Strategic Economic Research, LLC

ECONOMIC IMPACT ANALYSIS OF THE SOUTH SPUR SOLAR PROJECT

April 2025

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About the Authors

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Dr. David G. Loomis is Professor Emeritus of Economics at Illinois State University and Co-Founder of the Center for Renewable Energy. He has over 20 years of experience in the renewable energy field. He has served as a consultant for 43 renewable energy development companies. He has testified on the economic impacts of energy projects before the Illinois Commerce Commission, Iowa Utilities Board, Missouri Public Service Commission, Illinois Senate Energy and Environment Committee, the Wisconsin Public Service Commission, Kentucky Public Service Commission, Ohio Public Siting Board, and numerous county boards. Dr. Loomis, a widely recognized expert, has appeared on CNN and been quoted in the Wall Street Journal, Forbes Magazine, Associated Press, and the Chicago Tribune.

Dr. Loomis has published 40 peer-reviewed articles in leading energy policy and economics journals. He has raised and managed over $7 million in grants and contracts from government, corporate, and foundation sources. He received the 2011 Department of Energy's Midwestern Regional Wind Advocacy Award and the 2006 Best Wind Working Group Award. Dr. Loomis received his Ph.D. in Economics from Temple University in 1995.

Bryan Loomis, MBA

Vice President of Strategic Economic Research, LLC

Bryan Loomis has been conducting economic impact, property tax, and land use analyses for Strategic Economic Research since 2019. He has performed or overseen over 200 wind and solar analyses and provided expert testimony for permitting hearings and open houses in many states, including Colorado, Kansas, Indiana, Illinois, and Iowa. He improved the property tax analysis methodology at SER by researching various state taxing laws, implementing depreciation and taxing jurisdiction millage rates, and incorporating other factors into the tax analysis tool. Before working with SER, Bryan ran a consulting agency that collaborated with over 30 technology startups on their growth and marketing strategies. Bryan received his MBA from Belmont University in 2016.

Christopher Thankan

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Christopher Thankan directs the production of the economic impact studies including sourcing, analyzing, and graphing government data. He also performs economic and property tax analyses for wind, solar, and transmission projects. Chris has a Bachelor of Science degree in Sustainable & Renewable Energy and minored in Economics.

Strategic Economic Research, LLC (SER) provides economic consulting for renewable energy projects across the U.S. We have produced over 400 economic impact reports in over 35 states. Research Associates who performed work on this project include Paige Afram, Amanda Battaglia, Lindsey Cohn, Sawyer Keithley, Clara Lewis, Ethan Loomis, Hannah Loomis, Nita Loomis, Jessica Lucht, Mandi Mitchell, Russell Piontek, Isabelle Piwowarczyk, Tim Roberts, Krista Rust, and Ashley Thompson.

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I. Executive Summary

Bechtel is developing the South Spur Solar Project in Kit Carson County and Yuma County, Colorado. The purpose of this report is to aid in evaluating the economic impact of this project on Kit Carson County, Yuma County, and the State of Colorado. The basis of this analysis is to study the direct, indirect, and induced impacts on job creation, wages, and total economic output.

The South Spur Solar Project is a 158-megawatt alternating current (MWac) utility-scale solar powered-electric generation facility that will utilize photovoltaic (PV) panels installed on a single-axis tracking system with the option for a 79 MW Battery Energy Storage System (BESS). The total Project represents an investment in excess of $173 million. The total development is anticipated to result in the following:

Economic Impact

Jobs – all numbers are full-time equivalents

- 41 new local jobs during construction for Kit Carson County
- 45 new local jobs during construction for Yuma County
- 326 new local jobs during construction for the State of Colorado
- 4.2 new local long-term jobs for Kit Carson County
- 5.6 new local long-term jobs for Yuma County
- 17.3 new local long-term jobs for the State of Colorado

Earnings

- Over $2.2 million in new local earnings during construction for Kit Carson County
- Over $2.2 million in new local earnings during construction for Yuma County
- Over $22.6 million in new local earnings during construction for the State of Colorado
- Over $255 thousand in new local long-term earnings Kit Carson County annually
- Over $342 thousand in new local long-term earnings for Yuma County annually
- Over $1.1 million in new local long-term earnings for the State of Colorado annually

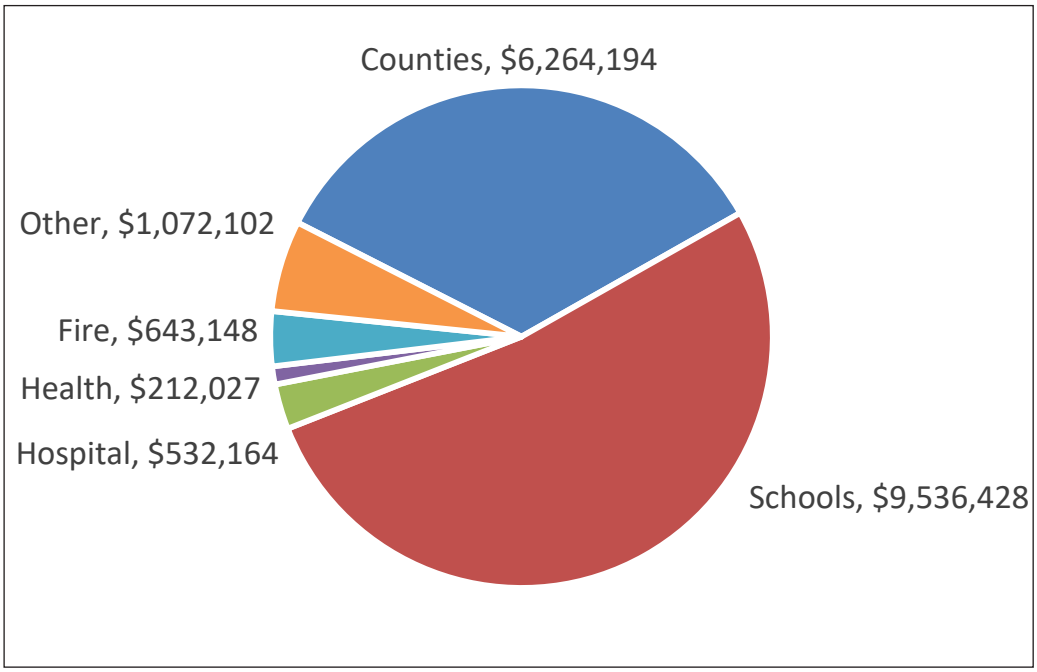
Output

- Over $5.8 million in new local output during construction for Kit Carson County
- Over $6.6 million in new local output during construction for Yuma County
- Over $57.7 million in new local output during construction for the State of Colorado
- Over $560 thousand in new local long-term output for Kit Carson County annually
- Over $639 thousand in new local long-term output for Yuma County annually
- Over $3.0 million in new local long-term output for the State of Colorado annually

Tax Benefits

- Over $9.5 million in total school district property taxes over the life of the Project
- Over $2.6 million in total county property taxes for Kit Carson County over the life of the Project
- Over $3.5 million in total county property taxes for Yuma County over the life of the Project
- Over $18.2 million in total property taxes for all taxing districts over the life of the Project

Figure 1.1 – Total Property Taxes Paid by the South Spur Solar Project

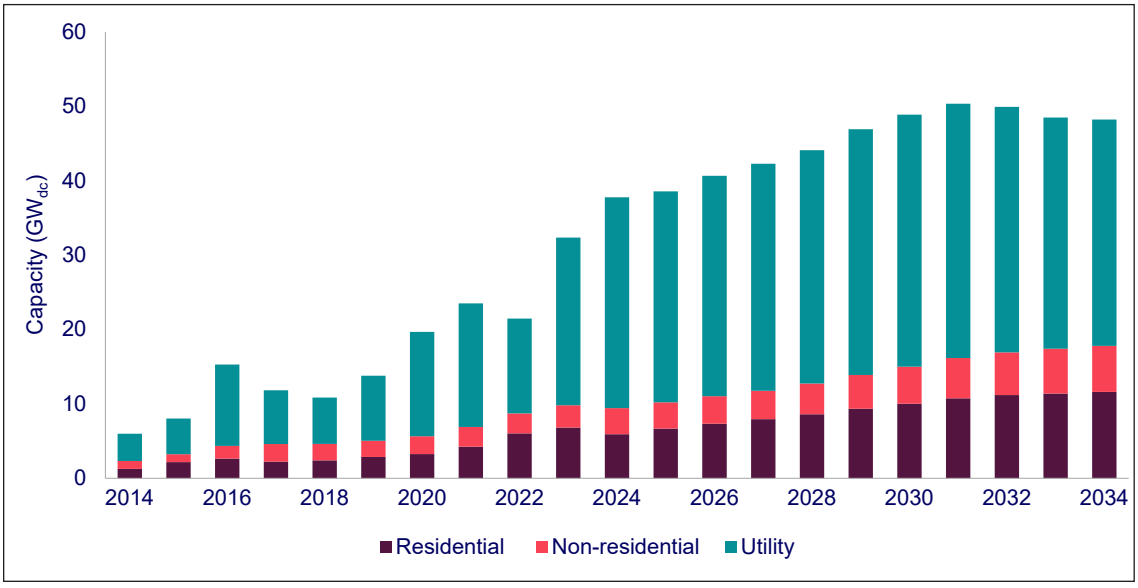


a. U.S. Solar PV Industry Growth

The U.S. solar industry is growing at a rapid but uneven pace. Solar energy systems are installed for onsite use — including residential, commercial, and industrial properties — and utility-scale solar powered-electric generation facilities intended for wholesale distribution. South Spur Solar is a utility-scale solar PV project intended for wholesale markets through the transmission grid. From 2013 to 2018, the amount of electricity generated from solar more than quadrupled, increasing 444% (SEIA, 2020). The industry has continued to add PV systems to the grid. In the first half of 2021, the U.S. installed over 11,000 MW direct current (MWdc) of solar PV, driven mostly by utility-scale PV, which exceeded most of the annual installations in the last decade. Figure 2.1 shows the historical capacity additions as well as the forecasted additions through 2034. The primary driver of this overall sharp pace of growth is large price declines in solar equipment. According to Figure 2.2, utility-scale solar fixed tilt and single-axis tracking have decreased from an average of $6/watt in 2010 to slightly more than $1/watt in 2022. Solar PV also benefits from the Federal Investment Tax Credit (ITC) that provides a tax credit for residential, commercial, and utility-scale properties.

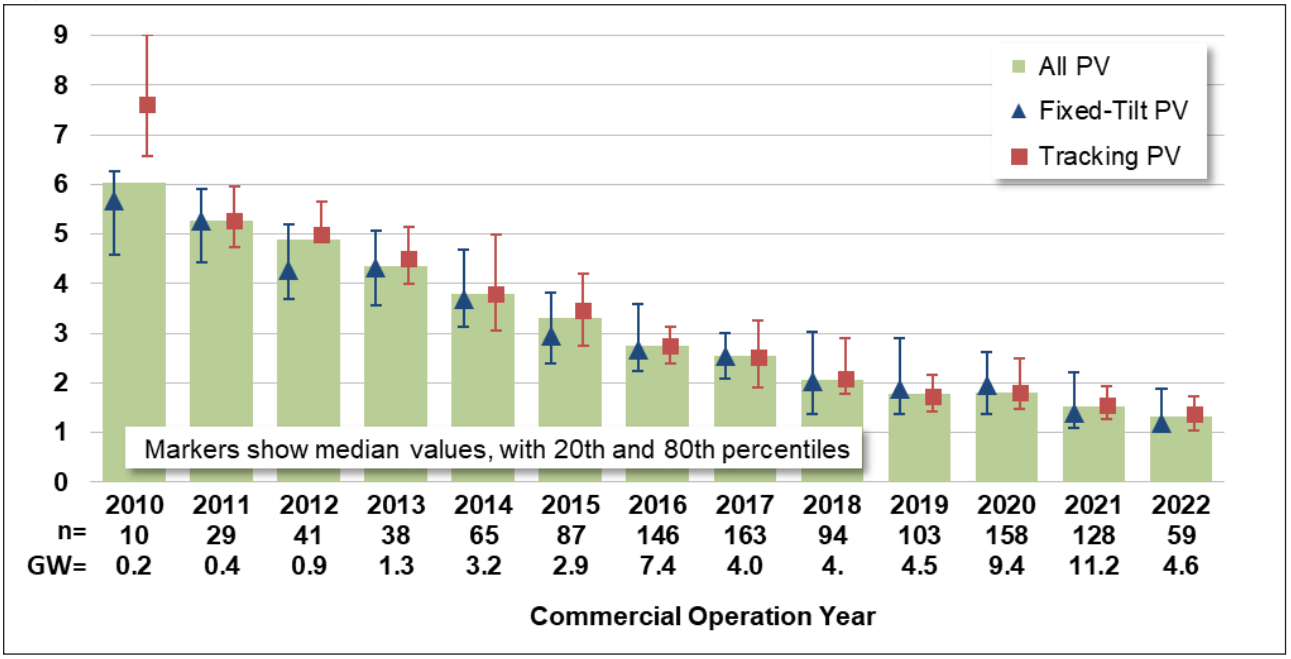
According to Figure 2.3, utility-scale PV installations jumped in the fourth quarter of 2023 to over 10,000 MWdc. In addition to this large ramp-up of installations, there are 82,000 MWdc of contracted utility-scale installations that have yet to be built.

Figure 2.1 – Annual U.S. Solar PV Installations, 2014 – 2034E



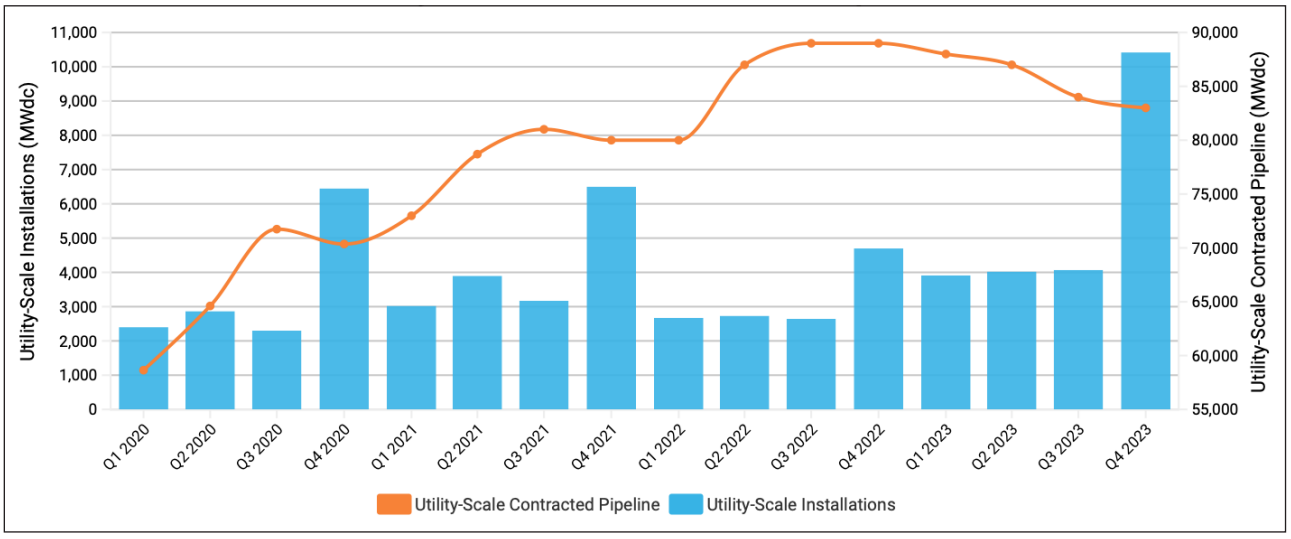
Source: Solar Energy Industries Association, Solar Market Insight Report 2023

Figure 2.2 – Installed Costs of Utility-Scale Solar from 2010 to 2022 (adjusted for inflation)



Source: Lawrence Berkeley National Laboratory, Utility-Scale Solar, 2023 Edition

Figure 2.3 – U.S. Utility PV Installations vs. Contracted Pipeline



Source: Solar Energy Industries Association, Solar Market Insight Report Q4 2023

b. Colorado Solar PV Industry

According to the Solar Energy Industries Association (SEIA), Colorado is ranked 14th in the U.S. in cumulative installations of solar PV. Texas, California, and Florida are the top 3 states for utility-scale solar. In 2024, Colorado installed 373.49 MW of solar electric capacity, bringing its cumulative capacity to 4,457.78 MW.

Colorado has great potential to expand its solar installations. Table 2.1 has a list of the operational utility-scale solar farms in operation in Colorado through 2024 (some small projects below 20 MW were omitted from the table). The 158 MW South Spur Solar will be one of the largest installations in Colorado to date.

