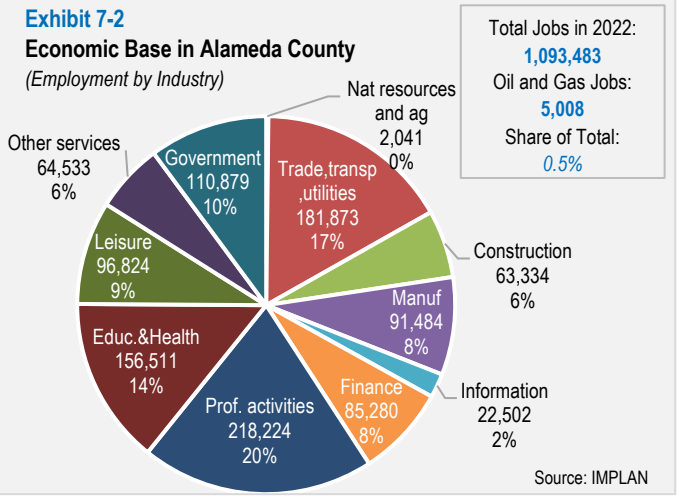


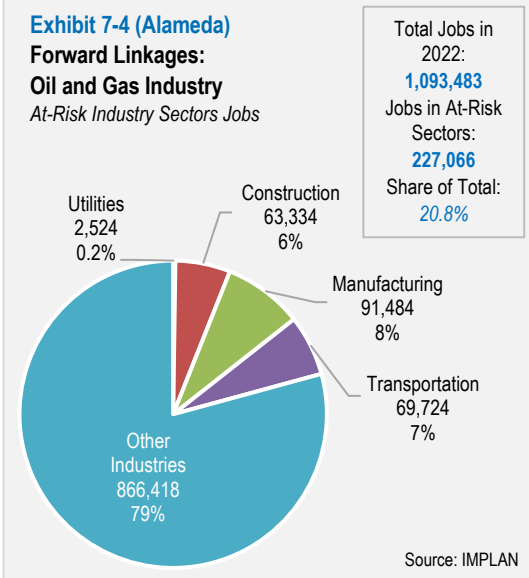
Exhibit 7-3
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Alameda County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	5,008	876.9	3,105.4	5,571.5
Indirect	7,061	721.8	1,028.9	1,619.6
Induced	5,145	411.4	723.1	1,111.9
TOTAL CONTRIBUTION	**17,214**	**2,010.1**	**4,857.3**	**8,303.1**
Percent of County Total	*1.6%*	*1.8%*	*2.8%*	*2.9%*
Percent of Total CA Contribution	*3.2%*	*3.8%*	*2.9%*	*2.5%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	68.7	195.7
Social insurance	9.1	191.1
Sales and excise taxes	357.6	13.7
Property taxes	411.3	0.0
Corporate profits taxes	79.4	79.4
Special Assessments	10.7	0.0
Other taxes	126.6	0.0
Fees, fines and permits	11.9	15.2
TOTAL TAX REVENUES	**1,075.3**	**495.2**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-4 (Alameda)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Alpine County

Exhibit 7-4
Direct Activity of Oil and Gas Industry
Alpine County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	0	0.0
Midstream	0	0.0
Downstream	0	0.0
Market	1	0.0
Total Direct Activity	**1**	**0.0**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-5
Economic Base in Alpine County
(Employment by Industry)

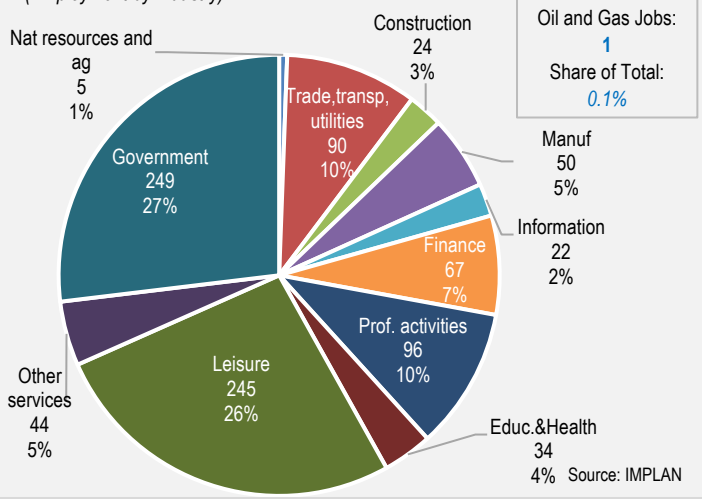


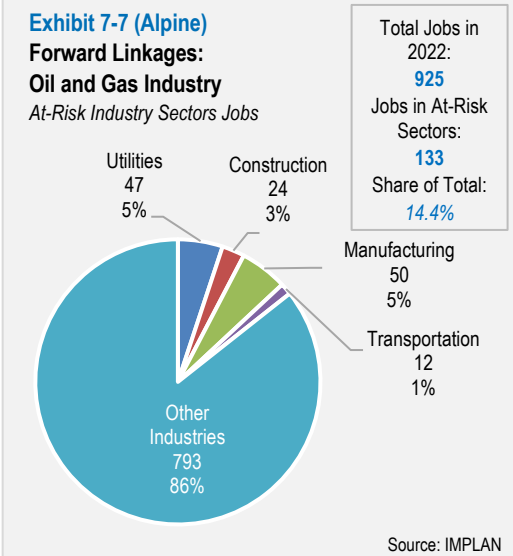
Exhibit 7-6
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Alpine County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	1	0.0	0.1	0.2
Indirect	0	0.0	0.0	0.1
Induced	0	0.0	0.0	0.1
TOTAL CONTRIBUTION	**2**	**0.0**	**0.2**	**0.4**
Percent of County Total	*0.2%*	*0.1%*	*0.2%*	*0.3%*
Percent of Total CA Contribution	*0.0%*	*0.0%*	*0.0%*	*0.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	0.0	0.0
Social insurance	0.0	0.0
Sales and excise taxes	0.0	0.0
Property taxes	0.0	0.0
Corporate profits taxes	0.0	0.0
Special Assessments	0.0	0.0
Other taxes	0.0	0.0
Fees, fines and permits	0.0	0.0
TOTAL TAX REVENUES	**0.0**	**0.0**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-7 (Alpine)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Amador County

Exhibit 7-9
Direct Activity of Oil and Gas Industry
Amador County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	22	0.0
Midstream	0	0.0
Downstream	2	0.0
Market	100	7.0
Total Direct Activity	**124**	**7.0**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-10
Economic Base in Amador County
(Employment by Industry)

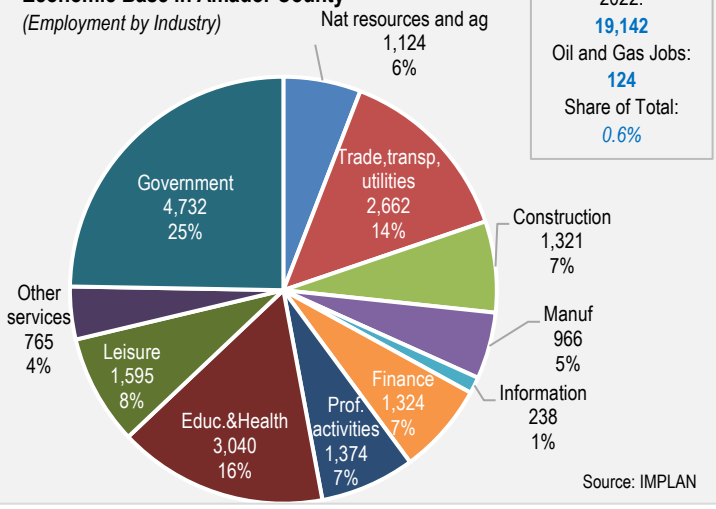


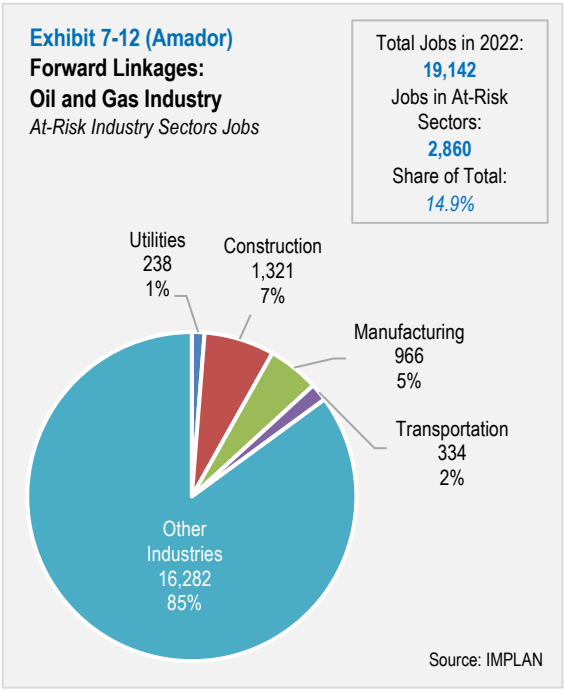
Exhibit 7-11
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Amador County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	124	7.0	17.1	64.2
Indirect	58	2.8	3.8	10.5
Induced	44	2.1	4.1	7.6
TOTAL CONTRIBUTION	**226**	**11.9**	**25.0**	**82.3**
Percent of County Total	*1.2%*	*1.1%*	*1.3%*	*2.3%*
Percent of Total CA Contribution	*0.0%*	*0.0%*	*0.0%*	*0.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	0.4	1.2
Social insurance	0.0	1.0
Sales and excise taxes	3.4	0.1
Property taxes	2.8	0.0
Corporate profits taxes	0.3	0.3
Special Assessments	0.0	0.0
Other taxes	0.4	0.0
Fees, fines and permits	0.1	0.1
TOTAL TAX REVENUES	**7.4**	**2.6**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-12 (Amador)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Butte County

Exhibit 7-13
Direct Activity of Oil and Gas Industry
Butte County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	29	0.1
Midstream	128	10.8
Downstream	2	0.1
Market	323	30.6
Total Direct Activity	**482**	**41.7**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-14
Economic Base in Butte County
(Employment by Industry)

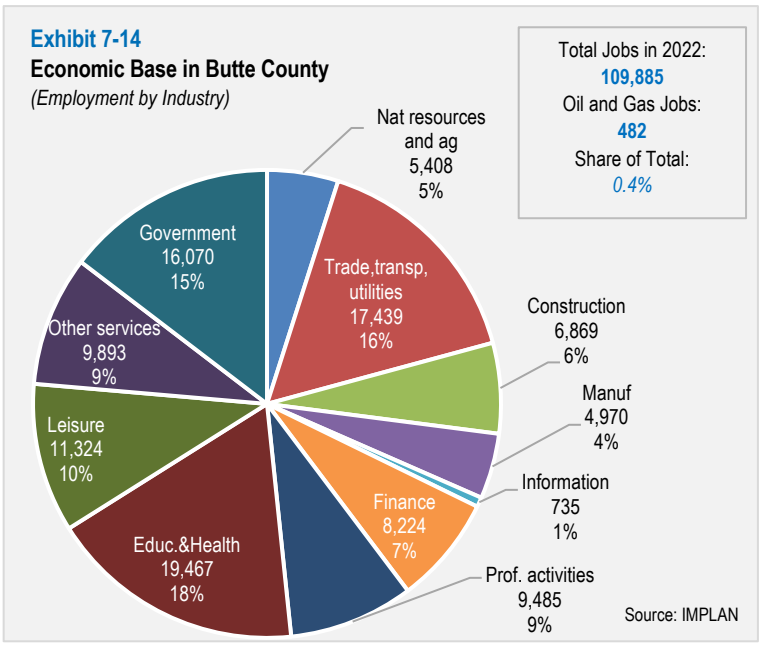


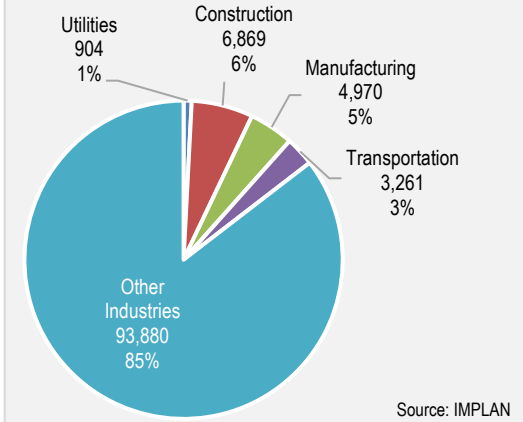
Exhibit 7-15
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Butte County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	482	41.7	259.7	366.6
Indirect	326	20.4	31.1	60.9
Induced	305	17.8	31.7	53.7
TOTAL CONTRIBUTION	**1,113**	**79.9**	**322.4**	**481.3**
Percent of County Total	*1.0%*	*1.2%*	*2.9%*	*2.5%*
Percent of Total CA Contribution	*0.2%*	*0.1%*	*0.2%*	*0.1%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	3.5	10.3
Social insurance	0.3	7.4
Sales and excise taxes	114.9	4.3
Property taxes	61.3	0.0
Corporate profits taxes	1.8	1.8
Special Assessments	0.8	0.0
Other taxes	11.3	0.0
Fees, fines and permits	2.0	4.8
TOTAL TAX REVENUES	**195.9**	**28.5**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-16 (Butte)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Calaveras County

Exhibit 7-17
Direct Activity of Oil and Gas Industry
Calaveras County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	23	0.1
Midstream	43	2.5
Downstream	3	0.0
Market	226	22.4
Total Direct Activity	**295**	**25.0**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-18
Economic Base in Calaveras County
(Employment by Industry)

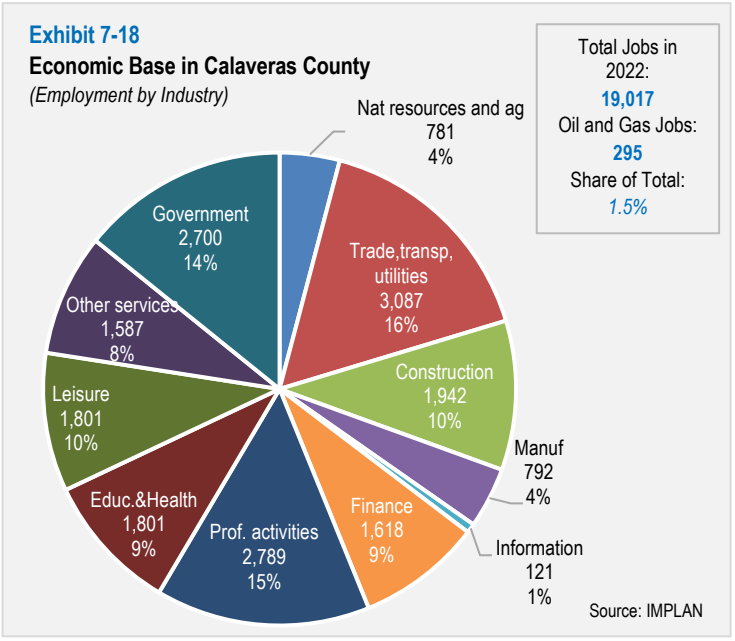


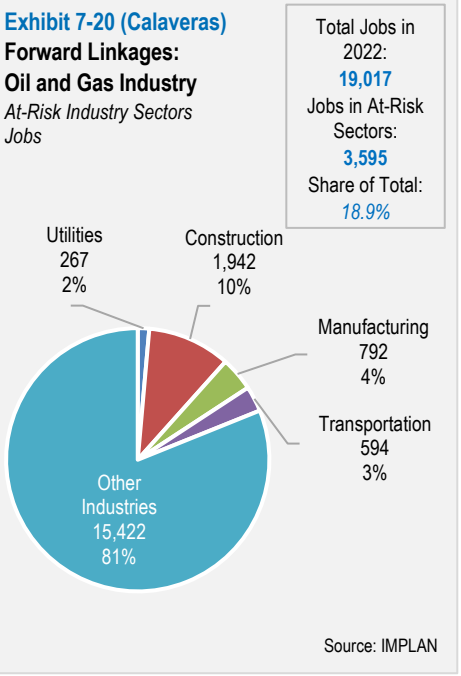
Exhibit 7-19
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Calaveras County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	295	25.0	208.2	318.1
Indirect	284	11.6	16.6	39.4
Induced	108	4.6	9.9	17.4
TOTAL CONTRIBUTION	**687**	**41.2**	**234.7**	**374.9**
Percent of County Total	*3.6%*	*4.3%*	*13.2%*	*11.3%*
Percent of Total CA Contribution	*0.1%*	*0.1%*	*0.1%*	*0.1%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	1.7	4.8
Social insurance	0.2	5.1
Sales and excise taxes	57.8	3.7
Property taxes	67.8	0.0
Corporate profits taxes	1.1	1.1
Special Assessments	5.0	0.0
Other taxes	12.6	0.0
Fees, fines and permits	1.4	4.1
TOTAL TAX REVENUES	**147.7**	**18.8**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-20 (Calaveras)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors
Jobs



Colusa County

Exhibit 7-21
Direct Activity of Oil and Gas Industry
Colusa County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	23	1.1
Midstream	29	3.0
Downstream	0	0.0
Market	226	21.0
Total Direct Activity	**279**	**25.1**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-22
Economic Base in Colusa County
(Employment by Industry)

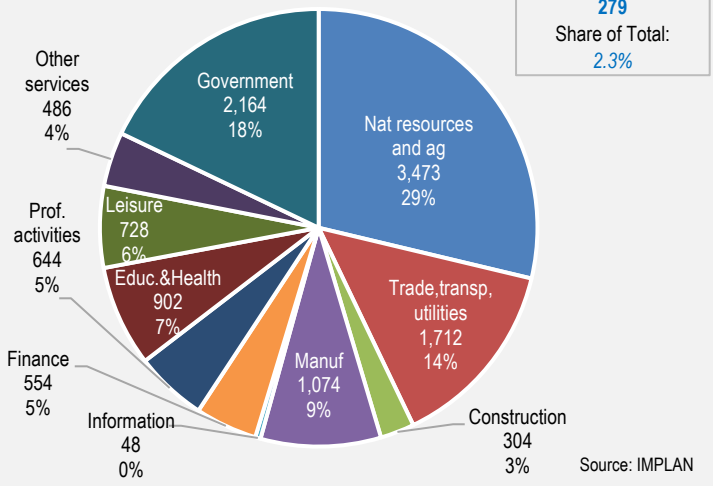


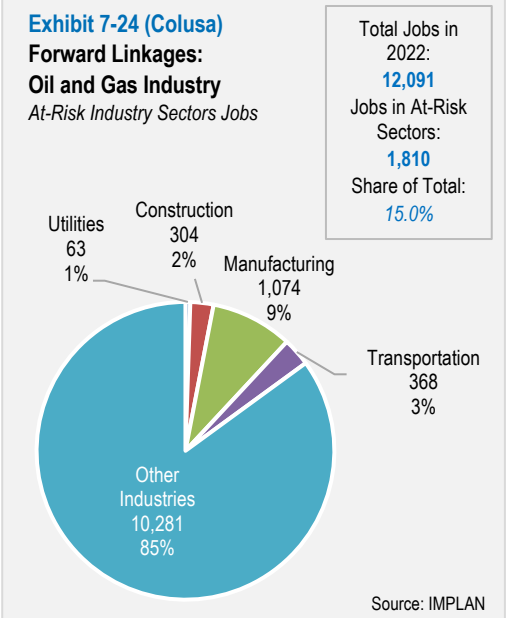
Exhibit 7-23
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Colusa County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	279	25.1	162.1	239.4
Indirect	138	9.6	13.4	25.5
Induced	53	3.2	6.6	10.6
TOTAL CONTRIBUTION	**469**	**38.0**	**182.1**	**275.5**
Percent of County Total	*3.9%*	*5.0%*	*12.3%*	*8.8%*
Percent of Total CA Contribution	*0.1%*	*0.1%*	*0.1%*	*0.1%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	1.3	3.8
Social insurance	0.2	3.9
Sales and excise taxes	36.6	3.0
Property taxes	48.5	0.0
Corporate profits taxes	1.8	1.8
Special Assessments	5.1	0.0
Other taxes	4.9	0.0
Fees, fines and permits	0.9	3.3
TOTAL TAX REVENUES	**99.3**	**15.9**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-24 (Colusa)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Contra Costa County

Exhibit 7-25
Direct Activity of Oil and Gas Industry
Contra Costa County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	417	39.0
Midstream	1,510	188.8
Downstream	3,173	977.9
Market	6,217	1,877.6
Total Direct Activity	**11,318**	**3,083.3**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-26
Economic Base in Contra Costa County
(Employment by Industry)

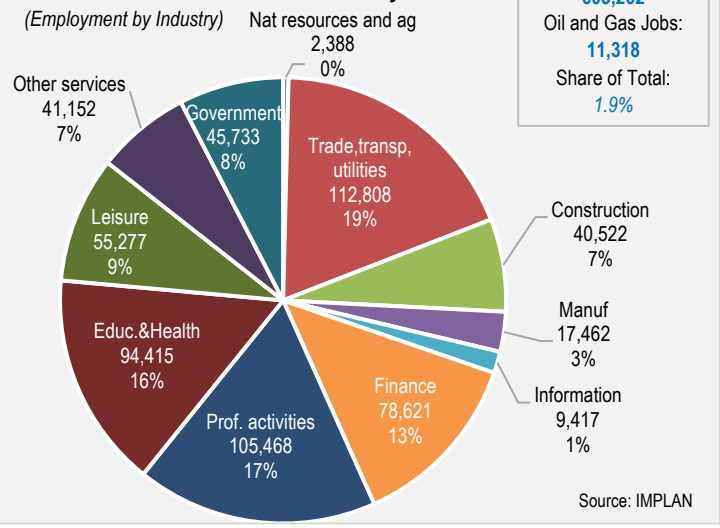


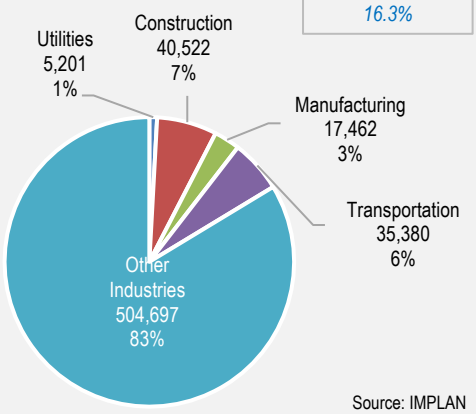
Exhibit 7-27
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Contra Costa County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	11,318	3,083.3	20,095.2	55,545.9
Indirect	25,901	2,387.0	3,572.8	5,878.6
Induced	13,337	953.7	1,776.3	2,735.9
TOTAL CONTRIBUTION	**50,555**	**6,424.1**	**25,444.3**	**64,160.4**
Percent of County Total	*8.4%*	*13.0%*	*26.5%*	*36.5%*
Percent of Total CA Contribution	*9.4%*	*12.0%*	*15.3%*	*19.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	256.2	725.6
Social insurance	29.0	667.0
Sales and excise taxes	1,652.8	108.7
Property taxes	2,001.2	0.0
Corporate profits taxes	620.6	620.7
Special Assessments	48.0	0.0
Other taxes	490.3	0.0
Fees, fines and permits	64.5	121.1
TOTAL TAX REVENUES	**5,162.6**	**2,243.1**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-28 (Contra Costa)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Del Norte County

Exhibit 7-29
Direct Activity of Oil and Gas Industry
Del Norte County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	21	0.0
Midstream	0	0.0
Downstream	0	0.0
Market	95	5.6
Total Direct Activity	**116**	**5.7**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-30
Economic Base in Del Norte County
(Employment by Industry)

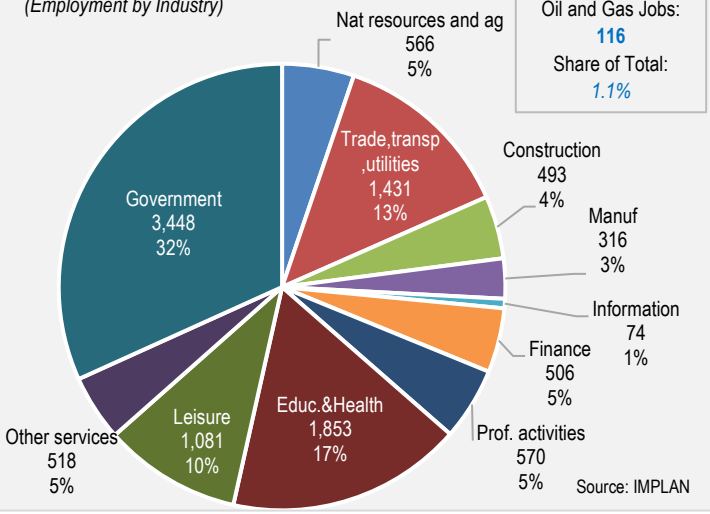


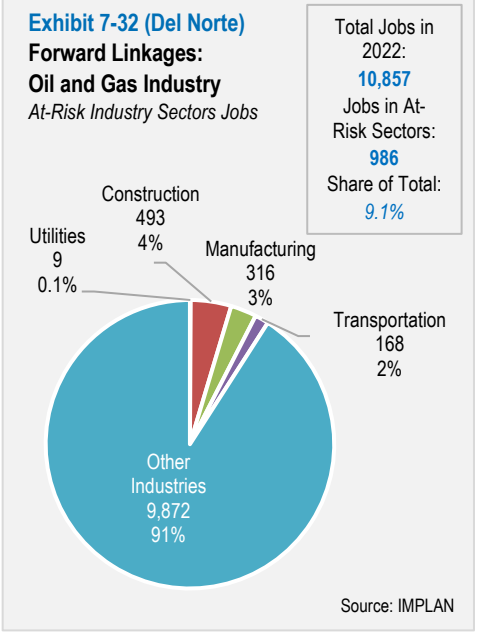
Exhibit 7-31
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Del Norte County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	116	5.7	19.8	41.9
Indirect	39	1.6	2.4	7.2
Induced	16	0.8	1.7	2.9
TOTAL CONTRIBUTION	**171**	**8.1**	**24.0**	**51.9**
Percent of County Total	*1.6%*	*1.3%*	*2.5%*	*3.0%*
Percent of Total CA Contribution	*0.0%*	*0.0%*	*0.0%*	*0.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	0.3	1.0
Social insurance	0.0	0.8
Sales and excise taxes	3.6	0.0
Property taxes	1.7	0.0
Corporate profits taxes	0.4	0.4
Special Assessments	0.0	0.0
Other taxes	0.3	0.0
Fees, fines and permits	0.1	0.1
TOTAL TAX REVENUES	**6.4**	**2.3**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-32 (Del Norte)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



El Dorado County

Exhibit 7-33
Direct Activity of Oil and Gas Industry
El Dorado County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	89	0.6
Midstream	88	6.6
Downstream	0	0.0
Market	375	29.8
Total Direct Activity	**552**	**37.0**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-34
Economic Base in El Dorado County
(Employment by Industry)

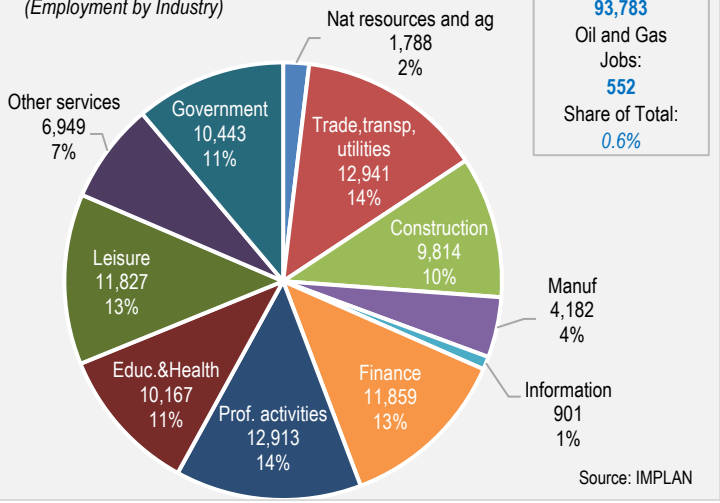


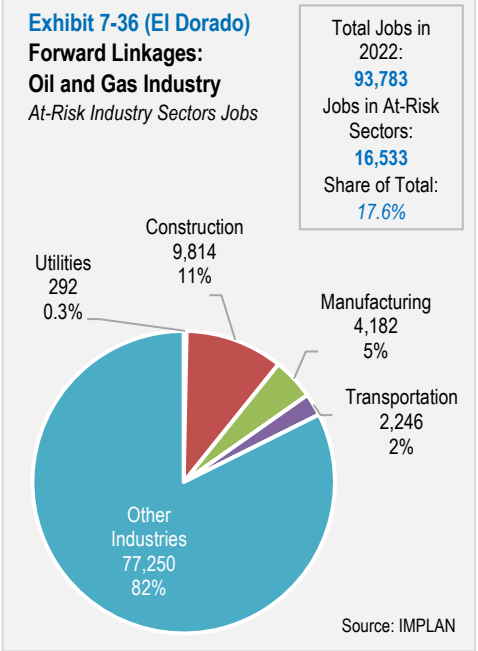
Exhibit 7-35
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
El Dorado County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	552	37.0	260.2	386.8
Indirect	535	35.9	47.8	92.4
Induced	519	28.8	55.5	92.4
TOTAL CONTRIBUTION	**1,606**	**101.7**	**363.4**	**571.6**
Percent of County Total	*1.7%*	*1.7%*	*3.8%*	*3.4%*
Percent of Total CA Contribution	*0.3%*	*0.2%*	*0.2%*	*0.2%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	4.2	12.1
Social insurance	0.4	10.5
Sales and excise taxes	82.7	3.1
Property taxes	89.8	0.0
Corporate profits taxes	1.6	1.6
Special Assessments	4.2	0.0
Other taxes	18.4	0.0
Fees, fines and permits	2.6	3.5
TOTAL TAX REVENUES	**203.9**	**30.7**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-36 (El Dorado)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Fresno County

Exhibit 7-37
Direct Activity of Oil and Gas Industry
Fresno County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	236	23.0
Midstream	456	55.2
Downstream	33	7.2
Market	3,923	748.6
Total Direct Activity	**4,649**	**833.9**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-38
Economic Base in Fresno County
(Employment by Industry)

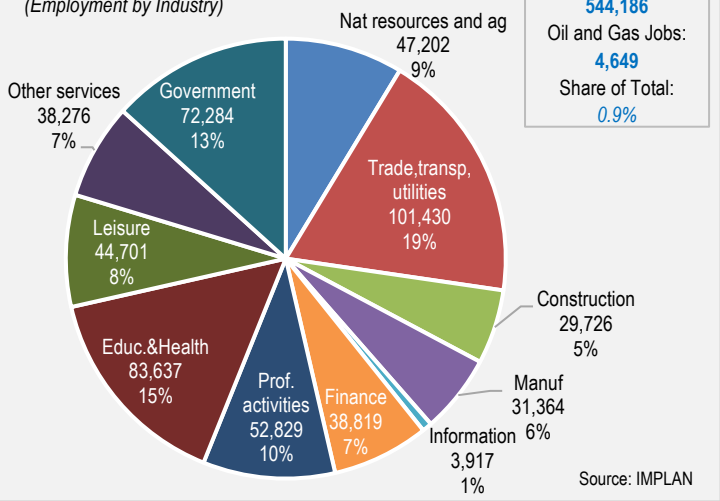


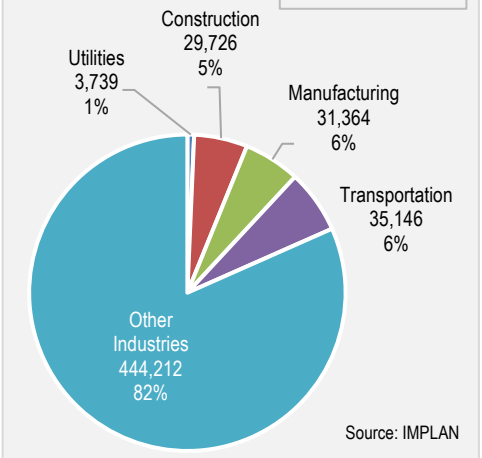
Exhibit 7-39
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Fresno County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	4,649	833.9	3,756.9	5,916.1
Indirect	7,002	453.4	679.3	1,239.6
Induced	5,230	313.4	550.3	922.8
TOTAL CONTRIBUTION	**16,881**	**1,600.7**	**4,986.5**	**8,078.5**
Percent of County Total	*3.1%*	*4.5%*	*8.4%*	*7.8%*
Percent of Total CA Contribution	*3.1%*	*3.0%*	*3.0%*	*2.4%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	72.2	204.4
Social insurance	7.8	172.3
Sales and excise taxes	826.7	37.1
Property taxes	466.6	0.0
Corporate profits taxes	78.2	78.2
Special Assessments	26.9	0.0
Other taxes	117.1	0.0
Fees, fines and permits	16.8	41.4
TOTAL TAX REVENUES	**1,612.3**	**533.3**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-40 (Fresno)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Glenn County

Exhibit 7-41
Direct Activity of Oil and Gas Industry
Glenn County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	30	1.5
Midstream	36	4.1
Downstream	2	0.0
Market	180	18.6
Total Direct Activity	**249**	**24.3**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-42
Economic Base in Glenn County
(Employment by Industry)

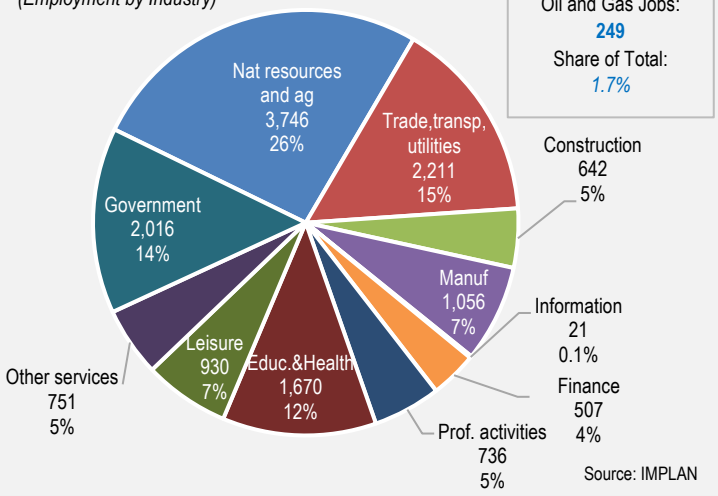


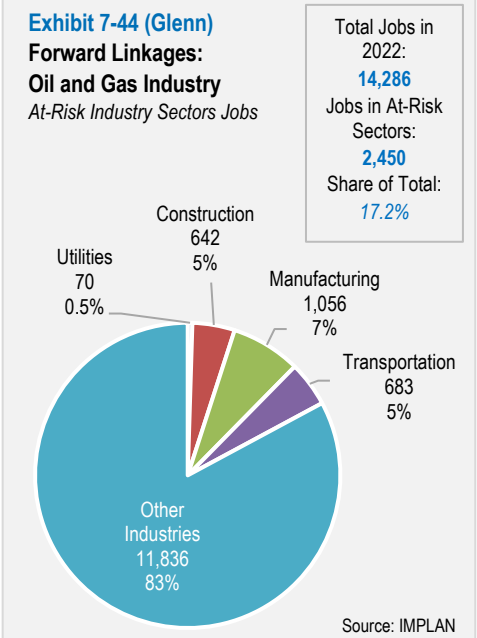
Exhibit 7-43
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Glenn County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	249	24.3	185.2	279.7
Indirect	161	9.6	13.5	27.4
Induced	75	3.3	7.1	11.9
TOTAL CONTRIBUTION	**485**	**37.2**	**205.8**	**319.0**
Percent of County Total	*3.4%*	*4.8%*	*12.3%*	*10.8%*
Percent of Total CA Contribution	*0.1%*	*0.1%*	*0.1%*	*0.1%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$1.5	$4.2
Social insurance	0.2	4.3
Sales and excise taxes	56.6	4.0
Property taxes	47.4	0.0
Corporate profits taxes	1.7	1.7
Special Assessments	7.1	0.0
Other taxes	6.9	0.0
Fees, fines and permits	1.2	4.5
TOTAL TAX REVENUES	**$122.6**	**$18.7**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-44 (Glenn)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Humboldt County

