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Economic Impact Report Shows that Oil and Gas Industry Spending Billions on Major Developments Powering Tens of Thousands of Construction Jobs Across California

California's Oil and Gas Jobs Power Middle-Class Mobility

Sacramento, CA-An Economic Impact Report released today outlines the effect that the oil and gas industry has on construction in the State of California. The study, conducted by The Institute for Construction Economic Research ("ICERES"), found that over the last 10 years, the oil and gas industry spent more than \$30 billion on construction. This \$30 billion represents nearly 130 million construction labor hours from almost 200 major oil and gas projects. The 130 million construction labor hours is the equivalent of five times the labor hours used to build the Golden 1 Center (Sacramento Kings), Chase Center (Golden State Warriors), Los Angeles Stadium at Hollywood Park (LA Rams), Banc of California Stadium (Major League Soccer Los Angeles FC), Wizarding World of Harry Potter (NBC Universal), Wilshire Grand Hotel combined.

Upon reviewing the report, Robbie Hunter, President of the State Building and Construction Trades Council of California stated: "We knew that the oil and gas industry was putting a lot of hard-working Californians to work and now we have the numbers to show just how many. The oil and gas industry is that rare industry that provides a path to the middle class for Californians who did not have the benefit of or interest in a college degree. This path is a hard one to find in California these days and we need to remain laser focused on supporting these types of opportunities for California's working families."

California's oil and gas industry is a largely union workforce with every major refinery and the state's largest extractor employing members of the Building Trades under some of the strictest labor, environmental and safety laws in the world. This partnership has been instrumental in increasing apprenticeship opportunities within the Building Trades to provide local, skilled and trained workers. Tom Baca, International Vice-President of the Boilermakers is overseeing the construction of new apprenticeship training centers in both the North Bay and Los Angeles area due to the influx of energy industry jobs. "The Building Trades are training more than 63,000 apprentices currently in California. The Boilermakers are taking in new apprentices every day. These apprentices are learning a trade that will put them on the road to owning their own homes. Upon graduating from our apprenticeship program, they will have a real profession and the pride of earning a good salary, with benefits, from a hard day's work. It's because of partnerships like the one we have with the oil and gas industry that we can help these kids find a profession that can support a family in California."

Echoing the sentiments of the Building Trades, the ICERES study summarized the impact the oil and gas industry has in California. "The oil and gas industry is vital to the economic well-being of the state, helping to power an economy that has made great strides in recovering from the Great Recession."

A full copy of the report is available upon request.

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An Analysis of Construction Spending and Employment in the California Oil & Gas Industry, 2008-2018

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INSTITUTE FOR CONSTRUCTION ECONOMIC RESEARCH (ICERES)

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The construction industry and its stakeholders face pressing long term issues regarding workforce sustainability, safety, productivity and integration of technology. The Institute for Construction Economic Research (ICERES) supports high quality research with the goal of finding and disseminating pragmatic solutions to these and other construction issues. The Institute for Construction Economic Research undertakes non-partisan research on issues facing the industry, collaborating with existing construction researchers and attracting new investigators into the field of construction research. The Institute also works to develop a network of researchers with ongoing programs on construction issues.

An Analysis of Construction Spending and Employment in the California Oil & Gas Industry, 2008-2018

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Executive Summary

The California oil and gas industry helps power the state's economy by investing in the infrastructure to extract, refine, and distribute the oil necessary to keep up with consumer demand. In the pursuit of this endeavor, the industry is a consistent economic engine, investing billions of dollars annually and employing thousands of hard-working California construction workers in good-paying jobs. These jobs represent vital pathways to the middle class, especially for workers who lack a college degree.

The purpose of the present report is to analyze the impact of the oil and gas sector on construction employment associated with building and maintenance of facilities related to oil and gas operations in California between 2008 and 2018. This report analyzes construction projects that fall within five categories of operations within the oil and gas sector: terminals (oil, gas, and chemical storage), pipelines (oil, gas, and related products transmission), production (offshore and onshore oil and gas processing), petroleum refining (hydrocarbon processing), and alternative fuels (gas and liquids production). Relying on data from Industrial Information Resources (IIR), a respected global consulting firm specializing in market data on major power, energy and industrial infrastructure projects, this report finds the following:

- There were **194** major (\$5+ million) California oil and gas projects that were active between 2008 and 2018 as identified by IIR. This amounts to a total of **\$6.5 billion** in total investment by the industry in this 11-year period. Oil and gas investment was most concentrated in Los Angeles County (97 major projects, \$2.4 billion in investment), Contra Costa County (43, \$1.8 billion), and Kern County (14, \$1.4 billion). However, there was at least \$10 million in spending in 16 counties, with 11 of the 16 counties featuring at least \$50 million in spending.
- Including projects less than \$5 million and accounting for all potential projects in the state, IIR estimates that the California oil and gas industry invested a grand total of **\$30.18 billion** in infrastructure between 2008 and 2018. Total spending is split between an estimated \$20.44 billion in capital expenditures and \$9.74 billion in maintenance, repair, and overhaul. IIR data indicate that infrastructure spending in the oil and gas industry exceeded \$2 billion in 10 out of the last 11 years, highlighting the consistent impact the oil and gas industry continues to make on the state's economy.
- Petroleum refining comprised the majority of oil and gas spending in each of the last 11 years, accounting for an annual average of 57 percent of spending (\$17.1 billion total). Oil and gas production is the next largest operational category, comprising an annual average of 23 percent of oil and gas spending (\$7 billion total). Storage terminals represent an average of 11 percent of annual spending (\$3.4 billion). Pipelines and alternative fuels are the two smallest operations, making up averages of 6 percent (\$1.9 billion) and 3 percent (\$826.2 million) of annual oil and gas spending, respectively.

- California's oil and gas industry required **128.72 million construction labor hours** between 2008 and 2018 across 14 different trades, with plumbers and pipefitters, electricians, and welders comprising nearly half of that total. In the year 2018 alone, the industry required 11.13 million construction labor hours across all 14 trades to build and renovate its infrastructure. This provides evidence of the middle class, family-supporting employment opportunities available to highly-skilled construction workers in California's oil and gas industry.

AN ANALYSIS OF CONSTRUCTION SPENDING AND EMPLOYMENT IN THE CALIFORNIA OIL & GAS INDUSTRY, 2008-2018

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INTRODUCTION

The California oil and gas industry helps power the state and national economies by investing in infrastructure to extract, refine, store, and distribute the oil necessary to keep up with consumer demand. In the pursuit of this endeavor, the industry is a consistent economic engine of California and the United States, investing billions of dollars annually and employing thousands of hard-working California construction workers in good-paying jobs. Such jobs represent vital pathways to the middle class, especially for workers who lack a college degree.

The growth and maintenance of California's oil and gas infrastructure requires the work of highly-skilled construction workers from across the spectrum of skills associated with the modern construction industry, workers who can build and maintain complex infrastructure to exacting specifications necessary for safe and efficient production. The purpose of the present report is to analyze the impact of the oil and gas sector on construction employment associated with building and maintenance of facilities related to oil and gas operations in California between 2008 and 2018. In particular, the analysis focuses on five categories of operations within the oil and gas sector: terminals (oil, gas, and chemical storage), pipelines (oil, gas, and related products transmission), production (offshore and onshore oil and gas processing), petroleum refining (hydrocarbon processing), and alternative fuels (gas and liquids production).

Analysis of data obtained from Industrial Information Resources (IIR), a respected global consulting firm specializing in market data on major power, energy and industrial infrastructure projects in the United States, reveals that the oil and gas industry in California spent more than \$30.18 billion on construction

during the period between 2008 and 2018. These construction expenditures resulted in 128.72 million labor hours.

MAJOR CONSTRUCTION PROJECTS

Firms in the oil and gas extraction industry account for a substantial amount of economic activity and construction employment through investments in new infrastructure in the form of extraction sites, pipelines, refineries, terminals, and storage facilities as well as through investments in maintenance of existing production capacity. According to data from IIR, companies in the industry reported 194 major projects valued at \$5 million or more across California that were active at any point between 2008 and 2018. The total value of these major construction projects exceeded **\$6.5 billion**.

As detailed in Table 1 (*below*), during the period between 2008 and 2018 major construction projects were dispersed among 16 counties in California, with most projects concentrated in Los Angeles, Contra Costa, and Kern Counties. Almost half of the major projects are located in Los Angeles County, where 97 construction projects worth \$2.4 billion of total investment value were reported. Of the 97 projects in L.A. County, a vast majority (84) are investments in refining petroleum products that have already been extracted. Nine of the projects were aimed at building and maintaining production operations, and three to increase storage capacity at existing terminal sites. The remaining project was a bio-fuels refinery.

Table 1. Major Projects, Total Investment Value, and Operations by County, 2008-2018

County	Number of Projects	Total Investment Value	Categories of Operations
Alameda	2	\$23,000,000	AF
Butte	1	\$75,000,000	ST
Colusa	3	\$128,000,000	ST
Contra Costa	43	\$1,805,500,000	PR
Fresno	4	\$70,000,000	PROD, AF
Kern	14	\$1,395,000,000	PIPE, PROD, AF, PR
Los Angeles	97	\$2,401,000,000	ST, PROD, AF, PR
Madera	1	\$10,000,000	AF
Sacramento	2	\$70,000,000	PIPE
San Bernadino	1	\$15,700,000	PIPE
San Joaquin	3	\$226,000,000	ST, AF
San Luis Obispo	4	\$40,500,000	AF, PR
Santa Barbara	4	\$55,000,000	PROD
Solano	9	\$95,500,000	PR
Sonoma	1	\$15,000,000	AF
Tulare	5	\$79,000,000	PIPE, AF
Total	194	\$6,504,200,000	

Source: Industrial Information Resources. Total investment value included for any major project (\$5+ million TIV) active between 2008 and 2018. ST=Storage Terminals; PIPE=Oil & Gas Pipelines; PROD=Oil & Gas Production; AF=Alternative Fuels; PR=Petroleum Refining.