There are 368 solar companies in Colorado including 37 manufacturers, 170 installers/developers, and 161 others.[1] Figure 2.4 shows the locations of solar companies in Colorado as of the time of this report. Currently, there are 8,177 solar jobs in the State of Colorado according to SEIA.

Figure 2.5 shows the Colorado historical installed capacity by year according to the SEIA. Utility-Scale solar installation saw huge growth in 2023 and is forecasted to continue to grow. Over the next five years, solar in Colorado is projected to grow by 4,952.66 MW (SEIA, 2024).

The Energy Information Administration (EIA) calculated the number of megawatt-hours generated from different energy sources in 2023. As shown in Figure 2.6, the greatest percentage of electricity generated in Colorado came from coal with 32.9% followed by wind with 28.0% and natural gas with 30.0%. Approximately 6.3% of the total electricity power generated in Colorado came from solar thermal and solar PV in 2023.

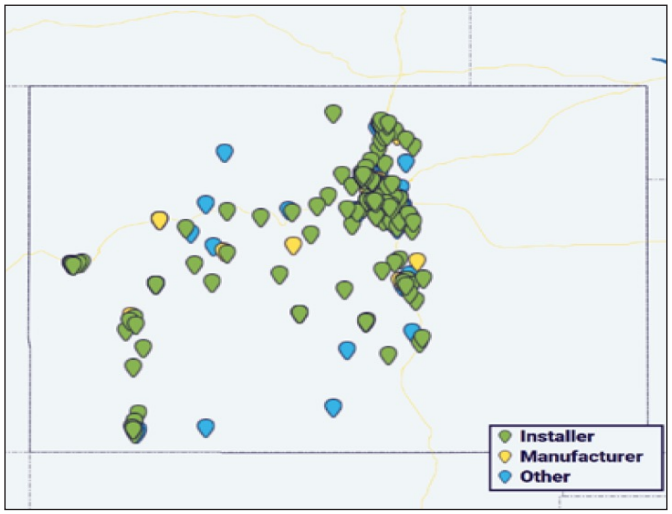
The U.S. Department of Energy sponsors the U.S. Energy and Employment Report each year. Electric Power Generation covers all utility and non-utility employment across electric generating technologies, including fossil fuels, nuclear, and renewable technologies. It also includes employees engaged in facility construction, turbine and other generation equipment manufacturing, operations and maintenance, and wholesale parts distribution for all electric generation technologies. According to Figure 2.7, employment in Colorado in the solar energy industry (9,017) is larger than wind electric generation (7,880), coal electric generation (2,089), and natural gas generation (989).

[1] "Other" includes Sales and Distribution, Project Management, and Engineering.

Table 2.1 – Colorado Solar Projects

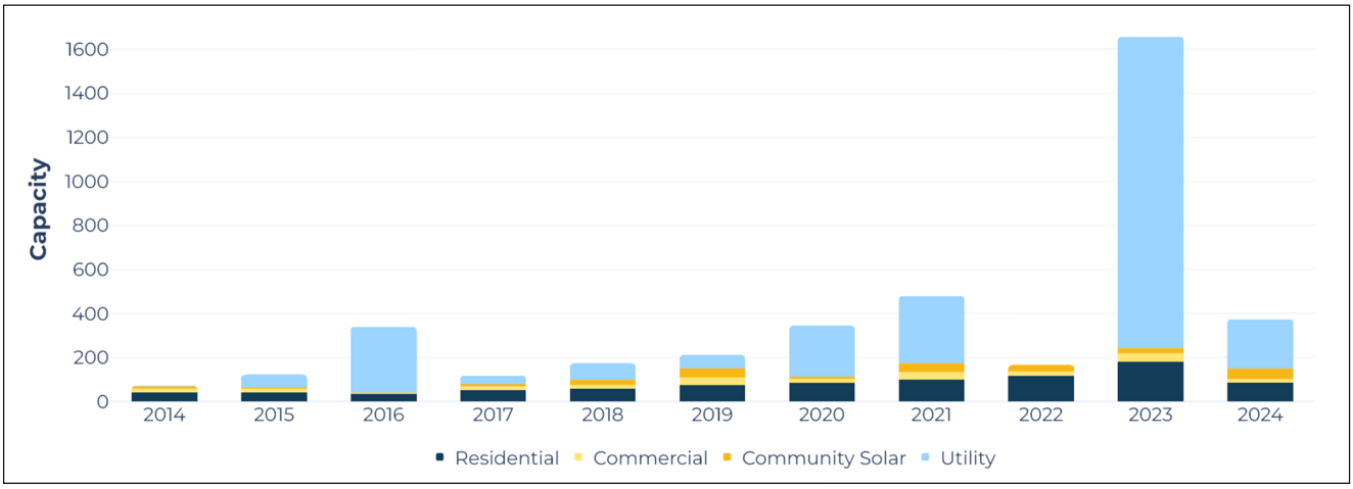
Utility-Scale Solar Farm	Capacity (MW)	County	Year Online
San Luis Valley Solar Ranch	35	Alamosa County	2011
Cogentrix of Alamosa	30	Alamosa County	2012
Hooper Solar	52	Alamosa County	2015
Comanche Solar	120	Pueblo County	2016
Bison Solar LLC	30	Larimer County	2016
San Isabel Solar, LLC	30	Las Animas County	2016
Titan Solar	50	Arapahoe County	2018
Oak Leaf Solar	33	Adams, Alamosa, Arapahoe, Chaffee, Denver, Garfield, Mesa, and Weld Counties	2018
Grazing Yak Solar	35	El Paso County	2019
Palmer Solar	60	El Paso County	2020
Bighorn Solar 1	240	Pueblo County	2021
Pioneer Solar	80	Adams County	2021
Rawhide Prairie Solar Hybrid	22	Larimer County	2021
Sun Mountain	200	Pueblo County	2022
Neptune Solar & Battery Storage Project	325	Pueblo County	2023
Thunder Wolf Solar & Battery Storage	248	Pueblo County	2023
Pike Solar + Storage Project	175	El Paso County	2023
Hunter Solar Project	75	Arapahoe County	2023
Spanish Peaks Solar Project	140	Las Animas County	2024

Figure 2.4 – Solar Company Locations in Colorado



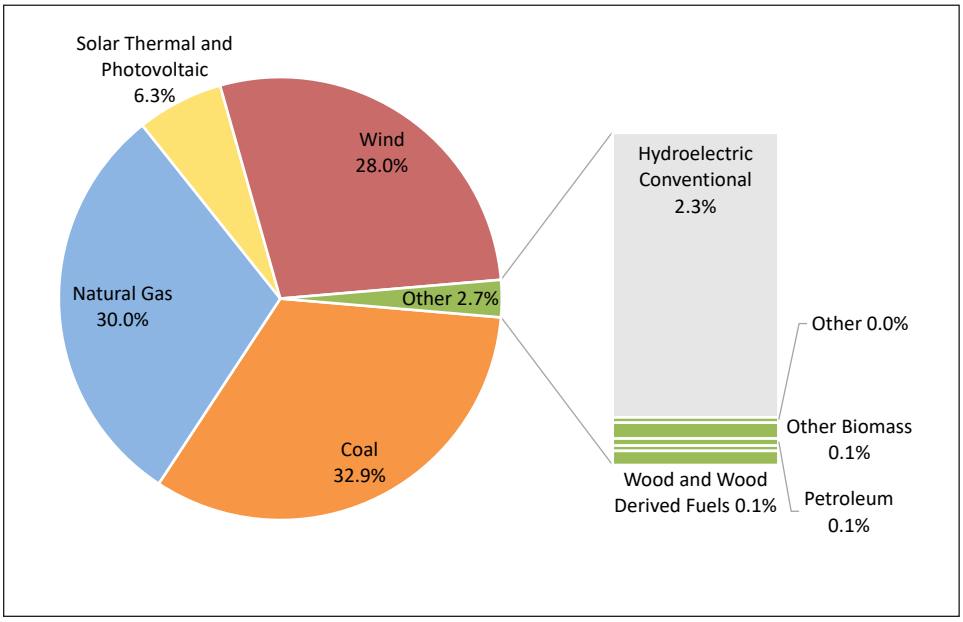
Source: Solar Energy Industries Association, Solar Spotlight: Colorado Q3 2024

Figure 2.5 – Colorado Annual Solar Installations



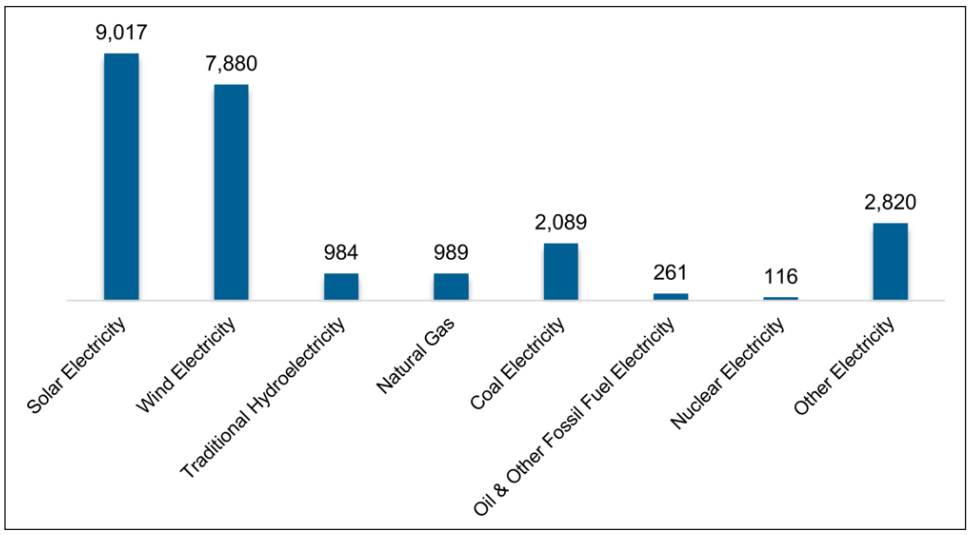
Source: Solar Energy Industries Association, Solar Spotlight: Colorado Q4 2024

Figure 2.6 – Electric Generation by Fuel Type for Colorado in 2023



Source: U.S. Energy Information Association (EIA): Colorado 2023

Figure 2.7 – Electric Generation Employment by Technology



Source: U.S. Energy and Employment Report 2024: Colorado

c. Economic Benefits of Utility-Scale Solar PV Energy

Utility-scale solar powered-electric generation facilities have numerous economic benefits. Solar PV installations create job opportunities in the local area during both the short-term construction phase and the long-term operational phase. In addition to the workers directly involved in the construction and maintenance of the solar energy project, numerous other jobs are supported through indirect supply chain purchases and the higher spending that is induced by these workers. Solar PV projects strengthen the local tax base and help improve county services and local infrastructure, such as public roads.

Bessette et al. (2024) state that the potential economic benefits of a utility-scale solar project would include "increased property tax revenue, landowner payments, and increased employment" (Bessette et al., 2024, 7). They highlight the fact that the tax benefits have been difficult for residents to understand – perhaps because they have not been quantified clearly. They also mention both the direct and indirect (supply chain) economic impacts.

Numerous studies have quantified the economic benefits of solar PV projects across the United States and have been published in peer-reviewed academic journals using the same methodology as this report. Some of these studies examine smaller-scale solar systems, and some examine utility-scale solar energy. Croucher (2012) uses NREL's Jobs and Economic Development Impacts ("JEDI") modeling methodology to find which state will receive the greatest economic impact from installing one hundred 2.5 kW residential systems. He shows that Pennsylvania ranked first supporting 28.98 jobs during installation and 0.20 jobs during operations. Illinois ranked second supporting 27.65 jobs during construction and 0.18 jobs during operations.

Colorado Fiscal Institute (2018) performed an economic impact analysis of the Colorado Energy Plan proposed by Xcel Energy as part of their 2016 Electric Resource Plan. Under the plan, they would replace coal-fired power plants Comanche 1 and 2 in Pueblo County with 1,100 MW of new wind energy, 700 MW of new solar and 275 MW of battery storage. According to the study, the net economic impact would be 133 jobs with $8.6 million in disposable personal income for Pueblo County and 549 jobs and $48.2 million in disposable person income for the State of Colorado.

Perry (2020) finds that a 145 MW solar power plant in Colorado creates or supports 527 jobs over a 2-year construction period and 12 jobs annually during the operations phase of the project. A 600 MW project supports 2,184 jobs during construction and 48 jobs annually during operations and a 1200 MW project supports 4,369 jobs during construction and 96 jobs annually during operations.

Several other reports quantify the economic impact of solar energy. Bezdek (2006) estimates the economic impact for the State of Ohio and finds the potential for PV market in Ohio to be $25 million with 200 direct jobs and 460 total jobs. The Center for Competitive Florida (2009) estimates the impact if the state were to install 1,500 MW of solar and finds that 45,000 direct jobs and 50,000 indirect jobs could be created. The Solar Foundation (2013) uses the JEDI modeling methodology to show that Colorado's solar PV installation to date created 10,790 job-years. They also analyze what would happen if the state were to install 2,750 MW of solar PV from 2013 to 2030 and find that it would result in nearly 32,500 job years. Berkman et al. (2011) estimates the economic and fiscal impacts of the 550 MWac Desert Sunlight Solar Farm. The project creates approximately 440 construction jobs over a 26-month period, $15 million in new sales tax revenues, $12 million in new property revenues for Riverside County, CA, and $336 million in indirect benefits to local businesses in the county.

Finally, Jenniches (2018) performed a review of the literature assessing the regional economic impacts of renewable energy sources. After reviewing all of the different techniques for analyzing the economic impacts, he concludes "for assessment of current renewable energy developments, beyond employment in larger regions, IO [Input-Output] tables are the most suitable approach" (Jenniches, 2018, 48). Input-Output analysis is the basis for the methodology used in the economic impact analysis of this report.

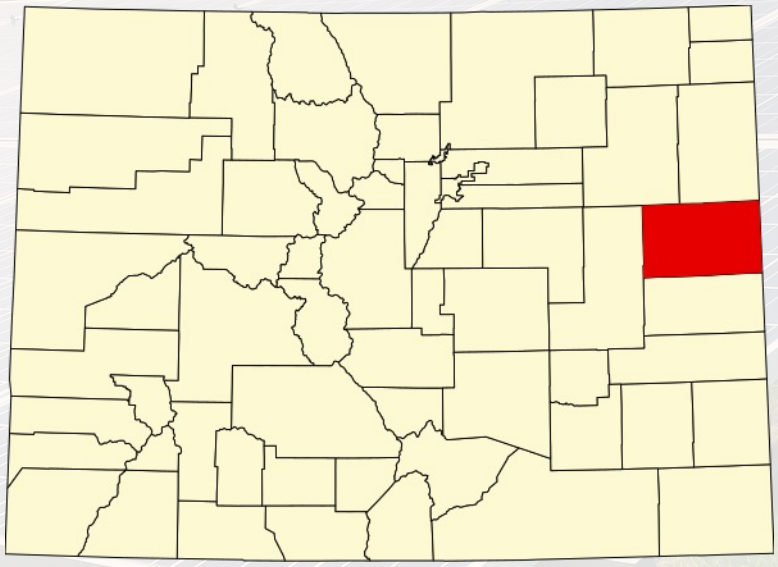
a. South Spur Solar Project

Bechtel is developing the South Spur Solar Project in Kit Carson County and Yuma County, Colorado. The Project consists of an estimated 158-megawatt alternative current (MWac) utility-scale solar powered-electric generation facility that will utilize photovoltaic (PV) panels installed on a single-axis tracking system with the option for a 79 MW BESS. The total Project represents an investment in excess of $173 million.

b. Kit Carson County Economic and Demographic Statistics

Kit Carson County is located in the eastern part of Colorado (see Figure 3.1). It has a total area of 2,162 square miles, and the U.S. Census estimates that the 2023 population was 6,994 with 3,438 housing units. The county has a population density of 3.2 (persons per square mile) compared to 56.6 for the State of Colorado (2023). Median household income in the county was $59,810 in 2023 (U.S. Census Bureau, 2024).

Figure 3.1 – Location of Kit Carson County, Colorado



As shown in Table 3.1, the largest industries in the county are "Agriculture, Forestry, Fishing and Hunting" followed by "Administrative Government," "Retail Trade," and "Wholesale Trade." These data for Table 3.1 come from IMPLAN covering the year 2023 (the latest year available).