Exhibit 7-45
Direct Activity of Oil and Gas Industry
Humboldt County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	67	0.2
Midstream	66	8.6
Downstream	5	0.2
Market	507	52.5
Total Direct Activity	**645**	**61.5**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-46
Economic Base in Humboldt County
(Employment by Industry)

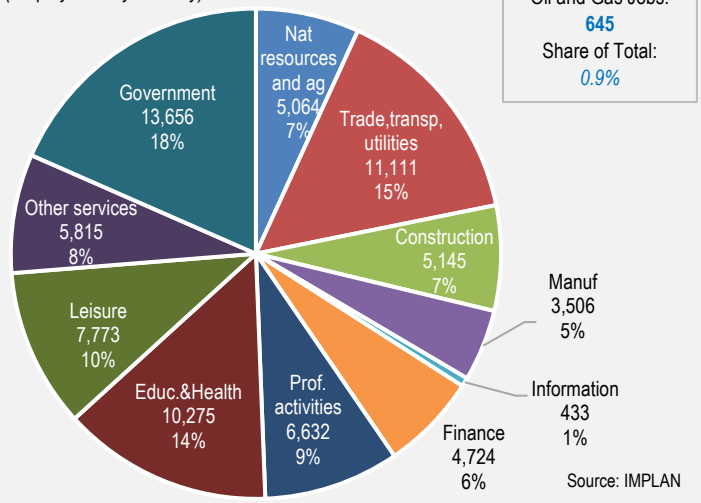


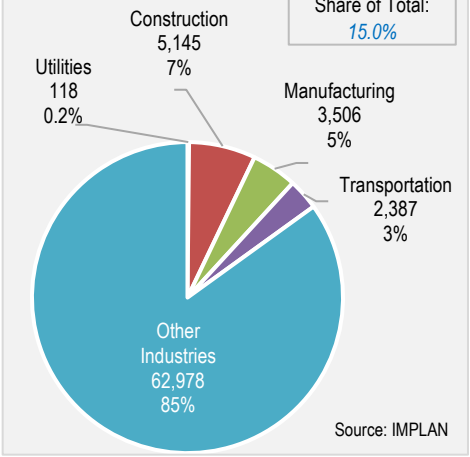
Exhibit 7-47
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Humboldt County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	645	61.5	362.3	575.6
Indirect	499	29.0	42.2	86.2
Induced	324	18.4	33.3	56.2
TOTAL CONTRIBUTION	**1,468**	**108.9**	**437.7**	**718.1**
Percent of County Total	*2.0%*	*2.5%*	*6.2%*	*5.7%*
Percent of Total CA Contribution	*0.3%*	*0.2%*	*0.3%*	*0.2%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$5.1	$15.0
Social insurance	0.4	10.5
Sales and excise taxes	156.3	6.4
Property taxes	57.0	0.0
Corporate profits taxes	3.4	3.4
Special Assessments	2.9	0.0
Other taxes	11.3	0.0
Fees, fines and permits	2.7	7.2
TOTAL TAX REVENUES	**$239.1**	**$42.5**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-48 (Humboldt)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Imperial County

Exhibit 7-49
Direct Activity of Oil and Gas Industry
Imperial County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	5	0.1
Midstream	151	13.5
Downstream	0	0.0
Market	557	39.9
Total Direct Activity	**712**	**53.5**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-50
Economic Base in Imperial County
(Employment by Industry)

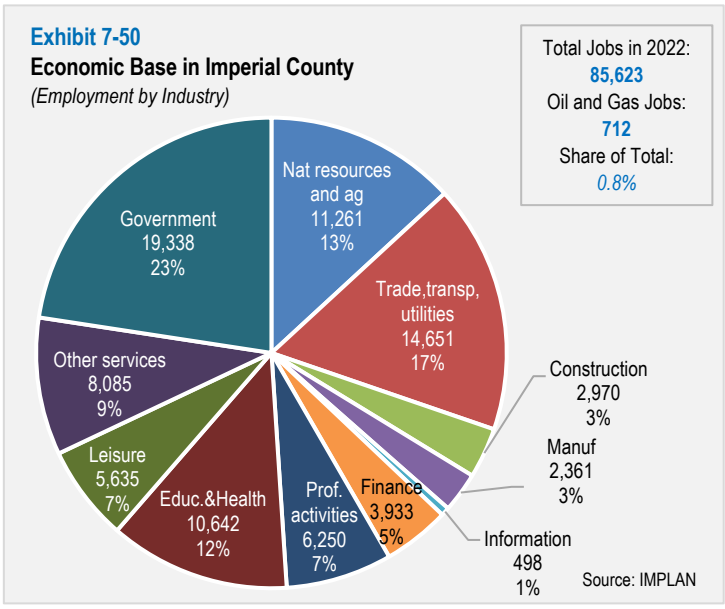


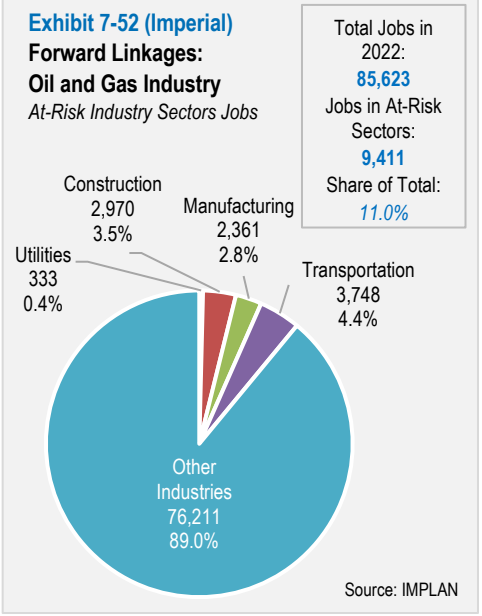
Exhibit 7-51
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Imperial County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	712	53.5	494.1	613.6
Indirect	399	21.5	32.5	69.2
Induced	212	9.9	20.1	34.9
TOTAL CONTRIBUTION	**1,323**	**84.9**	**546.7**	**717.7**
Percent of County Total	*1.5%*	*1.6%*	*6.0%*	*4.8%*
Percent of Total CA Contribution	*0.2%*	*0.2%*	*0.3%*	*0.2%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$4.7	$13.4
Social insurance	0.4	8.5
Sales and excise taxes	244.0	9.9
Property taxes	109.9	0.0
Corporate profits taxes	2.4	2.4
Special Assessments	1.1	0.0
Other taxes	24.8	0.0
Fees, fines and permits	4.0	11.0
TOTAL TAX REVENUES	**$391.3**	**$45.2**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-52 (Imperial)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Inyo County

Exhibit 7-53
Direct Activity of Oil and Gas Industry
Inyo County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	38	4.6
Midstream	33	5.1
Downstream	2	0.0
Market	71	4.8
Total Direct Activity	**144**	**14.5**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-54
Economic Base in Inyo County
(Employment by Industry)

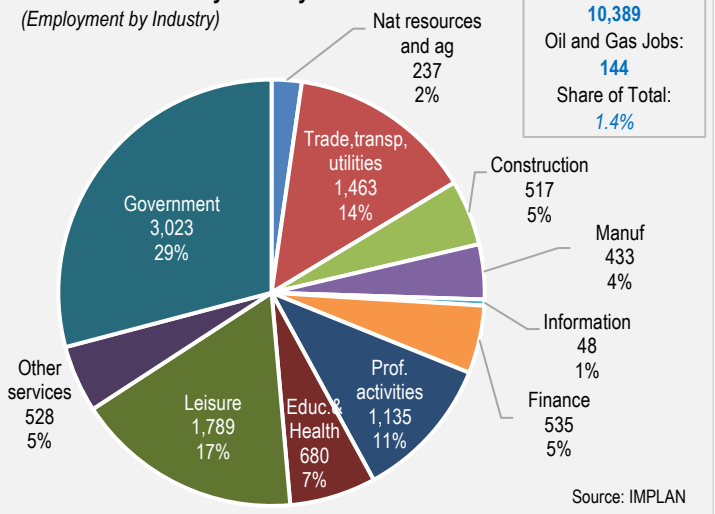


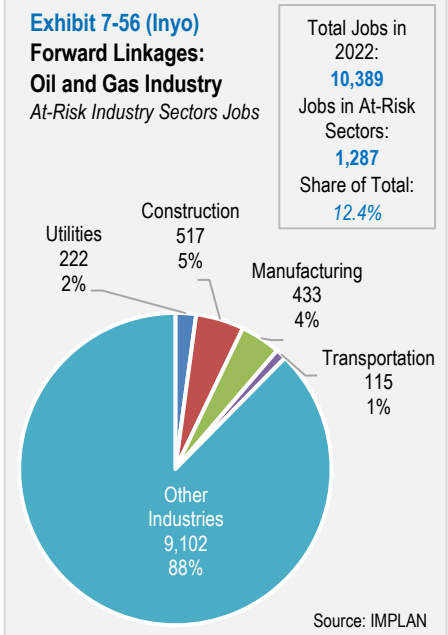
Exhibit 7-55
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Inyo County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	144	14.5	131.1	197.3
Indirect	101	5.0	7.3	16.8
Induced	44	2.1	4.8	7.9
TOTAL CONTRIBUTION	**289**	**21.7**	**143.2**	**222.0**
Percent of County Total	*2.8%*	*3.0%*	*11.2%*	*10.5%*
Percent of Total CA Contribution	*0.1%*	*0.0%*	*0.1%*	*0.1%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$1.0	$2.9
Social insurance	0.1	1.8
Sales and excise taxes	44.7	3.1
Property taxes	48.5	0.0
Corporate profits taxes	0.4	0.4
Special Assessments	0.2	0.0
Other taxes	10.6	0.0
Fees, fines and permits	0.8	3.5
TOTAL TAX REVENUES	**$106.2**	**$11.9**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-56 (Inyo)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Kern County

Exhibit 7-57
Direct Activity of Oil and Gas Industry
Kern County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	7,080	1,011.6
Midstream	2,721	234.5
Downstream	547	117.2
Market	3,071	376.3
Total Direct Activity	**13,418**	**1,739.5**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-58
Economic Base in Kern County
(Employment by Industry)

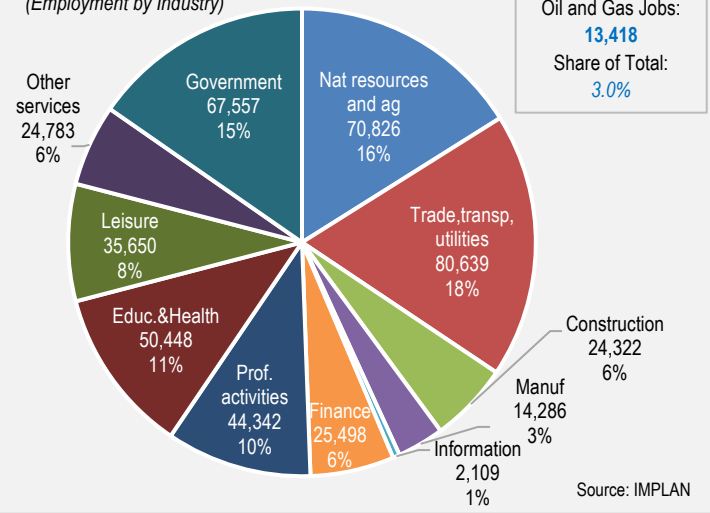


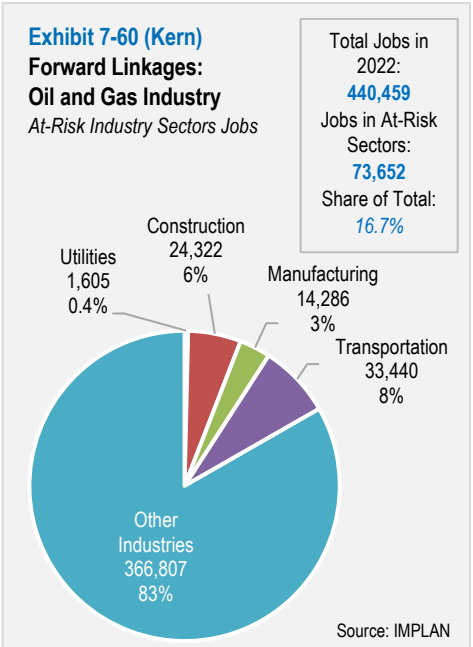
Exhibit 7-59
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Kern County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	13,418	1,739.5	7,654.8	16,355.0
Indirect	12,754	972.8	1,463.3	2,631.3
Induced	9,044	502.5	936.4	1,523.3
TOTAL CONTRIBUTION	**35,216**	**3,214.8**	**10,054.5**	**20,509.5**
Percent of County Total	*8.0%*	*10.9%*	*19.2%*	*23.4%*
Percent of Total CA Contribution	*6.6%*	*6.0%*	*6.1%*	*6.1%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$143.4	$406.9
Social insurance	15.9	350.8
Sales and excise taxes	1,074.2	52.4
Property taxes	792.9	0.0
Corporate profits taxes	197.2	197.2
Special Assessments	71.1	0.0
Other taxes	112.7	0.0
Fees, fines and permits	21.4	58.4
TOTAL TAX REVENUES	**$2,429.0**	**$1,065.6**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-60 (Kern)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Kings County

Exhibit 7-61
Direct Activity of Oil and Gas Industry
Kings County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	124	0.3
Midstream	55	5.5
Downstream	2	0.0
Market	389	38.6
Total Direct Activity	570	44.3

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-62
Economic Base in Kings County
(Employment by Industry)

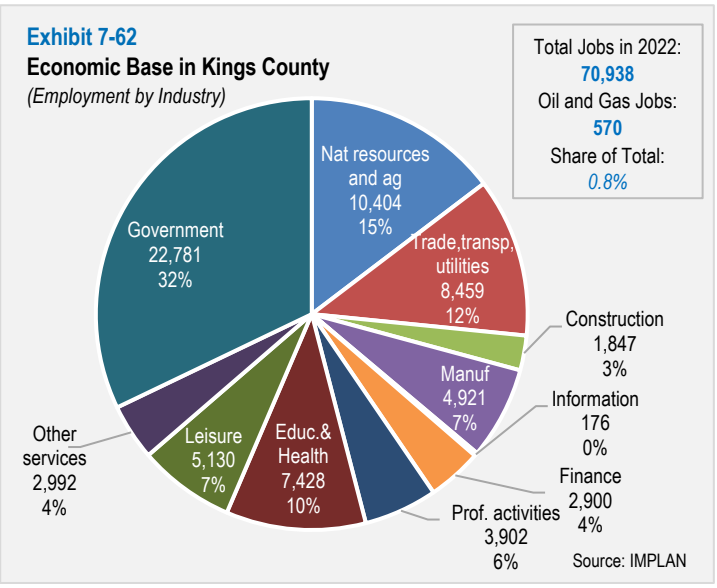


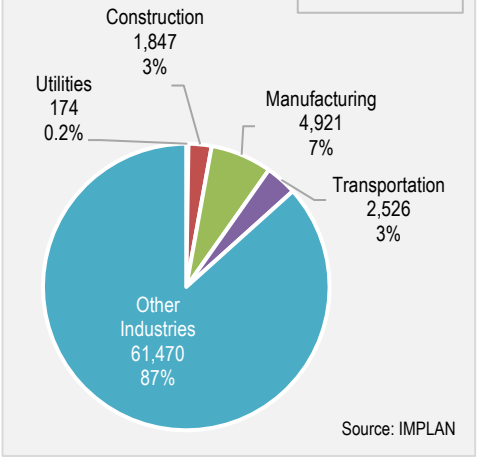
Exhibit 7-63
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Kings County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	570	44.3	320.6	562.9
Indirect	323	19.3	28.5	58.8
Induced	200	10.0	20.3	34.3
TOTAL CONTRIBUTION	**1,092**	**73.5**	**369.4**	**656.0**
Percent of County Total	*1.5%*	*1.5%*	*4.0%*	*4.0%*
Percent of Total CA Contribution	*0.2%*	*0.1%*	*0.2%*	*0.2%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$2.5	$7.0
Social insurance	0.4	7.6
Sales and excise taxes	115.7	4.6
Property taxes	57.3	0.0
Corporate profits taxes	3.7	3.7
Special Assessments	5.7	0.0
Other taxes	18.0	0.0
Fees, fines and permits	2.8	5.1
TOTAL TAX REVENUES	**$206.1**	**$28.1**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-64 (Kings)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Lake County

Exhibit 7-65
Direct Activity of Oil and Gas Industry
Lake County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	124	0.1
Midstream	51	4.1
Downstream	2	0.0
Market	359	42.7
Total Direct Activity	**537**	**46.8**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-66
Economic Base in Lake County
(Employment by Industry)

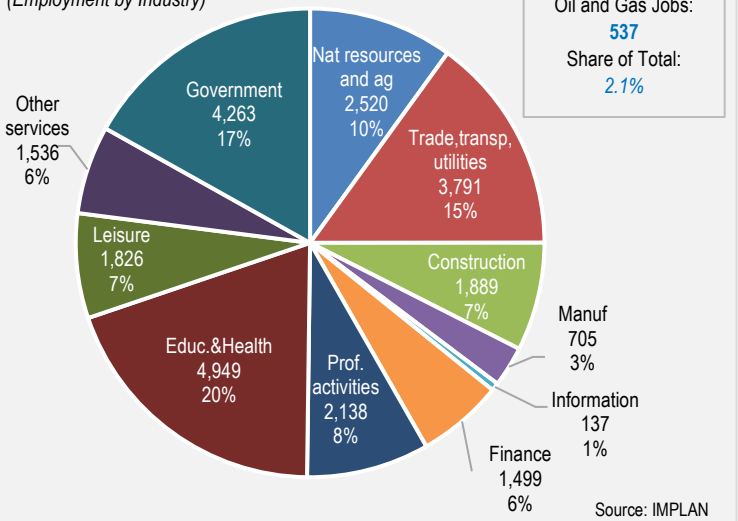


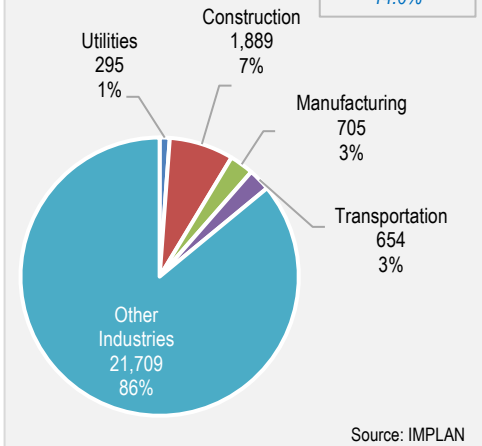
Exhibit 7-67
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Lake County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	537	46.8	254.4	489.0
Indirect	397	20.0	30.2	69.7
Induced	169	8.7	17.8	30.7
TOTAL CONTRIBUTION	**1,103**	**75.6**	**302.4**	**589.3**
Percent of County Total	*4.4%*	*5.8%*	*13.0%*	*13.7%*
Percent of Total CA Contribution	*0.2%*	*0.1%*	*0.2%*	*0.2%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$2.9	$8.4
Social insurance	0.4	9.6
Sales and excise taxes	62.0	2.3
Property taxes	48.3	0.0
Corporate profits taxes	4.0	4.0
Special Assessments	1.6	0.0
Other taxes	13.6	0.0
Fees, fines and permits	1.3	2.6
TOTAL TAX REVENUES	**$134.1**	**$26.8**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-68 (Lake)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Lassen County

Exhibit 7-69
Direct Activity of Oil and Gas Industry
Lassen County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	21	0.0
Midstream	0	0.0
Downstream	0	0.0
Market	71	2.9
Total Direct Activity	**92**	**2.9**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-70
Economic Base in Lassen County
(Employment by Industry)

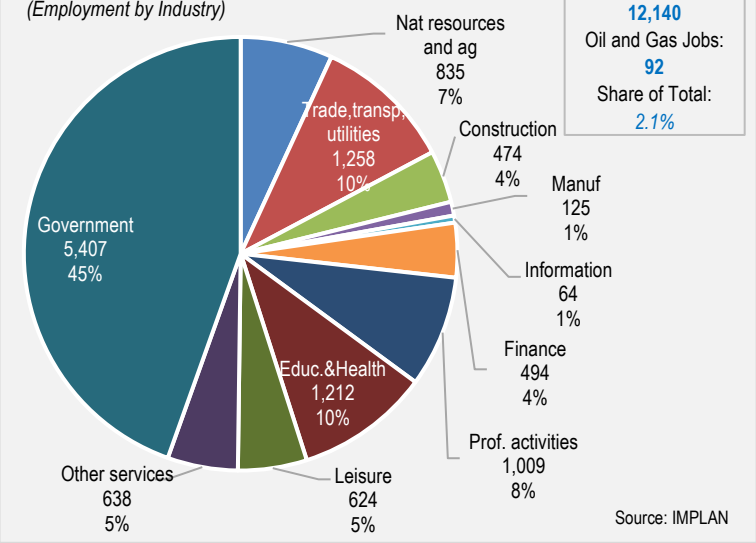


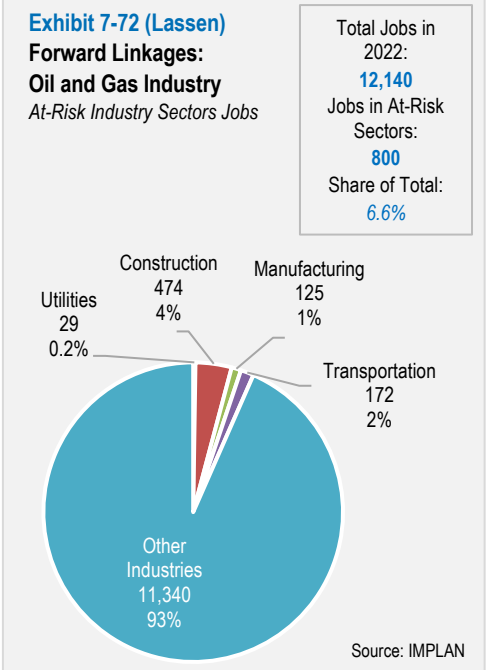
Exhibit 7-71
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Lake County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	92	2.9	11.1	31.0
Indirect	39	1.7	2.6	6.6
Induced	9	0.5	1.0	1.8
TOTAL CONTRIBUTION	**140**	**5.1**	**14.7**	**39.3**
Percent of County Total	*1.2%*	*0.6%*	*1.2%*	*2.2%*
Percent of Total CA Contribution	*0.0%*	*0.0%*	*0.0%*	*0.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$0.2	$0.5
Social insurance	0.0	0.5
Sales and excise taxes	2.7	0.1
Property taxes	1.8	0.0
Corporate profits taxes	0.2	0.2
Special Assessments	0.0	0.0
Other taxes	0.3	0.0
Fees, fines and permits	0.1	0.1
TOTAL TAX REVENUES	**$5.2**	**$1.3**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-72 (Lassen)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Los Angeles County

Exhibit 7-73
Direct Activity of Oil and Gas Industry
Los Angeles County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	4,143	237.9
Midstream	5,444	647.4
Downstream	4,921	1,395.4
Market	18,688	3,030.9
Total Direct Activity	**33,196**	**5,311.7**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-74
Economic Base in Los Angeles County
(Employment by Industry)

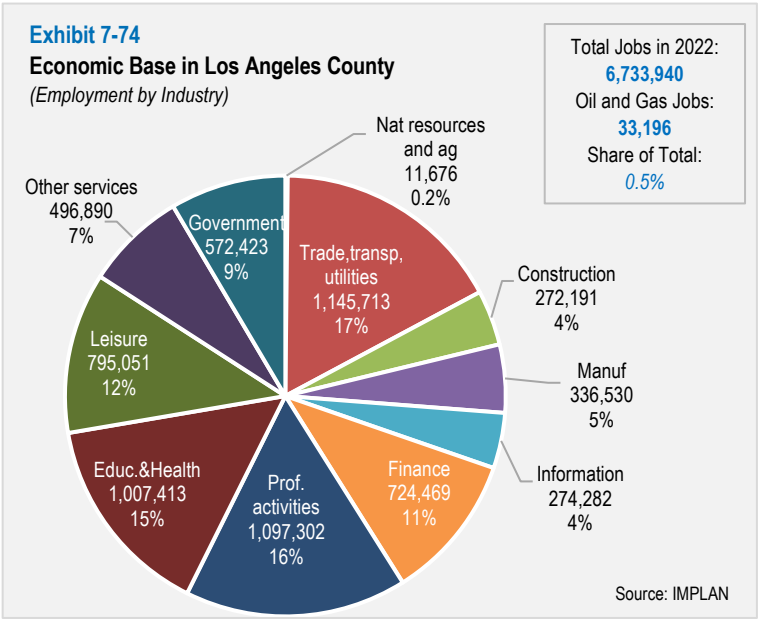


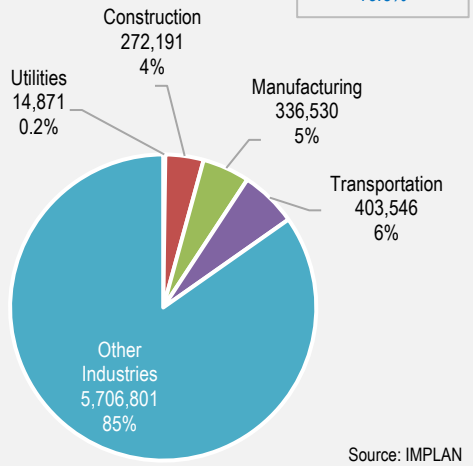
Exhibit 7-75
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Los Angeles County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	33,196	5,311.7	31,524.1	86,464.4
Indirect	69,747	6,292.1	9,473.9	16,029.8
Induced	48,547	3,513.9	6,141.5	9,769.4
TOTAL CONTRIBUTION	**151,490**	**15,117.7**	**47,139.5**	**112,263.6**
Percent of County Total	*2.2%*	*2.8%*	*5.2%*	*7.3%*
Percent of Total CA Contribution	*28.2%*	*28.3%*	*28.4%*	*33.2%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$655.3	$1,839.6
Social insurance	68.7	1,487.6
Sales and excise taxes	4,217.1	156.7
Property taxes	3,440.1	0.0
Corporate profits taxes	975.8	975.9
Special Assessments	105.0	0.0
Other taxes	661.5	0.0
Fees, fines and permits	94.0	174.6
TOTAL TAX REVENUES	**$10,217.4**	**$4,634.5**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-76 (Los Angeles)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Madera County

Exhibit 7-77
Direct Activity of Oil and Gas Industry
Madera County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	61	4.9
Midstream	77	4.9
Downstream	0	0.0
Market	679	87.7
Total Direct Activity	**816**	**97.5**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-78
Economic Base in Madera County
(Employment by Industry)

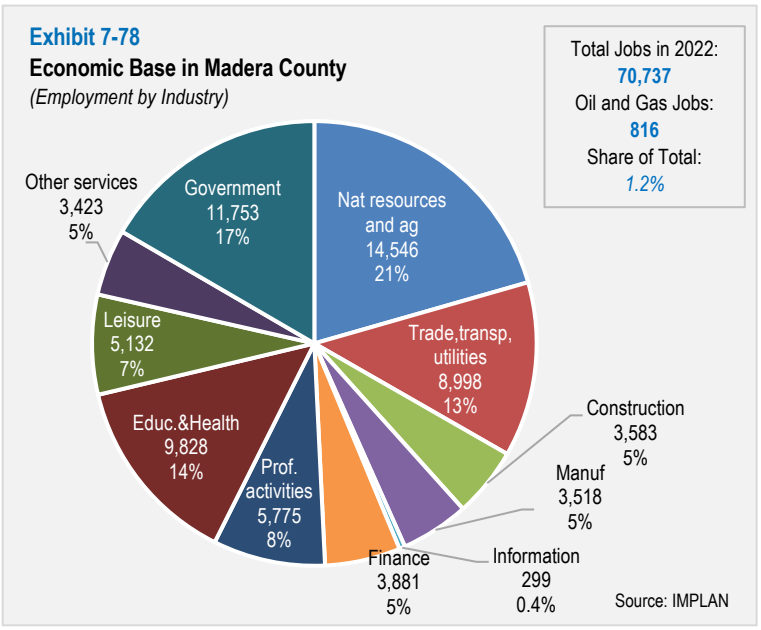


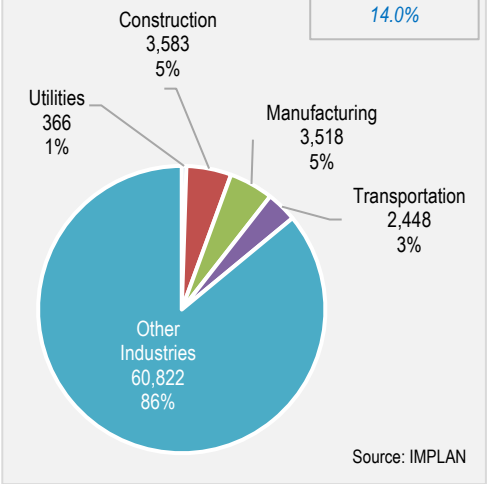
Exhibit 7-79
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Madera County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	816	97.5	530.7	781.3
Indirect	550	32.7	43.9	89.0
Induced	413	25.4	45.3	75.0
TOTAL CONTRIBUTION	**1,779**	**155.6**	**619.9**	**945.2**
Percent of County Total	*2.5%*	*3.3%*	*8.1%*	*7.2%*
Percent of Total CA Contribution	*0.3%*	*0.3%*	*0.4%*	*0.3%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$5.6	$16.0
Social insurance	0.7	16.6
Sales and excise taxes	136.3	6.2
Property taxes	100.4	0.0
Corporate profits taxes	7.5	7.5
Special Assessments	14.0	0.0
Other taxes	21.2	0.0
Fees, fines and permits	3.2	6.9
TOTAL TAX REVENUES	**$289.0**	**$53.1**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-80 (Madera)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Marin County

Exhibit 7-81
Direct Activity of Oil and Gas Industry
Marin County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	205	0.7
Midstream	29	4.0
Downstream	0	0.0
Market	604	130.4
Total Direct Activity	**838**	**135.1**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-82
Economic Base in Marin County
(Employment by Industry)

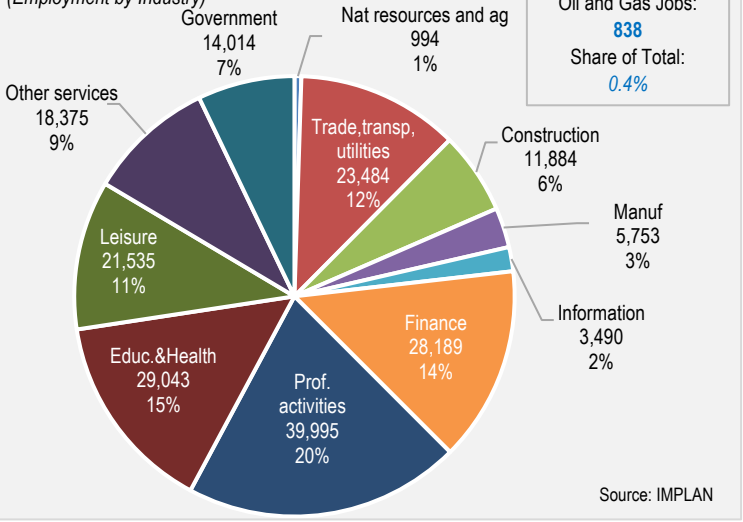


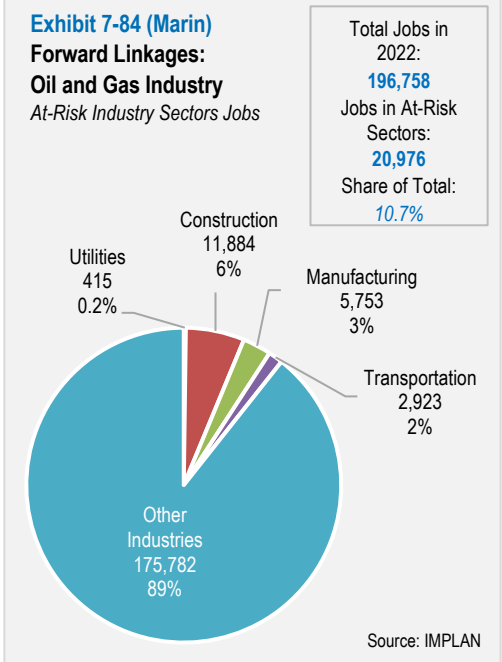
Exhibit 7-83
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Marin County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	838	135.1	420.9	788.2
Indirect	1,213	136.6	183.6	285.5
Induced	691	55.5	96.9	144.8
TOTAL CONTRIBUTION	**2,742**	**327.2**	**701.4**	**1,218.5**
Percent of County Total	*1.4%*	*1.8%*	*2.4%*	*2.8%*
Percent of Total CA Contribution	*0.5%*	*0.6%*	*0.4%*	*0.4%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$12.5	$35.6
Social insurance	1.2	30.7
Sales and excise taxes	57.6	1.9
Property taxes	68.8	0.0
Corporate profits taxes	4.4	4.4
Special Assessments	3.3	0.0
Other taxes	18.3	0.0
Fees, fines and permits	2.5	2.1
TOTAL TAX REVENUES	**$168.5**	**$74.7**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-84 (Marin)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Mariposa County

Exhibit 7-85
Direct Activity of Oil and Gas Industry
Mariposa County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	28	0.1
Midstream	1	0.0
Downstream	0	0.0
Market	46	6.8
Total Direct Activity	**75**	**7.0**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-86
Economic Base in Mariposa County
(Employment by Industry)

