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# ***Economic and Fiscal Impacts of Utah's Petroleum Industry: 2020-2024***

*April 2023*

Prepared for

**Utah Petroleum  
Association**



# *Table of Contents*

Executive Summary	E-1
I. Introduction	1
II. Industry Definition	3
III. Economic and Fiscal Impacts of Utah's Petroleum Industry	6
A. State Results	6
B. County Results	18
Appendix A: Direct Impact by Detailed Sector	A-1
Appendix B: Data Sources and Methodology	B-1

# Economic and Fiscal Impacts of Utah’s Petroleum Industry: 2020-2024

## Executive Summary

The Utah Petroleum Association (“UPA”) engaged PwC to quantify the economic and fiscal impacts of Utah’s petroleum industry in terms of employment, labor income, value added, and tax and royalty payments at the state level and for five counties: Carbon, Davis, Duchesne, Salt Lake, and Uintah.<sup>1</sup>

This report provides PwC’s economic and fiscal impact estimates for the three most recent prior years, 2020-2022, and projections for 2023 and 2024. The impacts of Utah’s petroleum industry are the result of three channels: direct impacts from the employment and production within the petroleum industry; indirect impacts through the industry’s purchases of intermediate and capital goods from a variety of other Utah industries; and induced impacts from the personal purchases of employees and business owners both within the petroleum industry and its supply chain.<sup>2</sup>

### Economic Impact

As shown in **Table E-1** and **Figure E-1**, below, Utah’s petroleum industry has a significant impact on the state economy. At the state level, the report finds that each direct job in the petroleum industry supports approximately two additional jobs elsewhere in Utah’s economy, resulting in an employment multiplier of three. Combining the direct, indirect, and induced impacts, the industry’s total impact on employment is projected to grow by 14,570 jobs between 2021 and 2024, from 63,400 full-time and part-time jobs in 2021 to 77,970 in 2024, a 23 percent increase.<sup>3</sup>

Counting direct, indirect, and induced impacts, the industry’s total impact on state labor income (including proprietors’ income) is projected to grow from \$4.3 billion in 2021 to \$5.8 billion in 2024, a 36 percent increase. The industry’s total impact on Utah’s value added (i.e., contribution to GDP) is projected to grow from \$10.2 billion in 2021 to \$13.4 billion in 2024, a 31 percent

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<sup>1</sup> Value added is a term commonly used by economists to describe how much an industry contributes to a nation’s or state’s Gross Domestic Product, or GDP. It represents the additional value created at a particular stage of production. Value added is measured as the difference between the total revenue of the industry and the total cost of its materials, supplies, and services purchased from other businesses, other than capital goods. Value added can also be derived as the sum of employee compensation, proprietors’ income, pretax income to capital owners from property (including depreciation), and taxes on production and imports (including excise taxes, property taxes, fees, licenses, sales taxes, and custom duties paid by businesses).

<sup>2</sup> These economic impacts represent the entire *backward linkages* of Utah’s petroleum industry to its suppliers. They do not capture *forward linkages* (i.e., the economic impact on production in sectors that use petroleum as an input).

<sup>3</sup> 2021 is used as the reference base year, because 2020 was not a representative year for the petroleum industry (or any other industry) due to the onset of Covid-19, which caused widespread disruptions to virtually all sectors of the economy, including the petroleum industry. According to the US Energy Information Administration, Utah’s First Purchase Price for crude oil (the price paid on the first transfer of ownership of crude oil from a property) dropped almost 30 percent in 2020 compared to 2019. Utah’s oil and natural gas production saw a sharp decline in 2020 as well.

increase. For the 2020-2024 period, the industry’s direct and total labor income impacts are estimated to total \$9.0 billion and \$24.1 billion, respectively.

The impacts quantified in this analysis are limited to Utah and do not include any spillover effects on other states or spillover effects on Utah due to the industry’s economic activities outside of Utah. Including such spillover effects would have significantly increased the overall impact of the industry on Utah.<sup>4</sup> For the 2020-2024 period, the industry’s direct and total value added impacts are estimated to total \$30.9 billion and \$55.4 billion, respectively.

**Table E-1. – Direct and Total Economic Impacts of Utah’s Petroleum Industry to Utah, 2020-2024**

Item	2020	2021	2022	2023	2024
<b>Employment (jobs)<sup>(1)</sup></b>					
Direct Impact	19,950	19,780	21,390	22,060	22,840
Indirect and Induced Impact	32,180	43,620	49,910	52,960	55,130
Total Impact <sup>(4)</sup>	52,130	63,400	71,300	75,020	77,970
Multiplier <sup>(5)</sup>	2.6	3.2	3.3	3.4	3.4
<b>Labor Income (\$millions)<sup>(2)</sup></b>					
Direct Impact	\$1,586	\$1,559	\$1,826	\$1,946	\$2,061
Indirect and Induced Impact	\$1,814	\$2,727	\$3,289	\$3,582	\$3,756
Total Impact <sup>(4)</sup>	\$3,400	\$4,286	\$5,115	\$5,529	\$5,817
Multiplier <sup>(5)</sup>	2.1	2.8	2.8	2.8	2.8
<b>Value Added (\$millions)<sup>(3)</sup></b>					
Direct Impact	\$4,306	\$5,752	\$6,564	\$6,967	\$7,337
Indirect and Induced Impact	\$2,874	\$4,438	\$5,314	\$5,767	\$6,041
Total Impact <sup>(4)</sup>	\$7,180	\$10,190	\$11,878	\$12,733	\$13,378
Multiplier <sup>(5)</sup>	1.7	1.8	1.8	1.8	1.8

Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies. Details may not add up to totals due to rounding.

(1) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(2) Labor income is defined as wages and salaries and benefits as well as proprietors’ income.

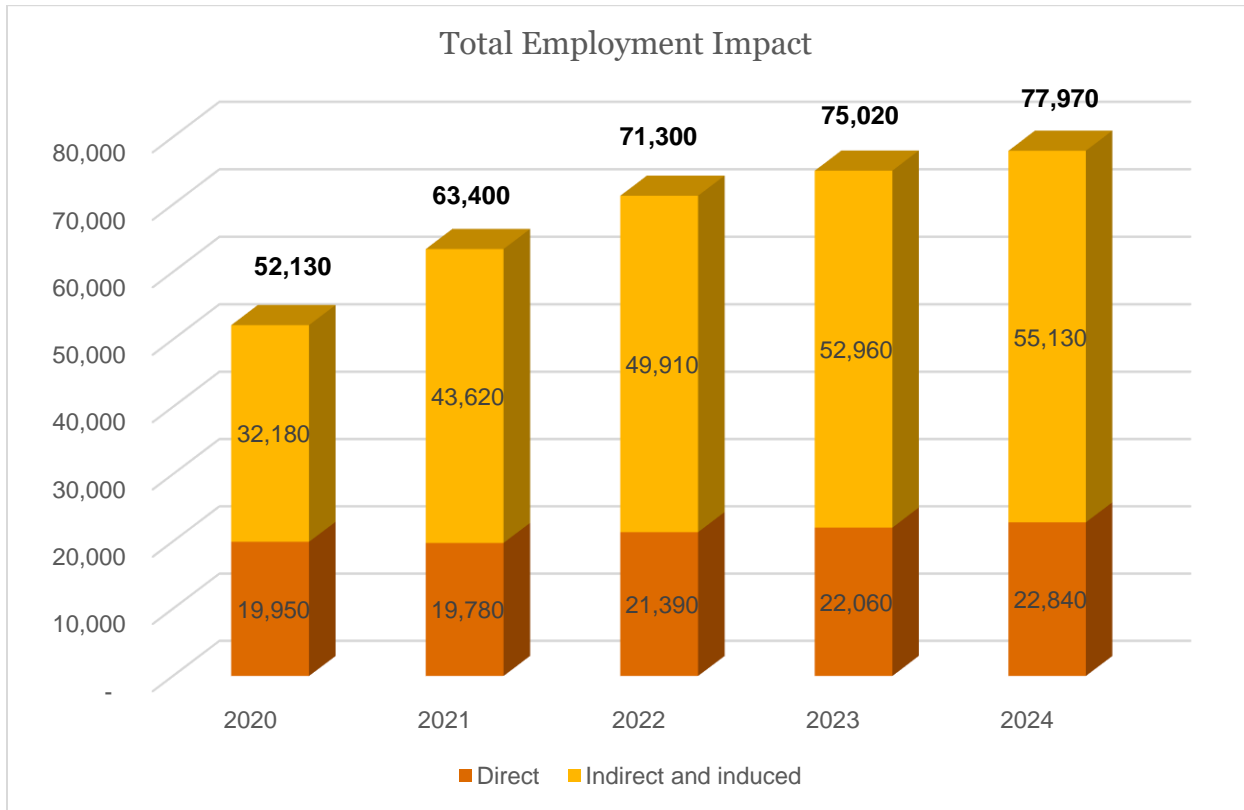
(3) Value added refers to the additional value created at a particular stage of production. It is measured as the difference between the total revenue of the industry and the total cost of its materials, supplies, and services purchased from other businesses, other than capital goods.

(4) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the petroleum industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the petroleum industry. Induced impacts are those arising from household spending of income earned from the petroleum industry or its supply chain.

(5) Economic multiplier represents the overall impact (including direct, indirect, and induced) relative to the direct impact.

<sup>4</sup> For example, for 2021, the most recent year with complete historical data, including the cross-state spillover effects would have increased the industry’s total employment impact on Utah to 104,100 jobs from 63,400 jobs excluding the cross-state spillover effects.