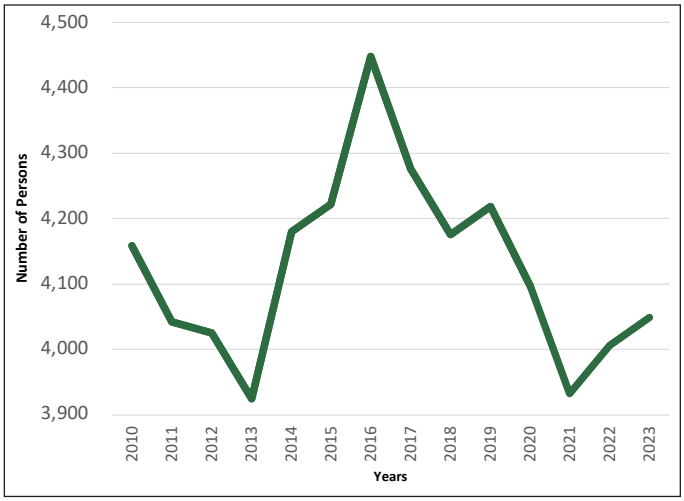
Table 3.1 provides the most recent snapshot of total employment but does not examine the historical trends within the county. Figure 3.2 shows the number of employed persons in Kit Carson County from 2010 to 2023. The total number of employed persons was at its lowest at 3,924 in 2013 and its highest at 4,448 in 2016 (FRED, 2024).

Table 3.1 – Employment by Industry in Kit Carson County

Industry	Number	Percent
Agriculture, Forestry, Fishing and Hunting	1,144	22%
Administrative Government	709	14%
Retail Trade	410	8%
Wholesale Trade	382	7%
Real Estate and Rental and Leasing	347	7%
Accommodation and Food Services	346	7%
Construction	312	6%
Finance and Insurance	295	6%
Health Care and Social Assistance	265	5%
Professional, Scientific, and Technical Services	177	3%
Mining, Quarrying, and Oil and Gas Extraction	165	3%
Transportation and Warehousing	143	3%
Other Services (except Public Administration)	142	3%
Manufacturing	118	2%
Arts, Entertainment, and Recreation	63	1%
Utilities	42	1%
Information	37	1%
Administrative and Support and Waste Management and Remediation Services	33	1%
Management of Companies and Enterprises	33	1%
Government Enterprises	27	1%
Educational Services	6	0%

Source: Impact Analysis for Planning (IMPLAN), County Employment by Industry, 2022

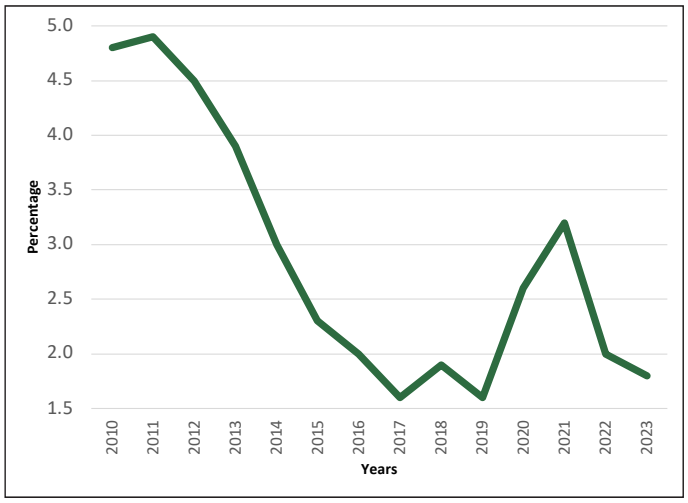
Figure 3.2 – Total Employed Persons in Kit Carson County from 2010 to 2023



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Employed Persons, 2010-2023

The unemployment rate signifies the percentage of the labor force without employment in the county. Figure 3.3 shows the unemployment rates from 2010 to 2023. Unemployment in Kit Carson County was at its highest at 4.9% in 2011 and its lowest at 1.6% in 2017 and 2019 (FRED, 2024). The unemployment rate spiked to 3.2% in 2021 then normalized to 1.8% in 2023.

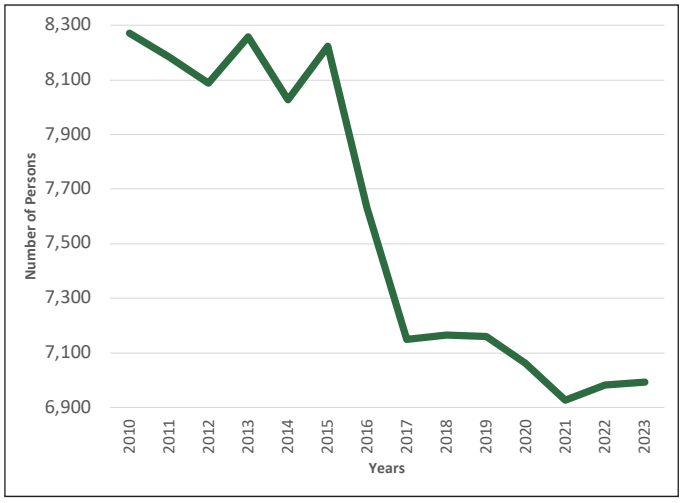
Figure 3.3 – Unemployment Rate in Kit Carson County from 2010 to 2023



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Unemployment Rates, 2010-2023

The overall population in the county has trended downward, as shown in Figure 3.4. Kit Carson County's population was 8,271 in 2010 and 6,994 in 2023, a loss of 1,277 people (FRED, 2024). The average annual population decrease over this time period was 98 people.

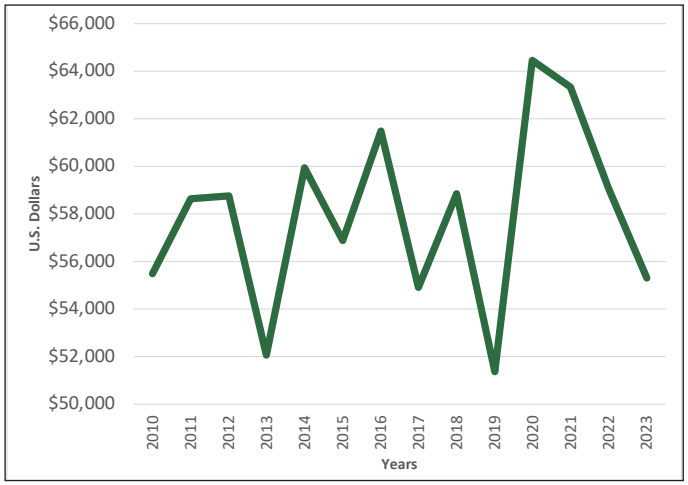
Figure 3.4 – Population in Kit Carson County from 2010 to 2023



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Population Estimates, 2010-2023

Household income has fluctuated in the county. Figure 3.5 shows the real median household income in Kit Carson County from 2010 to 2023. Using the national Consumer Price Index (CPI), the nominal median household income for each year was adjusted to 2023 dollars. Household income was at its lowest at $51,351 in 2019 and its highest at $64,471 in 2020 (FRED, 2024).

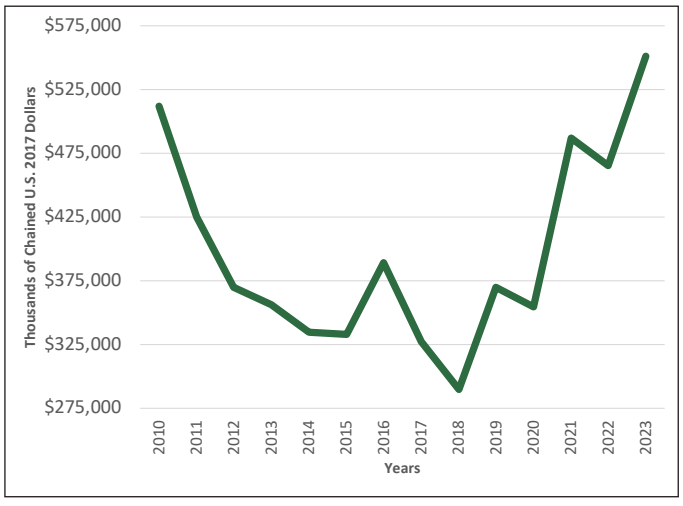
Figure 3.5 – Real Median Household Income in Kit Carson County from 2010 to 2023



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Estimate of Median Household Income, 2010-2023

Real Gross Domestic Product (GDP) is a measure of the value of goods and services produced in an area and adjusted for inflation over time. The Real GDP for Kit Carson County trended downward until 2018 after which point the Real GDP in Kit Carson has trended upward, as shown in Figure 3.6 (FRED, 2024).

Figure 3.6 – Real Gross Domestic Product (GDP) in Kit Carson County from 2010 to 2023

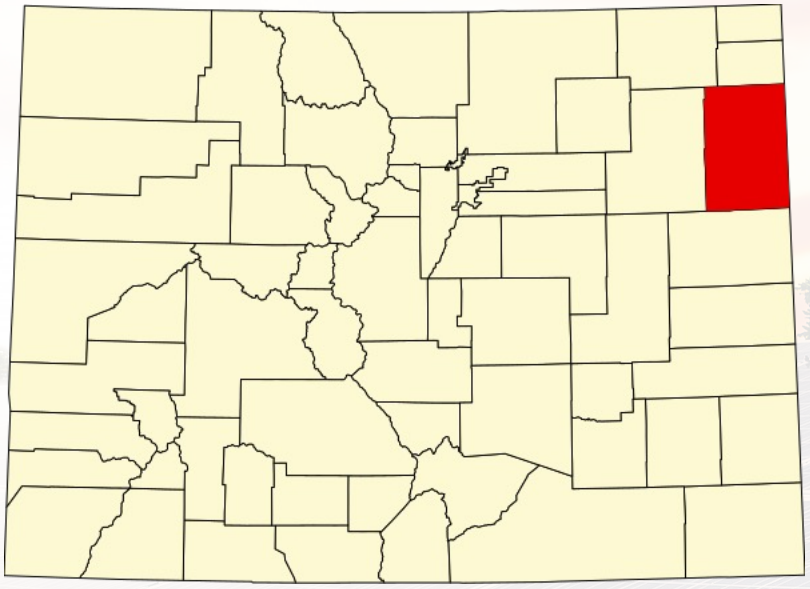


Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Real Gross Domestic Product, 2010-2023

c. Yuma County Economic and Demographic Statistics

Yuma County is located in the eastern part of Colorado (see Figure 3.7). It has a total area of 2,369 square miles, and the U.S. Census estimates that the 2023 population was 9,862 with 4,350 housing units. The county has a population density of 4.1 (persons per square mile) compared to 56.6 for the State of Colorado (2023). Median household income in the county was $60,051 in 2023 (U.S. Census Bureau, 2024).

Figure 3.7 – Location of Yuma County, Colorado



As shown in Table 3.2, the largest industries in the county are "Agriculture, Forestry, Fishing and Hunting" followed by "Administrative Government," "Finance and Insurance," and "Retail Trade." These data for Table 3.2 come from IMPLAN covering the year 2023 (the latest year available).

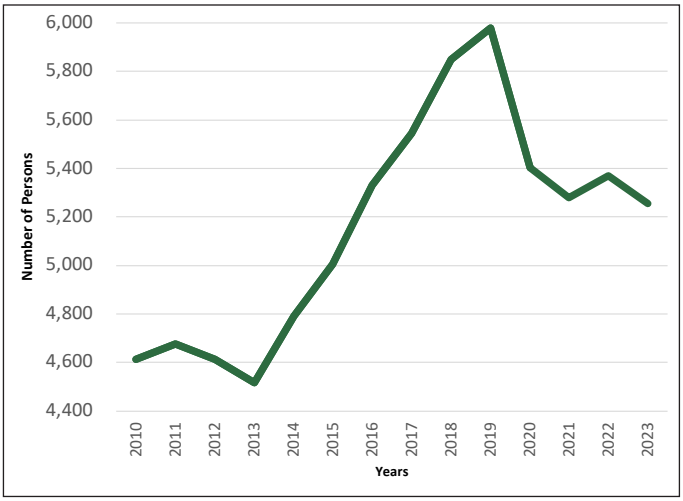
Table 3.2 provides the most recent snapshot of total employment but does not examine the historical trends within the county. Figure 3.8 shows the number of employed persons in Yuma County from 2010 to 2023. The total number of employed persons was at its lowest at 4,515 in 2013 and its highest at 5,979 in 2019 (FRED, 2024).

Table 3.2 – Employment by Industry in Yuma County

Industry	Number	Percent
Agriculture, Forestry, Fishing and Hunting	1,935	26%
Administrative Government	982	13%
Finance and Insurance	621	8%
Retail Trade	514	7%
Real Estate and Rental and Leasing	420	6%
Health Care and Social Assistance	370	5%
Construction	367	5%
Accommodation and Food Services	353	5%
Other Services (except Public Administration)	278	4%
Transportation and Warehousing	253	3%
Professional, Scientific, and Technical Services	250	3%
Wholesale Trade	249	3%
Administrative and Support and Waste Management and Remediation Services	223	3%
Manufacturing	164	2%
Arts, Entertainment, and Recreation	99	1%
Educational Services	54	1%
Mining, Quarrying, and Oil and Gas Extraction	53	1%
Management of Companies and Enterprises	52	1%
Government Enterprises	42	1%
Information	36	0%
Utilities	5	0%

Source: Impact Analysis for Planning (IMPLAN), County Employment by Industry, 2023

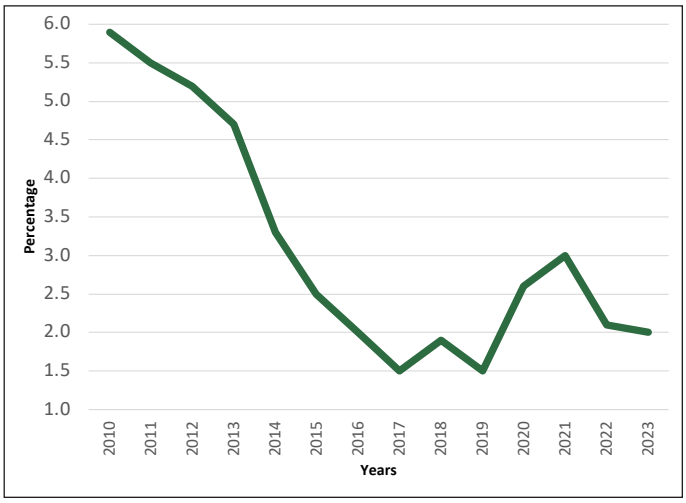
Figure 3.8 – Total Employed Persons in Yuma County from 2010 to 2023



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Employed Persons, 2010-2023

The unemployment rate signifies the percentage of the labor force without employment in the county. Figure 3.9 shows the unemployment rates from 2010 to 2023. Unemployment in Yuma County was at its highest at 5.9% in 2010 and its lowest at 1.5% in 2017 and 2019 (FRED, 2024). The unemployment rate spiked to 3.0% in 2021 but normalized to 2.0% in 2023.

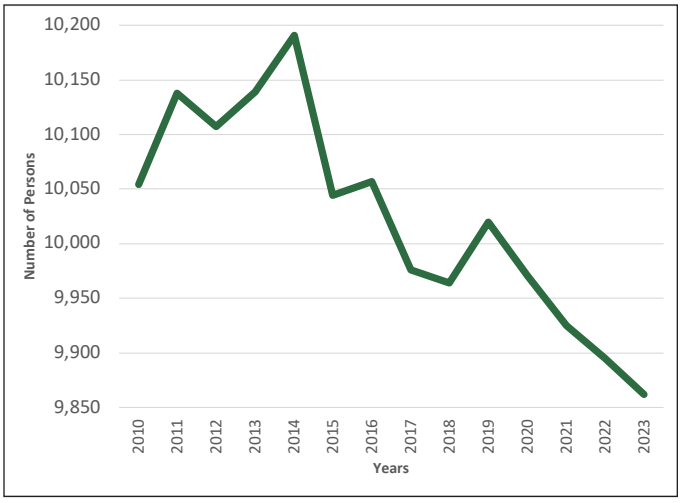
Figure 3.9 – Unemployment Rate in Yuma County from 2010 to 2023



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Unemployment Rates, 2010-2023

The overall population in the county has trended downward, as shown in Figure 3.10. Yuma County's population was 10,054 in 2010 and 9,862 in 2023, a loss of 192 people (FRED, 2024). The average annual population decrease over this time period was 15 people.