Results in Table 1 also demonstrate how the \$6.5 billion in investments were distributed across California. For example, owners in Contra Costa County have undertaken 43 projects worth \$1.805 billion in total investment value, all of which are devoted to investments in refining operations. In Kern County, home of Bakersfield, 14 projects were reported over the 11-year period worth \$1.395 billion in total investment value. In contrast to Contra Costa, however, the major investments in Kern were largely on the production side, with the remaining generally smaller projects in refining, transmission, and alternative fuels. By far, Los Angeles County has the largest number of projects and investment value, with projects amounting to just over \$2.4 billion, which includes refining, alternative fuels, production, and storage.

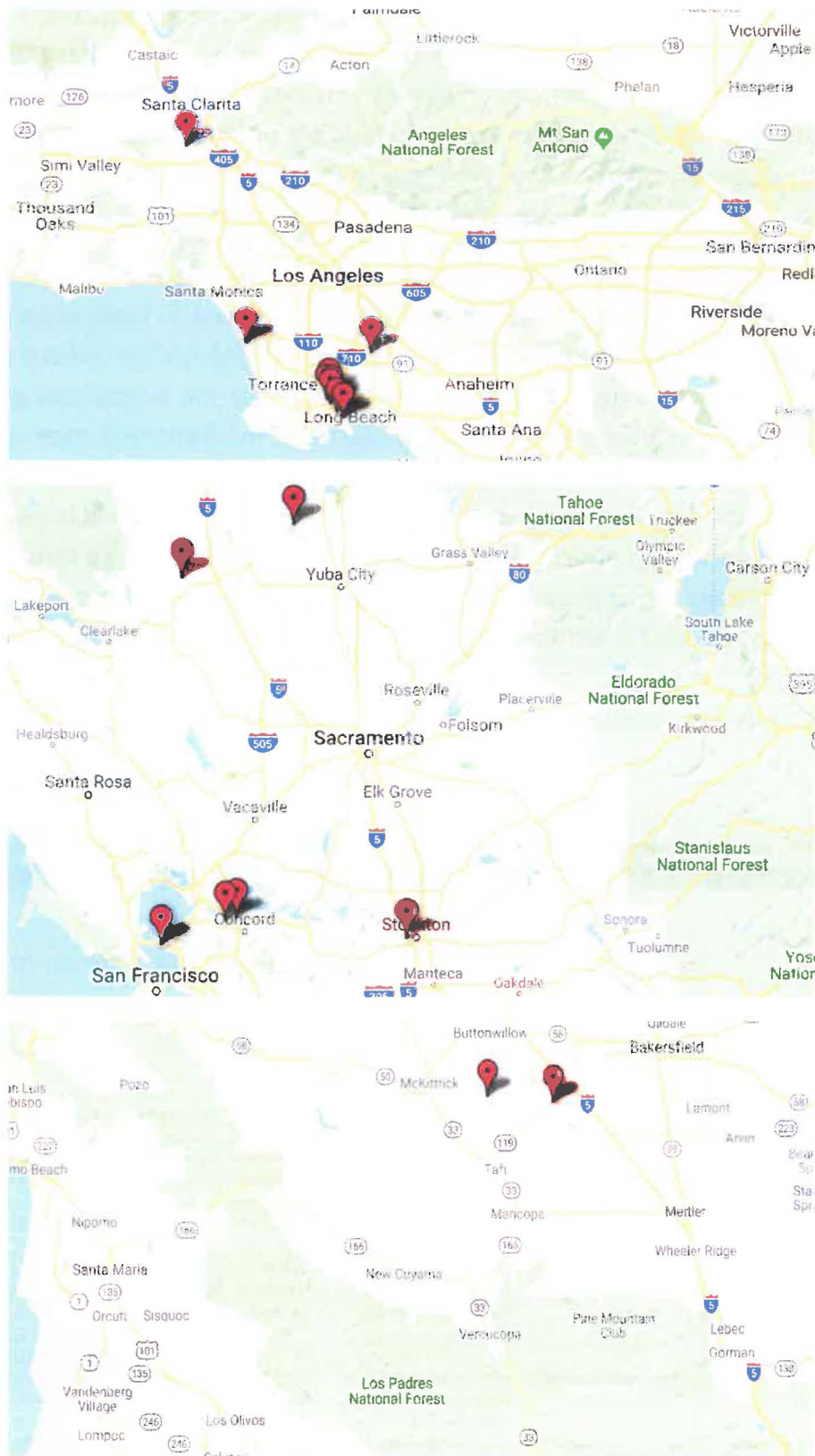
Because the very large infrastructure investment projects represent significant sources of economic activity and construction employment, we examine the largest projects in more detail. Table 2 (*below*) provides details on the 27 oil and gas projects identified by IIR with \$50+ million in total investment value during the period between 2008 and 2018. The table reveals that the largest two projects, Shell Oil Products US's Martinez Greenhouse Gas Reduction project and the Richmond Hydrogen Replacement unit, are located in Contra Costa County, along with several other large petroleum refining operations located there. Although Los Angeles County joins Contra Costa as home to several large refining projects, there were also large construction projects in oil and gas production and storage terminals. Table 2 also highlights three large storage terminal construction projects in San Joaquin, Colusa, and Butte Counties. Interestingly, the findings in Table 2 demonstrate that five of the largest eight projects during 2008–2018 were devoted to production and located in Kern County. Figure 1 (*next page*) shows the geographic distribution of large projects as listed in Table 2. The map in particular highlights the concentration of large oil and gas construction projects in Los Angeles, Kern, and Contra Costa Counties.