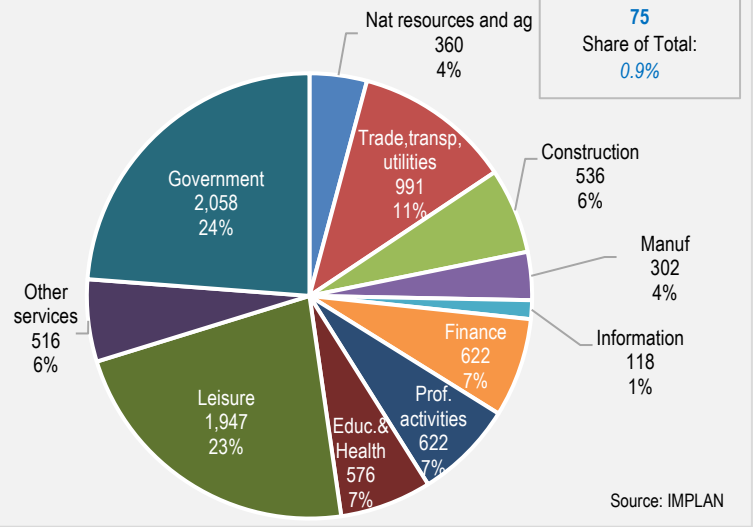


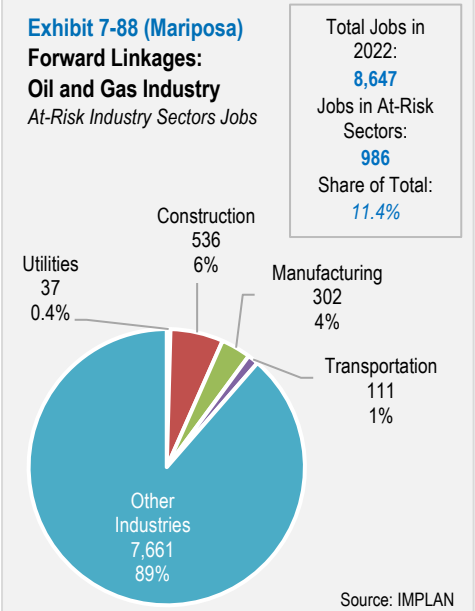
Exhibit 7-87
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Mariposa County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	75	7.0	16.6	50.9
Indirect	72	2.8	4.0	10.8
Induced	25	1.0	2.6	4.4
TOTAL CONTRIBUTION	**172**	**10.8**	**23.2**	**66.1**
Percent of County Total	*2.0%*	*2.4%*	*3.0%*	*4.8%*
Percent of Total CA Contribution	*0.0%*	*0.0%*	*0.0%*	*0.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	-$1.6	$1.6
Social insurance	-1.0	1.0
Sales and excise taxes	-0.1	0.1
Property taxes	0.0	0.0
Corporate profits taxes	-0.2	0.2
Special Assessments	0.0	0.0
Other taxes	0.0	0.0
Fees, fines and permits	-0.1	0.1
TOTAL TAX REVENUES	**-$3.0**	**$3.0**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-88 (Mariposa)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Mendocino County

Exhibit 7-89
Direct Activity of Oil and Gas Industry
Mendocino County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	27	0.0
Midstream	89	7.7
Downstream	2	0.3
Market	436	58.1
Total Direct Activity	**554**	**66.2**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-90
Economic Base in Mendocino County
(Employment by Industry)

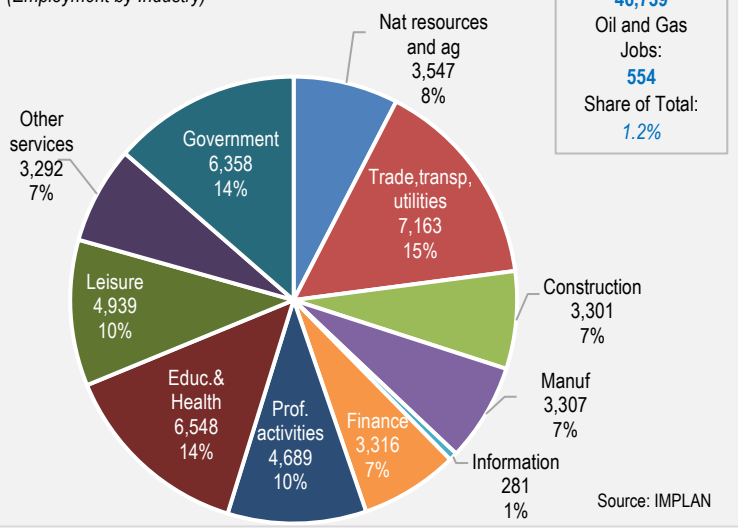


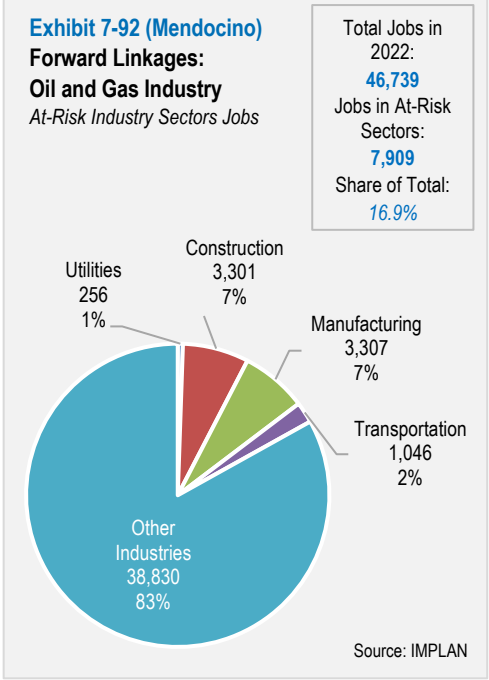
Exhibit 7-91
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Mendocino County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	554	66.2	470.4	667.6
Indirect	456	27.3	41.5	82.2
Induced	299	16.9	31.9	52.7
TOTAL CONTRIBUTION	**1,309**	**110.4**	**543.7**	**802.4**
Percent of County Total	*2.8%*	*4.0%*	*11.0%*	*9.6%*
Percent of Total CA Contribution	*0.2%*	*0.2%*	*0.3%*	*0.2%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$4.9	$14.0
Social insurance	0.5	12.7
Sales and excise taxes	169.0	7.6
Property taxes	102.7	0.0
Corporate profits taxes	4.8	4.8
Special Assessments	3.8	0.0
Other taxes	19.0	0.0
Fees, fines and permits	2.5	8.5
TOTAL TAX REVENUES	**$307.1**	**$47.6**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-92 (Mendocino)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Merced County

Exhibit 7-93
Direct Activity of Oil and Gas Industry
Merced County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	147	0.1
Midstream	79	5.1
Downstream	2	0.0
Market	768	58.3
Total Direct Activity	**995**	**63.5**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-94
Economic Base in Merced County
(Employment by Industry)

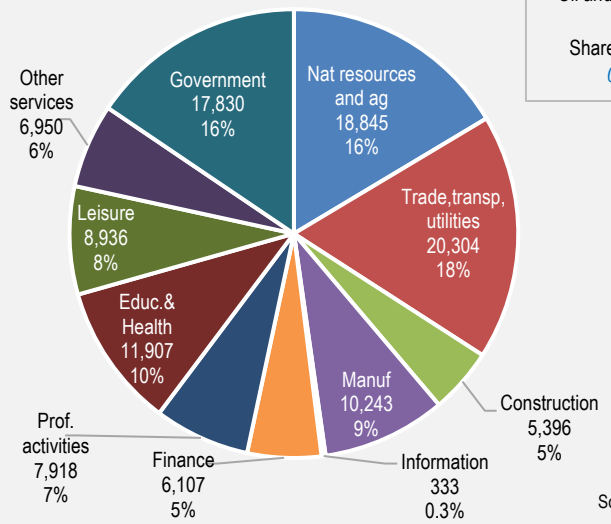


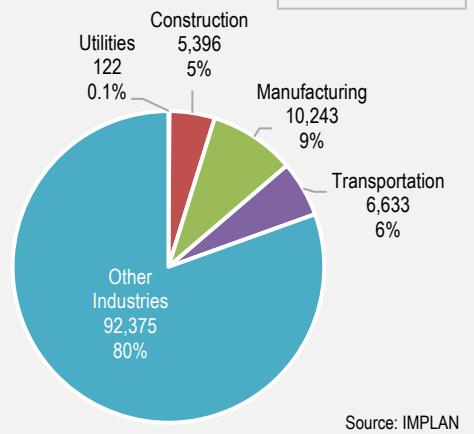
Exhibit 7-95
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Merced County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	995	63.5	417.5	673.5
Indirect	718	41.6	58.3	118.3
Induced	384	19.7	37.2	63.3
TOTAL CONTRIBUTION	**2,097**	**124.8**	**513.1**	**855.1**
Percent of County Total	*1.8%*	*1.8%*	*4.5%*	*3.8%*
Percent of Total CA Contribution	*0.4%*	*0.2%*	*0.3%*	*0.3%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$5.6	$16.2
Social insurance	0.5	12.4
Sales and excise taxes	150.3	6.5
Property taxes	103.9	0.0
Corporate profits taxes	3.4	3.4
Special Assessments	13.5	0.0
Other taxes	21.6	0.0
Fees, fines and permits	3.5	7.2
TOTAL TAX REVENUES	**$302.2**	**$45.7**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-96 (Merced)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Modoc County

Exhibit 7-97
Direct Activity of Oil and Gas Industry
Modoc County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	10	0.0
Midstream	17	2.1
Downstream	0	0.0
Market	30	2.0
Total Direct Activity	**57**	**4.1**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-98
Economic Base in Modoc County
(Employment by Industry)

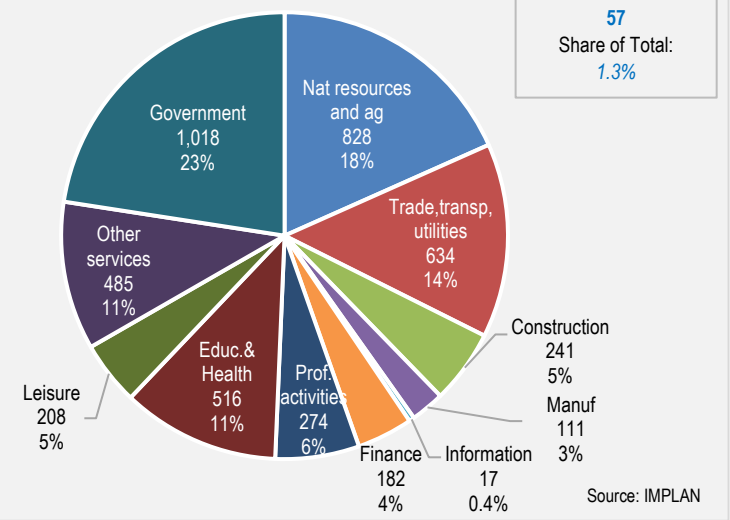


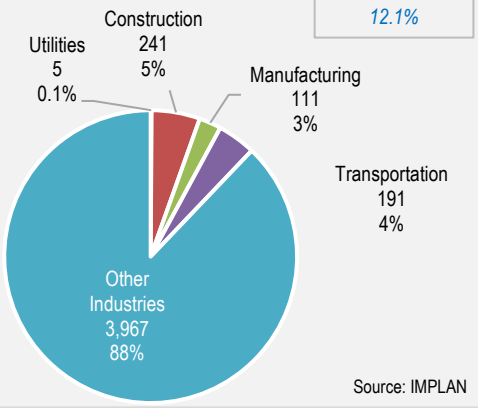
Exhibit 7-99
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Modoc County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	57	4.1	60.9	75.9
Indirect	30	1.3	1.9	4.4
Induced	9	0.4	0.9	1.6
TOTAL CONTRIBUTION	**96**	**5.7**	**63.6**	**81.9**
Percent of County Total	*2.1%*	*2.3%*	*14.1%*	*10.9%*
Percent of Total CA Contribution	*0.0%*	*0.0%*	*0.0%*	*0.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$0.3	$0.8
Social insurance	0.0	0.7
Sales and excise taxes	20.5	2.0
Property taxes	20.3	0.0
Corporate profits taxes	0.2	0.2
Special Assessments	5.2	0.0
Other taxes	3.0	0.0
Fees, fines and permits	0.6	2.2
TOTAL TAX REVENUES	**$50.1**	**$5.8**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-100 (Modoc)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Mono County

Exhibit 7-101
Direct Activity of Oil and Gas Industry
Mono County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	26	2.5
Midstream	0	0.0
Downstream	0	0.0
Market	73	6.0
Total Direct Activity	**100**	**8.4**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-102
Economic Base in Mono County
(Employment by Industry)

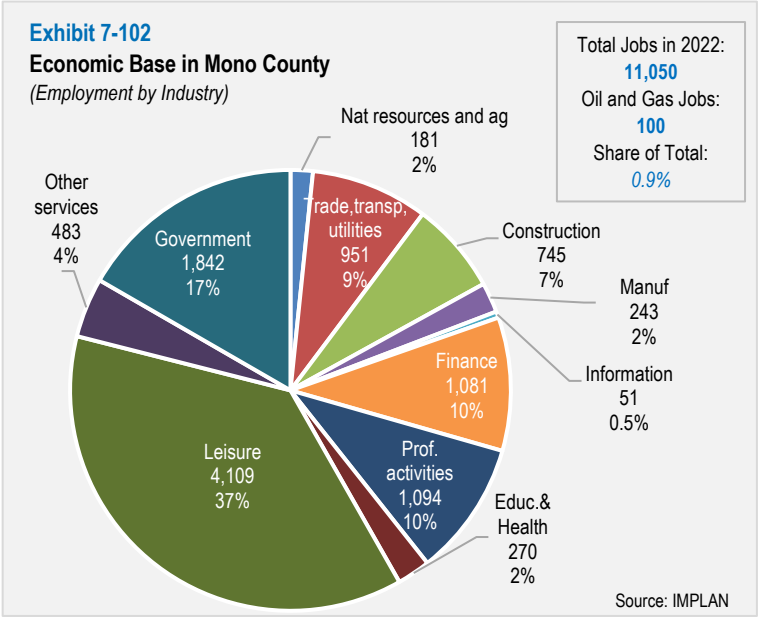


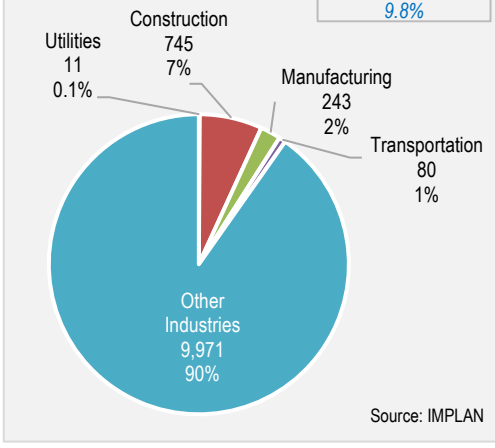
Exhibit 7-103
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Mono County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	100	8.4	24.8	49.6
Indirect	47	2.1	3.3	8.0
Induced	20	1.0	2.4	3.9
TOTAL CONTRIBUTION	**167**	**11.5**	**30.5**	**61.5**
Percent of County Total	*1.5%*	*1.8%*	*2.7%*	*3.3%*
Percent of Total CA Contribution	*0.0%*	*0.0%*	*0.0%*	*0.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$0.5	$1.3
Social insurance	0.0	1.2
Sales and excise taxes	2.6	0.1
Property taxes	2.9	0.0
Corporate profits taxes	0.6	0.6
Special Assessments	0.0	0.0
Other taxes	0.2	0.0
Fees, fines and permits	0.0	0.1
TOTAL TAX REVENUES	**$6.9**	**$3.2**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-104 (Mono)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Monterey County

Exhibit 7-105
Direct Activity of Oil and Gas Industry
Monterey County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	205	28.8
Midstream	122	19.1
Downstream	28	5.2
Market	706	78.8
Total Direct Activity	**1,060**	**131.9**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-106
Economic Base in Monterey County
(Employment by Industry)

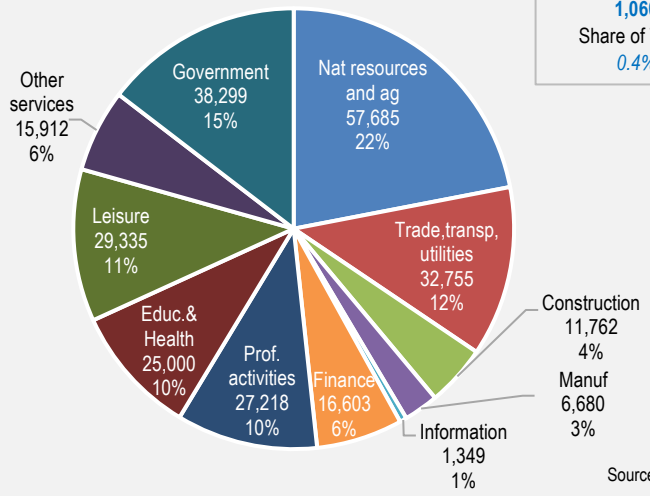


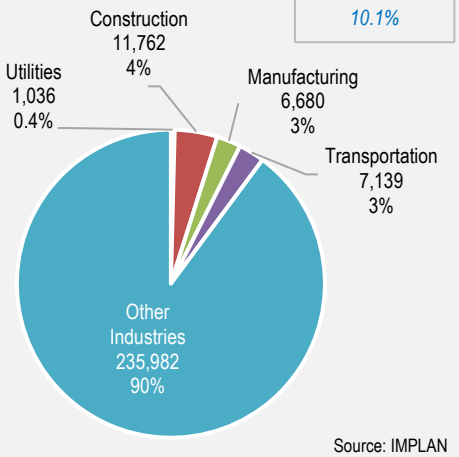
Exhibit 7-107
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Monterey County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	1,060	131.9	775.7	1,305.6
Indirect	1,008	76.7	109.6	196.7
Induced	685	45.0	79.1	124.8
TOTAL CONTRIBUTION	**2,753**	**253.7**	**964.4**	**1,627.1**
Percent of County Total	*1.0%*	*1.3%*	*3.2%*	*3.6%*
Percent of Total CA Contribution	*0.5%*	*0.5%*	*0.6%*	*0.5%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$11.3	$32.1
Social insurance	1.0	25.4
Sales and excise taxes	220.8	8.2
Property taxes	167.3	0.0
Corporate profits taxes	10.9	10.9
Special Assessments	9.0	0.0
Other taxes	30.8	0.0
Fees, fines and permits	4.7	9.2
TOTAL TAX REVENUES	**$455.8**	**$85.9**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-108 (Monterey)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Napa County

Exhibit 7-109
Direct Activity of Oil and Gas Industry
Napa County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	316	0.4
Midstream	94	9.5
Downstream	2	0.0
Market	294	46.7
Total Direct Activity	**707**	**56.6**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-110
Economic Base in Napa County
(Employment by Industry)

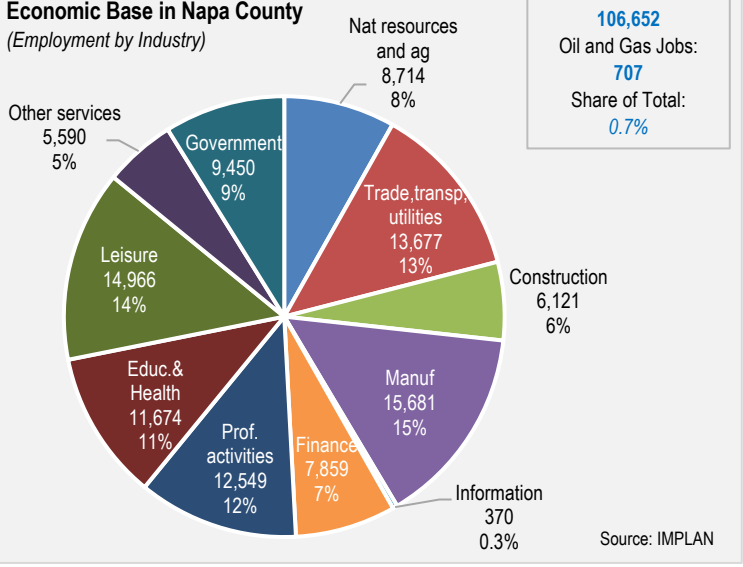


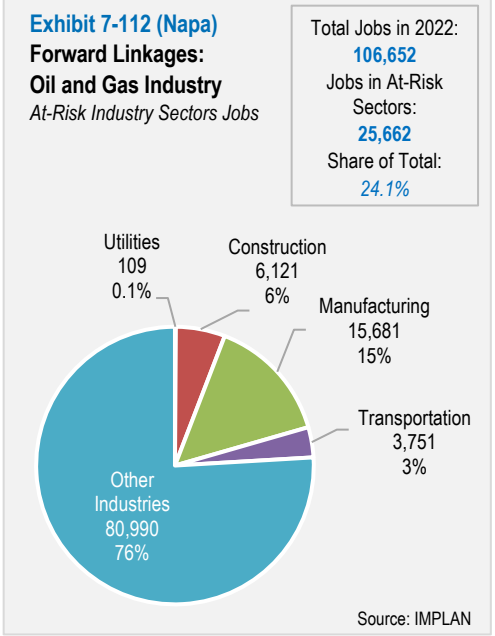
Exhibit 7-111
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Napa County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	707	56.6	220.8	547.5
Indirect	1,102	88.1	121.4	205.2
Induced	501	32.8	60.7	92.1
TOTAL CONTRIBUTION	**2,309**	**177.5**	**402.9**	**844.8**
Percent of County Total	*2.2%*	*2.2%*	*3.1%*	*3.8%*
Percent of Total CA Contribution	*0.4%*	*0.3%*	*0.2%*	*0.2%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$7.0	$19.9
Social insurance	0.7	17.8
Sales and excise taxes	42.8	2.2
Property taxes	54.6	0.0
Corporate profits taxes	3.6	3.6
Special Assessments	3.8	0.0
Other taxes	8.7	0.0
Fees, fines and permits	1.2	2.4
TOTAL TAX REVENUES	**$122.4**	**$45.9**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-112 (Napa)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Nevada County

Exhibit 7-113
Direct Activity of Oil and Gas Industry
Nevada County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	97	0.8
Midstream	83	2.1
Downstream	0	0.0
Market	369	41.5
Total Direct Activity	**549**	**44.3**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-114
Economic Base in Nevada County
(Employment by Industry)

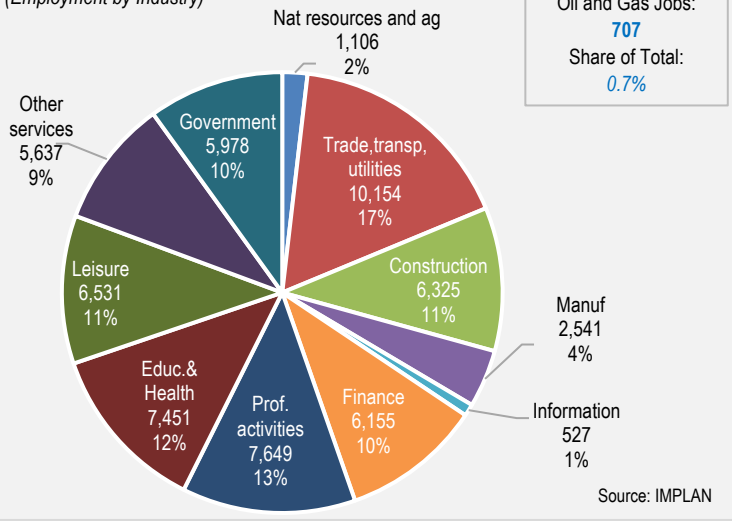


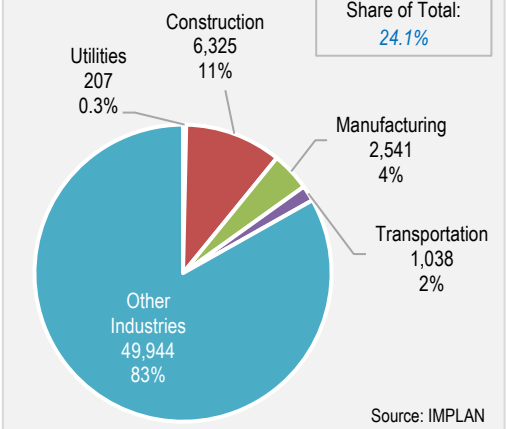
Exhibit 7-115
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Nevada County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	549	44.3	375.1	598.2
Indirect	778	38.4	57.0	120.8
Induced	415	20.1	38.6	68.0
TOTAL CONTRIBUTION	**1,742**	**102.8**	**470.6**	**787.0**
Percent of County Total	*2.9%*	*3.3%*	*8.5%*	*7.6%*
Percent of Total CA Contribution	*0.3%*	*0.2%*	*0.3%*	*0.2%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$4.3	$12.5
Social insurance	0.4	10.6
Sales and excise taxes	134.3	7.4
Property taxes	121.6	0.0
Corporate profits taxes	1.8	1.8
Special Assessments	6.9	0.0
Other taxes	18.2	0.0
Fees, fines and permits	3.0	8.2
TOTAL TAX REVENUES	**$290.4**	**$40.6**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-116 (Nevada)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Orange County

Exhibit 7-117
Direct Activity of Oil and Gas Industry
Orange County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	1,810	63.8
Midstream	2,299	265.9
Downstream	94	17.3
Market	5,692	1,624.4
Total Direct Activity	**9,895**	**1,971.4**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-118
Economic Base in Orange County
(Employment by Industry)

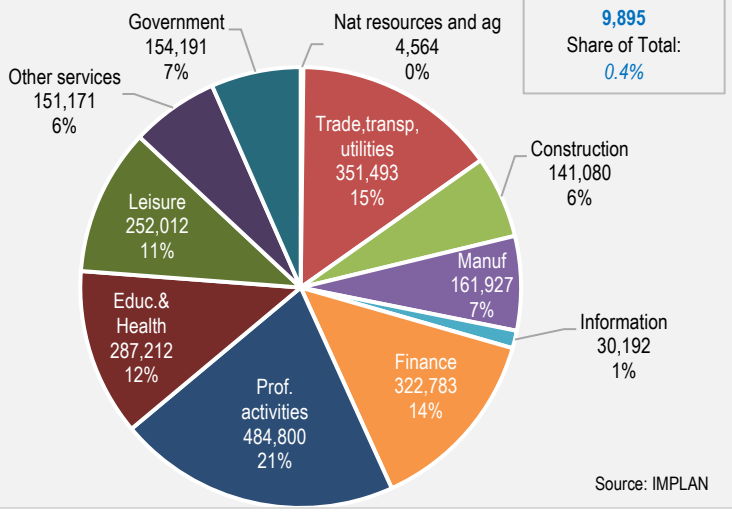


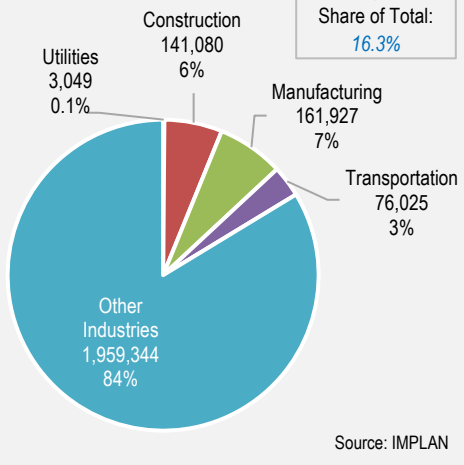
Exhibit 7-119
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Orange County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	9,895	1,971.4	6,937.8	10,760.1
Indirect	17,055	1,667.4	2,434.2	3,902.2
Induced	17,689	1,285.9	2,248.7	3,550.6
TOTAL CONTRIBUTION	**44,639**	**4,924.6**	**11,620.7**	**18,213.0**
Percent of County Total	*1.9%*	*2.6%*	*3.7%*	*3.5%*
Percent of Total CA Contribution	*8.3%*	*9.2%*	*7.0%*	*5.4%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$207.7	$592.8
Social insurance	17.8	445.4
Sales and excise taxes	1,903.2	90.0
Property taxes	1,678.1	0.0
Corporate profits taxes	103.2	103.3
Special Assessments	31.6	0.0
Other taxes	268.9	0.0
Fees, fines and permits	48.6	100.2
TOTAL TAX REVENUES	**$4,259.2**	**$1,331.6**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-120 (Orange)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Placer County

Exhibit 7-121
Direct Activity of Oil and Gas Industry
Placer County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	298	16.4
Midstream	285	33.6
Downstream	0	0.0
Market	2,256	479.3
Total Direct Activity	**2,839**	**529.3**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-122
Economic Base in Placer County
(Employment by Industry)

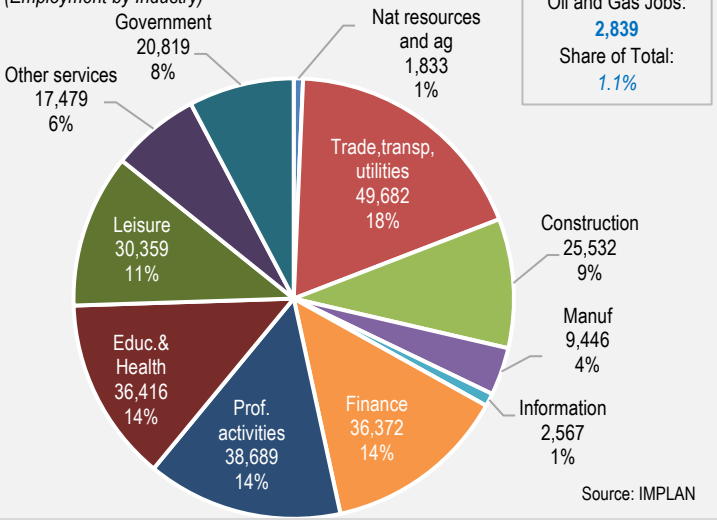


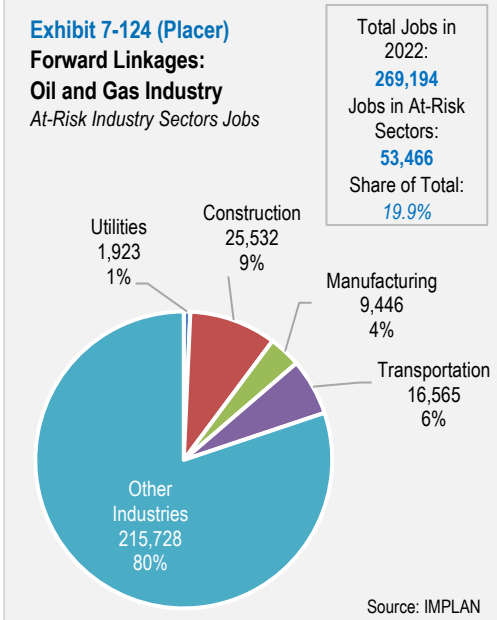
Exhibit 7-123
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Placer County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	2,839	529.3	2,279.4	3,651.3
Indirect	4,538	360.8	558.4	945.8
Induced	3,297	215.7	381.3	631.8
TOTAL CONTRIBUTION	**10,674**	**1,105.8**	**3,219.1**	**5,228.9**
Percent of County Total	*4.0%*	*5.8%*	*10.0%*	*9.4%*
Percent of Total CA Contribution	*2.0%*	*2.1%*	*1.9%*	*1.5%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$37.3	$106.3
Social insurance	5.3	120.9
Sales and excise taxes	424.8	17.5
Property taxes	384.4	0.0
Corporate profits taxes	48.0	48.0
Special Assessments	45.1	0.0
Other taxes	63.9	0.0
Fees, fines and permits	9.6	19.5
TOTAL TAX REVENUES	**$1,018.4**	**$312.3**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-124 (Placer)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Plumas County

Exhibit 7-125
Direct Activity of Oil and Gas Industry
Plumas County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	18	0.0
Midstream	8	0.3
Downstream	0	0.0
Market	79	5.9
Total Direct Activity	**105**	**6.3**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-126
Economic Base in Plumas County
(Employment by Industry)

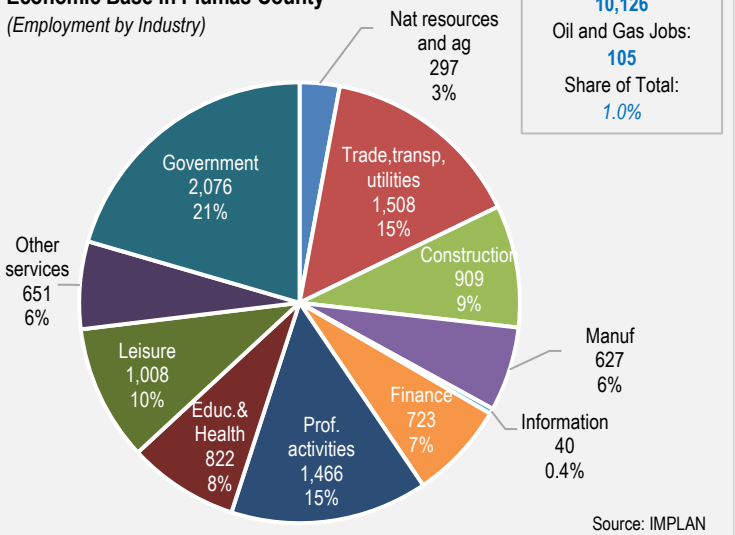


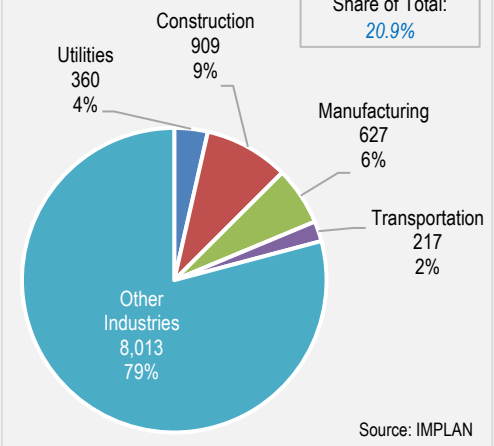
Exhibit 7-127
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Plumas County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	105	6.3	39.5	60.9
Indirect	78	2.7	4.1	11.7
Induced	20	0.8	1.9	3.3
TOTAL CONTRIBUTION	**203**	**9.8**	**45.6**	**75.9**
Percent of County Total	*2.0%*	*1.6%*	*4.2%*	*3.9%*
Percent of Total CA Contribution	*0.0%*	*0.0%*	*0.0%*	*0.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$0.4	$1.3
Social insurance	0.0	0.9
Sales and excise taxes	11.0	0.7
Property taxes	15.1	0.0
Corporate profits taxes	0.2	0.2
Special Assessments	0.4	0.0
Other taxes	2.0	0.0
Fees, fines and permits	0.3	0.8
TOTAL TAX REVENUES	**$29.4**	**$3.8**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-128 (Plumas)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Riverside County

Exhibit 7-129
Direct Activity of Oil and Gas Industry
Riverside County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	879	50.0
Midstream	1,174	97.2
Downstream	97	15.5
Market	4,504	409.4
Total Direct Activity	**6,654**	**572.1**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-130
Economic Base in Riverside County
(Employment by Industry)