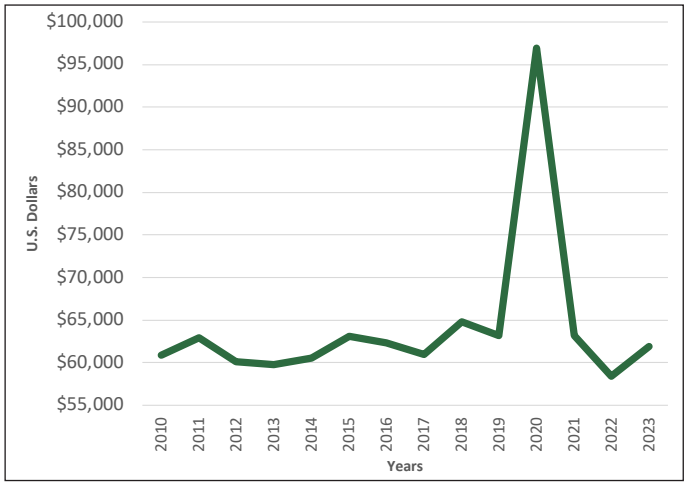
Figure 3.10 – Population in Yuma County from 2010 to 2023



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Population Estimates, 2010-2023

Household income has fluctuated in the county. Figure 3.11 shows the real median household income in Yuma County from 2010 to 2023. Using the national Consumer Price Index (CPI), the nominal median household income for each year was adjusted to 2023 dollars. Household income was at its highest at $96,897 in 2020 and its lowest at $58,388 in 2022 (FRED, 2024).

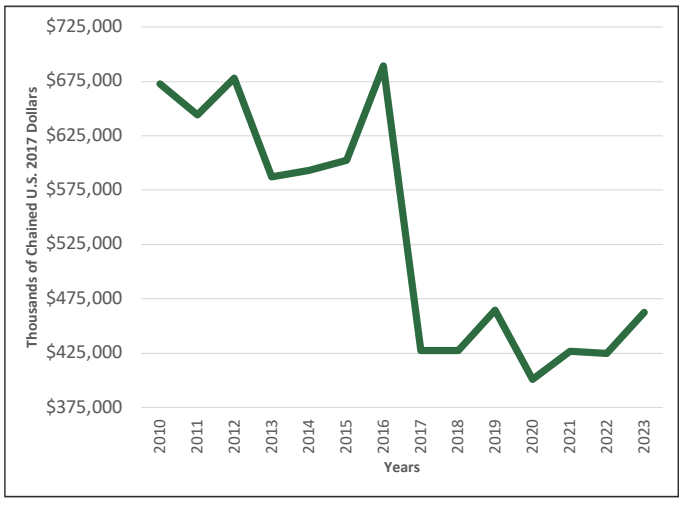
Figure 3.11 – Real Median Household Income in Yuma County from 2010 to 2023



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Estimate of Median Household Income, 2010-2023

Real Gross Domestic Product (GDP) is a measure of the value of goods and services produced in an area and adjusted for inflation over time. The Real GDP for Yuma County has trended downward since hitting a high in 2016, as shown in Figure 3.12 (FRED, 2024).

Figure 3.12 – Real Gross Domestic Product (GDP) in Yuma County from 2010 to 2023



Source: Federal Reserve Bank of St. Louis Economic Data, U.S. Census Bureau, Real Gross Domestic Product, 2010-2023

The economic analysis of the Project uses IMPLAN (IMpact analysis for PLANning). IMPLAN software and parameters are based on government data collected at federal, state, and local levels. IMPLAN is a leading provider of economic development software that is widely used by economists and economic development professionals. More information about IMPLAN can be found at implan.com.

IMPLAN is an input-output model that measures the spending patterns and location-specific economic structures that reflect expenditures supporting varying levels of employment, income, and output. That is, IMPLAN takes into account that the output of one industry can be used as an input for another. For example, when a PV system is installed, there are both soft costs — consisting of permitting, installation, and customer acquisition costs — and hardware costs, of which the PV module is the largest component. The purchase of a module not only increases demand for manufactured components and raw materials but also supports the labor required to build and install the module. When a module is purchased from a manufacturing facility, the manufacturer uses some of that money to pay their employees. The employees use a portion of their compensation to purchase goods and services within their community. Likewise, when a developer pays workers to install the systems, those workers spend money in the local economy which boosts economic activity and employment in other sectors. The goal of an economic impact analysis is to quantify all of those reverberations throughout the local and state economies.

The IMPLAN model utilizes county-specific and state-specific industry multipliers in the analysis. This study analyzes the gross jobs that the new solar energy project development supports and does not analyze the potential loss of jobs due to declines in other forms of electric generation.

The total economic impact can be broken down into three distinct types: direct impacts, indirect impacts, and induced impacts. **Direct impacts** during the construction period refer to the changes that occur in the onsite construction industries in which the direct final demand (i.e., spending on construction labor and services) change is made. Onsite construction-related services include installation labor, engineering, design, and other professional services. Direct impacts during operating years refer to the final demand changes that occur in the onsite spending for the solar operations and maintenance workers.

The initial spending on the construction and operation of the solar PV installation will create a second layer of impacts, referred to as "supply chain impacts" or "indirect impacts." **Indirect impacts** during the construction period consist of changes in inter-industry purchases resulting from the direct final demand changes and include construction spending on materials and PV equipment, as well as other purchases of goods and offsite services. Utility-scale solar PV indirect impacts include PV modules, invertors, tracking systems, cabling, and foundations.

Induced impacts during construction refer to the changes that occur in household spending as household income increases or decreases as a result of the direct and indirect effects of final demand changes. Local spending by employees working directly or indirectly on the Project that receive their paychecks and then spend money in the community is included. The model includes additional local jobs and economic activity that are supported by the purchase of these goods and services.

The majority of jobs during construction are construction workers but there are other occupations involved as well. In addition, during operations there are other occupations involved besides solar technicians. A sample of those occupations, the education/training needed, and percentile wages is contained in Table 7.1 in Appendix 1. A larger description of those occupations, their work environment, and future job growth is found in Table 7.2 in Appendix 1.

V. Economic Impact Results

The economic impact results were derived from detailed project cost estimates supplied by Bechtel. Additionally, Bechtel estimated the percentages of project materials and labor that will be coming from within Kit Carson County, Yuma County, and the State of Colorado.

Four models were produced to show the economic impact of the South Spur Solar Project. The first model uses capital expenditures and the 2022 IMPLAN Kit Carson County and Yuma County dataset. The second model uses the 2022 IMPLAN dataset for the State of Colorado and the same project costs. The third model uses the operating expenditures and the 2022 IMPLAN Kit Carson County and Yuma County dataset. The fourth model uses the 2022 IMPLAN dataset for the State of Colorado and the same project costs. The latest dataset from IMPLAN and specific project cost data from the South Spur Solar Project are used, and SER translated the project costs into IMPLAN sectors.

Tables 5.1 to 5.3 show the output from these models. Table 5.1 lists the total employment impact from the South Spur Solar Project for Kit Carson County, Yuma County, and the State of Colorado. Table 5.2 shows the impact on total earnings, and Table 5.3 contains the impact on total output.

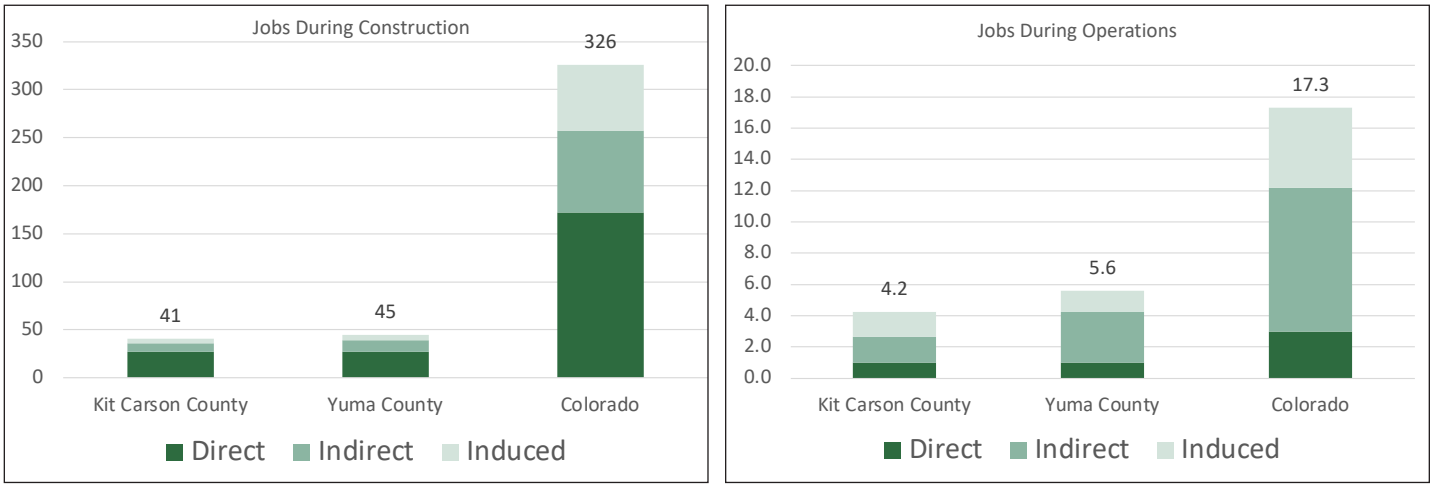
Table 5.1 – Total Employment Impact from the South Spur Solar Project

	Kit Carson County	Yuma County	State of Colorado
Construction			
Direct Impacts	28	28	172
Indirect Impacts	8	12	86
Induced Impacts	5	5	68
Local Jobs during Construction	41	45	326
Operations (Annual/Ongoing)			
Onsite Direct Impacts	1.0	1.0	3.0
Indirect Impacts	1.6	3.3	9.2
Induced Impacts	1.6	1.3	5.1
Local Long-Term Jobs	4.2	5.6	17.3

The results from the IMPLAN model show significant employment impacts from the South Spur Solar Project. Employment impacts can be broken down into several different components. Direct jobs created during the construction phase typically last anywhere from 12 to 18 months depending on the size of the project; however, the direct job numbers present in Table 5.1 from the IMPLAN model are based on a full time equivalent (FTE) basis for a year. In other words, 1 job = 1 FTE = 2,080 hours worked in a year. A part time or temporary job would constitute only a fraction of a job according to the model. For example, the IMPLAN model results show 28 new direct jobs during construction in Kit Carson County, though the construction of the solar center could involve closer to 56 workers working half-time for a year. Thus, due to the short-term nature of construction projects, IMPLAN often significantly understates the actual number of people hired to work on the project. It is important to keep this fact in mind when viewing or reporting the numbers.

As shown in Table 5.1, new local jobs created or retained during construction total 41 for Kit Carson County, 45 for Yuma County, and 326 for the State of Colorado. New local long-term jobs created from the South Spur Solar Project total 4.2 for Kit Carson County, 5.6 for Yuma County, and 17.3 for the State of Colorado.

Figure 5.1 – Total Employment Impact from the South Spur Solar Project



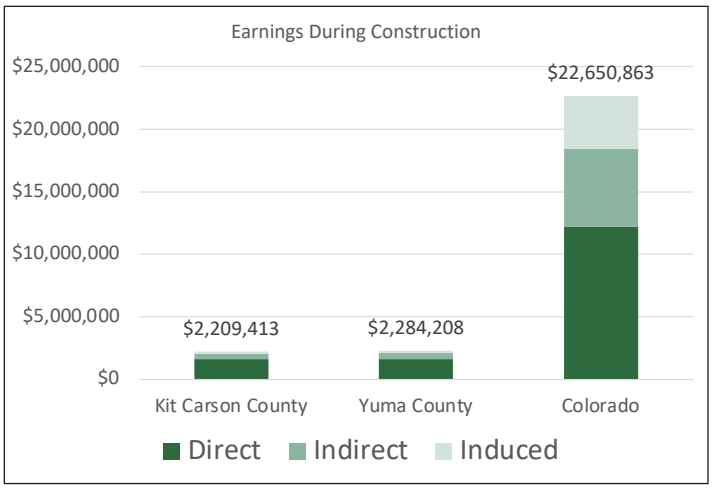
Direct jobs created during the operational phase last the life of the solar PV project, typically 30-35 years. Both direct construction jobs, and operations and maintenance jobs require highly skilled workers in the fields of construction, management, and engineering. For a list of occupations expected to be employed, their wages, benefits, total compensation, and hours worked, please see Tables 7.3 and 7.4 in the Appendix 1.

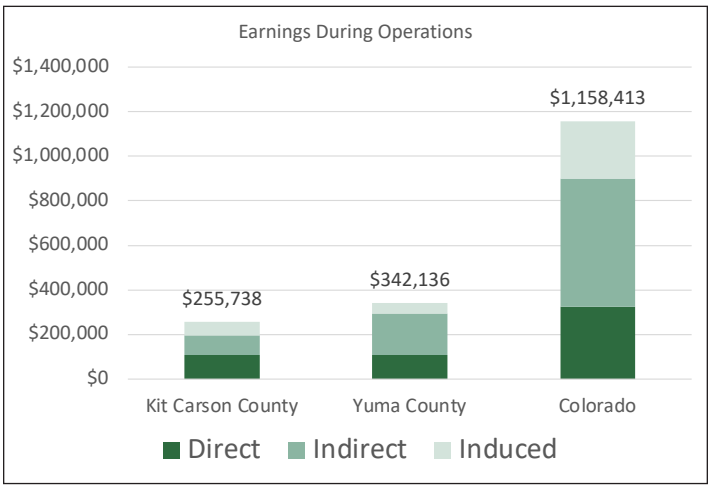
Accordingly, it is important to not just look at the number of jobs but also the earnings that they produce. Table 5.2 shows the earnings impacts from the South Spur Solar Project, which are categorized by construction impacts and operations impacts. The new local earnings during construction total over $2.2 million for Kit Carson County, over $2.2 million for Yuma County, and over $22.6 million for the State of Colorado. The new local long-term earnings total over $255 thousand for Kit Carson County, over $342 thousand for Yuma County, and over $1.1 million for the State of Colorado.

Table 5.2 – Total Earnings Impact from the South Spur Solar Project

	Kit Carson County	Yuma County	State of Colorado
Construction			
Direct Impacts	$1,616,426	$1,616,426	$12,180,038
Indirect Impacts	$416,527	$485,717	$6,238,329
Induced Impacts	$176,460	$182,065	$4,232,496
Local Earnings during Construction	$2,209,413	$2,284,208	$22,650,863
Operations (Annual/Ongoing)			
Onsite Direct Impacts	$106,634	$106,634	$323,134
Indirect Impacts	$88,405	$186,174	$576,118
Induced Impacts	$60,699	$49,328	$259,161
Local Long-Term Earnings	$255,738	$342,136	$1,158,413

Figure 5.2 – Total Earnings Impact from the South Spur Solar Project



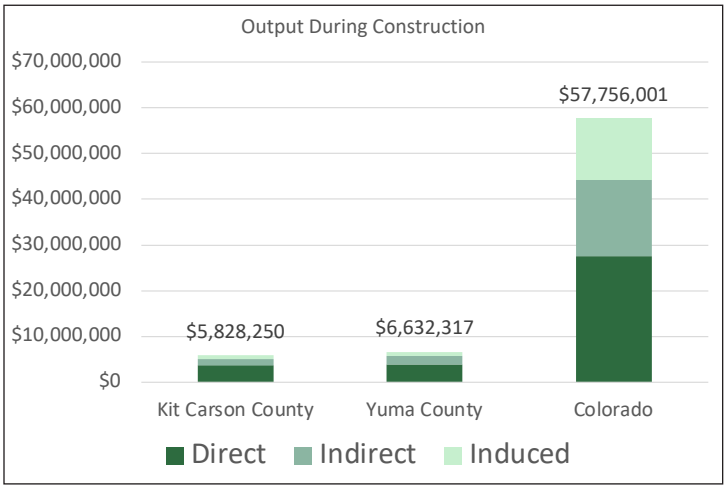


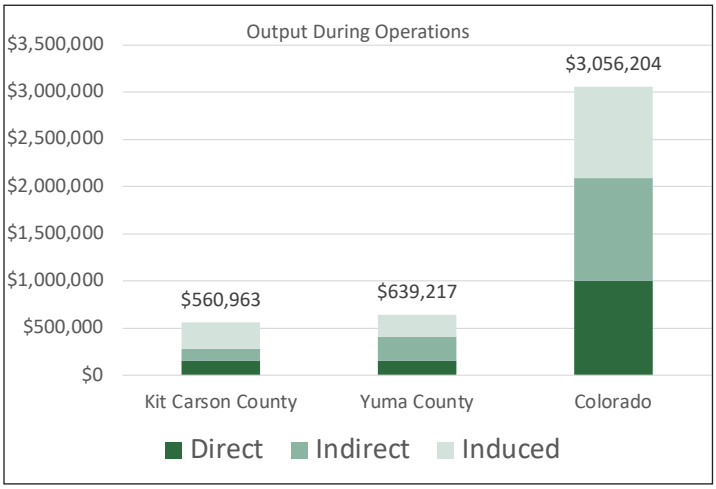
Output refers to economic activity or the value of production in the state or local economy. It is an equivalent measure to the Gross Domestic Product, which measures output on a national basis. According to Table 5.3, the new local output during construction totals over $5.8 million for Kit Carson County, over $6.6 million for Yuma County, and over $57.7 million for the State of Colorado. The new local long-term output totals over $560 thousand for Kit Carson County, over $639 thousand for Yuma County, and over $3.0 million for the State of Colorado.