Table 2. Oil and Gas Construction Projects, \$50+ Million Construction Value, Active Between 2008 and 2018

Owner	Operation	Site	County	Active	Value
Shell Oil Products US	Petroleum Refining	Martinez	Contra Costa	06/2016-04/2018	\$450,000,000
Chevron Corporation	Petroleum Refining	Richmond	Contra Costa	04/2016-06/2018	\$300,000,000
Occidental of Elk Hills Incorporated	Production (Oil & Gas)	Tupman	Kern	10/2010-07/2012	\$280,000,000
Chevron Chemical Company	Petroleum Refining	El Segundo	Los Angeles	04/2013-07/2014	\$260,000,000
Occidental of Elk Hills Incorporated	Production (Oil & Gas)	Tupman	Kern	01/2011-02/2012	\$250,000,000
Occidental of Elk Hills Incorporated	Production (Oil & Gas)	Tupman	Kern	02/2012-12/2012	\$250,000,000
Occidental of Elk Hills Incorporated	Production (Oil & Gas)	Tupman	Kern	01/2013-12/2013	\$250,000,000
Occidental of Elk Hills Incorporated	Production (Oil & Gas)	Tupman	Kern	01/2014-12/2014	\$250,000,000
Interacid Training SA (ITSA)	Storage Terminals	Stockton	San Joaquin	11/2017-05/2019	\$208,000,000
Southern California Gas Company	Storage Terminals	Northridge	Los Angeles	11/2015-11/2016	\$205,000,000
Tidelands Oil Production Company	Production (Oil & Gas)	Long Beach	Los Angeles	04/2010-08/2013	\$200,000,000
World Energy	Alternative Fuels	Paramount	Los Angeles	10/2011-03/2012	\$200,000,000
Chevron Corporation	Petroleum Refining	Richmond	Contra Costa	04/2016-06/2018	\$200,000,000
Chevron Corporation	Petroleum Refining	Richmond	Contra Costa	04/2016-06/2018	\$200,000,000
Tidelands Oil Production Company	Production (Oil & Gas)	Long Beach	Los Angeles	05/2012-11/2012	\$100,000,000
Marathon Petroleum Corporation	Petroleum Refining	Martinez	Contra Costa	09/2014-03/2015	\$100,000,000
Chevron Corporation	Petroleum Refining	Richmond	Contra Costa	04/2016-06/2018	\$100,000,000
Kinder Morgan Energy Partners LP	Storage Terminals	Carson	Los Angeles	05/2011-10/2012	\$85,000,000
Central Valley Gas Storage	Storage Terminals	Princeton	Colusa	06/2011-08/2012	\$85,000,000
Marathon Petroleum Corporation	Petroleum Refining	Carson	Los Angeles	07/2017-06/2018	\$80,000,000
Wild Goose Storage LLC	Storage Terminals	Girdley	Butte	12/2011-07/2012	\$75,000,000
Marathon Petroleum Corporation	Petroleum Refining	Wilmington	Los Angeles	04/2017-05/2018	\$75,000,000
California Resources Corporation/THUMS Long Beach Company	Production (Oil & Gas)	Long Beach	Los Angeles	11/2011-10/2012	\$65,000,000
Chevron Corporation	Petroleum Refining	El Segundo	Los Angeles	12/2010-11/2012	\$60,000,000
Chevron Headquarters	Petroleum Refining	Richmond	Contra Costa	01/2016-06/2017	\$60,000,000
Phillips 66	Petroleum Refining	Carson	Los Angeles	01/2015-02/2016	\$55,000,000
Chevron Corporation	Petroleum Refining	Richmond	Contra Costa	04/2016-06/2018	\$50,000,000