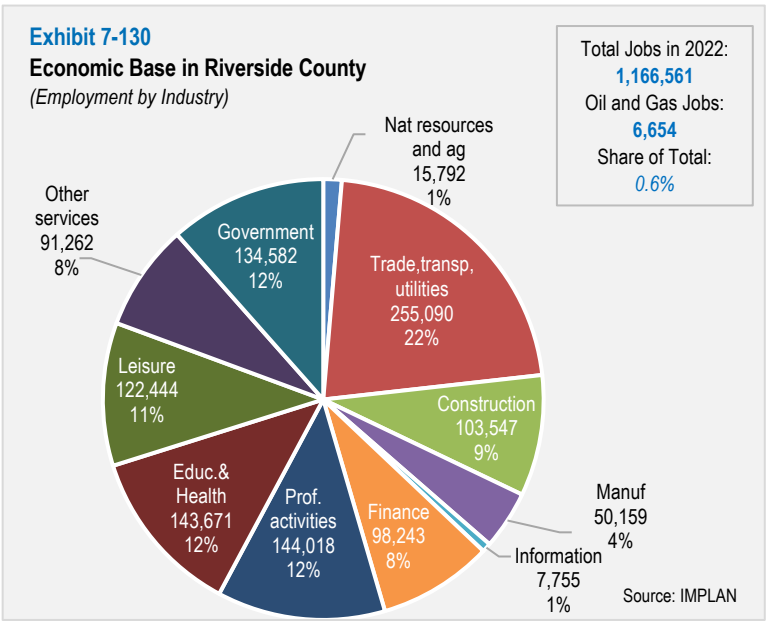


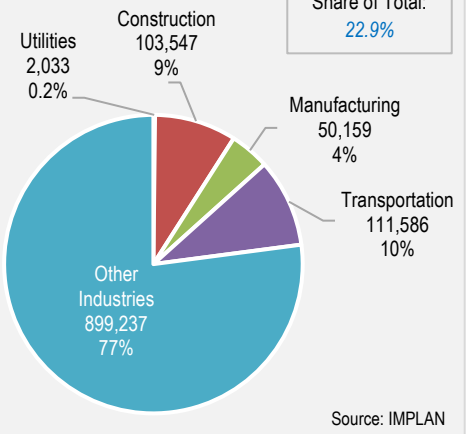
Exhibit 7-131
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Riverside County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	6,654	572.1	2,457.8	4,711.4
Indirect	7,971	459.7	669.9	1,323.7
Induced	6,593	342.2	617.4	1,071.4
TOTAL CONTRIBUTION	**21,218**	**1,374.0**	**3,745.2**	**7,106.4**
Percent of County Total	*1.8%*	*2.0%*	*3.4%*	*3.6%*
Percent of Total CA Contribution	*4.0%*	*2.6%*	*2.3%*	*2.1%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$57.2	$165.4
Social insurance	5.7	139.2
Sales and excise taxes	751.1	21.7
Property taxes	518.3	0.0
Corporate profits taxes	37.7	37.7
Special Assessments	29.5	0.0
Other taxes	87.2	0.0
Fees, fines and permits	14.7	24.2
TOTAL TAX REVENUES	**$1,501.3**	**$388.3**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-132 (Riverside)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Sacramento County

Exhibit 7-133
Direct Activity of Oil and Gas Industry
Sacramento County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	325	6.1
Midstream	1,352	175.7
Downstream	108	15.7
Market	3,290	471.8
Total Direct Activity	**5,074**	**669.3**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-134
Economic Base in Sacramento County
(Employment by Industry)

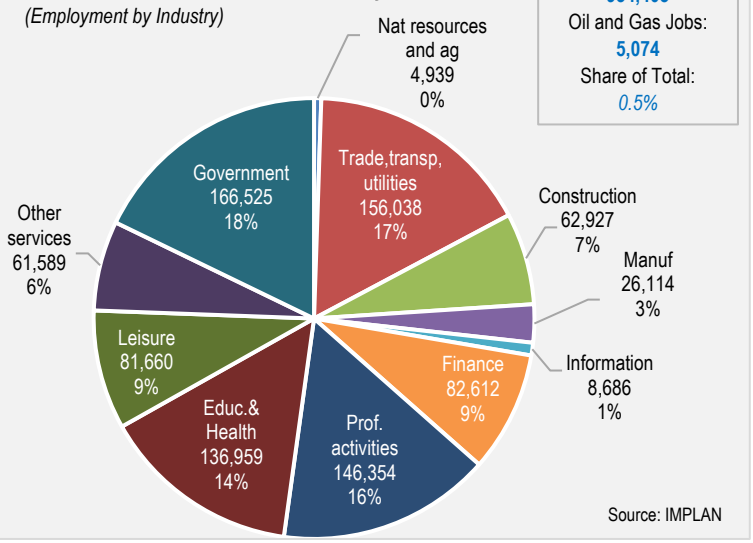


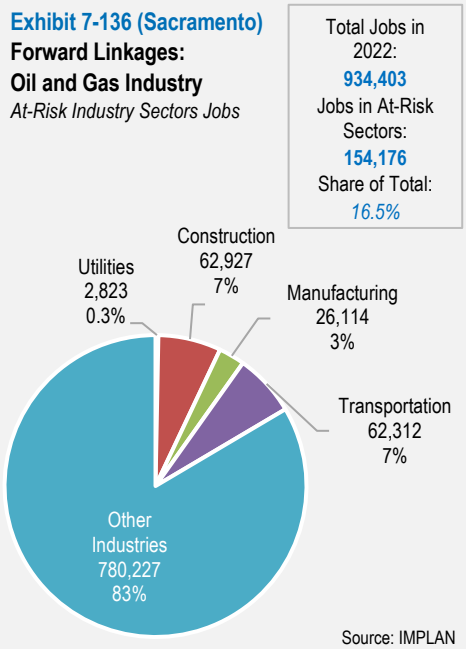
Exhibit 7-135
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Sacramento County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	5,074	669.3	3,681.5	5,884.0
Indirect	6,909	541.7	810.6	1,410.8
Induced	5,226	349.7	613.5	995.1
TOTAL CONTRIBUTION	**17,209**	**1,560.7**	**5,105.6**	**8,289.9**
Percent of County Total	*1.8%*	*2.1%*	*4.5%*	*4.6%*
Percent of Total CA Contribution	*3.2%*	*2.9%*	*3.1%*	*2.5%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$57.9	$165.3
Social insurance	7.4	152.4
Sales and excise taxes	1,023.0	41.5
Property taxes	694.5	0.0
Corporate profits taxes	62.3	62.3
Special Assessments	61.7	0.0
Other taxes	160.8	0.0
Fees, fines and permits	23.1	46.2
TOTAL TAX REVENUES	**$2,090.8**	**$467.7**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-136 (Sacramento)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



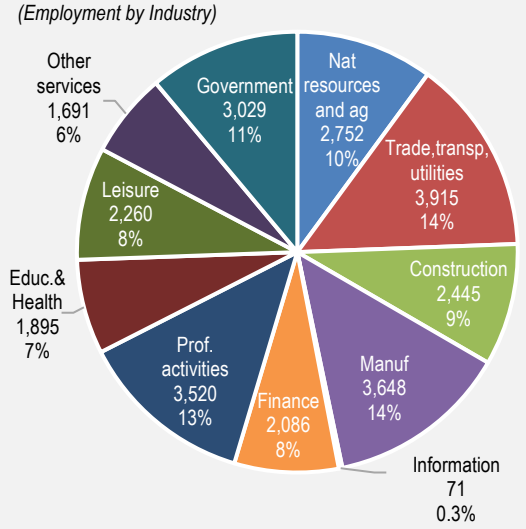
San Benito County

Exhibit 7-137
Direct Activity of Oil and Gas Industry
San Benito County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	21	0.0
Midstream	4	0.3
Downstream	0	0.0
Market	97	13.1
Total Direct Activity	**122**	**13.4**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-138
Economic Base in San Benito County
(Employment by Industry)



Total Jobs in 2022: **27,311**
Oil and Gas Jobs: **122**
Share of Total: *0.4%*

Source: IMPLAN

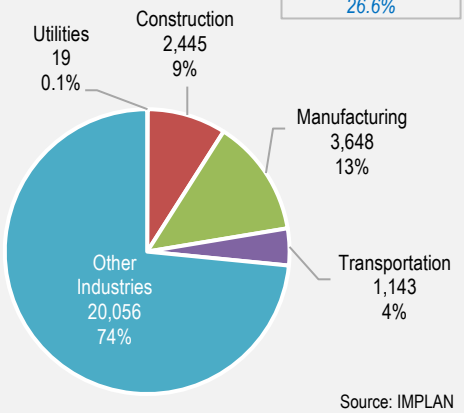
Exhibit 7-139
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
San Benito County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	122	13.4	39.5	72.3
Indirect	80	4.2	6.3	13.3
Induced	49	2.1	5.4	8.7
TOTAL CONTRIBUTION	**251**	**19.7**	**51.2**	**94.3**
Percent of County Total	*0.9%*	*1.2%*	*1.8%*	*1.6%*
Percent of Total CA Contribution	*0.0%*	*0.0%*	*0.0%*	*0.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$0.9	$2.6
Social insurance	0.1	1.8
Sales and excise taxes	7.0	0.3
Property taxes	8.5	0.0
Corporate profits taxes	0.5	0.5
Special Assessments	0.7	0.0
Other taxes	1.9	0.0
Fees, fines and permits	0.3	0.4
TOTAL TAX REVENUES	**$19.8**	**$5.5**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-140 (San Benito)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Total Jobs in 2022: **27,311**
Jobs in At-Risk Sectors: **7,255**
Share of Total: *26.6%*

Source: IMPLAN

San Bernardino County

Exhibit 7-141
Direct Activity of Oil and Gas Industry
San Bernardino County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	506	21.5
Midstream	1,204	132.1
Downstream	38	9.9
Market	5,806	530.5
Total Direct Activity	**7,553**	**694.0**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-142
Economic Base in San Bernardino County
(Employment by Industry)

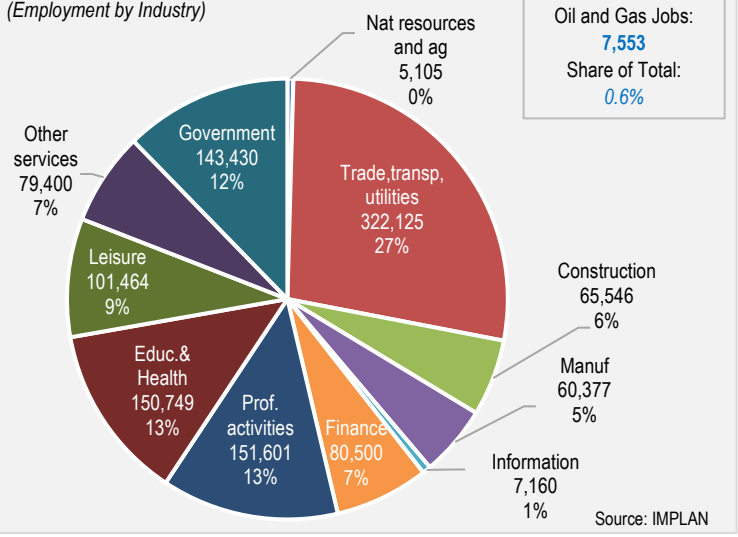


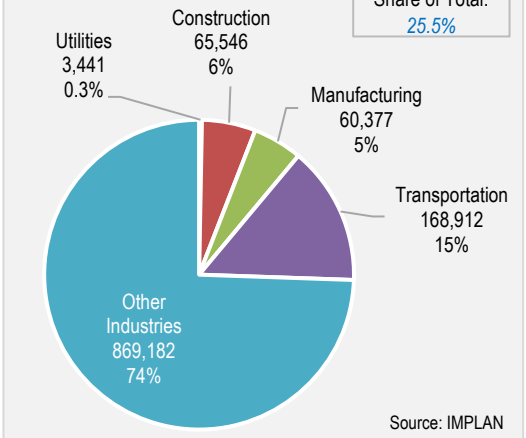
Exhibit 7-143
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
San Bernardino County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	7,553	694.0	3,392.0	5,571.6
Indirect	7,294	444.3	666.9	1,250.6
Induced	5,580	312.6	590.2	952.2
TOTAL CONTRIBUTION	**20,428**	**1,450.9**	**4,649.2**	**7,774.4**
Percent of County Total	*1.7%*	*1.9%*	*3.7%*	*3.5%*
Percent of Total CA Contribution	*3.8%*	*2.7%*	*2.8%*	*2.3%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$55.4	$158.6
Social insurance	6.7	151.5
Sales and excise taxes	992.8	37.1
Property taxes	684.5	0.0
Corporate profits taxes	50.9	50.9
Special Assessments	59.1	0.0
Other taxes	137.4	0.0
Fees, fines and permits	18.1	41.4
TOTAL TAX REVENUES	**$2,004.7**	**$439.6**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-144 (San Bernardino)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



San Diego County

Exhibit 7-145
Direct Activity of Oil and Gas Industry
San Diego County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	993	6.5
Midstream	840	122.0
Downstream	125	15.8
Market	11,180	2,210.6
Total Direct Activity	**13,139**	**2,354.9**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-146
Economic Base in San Diego County
(Employment by Industry)

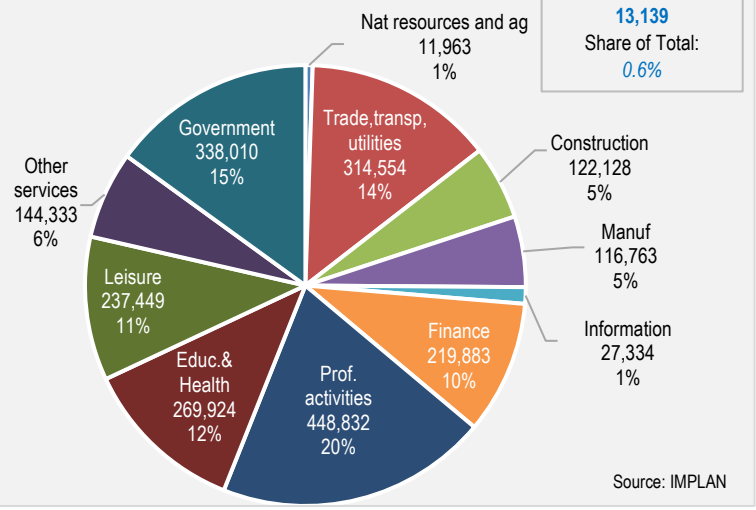


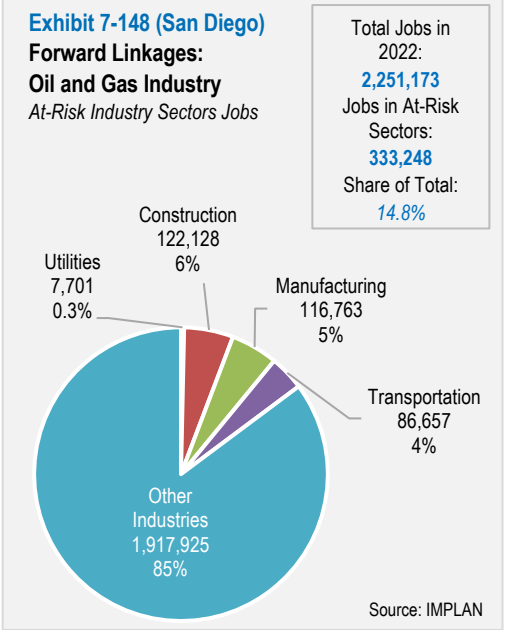
Exhibit 7-147
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
San Diego County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	13,139	2,354.9	8,930.9	15,254.0
Indirect	20,159	1,702.9	2,598.7	4,263.0
Induced	16,783	1,105.5	1,989.1	3,216.5
TOTAL CONTRIBUTION	**50,080**	**5,163.3**	**13,518.7**	**22,733.5**
Percent of County Total	*2.2%*	*2.8%*	*4.4%*	*4.6%*
Percent of Total CA Contribution	*9.3%*	*9.7%*	*8.1%*	*6.7%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$228.1	$640.4
Social insurance	25.1	521.3
Sales and excise taxes	1,400.9	54.2
Property taxes	1,308.3	0.0
Corporate profits taxes	220.1	220.2
Special Assessments	32.3	0.0
Other taxes	181.7	0.0
Fees, fines and permits	36.2	60.4
TOTAL TAX REVENUES	**$3,432.6**	**$1,496.4**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-148 (San Diego)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



San Francisco County

Exhibit 7-149
Direct Activity of Oil and Gas Industry
San Francisco County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	15	4.8
Midstream	81	11.2
Downstream	17	5.9
Market	624	184.1
Total Direct Activity	**737**	**206.0**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-150
Economic Base in San Francisco County
(Employment by Industry)

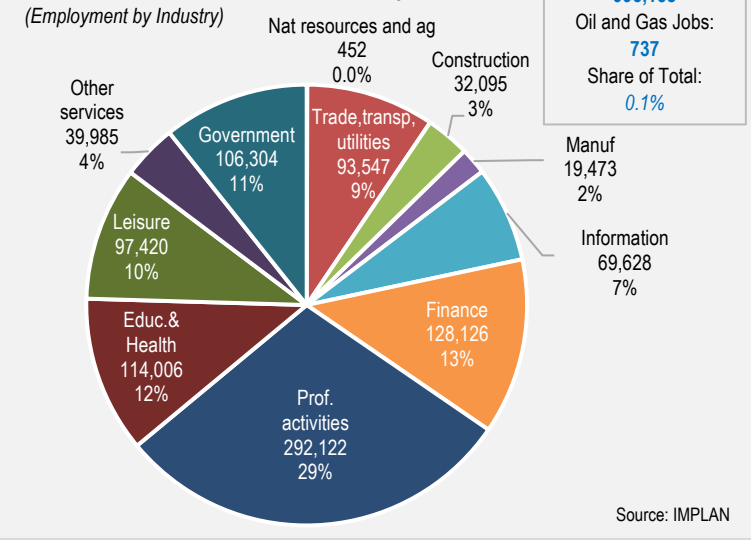


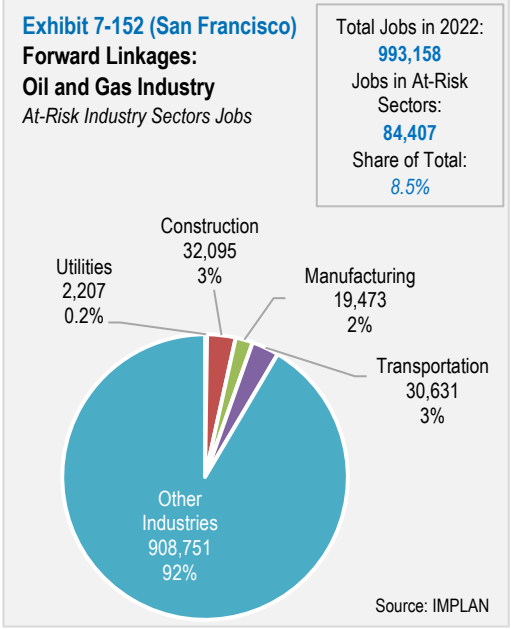
Exhibit 7-151
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
San Francisco County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	737	206.0	368.2	625.6
Indirect	1,323	224.7	371.1	529.0
Induced	1,484	173.5	307.4	427.2
TOTAL CONTRIBUTION	**3,544**	**604.2**	**1,046.7**	**1,581.8**
Percent of County Total	*0.4%*	*0.4%*	*0.4%*	*0.4%*
Percent of Total CA Contribution	*0.7%*	*1.1%*	*0.6%*	*0.5%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	-$17.2	$17.1
Social insurance	-2.2	2.1
Sales and excise taxes	-15.6	14.9
Property taxes	-0.9	0.0
Corporate profits taxes	-14.8	14.8
Special Assessments	0.0	0.0
Other taxes	-2.3	0.0
Fees, fines and permits	-0.6	0.6
TOTAL TAX REVENUES	**-$53.5**	**$49.5**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-152 (San Francisco)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



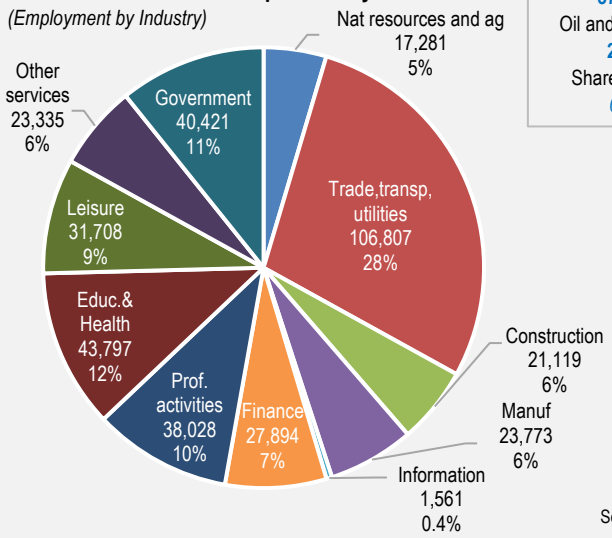
San Joaquin County

Exhibit 7-153
Direct Activity of Oil and Gas Industry
San Joaquin County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	101	5.4
Midstream	437	56.8
Downstream	0	0.0
Market	1,626	186.9
Total Direct Activity	**2,165**	**249.1**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-154
Economic Base in San Joaquin County
(Employment by Industry)



Total Jobs in 2022: **375,725**
Oil and Gas Jobs: **2,165**
Share of Total: *0.6%*

Source: IMPLAN

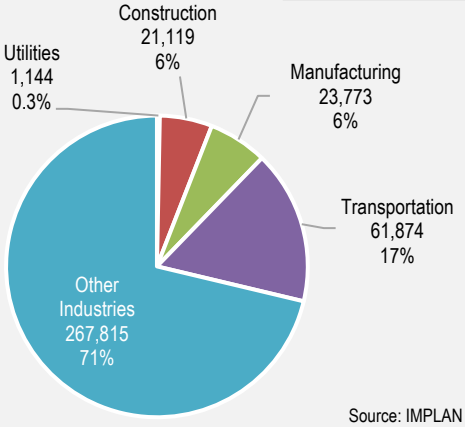
Exhibit 7-155
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
San Joaquin County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	2,165	249.1	1,911.5	2,472.9
Indirect	2,883	186.0	270.5	486.3
Induced	2,345	131.8	250.2	405.0
TOTAL CONTRIBUTION	**7,393**	**566.9**	**2,432.3**	**3,364.2**
Percent of County Total	*2.0%*	*2.3%*	*6.0%*	*4.7%*
Percent of Total CA Contribution	*1.4%*	*1.1%*	*1.5%*	*1.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$24.6	$70.3
Social insurance	2.5	59.6
Sales and excise taxes	708.9	32.7
Property taxes	477.2	0.0
Corporate profits taxes	17.4	17.4
Special Assessments	48.2	0.0
Other taxes	125.8	0.0
Fees, fines and permits	15.4	36.4
TOTAL TAX REVENUES	**$1,419.9**	**$216.5**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-156 (San Joaquin)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Total Jobs in 2022: **375,725**
Jobs in At-Risk Sectors: **107,910**
Share of Total: *28.7%*

Source: IMPLAN

San Luis Obispo County

Exhibit 7-157
Direct Activity of Oil and Gas Industry
San Luis Obispo County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	221	9.2
Midstream	220	18.2
Downstream	74	24.9
Market	802	182.2
Total Direct Activity	**1,318**	**234.4**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-158
Economic Base in San Luis Obispo County
(Employment by Industry)

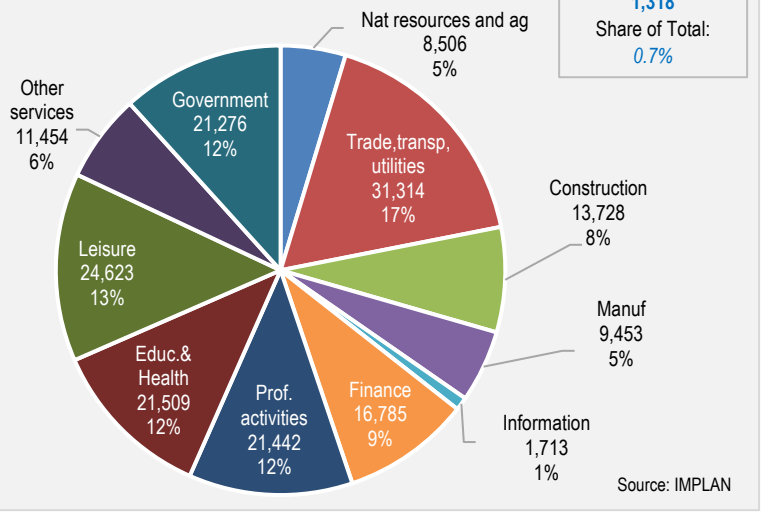


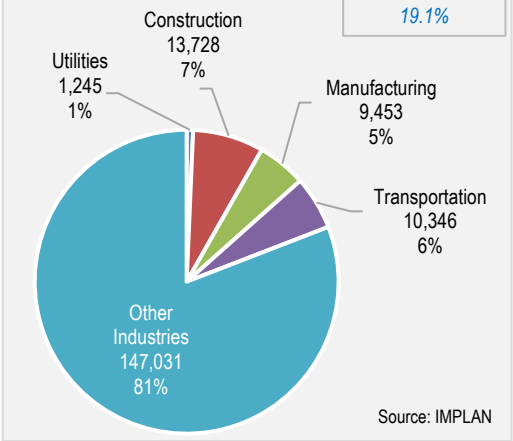
Exhibit 7-159
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
San Luis Obispo County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	1,318	234.4	1,130.9	2,343.0
Indirect	2,014	114.2	170.9	337.7
Induced	1,398	76.1	141.7	235.6
TOTAL CONTRIBUTION	**4,729**	**424.7**	**1,443.5**	**2,916.3**
Percent of County Total	*2.6%*	*3.9%*	*7.7%*	*8.9%*
Percent of Total CA Contribution	*0.9%*	*0.8%*	*0.9%*	*0.9%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$18.0	$52.0
Social insurance	1.6	42.4
Sales and excise taxes	242.7	10.7
Property taxes	220.5	0.0
Corporate profits taxes	16.8	16.8
Special Assessments	4.5	0.0
Other taxes	30.3	0.0
Fees, fines and permits	4.6	12.0
TOTAL TAX REVENUES	**$538.8**	**$133.8**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-160 (San Luis Obispo)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



San Mateo County

Exhibit 7-161
Direct Activity of Oil and Gas Industry
San Mateo County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	168	0.6
Midstream	34	3.8
Downstream	21	6.0
Market	968	139.3
Total Direct Activity	**1,190**	**149.7**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-162
Economic Base in San Mateo County
(Employment by Industry)

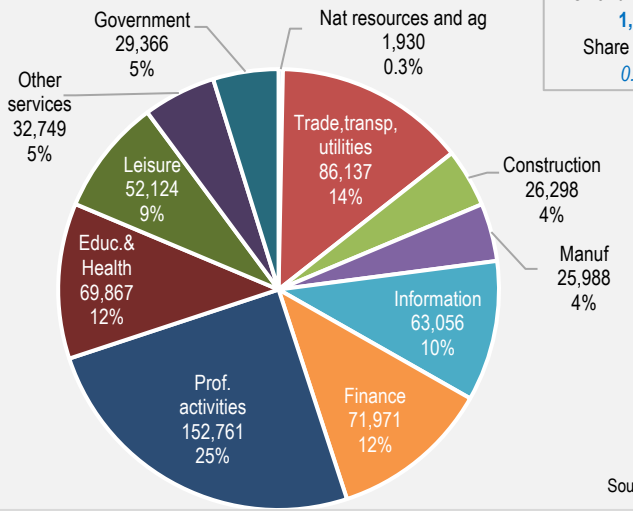


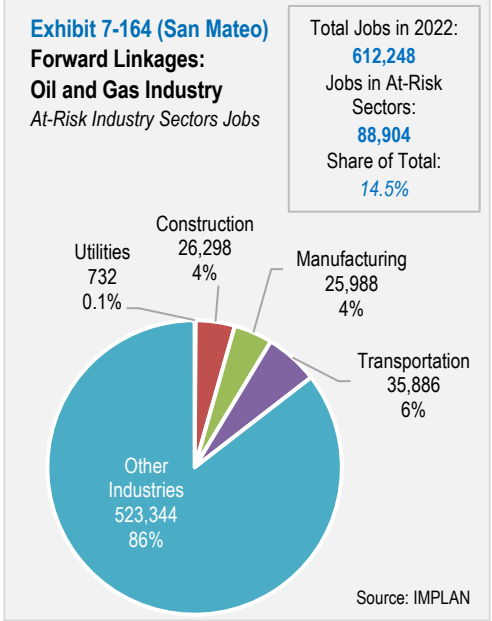
Exhibit 7-163
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
San Mateo County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	1,190	149.7	392.9	876.2
Indirect	969	144.0	206.0	298.5
Induced	659	64.2	112.5	159.2
TOTAL CONTRIBUTION	**2,819**	**357.8**	**711.5**	**1,333.9**
Percent of County Total	*0.5%*	*0.4%*	*0.4%*	*0.5%*
Percent of Total CA Contribution	*0.5%*	*0.7%*	*0.4%*	*0.4%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$11.3	$32.5
Social insurance	1.3	26.2
Sales and excise taxes	39.4	1.7
Property taxes	51.6	0.0
Corporate profits taxes	10.1	10.1
Special Assessments	0.8	0.0
Other taxes	11.5	0.0
Fees, fines and permits	1.7	1.9
TOTAL TAX REVENUES	**$127.8**	**$72.3**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-164 (San Mateo)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Santa Barbara County

Exhibit 7-165
Direct Activity of Oil and Gas Industry
Santa Barbara County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	524	78.5
Midstream	176	17.3
Downstream	7	0.1
Market	695	114.6
Total Direct Activity	**1,402**	**210.5**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-166
Economic Base in Santa Barbara County
(Employment by Industry)

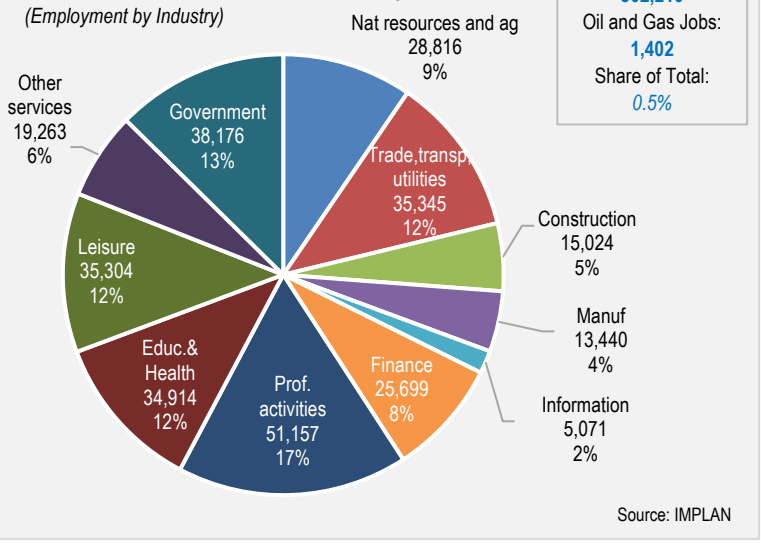


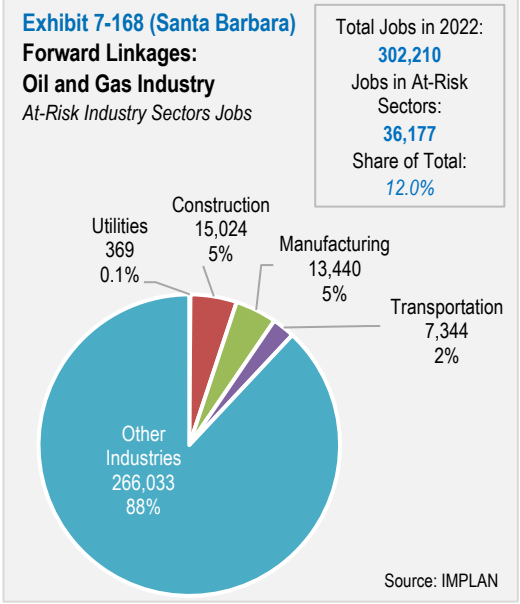
Exhibit 7-167
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Santa Barbara County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	1,402	210.5	810.9	1,345.2
Indirect	2,024	194.9	262.5	435.2
Induced	1,635	113.3	196.9	317.0
TOTAL CONTRIBUTION	**5,061**	**518.6**	**1,270.3**	**2,097.4**
Percent of County Total	*1.7%*	*2.3%*	*3.6%*	*3.6%*
Percent of Total CA Contribution	*0.9%*	*1.0%*	*0.8%*	*0.6%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$21.5	$60.5
Social insurance	2.2	50.8
Sales and excise taxes	135.3	4.6
Property taxes	132.0	0.0
Corporate profits taxes	14.4	14.4
Special Assessments	3.7	0.0
Other taxes	19.4	0.0
Fees, fines and permits	3.5	5.1
TOTAL TAX REVENUES	**$331.9**	**$135.4**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-168 (Santa Barbara)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



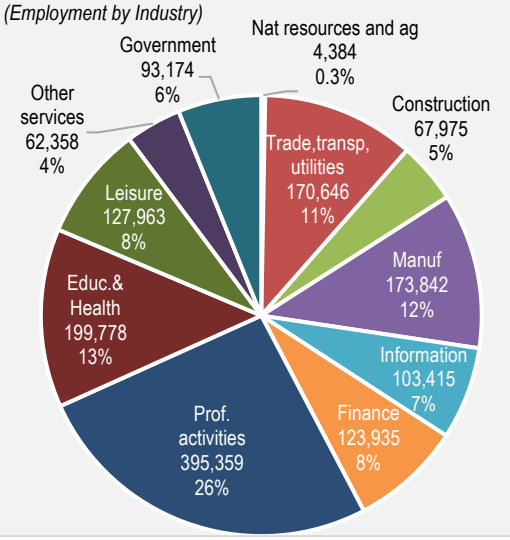
Santa Clara County

Exhibit 7-169
Direct Activity of Oil and Gas Industry
Santa Clara County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	442	9.7
Midstream	698	83.5
Downstream	180	49.9
Market	2,042	449.7
Total Direct Activity	**3,363**	**592.7**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-170
Economic Base in Santa Clara County
(Employment by Industry)



Total Jobs in 2022: **1,522,830**
Oil and Gas Jobs: **3,363**
Share of Total: *0.2%*

Source: IMPLAN

Exhibit 7-171
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Santa Clara County 2022

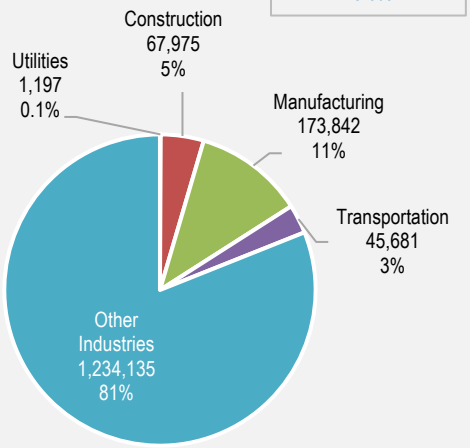
ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	3,363	592.7	2,513.6	4,967.5
Indirect	2,843	426.5	639.3	932.7
Induced	2,812	264.2	466.3	670.7
TOTAL CONTRIBUTION	**9,017**	**1,283.4**	**3,619.2**	**6,570.9**
Percent of County Total	*0.6%*	*0.5%*	*0.9%*	*1.1%*
Percent of Total CA Contribution	*1.7%*	*2.4%*	*2.2%*	*1.9%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$49.2	$141.5
Social insurance	4.6	91.8
Sales and excise taxes	483.6	20.3
Property taxes	604.0	0.0
Corporate profits taxes	43.5	43.5
Special Assessments	14.0	0.0
Other taxes	127.7	0.0
Fees, fines and permits	17.8	22.6
TOTAL TAX REVENUES	**$1,344.3**	**$319.7**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-172 (Santa Clara)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs

Total Jobs in 2022: **1,522,830**
Jobs in At-Risk Sectors: **288,695**
Share of Total: *19.0%*