Table 5.3 – Total Output Impact from the South Spur Solar Project

	Kit Carson County	Yuma County	State of Colorado
Construction			
Direct Impacts	$3,644,586	$3,911,395	$27,583,965
Indirect Impacts	$1,333,468	$1,861,739	$16,705,425
Induced Impacts	$850,196	$859,183	$13,466,611
Local Output during Construction	$5,828,250	$6,632,317	$57,756,001
Operations (Annual/Ongoing)			
Onsite Direct Impacts	$152,014	$152,014	$1,001,176
Indirect Impacts	$126,415	$258,882	$1,090,491
Induced Impacts	$282,534	$228,321	$964,537
Local Long-Term Output	$560,963	$639,217	$3,056,204

Figure 5.3 – Total Output Impact from the South Spur Solar Project





VI. Tax Benefits

Solar energy projects increase the property tax base of a county, creating a new revenue source for education and other local government services, such as fire protection, park districts, and road maintenance.

Tables 6.1-6.4 detail the tax implications of the South Spur Solar Project. There are several important assumptions built into the analysis in these tables.

- This analysis uses the depreciation schedule and valuation method laid out in Colorado's Renewable Energy Tax Factor Template provided by the Colorado Department of Local Affairs.[2]
- The analysis assumes a personal property value of $56.9 million based on a Project size of 158 MW AC and a capital cost threshold of $360/KW as laid out by the above guidance from the state.
- The analysis uses an assessment rate of 29% as appropriate for the Project's start year per the above guidance.
- The analysis assumes a capacity factor of 28.78%, a degradation factor of 1% for year 1 and an annual degradation factor of 0.3% thereafter, and an energy cost of $45/MWh with a no escalation.
- All tax rates are assumed to stay constant at their 2025 (2024 tax year) rates.
- The analysis assumes that the Project will be placed in service on January 1, 2028.
- The analysis assumes that the Project will be decommissioned in 36 years and will pay no more taxes after that date.
- The analysis assumes that 70% of the Project will be in Yuma County and 30% will be in Kit Carson County, per the most recently available design provided by Bechtel.
- The names of the taxing bodies used in this section come from the county and state tax websites. The millage rates assumed are 21.714 for Yuma County, 37.967 for Kit Carson County, 40.549 for Idalia RJ-3 School District, 40.318 Burlington School District, 3.227 for H2 Wray Community Hospital District, 3 for Kit Carson Health, 3 for Yuma County Fire District, 2.1 for Kit Carson Fire (BF), 2.5 for Yuma County Water Authority (PID), 2.004 for Yuma County Weed/Pest District, 0.931 for C3 East Yuma County Cemetery District, 0.705 for Cemetery (FVC), 0.264 for W2 Arikaree Water District, and 0.5 for Yuma County Soil Conservation District.
- The comprehensiveness and accuracy of the analysis below is dependent upon the assumptions listed above and used to calculate the property tax results. The analysis is to serve as a projection of property tax benefits to the local community and is not a guarantee of property tax revenue.
- If the inputs received from Bechtel, the laws surrounding renewable energy taxation in Colorado, or the millage rates in Yuma and Kit Carson Counties change in a material way after the completion of this report, this analysis may no longer accurately reflect the property taxes to be paid by the South Spur Solar Project.
- No comprehensive tax payment was calculated, and these calculations are only to be used to illustrate the economic impact of the Project.

[2] https://cdola.colorado.gov/renewable-energy

Figure 6.1 – Percentages of Property Taxes Paid to Taxing Jurisdictions

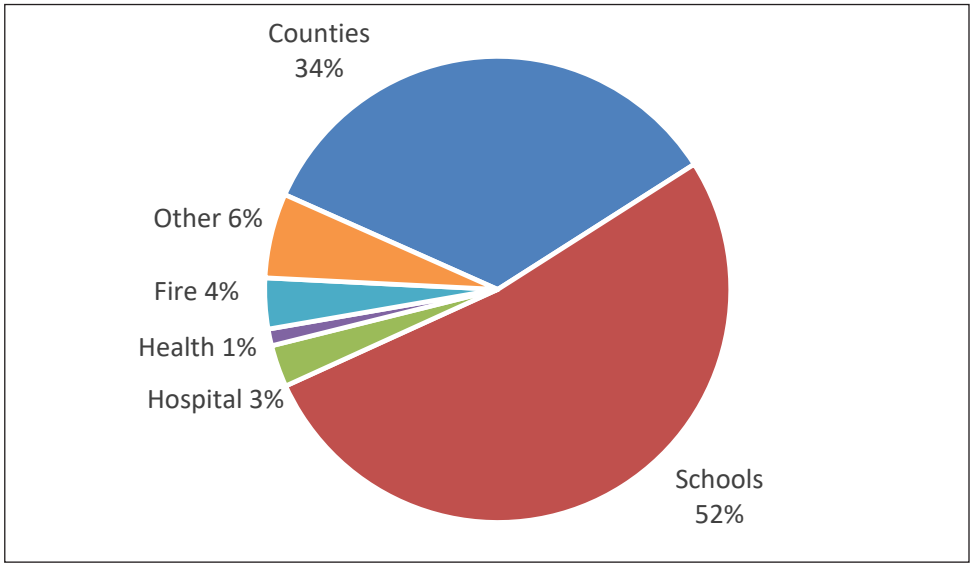


Table 6.1 – Total Property Taxes Paid by the South Spur Solar Project

Year	Total Property Taxes
2028	$535,329
2029	$533,723
2030	$532,117
2031	$530,511
2032	$528,905
2033	$527,299
2034	$525,693
2035	$524,087
2036	$522,481
2037	$520,875
2038	$519,269
2039	$517,663
2040	$516,057
2041	$514,451
2042	$512,845
2043	$511,239
2044	$509,633
2045	$508,027
2046	$506,421
2047	$504,815
2048	$503,209
2049	$501,603
2050	$499,997
2051	$498,391
2052	$496,785
2053	$495,179
2054	$493,573
2055	$491,967
2056	$490,361
2057	$488,755
2058	$487,149
2059	$485,543
2060	$483,937
2061	$482,331
2062	$480,725
2063	$479,119
TOTAL	$18,260,063
AVG ANNUAL	$507,224

As shown in Table 6.1, a conservative estimate of the total property taxes paid by the Project starts out at over $535 thousand. The expected total property taxes paid over the 36-year lifetime of the Project are over $18.2 million, and the average annual property taxes paid will be over $507 thousand.

Table 6.2 shows an estimate of the likely taxes paid to the following taxing bodies: Yuma County, Kit Carson County, H2 Wray Hospital District, Kit Carson Health, Yuma County Fire District, and Kit Carson Fire (BF).

According to Table 6.2, the total amounts paid over 36 years are over $3.5 million for Yuma County, over $2.6 million for Kit Carson County, over $532 thousand for H2 Wray Hospital District, over $212 thousand for Kit Carson Health, over $494 thousand for Yuma County Fire District, and over $148 thousand for Kit Carson Fire (BF) over the life of the Project.

Table 6.3 shows an estimate of the likely taxes paid to the following taxing bodies: Yuma County Water Authority (PID), Yuma County Weed/Pest District, C3 Yuma County Cemetery District, Cemetery (FVC), W2 Arikaree Water District, and Yuma County Soil Conversation District.

According to Table 6.3, the total amounts paid over 36 years are over $412 thousand for Yuma County Water Authority (PID), over $330 thousand for Yuma County Weed/Pest District, over $153 thousand for C3 Yuma County Cemetery District, over $49.8 thousand for Cemetery (FVC), over $43.5 thousand for W2 Arikaree Water District, and over $82.4 thousand for Yuma County Soil Conservation District over the life of the Project.

Table 6.2 – Tax Benefits from the South Spur Solar Project for the Counties and Other Taxing Bodies

Year	Yuma County	Kit Carson County	H2 Wray Hospital District	Kit Carson Health	Yuma County Fire District	Kit Carson Fire (BF)
2028	$104,980	$78,667	$15,601	$6,216	$14,504	$4,351
2029	$104,665	$78,431	$15,555	$6,197	$14,460	$4,338
2030	$104,350	$78,195	$15,508	$6,179	$14,417	$4,325
2031	$104,035	$77,959	$15,461	$6,160	$14,373	$4,312
2032	$103,720	$77,723	$15,414	$6,141	$14,330	$4,299
2033	$103,405	$77,487	$15,367	$6,123	$14,286	$4,286
2034	$103,090	$77,251	$15,321	$6,104	$14,243	$4,273
2035	$102,775	$77,015	$15,274	$6,085	$14,199	$4,260
2036	$102,460	$76,779	$15,227	$6,067	$14,156	$4,247
2037	$102,145	$76,543	$15,180	$6,048	$14,112	$4,234
2038	$101,830	$76,307	$15,133	$6,029	$14,069	$4,221
2039	$101,515	$76,071	$15,087	$6,011	$14,025	$4,208
2040	$101,200	$75,835	$15,040	$5,992	$13,982	$4,195
2041	$100,885	$75,599	$14,993	$5,974	$13,938	$4,181
2042	$100,570	$75,363	$14,946	$5,955	$13,895	$4,168
2043	$100,255	$75,127	$14,899	$5,936	$13,851	$4,155
2044	$99,941	$74,891	$14,853	$5,918	$13,808	$4,142
2045	$99,626	$74,655	$14,806	$5,899	$13,764	$4,129
2046	$99,311	$74,419	$14,759	$5,880	$13,721	$4,116
2047	$98,996	$74,183	$14,712	$5,862	$13,677	$4,103
2048	$98,681	$73,947	$14,665	$5,843	$13,634	$4,090
2049	$98,366	$73,711	$14,619	$5,824	$13,590	$4,077
2050	$98,051	$73,475	$14,572	$5,806	$13,547	$4,064
2051	$97,736	$73,239	$14,525	$5,787	$13,503	$4,051
2052	$97,421	$73,003	$14,478	$5,768	$13,460	$4,038
2053	$97,106	$72,767	$14,431	$5,750	$13,416	$4,025
2054	$96,791	$72,531	$14,384	$5,731	$13,373	$4,012
2055	$96,476	$72,295	$14,338	$5,712	$13,329	$3,999
2056	$96,161	$72,059	$14,291	$5,694	$13,286	$3,986
2057	$95,846	$71,823	$14,244	$5,675	$13,242	$3,973
2058	$95,531	$71,587	$14,197	$5,657	$13,199	$3,960
2059	$95,216	$71,351	$14,150	$5,638	$13,155	$3,947
2060	$94,901	$71,115	$14,104	$5,619	$13,112	$3,933
2061	$94,587	$70,879	$14,057	$5,601	$13,068	$3,920
2062	$94,272	$70,643	$14,010	$5,582	$13,025	$3,907
2063	$93,957	$70,407	$13,963	$5,563	$12,981	$3,894
TOTAL	$3,580,852	$2,683,342	$532,164	$212,027	$494,729	$148,419
AVG ANNUAL	$99,468	$74,537	$14,782	$5,890	$13,742	$4,123

Table 6.3 – Tax Benefits from the South Spur Solar Project for Other Taxing Bodies

Year	Yuma County Water Authority (PID)y	Yuma County Weed/ Pest District	C3 East Yuma County Cemetery District	Cemetery (FVC)	W2 Arikaree Water District	Yuma County Soil Conservation District
2028	$12,087	$9,689	$4,501	$1,461	$1,276	$2,417
2029	$12,050	$9,660	$4,488	$1,456	$1,273	$2,410
2030	$12,014	$9,631	$4,474	$1,452	$1,269	$2,403
2031	$11,978	$9,601	$4,461	$1,448	$1,265	$2,396
2032	$11,942	$9,572	$4,447	$1,443	$1,261	$2,388
2033	$11,905	$9,543	$4,434	$1,439	$1,257	$2,381
2034	$11,869	$9,514	$4,420	$1,434	$1,253	$2,374
2035	$11,833	$9,485	$4,407	$1,430	$1,250	$2,367
2036	$11,797	$9,456	$4,393	$1,426	$1,246	$2,359
2037	$11,760	$9,427	$4,380	$1,421	$1,242	$2,352
2038	$11,724	$9,398	$4,366	$1,417	$1,238	$2,345
2039	$11,688	$9,369	$4,353	$1,413	$1,234	$2,338
2040	$11,651	$9,340	$4,339	$1,408	$1,230	$2,330
2041	$11,615	$9,311	$4,326	$1,404	$1,227	$2,323
2042	$11,579	$9,282	$4,312	$1,399	$1,223	$2,316
2043	$11,543	$9,253	$4,299	$1,395	$1,219	$2,309
2044	$11,506	$9,224	$4,285	$1,391	$1,215	$2,301
2045	$11,470	$9,195	$4,272	$1,386	$1,211	$2,294
2046	$11,434	$9,165	$4,258	$1,382	$1,207	$2,287
2047	$11,398	$9,136	$4,244	$1,377	$1,204	$2,280
2048	$11,361	$9,107	$4,231	$1,373	$1,200	$2,272
2049	$11,325	$9,078	$4,217	$1,369	$1,196	$2,265
2050	$11,289	$9,049	$4,204	$1,364	$1,192	$2,258
2051	$11,253	$9,020	$4,190	$1,360	$1,188	$2,251
2052	$11,216	$8,991	$4,177	$1,356	$1,184	$2,243
2053	$11,180	$8,962	$4,163	$1,351	$1,181	$2,236
2054	$11,144	$8,933	$4,150	$1,347	$1,177	$2,229
2055	$11,108	$8,904	$4,136	$1,342	$1,173	$2,222
2056	$11,071	$8,875	$4,123	$1,338	$1,169	$2,214
2057	$11,035	$8,846	$4,109	$1,334	$1,165	$2,207
2058	$10,999	$8,817	$4,096	$1,329	$1,161	$2,200
2059	$10,963	$8,788	$4,082	$1,325	$1,158	$2,193
2060	$10,926	$8,759	$4,069	$1,321	$1,154	$2,185
2061	$10,890	$8,729	$4,055	$1,316	$1,150	$2,178
2062	$10,854	$8,700	$4,042	$1,312	$1,146	$2,171
2063	$10,818	$8,671	$4,028	$1,307	$1,142	$2,164
TOTAL	$412,275	$330,479	$153,531	$49,826	$43,536	$82,455
AVG ANNUAL	$11,452	$9,180	$4,265	$1,384	$1,209	$2,290

Table 6.4 – Tax Benefits from the South Spur Solar Project for the School Districts

Year	Idalia RJ-3 School District	Burlington School District
2028	$196,040	$83,539
2029	$195,452	$83,288
2030	$194,864	$83,037
2031	$194,276	$82,787
2032	$193,688	$82,536
2033	$193,100	$82,285
2034	$192,511	$82,035
2035	$191,923	$81,784
2036	$191,335	$81,534
2037	$190,747	$81,283
2038	$190,159	$81,032
2039	$189,571	$80,782
2040	$188,983	$80,531
2041	$188,395	$80,281
2042	$187,806	$80,030
2043	$187,218	$79,779
2044	$186,630	$79,529
2045	$186,042	$79,278
2046	$185,454	$79,027
2047	$184,866	$78,777
2048	$184,278	$78,526
2049	$183,690	$78,276
2050	$183,101	$78,025
2051	$182,513	$77,774
2052	$181,925	$77,524
2053	$181,337	$77,273
2054	$180,749	$77,023
2055	$180,161	$76,772
2056	$179,573	$76,521
2057	$178,985	$76,271
2058	$178,396	$76,020
2059	$177,808	$75,769
2060	$177,220	$75,519
2061	$176,632	$75,268
2062	$176,044	$75,018
2063	$175,456	$74,767
TOTAL	$6,686,928	$2,849,500
AVG ANNUAL	$185,748	$79,153

The largest taxing jurisdictions for property taxes are local school districts. However, the tax implications for school districts are more complicated than for other taxing bodies. School districts receive state aid based on the assessed value of the taxable property within their district. As assessed value increases, the state aid to the school district is decreased.

Although the exact amount of the reduction in state aid to the school districts is uncertain, local project tax revenue is superior to relying on state aid for the following reasons: (1) the solar project can't relocate – it is a permanent structure that will be within the school district's footprint for the life of the Project; (2) the school district can raise the tax rate and increase its revenues as needed; (3) the school district does not have to deal with the year-to-year uncertainty of state aid amounts; (4) the school district does not have to wait for months (or even into the next Fiscal Year) for payment.

Table 6.4 shows the direct property tax revenue coming from the Project to Idalia RJ-3 School District and Burlington School District. This tax revenue uses the assumptions outlined earlier to calculate the other tax revenue and assumes that 70% of the Project area is in Idalia RJ-3 County School District and 30% is in Burlington School District. Over the 36-year life of the Project, the school districts are expected to receive over $9.5 million in tax revenue.