**Figure E-1. – Direct, Indirect and Induced Employment Impacts of Utah's Petroleum Industry, 2020-2024**

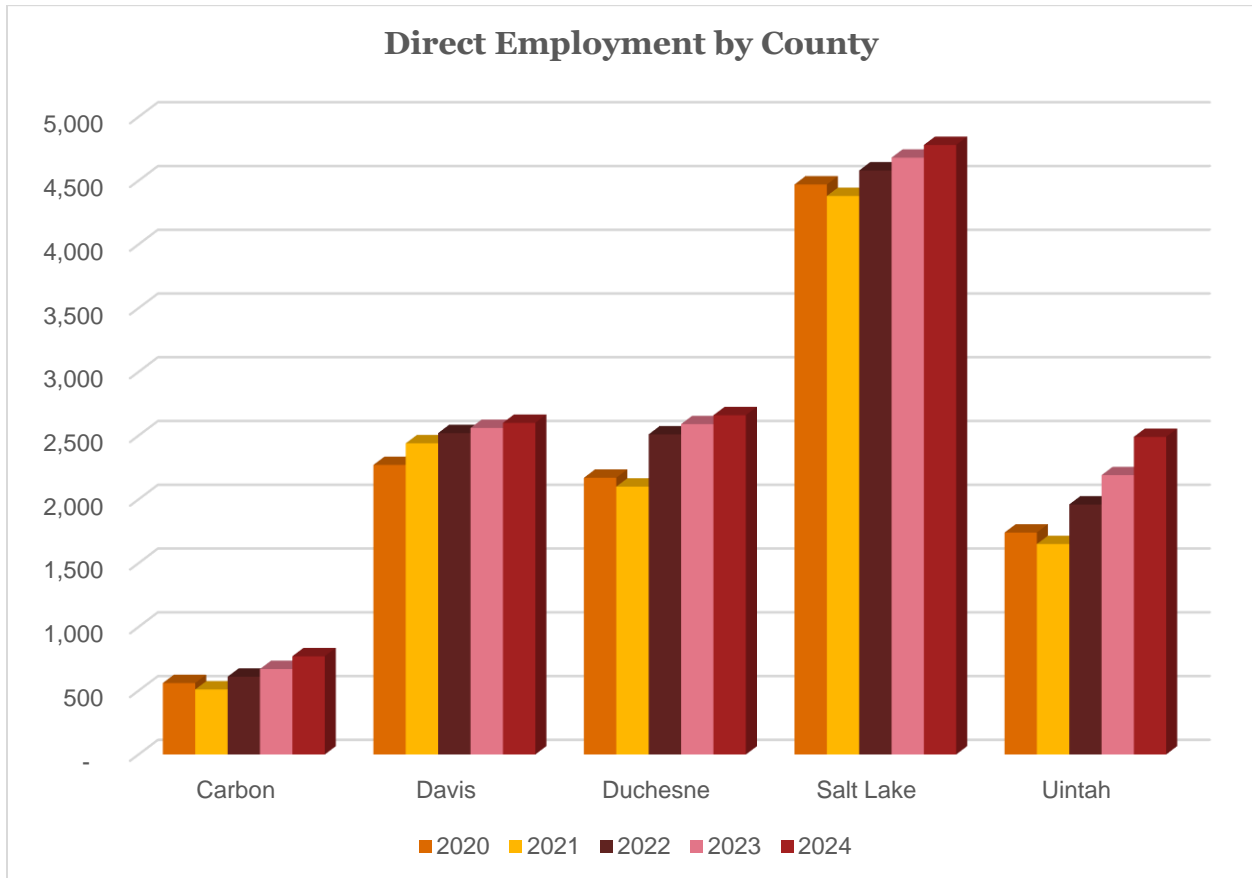


Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

Of the five Utah counties with the greatest amount of oil and gas production and petroleum refining, the industry’s direct employment in Salt Lake County is the largest, followed by Davis, Duchesne, Uintah, and Carbon (see **Figure E-2**, below).

Between 2021 and 2024, the industry is projected to show the fastest direct employment growth in Uintah County, with growth of 840 jobs or 51 percent, followed by Duchesne County, with growth of 560 jobs.

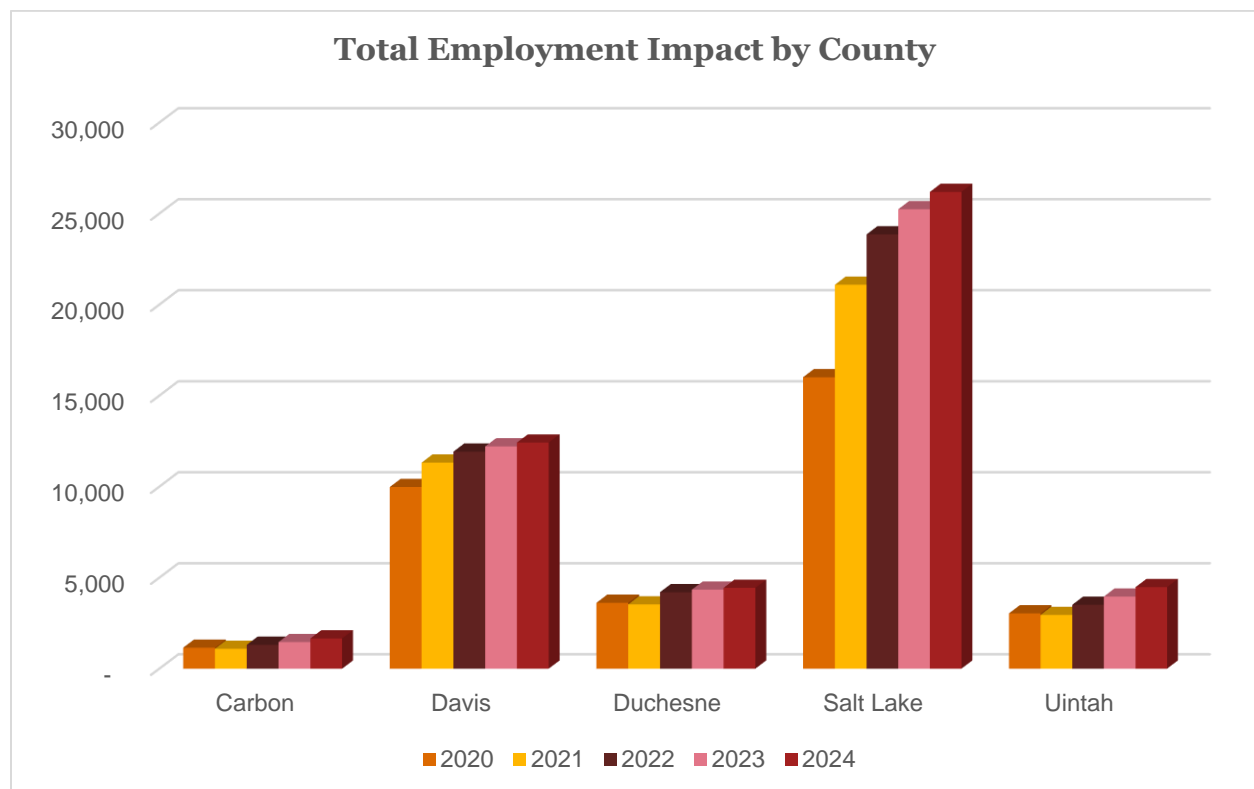
**Figure E-2. – Direct Employment Impacts of Utah’s Petroleum Industry on Selected Counties, 2020-2024**



Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

Counting direct, indirect, and induced impacts, the industry’s total impact on Salt Lake County is the greatest, followed by Davis, Uintah, Duchesne, and Carbon (see **Figure E-3**, below). Even though Salt Lake County is projected to experience relatively modest growth in direct petroleum industry employment, the indirect and induced employment impacts it receives significantly outpace that of the other four counties. Economywide, Salt Lake County has the largest employment in the state (it accounts for over 44 percent of Utah’s total employment across all sectors, compared to 11 percent for the other four counties combined). As such, Salt Lake County receives a large share of the petroleum industry’s indirect and induced impacts.

**Figure E-3. – Total Employment Impacts of Utah’s Petroleum Industry on Selected Counties, 2020-2024**



Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

### Fiscal Impact

In addition to corporate income taxes, companies in the Utah petroleum industry are directly subject to a number of other general and industry-specific taxes, royalty charges, and fees.<sup>5</sup> Through its indirect and induced economic impacts, the Utah petroleum industry further contributes to the public finances of Utah’s state and local governments.

As shown in **Table E-2**, below, including direct, indirect, and induced impacts, the industry’s total tax and royalty contribution to the State of Utah and its local governments is projected to increase from \$2.1 billion in 2021 to \$2.9 billion in 2024, a 34 percent increase. Severance taxes and royalties specific to oil and natural gas production, including federal royalties returned to

<sup>5</sup> The Utah Tax Commission lists a total of 54 taxes and fees in the state (<https://tax.utah.gov/utah-taxes>).

Utah and royalties paid to the State of Utah School and Institutional Trust Lands Administration (“SITLA”), are each projected to increase by more than 100 percent between 2021 and 2024.

**Table E-2. – Fiscal Impacts of Utah’s Petroleum Industry on Utah, 2020-2024**

Item	2020	2021	2022	2023	2024	2020-2024 Total
<b>Total Impact (\$millions)<sup>(1)</sup></b>	<b>\$1,569</b>	<b>\$2,140</b>	<b>\$2,523</b>	<b>\$2,682</b>	<b>\$2,859</b>	<b>\$11,775</b>
Corporate Income Taxes	\$24	\$39	\$45	\$48	\$50	\$204
Personal Income Taxes	\$99	\$125	\$149	\$161	\$169	\$701
Property Taxes	\$495	\$671	\$763	\$811	\$851	\$3,590
Sales and Use Taxes	\$799	\$1,082	\$1,231	\$1,308	\$1,373	\$5,794
Severance Tax	\$26	\$48	\$81	\$85	\$105	\$346
Oil and Gas Conservation Fee	\$3	\$4	\$8	\$8	\$10	\$33
Federal Royalty Disbursement <sup>(2)</sup>	\$32	\$49	\$90	\$94	\$115	\$380
SITLA Royalties	\$23	\$32	\$54	\$57	\$70	\$235
All Other Government Payments <sup>(3)</sup>	\$68	\$91	\$104	\$111	\$117	\$492

Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies. Details may not add up to totals due to rounding.

(1) This includes all taxes and royalties directly or indirectly resulting from the Utah petroleum industry’s operations (including direct, indirect, and induced economic effects) benefiting Utah’s state and local governments.

(2) Federal oil and gas royalty disbursement is roughly 50 percent of the federal oil and gas royalties paid by the Utah petroleum industry.

(3) These payments include such taxes and fees as motor vehicle license fees, special assessments, non-taxes (fines/fees), and other miscellaneous taxes/fees not specified by the Census Bureau.

Over the 2020-2024 period, sales and use taxes represent the largest tax contribution to the state from the Utah petroleum industry’s operations (including direct, indirect, and induced economic effects) and are projected to total \$5.8 billion over five years, followed by property taxes projected to total \$3.6 billion over five years.

Cumulative federal oil and gas royalty disbursements to Utah over the 2020-2024 period are projected to total \$380 million, representing roughly 50 percent of oil and gas royalties paid by the Utah petroleum industry to the federal government. Cumulative SITLA royalties paid by the industry over this period are projected to be \$235 million. Cumulative severance taxes paid by the industry are projected to be \$346 million. Cumulative oil and gas conservation fees over this period are projected to be \$33 million. In total, these royalty collections, severance taxes, and conservation fees are projected to total just under \$1 billion for Utah’s state and local governments over the 2020-2024 period.