Source: IMPLAN

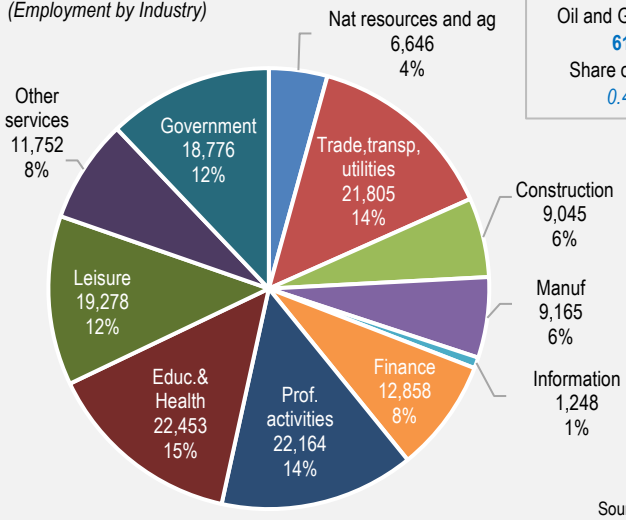
Santa Cruz County

Exhibit 7-173
Direct Activity of Oil and Gas Industry
Santa Cruz County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	61	0.3
Midstream	128	11.3
Downstream	10	1.2
Market	420	62.0
Total Direct Activity	**619**	**74.9**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-174
Economic Base in Santa Cruz County
(Employment by Industry)



Total Jobs in 2022: **155,190**
Oil and Gas Jobs: **619**
Share of Total: *0.4%*

Source: IMPLAN

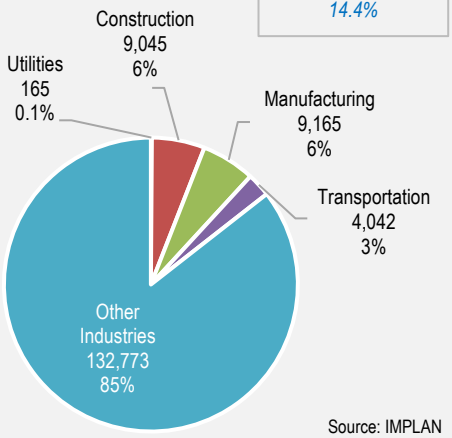
Exhibit 7-175
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Santa Cruz County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	619	74.9	305.3	540.1
Indirect	487	40.2	55.5	98.0
Induced	464	30.5	54.8	87.8
TOTAL CONTRIBUTION	**1,569**	**145.7**	**415.5**	**725.9**
Percent of County Total	*1.0%*	*1.3%*	*2.4%*	*2.4%*
Percent of Total CA Contribution	*0.3%*	*0.3%*	*0.3%*	*0.2%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$6.5	$18.8
Social insurance	0.5	13.6
Sales and excise taxes	79.6	3.1
Property taxes	71.3	0.0
Corporate profits taxes	2.9	2.9
Special Assessments	3.5	0.0
Other taxes	14.5	0.0
Fees, fines and permits	2.3	3.4
TOTAL TAX REVENUES	**$181.1**	**$41.8**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-176 (Santa Cruz)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Total Jobs in 2022: **155,190**
Jobs in At-Risk Sectors: **22,416**
Share of Total: *14.4%*

Source: IMPLAN

Shasta County

Exhibit 7-177
Direct Activity of Oil and Gas Industry
Shasta County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	334	3.1
Midstream	131	12.1
Downstream	47	7.9
Market	584	44.7
Total Direct Activity	**1,095**	**67.8**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-178
Economic Base in Shasta County
(Employment by Industry)

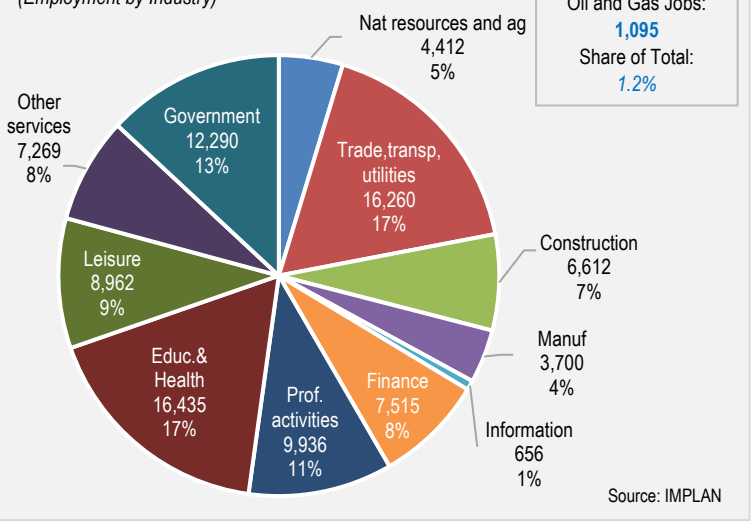


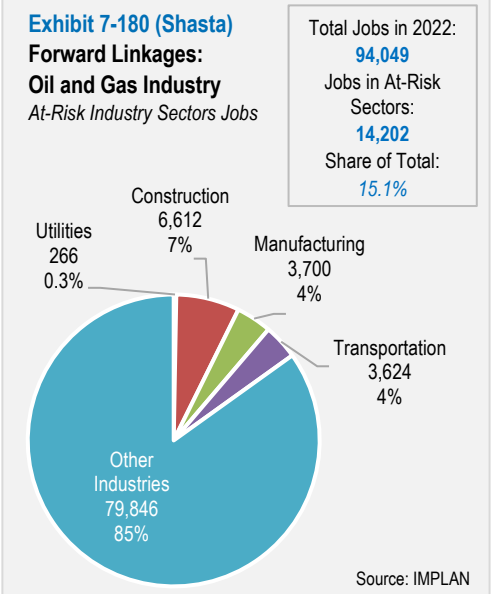
Exhibit 7-179
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Shasta County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	1,095	67.8	653.7	1,459.9
Indirect	1,107	77.2	120.6	237.4
Induced	591	34.4	61.1	102.7
TOTAL CONTRIBUTION	**2,793**	**179.4**	**835.4**	**1,800.0**
Percent of County Total	*3.0%*	*3.1%*	*8.5%*	*10.4%*
Percent of Total CA Contribution	*0.5%*	*0.3%*	*0.5%*	*0.5%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$7.5	$21.6
Social insurance	0.8	19.2
Sales and excise taxes	275.9	12.8
Property taxes	148.1	0.0
Corporate profits taxes	7.2	7.2
Special Assessments	2.0	0.0
Other taxes	24.6	0.0
Fees, fines and permits	4.4	14.3
TOTAL TAX REVENUES	**$470.5**	**$75.1**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-180 (Shasta)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Sierra County

Exhibit 7-181
Direct Activity of Oil and Gas Industry
Sierra County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	3	0.1
Midstream	0	0.0
Downstream	0	0.0
Market	14	0.5
Total Direct Activity	**17**	**0.6**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-182
Economic Base in Sierra County
(Employment by Industry)

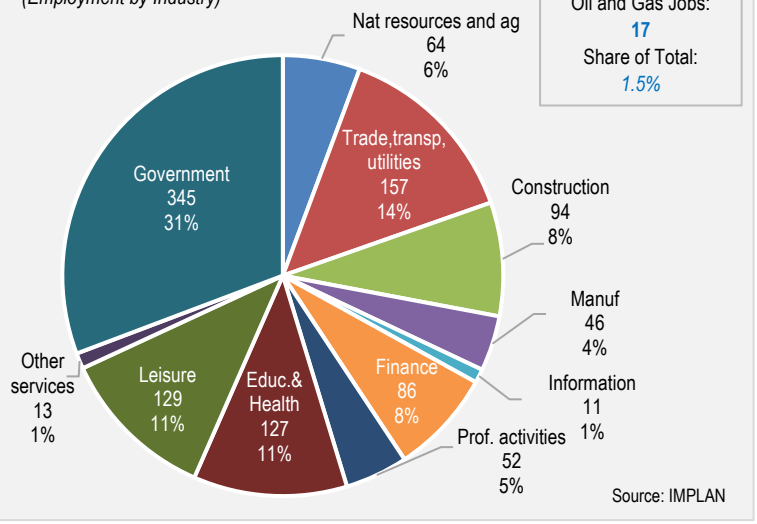


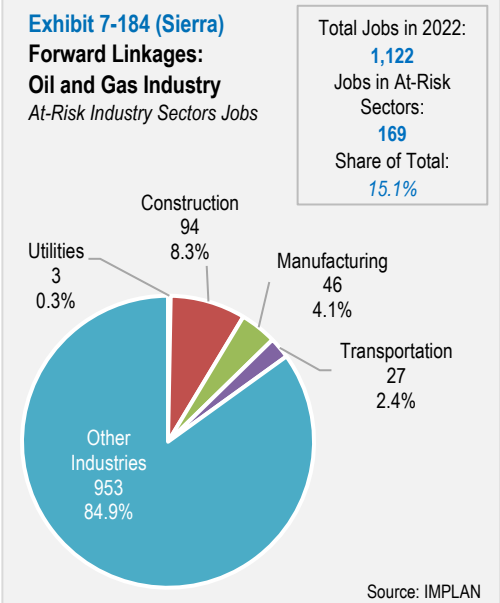
Exhibit 7-183
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Sierra County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	17	0.6	1.9	4.6
Indirect	4	0.1	0.2	0.6
Induced	2	0.0	0.2	0.3
TOTAL CONTRIBUTION	**23**	**0.8**	**2.3**	**5.5**
Percent of County Total	*2.0%*	*1.5%*	*2.7%*	*3.6%*
Percent of Total CA Contribution	*0.0%*	*0.0%*	*0.0%*	*0.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$0.0	$0.1
Social insurance	0.0	0.1
Sales and excise taxes	0.2	0.0
Property taxes	0.6	0.0
Corporate profits taxes	0.0	0.0
Special Assessments	0.0	0.0
Other taxes	0.0	0.0
Fees, fines and permits	0.0	0.0
TOTAL TAX REVENUES	**$0.9**	**$0.2**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-184 (Sierra)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Siskiyou County

Exhibit 7-185
Direct Activity of Oil and Gas Industry
Siskiyou County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	19	0.1
Midstream	21	0.9
Downstream	2	0.1
Market	220	12.4
Total Direct Activity	**262**	**13.4**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-186
Economic Base in Siskiyou County
(Employment by Industry)

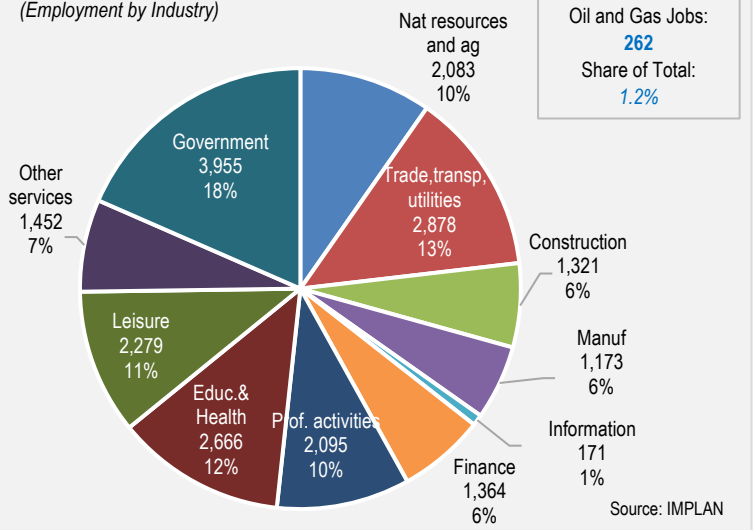


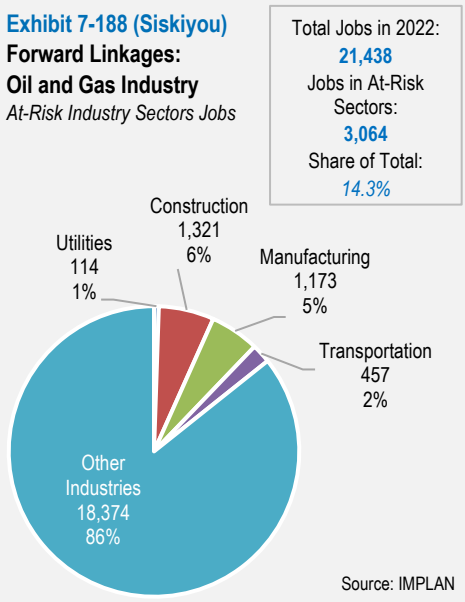
Exhibit 7-187
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Siskiyou County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	262	13.4	101.3	162.8
Indirect	107	4.4	7.0	17.3
Induced	50	2.4	4.8	8.4
TOTAL CONTRIBUTION	**419**	**20.3**	**113.2**	**188.6**
Percent of County Total	*2.0%*	*1.8%*	*5.7%*	*5.2%*
Percent of Total CA Contribution	*0.1%*	*0.0%*	*0.1%*	*0.1%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$0.9	$2.6
Social insurance	0.1	2.2
Sales and excise taxes	41.4	1.7
Property taxes	29.7	0.0
Corporate profits taxes	0.5	0.5
Special Assessments	0.5	0.0
Other taxes	4.2	0.0
Fees, fines and permits	0.8	1.9
TOTAL TAX REVENUES	**$77.9**	**$9.0**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-188 (Siskiyou)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Solano County

Exhibit 7-189
Direct Activity of Oil and Gas Industry
Solano County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	334	34.4
Midstream	736	73.6
Downstream	349	117.6
Market	1,101	187.3
Total Direct Activity	**2,520**	**412.9**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-190
Economic Base in Solano County
(Employment by Industry)

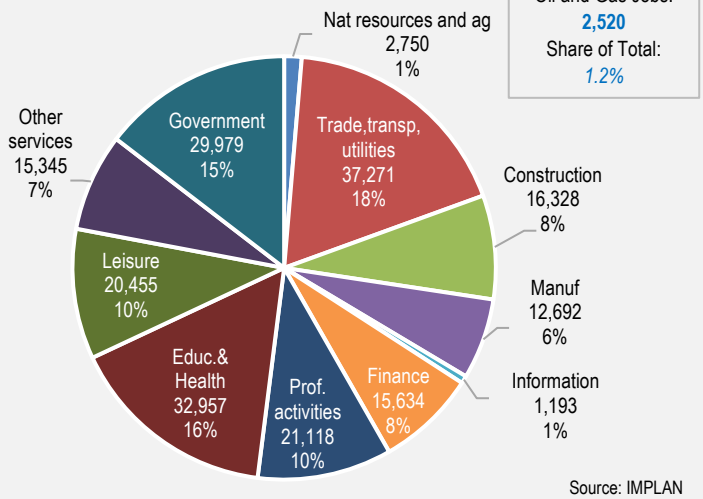


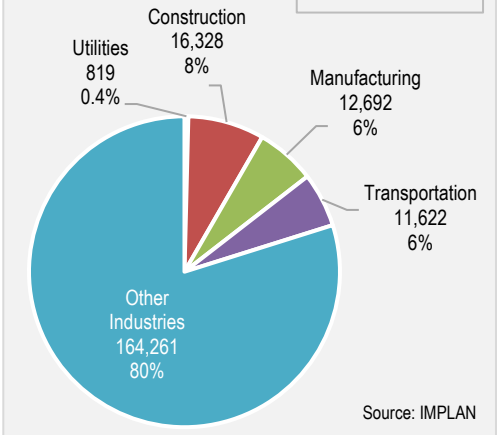
Exhibit 7-191
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Solano County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	2,520	412.9	2,385.5	6,507.7
Indirect	2,750	176.5	283.2	515.8
Induced	2,332	130.6	257.8	405.4
TOTAL CONTRIBUTION	**7,602**	**720.0**	**2,926.4**	**7,429.0**
Percent of County Total	*3.7%*	*4.9%*	*10.8%*	*15.8%*
Percent of Total CA Contribution	*1.4%*	*1.3%*	*1.8%*	*2.2%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$26.2	$73.9
Social insurance	3.8	80.6
Sales and excise taxes	198.5	7.4
Property taxes	143.3	0.0
Corporate profits taxes	76.5	76.5
Special Assessments	9.7	0.0
Other taxes	42.5	0.0
Fees, fines and permits	5.0	8.2
TOTAL TAX REVENUES	**$505.5**	**$246.7**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-192 (Solano)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Sonoma County

Exhibit 7-193
Direct Activity of Oil and Gas Industry
Sonoma County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	210	2.8
Midstream	153	13.2
Downstream	14	2.6
Market	742	83.6
Total Direct Activity	**1,119**	**102.2**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-194
Economic Base in Sonoma County
(Employment by Industry)

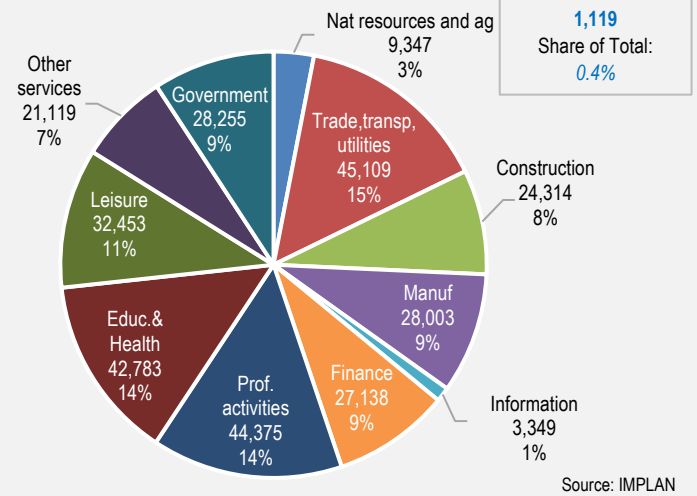


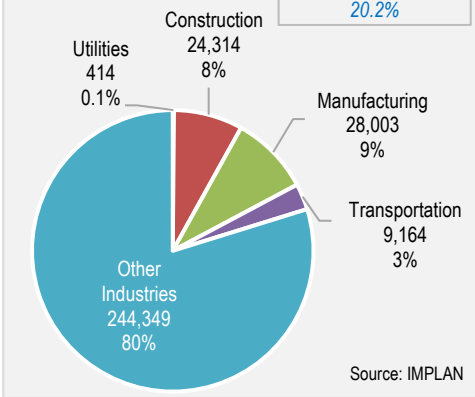
Exhibit 7-195
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Sonoma County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	1,119	102.2	735.2	1,158.2
Indirect	1,158	96.6	136.6	242.2
Induced	957	63.6	112.9	182.5
TOTAL CONTRIBUTION	**3,234**	**262.5**	**984.8**	**1,582.8**
Percent of County Total	*1.1%*	*1.2%*	*2.7%*	*2.5%*
Percent of Total CA Contribution	*0.6%*	*0.5%*	*0.6%*	*0.5%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$11.5	$32.7
Social insurance	1.0	25.1
Sales and excise taxes	242.5	9.9
Property taxes	226.4	0.0
Corporate profits taxes	5.9	5.9
Special Assessments	9.6	0.0
Other taxes	49.1	0.0
Fees, fines and permits	5.8	11.1
TOTAL TAX REVENUES	**$551.6**	**$84.7**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-196 (Sonoma)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Stanislaus County

Exhibit 7-197
Direct Activity of Oil and Gas Industry
Stanislaus County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	181	0.2
Midstream	412	30.3
Downstream	47	11.2
Market	1,262	148.8
Total Direct Activity	**1,901**	**190.4**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-198
Economic Base in Stanislaus County
(Employment by Industry)

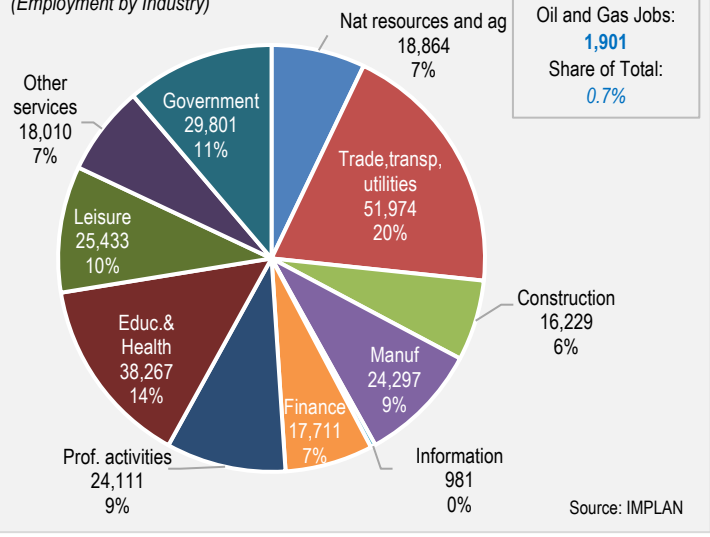


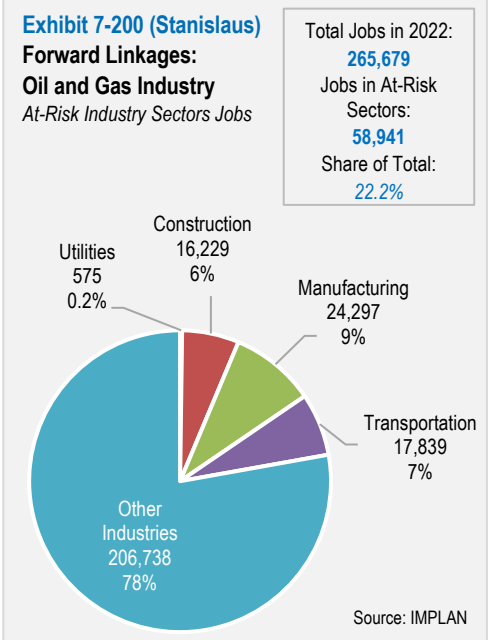
Exhibit 7-199
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Stanislaus County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	1,901	190.4	1,525.4	2,562.2
Indirect	2,217	146.2	214.9	398.1
Induced	1,399	84.7	149.0	240.4
TOTAL CONTRIBUTION	**5,517**	**421.3**	**1,889.2**	**3,200.7**
Percent of County Total	*2.1%*	*2.4%*	*6.6%*	*5.9%*
Percent of Total CA Contribution	*1.0%*	*0.8%*	*1.1%*	*0.9%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$17.2	$49.1
Social insurance	1.9	44.3
Sales and excise taxes	593.3	28.1
Property taxes	292.2	0.0
Corporate profits taxes	17.7	17.7
Special Assessments	19.1	0.0
Other taxes	71.2	0.0
Fees, fines and permits	11.2	31.4
TOTAL TAX REVENUES	**$1,023.7**	**$170.6**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-200 (Stanislaus)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Sutter County

Exhibit 7-201
Direct Activity of Oil and Gas Industry
Sutter County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	23	2.3
Midstream	54	4.5
Downstream	0	0.0
Market	220	20.6
Total Direct Activity	**297**	**27.4**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-202
Economic Base in Sutter County
(Employment by Industry)

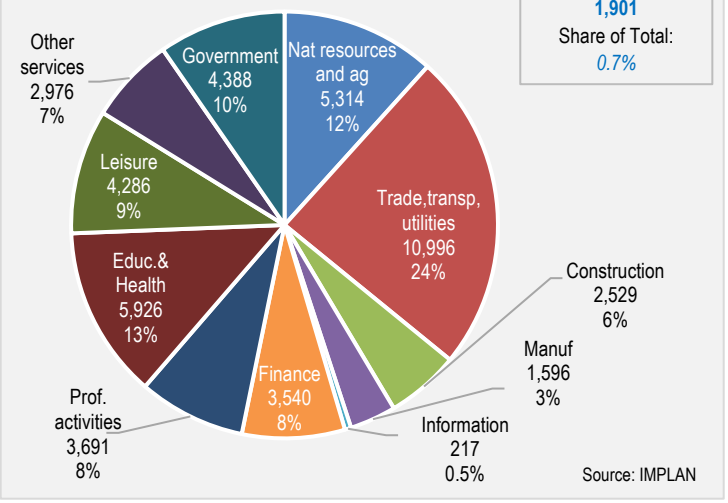


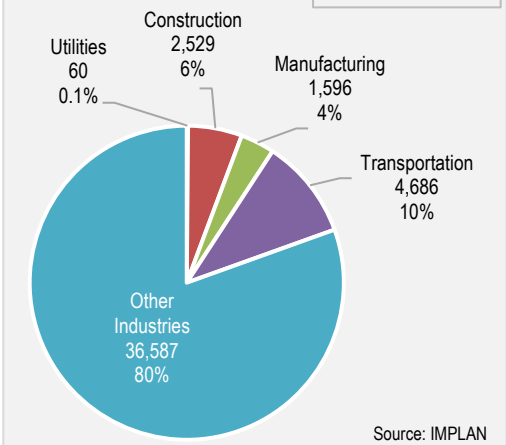
Exhibit 7-203
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Sutter County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	297	27.4	231.9	280.1
Indirect	250	14.0	21.2	40.5
Induced	261	14.3	26.6	43.8
TOTAL CONTRIBUTION	**808**	**55.7**	**279.8**	**364.4**
Percent of County Total	*1.8%*	*2.0%*	*6.0%*	*4.7%*
Percent of Total CA Contribution	*0.2%*	*0.1%*	*0.2%*	*0.1%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$2.1	$6.2
Social insurance	0.2	5.5
Sales and excise taxes	102.6	4.2
Property taxes	54.8	0.0
Corporate profits taxes	1.6	1.6
Special Assessments	6.6	0.0
Other taxes	11.9	0.0
Fees, fines and permits	1.8	4.6
TOTAL TAX REVENUES	**$181.5**	**$22.1**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-204 (Sutter)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Tehama County

Exhibit 7-205
Direct Activity of Oil and Gas Industry
Tehama County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	50	0.0
Midstream	26	2.1
Downstream	0	0.0
Market	354	31.2
Total Direct Activity	**430**	**33.3**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-206
Economic Base in Tehama County
(Employment by Industry)

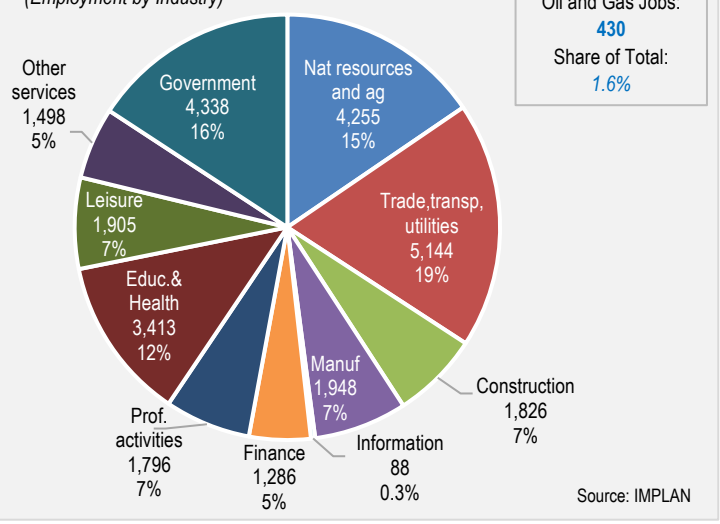


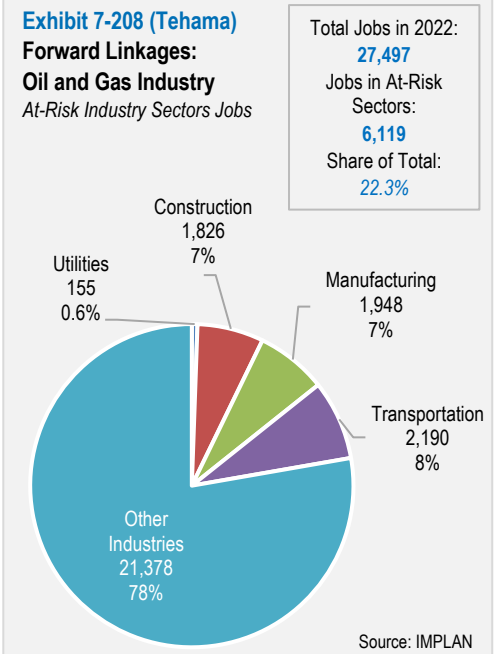
Exhibit 7-207
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Tehama County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	430	33.3	184.5	300.2
Indirect	289	17.7	24.9	50.3
Induced	146	7.9	15.7	26.0
TOTAL CONTRIBUTION	**865**	**58.9**	**225.1**	**376.5**
Percent of County Total	*3.1%*	*3.7%*	*8.1%*	*7.3%*
Percent of Total CA Contribution	*0.2%*	*0.1%*	*0.1%*	*0.1%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$2.2	$6.5
Social insurance	0.3	7.0
Sales and excise taxes	57.5	2.2
Property taxes	37.1	0.0
Corporate profits taxes	2.5	2.5
Special Assessments	0.4	0.0
Other taxes	6.1	0.0
Fees, fines and permits	1.2	2.5
TOTAL TAX REVENUES	**$107.3**	**$20.6**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-208 (Tehama)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Trinity County

Exhibit 7-209
Direct Activity of Oil and Gas Industry
Trinity County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	18	0.0
Midstream	0	0.0
Downstream	0	0.0
Market	48	2.0
Total Direct Activity	**67**	**2.0**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-210
Economic Base in Trinity County
(Employment by Industry)

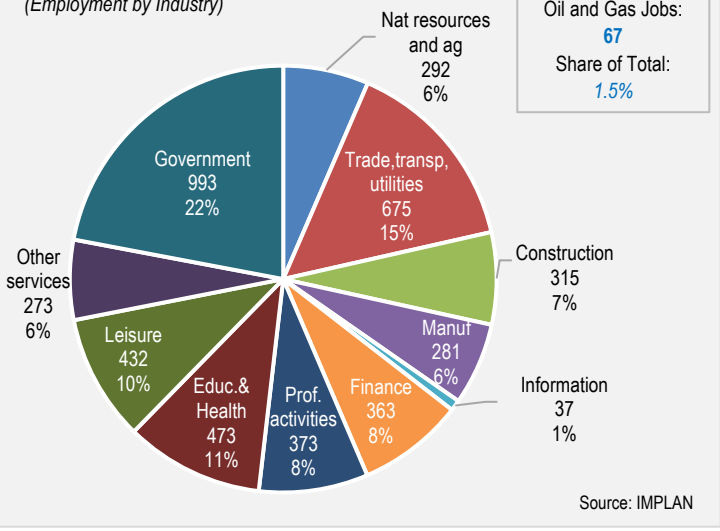


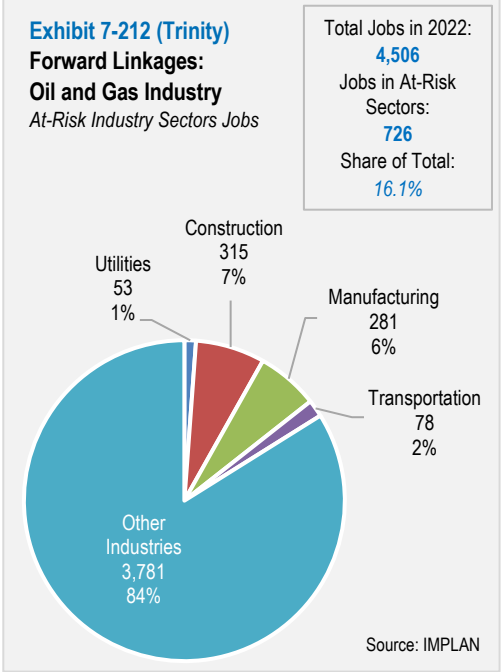
Exhibit 7-211
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Trinity County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	67	2.0	7.1	23.6
Indirect	25	1.2	1.9	4.6
Induced	6	0.3	0.7	1.1
TOTAL CONTRIBUTION	**98**	**3.5**	**9.7**	**29.3**
Percent of County Total	*2.2%*	*1.4%*	*2.1%*	*3.6%*
Percent of Total CA Contribution	*0.0%*	*0.0%*	*0.0%*	*0.0%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	-$0.4	$0.4
Social insurance	-0.4	0.4
Sales and excise taxes	-0.1	0.1
Property taxes	0.0	0.0
Corporate profits taxes	-0.1	0.1
Special Assessments	0.0	0.0
Other taxes	0.0	0.0
Fees, fines and permits	-0.1	0.1
TOTAL TAX REVENUES	**-$1.0**	**$1.0**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-212 (Trinity)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Tulare County

Exhibit 7-213
Direct Activity of Oil and Gas Industry
Tulare County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	69	1.6
Midstream	295	33.4
Downstream	4	1.0
Market	1,296	124.2
Total Direct Activity	**1,665**	**160.2**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-214
Economic Base in Tulare County
(Employment by Industry)

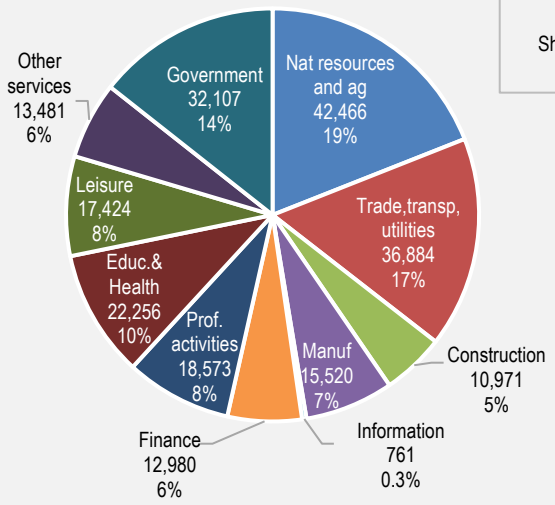


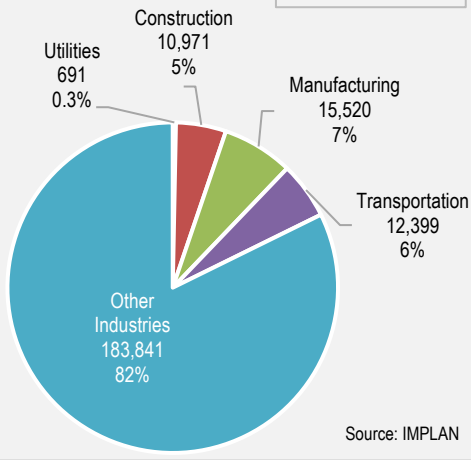
Exhibit 7-215
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Tulare County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	1,665	160.2	1,039.9	1,485.5
Indirect	1,411	85.5	124.6	238.3
Induced	1,089	54.0	102.6	174.8
TOTAL CONTRIBUTION	**4,164**	**299.7**	**1,267.1**	**1,898.6**
Percent of County Total	*1.9%*	*2.2%*	*5.7%*	*4.5%*
Percent of Total CA Contribution	*0.8%*	*0.6%*	*0.8%*	*0.6%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$14.2	$40.2
Social insurance	1.4	31.8
Sales and excise taxes	397.2	17.1
Property taxes	201.4	0.0
Corporate profits taxes	10.8	10.8
Special Assessments	12.9	0.0
Other taxes	55.7	0.0
Fees, fines and permits	7.8	19.1
TOTAL TAX REVENUES	**$701.3**	**$119.0**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-216 (Tulare)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Tuolumne County

Exhibit 7-217
Direct Activity of Oil and Gas Industry
Tuolumne County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	21	0.0
Midstream	21	1.6
Downstream	0	0.0
Market	249	21.9
Total Direct Activity	**291**	**23.5**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-218
Economic Base in Tuolumne County
(Employment by Industry)