The South Spur Solar Project may also include battery storage. Tables 6.5-6.8 detail the tax implications of the South Spur Solar Project if battery storage is included. There are several important assumptions built into the analysis in these tables.

- This analysis uses the depreciation schedule and valuation method laid out in Colorado's Renewable Energy Tax Factor Template provided by the Colorado Department of Local Affairs.[3]
- The analysis assumes a personal property value of $56.9 million based on a Project size of 158 MWac for solar, 79 MWac for BESS, and a capital cost threshold of $299/KW as laid out by the above guidance from the state.
- The analysis uses an assessment rate of 29% as appropriate for the Project's start year per the above guidance.
- The analysis assumes a capacity factor of 28.78%, a degradation factor of 1% for year 1 and an annual degradation factor of 0.3% thereafter, and an energy cost of $45/MWh with a no escalation.
- The analysis assumes that the solar equipment will be split between Kit Carson and Yuma Counties, but that the BESS will be placed only in Yuma County.
- All tax rates are assumed to stay constant at their 2025 (2024 tax year) rates.
- The analysis assumes that the Project will be placed in service on January 1, 2028.
- The analysis assumes that the Project will be decommissioned in 36 years and will pay no more taxes after that date.
- The analysis assumes that 70% of the solar Project will be in Yuma County and that 30% of the solar and 100% of the battery storage will be in Kit Carson County, per the most recently available design provided by Bechtel.
- The names of the taxing bodies used in this section come from the county and state tax websites. The millage rates assumed are 21.714 for Yuma County, 37.967 for Kit Carson County, 40.549 for Idalia RJ-3 School District, 40.318 Burlington School District, 3.227 for H2 Wray Community Hospital District, 3 for Kit Carson Health, 3 for Yuma County Fire District, 2.1 for Kit Carson Fire (BF), 2.5 for Yuma County Water Authority (PID), 2.004 for Yuma County Weed/Pest District, 0.931 for C3 East Yuma County Cemetery District, 0.705 for Cemetery (FVC), 0.264 for W2 Arikaree Water District, and 0.5 for Yuma County Soil Conservation District.
- The names of the taxing bodies used in this section come from the county and state tax websites.
- The comprehensiveness and accuracy of the analysis below is dependent upon the assumptions listed above and used to calculate the property tax results. The analysis is to serve as a projection of property tax benefits to the local community and is not a guarantee of property tax revenue.
- If the inputs received from Bechtel, the laws surrounding renewable energy taxation in Colorado, or the millage rates in Yuma and Kit Carson Counties change in a material way after the completion of this report, this analysis may no longer accurately reflect the property taxes to be paid by the South Spur Solar Project.
- No comprehensive tax payment was calculated, and these calculations are only to be used to illustrate the economic impact of the Project.

[3] https://cdola.colorado.gov/renewable-energy

Figure 6.2 – Percentages of Property Taxes Paid to Taxing Jurisdictions (Solar & BESS)

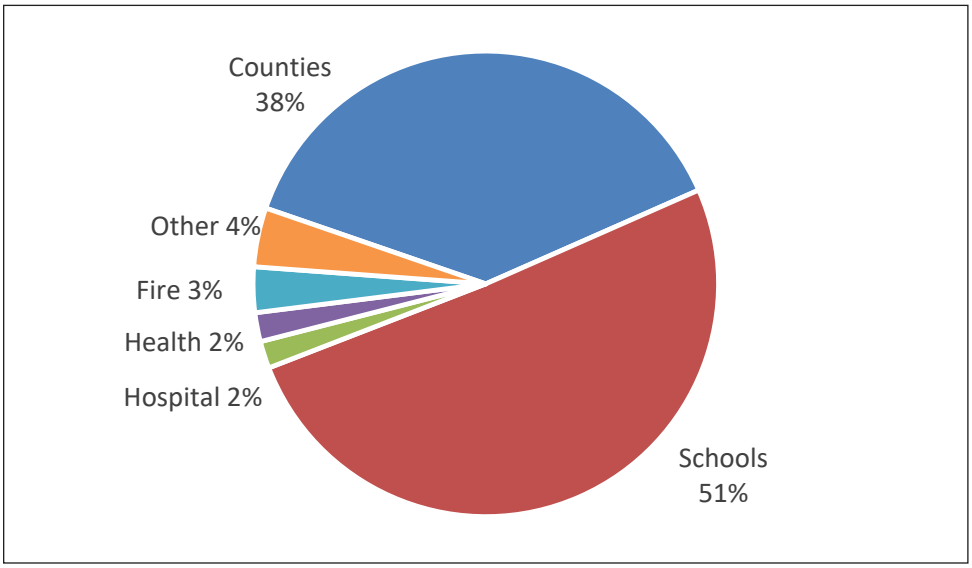


Table 6.5 – Total Property Taxes Paid by the South Spur Solar Project (Solar & BESS)

Year	Total Property Taxes
2028	$685,639
2029	$683,582
2030	$681,525
2031	$679,468
2032	$677,411
2033	$675,354
2034	$673,297
2035	$671,240
2036	$669,183
2037	$667,126
2038	$665,069
2039	$663,013
2040	$660,956
2041	$658,899
2042	$656,842
2043	$654,785
2044	$652,728
2045	$650,671
2046	$648,614
2047	$646,557
2048	$644,500
2049	$642,443
2050	$640,386
2051	$638,330
2052	$636,273
2053	$634,216
2054	$632,159
2055	$630,102
2056	$628,045
2057	$625,988
2058	$623,931
2059	$621,874
2060	$619,817
2061	$617,760
2062	$615,703
2063	$613,647
TOTAL	$23,387,134
AVG ANNUAL	$649,643

As shown in Table 6.5, a conservative estimate of the total property taxes paid by the Project starts out at over $685 thousand. The expected total property taxes paid over the 36-year lifetime of the Project are over $23.3 million, and the average annual property taxes paid will be over $649 thousand.

Table 6.6 shows an estimate of the likely taxes paid to the following taxing bodies: Yuma County, Kit Carson County, H2 Wray Hospital District, Kit Carson Health, Yuma County Fire District, and Kit Carson Fire (BF).

According to Table 6.6, the total amounts paid over 36 years are over $2.9 million for Yuma County, over $5.9 million for Kit Carson County, over $441 thousand for H2 Wray Hospital District, over $469 thousand for Kit Carson Health, over $410 thousand for Yuma County Fire District, and over $328 thousand for Kit Carson Fire (BF) over the life of the Project.

Table 6.7 shows an estimate of the likely taxes paid to the following taxing bodies: Yuma County Water Authority (PID), Yuma County Weed/Pest District, C3 Yuma County Cemetery District, Cemetery (FVC), W2 Arikaree Water District, and Yuma County Soil Conversation District.

According to Table 6.7, the total amounts paid over 36 years are over $342 thousand for Yuma County Water Authority (PID), over $274 thousand for Yuma County Weed/Pest District, over $127 thousand for C3 Yuma County Cemetery District, over $110 thousand for Cemetery (FVC), over $36.1 thousand for W2 Arikaree Water District, and over $68.4 thousand for Yuma County Soil Conservation District over the life of the Project.

Table 6.6 – Tax Benefits from the South Spur Solar Project for the Counties and Other Taxing Bodies (Solar & BESS)

Year	Yuma County	Kit Carson County	H2 Wray Hospital District	Kit Carson Health	Yuma County Fire District	Kit Carson Fire (BF)
2028	$87,170	$174,191	$12,955	$13,764	$12,043	$9,635
2029	$86,909	$173,669	$12,916	$13,723	$12,007	$9,606
2030	$86,647	$173,146	$12,877	$13,681	$11,971	$9,577
2031	$86,386	$172,624	$12,838	$13,640	$11,935	$9,548
2032	$86,124	$172,101	$12,799	$13,599	$11,899	$9,519
2033	$85,863	$171,578	$12,760	$13,557	$11,863	$9,490
2034	$85,601	$171,056	$12,722	$13,516	$11,827	$9,461
2035	$85,340	$170,533	$12,683	$13,475	$11,790	$9,432
2036	$85,078	$170,011	$12,644	$13,434	$11,754	$9,403
2037	$84,817	$169,488	$12,605	$13,392	$11,718	$9,375
2038	$84,555	$168,966	$12,566	$13,351	$11,682	$9,346
2039	$84,294	$168,443	$12,527	$13,310	$11,646	$9,317
2040	$84,032	$167,920	$12,488	$13,268	$11,610	$9,288
2041	$83,771	$167,398	$12,449	$13,227	$11,574	$9,259
2042	$83,509	$166,875	$12,411	$13,186	$11,538	$9,230
2043	$83,248	$166,353	$12,372	$13,145	$11,501	$9,201
2044	$82,986	$165,830	$12,333	$13,103	$11,465	$9,172
2045	$82,725	$165,308	$12,294	$13,062	$11,429	$9,143
2046	$82,463	$164,785	$12,255	$13,021	$11,393	$9,114
2047	$82,201	$164,262	$12,216	$12,979	$11,357	$9,086
2048	$81,940	$163,740	$12,177	$12,938	$11,321	$9,057
2049	$81,678	$163,217	$12,139	$12,897	$11,285	$9,028
2050	$81,417	$162,695	$12,100	$12,855	$11,249	$8,999
2051	$81,155	$162,172	$12,061	$12,814	$11,212	$8,970
2052	$80,894	$161,649	$12,022	$12,773	$11,176	$8,941
2053	$80,632	$161,127	$11,983	$12,732	$11,140	$8,912
2054	$80,371	$160,604	$11,944	$12,690	$11,104	$8,883
2055	$80,109	$160,082	$11,905	$12,649	$11,068	$8,854
2056	$79,848	$159,559	$11,866	$12,608	$11,032	$8,825
2057	$79,586	$159,037	$11,828	$12,566	$10,996	$8,797
2058	$79,325	$158,514	$11,789	$12,525	$10,960	$8,768
2059	$79,063	$157,991	$11,750	$12,484	$10,923	$8,739
2060	$78,802	$157,469	$11,711	$12,443	$10,887	$8,710
2061	$78,540	$156,946	$11,672	$12,401	$10,851	$8,681
2062	$78,279	$156,424	$11,633	$12,360	$10,815	$8,652
2063	$78,017	$155,901	$11,594	$12,319	$10,779	$8,623
TOTAL	$2,973,375	$5,941,664	$441,885	$469,486	$410,801	$328,641
AVG ANNUAL	$82,594	$165,046	$12,275	$13,041	$11,411	$9,129

Table 6.7 – Tax Benefits from the South Spur Solar Project for Other Taxing Bodies (Solar & BESS)

Year	Yuma County Water Authority (PID)y	Yuma County Weed/ Pest District	C3 East Yuma County Cemetery District	Cemetery (FVC)	W2 Arikaree Water District	Yuma County Soil Conservation District
2028	$10,036	$8,045	$3,737	$3,235	$1,060	$2,007
2029	$10,006	$8,021	$3,726	$3,225	$1,057	$2,001
2030	$9,976	$7,997	$3,715	$3,215	$1,053	$1,995
2031	$9,946	$7,973	$3,704	$3,205	$1,050	$1,989
2032	$9,916	$7,948	$3,693	$3,196	$1,047	$1,983
2033	$9,886	$7,924	$3,681	$3,186	$1,044	$1,977
2034	$9,856	$7,900	$3,670	$3,176	$1,041	$1,971
2035	$9,825	$7,876	$3,659	$3,167	$1,038	$1,965
2036	$9,795	$7,852	$3,648	$3,157	$1,034	$1,959
2037	$9,765	$7,828	$3,637	$3,147	$1,031	$1,953
2038	$9,735	$7,804	$3,625	$3,137	$1,028	$1,947
2039	$9,705	$7,780	$3,614	$3,128	$1,025	$1,941
2040	$9,675	$7,755	$3,603	$3,118	$1,022	$1,935
2041	$9,645	$7,731	$3,592	$3,108	$1,018	$1,929
2042	$9,615	$7,707	$3,580	$3,099	$1,015	$1,923
2043	$9,585	$7,683	$3,569	$3,089	$1,012	$1,917
2044	$9,554	$7,659	$3,558	$3,079	$1,009	$1,911
2045	$9,524	$7,635	$3,547	$3,070	$1,006	$1,905
2046	$9,494	$7,611	$3,536	$3,060	$1,003	$1,899
2047	$9,464	$7,586	$3,524	$3,050	$999	$1,893
2048	$9,434	$7,562	$3,513	$3,040	$996	$1,887
2049	$9,404	$7,538	$3,502	$3,031	$993	$1,881
2050	$9,374	$7,514	$3,491	$3,021	$990	$1,875
2051	$9,344	$7,490	$3,480	$3,011	$987	$1,869
2052	$9,314	$7,466	$3,468	$3,002	$984	$1,863
2053	$9,283	$7,442	$3,457	$2,992	$980	$1,857
2054	$9,253	$7,417	$3,446	$2,982	$977	$1,851
2055	$9,223	$7,393	$3,435	$2,973	$974	$1,845
2056	$9,193	$7,369	$3,424	$2,963	$971	$1,839
2057	$9,163	$7,345	$3,412	$2,953	$968	$1,833
2058	$9,133	$7,321	$3,401	$2,943	$964	$1,827
2059	$9,103	$7,297	$3,390	$2,934	$961	$1,821
2060	$9,073	$7,273	$3,379	$2,924	$958	$1,815
2061	$9,043	$7,249	$3,367	$2,914	$955	$1,809
2062	$9,012	$7,224	$3,356	$2,905	$952	$1,802
2063	$8,982	$7,200	$3,345	$2,895	$949	$1,796
TOTAL	$342,334	$274,415	$127,485	$110,329	$36,150	$68,467
AVG ANNUAL	$9,509	$7,623	$3,541	$3,065	$1,004	$1,902

Table 6.8 – Tax Benefits from the South Spur Solar Project for the School Districts (Solar & BESS)

Year	Idalia RJ-3 School District	Burlington School District
2028	$162,783	$184,978
2029	$162,294	$184,423
2030	$161,806	$183,868
2031	$161,318	$183,313
2032	$160,829	$182,758
2033	$160,341	$182,203
2034	$159,853	$181,648
2035	$159,364	$181,093
2036	$158,876	$180,538
2037	$158,388	$179,983
2038	$157,899	$179,428
2039	$157,411	$178,873
2040	$156,923	$178,318
2041	$156,434	$177,763
2042	$155,946	$177,209
2043	$155,457	$176,654
2044	$154,969	$176,099
2045	$154,481	$175,544
2046	$153,992	$174,989
2047	$153,504	$174,434
2048	$153,016	$173,879
2049	$152,527	$173,324
2050	$152,039	$172,769
2051	$151,551	$172,214
2052	$151,062	$171,659
2053	$150,574	$171,104
2054	$150,086	$170,549
2055	$149,597	$169,994
2056	$149,109	$169,439
2057	$148,621	$168,885
2058	$148,132	$168,330
2059	$147,644	$167,775
2060	$147,156	$167,220
2061	$146,667	$166,665
2062	$146,179	$166,110
2063	$145,691	$165,555
TOTAL	$5,552,518	$6,309,585
AVG ANNUAL	$154,237	$175,266

Table 6.8 shows the direct property tax revenue coming from the Project to Idalia RJ-3 School District and Burlington School District. This tax revenue uses the assumptions outlined earlier to calculate the other tax revenue and assumes that 70% of the solar Project area is in Idalia RJ-3 County School District and 30% is in Burlington School District. The proposed battery energy storage system will be located in the Burlington School District. Over the 36-year life of the Project, the school districts are expected to receive over $11.8 million in tax revenue.