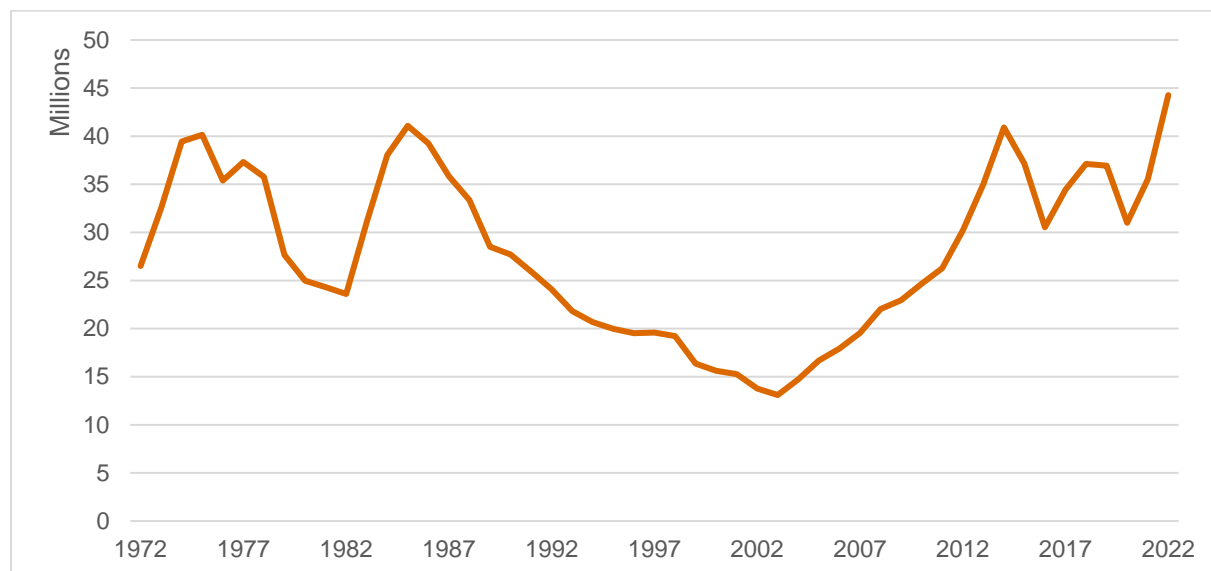


# Economic and Fiscal Impacts of Utah’s Petroleum Industry: 2020-2024

## I. Introduction

According to the US Energy Information Administration (“EIA”), Utah accounts for 13 in every 100 barrels of crude oil produced in the Rocky Mountain region, making it one of the largest oil producers in the country.<sup>6</sup> Utah has produced 1.8 billion barrels of oil over the past 75 years. Utah oil production has been generally rising over the past 20 years, having reached a 50-year low in 2003. Production in 2022 reached an all-time high of 45 million barrels, surpassing earlier record highs of 41 million barrels reached in 1985 and 2014, as shown in **Figure I-1**, below. Utah’s estimated oil reserves stood at 530 million barrels at the end of 2021.

**Figure I-1. – Oil Production in Utah, 1972-2022, Millions of Barrels**



Source: Utah Department of Natural Resources.

Utah is also a major natural gas producer, with its statewide natural gas production making up approximately 44 percent of Utah’s total produced energy resources.<sup>7</sup> Utah’s five oil refineries hold over 150,000 barrels per day of refining capacity for gasoline, diesel, jet fuel and related products. With some 20,000 industry jobs in Utah directly involved in extraction, well operations, support services, pipeline construction, refining, transportation, and distribution, the petroleum industry has a significant impact on Utah’s economy.

The Utah Petroleum Association (“UPA”) engaged PwC to quantify the economic and fiscal impacts of Utah’s petroleum industry in terms of employment, labor income, value added, and tax and royalty payments at the state level and for five counties: Carbon, Davis, Duchesne, Salt

<sup>6</sup> “Utah State Energy Profile,” US Energy Information Administration, <https://www.eia.gov/state/print.php?sid=UT>.

<sup>7</sup> “Learn about Utah Oil and Gas.” Lands Administration, <https://trustlands.utah.gov/work-with-us/oil-gas/learn-about-utah-oil-and-gas/>.

Lake, and Uintah.<sup>8</sup> This report presents PwC’s economic and fiscal impact estimates for the 2020-2024 period.

In describing the economic and fiscal impact of Utah’s petroleum industry through its employment and purchases of goods and services, this report considers three separate channels -- the direct impact, the indirect impact, and the induced impact -- that in aggregate provide a measure of the total economic and fiscal impact of Utah’s petroleum industry.<sup>9</sup>

- **Direct impact** is measured as the jobs, labor income, value added, and tax and royalty payments *within* the oil and natural gas industry.
- **Indirect impact** is measured as the jobs, labor income, value added, and tax payments occurring *throughout the supply chain* of the petroleum industry attributable to its operating and capital expenditures.<sup>10</sup>
- **Induced impact** is measured as the jobs, labor income, value added, and tax payments resulting from *household spending* of labor and proprietor’s income earned either directly or indirectly from the petroleum industry’s spending.

Together these effects result in the petroleum industry having an economic impact throughout all sectors of Utah’s economy.

The main data source for the industry’s direct jobs, labor income, and value added is the *State Annual Personal Income and Employment* data set published by the US Bureau of Economic Analysis (“BEA”). The BEA data are supplemented by projections collected from UPA members. Historical severance taxes, federal and state lease royalties, and the oil and gas conservation fee were collected from the Utah Tax Commission, the SITLA, and the US Department of Interior.

For the industry’s indirect and induced economic impacts, we have developed the estimates using customized input-output models for each Utah study area based on the IMPLAN input-output modeling system.<sup>11</sup> State and local tax payments for the industry’s indirect and induced economic impacts are also estimated based on the IMPLAN model.

The rest of this report is organized as follows. **Section II** defines the petroleum industry for this study. **Section III** presents PwC’s estimates of the industry’s economic and fiscal impacts in Utah. Detailed results by sector and an overview of the study methodology are provided in the appendices.

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<sup>8</sup> Value added is a term commonly used by economists to describe how much an industry contributes to a nation’s or state’s GDP. It represents the additional value created at a particular stage of production. Value added is measured as the difference between the total revenue of the industry and the total cost of its materials, supplies, and services purchased from other businesses, other than capital goods. Value added can also be derived as the sum of employee compensation, proprietors’ income, pretax income to capital owners from property (including depreciation), and taxes on production and imports (including excise taxes, property taxes, fees, licenses, sales taxes, and custom duties paid by businesses).

<sup>9</sup> These economic impacts represent all of the *backward linkages* of Utah’s petroleum industry to its suppliers. They do not capture *forward linkages* (i.e., the economic impact on production in sectors that use petroleum as an input).

<sup>10</sup> Operating expenditures are the costs on non-capital inputs (such as materials, rent, and utilities) for a company to run its business operations on a daily basis. Capital expenditures are the purchases of major physical goods or services that will have a productive life of more than one year.

<sup>11</sup> The IMPLAN input-output economic modeling system is supported by the IMPLAN Group LLC. Its users include academia, federal, state, and local governments, and the private sector.

## II. Industry Definition

The Utah petroleum industry encompasses multiple activities that span separate industry classifications in government economic data. Oil and natural gas exploration and production is included in the mining sector; oil refining is part of the manufacturing sector; pipeline operations are included in the transportation sector; natural gas distribution is in the utilities sector; and oil marketing is considered part of the wholesale and retail trade sector.

For this study, PwC has defined the Utah petroleum industry to include activities within the mining, manufacturing, transportation, utilities and retail trade sectors, as listed below. Detailed descriptions of these activities based on the *North American Industry Classification System* (“NAICS”) follow.

**Table II-1. – Composition of the Utah Petroleum Industry**

NAICS	Description
211	Oil and gas extraction (including NGL extraction)
213111	Drilling oil and gas wells
213112	Support activities for oil and gas operations
2212	Natural gas distribution (private and public)
23712	Oil and gas pipeline and related structures construction
32411	Petroleum refineries
32412	Asphalt paving, roofing and saturated materials manufacturing
324191	Petroleum lubricating oil and grease manufacturing
4247	Petroleum and petroleum products merchant wholesalers
44711, 44719	Gasoline stations
45431	Fuel dealers
486	Pipeline transportation

**NAICS Code 211. Oil and gas extraction.** Establishments in this subsector operate and/or develop oil and gas field properties. Such activities may 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, and 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.

**NAICS Code 213111. Drilling oil and gas wells.** This subsector 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, drilling, re-drilling, and directional drilling.

**NAICS Code 213112. Support activities for oil and gas operations.** This subsector comprises establishments primarily engaged in performing support activities on a contract or fee basis for oil and gas operations (except site preparation and related construction activities). Services included are exploration (except geophysical surveying and mapping); 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 Code 2212. Natural gas distribution.** This subsector 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. Both privately and publicly owned establishments are included.

**NAICS Code 23712. Oil and gas pipeline and related structures construction.** This subsector 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 group 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 subsector.

**NAICS Code 32411. Petroleum refineries.** This subsector 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 Code 32412. Asphalt paving, roofing, and saturated materials manufacturing.** This subsector comprises establishments primarily engaged in (1) manufacturing asphalt and tar paving mixtures and blocks and roofing cements and coatings from purchased asphaltic materials and/or (2) saturating purchased mats and felts with asphalt or tar from purchased asphaltic materials. These are primarily petroleum-based products.

**NAICS Code 324191. Petroleum lubricating oil and grease manufacturing.** This subsector 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 Code 4247. Petroleum and petroleum products merchant wholesalers.** This subsector comprises establishments with bulk liquid storage facilities primarily engaged in the merchant wholesale distribution of crude petroleum and petroleum products, including liquefied petroleum gas.

**NAICS Code 44711. Gasoline stations with convenience stores.** This subsector comprises establishments engaged in retailing automotive fuels (e.g., diesel fuel, gasohol, gasoline) in combination with convenience store or food mart items. These establishments can either be in a convenience store (i.e., food mart) setting or a gasoline station setting. These establishments may also provide automotive repair services.

**NAICS Code 44719. Other gasoline stations.** This subsector comprises establishments known as gasoline stations (except those with convenience stores) primarily engaged in one of the following: (1) retailing automotive fuels (e.g., diesel fuel, gasohol, gasoline) or (2) retailing these fuels in combination with activities, such as providing repair services; selling automotive oils, replacement parts, and accessories; and/or providing food services.

**NAICS Code 45431. Fuel dealers.** This subsector comprises establishments primarily engaged in retailing heating oil, liquefied petroleum gas, and other fuels via direct selling.

**NAICS Code 486. Pipeline transportation.** Establishments in this subsector use transmission pipelines to transport products, such as crude oil, natural gas, refined petroleum products, and slurry. It also 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.

### **III. Economic and Fiscal Impacts of Utah's Petroleum Industry**

This section presents the estimated economic and fiscal impacts of Utah's petroleum industry in Utah for the 2020-2024 period.

The total economic and fiscal impact we have measured includes the **direct impact** (the jobs, labor income, value added, and tax and royalty payments *within* the Utah petroleum industry), the **indirect impact** (the jobs, labor income, value added, and tax payments occurring *throughout the supply chain* of the Utah petroleum industry), and the **induced impact** (the jobs, labor income, value added, and tax payments resulting from *household spending* of labor and proprietor's income earned either directly or indirectly from the Utah petroleum industry's spending).