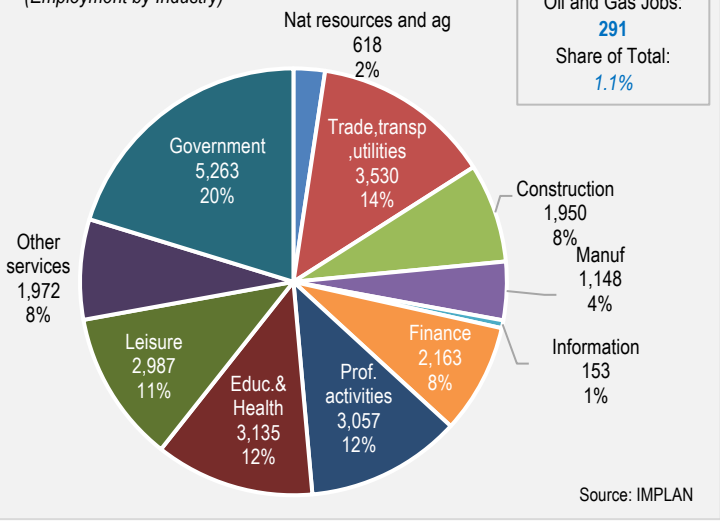


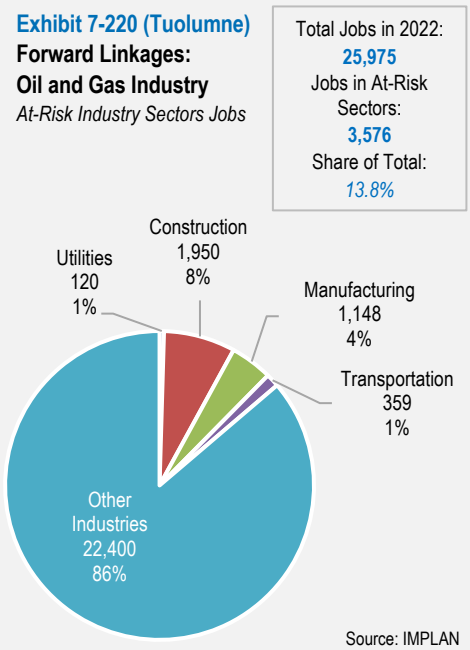
Exhibit 7-219
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Tuolumne County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	291	23.5	139.5	220.7
Indirect	173	8.0	12.1	29.3
Induced	96	4.8	9.4	16.3
TOTAL CONTRIBUTION	**559**	**36.3**	**160.9**	**266.3**
Percent of County Total	*2.2%*	*2.5%*	*6.4%*	*5.7%*
Percent of Total CA Contribution	*0.1%*	*0.1%*	*0.1%*	*0.1%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$1.2	$3.3
Social insurance	0.2	4.3
Sales and excise taxes	38.5	1.0
Property taxes	27.6	0.0
Corporate profits taxes	2.0	2.0
Special Assessments	1.2	0.0
Other taxes	4.4	0.0
Fees, fines and permits	0.7	1.1
TOTAL TAX REVENUES	**$75.7**	**$11.7**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-220 (Tuolumne)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Ventura County

Exhibit 7-221
Direct Activity of Oil and Gas Industry
Ventura County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	1,064	182.8
Midstream	173	18.5
Downstream	21	1.6
Market	1,286	177.1
Total Direct Activity	**2,544**	**380.1**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-222
Economic Base in Ventura County
(Employment by Industry)

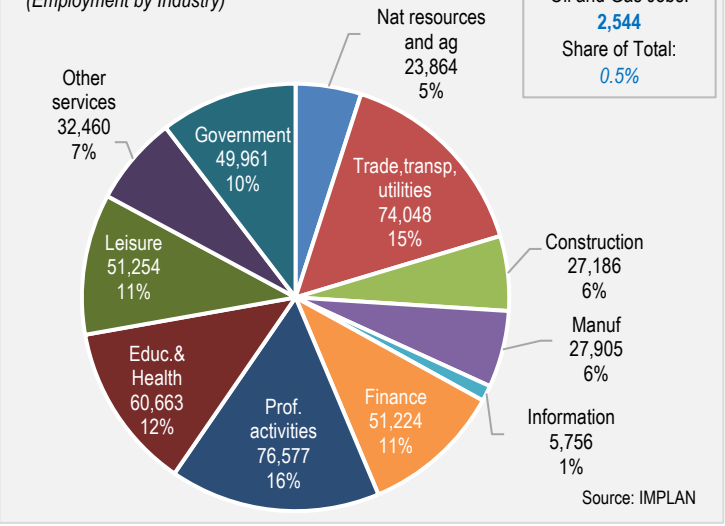


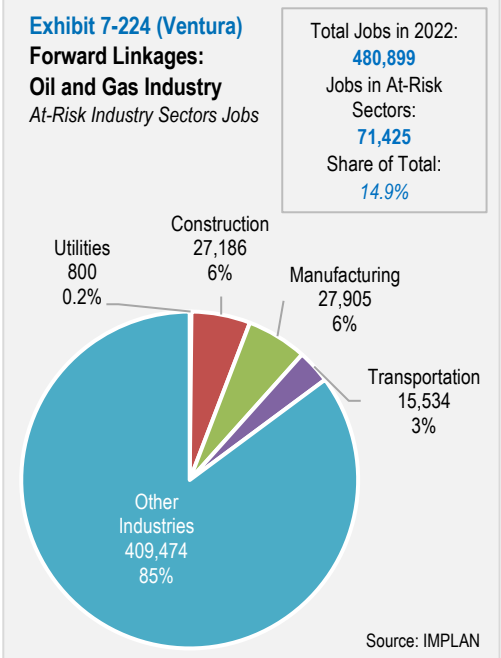
Exhibit 7-223
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Ventura County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	2,544	380.1	1,767.5	2,746.0
Indirect	4,176	378.9	524.1	882.5
Induced	4,040	252.3	446.9	734.2
TOTAL CONTRIBUTION	**10,760**	**1,011.3**	**2,738.6**	**4,362.8**
Percent of County Total	*2.2%*	*2.9%*	*4.8%*	*4.6%*
Percent of Total CA Contribution	*2.0%*	*1.9%*	*1.6%*	*1.3%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$43.0	$120.9
Social insurance	4.6	105.5
Sales and excise taxes	279.0	11.6
Property taxes	302.1	0.0
Corporate profits taxes	40.9	40.9
Special Assessments	8.5	0.0
Other taxes	45.0	0.0
Fees, fines and permits	7.7	12.9
TOTAL TAX REVENUES	**$730.8**	**$291.7**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-224 (Ventura)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Yolo County

Exhibit 7-225
Direct Activity of Oil and Gas Industry
Yolo County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	115	7.3
Midstream	322	37.0
Downstream	14	1.5
Market	881	177.8
Total Direct Activity	**1,333**	**223.6**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-226
Economic Base in Yolo County
(Employment by Industry)

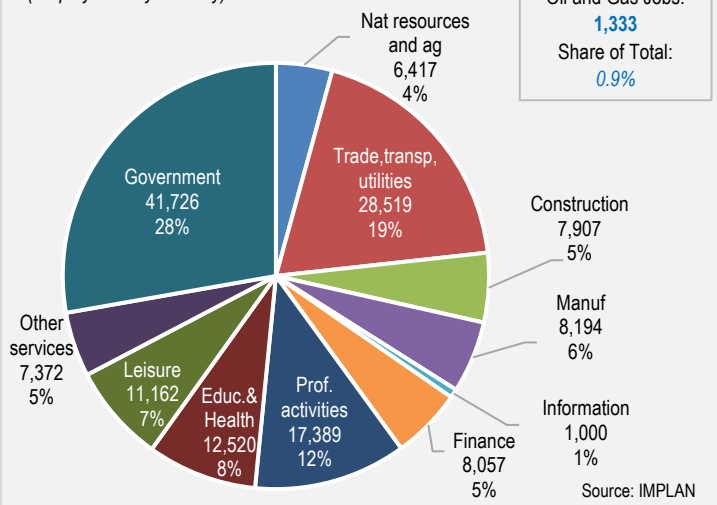


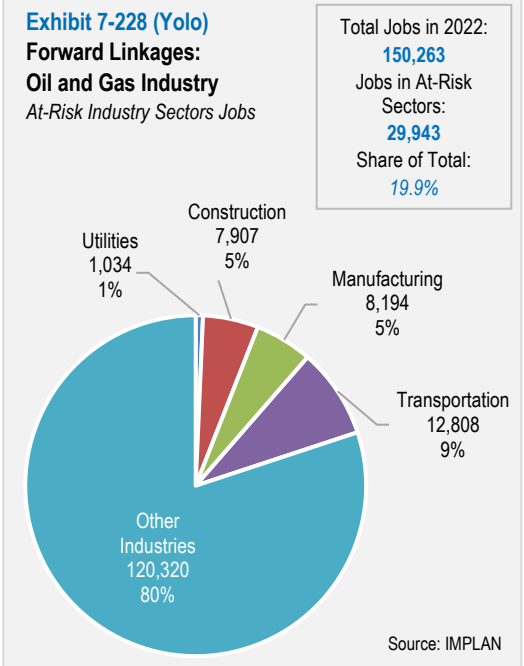
Exhibit 7-227
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Yolo County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	1,333	223.6	1,303.7	1,930.3
Indirect	1,624	126.5	185.6	322.2
Induced	814	51.0	98.9	155.7
TOTAL CONTRIBUTION	**3,771**	**401.2**	**1,588.1**	**2,408.1**
Percent of County Total	*2.5%*	*3.2%*	*8.1%*	*7.7%*
Percent of Total CA Contribution	*0.7%*	*0.8%*	*1.0%*	*0.7%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$10.8	$30.8
Social insurance	2.0	36.4
Sales and excise taxes	311.9	19.2
Property taxes	225.1	0.0
Corporate profits taxes	20.3	20.3
Special Assessments	22.2	0.0
Other taxes	102.3	0.0
Fees, fines and permits	8.1	21.4
TOTAL TAX REVENUES	**$702.7**	**$128.1**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-228 (Yolo)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Yuba County

Exhibit 7-229
Direct Activity of Oil and Gas Industry
Yuba County 2022

Industry Group	Employment	Labor Income ($ millions)
Upstream	32	0.0
Midstream	8	0.9
Downstream	0	0.0
Market	257	29.2
Total Direct Activity	**297**	**30.2**

Source: IMPLAN; Estimates by LAEDC

Exhibit 7-230
Economic Base in Yuba County
(Employment by Industry)

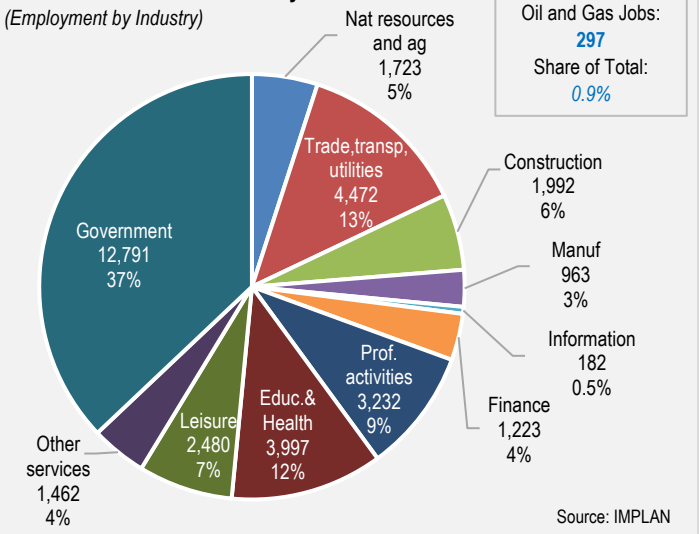


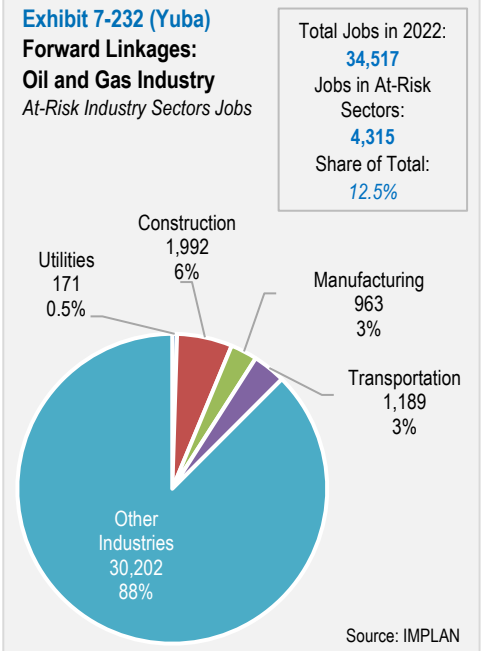
Exhibit 7-231
Backward Linkages: Oil and Gas Industry
Total Economic and Fiscal Contribution
Yuba County 2022

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	297	30.2	115.9	214.7
Indirect	195	12.2	16.5	33.7
Induced	131	7.0	13.5	23.1
TOTAL CONTRIBUTION	**624**	**49.3**	**145.9**	**271.5**
Percent of County Total	*1.8%*	*2.0%*	*3.4%*	*4.1%*
Percent of Total CA Contribution	*0.1%*	*0.1%*	*0.1%*	*0.1%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)
Personal income taxes	$1.4	$4.1
Social insurance	0.2	4.9
Sales and excise taxes	16.9	0.2
Property taxes	17.7	0.0
Corporate profits taxes	2.3	2.3
Special Assessments	1.5	0.0
Other taxes	5.0	0.0
Fees, fines and permits	0.6	0.2
TOTAL TAX REVENUES	**$45.7**	**$11.7**

* May not sum due to rounding
Source: Estimates by LAEDC

Exhibit 7-232 (Yuba)
Forward Linkages:
Oil and Gas Industry
At-Risk Industry Sectors Jobs



Appendix

Detailed Tables

Oil and Gas Wells and Production by County

The oil and gas production associated with the active wells in California in 2022 by county are displayed in **Exhibit A-1** along with select estimated production-based revenues collected by the state.

Exhibit A-1
County Oil & Gas Production
California

County	Well Count			Oil Production (Bbl)	Gas Production (Mcf)	Oil Spill Prevention and Administration Fee [a]	DOGGR Assessment [b]
	Active Wells	Inactive Wells	Total				
Alameda	5	3	8	3,545	237	$301	$3,118
Alpine							
Amador							
Butte	17	5	22	0	0	0	0
Calaveras							
Colusa	152	186	338	0	1,641,774	0	143,466
Contra Costa	21	25	46	36,418	86,875	3,096	39,415
Del Norte							
El Dorado							
Fresno	1,754	1,610	3,364	5,202,947	1,158,598	442,250	4,647,819
Glenn	181	120	301	0	1,754,529	0	153,319
Humboldt	26	26	52	0	268,653	0	23,476
Imperial							
Inyo							
Kern	36,649	21,205	57,854	96,498,929	91,997,984	8,202,409	92,364,421
Kings	140	206	346	112,189	157,204	9,536	111,773
Lake							
Lassen		1	1	0	0	0	0
Los Angeles	3,126	2,109	5,235	17,671,738	8,401,151	1,502,098	16,176,511
Madera	14	15	29	0	105,508	0	9,220
Marin							
Mariposa							
Mendocino							
Merced		2	2	0	0	0	0
Modoc							
Mono							
Monterey	673	383	1,056	5,945,161	873,457	505,339	5,271,482
Napa							
Nevada							
Orange	817	531	1,348	2,993,464	1,175,899	254,444	2,718,582
Placer							
Plumas							
Riverside		3	3	0	0	0	0
Sacramento	69	124	193	2,749	1,779,378	234	157,892
San Benito	16	25	41	11,050	15,336	939	10,996
San Bernardino	24	14	38	5,683	36,500	483	8,156
San Diego							

Exhibit A-1 (Cont'd)

County	Well Count			Oil Production (Bbl)	Gas Production (Mcf)	Oil Spill Prevention and Administration Fee [a]	DOGGR Assessment [b]
	Active Wells	Inactive Wells	Total				
San Francisco							
San Joaquin	116	106	222	0	676,781	0	59,140
San Luis Obispo	188	146	334	538,376	539,742	45,762	517,623
San Mateo		21	21	46.35745391	0	4	41
Santa Barbara	873	1,317	2,190	3,104,164	2,145,586	263,854	2,900,053
Santa Clara	11	14	25	15,759	15,374	1,340	15,114
Santa Cruz							
Shasta							
Sierra							
Siskiyou							
Solano	56	152	208	177	739,238	15	64,753
Sonoma							
Stanislaus		2	2			0	0
Sutter	211	194	405		2,517,241	0	219,968
Tehama	86	63	149		469,103	0	40,992
Trinity							
Tulare	69	17	86	29,533		2,510	25,807
Tuolumne							
Ventura	1,245	1,729	2,974	4,928,550	4,939,787	418,927	4,738,456
Yolo	7	63	70		12,279	0	1,073
Yuba		1	1		104	0	9
Total	**46,546**	**30,418**	**76,964**	**137,100,479**	**121,508,319**	**$11,653,541**	**$130,422,675**

Notes: a. Estimated by multiplying the oil production level by the Oil Spill Prevention and Administration Fee at the rate of $0.085 per barrel in 2022.

b. Estimated by multiplying the oil and gas production levels by the Oil and Gas Assessment rate, which was $0.8738461 per equivalent BBL or 10 MCF of gas for FY 2022/23.

Source: CA DOGGR, estimates by LAEDC

Oil and Gas Primary User Industries

Exhibit A-2
Purchases from California Upstream Operations by Industry

Industry Sector	$ millions
32411 Petroleum Refineries	$7,708.0
2212 Natural Gas Distribution	$656.8
9A - Government Enterprises	$221.7
Upstream Industry Segment	$129.2
22 Utilities	$120.1
484 - Truck Transportation	$65.4
481 - Air Transportation	$37.6
23 - Construction	$37.4
325 - Chemical Manufacturing	$13.0
42 - Wholesale Trade	$8.5
492 - Couriers and Messengers	$7.6
722 - Food Services and Drinking Places	$6.3
531 - Real Estate	$5.9
561 - Administrative and Support Services	$5.7
521 - Monetary Authorities-Central Bank	$5.5
485 - Transit and Ground Passenger Transportation	$5.1
324 - Petroleum and Coal Products Manufacturing	$4.7
482 - Rail Transportation	$4.6
324191 Petroleum Lubricating Oil and Grease Manufacturing	$4.6
523 - Securities, Commodity Contracts, and Other Financial Investments and Related Activities	$4.6
483 - Water Transportation	$4.3
622 - Hospitals	$4.0
541 - Professional, Scientific, and Technical Services	$3.9
813 - Religious, Grantmaking, Civic, Professional, and Similar Organizations	$3.6
487 - Scenic and Sightseeing Transportation	$3.5
562 - Waste Management and Remediation Services	$2.7
32511 Petrochemical Manufacturing	$2.5
112 - Animal Production and Aquaculture	$1.9
333 - Machinery Manufacturing	$1.8
551 - Management of Companies and Enterprises	$1.8
111 - Crop Production	$1.7
532 - Rental and Leasing Services	$1.7
518 - Data Processing, Hosting, and Related Services	$1.7
811 - Repair and Maintenance	$1.7
212 - Mining (except Oil and Gas)	$1.4
323 - Printing and Related Support Activities	$1.1
327 - Nonmetallic Mineral Product Manufacturing	$1.1
522 - Credit Intermediation and Related Activities	$1.1
721 - Accommodation	$1.1
311 - Food Manufacturing	$1.1
519 - Other Information Services	$1.1
611 - Educational Services	$1.0
322 - Paper Manufacturing	$0.9
624 - Social Assistance	$0.9
713 - Amusement, Gambling, and Recreation Industries	$0.8
326 - Plastics and Rubber Products Manufacturing	$0.8
525 - Funds, Trusts, and Other Financial Vehicles	$0.8
334 - Computer and Electronic Product Manufacturing	$0.8
332 - Fabricated Metal Product Manufacturing	$0.7
621 - Ambulatory Health Care Services	$0.7
445 - Food and Beverage Stores	$0.7
336 - Transportation Equipment Manufacturing	$0.6
623 - Nursing and Residential Care Facilities	$0.6
493 - Warehousing and Storage	$0.5
321 - Wood Product Manufacturing	$0.5
444 - Building Material and Garden Equipment and Supplies Dealers	$0.5
454 - Nonstore Retailers	$0.4
511 - Publishing Industries (except Internet)	$0.4
331 - Primary Metal Manufacturing	$0.4
312 - Beverage and Tobacco Product Manufacturing	$0.3
486 Pipeline Transportation	$0.3
517 - Telecommunications	$0.3
4247 Wholesale - Petroleum and Petroleum Products	$0.3
441 - Motor Vehicle and Parts Dealers	$0.3
512 - Motion Picture and Sound Recording Industries	$0.3
812 - Personal and Laundry Services	$0.3
339 - Miscellaneous Manufacturing	$0.3
213 - Support Activities for Mining	$0.3
711 - Performing Arts, Spectator Sports, and Related Industries	$0.2
453 - Miscellaneous Store Retailers	$0.2
335 - Electrical Equipment, Appliance, and Component Manufacturing	$0.2
442 - Furniture and Home Furnishings Stores	$0.1
448 - Clothing and Clothing Accessories Stores	$0.1
515 - Broadcasting (except Internet)	$0.1
452 - General Merchandise Stores	$0.1
337 - Furniture and Related Product Manufacturing	$0.1
443 - Electronics and Appliance Stores	$0.1
451 - Sporting Goods, Hobby, Musical Instrument, and Book Stores	$0.1
115 - Support Activities for Agriculture and Forestry	$0.1
4571 Gasoline stations	$0.1
313 - Textile Mills	$0.1
113 - Forestry and Logging	$0.1
446 - Health and Personal Care Stores	$0.04
314 - Textile Product Mills	$0.04
712 - Museums, Historical Sites, and Similar Institutions	$0.04
524 - Insurance Carriers and Related Activities	$0.03
316 - Leather and Allied Product Manufacturing	$0.02
315 - Apparel Manufacturing	$0.01
533 - Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	$0.01
114 - Fishing, Hunting and Trapping	$0.00
814 - Private Households	$0.00
9B - Administrative Government	$0.00
Total Purchases	**$9,113.2**

* Oil and gas upstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-3
Purchases from California Midstream Operations by Industry

Industry Sector	$ millions
32411 Petroleum Refineries	$5,321.9
484 - Truck Transportation	$2,344.3
23 - Construction	$1,514.8
9A - Government Enterprises	$869.4
2212 Natural Gas Distribution	$833.3
481 - Air Transportation	$401.7
42 - Wholesale Trade	$277.7
22 Utilities	$261.0
531 - Real Estate	$241.4
561 - Administrative and Support Services	$182.6
521 - Monetary Authorities-Central Bank	$181.7
485 - Transit and Ground Passenger Transportation	$180.4
492 - Couriers and Messengers	$174.9
211 Oil and Gas Extraction	$165.3
722 - Food Services and Drinking Places	$152.3
523 - Securities, Commodity Contracts, and Other Financial Investments and Related Activities	$134.4
325 - Chemical Manufacturing	$131.7
482 - Rail Transportation	$125.1
483 - Water Transportation	$118.2
541 - Professional, Scientific, and Technical Services	$111.4
487 - Scenic and Sightseeing Transportation	$98.5
532 - Rental and Leasing Services	$66.3
311 - Food Manufacturing	$62.3
518 - Data Processing, Hosting, and Related Services	$58.3
112 - Animal Production and Aquaculture	$51.7
622 - Hospitals	$47.5
111 - Crop Production	$45.9
813 - Religious, Grantmaking, Civic, Professional, and Similar Organizations	$45.8
324 - Petroleum and Coal Products Manufacturing	$43.6
326 - Plastics and Rubber Products Manufacturing	$41.2
327 - Nonmetallic Mineral Product Manufacturing	$38.3
212 - Mining (except Oil and Gas)	$36.3
519 - Other Information Services	$34.2
551 - Management of Companies and Enterprises	$33.3
522 - Credit Intermediation and Related Activities	$31.8
562 - Waste Management and Remediation Services	$29.9
525 - Funds, Trusts, and Other Financial Vehicles	$28.9
336 - Transportation Equipment Manufacturing	$28.0
721 - Accommodation	$26.7
621 - Ambulatory Health Care Services	$24.6
334 - Computer and Electronic Product Manufacturing	$24.2
333 - Machinery Manufacturing	$23.2
339 - Miscellaneous Manufacturing	$23.0
335 - Electrical Equipment, Appliance, and Component Manufacturing	$22.1
611 - Educational Services	$20.5
811 - Repair and Maintenance	$19.9
213112 Support Activities for Oil and Gas Operations	$19.3
312 - Beverage and Tobacco Product Manufacturing	$19.3
332 - Fabricated Metal Product Manufacturing	$19.2
213 - Support Activities for Mining	$18.6
445 - Food and Beverage Stores	$16.9
624 - Social Assistance	$16.8
323 - Printing and Related Support Activities	$16.3
623 - Nursing and Residential Care Facilities	$15.1
321 - Wood Product Manufacturing	$15.1
322 - Paper Manufacturing	$15.0
493 - Warehousing and Storage	$14.5
324191 Petroleum Lubricating Oil and Grease Manufacturing	$14.0
713 - Amusement, Gambling, and Recreation Industries	$13.3
454 - Nonstore Retailers	$12.3
337 - Furniture and Related Product Manufacturing	$12.1
517 - Telecommunications	$11.8
331 - Primary Metal Manufacturing	$11.4
Midstream Industry Segment	$11.2
444 - Building Material and Garden Equipment and Supplies Dealers	$11.1
213111 Drilling Oil and Gas Wells	$11.0
511 - Publishing Industries (except Internet)	$10.2
512 - Motion Picture and Sound Recording Industries	$9.0
452 - General Merchandise Stores	$8.1
448 - Clothing and Clothing Accessories Stores	$7.2
812 - Personal and Laundry Services	$7.1
441 - Motor Vehicle and Parts Dealers	$7.0
711 - Performing Arts, Spectator Sports, and Related Industries	$6.3
32511 Petrochemical Manufacturing	$5.3
316 - Leather and Allied Product Manufacturing	$4.8
115 - Support Activities for Agriculture and Forestry	$4.2
453 - Miscellaneous Store Retailers	$4.1
315 - Apparel Manufacturing	$3.2
442 - Furniture and Home Furnishings Stores	$2.9
4571 Gasoline stations	$2.6
313 - Textile Mills	$2.5
443 - Electronics and Appliance Stores	$2.3
451 - Sporting Goods, Hobby, Musical Instrument, and Book Stores	$2.34
113 - Forestry and Logging	$2.09
314 - Textile Product Mills	$1.88
515 - Broadcasting (except Internet)	$1.52
524 - Insurance Carriers and Related Activities	$1.38
446 - Health and Personal Care Stores	$0.95
712 - Museums, Historical Sites, and Similar Institutions	$0.44
533 - Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	$0.19
114 - Fishing, Hunting and Trapping	$0.12
333132 Oil and Gas Field Machinery and Equipment Manufacturing	$0.10
814 - Private Households	$0.00
9B - Administrative Government	$0.00
Total Purchases	**$15,121.6**

* Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-4
Purchases from California Downstream Operations by Industry

Industry Sector	$ millions
484 - Truck Transportation	$6,639.2
Downstream Industry Segment	$5,313.5
23 - Construction	$3,904.8
481 - Air Transportation	$3,819.5
9A - Government Enterprises	$3,052.2
325 - Chemical Manufacturing	$2,539.7
42 - Wholesale Trade	$866.8
492 - Couriers and Messengers	$768.0
22 Utilities	$727.3
531 - Real Estate	$717.1
561 - Administrative and Support Services	$680.3
722 - Food Services and Drinking Places	$599.7
521 - Monetary Authorities-Central Bank	$555.4
485 - Transit and Ground Passenger Transportation	$514.3
482 - Rail Transportation	$470.6
523 - Securities, Commodity Contracts, and Other Financial Investments and Related Activities	$467.3
483 - Water Transportation	$431.2
541 - Professional, Scientific, and Technical Services	$425.0
324 - Petroleum and Coal Products Manufacturing	$398.9
211 Oil and Gas Extraction	$395.8
622 - Hospitals	$390.7
813 - Religious, Grantmaking, Civic, Professional, and Similar Organizations	$378.7
487 - Scenic and Sightseeing Transportation	$359.2
311 - Food Manufacturing	$309.9
562 - Waste Management and Remediation Services	$195.1
112 - Animal Production and Aquaculture	$189.8
333 - Machinery Manufacturing	$186.4
811 - Repair and Maintenance	$182.6
532 - Rental and Leasing Services	$175.6
111 - Crop Production	$170.7
518 - Data Processing, Hosting, and Related Services	$167.5
326 - Plastics and Rubber Products Manufacturing	$167.3
551 - Management of Companies and Enterprises	$159.8
327 - Nonmetallic Mineral Product Manufacturing	$135.2
335 - Electrical Equipment, Appliance, and Component Manufacturing	$124.1
212 - Mining (except Oil and Gas)	$122.1
721 - Accommodation	$113.5
611 - Educational Services	$112.7
323 - Printing and Related Support Activities	$111.4
621 - Ambulatory Health Care Services	$110.7
522 - Credit Intermediation and Related Activities	$110.6
519 - Other Information Services	$108.2
334 - Computer and Electronic Product Manufacturing	$105.0
312 - Beverage and Tobacco Product Manufacturing	$103.8
339 - Miscellaneous Manufacturing	$98.9
624 - Social Assistance	$97.4
322 - Paper Manufacturing	$91.8
331 - Primary Metal Manufacturing	$84.2
713 - Amusement, Gambling, and Recreation Industries	$81.7
525 - Funds, Trusts, and Other Financial Vehicles	$79.0
332 - Fabricated Metal Product Manufacturing	$76.9
445 - Food and Beverage Stores	$73.3
213112 Support Activities for Oil and Gas Operations	$71.7
623 - Nursing and Residential Care Facilities	$70.9
321 - Wood Product Manufacturing	$60.3
213 - Support Activities for Mining	$56.3
493 - Warehousing and Storage	$50.6
336 - Transportation Equipment Manufacturing	$49.6
454 - Nonstore Retailers	$48.7
444 - Building Material and Garden Equipment and Supplies Dealers	$48.4
213111 Drilling Oil and Gas Wells	$43.8
511 - Publishing Industries (except Internet)	$38.6
441 - Motor Vehicle and Parts Dealers	$32.5
517 - Telecommunications	$30.9
2212 Natural Gas Distribution	$30.5
512 - Motion Picture and Sound Recording Industries	$28.7
4247 Wholesale - Petroleum and Petroleum Products	$28.5
812 - Personal and Laundry Services	$27.2
337 - Furniture and Related Product Manufacturing	$25.5
711 - Performing Arts, Spectator Sports, and Related Industries	$25.0
448 - Clothing and Clothing Accessories Stores	$21.1
453 - Miscellaneous Store Retailers	$20.6
442 - Furniture and Home Furnishings Stores	$14.5
452 - General Merchandise Stores	$12.8
443 - Electronics and Appliance Stores	$11.7
451 - Sporting Goods, Hobby, Musical Instrument, and Book Stores	$11.7
115 - Support Activities for Agriculture and Forestry	$10.0
4571 Gasoline stations	$9.3
313 - Textile Mills	$9.2
515 - Broadcasting (except Internet)	$6.4
113 - Forestry and Logging	$6.1
446 - Health and Personal Care Stores	$5.5
486 Pipeline Transportation	$5.38
314 - Textile Product Mills	$4.39
712 - Museums, Historical Sites, and Similar Institutions	$3.68
524 - Insurance Carriers and Related Activities	$3.57
316 - Leather and Allied Product Manufacturing	$2.02
315 - Apparel Manufacturing	$0.96
533 - Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	$0.56
114 - Fishing, Hunting and Trapping	$0.27
333132 Oil and Gas Field Machinery and Equipment Manufacturing	$0.25
814 - Private Households	$0.00
9B - Administrative Government	$0.00
Total Purchases	**$39,187.9**

* Oil and gas downstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-5
Purchases from California Market Operations by Industry

Industry Sector	$ millions
531 - Real Estate	$3,673.1
484 - Truck Transportation	$1,729.9
32411 Petroleum Refineries	$1,015.0
325 - Chemical Manufacturing	$568.4
311 - Food Manufacturing	$301.0
611 - Educational Services	$252.0
9A - Government Enterprises	$240.0
327 - Nonmetallic Mineral Product Manufacturing	$180.2
722 - Food Services and Drinking Places	$163.0
525 - Funds, Trusts, and Other Financial Vehicles	$143.8
485 - Transit and Ground Passenger Transportation	$126.2
332 - Fabricated Metal Product Manufacturing	$111.4
334 - Computer and Electronic Product Manufacturing	$100.6
532 - Rental and Leasing Services	$97.9
813 - Religious, Grantmaking, Civic, Professional, and Similar Organizations	$88.3
622 - Hospitals	$84.2
42 - Wholesale Trade	$79.7
23 - Construction	$74.9
336 - Transportation Equipment Manufacturing	$73.4
111 - Crop Production	$67.6
486 Pipeline Transportation	$66.4
492 - Couriers and Messengers	$61.1
112 - Animal Production and Aquaculture	$59.8
331 - Primary Metal Manufacturing	$59.7
Utilities	$59.5
211 Oil and Gas Extraction	$55.3
312 - Beverage and Tobacco Product Manufacturing	$52.1
521 - Monetary Authorities-Central Bank	$51.9
322 - Paper Manufacturing	$48.5
326 - Plastics and Rubber Products Manufacturing	$41.8
561 - Administrative and Support Services	$41.5
487 - Scenic and Sightseeing Transportation	$40.8
811 - Repair and Maintenance	$39.5
721 - Accommodation	$33.8
551 - Management of Companies and Enterprises	$32.8
32511 Petrochemical Manufacturing	$30.7
339 - Miscellaneous Manufacturing	$30.6
335 - Electrical Equipment, Appliance, and Component Manufacturing	$30.6
333 - Machinery Manufacturing	$28.8
541 - Professional, Scientific, and Technical Services	$28.1
321 - Wood Product Manufacturing	$25.2
213 - Support Activities for Mining	$23.9
212 - Mining (except Oil and Gas)	$17.4
313 - Textile Mills	$16.9
621 - Ambulatory Health Care Services	$16.6
624 - Social Assistance	$16.6
Market Industry Segment	$14.7
493 - Warehousing and Storage	$14.5
562 - Waste Management and Remediation Services	$14.2
337 - Furniture and Related Product Manufacturing	$13.8
623 - Nursing and Residential Care Facilities	$13.4
441 - Motor Vehicle and Parts Dealers	$13.2
482 - Rail Transportation	$13.1
445 - Food and Beverage Stores	$12.2
444 - Building Material and Garden Equipment and Supplies Dealers	$11.4
713 - Amusement, Gambling, and Recreation Industries	$8.2
323 - Printing and Related Support Activities	$8.0
483 - Water Transportation	$7.5
481 - Air Transportation	$7.5
812 - Personal and Laundry Services	$7.5
324 - Petroleum and Coal Products Manufacturing	$7.3
511 - Publishing Industries (except Internet)	$7.2
523 - Securities, Commodity Contracts, and Other Financial Investments and Related Activities	$6.1
453 - Miscellaneous Store Retailers	$6.0
454 - Nonstore Retailers	$5.9
524 - Insurance Carriers and Related Activities	$5.5
512 - Motion Picture and Sound Recording Industries	$5.0
448 - Clothing and Clothing Accessories Stores	$4.3
711 - Performing Arts, Spectator Sports, and Related Industries	$4.3
442 - Furniture and Home Furnishings Stores	$4.2
4247 Wholesale - Petroleum and Petroleum Products	$4.1
519 - Other Information Services	$4.0
452 - General Merchandise Stores	$3.9
315 - Apparel Manufacturing	$3.6
314 - Textile Product Mills	$3.5
443 - Electronics and Appliance Stores	$3.4
451 - Sporting Goods, Hobby, Musical Instrument, and Book Stores	$3.4
115 - Support Activities for Agriculture and Forestry	$2.5
517 - Telecommunications	$2.5
522 - Credit Intermediation and Related Activities	$2.4
324191 Petroleum Lubricating Oil and Grease Manufacturing	$1.6
515 - Broadcasting (except Internet)	$1.4
518 - Data Processing, Hosting, and Related Services	$1.29
446 - Health and Personal Care Stores	$1.23
712 - Museums, Historical Sites, and Similar Institutions	$1.02
113 - Forestry and Logging	$0.38
333132 Oil and Gas Field Machinery and Equipment Manufacturing	$0.37
213111 Drilling Oil and Gas Wells	$0.23
533 - Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	$0.09
114 - Fishing, Hunting and Trapping	$0.08
213112 Support Activities for Oil and Gas Operations	$0.00
316 - Leather and Allied Product Manufacturing	$0.00
814 - Private Households	$0.00
9B - Administrative Government	$0.00
Total Purchases	**$10,436.9**