VII. Appendix 1

Table 7.1 – Local and Statewide Compensation by Occupation

BLS Occupation Code	Job Type	Education/Training Required	Colorado 10th Percentile of Wages	Colorado 90th Percentile of Wages	Colorado Mean Wages	Denver, CO 10th Percentile of Wages	Denver, CO 90th Percentile of Wages	Denver, CO Mean Wages	US Fringe Benefits Median	Total Compensation Local mean wages plus US Fringe
	Jobs during Construction									
47-2231	Solar Photovoltaic Installers	High school diploma or equivalent	$34,620	$63,450	$48,350	$33,470	$63,450	$47,600	$27,394	$74,994
47-3013	Helpers – Electricians	High school diploma or equivalent	$33,490	$51,290	$40,940	$36,400	$58,380	$40,620	$27,394	$68,014
47-2111	Electricians	High school diploma or equivalent	$37,150	$81,020	$59,280	$37,550	$82,030	$60,440	$27,394	$87,834
47-2061	Construction Laborers	No formal educational credential	$31,240	$52,710	$42,870	$32,200	$53,700	$43,420	$27,394	$70,814
47-2073	Operating Engineers and Other Construction Equipment Operators	High school diploma or equivalent	$40,620	$71,730	$55,800	$44,670	$73,460	$57,950	$27,394	$85,344
47-1011	First-Line Supervisors of Construction Trades	High school diploma or equivalent	$50,820	$106,180	$78,110	$52,640	$105,940	$79,480	$27,394	$106,874
13-1082	Project Management Specialists and Business Operations Specialists		$57,090	$156,450	$102,360	$59,430	$158,800	$104,580	$27,394	$131,974
49-9071	Maintenance and Repair Workers, General (Operations)	High school diploma or equivalent	$32,270	$72,080	$49,960	$35,030	$76,100	$52,560	$27,394	$79,954
13-1111	Management Analysts	Bachelor's degree	$60,550	$162,490	$104,980	$63,250	$162,490	$105,540	$27,394	$132,934
11-1021	General and Operations Managers	Bachelor's degree	$60,060	N/A	$147,010	$65,000	N/A	$156,360	$27,394	$183,754
17-2071	Electrical Engineers		$75,780	$162,910	$112,490	$77,050	$158,420	$110,330	$27,394	$137,724
41-3091	Sales Representatives of Services		$40,120	N/A	$107,100	$42,360	N/A	$111,390	$27,394	$138,784
53-7062	Laborers and Freight, Stock and Material Movers	No formal educational credential	$31,520	$49,750	$40,920	$32,590	$49,940	$42,060	$27,394	$69,454
43-3031	Bookkeeping, Accounting and Auditing	Some college, no degree	$33,270	$66,130	$49,590	$34,920	$67,770	$51,810	$27,394	$79,204
	Jobs during Operations									
51-8013	Power Plant Operators	High school diploma or equivalent	$66,150	$114,400	$93,940	$62,730	$118,450	$98,410	$27,394	$125,804
37-3011	Landscaping and Groundskeeping	No formal educational credential	$31,570	$53,130	$42,170	$33,470	$50,460	$42,120	$27,394	$69,514
51-1011	First-Line Supervisors of Production and Operating Workers	High school diploma or equivalent	$43,500	$106,290	$72,090	$43,500	$104,000	$71,660	$27,394	$99,054

Table 7.2 – Occupational Description and Future Outlook

Occupation Code	Occupation Title	Description	Work Environment	Current Employment	Job Growth, 2021-2031 (percent)
11-1021	General and Operations Managers	Plan, direct, or coordinate the operations of public or private sector organizations, overseeing multiple departments or locations. Duties and responsibilities include formulating policies, managing daily operations, and planning the use of materials and human resources, but are too diverse and general in nature to be classified in any one functional area of management or administration, such as personnel, purchasing, or administrative services. Usually manage through subordinate supervisors. Excludes First-Line Supervisors.	Top executives work in nearly every industry, for both small and large organizations. They often have irregular schedules, which may include working evenings and weekends. Travel is common, particularly for chief executives.	3,328,200	209,800 (7%)
13-1082	Project Management Specialists and Business Operations Specialists	Analyze and coordinate the schedule, timeline, procurement, staffing, and budget of a product or service on a per project basis. Lead and guide the work of technical staff. May serve as a point of contact for the client or customer. Excludes "Management Occupations" (11-0000), "Logisticians" (13-1081), "Meeting, Convention, and Event Planners" (13-1121), and "Production, Planning, and Expediting Clerks" (43-5061).	Project management specialists usually work in an office setting. Although project management specialists may collaborate on teams, some work independently. Project management specialists also may travel to their clients' places of business.	781,400	56,300 (7%)
13-1111	Management Analysts	Conduct organizational studies and evaluations, design systems and procedures, conduct work simplification and measurement studies, and prepare operations and procedures manuals to assist management in operating more efficiently and effectively. Includes program analysts and management consultants. Excludes "Computer Systems Analysts" (15-1211) and "Operations Research Analysts" (15-2031).	Management analysts may travel frequently to meet with clients. Some work more than 40 hours per week.	950,600	108,400 (11%)
17-2071	Electrical Engineers	Research, design, develop, test, or supervise the manufacturing and installation of electrical equipment, components, or systems for commercial, industrial, military, or scientific use. Excludes "Computer Hardware Engineers" (17-2061).	Electrical and electronics engineers work in industries including research and development, engineering services, manufacturing, telecommunications, and the federal government. Electrical and electronics engineers generally work indoors in offices. However, they may have to visit sites to observe a problem or a piece of complex equipment.	303,800	9,800 (3%)
37-3011	Landscaping and Groundskeeping	Landscape or maintain grounds of property using hand or power tools or equipment. Workers typically perform a variety of tasks, which may include any combination of the following: sod laying, mowing, trimming, planting, watering, fertilizing, digging, raking, sprinkler installation, and installation of mortarless segmental concrete masonry wall units. Excludes "Farmworkers and Laborers, Crop, Nursery, and Greenhouse" (45-2092).	Most grounds maintenance work is done outdoors in all weather conditions. Some work is seasonal, available mainly in the spring, summer, and fall. The work may be repetitive and physically demanding, requiring frequent bending, kneeling, lifting, or shoveling.	1,299,000	61,300 (5%)
41-3091	Sales Representatives of Services	Sell services to individuals or businesses. May describe options or resolve client problems. Excludes "Advertising Sales Agents" (41-3011), "Insurance Sales Agents" (41-3021), "Securities, Commodities, and Financial Services Sales Agents" (41-3031), "Travel Agents" (41-3041), "Sales Representatives, Wholesale and Manufacturing" (41-4010), and "Telemarketers" (41-9041).	Wholesale and manufacturing sales representatives work under pressure because their income and job security depend on the amount of merchandise they sell. Some sales representatives travel frequently.	1,597,600	63,300 (4%)
43-3031	Bookkeeping, Accounting and Auditing	Compute, classify, and record numerical data to keep financial records complete. Perform any combination of routine calculating, posting, and verifying duties to obtain primary financial data for use in maintaining accounting records. May also check the accuracy of figures, calculations, and postings pertaining to business transactions recorded by other workers. Excludes "Payroll and Timekeeping Clerks" (43-3051).	Most accountants and auditors work full time. Overtime hours are typical at certain periods of the year, such as for quarterly audits or during tax season.	1,449,800	81,800 (6%)
47-1011	First-Line Supervisors of Construction Trades	Directly supervise and coordinate activities of construction or extraction workers.	N/A	735,500	29,900 (4%)

Table 7.2 – Occupational Description and Future Outlook (Cont.)

47-2061	Construction Laborers	Perform tasks involving physical labor at construction sites. May operate hand and power tools of all types: air hammers, earth tampers, cement mixers, small mechanical hoists, surveying and measuring equipment, and a variety of other equipment and instruments. May clean and prepare sites, dig trenches, set braces to support the sides of excavations, erect scaffolding, and clean up rubble, debris, and other waste materials. May assist other craft workers. Construction laborers who primarily assist a particular craft worker are classified under "Helpers, Construction Trades" (47-3010). Excludes "Hazardous Materials Removal Workers" (47-4041).	Most construction laborers and helpers typically work full time and do physically demanding work. Some work at great heights or outdoors in all weather conditions. Construction laborers have one of the highest rates of injuries and illnesses of all occupations.	1,572,200	69,500 (4%)
47-2073	Operating Engineers and Other Construction Equipment Operators	Operate one or several types of power construction equipment, such as motor graders, bulldozers, scrapers, compressors, pumps, derricks, shovels, tractors, or front-end loaders to excavate, move, and grade earth, erect structures, or pour concrete or other hard surface pavement. May repair and maintain equipment in addition to other duties. Excludes "Extraction Workers" (47-5000) and "Crane and Tower Operators" (53-7021).	Construction equipment operators may work even in unpleasant weather. Most operators work full time, and some have irregular work schedules that include nights.	466,900	22,000 (5%)
47-2111	Electricians	Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems. Excludes "Security and Fire Alarm Systems Installers" (49-2098).	Almost all electricians work full time. Work schedules may include evenings and weekends. Overtime is common.	711,200	50,200 (7%)
47-2231	Solar Photovoltaic Installers	Assemble, install, or maintain solar photovoltaic (PV) systems on roofs or other structures in compliance with site assessment and schematics. May include measuring, cutting, assembling, and bolting structural framing and solar modules. May perform minor electrical work such as current checks. Excludes solar PV electricians who are included in "Electricians" (47-2111) and solar thermal installers who are included in "Plumbers, Pipefitters, and Steamfitters" (47-2152).	Most solar panel installations are done outdoors, but PV installers sometimes work in attics and crawl spaces to connect panels to the electrical grid. Installers also must travel to jobsites.	17,100	4,600 (27%)
47-3013	Helpers – Electricians	Help electricians by performing duties requiring less skill. Duties include using, supplying, or holding materials or tools, and cleaning work area and equipment. Construction laborers who do not primarily assist electricians are classified under "Construction Laborers" (47-2061). Apprentice workers are classified with the appropriate skilled construction trade occupation (47-2011 through 47-2231).	Most construction laborers and helpers typically work full time and do physically demanding work. Some work at great heights or outdoors in all weather conditions. Construction laborers have one of the highest rates of injuries and illnesses of all occupations.	1,572,200	69,500 (4%)
49-9071	Maintenance and Repair Workers, General (Operations)	Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of a building in repair. Duties may involve pipe fitting; HVAC maintenance; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs. Excludes "Facilities Managers" (11-3013) and "Maintenance Workers, Machinery" (49-9043).	General maintenance and repair workers often carry out many different tasks in a single day. They could work at any number of indoor or outdoor locations. They may work inside a single building, such as a hotel or hospital, or be responsible for the maintenance of many buildings, such as those in an apartment complex or on a college campus.	1,539,100	76,300 (5%)
51-1011	First-Line Supervisors of Production and Operating Workers	Directly supervise and coordinate the activities of production and operating workers, such as inspectors, precision workers, machine setters and operators, assemblers, fabricators, and plant and system operators. Excludes team or work leaders.	N/A	646,800	12,200 (2%)
51-8013	Power Plant Operators	Control, operate, or maintain machinery to generate electric power. Includes auxiliary equipment operators. Excludes "Nuclear Power Reactor Operators" (51-8011).	Most power plant operators, distributors, and dispatchers work full time. Many work rotating 8- or 12-hour shifts.	43,700	(6,500) (-15%)
53-7062	Laborers and Freight, Stock and Material Movers	Manually move freight, stock, luggage, or other materials, or perform other general labor. Includes all manual laborers not elsewhere classified. Excludes "Construction Laborers" (47-2061) and "Helpers, Construction Trades" (47-3011 through 47-3019). Excludes "Material Moving Workers" (53-7011 through 53-7199) who use power equipment.	Most hand laborers and material movers work full time. Because materials are shipped around the clock, some workers, especially those in warehousing, work overnight shifts.	6,473,000	358,300 (6%)

Table 7.3 – Occupational Output from IMPLAN Construction Model, Direct Jobs, Employment Greater than 1.0

Occ Code	Occupation	Wage and Salary Employment	Wage and Salary Income	Supplements to Wages and Salaries	Employee Compensation	Hours Worked
47-2000	Construction Trades Workers	16.24	$646,948.16	$111,424.02	$758,372.17	31,399.72
49-9000	Other Installation, Maintenance, and Repair Occupations	12.94	$606,637.93	$104,481.38	$711,119.30	27,362.22
47-1000	Supervisors of Construction and Extraction Workers	4.30	$249,776.83	$43,019.12	$292,795.95	9,317.64
49-1000	Supervisors of Installation, Maintenance, and Repair Workers	3.12	$195,968.31	$33,751.67	$229,719.97	6,766.46
13-1000	Business Operations Specialists	2.64	$159,108.71	$27,403.33	$186,512.04	5,321.78
11-9000	Other Management Occupations	2.08	$173,094.10	$29,812.04	$202,906.12	4,458.02
11-1000	Top Executives	1.54	$160,442.61	$27,633.06	$188,075.67	3,377.62
43-9000	Other Office and Administrative Support Workers	1.10	$32,253.60	$5,555.05	$37,808.65	1,778.58

Table 7.4 – Occupational Output from IMPLAN Construction Model, Indirect Jobs, Employment Greater than 1.0

Occ Code	Occupation	Wage and Salary Employment	Wage and Salary Income	Supplements to Wages and Salaries	Employee Compensation	Hours Worked
47-2000	Construction Trades Workers	3.89	$154,769.49	$26,899.35	$181,668.83	7,503.67

VIII. Appendix 2

This section of the report meets the following Tri-State RFP response requirements: Best Value Employment Metrics:

- Availability, cost and duration of training programs including training through apprenticeship programs register with the United States Department of Labor Office of Apprenticeship and Training
- Estimates of the number of man-hours worked by workers in the state in which the proposed project is located, as compared to total man-hours for each job classification
- Long-term career opportunities for each job clarification
- Wages and fringe benefits (healthcare, pension and other compensation) by job classification

Training Programs

https://cccs.edu/colleges-programs/programs/workforce-programs/energy/
Community colleges throughout Colorado offer various training programs for the solar industry. There are no community colleges in the surrounding area offering training courses.

https://www.solarenergy.org/training-schedule/?category[]=125&order=date
Various training programs. Programs take 5 days to complete and cost $900 - $2,000. They offer both in-person and online courses. All physical training takes place in their training facility at Paonia, CO.

- PV201L: SOLAR TRAINING – SOLAR ELECTRIC LAB WEEK (GRID-DIRECT)
- PV301L: SOLAR TRAINING – SOLAR ELECTRIC LAB WEEK (BATTERY-BASED)
- PV 351L: SOLAR TRAINING – PV SYSTEMS – TOOLS AND TECHNIQUES FOR OPERATIONS AND MAINTENANCE LAB WEEK (GRID-DIRECT)

Table 8.1 - Estimated Man-Hours: Direct-only, features Occupations with greater than 1.0 FTE in Colorado

Occupation Code	Description	In State – Hours Worked	Out of State – Hours Worked	Portion of Hours Worked in State (%)	Calculated Portion of Hours Worked in State (%)
47-2000	Construction Trades Workers	97,913	135,010	72.5%	27.5%
49-9000	Other Installation, Maintenance, and Repair Occupations	85,323	117,650	72.5%	27.5%
47-1000	Supervisors of Construction and Extraction Workers	29,055	40,063	72.5%	27.5%
49-1000	Supervisors of Installation, Maintenance, and Repair Workers	21,100	29,094	72.5%	27.5%
13-1000	Business Operations Specialists	16,595	22,882	72.5%	27.5%
11-9000	Other Management Occupations	13,901	19,168	72.5%	27.5%
11-1000	Top Executives	10,532	14,523	72.5%	27.5%
43-9000	Other Office and Administrative Support Workers	5,546	7,647	72.5%	27.5%
43-3000	Financial Clerks	5,165	7,122	72.5%	27.5%
49-2000	Electrical and Electronic Equipment Mechanics, Installers, and Repairers	5,483	7,561	72.5%	27.5%
43-6000	Secretaries and Administrative Assistants	4,381	6,041	72.5%	27.5%
53-3000	Motor Vehicle Operators	4,986	6,875	72.5%	27.5%
53-7000	Material Moving Workers	4,209	5,803	72.5%	27.5%
49-3000	Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	4,817	6,642	72.5%	27.5%
47-4000	Other Construction and Related Workers	3,493	4,817	72.5%	27.5%
17-2000	Engineers	3,560	4,909	72.5%	27.5%
17-3000	Drafters, Engineering Technicians, and Mapping Technicians	3,002	4,140	72.5%	27.5%
13-2000	Financial Specialists	2,863	3,948	72.5%	27.5%
11-3000	Operations Specialties Managers	2,965	4,089	72.5%	27.5%
51-4000	Metal Workers and Plastic Workers	2,767	3,815	72.5%	27.5%
15-1200	Computer Occupations	2,506	3,455	72.5%	27.5%
19-5000	Occupational Health and Safety Specialists and Technicians	2,239	3,087	72.5%	27.5%
43-5000	Material Recording, Scheduling, Dispatching, and Distributing Workers	2,113	2,914	72.5%	27.5%
47-5000	Extraction Workers	2,440	3,365	72.5%	27.5%

Table 8.2 – Estimated Man Hours: Indirect-only, features Occupations with greater than 1.0 FTE in Colorado