To quantify these linkages, we developed customized economic impact models for Utah and its selected counties using the IMPLAN modeling system, a well-known input-output (I-O) modeling tool designed to quantify the direct, indirect, and induced economic impacts. We have conducted extensive data analyses based on the latest historical data from the Federal and Utah state governments, inflation projections from the Congressional Budget Office and oil price projections from the EIA, and incorporated estimates of projected Utah production provided by UPA member companies (a detailed description of the data sources and modeling methodology used can be found in **Appendix B**).

#### **A. State Results**

The economic activity of the Utah petroleum industry can be measured using four separate metrics: employment, labor income, value added, and tax and royalty payments, as defined below.

- **Employment:** The number of payroll and self-employed jobs (including part-time jobs), averaged over the year.
- **Labor income:** The wages, salaries and benefits paid to employees and proprietors' income for the self-employed.
- **Value added:** The total output of each sector less the associated value of intermediate inputs. The sum of the value added across all sectors in the economy is GDP.<sup>12</sup> An industry's value added represents its contribution to GDP.
- **Tax and royalty payments:** Contributions to government finances at the state and local level.

#### **Economic Impact**

As shown in **Table III-1** and **Figure III-1**, below, Utah's petroleum industry has a significant impact on the state economy. The industry's direct employment is projected to grow by 3,060 between 2021 and 2024. 2021 is used as the reference base year, because 2020 was not a representative year for the petroleum industry (or any other industry) due to the onset of Covid-19, which caused widespread disruptions to virtually all sectors of the economy, including the petroleum industry. According to the EIA, Utah's First Purchase Price for crude oil dropped

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<sup>12</sup> Value added differs from gross output (or sales) because it excludes the value of intermediate goods that are embedded in the final sales of each industry.

almost 30 percent in 2020 compared to 2019. Utah’s oil and natural gas production saw a sharp decline in 2020 as well.

The industry’s direct labor income (including proprietors’ income) is projected to grow from \$1.6 billion in 2021 to \$2.1 billion in 2024, a 32 percent increase. For the 2020-2024 period, the industry’s direct labor income impact is estimated to total \$9.0 billion.

The industry’s direct value added (i.e., contribution to GDP) is projected to grow from \$5.8 billion in 2021 to \$7.3 billion in 2024, a 28 percent increase. For the 2020-2024 period, the industry’s direct value added impact is estimated to total \$30.9 billion (see **Appendix A** for a breakout of the industry’s direct impact by detailed subsector).

**Table III-1. – Direct and Total Economic Impacts of Utah’s Petroleum Industry to Utah, 2020-2024**

Item	2020	2021	2022	2023	2024
<b>Employment (jobs)<sup>(1)</sup></b>					
Direct Impact	19,950	19,780	21,390	22,060	22,840
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(2) Labor income is defined as wages and salaries and benefits as well as proprietors’ income.

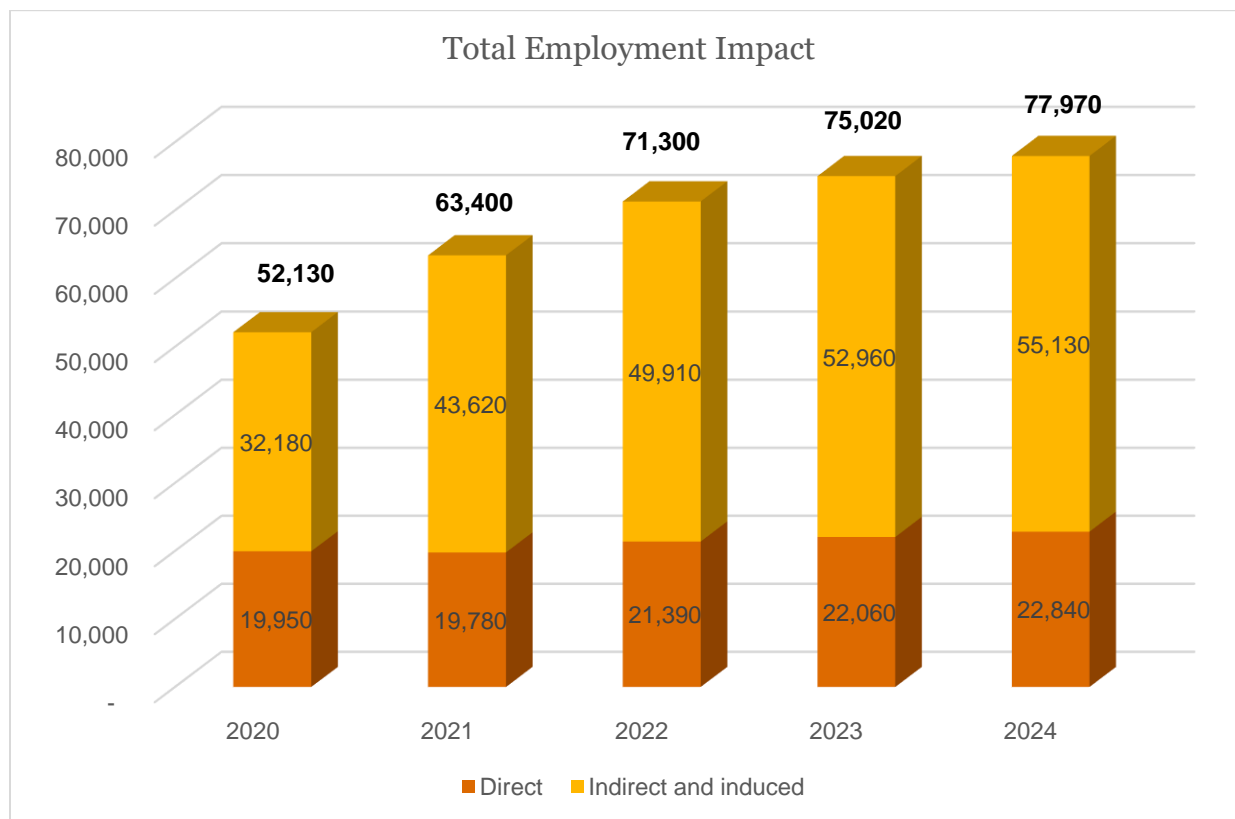
(3) Value added refers to the additional value created at a particular stage of production. It is measured as the difference between the total revenue of the industry and the total cost of its materials, supplies, and services purchased from other businesses, other than capital goods.

(4) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the petroleum industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the petroleum industry. Induced impacts are those arising from household spending of income earned from the petroleum industry or its supply chain.

(5) Economic multiplier represents the overall impact (including direct, indirect, and induced) relative to the direct impact.



**Figure III-1. – Direct, Indirect and Induced Employment Impacts of Utah’s Petroleum Industry, 2020-2024**



Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

At the state level, the report finds that each direct job in the petroleum industry supports approximately two additional jobs elsewhere in Utah’s economy, resulting in an employment multiplier of three. Combining the direct, indirect, and induced impacts, the industry’s total impact on employment is projected to grow by 14,570 jobs between 2021 and 2024, from 63,400 full-time and part-time jobs in 2021 to 77,970 in 2024, a 23 percent increase.

Counting direct, indirect, and induced impacts, the industry’s total impact on state labor income (including proprietors’ income) is projected to grow from \$4.3 billion in 2021 to \$5.8 billion in 2024, a 36 percent increase. For the 2020-2024 period, the industry’s total labor income impact is estimated to total \$24.1 billion. The industry’s total impact on Utah’s value added (i.e., contribution to GDP) is projected to grow from \$10.2 billion in 2021 to \$13.4 billion in 2024, a 31 percent increase. For the 2020-2024 period, the industry’s total value added impact is estimated to total \$55.4 billion.

The impacts quantified in this analysis are limited to Utah and do not include any spillover effects on other states or spillover effects on Utah due to the industry’s economic activities outside of Utah. Including such spillover effects would have significantly increased the overall impact of the industry on Utah.<sup>13</sup>

<sup>13</sup> For example, for 2021, the most recent year with complete historical data, including the cross-state spillover effects would have increased the industry’s total employment impact on Utah to 104,100 jobs from the 63,400 jobs shown in Table 1, which excludes the cross-state spillover effects.



The indirect and induced economic activity occurs across a broad range of other Utah industries. For employment, over 50 percent of the indirect and induced impact attributable to the Utah petroleum industry's operational and capital expenditures in the 2020-2024 period is in the services sector. The next three sectors receiving a significant share of the petroleum industry's indirect and induced impacts are: (1) finance, insurance, real estate, rental, and leasing; (2) transportation and warehousing; and (3) wholesale and retail trade, with each receiving more than 10 percent (see **Table III-2a** and **Figure III-2a**, below).

For labor income, roughly 48 percent of the indirect and induced impact attributable to the Utah petroleum industry's operational and capital expenditures in the 2020-2024 period is in the services sector, followed by transportation and warehousing (averaging 13 percent over the period), finance, insurance, real estate, rental, and leasing (averaging 11.8 percent over the period), and wholesale and retail trade (averaging 11.3 percent over the period) (see **Table III-2b** and **Figure III-2b**, below).

For value added, the services sector accounted for about 35 percent of the indirect and induced impact attributable to the Utah petroleum industry's operational and capital expenditures in the 2020-2024 period. Finance, real estate, rental, and leasing accounted for another 25.7 percent, followed by wholesale and retail trade (11 percent) and transportation and warehousing (averaging 9.6 percent over the period) (see **Table III-2c** and **Figure III-2c**, below).