* Oil and gas market industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-6
All Industries by Inputs of Upstream Products as a Percentage of Output

Industry Sector	Inputs as % of Output
32411 Petroleum Refineries	6.207%
2212 Natural Gas Distribution	1.183%
22 Upstream	0.669%
324191 Petroleum Lubricating Oil and Grease Manufacturing	0.417%
22 Utilities	0.328%
324 - Petroleum and Coal Products Manufacturing	0.280%
9A - Government Enterprises	0.259%
32511 Petrochemical Manufacturing	0.184%
481 - Air Transportation	0.110%
484 - Truck Transportation	0.103%
482 - Rail Transportation	0.098%
483 - Water Transportation	0.081%
212 - Mining (except Oil and Gas)	0.034%
492 - Couriers and Messengers	0.029%
485 - Transit and Ground Passenger Transportation	0.025%
487 - Scenic and Sightseeing Transportation	0.020%
562 - Waste Management and Remediation Services	0.015%
23 - Construction	0.014%
323 - Printing and Related Support Activities	0.013%
486 Pipeline Transportation	0.013%
325 - Chemical Manufacturing	0.012%
112 - Animal Production and Aquaculture	0.011%
213 - Support Activities for Mining	0.009%
327 - Nonmetallic Mineral Product Manufacturing	0.008%
322 - Paper Manufacturing	0.007%
813 - Religious, Grantmaking, Civic, Professional, and Similar Organizations	0.007%
521 - Monetary Authorities-Central Bank	0.006%
111 - Crop Production	0.006%
532 - Rental and Leasing Services	0.005%
523 - Securities, Commodity Contracts, and Other Financial Investments and Related Activities	0.005%
333 - Machinery Manufacturing	0.005%
321 - Wood Product Manufacturing	0.005%
113 - Forestry and Logging	0.004%
622 - Hospitals	0.004%
326 - Plastics and Rubber Products Manufacturing	0.004%
713 - Amusement, Gambling, and Recreation Industries	0.004%
522 - Credit Intermediation and Related Activities	0.004%
313 - Textile Mills	0.004%
722 - Food Services and Drinking Places	0.003%
721 - Accommodation	0.003%
525 - Funds, Trusts, and Other Financial Vehicles	0.003%
561 - Administrative and Support Services	0.003%
42 - Wholesale Trade	0.003%
331 - Primary Metal Manufacturing	0.003%
611 - Educational Services	0.003%
811 - Repair and Maintenance	0.003%
316 - Leather and Allied Product Manufacturing	0.002%
551 - Management of Companies and Enterprises	0.002%
712 - Museums, Historical Sites, and Similar Institutions	0.002%
444 - Building Material and Garden Equipment and Supplies Dealers	0.002%
518 - Data Processing, Hosting, and Related Services	0.002%
332 - Fabricated Metal Product Manufacturing	0.002%
623 - Nursing and Residential Care Facilities	0.002%
445 - Food and Beverage Stores	0.002%
314 - Textile Product Mills	0.002%
441 - Motor Vehicle and Parts Dealers	0.002%
493 - Warehousing and Storage	0.002%
624 - Social Assistance	0.002%
812 - Personal and Laundry Services	0.001%
337 - Furniture and Related Product Manufacturing	0.001%
335 - Electrical Equipment, Appliance, and Component Manufacturing	0.001%
442 - Furniture and Home Furnishings Stores	0.001%
443 - Electronics and Appliance Stores	0.001%
451 - Sporting Goods, Hobby, Musical Instrument, and Book Stores	0.001%
453 - Miscellaneous Store Retailers	0.001%
311 - Food Manufacturing	0.001%
312 - Beverage and Tobacco Product Manufacturing	0.001%
531 - Real Estate	0.001%
4247 Wholesale - Petroleum and Petroleum Products	0.001%
339 - Miscellaneous Manufacturing	0.001%
454 - Nonstore Retailers	0.001%
336 - Transportation Equipment Manufacturing	0.001%
114 - Fishing, Hunting and Trapping	0.001%
517 - Telecommunications	0.001%
541 - Professional, Scientific, and Technical Services	0.001%
115 - Support Activities for Agriculture and Forestry	0.001%
519 - Other Information Services	0.001%
4571 Gasoline stations	0.001%
448 - Clothing and Clothing Accessories Stores	0.000%
711 - Performing Arts, Spectator Sports, and Related Industries	0.000%
511 - Publishing Industries (except Internet)	0.000%
621 - Ambulatory Health Care Services	0.000%
452 - General Merchandise Stores	0.000%
512 - Motion Picture and Sound Recording Industries	0.000%
334 - Computer and Electronic Product Manufacturing	0.000%
446 - Health and Personal Care Stores	0.000%
315 - Apparel Manufacturing	0.000%
515 - Broadcasting (except Internet)	0.000%
533 - Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	0.000%
524 - Insurance Carriers and Related Activities	0.000%
814 - Private Households	0.000%
9B - Administrative Government	0.000%
Average of All Industries	**0.153%**

* Oil and gas upstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-7
All Industries by Inputs of Midstream Products as a Percentage of Output

Industry Sector	Inputs as % of Output
32411 Petroleum Refineries	4.285%
484 - Truck Transportation	3.691%
482 - Rail Transportation	2.644%
324 - Petroleum and Coal Products Manufacturing	2.611%
483 - Water Transportation	2.236%
2212 Natural Gas Distribution	1.501%
324191 Petroleum Lubricating Oil and Grease Manufacturing	1.267%
481 - Air Transportation	1.171%
211 Oil and Gas Extraction	1.140%
9A - Government Enterprises	1.017%
485 - Transit and Ground Passenger Transportation	0.907%
212 - Mining (except Oil and Gas)	0.863%
213112 Support Activities for Oil and Gas Operations	0.754%
22 Utilities	0.714%
492 - Couriers and Messengers	0.662%
316 - Leather and Allied Product Manufacturing	0.650%
213 - Support Activities for Mining	0.630%
213111 Drilling Oil and Gas Wells	0.584%
23 - Construction	0.584%
487 - Scenic and Sightseeing Transportation	0.556%
32511 Petrochemical Manufacturing	0.398%
112 - Animal Production and Aquaculture	0.300%
327 - Nonmetallic Mineral Product Manufacturing	0.275%
532 - Rental and Leasing Services	0.208%
326 - Plastics and Rubber Products Manufacturing	0.204%
521 - Monetary Authorities-Central Bank	0.203%
323 - Printing and Related Support Activities	0.194%
562 - Waste Management and Remediation Services	0.169%
335 - Electrical Equipment, Appliance, and Component Manufacturing	0.154%
111 - Crop Production	0.154%
113 - Forestry and Logging	0.142%
337 - Furniture and Related Product Manufacturing	0.142%
523 - Securities, Commodity Contracts, and Other Financial Investments and Related Activities	0.139%
313 - Textile Mills	0.133%
321 - Wood Product Manufacturing	0.132%
325 - Chemical Manufacturing	0.121%
525 - Funds, Trusts, and Other Financial Vehicles	0.119%
322 - Paper Manufacturing	0.119%
522 - Credit Intermediation and Related Activities	0.111%
561 - Administrative and Support Services	0.097%
42 - Wholesale Trade	0.090%
722 - Food Services and Drinking Places	0.083%
721 - Accommodation	0.083%
813 - Religious, Grantmaking, Civic, Professional, and Similar Organizations	0.083%
331 - Primary Metal Manufacturing	0.082%
314 - Textile Product Mills	0.076%
339 - Miscellaneous Manufacturing	0.068%
518 - Data Processing, Hosting, and Related Services	0.067%
713 - Amusement, Gambling, and Recreation Industries	0.063%
333 - Machinery Manufacturing	0.061%
312 - Beverage and Tobacco Product Manufacturing	0.059%
311 - Food Manufacturing	0.059%
611 - Educational Services	0.050%
623 - Nursing and Residential Care Facilities	0.049%
622 - Hospitals	0.049%
332 - Fabricated Metal Product Manufacturing	0.048%
315 - Apparel Manufacturing	0.047%
444 - Building Material and Garden Equipment and Supplies Dealers	0.046%
493 - Warehousing and Storage	0.045%
551 - Management of Companies and Enterprises	0.043%
445 - Food and Beverage Stores	0.042%
531 - Real Estate	0.040%
441 - Motor Vehicle and Parts Dealers	0.040%
812 - Personal and Laundry Services	0.038%
114 - Fishing, Hunting and Trapping	0.033%
624 - Social Assistance	0.032%
811 - Repair and Maintenance	0.030%
336 - Transportation Equipment Manufacturing	0.029%
Midstream	0.028%
115 - Support Activities for Agriculture and Forestry	0.028%
712 - Museums, Historical Sites, and Similar Institutions	0.026%
442 - Furniture and Home Furnishings Stores	0.026%
333132 Oil and Gas Field Machinery and Equipment Manufacturing	0.026%
448 - Clothing and Clothing Accessories Stores	0.026%
443 - Electronics and Appliance Stores	0.026%
452 - General Merchandise Stores	0.026%
451 - Sporting Goods, Hobby, Musical Instrument, and Book Stores	0.025%
517 - Telecommunications	0.024%
453 - Miscellaneous Store Retailers	0.024%
454 - Nonstore Retailers	0.020%
519 - Other Information Services	0.019%
541 - Professional, Scientific, and Technical Services	0.018%
4571 Gasoline stations	0.018%
621 - Ambulatory Health Care Services	0.015%
711 - Performing Arts, Spectator Sports, and Related Industries	0.012%
511 - Publishing Industries (except Internet)	0.012%
512 - Motion Picture and Sound Recording Industries	0.011%
334 - Computer and Electronic Product Manufacturing	0.011%
446 - Health and Personal Care Stores	0.006%
533 - Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	0.002%
515 - Broadcasting (except Internet)	0.001%
524 - Insurance Carriers and Related Activities	0.001%
814 - Private Households	0.000%
9B - Administrative Government	0.000%
Total Purchases	**0.254%**

* Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-8
All Industries by Inputs of Downstream Products as a Percentage of Output

Industry Sector	Inputs as % of Output
324 - Petroleum and Coal Products Manufacturing	23.918%
481 - Air Transportation	11.134%
484 - Truck Transportation	10.454%
482 - Rail Transportation	9.945%
483 - Water Transportation	8.157%
Downstream Industry Segement	4.196%
9A - Government Enterprises	3.570%
212 - Mining (except Oil and Gas)	2.907%
492 - Couriers and Messengers	2.905%
213112 Support Activities for Oil and Gas Operations	2.795%
211 Oil and Gas Extraction	2.731%
485 - Transit and Ground Passenger Transportation	2.586%
325 - Chemical Manufacturing	2.329%
213111 Drilling Oil and Gas Wells	2.323%
487 - Scenic and Sightseeing Transportation	2.026%
22 Utilities	1.989%
213 - Support Activities for Mining	1.906%
23 - Construction	1.504%
323 - Printing and Related Support Activities	1.325%
562 - Waste Management and Remediation Services	1.104%
112 - Animal Production and Aquaculture	1.100%
327 - Nonmetallic Mineral Product Manufacturing	0.971%
335 - Electrical Equipment, Appliance, and Component Manufacturing	0.867%
326 - Plastics and Rubber Products Manufacturing	0.827%
322 - Paper Manufacturing	0.726%
813 - Religious, Grantmaking, Civic, Professional, and Similar Organizations	0.684%
521 - Monetary Authorities-Central Bank	0.622%
331 - Primary Metal Manufacturing	0.608%
111 - Crop Production	0.573%
532 - Rental and Leasing Services	0.551%
321 - Wood Product Manufacturing	0.526%
333 - Machinery Manufacturing	0.491%
313 - Textile Mills	0.489%
523 - Securities, Commodity Contracts, and Other Financial Investments and Related Activities	0.484%
113 - Forestry and Logging	0.416%
622 - Hospitals	0.400%
713 - Amusement, Gambling, and Recreation Industries	0.389%
522 - Credit Intermediation and Related Activities	0.384%
561 - Administrative and Support Services	0.361%
721 - Accommodation	0.353%
722 - Food Services and Drinking Places	0.328%
525 - Funds, Trusts, and Other Financial Vehicles	0.325%
312 - Beverage and Tobacco Product Manufacturing	0.316%
337 - Furniture and Related Product Manufacturing	0.298%
311 - Food Manufacturing	0.292%
339 - Miscellaneous Manufacturing	0.292%
42 - Wholesale Trade	0.280%
811 - Repair and Maintenance	0.278%
611 - Educational Services	0.277%
316 - Leather and Allied Product Manufacturing	0.275%
623 - Nursing and Residential Care Facilities	0.231%
712 - Museums, Historical Sites, and Similar Institutions	0.222%
486 Pipeline Transportation	0.209%
551 - Management of Companies and Enterprises	0.205%
444 - Building Material and Garden Equipment and Supplies Dealers	0.199%
332 - Fabricated Metal Product Manufacturing	0.193%
518 - Data Processing, Hosting, and Related Services	0.192%
441 - Motor Vehicle and Parts Dealers	0.187%
624 - Social Assistance	0.185%
445 - Food and Beverage Stores	0.182%
314 - Textile Product Mills	0.178%
493 - Warehousing and Storage	0.155%
812 - Personal and Laundry Services	0.144%
442 - Furniture and Home Furnishings Stores	0.130%
443 - Electronics and Appliance Stores	0.129%
451 - Sporting Goods, Hobby, Musical Instrument, and Book Stores	0.123%
453 - Miscellaneous Store Retailers	0.120%
531 - Real Estate	0.119%
454 - Nonstore Retailers	0.078%
4247 Wholesale - Petroleum and Petroleum Products	0.077%
448 - Clothing and Clothing Accessories Stores	0.076%
114 - Fishing, Hunting and Trapping	0.075%
541 - Professional, Scientific, and Technical Services	0.068%
333132 Oil and Gas Field Machinery and Equipment Manufacturing	0.068%
115 - Support Activities for Agriculture and Forestry	0.067%
621 - Ambulatory Health Care Services	0.066%
4571 Gasoline stations	0.065%
517 - Telecommunications	0.063%
519 - Other Information Services	0.060%
2212 Natural Gas Distribution	0.055%
336 - Transportation Equipment Manufacturing	0.052%
334 - Computer and Electronic Product Manufacturing	0.048%
711 - Performing Arts, Spectator Sports, and Related Industries	0.048%
511 - Publishing Industries (except Internet)	0.043%
452 - General Merchandise Stores	0.040%
512 - Motion Picture and Sound Recording Industries	0.036%
446 - Health and Personal Care Stores	0.033%
315 - Apparel Manufacturing	0.014%
515 - Broadcasting (except Internet)	0.006%
533 - Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	0.005%
524 - Insurance Carriers and Related Activities	0.003%
814 - Private Households	0.000%
9B - Administrative Government	0.000%
Total Purchases	**0.658%**

* Oil and gas downstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-9
All Industries by Inputs of Market Products as a Percentage of Output

Industry Sector	Inputs as % of Output
484 - Truck Transportation	2.724%
486 Pipeline Transportation	2.582%
32511 Petrochemical Manufacturing	2.301%
327 - Nonmetallic Mineral Product Manufacturing	1.295%
313 - Textile Mills	0.897%
32411 Petroleum Refineries	0.817%
213 - Support Activities for Mining	0.809%
485 - Transit and Ground Passenger Transportation	0.634%
611 - Educational Services	0.620%
531 - Real Estate	0.611%
525 - Funds, Trusts, and Other Financial Vehicles	0.591%
325 - Chemical Manufacturing	0.521%
324 - Petroleum and Coal Products Manufacturing	0.439%
331 - Primary Metal Manufacturing	0.432%
212 - Mining (except Oil and Gas)	0.414%
322 - Paper Manufacturing	0.384%
211 Oil and Gas Extraction	0.382%
112 - Animal Production and Aquaculture	0.347%
532 - Rental and Leasing Services	0.307%
311 - Food Manufacturing	0.284%
9A - Government Enterprises	0.281%
332 - Fabricated Metal Product Manufacturing	0.279%
482 - Rail Transportation	0.277%
492 - Couriers and Messengers	0.231%
487 - Scenic and Sightseeing Transportation	0.230%
111 - Crop Production	0.227%
321 - Wood Product Manufacturing	0.219%
335 - Electrical Equipment, Appliance, and Component Manufacturing	0.214%
326 - Plastics and Rubber Products Manufacturing	0.207%
Utilities	0.163%
337 - Furniture and Related Product Manufacturing	0.161%
813 - Religious, Grantmaking, Civic, Professional, and Similar Organizations	0.160%
312 - Beverage and Tobacco Product Manufacturing	0.159%
324191 Petroleum Lubricating Oil and Grease Manufacturing	0.144%
314 - Textile Product Mills	0.143%
483 - Water Transportation	0.142%
721 - Accommodation	0.105%
333132 Oil and Gas Field Machinery and Equipment Manufacturing	0.099%
323 - Printing and Related Support Activities	0.096%
339 - Miscellaneous Manufacturing	0.090%
722 - Food Services and Drinking Places	0.089%
622 - Hospitals	0.086%
562 - Waste Management and Remediation Services	0.080%
336 - Transportation Equipment Manufacturing	0.077%
333 - Machinery Manufacturing	0.076%
441 - Motor Vehicle and Parts Dealers	0.076%
712 - Museums, Historical Sites, and Similar Institutions	0.061%
811 - Repair and Maintenance	0.060%
521 - Monetary Authorities-Central Bank	0.058%
315 - Apparel Manufacturing	0.053%
444 - Building Material and Garden Equipment and Supplies Dealers	0.047%
334 - Computer and Electronic Product Manufacturing	0.046%
493 - Warehousing and Storage	0.045%
623 - Nursing and Residential Care Facilities	0.044%
551 - Management of Companies and Enterprises	0.042%
812 - Personal and Laundry Services	0.040%
713 - Amusement, Gambling, and Recreation Industries	0.039%
442 - Furniture and Home Furnishings Stores	0.038%
443 - Electronics and Appliance Stores	0.038%
451 - Sporting Goods, Hobby, Musical Instrument, and Book Stores	0.036%
453 - Miscellaneous Store Retailers	0.035%
624 - Social Assistance	0.032%
445 - Food and Beverage Stores	0.030%
23 - Construction	0.029%
113 - Forestry and Logging	0.026%
42 - Wholesale Trade	0.026%
114 - Fishing, Hunting and Trapping	0.022%
561 - Administrative and Support Services	0.022%
481 - Air Transportation	0.022%
Market	0.021%
115 - Support Activities for Agriculture and Forestry	0.017%
448 - Clothing and Clothing Accessories Stores	0.015%
452 - General Merchandise Stores	0.012%
213111 Drilling Oil and Gas Wells	0.012%
4247 Wholesale - Petroleum and Petroleum Products	0.011%
621 - Ambulatory Health Care Services	0.010%
454 - Nonstore Retailers	0.009%
522 - Credit Intermediation and Related Activities	0.008%
511 - Publishing Industries (except Internet)	0.008%
711 - Performing Arts, Spectator Sports, and Related Industries	0.008%
446 - Health and Personal Care Stores	0.007%
512 - Motion Picture and Sound Recording Industries	0.006%
523 - Securities, Commodity Contracts, and Other Financial Investments and Related Activities	0.006%
517 - Telecommunications	0.005%
524 - Insurance Carriers and Related Activities	0.005%
541 - Professional, Scientific, and Technical Services	0.004%
519 - Other Information Services	0.002%
518 - Data Processing, Hosting, and Related Services	0.001%
515 - Broadcasting (except Internet)	0.001%
533 - Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	0.001%
316 - Leather and Allied Product Manufacturing	0.000%
213112 Support Activities for Oil and Gas Operations	0.000%
814 - Private Households	0.000%
9B - Administrative Government	0.000%
Total Purchases	**0.175%**

* Oil and gas market industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
Source: IMPLAN Data for California; Analysis by LAEDC

South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) consists of the four counties of Los Angeles, Orange, Riverside and San Bernardino.

Exhibit A-10
SCAQMD

Source: ESRI

Exhibit A-11
Direct Employment of Oil and Gas Industry – SCAQMD Region 2022*

		Employment
Upstream		**7,350**
211	Oil and gas extraction	4,350
213111	Drilling oil and gas wells	820
213112	Support activities for oil and gas operations	1,830
333132	Oil and gas field machinery and eqpmt mfg.	350
Midstream		**10,120**
23712	Oil and gas pipeline construction	5,310
4247	Petroleum and petroleum prods wholesalers	3,550
486	Pipeline transportation	1,260
Downstream		**5,140**
32411	Petroleum refineries	4,580
324191	Petroleum lubricating oil and grease mfg.	540
32511	Petrochemical manufacturing	20
Market		**34,700**
2212	Natural gas distribution	11,820
4571	Gasoline stations	22,190
45721	Fuel dealers	690
TOTAL DIRECT EMPLOYMENT		**57,310**
Percent of California O&G Industry Employment		*38.7%*

* Includes royalty owners as proprietors

Exhibit A-12
Backward Linkages: Oil and Gas Industry Total Economic and Fiscal Contribution – SCAQMD Region 2022*

ECONOMIC CONTRIBUTION	Employment	Labor Income ($ millions)	Value Added ($ millions)	Output ($ millions)
Direct	57,299	$8,549	$44,312	$107,507
Indirect	102,066	8,863	13,245	22,506
Induced	78,410	5,455	9,598	15,344
TOTAL CONTRIBUTION	**237,775**	**$22,867**	**$67,154**	**$145,357**
Percent of Total CA O&G Industry Contribution	*44.30%*	*42.85%*	*40.44%*	*43.01%*
Percent of Region Total	*2.08%*	*2.62%*	*4.62%*	*5.87%*

FISCAL CONTRIBUTION	State and Local ($ millions)	Federal ($ millions)	Total ($ millions)
Personal income taxes	976	2,756	3,732
Social insurance	99	2,224	2,323
Sales and excise taxes	7,864	306	8,170
Property taxes	6,321	0	6,321
Corporate profits taxes	1,168	1,168	2,335
Special Assessments	225	0	225
Other taxes	1,155	0	1,155
Fees, fines and permits	175	340	516
TOTAL TAX REVENUES	**17,983**	**6,794**	**24,776**

* Includes royalty owners as proprietors

Characteristics of the Industry Workforce in SCAQMD Region

Gender of Workforce

In the SCAQMD region, the oil and gas workforce is predominantly male, with 64.3 percent of workers being male compared to 35.7 percent female. This gender distribution is more imbalanced than the average across all industries, where the workforce is evenly split between males (49.3 percent) and females (50.7 percent).

Age of Workforce

The age distribution in the oil and gas workforce in the SCAQMD region reveals that workers aged 35–54 make up the largest group, comprising 46 percent of the workforce. Younger workers under 25 represent 8 percent, slightly below the regional average for all industries (11 percent). Workers aged 55 and above account for 39.1 percent, indicating an older workforce compared to other industries.

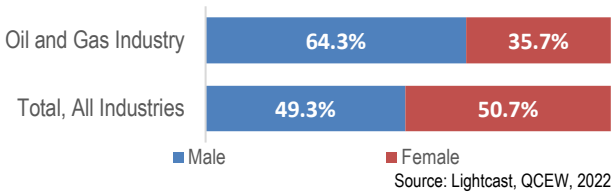
Race and Ethnicity in the Workforce

Hispanic or Latino workers are the largest ethnic group in the oil and gas workforce, making up 44.5 percent. This is slightly higher than their representation across all industries (41.2 percent). White workers represent 34.6 percent, while Asians make up 6.3 percent. Black workers comprise 11.8 percent, a higher representation than the 6.9 percent observed in all industries.

Educational Attainment of Workers

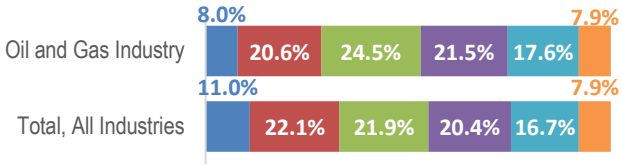
A notable portion of the oil and gas workforce in the SCAQMD region has attained some college or an associate degree (28.1 percent), slightly higher than the average for all industries (26.3 percent). Workers with a bachelor's degree or higher represent 23.5 percent, similar to the regional average. Meanwhile, 19.7 percent have less than a high school diploma, comparable to the total workforce in all industries.

Gender



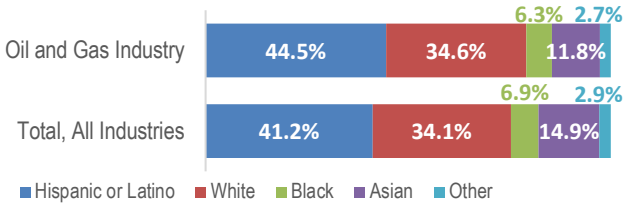
Source: Lightcast, QCEW, 2022

Age



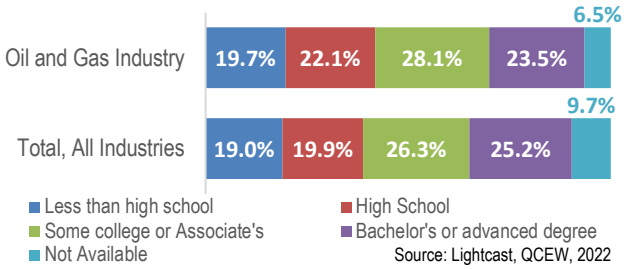
Source: Lightcast, QCEW, 2022

Race and Ethnicity



Source: Lightcast, QCEW, 2022

Educational Attainment



Source: Lightcast, QCEW, 2022

California Senate Districts

Jobs are at risk for individuals employed in major industries that depend on oil and gas products in their supply chain or rely on the outputs of industries connected to oil and gas. Exhibit A-5 presents employment data by Senate district for the California industry sectors most vulnerable due to their ties to the oil and gas industry: manufacturing, transportation and warehousing, utilities, and construction. The employment data for the mining, quarrying and oil & gas extraction industry are also presented. Additionally, the exhibit includes each district's total employment share from these sectors and the proportion of female workers in these five interconnected industries.

Exhibit A-18
California Senate Districts Oil & Gas Related Industry Employment

District	21 Mining, Quarrying and Oil & Gas Extraction	22 Utilities	23 Construction	31-33 Manufacturing	48-49 Transportation & Warehousing	% of Total Employment	% Female in Industry
Senate 1	389	6,117	35,255	26,627	13,086	18.92%	20.91%
Senate 2	460	4,227	36,311	33,394	12,309	19.35%	22.72%
Senate 3	394	5,052	35,949	40,491	20,490	21.43%	22.50%
Senate 4	514	5,341	34,327	28,318	20,011	19.82%	19.97%
Senate 5	346	3,397	38,639	44,540	33,585	26.98%	21.03%
Senate 6	314	5,690	31,880	26,105	25,790	18.32%	22.14%
Senate 7	578	5,715	33,910	40,891	18,928	19.40%	22.34%
Senate 8	367	5,851	30,740	27,922	21,435	19.55%	22.28%
Senate 9	296	3,476	32,431	32,974	29,428	18.27%	25.15%
Senate 10	179	2,507	26,304	87,834	23,782	25.70%	27.76%
Senate 11	51	3,336	19,779	30,025	27,117	13.76%	26.82%
Senate 12	291	3,420	33,398	37,748	20,805	24.12%	18.74%
Senate 13	255	2,074	23,224	55,368	20,338	18.99%	28.67%
Senate 14	1,625	1,897	19,015	25,340	16,525	18.54%	18.60%
Senate 15	230	1,629	29,166	80,753	13,738	25.38%	24.55%
Senate 16	8,639	4,037	30,132	24,264	21,535	22.21%	17.74%
Senate 17	526	5,146	37,335	40,745	14,406	20.70%	20.09%
Senate 18	175	1,955	38,896	38,545	22,570	21.25%	21.79%
Senate 19	1,022	2,375	30,384	39,144	14,594	19.01%	22.32%
Senate 20	340	3,913	38,276	44,093	52,078	30.86%	23.19%
Senate 21	623	4,204	33,784	37,328	30,382	26.08%	20.09%
Senate 22	295	4,449	27,179	47,838	27,047	24.13%	24.28%
Senate 23	336	4,634	37,109	29,579	33,833	23.92%	21.69%
Senate 24	145	1,442	34,329	36,976	21,705	20.19%	21.40%
Senate 25	282	4,661	23,107	29,711	18,988	16.19%	22.90%
Senate 26	177	1,649	13,903	32,520	16,228	12.58%	28.86%
Senate 27	358	2,190	28,272	41,323	15,150	17.93%	23.39%
Senate 28	241	3,955	37,574	28,873	18,118	20.69%	20.03%
Senate 29	310	3,437	27,806	55,238	22,052	23.10%	26.96%
Senate 30	41	1,763	27,936	34,525	27,858	20.10%	23.71%
Senate 31	186	3,596	44,886	48,106	39,108	29.13%	21.26%
Senate 32	183	4,140	27,541	50,228	32,729	25.23%	23.94%
Senate 33	415	2,546	30,783	53,853	38,795	29.15%	24.43%
Senate 34	452	2,176	32,156	61,574	18,595	24.93%	25.61%
Senate 35	320	1,997	29,452	46,827	44,868	27.53%	25.11%
Senate 36	358	2,596	29,188	52,837	13,347	20.48%	25.67%
Senate 37	459	2,352	26,694	58,532	15,410	19.27%	26.56%
Senate 38	135	4,752	38,250	43,952	16,634	22.19%	21.45%
Senate 39	172	3,213	18,854	49,238	15,232	16.74%	25.48%
Senate 40	199	3,905	31,432	32,536	21,740	21.66%	20.76%

Source: 2021 ACS 5-year estimates

California Assembly Districts

Jobs are at risk for individuals employed in major industries that depend on oil and gas products in their supply chain or rely on the outputs of industries connected to oil and gas. Exhibit A-8 presents employment data by assembly district for the California industry sectors most vulnerable due to their ties to the oil and gas industry: manufacturing, transportation and warehousing, utilities, and construction. The employment data for the mining, quarrying and oil & gas extraction industry are also presented. Additionally, the exhibit includes each district's total employment share from these sectors and the proportion of female workers in these five interconnected industries.

Exhibit A-19
California Assembly Districts Oil & Gas Related Industry Employment

District	21 Mining, Quarrying and Oil & Gas Extraction	22 Utilities	23 Construction	31-33 Manufacturing	48-49 Transportation & Warehousing	% of Total Employment	% Female in Industry
Assembly 1	240	2,840	17,808	10,064	6,674	19.39%	19.60%
Assembly 2	255	2,403	18,281	18,049	6,283	21.14%	22.61%
Assembly 3	342	2,663	14,331	14,639	7,860	19.55%	19.29%
Assembly 4	158	2,241	16,765	19,550	8,276	20.26%	22.68%
Assembly 5	269	2,697	17,609	12,480	6,294	20.50%	18.10%
Assembly 6	180	3,357	15,924	18,574	7,310	18.13%	23.61%
Assembly 7	101	2,722	18,576	11,922	13,144	18.75%	21.54%
Assembly 8	194	2,645	19,138	11,538	12,444	18.94%	19.38%
Assembly 9	175	3,013	15,149	15,848	12,359	20.24%	22.38%
Assembly 10	178	1,744	17,964	17,392	6,096	17.90%	22.36%
Assembly 11	325	2,566	21,917	17,652	14,147	23.02%	20.18%
Assembly 12	165	1,800	19,123	25,139	14,808	27.53%	21.98%
Assembly 13	158	1,519	17,925	19,794	18,429	26.56%	21.45%
Assembly 14	222	3,038	19,327	17,690	11,758	20.88%	21.05%
Assembly 15	187	1869	14830	13,557	12,588	15.89%	24.17%
Assembly 16	333	3,026	12,273	25,266	6,218	17.69%	26.69%
Assembly 17	25	1373	10115	16,063	12,173	13.01%	26.07%
Assembly 18	70	1,635	17,606	19,532	16,474	20.63%	26.12%
Assembly 19	26	1963	9856	14,044	15,046	14.56%	27.40%
Assembly 20	49	1319	15835	31,812	15,145	24.91%	26.22%
Assembly 21	106	1,744	17,934	22,869	14,055	28.76%	18.56%
Assembly 22	107	1,466	14,396	21,573	13,904	19.16%	27.52%
Assembly 23	91	2,688	13,982	12,439	12,313	17.50%	23.03%
Assembly 24	148	618	8,690	34,010	6,332	18.91%	30.01%
Assembly 25	158	1,140	10,485	56,433	8,688	26.85%	29.04%
Assembly 26	111	1,511	11,990	15,756	8,406	19.26%	19.89%
Assembly 27	114	868	19,378	37,789	8,810	27.34%	22.66%
Assembly 28	88	725	11389	41,550	5,264	23.36%	25.66%
Assembly 29	82	1,941	16,253	20,853	6,438	18.77%	20.01%
Assembly 30	150	2,122	19,363	19,871	7,993	21.89%	20.04%
Assembly 31	183	843	11,635	14,570	9,045	20.03%	21.17%
Assembly 32	1,773	890	9,003	10,421	8,713	18.33%	15.19%
Assembly 33	435	2,254	16,001	12,017	19,007	27.12%	18.91%
Assembly 34	7,818	2,602	16,625	10,897	12,298	22.96%	17.47%
Assembly 35	828	2,962	17,860	16,905	7,201	20.55%	21.56%
Assembly 36	601	1,736	18,239	20,989	11,735	27.35%	18.53%
Assembly 37	517	1,238	14,387	17,891	6,948	17.08%	22.14%
Assembly 38	159	2,454	14,434	22,863	8,514	20.11%	23.15%
Assembly 39	150	1,344	20,692	22,467	11,906	25.56%	21.82%
Assembly 40	79	2,114	15,187	15,036	19,293	22.99%	23.41%
Assembly 41	171	2,728	11,622	15,244	9,232	16.35%	23.12%
Assembly 42	122	2,044	17,007	9,900	11,120	20.51%	19.73%
Assembly 43	166	1417	10607	13,121	9,307	14.22%	22.58%
Assembly 44	128	1,074	12,937	23,491	6,753	19.72%	23.96%
Assembly 45	173	587	15,255	19,188	8,966	17.44%	22.19%
Assembly 46	21	652	19369	15,909	10,903	18.11%	22.21%
Assembly 47	154	1,776	19,347	19,682	30,306	32.51%	22.81%
Assembly 48	248	2,451	16,226	24,676	13,570	25.13%	22.82%

Assembly 49	80	2185	10384	20,181	12,252	20.91%	26.40%
Assembly 50	47	830	6998	11,135	6,288	9.54%	27.36%

Exhibit A-19 (Cont'd)

District	21 Mining, Quarrying and Oil & Gas Extraction	22 Utilities	23 Construction	31-33 Manufacturing	48-49 Transportation & Warehousing	% of Total Employment	% Female in Industry
Assembly 51	49	874	15,366	20,158	11,678	21.09%	22.50%
Assembly 52	186	2,137	18,929	24,411	21,772	29.29%	23.60%
Assembly 53	64	711	18,743	20,870	11,182	21.58%	20.82%
Assembly 54	36	830	9137	11,769	9,115	12.70%	25.36%
Assembly 55	157	2,202	12,305	25,478	11,148	21.54%	27.67%
Assembly 56	161	2,797	14,848	7,248	6,803	17.73%	18.53%
Assembly 57	91	2,210	14,050	26,223	14,994	25.94%	23.24%
Assembly 58	43	1,878	14,157	25,391	18,671	26.82%	23.62%
Assembly 59	20	610	19,083	25,077	18,054	29.60%	22.17%
Assembly 60	162	2,050	23,407	29,373	16,244	29.59%	21.65%
Assembly 61	24	1,546	21,479	18,733	22,864	28.63%	20.84%
Assembly 62	101	1,036	12,261	18,141	17,175	19.89%	26.24%
Assembly 63	129	1,244	16,554	27,070	19,559	30.78%	23.46%
Assembly 64	137	825	15,601	24,527	22,999	30.77%	24.41%
Assembly 65	100	1,395	14,245	28,948	11,408	24.15%	27.50%
Assembly 66	162	1014	10165	26,968	14,322	22.17%	28.15%
Assembly 67	261	2,185	23,546	19,723	11,899	24.52%	20.15%
Assembly 68	174	1,272	14,701	32,353	8,381	20.76%	26.22%
Assembly 69	176	795	19,758	31,093	9,145	26.23%	24.42%
Assembly 70	411	1,753	13,242	20,783	19,424	22.98%	27.03%
Assembly 71	175	2,461	21,656	16,912	9,307	22.62%	21.04%
Assembly 72	283	1,283	13,713	33,222	9,514	25.03%	26.18%
Assembly 73	308	1418	13260	24,970	6,402	18.62%	27.05%
Assembly 74	285	1080	11931	25,661	6,759	17.60%	26.81%
Assembly 75	38	2,097	20,025	23,436	8,497	23.11%	21.90%
Assembly 76	50	1,161	15,689	27,647	6,835	22.60%	24.40%
Assembly 77	85	1,835	8,430	33,910	6,467	20.33%	26.09%
Assembly 78	69	1569	10140	18,856	8,238	14.99%	24.51%
Assembly 79	66	1915	12912	19,763	10,954	18.52%	24.03%
Assembly 80	15	1192	18226	17,670	11,473	23.08%	19.34%

Source: 2021 ACS 5-year estimates

Total Forward Linkage Effects by Subregion

The total forward linkage effects of the oil and gas industries are evaluated for individual subregions, highlighting how changes in the supply of oil and gas products propagate through downstream sectors in the user chain. The exhibits below summarize the forward-linkage economic effects of a $1 billion disruption in the supply of oil and gas products by industry segment for each of the five subregions.