Source: Industrial Information Resources

Figure 1. Locations of Major Projects in Southern, Northern, & Central California, 2008-2018



ANNUAL CONSTRUCTION SPENDING

Determining the economic contribution and impact of the oil and gas industry exclusively via the preceding analysis of major construction projects results in an incomplete picture, largely because the preceding analysis does not include the hundreds—if not thousands—of industry projects that fall beneath the \$5 million threshold. Further, IIR acknowledges that its database of projects may only account for 85% to 90% of relevant investments. As such, IIR uses a proprietary algorithm to estimate total construction spending in the industry. These results are presented in Table 3 (below), as IIR estimates that the the industry spent a total of **\$30.18 billion** between 2008 and 2018. This section analyzes IIR's "topline" construction spending estimates for the California oil and gas industry, which include projects costing less than \$5 million and provide annual spending estimates that isolate year-to-year trends.

Of the \$30.18 billion in infrastructure spending between 2008 and 2018, the total is split between an estimated \$20.44 billion in capital expenditures and \$9.74 billion in maintenance, repair, and overhaul. Oil and gas spending dropped from 2008 to 2009, likely as a result of the Great Recession, before increasing in 2010 and 2011 as the broader economy began to recover. After holding relatively steady from 2011 to 2013, spending dropped by approximately \$1.2 billion by 2015, before quickly recovering to 2011-2013 levels by 2017.

Excluding the alternative fuels sector, the California oil and gas industry is estimated to have spent a total of \$29.36 billion between 2008 and 2018, with \$19.85 billion in capital expenditures and \$9.50 billion in maintenance, repair, and overhaul. Table 3 shows that even with alternative fuel spending excluded, California's oil and gas industry is a consistent, important contributor to the state economy. In 10 out of the last 11 years, the oil and gas industry has spent at least \$2 billion on various construction projects. Overall, regardless of whether the spending is on new construction or on repair and maintenance of existing work, Table 3 offers clear evidence of the billions of dollars that the oil and gas industry annually invests into California's economy.

Table 3. Annual Construction Spending, Oil and Gas Industry, 2008-2018

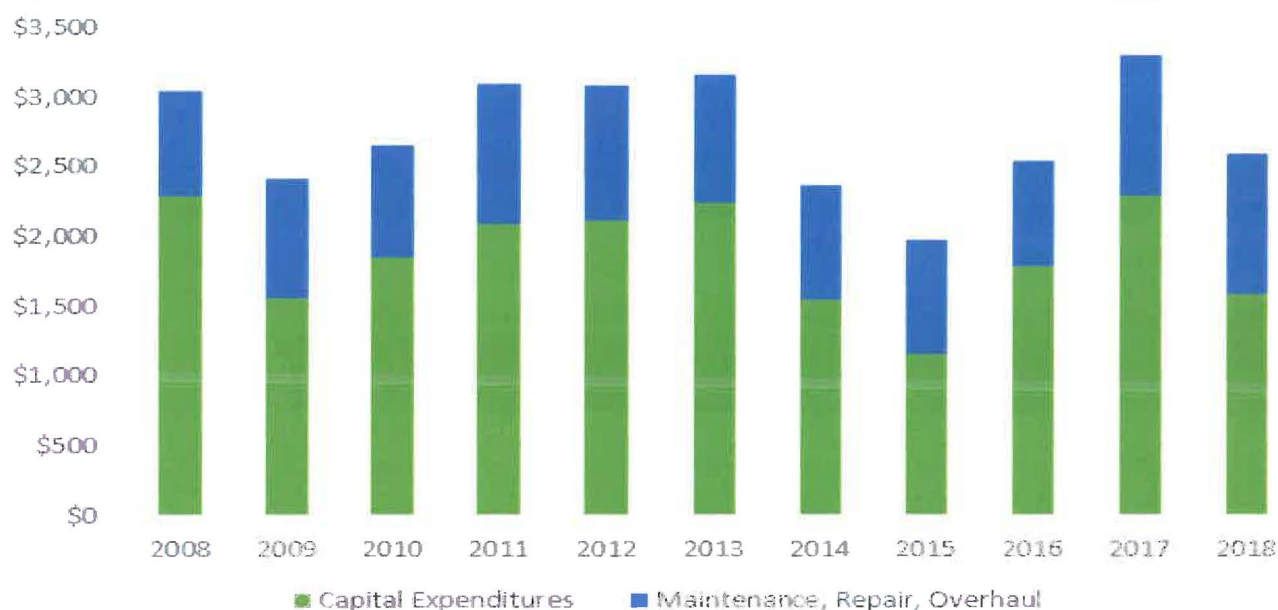
Year	Capital Expenditures	Maintenance, Repair, Overhaul	Total	Total (Minus Alternative Fuels)
2008	\$2,280,607,419	\$767,081,350	\$3,047,688,769	\$2,920,475,358
2009	\$1,555,539,726	\$858,291,248	\$2,413,830,974	\$2,376,977,943
2010	\$1,841,194,910	\$811,565,888	\$2,652,760,798	\$2,612,478,369
2011	\$2,083,995,025	\$1,006,193,216	\$3,090,188,241	\$3,005,863,836
2012	\$2,107,984,379	\$971,509,349	\$3,079,493,728	\$3,015,101,276
2013	\$2,231,883,315	\$920,813,911	\$3,152,697,226	\$3,094,368,078
2014	\$1,548,388,200	\$818,178,444	\$2,366,566,644	\$2,313,732,474
2015	\$1,153,739,468	\$816,514,526	\$1,970,253,994	\$1,898,811,126
2016	\$1,775,819,689	\$757,537,614	\$2,533,357,303	\$2,469,423,444
2017	\$2,285,185,695	\$1,007,118,251	\$3,292,303,946	\$3,177,143,434
2018	\$1,578,685,742	\$1,003,517,777	\$2,582,203,519	\$2,470,801,019
Total	\$20,443,023,568	\$9,738,321,574	\$30,181,345,142	\$29,355,176,357