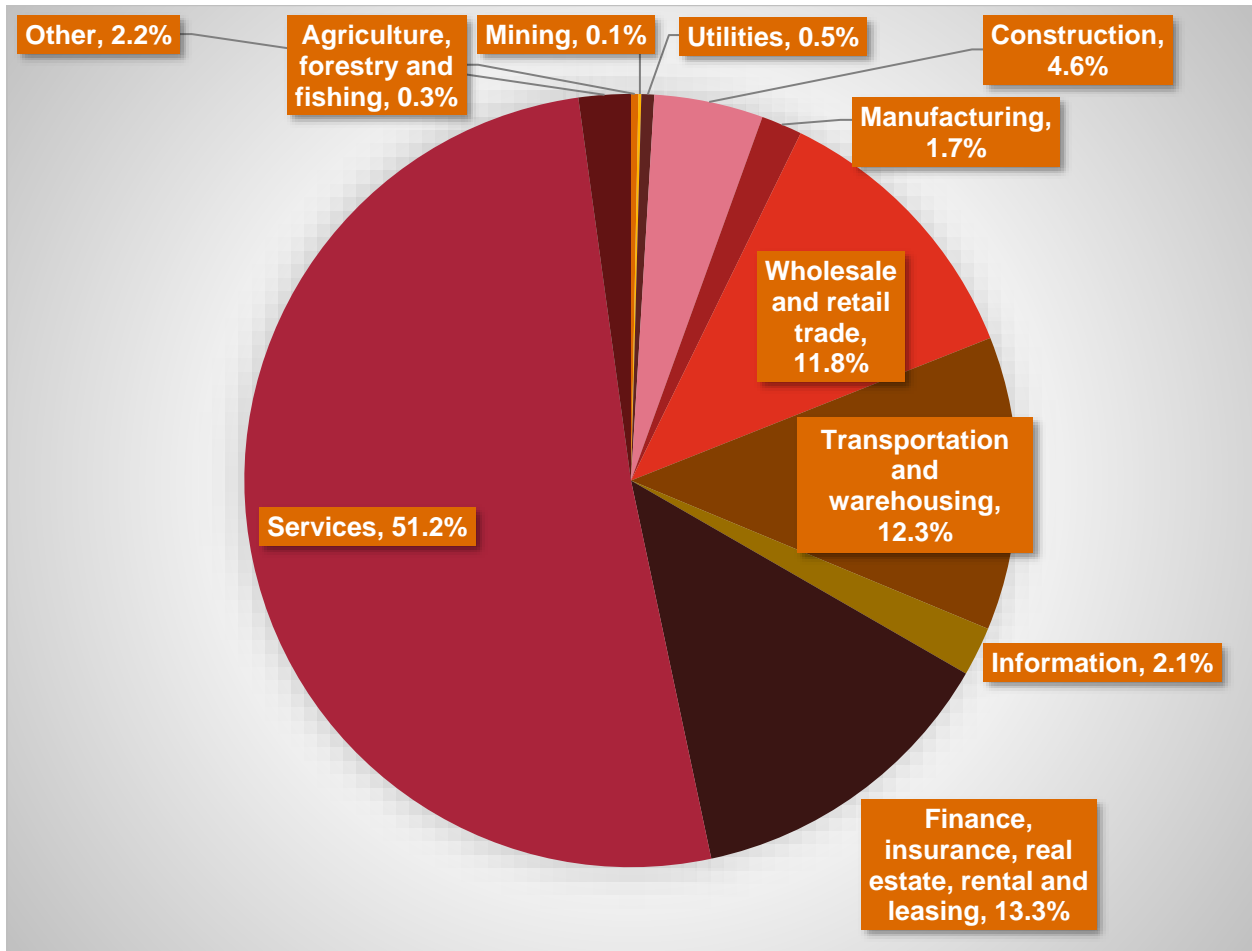
**Table III-2a. – Distribution of Indirect and Induced Activity Generated by Utah’s Petroleum Industry, 2020-2024: *Employment***

Industry Impacted	Indirect and Induced Impacts				
	2020	2021	2022	2023	2024
<b>Total (jobs)</b>	<b>32,180</b>	<b>43,620</b>	<b>49,910</b>	<b>52,960</b>	<b>55,130</b>
Agriculture, forestry and fishing	0.3%	0.3%	0.3%	0.3%	0.3%
Mining	0.1%	0.1%	0.1%	0.1%	0.1%
Utilities	0.6%	0.6%	0.5%	0.5%	0.5%
Construction	3.6%	5.1%	4.7%	4.8%	4.6%
Manufacturing	1.6%	1.6%	1.7%	1.8%	1.9%
Wholesale and retail trade	11.4%	10.9%	11.8%	12.2%	12.5%
Transportation and warehousing	12.2%	13.1%	12.3%	12.0%	11.8%
Information	2.2%	2.0%	2.0%	2.0%	2.1%
Finance, insurance, real estate, rental and leasing	14.2%	13.1%	13.2%	13.1%	13.1%
Services	51.7%	50.9%	51.1%	51.0%	51.1%
Other	2.1%	2.4%	2.2%	2.1%	2.1%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

**Figure III-2a. – Distribution of Indirect and Induced Activity Generated by Utah's Petroleum Industry: Employment, 2020-2024 Average**



Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

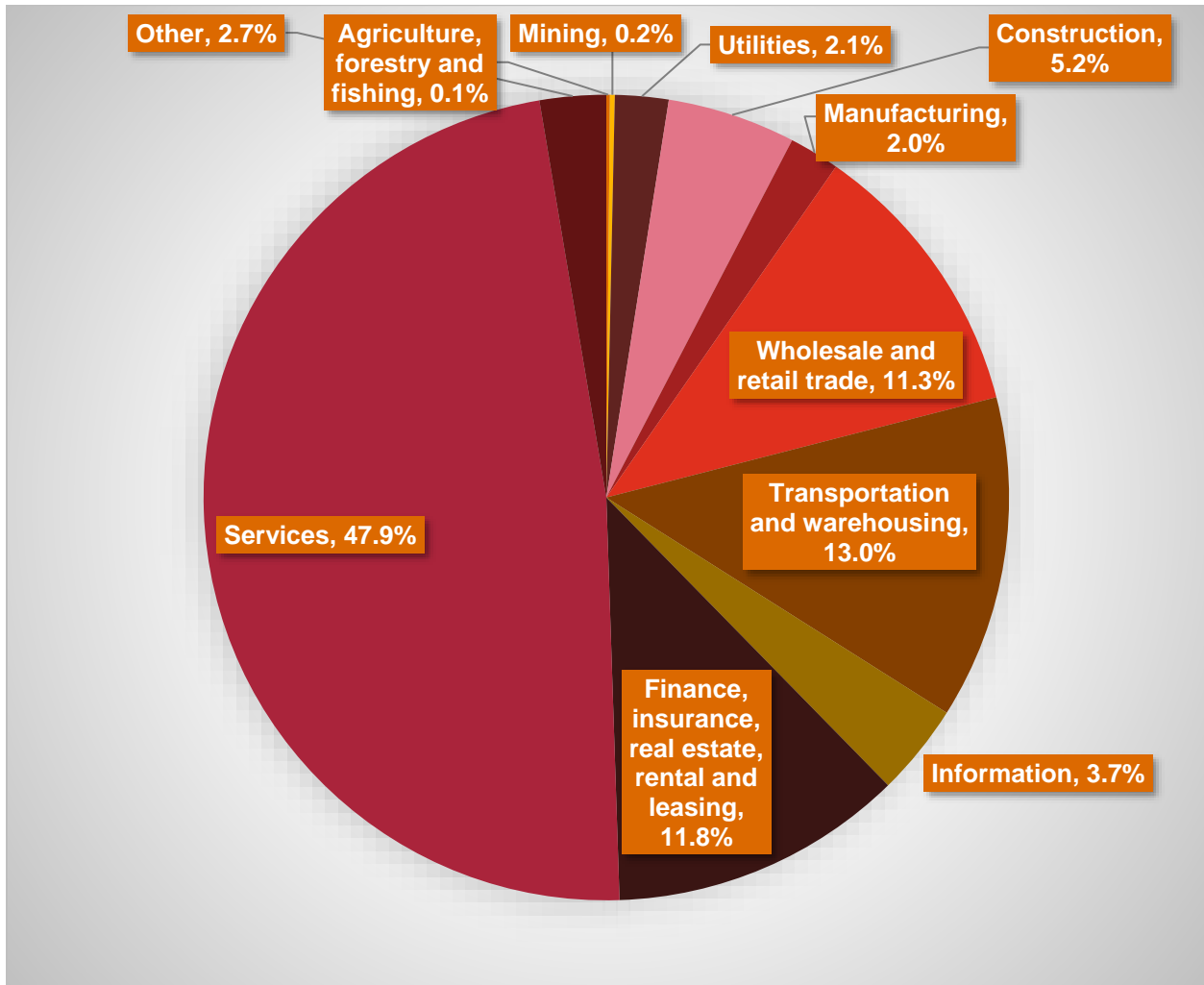
**Table III-2b. – Distribution of Indirect and Induced Activity Generated by Utah’s Petroleum Industry, 2020-2024: Labor Income**

Industry Impacted	Indirect and Induced Impacts				
	2020	2021	2022	2023	2024
<b>Total (\$millions)</b>	<b>\$1,814</b>	<b>\$2,727</b>	<b>\$3,289</b>	<b>\$3,582</b>	<b>\$3,756</b>
Agriculture, forestry and fishing	0.1%	0.2%	0.1%	0.1%	0.1%
Mining	0.2%	0.2%	0.2%	0.2%	0.2%
Utilities	2.0%	2.3%	2.2%	2.1%	2.1%
Construction	4.1%	5.7%	5.3%	5.3%	5.1%
Manufacturing	1.9%	1.8%	2.0%	2.1%	2.2%
Wholesale and retail trade	11.6%	10.4%	11.3%	11.7%	12.0%
Transportation and warehousing	13.4%	13.7%	12.8%	12.4%	12.2%
Information	3.9%	3.5%	3.6%	3.7%	3.7%
Finance, insurance, real estate, rental and leasing	12.0%	11.9%	11.8%	11.7%	11.7%
Services	48.1%	47.5%	48.0%	48.0%	48.1%
Other	2.7%	2.9%	2.7%	2.6%	2.5%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

Labor income is defined as wages and salaries and benefits as well as proprietors’ income.

**Figure III-2b. – Distribution of Indirect and Induced Activity Generated by Utah's Petroleum Industry: Labor Income, 2020-2024 Average**



Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

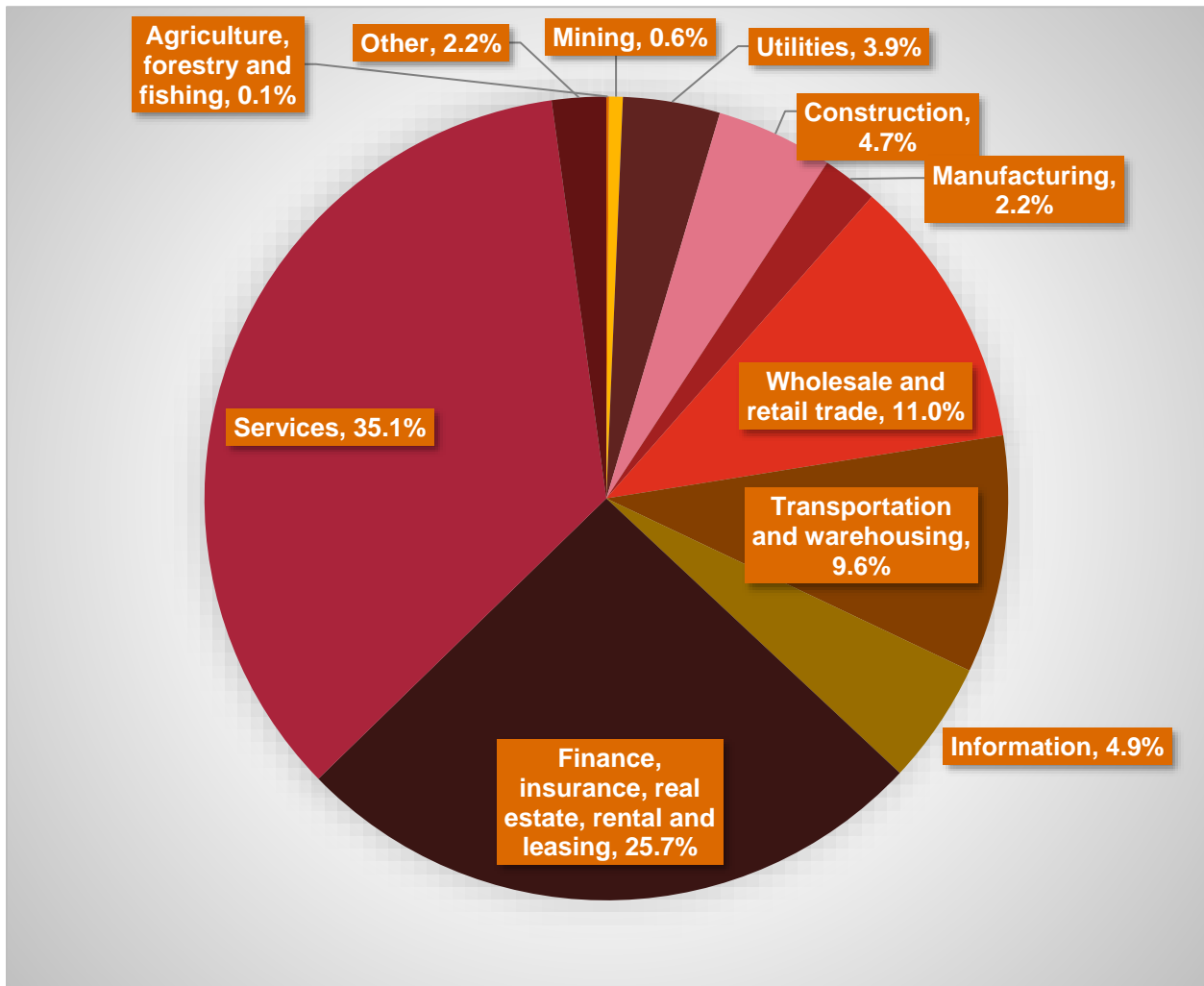
**Table III-2c. – Distribution of Indirect and Induced Activity Generated by Utah's Petroleum Industry, 2020-2024: Value Added**