Across all five subregions, industries such as petroleum refineries and natural gas distribution consistently appear as top affected user industries in upstream and midstream product disruptions. Construction, truck transportation, professional, scientific, and technical services, and real estate are also consistently identified as top affected industries by disruptions in the oil and gas industry.

Construction: The construction industry relies heavily on products derived from petroleum and natural gas, such as asphalt, chemicals for cement, and synthetic building materials, including plastics. A disruption in the oil and gas industry, particularly in the upstream segment (oil extraction), reduces the availability of these critical inputs, which in turn negatively impacts construction activities. This sector is also sensitive to disruptions in fuel supplies for machinery and transportation, further linking it to the oil and gas supply chain.

Real Estate: Disruptions in the oil and gas industry can affect the availability of raw materials and fuel necessary for real estate developments. Many real estate projects depend on petroleum-derived products for construction, and disruptions in oil production can delay or increase the cost of development. Additionally, fluctuations in energy prices can impact the cost of operating buildings, further extend the supply-side impacts to the real estate industry.

Truck Transportation: Truck transportation is consistently affected by disruptions in the oil and gas industry, primarily due to its reliance on fuel derived from oil, especially diesel. A disruption in oil production can affect the availability and price of fuel, leading to higher operational costs for trucking companies or limiting their ability to operate efficiently. Furthermore, trucking plays an integral role in the broader supply chains of industries such as construction, manufacturing, and agriculture. Any slowdown or bottleneck in oil and gas production ripples through these industries, reducing the demand for transportation services in those sectors.

In terms of the magnitude of the supply-side output multipliers, the multipliers generally range from 1.3 to 2.7, reflecting the extent to which an initial disruption in the oil and gas industry reverberates through the economy across the user chains. Midstream product disruptions tend to show the highest multipliers, consistently above 2.0. This is likely because midstream industries, such as transportation, wholesale, and storage, serve as key intermediaries, connecting extraction and refinement to final markets. Consequently, any disruption in these industries creates significant ripple effects throughout sectors like transportation, construction, and real estate.

Upstream product disruptions tend to exhibit slightly lower multipliers compared to midstream disruptions. This is because upstream industries, which focus on oil and gas extraction, are often more specialized and have fewer linkages to other sectors than midstream industries. Disruptions in these specialized areas, while impactful, have a somewhat narrower economic linkage.

Downstream and market product disruptions typically show smaller multipliers, though not uniformly. For instance, the market products segment (which includes retail and direct sales) in the Central Coast subregion exhibits a relatively high multiplier (2.47), likely due to the combination of consumer goods and services that are strongly linked to both oil and gas industry products and local demand. This highlights that the specific characteristics of each subregion, including its industrial composition and reliance on specific types of oil and gas products, can influence the magnitude of economic impacts.

In general, subregions with higher multipliers, like Southern California and the San Francisco Bay Area, tend to have larger, more interconnected economies supported by a diverse range of service and infrastructure industries. These industries extend the economic impacts of oil and gas disruptions into various sectors. In contrast, regions like the San Joaquin Valley and Central Coast experience more localized and specialized effects, such as in agriculture, food manufacturing, and transportation. These regions rely more heavily on specific oil-dependent industries, and disruptions tend to have more concentrated effects in these key sectors.

Southern California Subregion

Exhibit A-20
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Upstream Products Disruption in Southern California Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
32411	Petroleum Refineries	$451.5
541	Professional, Scientific, and Technical Services	$124.6
42	Wholesale Trade	$69.8
23	Construction	$66.3
531	Real Estate	$66.2
561	Administrative and Support Services	$54.3
9A	Government Enterprises	$48.7
484	Truck Transportation	$43.8
621	Ambulatory Health Care Services	$43.3
2212	Natural Gas Distribution	$43.0
	Top 10	*$1,011.7*
	All Other Industries	*$704.3*
	Total Forward-linkage Effects[b]	$2,725.0
	Supply-Side Output Multiplier	2.725

[a] Oil and gas upstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas upstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-21
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Midstream Products Disruption in Southern California Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
32411	Petroleum Refineries	$176.7
541	Professional, Scientific, and Technical Services	$155.8
23	Construction	$116.3
484	Truck Transportation	$104.2
42	Wholesale Trade	$94.8
531	Real Estate	$90.4
561	Administrative and Support Services	$70.4
9A	Government Enterprises	$62.1
722	Food Services and Drinking Places	$54.4
621	Ambulatory Health Care Services	$53.5
	Top 10	*$978.7*
	All Other Industries	*$894.4*
	Total Forward-linkage Effects[b]	$2,875.0
	Supply-Side Output Multiplier	2.875

[a] Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas midstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-22
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Downstream Products Disruption in Southern California Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
541	Professional, Scientific, and Technical Services	$103.4
23	Construction	$76.9
484	Truck Transportation	$71.6
42	Wholesale Trade	$65.1
531	Real Estate	$59.6
561	Administrative and Support Services	$48.3
481	Air Transportation	$46.9
9A	Government Enterprises	$43.6
722	Food Services and Drinking Places	$37.4
621	Ambulatory Health Care Services	$35.2
	Top 10	*$588.1*
	All Other Industries	*$586.2*
	Total Forward-linkage Effects[b]	$2,220.6
	Supply-Side Output Multiplier	2.221

[a] Oil and gas downstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas downstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-23
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Market Products Disruption in Southern California Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
531	Real Estate	$122.4
541	Professional, Scientific, and Technical Services	$121.6
42	Wholesale Trade	$63.8
561	Administrative and Support Services	$50.7
23	Construction	$50.4
621	Ambulatory Health Care Services	$42.7
484	Truck Transportation	$41.5
722	Food Services and Drinking Places	$40.9
523	Securities, Commodity Contracts, and Other Financial Investments and Related Activities	$24.8
9A	Government Enterprises	$24.3
	Top 10	*$583.0*
	All Other Industries	*$608.1*
	Total Forward-linkage Effects[b]	$2,200.3
	Supply-Side Output Multiplier	2.200

[a] Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas market industries.
Source: IMPLAN Data for California; Analysis by LAEDC

San Francisco Bay Subregion

Exhibit A-24
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Upstream Products Disruption in San Francisco Bay Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
32411	Petroleum Refineries	$505.0
541	Professional, Scientific, and Technical Services	$66.3
2212	Natural Gas Distribution	$24.5
334	Computer and Electronic Product Manufacturing	$23.2
519	Other Information Services	$23.1
23	Construction	$22.4
531	Real Estate	$18.2
9A	Government Enterprises	$15.1
42	Wholesale Trade	$14.3
561	Administrative and Support Services	$13.2
	Top 10	*$725.4*
	All Other Industries	*$213.3*
	Total Forward-linkage Effects[b]	$1,942.1
	Supply-Side Output Multiplier	1.942

[a] Oil and gas upstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas upstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-25
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Midstream Products Disruption in San Francisco Bay Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
32411	Petroleum Refineries	$300.0
541	Professional, Scientific, and Technical Services	$196.4
23	Construction	$87.7
334	Computer and Electronic Product Manufacturing	$70.0
519	Other Information Services	$69.9
484	Truck Transportation	$57.6
531	Real Estate	$55.5
42	Wholesale Trade	$44.6
9A	Government Enterprises	$40.3
561	Administrative and Support Services	$40.3
	Top 10	*$962.5*
	All Other Industries	*$608.1*
	Total Forward-linkage Effects[b]	$2,571.6
	Supply-Side Output Multiplier	2.572

[a] Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas midstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-26
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Downstream Products Disruption in San Francisco Bay Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
541	Professional, Scientific, and Technical Services	$69.6
23	Construction	$31.4
519	Other Information Services	$26.1
334	Computer and Electronic Product Manufacturing	$25.1
484	Truck Transportation	$21.7
481	Air Transportation	$20.3
531	Real Estate	$20.1
9A	Government Enterprises	$20.0
42	Wholesale Trade	$16.7
561	Administrative and Support Services	$15.2
	Top 10	*$266.3*
	All Other Industries	*$223.3*
	Total Forward-linkage Effects[b]	$1,535.6
	Supply-Side Output Multiplier	1.536

[a] Oil and gas downstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas downstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-27
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Market Products Disruption in San Francisco Bay Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
531	541 - Professional, Scientific, and Technical Services	$130.4
541	531 - Real Estate	$75.5
42	334 - Computer and Electronic Product Manufacturing	$47.6
561	519 - Other Information Services	$41.7
23	005 Petroleum Refineries	$31.1
621	23 - Construction	$26.0
484	42 - Wholesale Trade	$24.7
722	561 - Administrative and Support Services	$23.1
523	621 - Ambulatory Health Care Services	$22.3
9A	523 - Securities, Commodity Contracts, and Other Financial Investments and Related Activities	$19.2
	Top 10	*$441.6*
	All Other Industries	*$338.2*
	Total Forward-linkage Effects[b]	$1,784.1
	Supply-Side Output Multiplier	1.784

[a] Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas market industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Central Coast Subregion

Exhibit A-28
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Upstream Products Disruption in Central Coast Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
32411	Petroleum Refineries	$68.6
541	Professional, Scientific, and Technical Services	$24.8
23	Construction	$19.7
531	Real Estate	$19.6
42	Wholesale Trade	$14.5
2212	Natural Gas Distribution	$13.0
722	Food Services and Drinking Places	$12.1
621	Ambulatory Health Care Services	$11.6
561	Administrative and Support Services	$11.6
9A	Government Enterprises	$10.0
	Top 10	*$205.7*
	All Other Industries	*$185.0*
	Total Forward-linkage Effects[b]	$1,401.7
	Supply-Side Output Multiplier	1.402

[a] Oil and gas upstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas upstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-29
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Midstream Products Disruption in Central Coast Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
23	Construction	$114.9
541	Professional, Scientific, and Technical Services	$85.3
531	Real Estate	$69.6
484	Truck Transportation	$63.1
42	Wholesale Trade	$53.4
561	Administrative and Support Services	$42.6
722	Food Services and Drinking Places	$42.6
621	Ambulatory Health Care Services	$39.5
32411	Petroleum Refineries	$37.8
111	Crop Production	$32.5
	Top 10	*$581.4*
	All Other Industries	*$624.6*
	Total Forward-linkage Effects[b]	$1,320.9
	Supply-Side Output Multiplier	2.188

[a] Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas midstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-30
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Downstream Products Disruption in Central Coast Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
23	Construction	$82.5
541	Professional, Scientific, and Technical Services	$74.4
484	Truck Transportation	$60.9
531	Real Estate	$60.2
42	Wholesale Trade	$48.9
722	Food Services and Drinking Places	$39.3
561	Administrative and Support Services	$38.6
9A	Government Enterprises	$34.0
621	Ambulatory Health Care Services	$33.8
111	Crop Production	$30.8
	Top 10	*$503.3*
	All Other Industries	*$543.6*
	Total Forward-linkage Effects[b]	$2,058.6
	Supply-Side Output Multiplier	2.059

[a] Oil and gas downstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas downstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-31
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Market Products Disruption in Central Coast Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
531	Real Estate	$152.3
541	Professional, Scientific, and Technical Services	$119.4
23	Construction	$71.2
42	Wholesale Trade	$64.5
722	Food Services and Drinking Places	$57.5
621	Ambulatory Health Care Services	$56.9
561	Administrative and Support Services	$52.0
484	Truck Transportation	$45.5
115	Support Activities for Agriculture and Forestry	$44.4
111	Crop Production	$44.2
	Top 10	*$708.0*
	All Other Industries	*$754.9*
	Total Forward-linkage Effects[b]	$2,471.8
	Supply-Side Output Multiplier	2.472

[a] Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas market industries.
Source: IMPLAN Data for California; Analysis by LAEDC

San Joaquin Valley Subregion

Exhibit A-32
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Upstream Products Disruption in San Joaquin Valley Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
32411	Petroleum Refineries	$73.0
2212	Natural Gas Distribution	$12.4
484	Truck Transportation	$10.3
23	Construction	$8.6
311	Food Manufacturing	$7.8
621	Ambulatory Health Care Services	$5.4
9A	Government Enterprises	$5.4
42	Wholesale Trade	$5.3
111	Crop Production	$4.3
541	Professional, Scientific, and Technical Services	$4.2
	Top 10	*$136.6*
	All Other Industries	*$77.9*
	Total Forward-linkage Effects[b]	$1,220.2
	Supply-Side Output Multiplier	1.220

[a] Oil and gas upstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas upstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-33
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Midstream Products Disruption in San Joaquin Valley Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
484	Truck Transportation	$65.6
32411	Petroleum Refineries	$53.6
23	Construction	$42.4
311	Food Manufacturing	$36.5
2212	Natural Gas Distribution	$21.7
42	Wholesale Trade	$21.2
621	Ambulatory Health Care Services	$19.5
9A	Government Enterprises	$17.7
111	Crop Production	$16.4
531	Real Estate	$16.2
	Top 10	*$310.8*
	All Other Industries	*$302.5*
	Total Forward-linkage Effects[b]	$1,614.7
	Supply-Side Output Multiplier	1.615

[a] Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas midstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-34
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Downstream Products Disruption in San Joaquin Valley Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
484	Truck Transportation	$68.3
23	Construction	$41.2
311	Food Manufacturing	$37.8
42	Wholesale Trade	$21.6
9A	Government Enterprises	$19.5
621	Ambulatory Health Care Services	$18.5
112	Animal Production and Aquaculture	$17.7
111	Crop Production	$16.3
722	Food Services and Drinking Places	$15.4
531	Real Estate	$15.4
	Top 10	*$271.8*
	All Other Industries	*$283.6*
	Total Forward-linkage Effects[b]	$1,572.2
	Supply-Side Output Multiplier	1.572

[a] Oil and gas downstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas downstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-35
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Market Products Disruption in San Joaquin Valley Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
484	Truck Transportation	$53.0
311	Food Manufacturing	$50.0
531	Real Estate	$39.7
23	Construction	$35.2
621	Ambulatory Health Care Services	$29.7
325	Chemical Manufacturing	$26.2
42	Wholesale Trade	$25.4
111	Crop Production	$23.8
541	Professional, Scientific, and Technical Services	$22.3
115	Support Activities for Agriculture and Forestry	$21.3
	Top 10	*$326.7*
	All Other Industries	*$380.1*
	Total Forward-linkage Effects[b]	$1,715.4
	Supply-Side Output Multiplier	1.715

[a] Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas market industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Rest of California Subregion

Exhibit A-36
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Upstream Products Disruption in Rest of California Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
32411	Petroleum Refineries	$147.5
2212	Natural Gas Distribution	$130.2
9A	Government Enterprises	$83.3
23	Construction	$66.2
541	Professional, Scientific, and Technical Services	$65.1
621	Ambulatory Health Care Services	$44.5
531	Real Estate	$44.3
561	Administrative and Support Services	$33.0
42	Wholesale Trade	$30.1
722	Food Services and Drinking Places	$30.0
	Top 10	*$674.1*
	All Other Industries	*$506.2*
	Total Forward-linkage Effects[b]	$2,202.8
	Supply-Side Output Multiplier	2.203

[a] Oil and gas upstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas upstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-37
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Midstream Products Disruption in Rest of California Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
23	Construction	$69.6
484	Truck Transportation	$46.3
541	Professional, Scientific, and Technical Services	$44.2
9A	Government Enterprises	$40.7
531	Real Estate	$30.9
621	Ambulatory Health Care Services	$29.5
561	Administrative and Support Services	$24.8
42	Wholesale Trade	$22.9
722	Food Services and Drinking Places	$21.3
2212	Natural Gas Distribution	$21.1
	Top 10	*$351.1*
	All Other Industries	*$355.0*
	Total Forward-linkage Effects[b]	$1,707.7
	Supply-Side Output Multiplier	1.708

[a] Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas midstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-38
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Downstream Products Disruption in Rest of California Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
23	Construction	$60.4
484	Truck Transportation	$43.0
9A	Government Enterprises	$40.3
541	Professional, Scientific, and Technical Services	$38.5
531	Real Estate	$26.7
621	Ambulatory Health Care Services	$25.7
325	Chemical Manufacturing	$22.5
561	Administrative and Support Services	$22.3
42	Wholesale Trade	$20.9
722	Food Services and Drinking Places	$19.3
	Top 10	*$319.6*
	All Other Industries	*$320.5*
	Total Forward-linkage Effects[b]	$1,666.6
	Supply-Side Output Multiplier	1.667

[a] Oil and gas downstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas downstream industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Exhibit A-39
Forward-linkage Effects: Top 10 Industries Affected by $1 billion Oil and Gas Industry Market Products Disruption in Rest of California Subregion[a]

NAICS	Industry Description	Total Forward-linkage Effects ($ millions)
531	Real Estate	$68.5
541	Professional, Scientific, and Technical Services	$59.5
23	Construction	$55.5
621	Ambulatory Health Care Services	$40.9
484	Truck Transportation	$32.7
561	Administrative and Support Services	$29.4
9A	Government Enterprises	$29.1
722	Food Services and Drinking Places	$27.6
42	Wholesale Trade	$26.2
622	Hospitals	$25.0
	Top 10	*$394.3*
	All Other Industries	*$420.2*
	Total Forward-linkage Effects[b]	$1,823.8
	Supply-Side Output Multiplier	1.824

[a] Oil and gas midstream industries are aggregated into one single segment, whereas individual industries in other oil and gas industry segments are kept disaggregated. Meanwhile, all other industries are aggregated at the 3-digit NAICS classification level.
[b] This also includes the direct and indirect impacts to the oil and gas market industries.
Source: IMPLAN Data for California; Analysis by LAEDC

Oil and Gas Industries

NAICS 211: Oil and gas extraction

Industries in the Oil and Gas Extraction subsector operate and/or develop oil and gas field properties. Operation and development activities include exploration for crude petroleum and natural gas; drilling, completing, and equipping wells; operating separators, emulsion breakers, desilting equipment, and field gathering lines for crude petroleum and natural gas; and all other activities in the preparation of oil and gas up to the point of shipment from the producing property. This subsector includes the production of crude petroleum, the mining and extraction of oil from oil shale and oil sands, the production of natural gas, sulfur recovery from natural gas, and recovery of hydrocarbon liquids.

Establishments in this subsector include those that operate oil and gas wells on their own account or for others on a contract or fee basis. Establishments primarily engaged in providing support services, on a contract or fee basis, required for the drilling or operation of oil and gas wells (except geophysical surveying and mapping, mine site preparation, construction of oil/gas pipelines, and transportation activities) are classified in Subsector 213, Support Activities for Mining.

NAICS 213111: Drilling oil and gas wells

This U.S. industry comprises establishments primarily engaged in drilling oil and gas wells for others on a contract or fee basis. This industry includes contractors that specialize in spudding in, drilling in, redrilling, and directional drilling.

NAICS 213112: Support activities for oil and gas operations

This U.S. industry comprises establishments primarily engaged in performing support activities, on a contract or fee basis, for oil and gas operations (except geophysical surveying and mapping, site preparation, construction, and transportation activities). Services included are exploration; excavating slush pits and cellars, well surveying; running, cutting, and pulling casings, tubes, and rods; cementing wells, shooting wells; perforating well casings; acidizing and chemically treating wells; and cleaning out, bailing, and swabbing wells.

NAICS 2212: Natural gas distribution

This industry comprises: (1) establishments primarily engaged in operating gas distribution systems (e.g., mains, meters); (2) establishments known as gas marketers that buy gas from the well and sell it to a distribution system; (3) establishments known as gas brokers or agents that arrange the sale of gas over gas distribution systems operated by others; and (4) establishments primarily engaged in transmitting and distributing gas to final consumers.

NAICS 23712: Oil and gas pipeline and related structures construction

This industry comprises establishments primarily engaged in the construction of oil and gas lines, mains, refineries, and storage tanks. The work performed may include new work, reconstruction, rehabilitation, and repairs. Specialty trade contractors are included in this industry if they are engaged in activities primarily related to oil and gas pipeline and related structures construction. All structures (including buildings) that are integral parts of oil and gas networks (e.g., storage tanks, pumping stations, and refineries) are included in this industry.

NAICS 32411: Petroleum refineries

This industry comprises establishments primarily engaged in refining crude petroleum into refined petroleum. Petroleum refining involves one or more of the following activities: (1) fractionation; (2) straight distillation of crude oil; and (3) cracking.

NAICS 324191: Petroleum lubricating oil and grease manufacturing

This U.S. industry comprises establishments primarily engaged in blending or compounding refined petroleum to make lubricating oils and greases and/or re-refining used petroleum lubricating oils.

NAICS 32511: Petrochemical manufacturing

This industry comprises establishments primarily engaged in (1) manufacturing acyclic (i.e., aliphatic) hydrocarbons such as ethylene, propylene, and butylene made from refined petroleum or liquid hydrocarbons and/or (2) manufacturing cyclic aromatic hydrocarbons such as benzene, toluene, styrene, xylene, ethyl benzene, and cumene made from refined petroleum or liquid hydrocarbons.

NAICS 333132: Oil and gas field machinery and equipment manufacturing

This U.S. industry comprises establishments primarily engaged in (1) manufacturing oil and gas field machinery and equipment, such as oil and gas field drilling machinery and equipment; oil and gas field production machinery and equipment; and oil and gas field derricks, and (2) manufacturing water well drilling machinery.

NAICS 4247: Petroleum and petroleum products merchant wholesalers

Establishments in this industry group are primarily engaged in the Petroleum Bulk Stations and Terminals industry, with bulk liquid storage facilities primarily engaged in the merchant wholesale distribution of crude, petroleum and petroleum products, including liquefied petroleum gas, or the Petroleum and Petroleum Products Merchant Wholesalers industry, the merchant wholesale distribution of petroleum and petroleum products (except from bulk liquid storage facilities).

NAICS 4571: Gasoline stations

This industry group comprises establishments primarily engaged in retailing automotive fuels (e.g., gasoline, diesel fuel, gasohol, alternative fuels) and automotive oils or retailing these products in combination with convenience store items. These establishments have specialized equipment for storing and dispensing automotive fuels.

NAICS 45721: Fuel dealers

This industry comprises establishments primarily engaged in retailing heating oil, liquefied petroleum (LP) gas, and other fuels via direct selling (i.e., home delivery).

NAICS 486: Pipeline transportation

Industries in the Pipeline Transportation subsector use transmission pipelines to transport products, such as crude oil, natural gas, refined petroleum products, and slurry. Industries are identified based on the products transported (i.e., pipeline transportation of crude oil, natural gas, refined petroleum products, and other products).

The Pipeline Transportation of Natural Gas industry includes the storage of natural gas because the storage is usually done by the pipeline establishment and because a pipeline is inherently a network in which all the nodes are interdependent. ❖

Methodology

Economic Contribution Analysis

Economic contribution analysis is used to describe that portion of a region's economy that can be attributed to an existing industry (or an industry cluster). It is a method to assess the value of an industry or a group of industries within a specific region, based on their existing production levels. It captures the industry's value through its backward linkages — such as purchases in the supply chain, payments of labor income to local workers, and tax revenues generated from operations and multiplier effects. This analysis models address questions such as what would happen if an industry did not exist for those whose economic activity depends on supplying the industry.

Contribution analysis measures not only direct activity but also indirect and induced effects. These effects depend on payments made by the industry of interest to suppliers of goods and services, which ripple through the economy as these funds circulate to employees, business owners, and other establishments that supply the industry. Moreover, the industry also spends billions of dollars every year for the wages and benefits of employees and contingent workers. These workers, as well as the employees of all suppliers, spend a portion of their income on groceries, rent, vehicle expenses, healthcare, entertainment, and so on. This recirculation of household earnings multiplies the initial industry spending through such indirect and induced effects.

The extent to which the initial expenditures multiply is estimated using economic models that depict the relationships between industries (such as the oil and gas industry and its suppliers) and among different economic agents (such as households and institutions).

These models are built upon actual data of expenditure patterns that are reported to the U.S. Bureau of Labor Statistics, the U.S. Census Bureau, and the Bureau of Economic Analysis of the U.S. Department of Commerce. Data is regionalized so that it reflects and incorporates local conditions such as prevailing wages rates, expenditure patterns, and resource availability and costs. The model does not assess other factors related to the industry outside of these measures, such as environmental, governmental, or social costs and benefits.

The magnitude of the multiplying effect differs from one region to another depending on the extent to which the local region can fill the demand for all rounds of supplying

needs. For example, the automobile manufacturing industry has high multipliers in Detroit and Indiana since these regions have deep and wide supplier networks, while the same industry multiplier in Phoenix is quite small. In another example, the jobs multiplier for the construction industry is higher in, say, Arkansas, than in California because the same amount of spending will purchase fewer workers in Los Angeles than in Little Rock.

Multipliers can also differ from year to year as relative material and labor costs change and as the production "recipe" of industries change. For example, the IT revolution significantly reduced the job multiplier of many industries (such as manufacturing, accounting, architecture, and publishing) as computers replaced administrative and production workers.

The metrics used to determine the value of the economic contribution are employment, labor income, value-added and the value of output. Employment includes full-time, part-time, permanent, and seasonal employees and the self-employed, and is measured on a job-count basis regardless of the number of hours worked. Labor income includes all income received by both payroll employees and the self-employed, including wages and benefits such as health insurance and pension plan contributions. Value-added is the measure of the contribution to GDP made by the industry, and consists of compensation of employees, taxes on production and gross operating surplus. Output is the value of the goods and services produced. For most industries, this is simply the revenues generated through sales; for others, in particular wholesale trade and retail industries, output is the value of the services supplied.

Estimates are developed using software and data from IMPLAN Group, LLC, which traces inter-industry transactions resulting from an increase in demand in a given region. The economic regions of interest include the state, the five subregions, and individual counties, and the activity is reported for 2022, the most recent year for which a complete set of data is available. Estimates for labor income, value added, and output are expressed in 2022 dollars to maintain consistency with the reported industry activity.

The total estimated economic contribution includes direct, indirect, and induced effects. Direct activity includes the materials purchased and the employees hired by the industry itself. Indirect effects are those which stem from the employment and business revenues motivated by the purchases made by the industry and any of its suppliers. Induced effects are those generated by the spending of employees whose wages are sustained by both direct and indirect spending.

Contribution analysis differs from economic impact analysis in that feedback linkages to the industry (or the group of industries) being analyzed are removed so that indirect activity is not double-counted as it is already part of current direct activity of the industry (industries group). Breaking these interindustry linkages eliminates this double-counting and is a more accurate method of estimating the economic contribution of the industry.

Direct activity related to the economic activity of the oil and gas industry was based on employment and wage data from the Quarterly Census of Employment and Wages and Nonemployer statistics from the U.S. Census Bureau with imputed nondisclosed data estimated by IMPLAN.

Forward Linkages and Supply-Driven Analysis

Another prism through which the industry can be viewed is its forward linkages—the extent to which its products are incorporated into the manufacturing and service delivery operations of the rest of the economy. In the case of the refinery industry, for example, those industries which are highly dependent on transportation fuels, such as trucking, aviation and construction industries, and manufacturing industries dependent on petroleum byproducts in the production of their own products, such as plastics manufacturers and medical device manufacturers.

Understanding these linkages is important in evaluating how production shifts and cost increases in oil and gas industry products might extend through the manufacturing and service delivery chains.

This study examines the flow of oil and gas industry products through the industry user chain, evaluating both the magnitude and intensity of use by each primary user industry. The intensity of use for the user industry is measured in terms of its use of oil and gas products as production inputs as a share of revenues, reflecting the industry's dependency on these inputs. Industries that rely heavily on oil and gas for their production processes will be more significantly impacted by disruptions compared to those that depend less on these products.

In addition to identifying the major primary user industries of the oil and gas products, we also conduct a supply-driven analysis using IMPLAN input-output tables to assess the impact of production activities in the oil and gas industries on their successive rounds of downstream

customer sectors (user industries). Supply-driven I-O analysis explores how changes in the supply of goods and services from specific industries affect the broader economy through forward linkages. Unlike demand-driven I-O analysis (that is used in economic contribution analysis), which examines how changes in economic activities of specific industries affect their successive rounds of upstream suppliers, supply-driven analysis measures how supply changes propagate through the economy across interconnected chains of downstream customers. The input-output data provide information on the distribution of the oil and gas industries' output to other sectors, which use these products as inputs for their own production. Supply-side multipliers can be calculated by constructing supply-driven I-O models, which provide insights into the economy-wide impacts of any disruptions in oil and gas production.

Description of Industry Sectors

The industry sectors used in this report are established by the North American Industry Classification System (NAICS). NAICS divides the economy into twenty sectors, and groups industries within these sectors according to production criteria. Listed below is a short description of each sector as taken from the sourcebook, North American Industry Classification System, published by the U.S. Office of Management and Budget (2022).

Agriculture, Forestry, Fishing and Hunting: Activities of this sector are growing crops, raising animals, harvesting timber, and harvesting fish and other animals from farms, ranches, or the animals' natural habitats.

Mining: Activities of this sector are extracting naturally occurring mineral solids, such as coal and ore; liquid minerals, such as crude petroleum; and gases, such as natural gas; and beneficiating (e.g., crushing, screening, washing and flotation) and other preparation at the mine site, or as part of mining activity.

Utilities: Activities of this sector are generating, transmitting, and/or distributing electricity, gas, steam, and water and removing sewage through a permanent infrastructure of lines, mains, and pipes.

Construction: Activities of this sector are erecting buildings and other structures (including additions); heavy construction other than buildings; and alterations, reconstruction, installation, and maintenance and repairs.

Manufacturing: Activities of this sector are the mechanical, physical, or chemical transformation of material, substances, or components into new products.

Wholesale Trade: Activities of this sector are selling or arranging for the purchase or sale of goods for resale; capital or durable non-consumer goods; and raw and intermediate materials and supplies used in production and providing services incidental to the sale of the merchandise.

Retail Trade: Activities of this sector are retailing merchandise generally in small quantities to the general public and providing services incidental to the sale of the merchandise.

Transportation and Warehousing: Activities of this sector are providing transportation of passengers and cargo, warehousing and storing goods, scenic and sightseeing transportation, and supporting these activities.

Information: Activities of this sector are distributing information and cultural products, providing the means to transmit or distribute these products as data or communications, and processing data. This industry contains all aspects of motion picture recording and distribution as well as the sound and telecommunications industry.

Finance and Insurance: Activities of this sector involve the creation, liquidation, or change of ownership of financial assets (financial transactions) and/or facilitating financial transactions.

Real Estate and Rental and Leasing: Activities of this sector are renting, leasing, or otherwise allowing the use of tangible or intangible assets (except copyrighted works) and providing related services.

Professional, Scientific, and Technical Services: Activities of this sector are performing professional, scientific, and technical services for the operations of other organizations.

Management of Companies and Enterprises: Activities of this sector are the holding of securities of companies and enterprises, for the purpose of owning controlling interest or influencing their management decision, or administering, overseeing, and managing other establishments of the same company or enterprise and normally undertaking the strategic or organizational

planning and decision-making of the company or enterprise.

Administrative and Support and Waste Management and Remediation Services: Activities of this sector are performing routine support activities for the day-to-day operations of other organizations, such as: office administration, hiring and placing of personnel, document preparation and similar clerical services, solicitation, collection, security and surveillance services, cleaning, and waste disposal services.

Educational Services: Activities of this sector are providing instruction and training in a wide variety of subjects. Educational services are usually delivered by teachers or instructors that explain, tell, demonstrate, supervise, and direct learning. Instruction is imparted in diverse settings, such as educational institutions, the workplace, or the home through correspondence, television, or other means.

Health Care and Social Assistance: Activities of this sector are operating or providing health care and social assistance for individuals.

Arts, Entertainment and Recreation: Activities of this sector are operating facilities or providing services to meet varied cultural, entertainment, and recreational interests of their patrons, such as: (1) producing, promoting, or participating in live performances, events, or exhibits intended for public viewing; (2) preserving and exhibiting objects and sites of historical, cultural, or educational interest; and (3) operating facilities or providing services that enable patrons to participate in recreational activities or pursue amusement, hobby, and leisure-time interests.

Accommodation and Food Services: Activities of this sector are providing customers with lodging and/or preparing meals, snacks, and beverages for immediate consumption.

Other Services (except Public Administration): Activities of this sector provide services not specifically provided elsewhere in the classification system. Establishments in this sector are primarily engaged in activities, such as equipment and machinery repairing, promoting, or administering religious activities, grant-making, advocacy, and providing dry-cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services.

Los Angeles County Economic Development Corporation
633 W. 5th Street, Suite 3300
Los Angeles, CA 90071
(888) 4-LAEDC-1