Source: Industrial Information Resources

To more closely examine year-to-year trends, Figure 2 (*below*) is a visual representations of the annual totals from Table 3 that include alternative fuels.¹ Capital expenditures are shaded green, and maintenance, repair, and overhaul spending is shaded blue. The construction industry as a whole is more sensitive to fluctuations in the business cycle than other industries. As a result, effects of the business cycle are often more pronounced in construction. Figure 2 shows that oil and gas is no exception; however, even in the presence of some volatility caused by the business cycle, Figure 2 and Table 3 illustrate the oil and gas industry's consistently positive impact on the California economy.

Figure 3 (*next page*) provides an annual breakdown of oil and gas spending by operational category. Petroleum refining has comprised the majority of oil and gas spending in each of the last 11 years, featuring \$17.1 billion in total expenditures and making up an annual average of 57 percent of spending. Oil and gas production is the second largest operational category, comprising an average of 23 percent of yearly infrastructure spending, totaling \$7 billion. Storage terminals represent \$3.4 billion in total spending, or an annual average of 11 percent of industry spending. Pipelines and alternative fuels are the two smallest operations, making up averages of 6 percent and 3 percent of annual oil and gas spending, respectively. However, pipelines and alternative fuels are still key sources of economic activity for the industry, with respective totals of \$1.9 billion and \$826.2 million over the last 11 years.

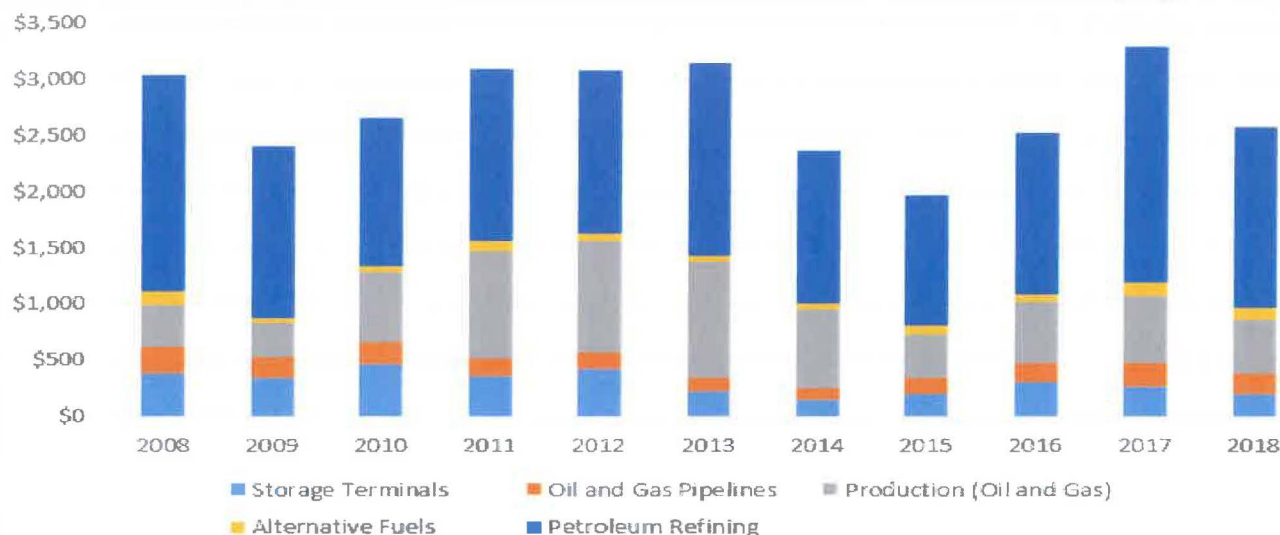
Figure 2. Annual Construction Spending (In Millions), Oil and Gas Industry, 2008-2018



Source: Industrial Information Resources

¹ Excluding alternative fuels does not affect year-to-year trends; the trends are virtually identical with alternative fuels excluded, reflecting the fact that alternative fuels make up such a small average percentage (3 percent) of annual oil and gas spending.