Industry Impacted	Indirect and Induced Impacts				
	2020	2021	2022	2023	2024
<b>Total (\$millions)</b>	<b>\$2,874</b>	<b>\$4,438</b>	<b>\$5,314</b>	<b>\$5,767</b>	<b>\$6,041</b>
Agriculture, forestry and fishing	0.1%	0.1%	0.1%	0.1%	0.1%
Mining	0.6%	0.6%	0.5%	0.5%	0.5%
Utilities	3.6%	4.2%	3.9%	3.8%	3.8%
Construction	4.1%	5.1%	4.7%	4.7%	4.6%
Manufacturing	2.1%	2.0%	2.2%	2.3%	2.4%
Wholesale and retail trade	10.9%	10.3%	11.0%	11.3%	11.6%
Transportation and warehousing	9.6%	10.1%	9.4%	9.2%	9.1%
Information	5.1%	4.7%	4.9%	5.0%	5.0%
Finance, insurance, real estate, rental and leasing	26.4%	25.9%	25.7%	25.6%	25.5%
Services	35.2%	34.7%	35.2%	35.2%	35.4%
Other	2.2%	2.3%	2.2%	2.1%	2.1%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

Value added refers to the additional value created at a particular stage of production. It is measured as the difference between the total revenue of the industry and the total cost of its materials, supplies, and services purchased from other businesses, other than capital goods.

**Figure III-2c. – Distribution of Indirect and Induced Activity Generated by Utah's Petroleum Industry: Value Added, 2020-2024 Average**



Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

## Fiscal Impact

In addition to corporate income taxes, companies in the Utah petroleum industry are directly subject to a number of other general and industry-specific taxes, royalty charges, and fees.<sup>14</sup> Through its indirect and induced economic impacts, the Utah petroleum industry further contributes to the public finances of Utah's state and local governments.

As shown in **Table III-3**, below, including direct, indirect, and induced impacts, the industry's total tax and royalty contribution to the State of Utah and its local governments is projected to increase from \$2.1 billion in 2021 to \$2.9 billion in 2024, a 34 percent increase. Severance taxes and royalties specific to oil and natural gas production, including federal royalties returned to Utah and SITLA royalties, are each projected to increase by more than 100 percent between 2021 and 2024.

Over the 2020-2024 period, state and local sales and use taxes represent the largest tax contribution to the state from the Utah petroleum industry's operations (including direct, indirect, and induced economic effects) and are projected to total \$5.8 billion over five years (accounting for 49.2 percent of its total \$11.8 billion contribution over five years). The second largest tax contribution directly or indirectly attributable to the Utah petroleum industry is property taxes, projected to total \$3.6 billion over five years (30.5 percent of the total).

Cumulative federal oil and gas royalty disbursements to Utah are projected to total \$380 million over the 2020-2024 period. These disbursements represent roughly 50 percent of oil and gas royalties paid by the Utah petroleum industry to the federal government. Cumulative SITLA royalties paid by the industry over this period are projected to be \$235 million. Cumulative severance taxes paid by the industry are projected to be \$346 million. Cumulative oil and gas conservation fees are projected to be \$33 million. In total, these royalty collections, severance taxes, and conservation fees are projected to total just under \$1 billion for Utah's state and local governments over the 2020-2024 period.

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<sup>14</sup> The Utah Tax Commission lists a total of 54 taxes and fees in the state (<https://tax.utah.gov/utah-taxes>).



**Table III-3. – Fiscal Impacts of Utah’s Petroleum Industry on Utah, 2020-2024**

Item	2020	2021	2022	2023	2024	2020-2024 Total
<b>Total Impact (\$millions)<sup>(1)</sup></b>	<b>\$1,569</b>	<b>\$2,140</b>	<b>\$2,523</b>	<b>\$2,682</b>	<b>\$2,859</b>	<b>\$11,775</b>
Corporate Income Taxes	\$24	\$39	\$45	\$48	\$50	<b>\$204</b>
Personal Income Taxes	\$99	\$125	\$149	\$161	\$169	<b>\$701</b>
Property Taxes	\$495	\$671	\$763	\$811	\$851	<b>\$3,590</b>
Sales and Use Taxes	\$799	\$1,082	\$1,231	\$1,308	\$1,373	<b>\$5,794</b>
Severance Tax	\$26	\$48	\$81	\$85	\$105	<b>\$346</b>
Oil and Gas Conservation Fee	\$3	\$4	\$8	\$8	\$10	<b>\$33</b>
Federal Royalty Disbursement <sup>(2)</sup>	\$32	\$49	\$90	\$94	\$115	<b>\$380</b>
SITLA Royalties	\$23	\$32	\$54	\$57	\$70	<b>\$235</b>
All Other Government Payments <sup>(3)</sup>	\$68	\$91	\$104	\$111	\$117	<b>\$492</b>

Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies. Details may not add up to totals due to rounding.

(1) This includes all taxes and royalties directly or indirectly resulting from the Utah petroleum industry’s operations (including direct, indirect, and induced economic effects) benefiting Utah’s state and local governments.

(2) Federal oil and gas royalty disbursement is roughly 50 percent of the federal oil and gas royalties paid by the Utah petroleum industry.

(3) These payments include such taxes and fees as motor vehicle license fees, special assessments, non-taxes (fines/fees), and other miscellaneous taxes/fees not specified by the Census Bureau.

## *B. County Results*

The economic impact of the Utah petroleum industry at the county level reflects the indirect and induced effects attributable to direct activity within each county's borders, as well as indirect and induced activity within a county that is attributable to direct activity in other Utah counties.<sup>15</sup>

The economic impact of the Utah petroleum industry varies from county to county, depending on factors such as each county's population, natural resources, industry mix, wage structure, spending and saving patterns, and connections to other economies.

Of the five Utah counties with the greatest amount of oil and gas production and petroleum refining, the industry's direct employment in Salt Lake County is the largest, followed by Davis, Duchesne, Uintah, and Carbon (see **Table III-4** and **Figure III-3**, below).

Between 2021 and 2024, the industry is projected to show the fastest direct employment growth in Uintah County, with growth of 840 jobs or 51 percent, followed by Duchesne County, with growth of 560 jobs.

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<sup>15</sup> We have allocated the indirect and induced effects by industry attributable to direct activity in other counties based on the overall level of economic activity of that industry in each county under study.

**Table III-4. – Direct Economic Impacts of Utah's Petroleum Industry by County, 2020-2024<sup>(1)</sup>**

Item	2020	2021	2022	2023	2024
<b>Employment (jobs)<sup>(2)</sup></b>	<b>19,950</b>	<b>19,780</b>	<b>21,390</b>	<b>22,060</b>	<b>22,840</b>
Carbon	560	510	610	670	770
Davis	2,270	2,440	2,520	2,560	2,600
Duchesne	2,170	2,100	2,510	2,590	2,660
Salt Lake	4,470	4,380	4,580	4,680	4,780
Uintah	1,740	1,650	1,960	2,190	2,490
Rest of Utah	8,740	8,700	9,210	9,370	9,540
<b>Labor Income (\$millions)<sup>(3)</sup></b>	<b>\$1,586</b>	<b>\$1,559</b>	<b>\$1,826</b>	<b>\$1,946</b>	<b>\$2,061</b>
Carbon	\$63	\$52	\$69	\$82	\$100
Davis	\$297	\$325	\$361	\$379	\$395
Duchesne	\$176	\$158	\$205	\$217	\$224
Salt Lake	\$487	\$472	\$539	\$566	\$591
Uintah	\$140	\$130	\$165	\$189	\$216
Rest of Utah	\$423	\$421	\$487	\$512	\$535
<b>Value Added (\$millions)<sup>(4)</sup></b>	<b>\$4,306</b>	<b>\$5,752</b>	<b>\$6,564</b>	<b>\$6,967</b>	<b>\$7,337</b>
Carbon	\$188	\$245	\$328	\$398	\$493
Davis	\$1,576	\$2,111	\$2,289	\$2,396	\$2,478
Duchesne	\$411	\$583	\$763	\$815	\$857
Salt Lake	\$1,233	\$1,464	\$1,621	\$1,697	\$1,757
Uintah	\$147	\$258	\$327	\$372	\$422
Rest of Utah	\$750	\$1,091	\$1,236	\$1,289	\$1,330

Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies. Details may not add up to totals due to rounding.