Figure 3. Annual Spending (In Millions), Oil and Gas Industry by Operational Category, 2008-2018



Source: Industrial Information Resources

CONSTRUCTION EMPLOYMENT

The California oil and gas industry invests billions of dollars annually to extract, refine, and distribute the oil necessary to keep up with consumer demand. In doing so, the oil and gas industry is vital to the economic well-being of the state, helping to power an economy that has made great strides in recovering from the Great Recession. Of course, this would not be possible without the highly-skilled labor of California construction workers, which the oil and gas industry employs for millions of hours per year. Thus, the positive impact the oil and gas industry makes on the California economy is two-fold: alongside its annual investments in the infrastructure necessary for extraction, refinement and distribution of oil, the oil and gas industry benefits the California economy by providing vital employment opportunities to thousands of the state's construction workforce.

As described in the previous section, IIR estimates that the California oil and gas industry spent a total of \$30.18 billion on infrastructure between 2008 and 2018. According to the IIR data presented in Table 4 (right), this generates **128.72 million construction labor hours** across 14 different trades, with plumbers and pipefitters, electricians, and welders comprising nearly half of that total. In the year 2018 alone, the industry required 11.13 million construction labor hours across all 14 trades to build and renovate its infrastructure. This was down from 2017, when the industry required 14.56 million construction labor hours.

Table 4. Labor Hours Demanded, Oil and Gas Industry (By Trade), 2008-2018

Trade	Labor Hours
Boilermaker	5,432,091
Carpenter	9,237,289
Electrician	17,332,891
HVAC Installers	5,610,839
Instrumentation Tech	2,853,289
Insulator	4,576,720
Ironworker	7,012,172
Laborer	6,693,948
Millwright	4,468,757
Operator	9,988,647
Painting	2,552,098
Plumber + Pipefitter	26,484,072
Scaffolding	10,406,397
Welder	16,071,034
Total	128,720,244

Source: Industrial Information Resources

Table 5. Labor Hours Demanded, Oil and Gas Industry (By Trade and Operational Category), 2008-2018

Trade	Storage Terminals	Oil & Gas Pipelines	Production (Oil & Gas)	Alternative Fuels	Petroleum Refining
Boilermaker	1,027,572	117,247	1,847,247	28,323	2,411,700
Carpenter	294,210	179,493	378,306	42,161	8,343,119
Electrician	1,704,564	795,315	1,005,423	597,321	13,230,269
HVAC Installers	340,837	159,922	904,904	100,760	4,104,415
Instrumentation Tech	453,095	39,839	396,542	45,464	1,918,349
Insulator	302,835	31,772	1,554,332	5,355	2,682,425
Ironworker	400,760	34,987	2,338,058	31,999	4,206,367
Laborer	386,909	217,241	1,065,059	63,592	4,961,146
Millwright	319,285	233,953	407,454	44,152	3,463,912
Operator	422,301	214,582	1,033,045	125,853	8,192,866
Painting	129,403	89,634	307,437	12,195	2,013,429
Plumber + Pipefitter	1,465,192	739,139	3,884,382	437,599	19,957,760
Scaffolding	1,095,952	189	3,449,881	6,869	5,853,506
Welder	782,217	266,384	2,264,153	23,591	12,734,689
Total	9,125,132	3,119,697	20,836,223	1,565,234	94,073,952

Source: Industrial Information Resources

Table 5 (above) provides a breakdown of the totals from Table 4. Table 5 isolates labor hours demanded, by trade, for each of the five operational categories featured in the IIR data: storage terminals, oil and gas pipelines, oil and gas production, alternative fuels, and petroleum refining. Petroleum refining required 94.1 million labor hours between 2008 and 2018, approximately 73.1 percent of total labor hours demanded. Oil and gas production was another substantial source of labor hours, requiring 20.1 million labor hours between 2008 and 2018 and accounting for 16.2 percent of total labor hours demanded. Combined, petroleum refining and oil and gas production make up nearly 90 percent of all building trades labor hours demanded between 2008 and 2018. This is to be expected, as these two operations comprise 80 percent of all oil and gas expenditures during this time period. As expected, the alternative fuels sector demands the lowest amount of building trades labor: 1.6 million total labor hours in 2008-2018 combined. Overall, Tables 4 and 5 provide evidence of the numerous good-paying employment opportunities available to highly-skilled construction workers in California's oil and gas industry.

CONCLUSION

The California oil and gas industry continues to help power the state's economy by providing the oil necessary to keep up with consumer demand. As outlined in this study, the industry invests billions of dollars in industrial infrastructure on an annual basis. Between 2008 and 2018, data from IIR indicates that there were 194 major (\$5+ million) active. After incorporating the amount spent on smaller projects, IIR estimates that the industry spent a total of \$30.18 billion on new construction and renovation projects between 2008 and 2018.

The billions of dollars of investments by the oil and gas industry are highly dependent upon the highly-skilled labor of California's construction workers. In the last 11 years, the oil and gas industry required nearly 128.72 million hours of construction labor across 14 trades, with 11.13 million hours required in the year 2018 alone. In this 11-year period, labor hours demanded were spread across the five oil and gas operational categories, with petroleum refining alone requiring 94 million construction labor hours. This

study paints a picture of an industry that continues to be a major source of economic activity and employment opportunity for the state of California. Going forward, the California oil and gas industry will undoubtedly continue to be a major employer of construction labor as they invest in new infrastructure and maintain, repair and overhaul existing plants and equipment needed to extract, refine, and distribute the oil necessary to power the California economy.

Operational Category Fact Sheets

Storage Terminals California, 2008-2018

Total Investment Value	
CAP	\$826,168,585
MRO	\$637,557,221
Total	\$1,463,725,806
Number of Major Projects	9
Value of Major Projects	\$712,000,000
Skilled Construction Employment Hours	
Boilermaker	1,027,572
Carpenter	294,210
Electrician	1,704,564
HVAC Installers	340,837
Instrumentation Tech	453,095
Insulator	302,835
Ironworker	400,760
Laborer	386,909
Millwright	319,285
Operator	422,301
Painting	129,403
Plumber + Pipefitter	1,465,192
Scaffolding	1,095,952
Welder	782,217
Total	9,125,132

Note: CAP=Capital Expenditures, MRO=Maintenance, Repair and Overhaul

Oil & Gas Pipelines
California, 2008-2018

Total Investment Value	
CAP	\$889,429,764
MRO	\$998,820,286
Total	\$1,888,250,050
Number of Major Projects	
	5
Value of Major Projects	
	122,700,000
Skilled Construction Employment Hours	
Boilermaker	117,247
Carpenter	179,493
Electrician	795,315
HVAC Installers	159,922
Instrumentation Tech	39,839
Insulator	31,772
Ironworker	34,987
Laborer	217,241
Millwright	233,953
Operator	214,582
Painting	89,634
Plumber + Pipefitter	739,139
Scaffolding	189
Welder	266,384
Total	3,119,697

Note: CAP=Capital Expenditures, MRO=Maintenance, Repair and Overhaul

Oil & Gas Production

California, 2008-2018

Total Investment Value	
CAP	\$5,572,490,842
MRO	\$1,381,138,369
Total	\$6,953,629,211
Number of Major Projects	22
Value of Major Projects	1,950,000,000
Skilled Construction Employment Hours	
Boilermaker	1,847,247
Carpenter	378,306
Electrician	1,005,423
HVAC Installers	904,904
Instrumentation Tech	396,542
Insulator	1,554,332
Ironworker	2,338,058
Laborer	1,065,059
Millwright	407,454
Operator	1,033,045
Painting	307,437
Plumber + Pipefitter	3,884,382
Scaffolding	3,449,881
Welder	2,264,153
Total	20,836,223

Note: CAP=Capital Expenditures, MRO=Maintenance, Repair and Overhaul

Alternative Fuels
California, 2008-2018

Total Investment Value	
CAP	\$589,698,589
MRO	\$236,469,996
Total	\$826,168,585
Number of Major Projects	14
Value of Major Projects	383,000,000
Skilled Construction Employment Hours	
Boilermaker	28,323
Carpenter	42,161
Electrician	597,321
HVAC Installers	100,760
Instrumentation Tech	45,464
Insulator	5,355
Ironworker	31,999
Laborer	63,592
Millwright	44,152
Operator	125,853
Painting	12,195
Plumber + Pipefitter	437,599
Scaffolding	6,869
Welder	23,591
Total	1,565,234

Note: CAP=Capital Expenditures, MRO=Maintenance, Repair and Overhaul

Petroleum Refining
California, 2008-2018

Total Investment Value	
CAP	\$10,655,487,689
MRO	\$6,484,335,702
Total	\$17,139,823,391
Number of Major Projects	144
Value of Major Projects	3,336,500,000
Skilled Construction Employment Hours	
Boilermaker	2,411,700
Carpenter	8,343,119
Electrician	13,230,269
HVAC Installers	4,104,415
Instrumentation Tech	1,918,349
Insulator	2,682,425
Ironworker	4,206,367
Laborer	4,961,146
Millwright	3,463,912
Operator	8,192,866
Painting	2,013,429
Plumber + Pipefitter	19,957,760
Scaffolding	5,853,506
Welder	12,734,689
Total	94,073,952

Note: CAP=Capital Expenditures, MRO=Maintenance, Repair and Overhaul