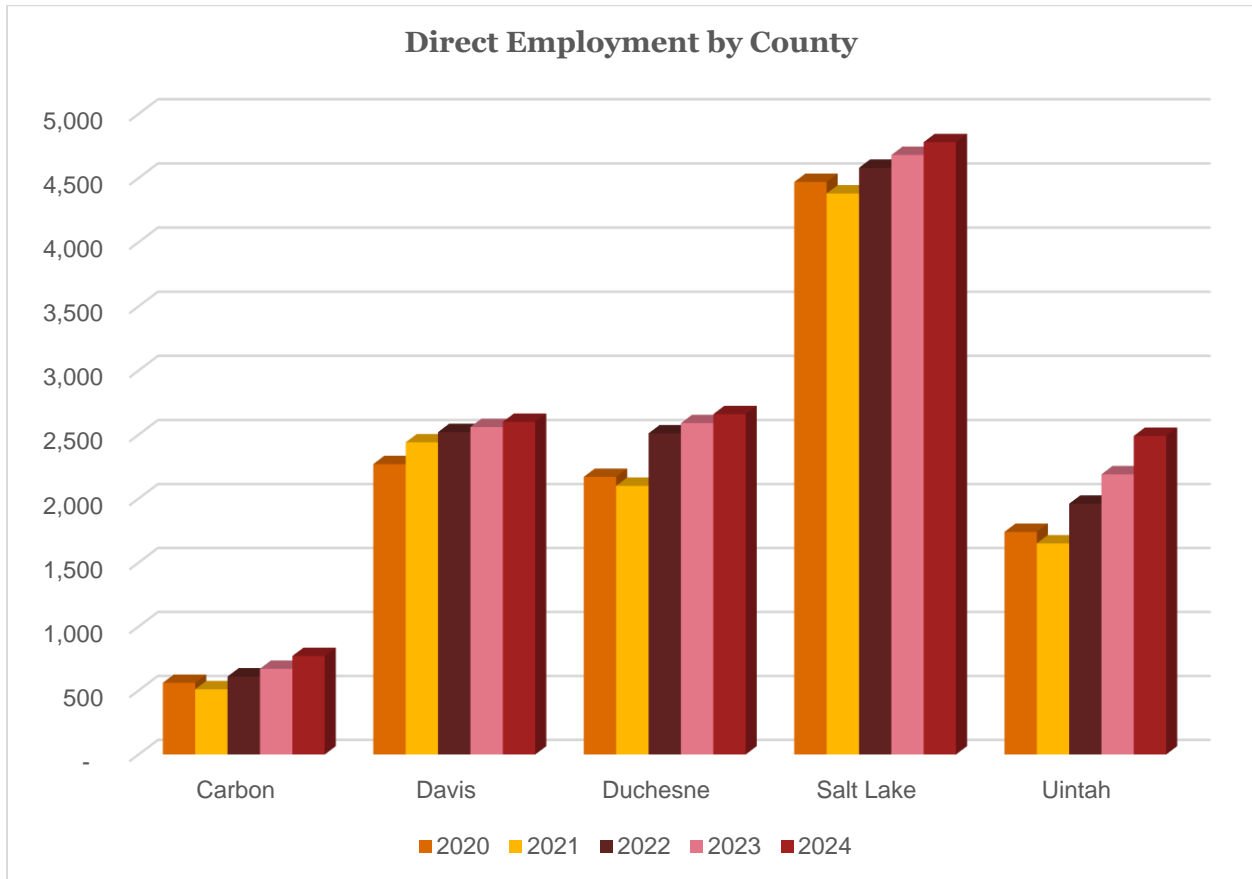
(1) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the petroleum industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the petroleum industry. Induced impacts are those arising from household spending of income earned from the petroleum industry or its supply chain.

(2) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(3) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(4) Value added refers to the additional value created at a particular stage of production. It is measured as the difference between the total revenue of the industry and the total cost of its materials, supplies, and services purchased from other businesses, other than capital goods.

**Figure III-3. – Direct Employment Impacts of Utah's Petroleum Industry on Selected Counties, 2020-2024**



Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

Counting direct, indirect, and induced impacts, the industry's total impact on Salt Lake County is the greatest, followed by Davis, Uintah, Duchesne, and Carbon (see **Table III-5** and **Figure III-4**, below). Even though Salt Lake County is projected to experience rather modest growth in direct petroleum industry employment, the indirect and induced employment impacts it receives significantly outpace that of the other four counties. Economywide, Salt Lake County has the largest employment in the state (it accounts for over 44 percent of Utah's total employment across all sectors, compared to 11 percent for the other four counties combined). As such, Salt Lake County receives a large share of the petroleum industry's indirect and induced impacts.

**Table III-5. – Total Economic Impacts of Utah's Petroleum Industry by County, 2020-2024<sup>(1)</sup>**

Item	2020	2021	2022	2023	2024
<b>Employment (jobs)<sup>(2)</sup></b>	<b>52,140</b>	<b>63,390</b>	<b>71,310</b>	<b>75,050</b>	<b>77,960</b>
Carbon	1,150	1,090	1,310	1,460	1,660
Davis	9,980	11,320	11,920	12,210	12,420
Duchesne	3,620	3,530	4,200	4,340	4,440
Salt Lake	16,010	21,090	23,860	25,240	26,190
Uintah	3,040	2,950	3,510	3,960	4,480
Rest of Utah	18,340	23,410	26,510	27,840	28,770
<b>Labor Income (\$millions)<sup>(3)</sup></b>	<b>\$3,400</b>	<b>\$4,286</b>	<b>\$5,115</b>	<b>\$5,529</b>	<b>\$5,817</b>
Carbon	\$89	\$79	\$103	\$121	\$144
Davis	\$705	\$806	\$894	\$940	\$970
Duchesne	\$232	\$214	\$273	\$288	\$296
Salt Lake	\$1,294	\$1,770	\$2,123	\$2,302	\$2,415
Uintah	\$194	\$186	\$232	\$268	\$306
Rest of Utah	\$886	\$1,231	\$1,490	\$1,610	\$1,687
<b>Value Added (\$millions)<sup>(4)</sup></b>	<b>\$7,180</b>	<b>\$10,190</b>	<b>\$11,878</b>	<b>\$12,733</b>	<b>\$13,378</b>
Carbon	\$235	\$296	\$391	\$469	\$572
Davis	\$2,202	\$2,862	\$3,123	\$3,271	\$3,377
Duchesne	\$520	\$690	\$894	\$952	\$994
Salt Lake	\$2,448	\$3,503	\$4,086	\$4,386	\$4,577
Uintah	\$248	\$361	\$451	\$517	\$588
Rest of Utah	\$1,526	\$2,478	\$2,933	\$3,138	\$3,270

Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies. Details may not add up to totals due to rounding.

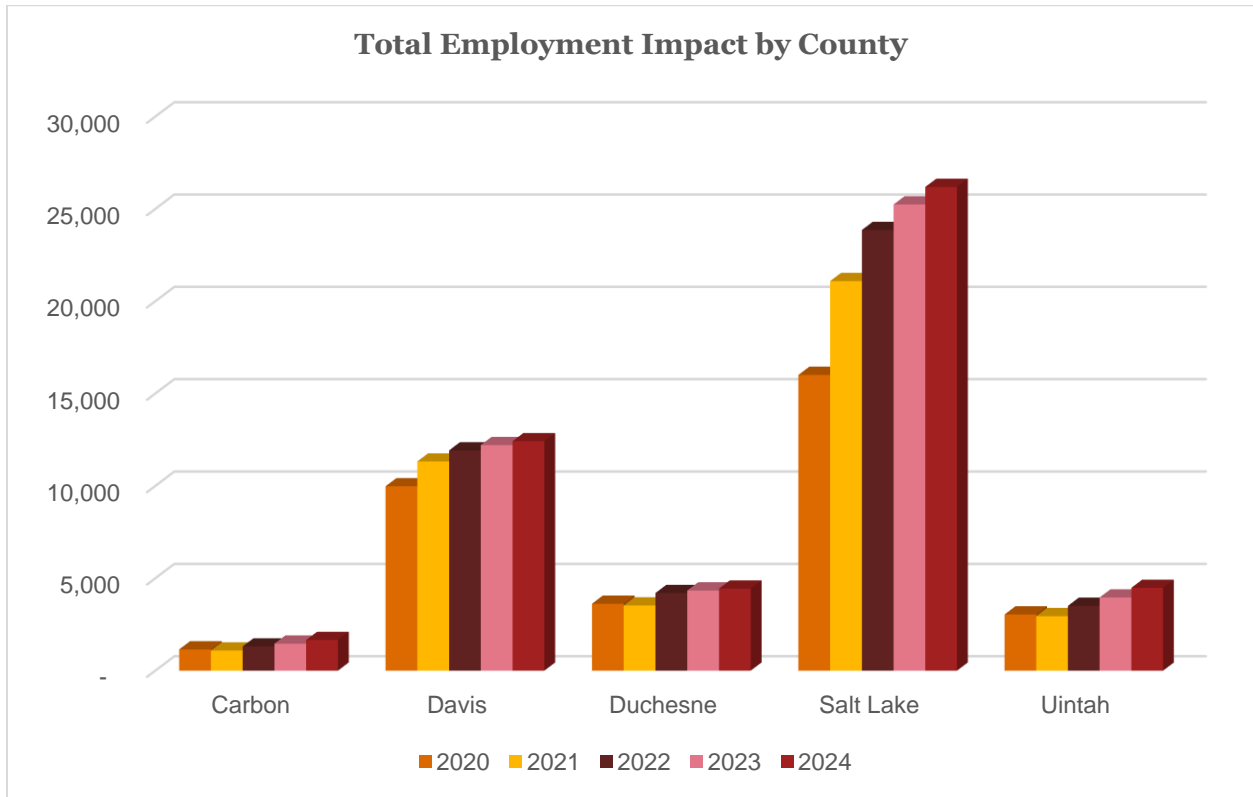
(1) Total impact includes direct, indirect, and induced impacts. Direct impacts are those occurring directly within the petroleum industry. Indirect impacts are those occurring within other businesses as part of the supply chain to the petroleum industry. Induced impacts are those arising from household spending of income earned from the petroleum industry or its supply chain.

(2) Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

(3) Labor income is defined as wages and salaries and benefits as well as proprietors' income.

(4) Value added refers to the additional value created at a particular stage of production. It is measured as the difference between the total revenue of the industry and the total cost of its materials, supplies, and services purchased from other businesses, other than capital goods.

**Figure III-4. – Total Employment Impacts of Utah's Petroleum Industry on Selected Counties, 2020-2024**



Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies

## Appendix A: Direct Impact by Detailed Sector

**Table A-1. – Direct Impact of Utah's Petroleum Industry by Subsector, 2020-2024**  
*Employment*

NAICS	Subsector Description	2020	2021	2022	2023	2024
211, 213111, 213112	Oil and gas drilling, extraction, and support services	4,800	4,510	5,500	5,870	6,300
2212	Natural gas distribution	1,030	920	1,110	1,160	1,220
23712	Oil and gas pipeline and related structures construction	820	780	950	990	1,050
32411	Petroleum refineries	1,360	1,320	1,320	1,320	1,320
32412	Asphalt paving, roofing and saturated materials manufacturing	370	400	410	420	430
324191	Petroleum lubricating oil and grease manufacturing	30	40	40	40	40
4247	Petroleum and petroleum products merchant wholesalers	650	610	630	650	660
44711, 44719	Gasoline stations	10,340	10,670	10,840	11,020	11,200
45431	Fuel dealers	270	270	270	260	260
486	Pipeline transportation	270	260	320	330	350
	<b>Total Utah Petroleum Industry</b>	<b>19,950</b>	<b>19,780</b>	<b>21,390</b>	<b>22,060</b>	<b>22,840</b>

Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

Note: Details may not add up to totals due to rounding.

Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.

**Table A-2. – Direct Impact of Utah's Petroleum Industry by Subsector, 2020-2024**  
**Labor Income (\$million)**

NAICS	Subsector Description	2020	2021	2022	2023	2024
211, 213111, 213112	Oil and gas drilling, extraction, and support services	\$335	\$293	\$384	\$426	\$471
2212	Natural gas distribution	\$293	\$260	\$334	\$358	\$384
23712	Oil and gas pipeline and related structures construction	\$72	\$75	\$96	\$103	\$110
32411	Petroleum refineries	\$297	\$297	\$320	\$335	\$346
32412	Asphalt paving, roofing and saturated materials manufacturing	\$42	\$46	\$51	\$55	\$58
324191	Petroleum lubricating oil and grease manufacturing	\$4	\$4	\$5	\$5	\$6
4247	Petroleum and petroleum products merchant wholesalers	\$59	\$64	\$70	\$73	\$75
44711, 44719	Gasoline stations	\$429	\$465	\$499	\$520	\$536
45431	Fuel dealers	\$16	\$17	\$17	\$17	\$17
486	Pipeline transportation	\$40	\$38	\$50	\$53	\$57
	<b>Total Utah Petroleum Industry</b>	<b>\$1,586</b>	<b>\$1,559</b>	<b>\$1,826</b>	<b>\$1,946</b>	<b>\$2,061</b>

Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

Note: Details may not add up to totals due to rounding.

Labor income is defined as wages and salaries and benefits as well as proprietors' income.



**Table A-3. – Direct Impact of Utah's Petroleum Industry by Subsector, 2020-2024**  
**Value Added (\$million)**

NAICS	Subsector Description	2020	2021	2022	2023	2024
211, 213111, 213112	Oil and gas drilling, extraction, and support services	\$418	\$893	\$1,186	\$1,321	\$1,470
2212	Natural gas distribution	\$360	\$451	\$581	\$622	\$668
23712	Oil and gas pipeline and related structures construction	\$90	\$100	\$129	\$137	\$147
32411	Petroleum refineries	\$1,867	\$2,523	\$2,721	\$2,846	\$2,940
32412	Asphalt paving, roofing and saturated materials manufacturing	\$174	\$83	\$92	\$99	\$106
324191	Petroleum lubricating oil and grease manufacturing	\$22	\$11	\$12	\$13	\$14
4247	Petroleum and petroleum products merchant wholesalers	\$808	\$840	\$912	\$955	\$987
44711, 44719	Gasoline stations	\$470	\$742	\$798	\$831	\$856
45431	Fuel dealers	\$26	\$27	\$28	\$28	\$28
486	Pipeline transportation	\$70	\$82	\$105	\$113	\$122
	<b>Total Utah Petroleum Industry</b>	<b>\$4,306</b>	<b>\$5,752</b>	<b>\$6,564</b>	<b>\$6,967</b>	<b>\$7,337</b>

Source: PwC calculations using the IMPLAN modeling system, public data sources, and projections provided by UPA member companies.

Note: Details may not add up to totals due to rounding.

Value added refers to the additional value created at a particular stage of production. It is measured as the difference between the total revenue of the industry and the total cost of its materials, supplies, and services purchased from other businesses, other than capital goods.

## **Appendix B: Data Sources and Methodology**

This appendix describes the methodology used to derive the results for the study. It first discusses the data sources PwC utilized to develop estimates of the Utah petroleum industry's direct employment, labor income, value-added, and tax and royalty payments. It then describes the development of the indirect and induced impact estimates.

### **Estimating the Direct Jobs, Labor Income, Value Added, and Tax and Royalty Payments**

#### ***Estimates for 2020-2022***

PwC's employment estimates for the Utah petroleum industry include both full-time and part-time workers as well as self-employed business owners. The *State Annual Personal Income and Employment* data set published by the BEA is the only government source on historical total employment including self-employed individuals by industry. These data are currently available for 2020 and 2021. In cases where there is a one-to-one correspondence between the subsectors of the Utah petroleum industry (as defined in this report) and the BEA sectors, we use the BEA data on employment, labor income, and GDP without any further adjustment. This is the case for three NAICS codes: NAICS 211 (Oil and Gas Extraction), NAICS 447 (Gasoline Stations), and NAICS 486 (Pipeline Transportation).

The remaining subsectors included in the definition for the Utah petroleum industry are more disaggregated compared to the BEA industry data. PwC obtained each subsector's paid employment from the BLS. For the proprietors in each such subsector, PwC started from the BEA's more aggregated industry data and allocated them across its more detailed subsectors according to each subsector's share of paid employment within the more aggregated industry. For example, self-employment was estimated for NAICS sector 213 (Support Activities for Mining) and then allocated across its five subsectors including 213111 (Drilling Oil and Gas Wells) and 213112 (Support Activities for Oil and Gas Operations).

A similar methodology was used to estimate the statewide direct labor income and direct value added for sectors where there was not a one-to-one correspondence between the subsectors of the Utah petroleum industry (as defined in this report) and the BEA sectors.<sup>16</sup>

The petroleum industry's estimated statewide direct jobs, labor income, and value added in Utah were allocated to each selected county based on the county-level paid employment for the industry from the BLS and data from the IMPLAN model.

Where appropriate, we relied on historical data on oil and gas prices published by the EIA. For valuing oil production, we used the crude oil First Purchase Price (FPP) for Utah. For valuing natural gas production, we applied an average discount to the Henry Hub natural gas spot price.

PwC obtained the data for 2020 through 2022 on severance tax and the oil and gas conservation fee from the Utah Tax Commission, SITLA royalties from the State of Utah School and

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<sup>16</sup> The BLS has released full-year data on paid employment through 2021. BLS employment data for 2022 are currently available at the state level only for the first nine months and only for selected industries. PwC developed the estimates on the Utah petroleum industry's direct impacts for 2022 based on our analysis of historical data, the information provided by UPA member companies, and the IMPLAN model. IMPLAN is a well-known input-output model for regional economic studies in the United States and is widely used by government, academics and private-sector researchers. More information on IMPLAN is available at [www.implan.com](http://www.implan.com).

Institutional Trust Lands Administration, and federal royalties from the US Department of Interior.<sup>17</sup> All other non-industry specific taxes (such as corporate income tax, personal income tax, property tax, and sales and use tax) resulting from the Utah petroleum industry’s operations are estimated based on the IMPLAN model’s tax calculator.

### ***Projections for 2023-2024***

For 2023 through 2024, PwC asked UPA member companies to project their employment, employee compensation, and revenues at the state level and for the five selected counties through 2024. Participating UPA members primarily operate in the oil and natural gas drilling, production, and support services subsectors. Therefore, we used the survey data, in conjunction with prices projections by the EIA, to develop forecasting assumptions for employment and output for these subsectors.<sup>18</sup> As such, our forecast for these sectors reflects the participating UPA member companies’ collective assumptions on future oil and gas production and prices in the state.

For the Utah petroleum industry’s remaining subsectors, we developed forecasting assumptions for employment and output based on a trend analysis of historical employment and GDP data at the state and county level in Utah.

Based on the projected direct output and employment at the state and county level, we used the IMPLAN model to estimate the corresponding direct labor income and direct value added for each subsector of Utah’s petroleum industry at the state level and for each of the five selected counties.

The projected output for oil and gas drilling, extraction, and support services is used to project severance tax, oil and gas conservation fee, SITLA royalties, and federal royalties through 2024. All other non-industry specific taxes are estimated based on the IMPLAN model’s tax calculator for each forecasted study year.

### **Estimating the Indirect and Induced Economic Impacts**

The initial round of output, income, and employment generated by the operations of the Utah petroleum industry leads to successive rounds of re-spending in the chain of production and through the personal consumption spending of industry and supplier employees. Such indirect and induced economic impacts can be measured using various approaches. The most common is multiplier analysis. In broad terms, a multiplier is an index that indicates the overall change in the level of economic activity that results from a given initial change. It effectively adds up all the successive rounds of re-spending, based on a number of assumptions that are embedded in the method of estimation.

There are different methods available for calculating multipliers. The method used in this report is *input-output* analysis. It is the most commonly used approach in regional economic impact studies. The input-output model developed by IMPLAN is built around an “input-output” table that relates the purchases that each industry has made from other industries to the value of the output of each industry. To meet the demand for goods and services from an industry, purchases

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<sup>17</sup> Data from the Utah Tax Commission and SITLA are available for fiscal years only. PwC converted the fiscal year figures into calendar years assuming a 50-50 fiscal split.

<sup>18</sup> In the EIA’s forecast released on March 7, 2023, the EIA projected the West Texas Intermediate (“WTI”) crude oil spot price to decline from an average price of \$94.91 in 2022 to \$77.10 in 2023 and to \$71.57 in 2024. See, “Short-Term Energy Outlook,” US Energy Information Administration, <https://www.eia.gov/outlooks/steo/archives/mar23.pdf>.

are made in other industries according to the patterns recorded in the input-output table. These purchases in turn spark still more purchases by the industry's suppliers, and so on. Additionally, employees and business owners make personal purchases out of the additional income that is generated by this process, sending new demands rippling through the economy. Multipliers describe these iterations. The Type I multiplier measures the direct and indirect effects of a change in economic activity. It captures the inter-industry effects only, i.e., industries buying from local industries. The Type II (Social Accounting Matrix or SAM) multiplier captures the direct and indirect effects, and, in addition, it also reflects induced effects (i.e., changes in spending from households as income increases or decreases due to the changes in production). The indirect and induced impacts by the Utah petroleum industry on other sectors of the economy in terms of employment, labor income (including wages and salaries and benefits as well as proprietors' income), value added, and tax payments were calculated through the multiplier process built into the model.<sup>19</sup>

For this study, PwC built customized IMPLAN input-output models for Utah and the five selected counties to calculate the Utah petroleum industry's *indirect* and *induced* economic impacts on each study area in terms of employment, labor income, value added, and tax payments. The indirect and induced impacts quantified in this analysis are limited to Utah and do not include any spillover effects on other states or spillover effects on Utah due to the industry's economic activities outside of Utah.

### **Estimating Capital Investment Impact**

PwC translated the collective capital expenditures in Utah provided by UPA member companies into purchases of capital assets by type through the use of the so-called "capital flow matrix" prepared by the BEA. The IMPLAN model was then used to quantify the full economic impact of this spending. The result of this analysis is included in the overall economic impact of the Utah petroleum industry.

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<sup>19</sup> Because the IMPLAN models are used for total impact analysis (as opposed to marginal impact analysis) in this study, necessary adjustments are made to the initial indirect and induced impact estimates to prevent double counting. For instance, any indirect or induced effects from the estimates that are mapped to the petroleum industry are removed.

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