Occupation Code	Description	In State – Hours Worked	Out of State – Hours Worked	Portion of Hours Worked in State (%)	Calculated Portion of Hours Worked in State (%)
47-2000	Construction Trades Workers	34,259	51,055	67.1%	32.9%
13-1000	Business Operations Specialists	10,759	28,250	38.1%	61.9%
47-1000	Supervisors of Construction and Extraction Workers	10,914	15,605	69.9%	30.1%
11-9000	Other Management Occupations	9,125	15,606	58.5%	41.5%
11-1000	Top Executives	4,791	16,201	29.6%	70.4%
53-3000	Motor Vehicle Operators	3,954	19,854	19.9%	80.1%
53-7000	Material Moving Workers	3,387	25,901	13.1%	86.9%
43-9000	Other Office and Administrative Support Workers	2,410	7,869	30.6%	69.4%
11-9000	Engineers	2,971	13,410	22.2%	77.8%
43-3000	Financial Clerks	2,243	7,607	29.5%	70.5%
49-9000	Other Installation, Maintenance, and Repair Occupations	2,505	14,685	17.1%	82.9%
43-6000	Secretaries and Administrative Assistants	1,931	5,795	33.3%	66.7%

Table 8.3 – Estimated Man Hours: Induced-only, features Occupations with greater than 1.0 FTE in Colorado

Occupation Code	Description	In State – Hours Worked	Out of State – Hours Worked	Portion of Hours Worked in State (%)	Calculated Portion of Hours Worked in State (%)
35-3000	Food and Beverage Serving Workers	5,835	19,571	29.8%	70.2%
41-2000	Retail Sales Workers	6,593	22,807	28.9%	71.1%
29-1000	Healthcare Diagnosing or Treating Practitioners	5,008	21,929	22.8%	77.2%
31-1100	Home Health and Personal Care Aides; and Nursing Assistants, Orderlies, and Psychiatric Aides	4,171	17,844	23.4%	76.6%
53-7000	Material Moving Workers	4,087	17,133	23.9%	76.1%
35-2000	Cooks and Food Preparation Workers	3,362	11,353	29.6%	70.4%
43-4000	Information and Record Clerks	3,587	14,092	25.5%	74.5%
13-1000	Business Operations Specialists	4,155	16,562	25.1%	74.9%
11-1000	Top Executives	3,385	12,790	26.5%	73.5%
15-1200	Computer Occupations	2,763	10,282	26.9%	73.1%
53-3000	Motor Vehicle Operators	2,733	11,521	23.7%	76.3%
29-2000	Health Technologists and Technicians	2,441	10,283	23.7%	76.3%
37-2000	Building Cleaning and Pest Control Workers	2,169	9,134	23.7%	76.3%
13-2000	Financial Specialists	2,486	9,455	26.3%	73.7%
43-6000	Secretaries and Administrative Assistants	2,161	8,623	25.1%	74.9%
43-9000	Other Office and Administrative Support Workers	1,798	7,053	25.5%	74.5%
11-9000	Other Healthcare Support Occupations	1,704	6,348	26.8%	73.2%
35-9000	Other Food Preparation and Serving Related Workers	1,037	3,520	29.5%	70.5%
2593528	Other Management Occupations	2,017	8,221	24.5%	75.5%
49-3000	Vehicle and Mobile Equipment Mechanics, Installers, and Repairers	1,982	6,682	29.7%	70.3%
35-1000	Supervisors of Food Preparation and Serving Workers	1,687	5,668	29.8%	70.2%
43-3000	Financial Clerks	1,767	6,909	25.6%	74.4%

Job Classifications

47-2231 Solar Photovoltaic Installers
Assemble, install, or maintain solar photovoltaic (PV) systems on roofs or other structures in compliance with site assessment and schematics. May include measuring, cutting, assembling, and bolting structural framing and solar modules. May perform minor electrical work such as current checks. Excludes solar PV electricians who are included in "Electricians" (47-2111) and solar thermal installers who are included in "Plumbers, Pipefitters, and Steamfitters" (47-2152).

- Career Opportunity
  - Industries with the highest levels of employment:
    - -Building Equipment Contractors (14,730)
    - -Employment Services (3,430)
    - -Electric Power Generation, Transmission and Distribution (2,510)
    - -Utility System Construction (1,160)
    - -Residential Building Construction (630)
  - States with the highest levels of employment:
    - -California (7,610)
    - -Texas (3,460)
    - -Florida (1,690)
    - -Arizona (1,490)
    - -New Jersey (1,460)
- Wages
  - Employment: 24,510
  - Mean Annual Wage: $53,140
- Fringe Benefits
  - US Median: $27,394

47-2031 Carpenters

Construct, erect, install, or repair structures and fixtures made of wood and comparable materials, such as concrete forms; building frameworks, including partitions, joists, studding, and rafters; and wood stairways, window and door frames, and hardwood floors. May also install cabinets, siding, drywall, and batt or roll insulation. Includes brattice builders who build doors or brattices (ventilation walls or partitions) in underground passageways.

- Career Opportunity
  - Industries with the highest levels of employment:
    - -Residential Building Construction (218,950)
    - -Building Finishing Contractors (123,630)
    - -Nonresidential Building Construction (118,290)
    - -Foundation, Structure, and Building Exterior Contractors (94,360)
    - -Other Specialty Trade Contractors (16,220)
  - States with the highest levels of employment:
    - -California (102,870)
    - -Florida (49,900)
    - -New York (47,740)
    - -Texas (34,970)
    - -Pennsylvania (29,270)
- Wages
  - Employment: 700,290
  - Mean Annual Wage: $60,970
- Fringe Benefits
  - US Median: $27,394

47-1011 First-Line Supervisors of Construction Trades and Extraction Workers
Directly supervise and coordinate activities of construction or extraction workers.

- Career Opportunity
  - Industries with the highest levels of employment:
    - -Building Equipment Contractors (136,450)
    - -Nonresidential Building Construction (101,430)
    - -Residential Building Construction (80,590)
    - -Foundation, Structure, and Building Exterior Contractors (78,900)
    - -Other Specialty Trade Contractors (57,720)
  - States with the highest levels of employment:
    - -Texas (86,650)
    - -California (72,120)
    - -Florida (61,880)
    - -North Carolina (32,840)
    - -New York (32,720)
- Wages
  - Employment: 777,420
  - Mean Annual Wage: $81,340
- Fringe Benefits
  - US Median: $27,394

47-2073 Operating Engineers and Other Construction Equipment Operators

Operate one or several types of power construction equipment, such as motor graders, bulldozers, scrapers, compressors, pumps, derricks, shovels, tractors, or front-end loaders to excavate, move, and grade earth, erect structures, or pour concrete or other hard surface pavement. May repair and maintain equipment in addition to other duties. Excludes "Extraction Workers" (47-5000) and "Crane and Tower Operators" (53-7021).

- Career Opportunity
  - Industries with the highest levels of employment:
    - -Other Specialty Trade Contractors (113,460)
    - -Local Government, excluding Schools and Hospitals (OEWS Designation) (63,420)
    - -Utility System Construction (58,910)
    - -Highway, Street, and Bridge Construction (55,430)
    - -Nonresidential Building Construction (16,650)
  - States with the highest levels of employment:
    - -Texas (49,120)
    - -California (32,690)
    - -Florida (27,540)
    - -Pennsylvania (21,210)
    - -North Carolina (15,510)
- Wages
  - Employment: 450,370
  - Mean Annual Wage: $62,180
- Fringe Benefits
  - US Median: $27,394

47-2111 Electricians

Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes. May install or service street lights, intercom systems, or electrical control systems. Excludes "Security and Fire Alarm Systems Installers" (49-2098).

- Career Opportunity
  - Industries with the highest levels of employment:
    - -Building Equipment Contractors ()
    - -Employment Services ()
    - -Local Government, excluding Schools and Hospitals (OEWS Designation) ()
    - -Nonresidential Building Construction ()
    - -Utility System Construction ()
  - States with the highest levels of employment:
    - -California (72,880)
    - -Texas (70,580)
    - -Florida (46,690)
    - -New York (40,670)
    - -Ohio (24,430)
- Wages
  - Employment: 712,580
  - Mean Annual Wage: $67,810
- Fringe Benefits
  - US Median: $27,394

47-4051 Highway Maintenance Workers

Maintain highways, municipal and rural roads, airport runways, and rights-of-way. Duties include patching broken or eroded pavement and repairing guard rails, highway markers, and snow fences. May also mow or clear brush from along road, or plow snow from roadway. Excludes "Tree Trimmers and Pruners" (37-3013).

- Career Opportunity
  - Industries with the highest levels of employment:
    - -Local Government, excluding Schools and Hospitals (OEWS Designation) (105,430)
    - -State Government, excluding Schools and Hospitals (OEWS Designation) (38,150)
    - -Highway, Street, and Bridge Construction (5,060)
    - -Other Support Services (340)
    - -Employment Services (320)
  - States with the highest levels of employment:
    - -New York (15,790)
    - -Pennsylvania (10,490)
    - -Illinois (10,220)
    - -California (7,320)
    - -Texas (7,090)
- Wages
  - Employment: 150,860
  - Mean Annual Wage: $62,180
- Fringe Benefits
  - US Median: $27,394

47-2051 Cement Masons and Concrete Finishers

Smooth and finish surfaces of poured concrete, such as floors, walks, sidewalks, roads, or curbs using a variety of hand and power tools. Align forms for sidewalks, curbs, or gutters; patch voids; and use saws to cut expansion joints. Installers of mortarless segmental concrete masonry wall units are classified in "Landscaping and Groundskeeping Workers" (37-3011).

- Career Opportunity
  - Industries with the highest levels of employment:
    - -Foundation, Structure, and Building Exterior Contractors (103,490)
    - -Other Specialty Trade Contractors (36,040)
    - -Highway, Street, and Bridge Construction (16,020)
    - -Nonresidential Building Construction (15,280)
    - -Residential Building Construction (7,530)
  - States with the highest levels of employment:
    - -California (28,890)
    - -Texas (20,900)
    - -Florida (15,680)
    - -New York (9,460)
    - -Arizona (7,270)
- Wages
  - Employment: 203,560
  - Mean Annual Wage: $57,410
- Fringe Benefits
  - US Median: $27,394

47-2152 Plumbers, Pipefitters, and Steamfitters
Assemble, install, alter, and repair pipelines or pipe systems that carry water, steam, air, or other liquids or gases. May install heating and cooling equipment and mechanical control systems. Includes sprinkler fitters.

- Career Opportunity
  - Industries with the highest levels of employment:
    - -Building Equipment Contractors ()
    - -Utility System Construction ()
    - -Local Government, excluding Schools and Hospitals (OEWS Designation) ()
    - -Nonresidential Building Construction ()
    - -Employment Services ()
  - States with the highest levels of employment:
    - -California (42,480)
    - -Texas (41,890)
    - -Florida (28,750)
    - -New York (24,440)
    - -Illinois (16,940)
- Wages
  - Employment: 436,160
  - Mean Annual Wage: $67,840
- Fringe Benefits
  - US Median: $27,394

IX. Glossary

Bb

Battery Energy Storage Systems (BESS)

An array of hundreds or thousands of small batteries that enable energy from renewables, like solar and wind, to be stored and released at a later time.

Cc

Consumer Price Index (CPI)

An index of the changes in the cost of goods and services to a typical consumer, based on the costs of the same goods and services at a base period.

Dd

Direct impacts

During the construction period: the changes that occur in the onsite construction industries in which the direct final demand change is made.

During operating years: the final demand changes that occur in the onsite spending for the solar operations and maintenance workers.

Ee

Equalized Assessed Value (EAV)

The product of the assessed value of property and the state equalization factor. This is typically used as the basis for the value of property in a property tax calculation.

Ff

Farming profit

The difference between total revenue (price multiplied by yield) and total cost regarding farmland.

Full-time equivalent (FTE)

A unit that indicates the workload of an employed person. One FTE is equivalent to one worker working 2,080 hours in a year. One half FTE is equivalent to a half-time worker or someone working 1,040 hours in a year.

Hh

HV line extension

High-voltage electric power transmission links used to connect generators to the electric transmission grid.

Ii

IMPLAN (IMpact analysis for PLANning)

A business who is the leading provider of economic impact data and analytic applications. IMPLAN data is collected at the federal, state, and local levels and used to create state-specific and county-specific industry multipliers.

Indirect impacts

Impacts that occur in industries that make up the supply chain for that industry.

During the construction period: the changes in inter-industry purchases resulting from the direct final demand changes, including construction spending on materials and equipment and other purchases of good and offsite services.

During operating years: the changes in inter-industry purchases resulting from the direct final demand changes.

Induced impacts

The changes that occur in household spending as household income increases or decreases as a result of the direct and indirect effects of final demand changes.

Inflation

A persistent rise in the general level of prices related to an increase in the volume of money and resulting in the loss of value of currency. Inflation is typically measured by the CPI.

Mm

Median Household Income (MHI)

The income amount that divides a population into two equal groups, half having an income above that amount, and half having an income below that amount.

Millage rate

The tax rate, as for property, assessed in mills per dollar.

Multiplier

A factor of proportionality that measures how much a variable changes in response to a change in another variable.

MW

A unit of power, equal to one million watts or one thousand kilowatts.

MWac (megawatt alternating current)

The power capacity of a utility-scale solar PV system after its direct current output has been fed through an inverter to create an alternating current (AC). A solar system's rated MWac will always be lower than its rated MWdc due to inverter losses. AC is the form in which electric energy is delivered to businesses and residences and that consumers typically use when plugging electric appliances into a wall socket.

MWdc (megawatt direct current)

The power capacity of a utility-scale solar PV system before its direct current output has been fed through an inverter to create an alternating current. A solar system's rated MWdc will always be higher than its rated MWac.

Nn

Net economic impact

Total change in economic activity in a specific region, caused by a specific economic event.

Net Present Value (NPV)

Cash flow determined by calculating the costs and benefits for each period of investment.

National Renewable Energy Laboratory's (NREL) Jobs and Economic Development Impacts (JEDI) Model

An input-output model that measures the spending patterns and location-specific economic structures that reflect expenditures supporting varying levels of employment, income, and output.

Oo

Output

Economic output measures the value of goods and services produced in a given area. Gross Domestic Product is the economic output of the United States as a whole.

Pp

PV (photovoltaic) system

Solar modules, each comprising a number of solar cells, which generate electrical power.

Rr

Real Gross Domestic Product (GDP)

A measure of the value of goods and services produced in an area and adjusted for inflation over time.

Real-options analysis

A model used to look at the critical factors affecting the decision to lease agricultural land to a company installing a solar powered electric generating facility.

Ss

Stochastic

To have some randomness.

Tt

Tax rate

The percentage (or millage) of the value of a property to be paid as a tax.

Total economic output

The quantity of goods or services produced in a given time period by a firm, industry, county, or country.

Uu

Utility-scale solar

Solar powered-electric generation facilities intended for wholesale distribution typically over 5MW in capacity.

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Education

Doctor of Philosophy, Economics, Temple University, Philadelphia, Pennsylvania, May 1995.

Bachelor of Arts, Mathematics and Honors Economics, Temple University, Magna Cum Laude, May 1985.

Experience

2011-present Strategic Economic Research, LLC
President

- Performed economic impact analyses on policy initiatives and energy projects such as wind energy, solar energy, natural gas plants and transmission lines at the county and state level
- Provided expert testimony before state legislative bodies, state public utility commissions, and county boards
- Wrote telecommunications policy impact report comparing Illinois to other Midwestern states

1996-2023 Illinois State University, Normal, IL
Professor Emeritus – Department of Economics (2023 - present)
Full Professor – Department of Economics (2010-2023)
Associate Professor - Department of Economics (2002-2009)
Assistant Professor - Department of Economics (1996-2002)

- Taught Regulatory Economics, Telecommunications Economics and Public Policy, Industrial Organization and Pricing, Individual and Social Choice, Economics of Energy and Public Policy and a Graduate Seminar Course in Electricity, Natural Gas and Telecommunications Issues
- Supervised as many as 5 graduate students in research projects each semester
- Served on numerous departmental committees

1997-2023 Institute for Regulatory Policy Studies, Normal, IL
Executive Director (2005-2023)
Co-Director (1997-2005)

- Grew contributing membership from 5 companies to 16 organizations
- Doubled the number of workshop/training events annually
- Supervised 2 Directors, Administrative Staff and internship program
- Developed and implemented state-level workshops concerning regulatory issues related to the electric, natural gas, and telecommunications industries

2006-2018 Illinois Wind Working Group, Normal, IL
Director

- Founded the organization and grew the organizing committee to over 200 key wind stakeholders
- Organized annual wind energy conference with over 400 attendees
- Organized strategic conferences to address critical wind energy issues
- Initiated monthly conference calls to stakeholders
- Devised organizational structure and bylaws

2007-2018 Center for Renewable Energy, Normal, IL
Director

- Created founding document approved by the Illinois State University Board of Trustees and Illinois Board of Higher Education
- Secured over $150,000 in funding from private companies
- Hired and supervised 4 professional staff members and supervised 3 faculty members as Associate Directors
- Reviewed renewable energy manufacturing grant applications for Illinois Department of Commerce and Economic Opportunity for a $30 million program
- Created technical "Due Diligence" documents for the Illinois Finance Authority loan program for wind farm projects in Illinois
- Published 40 articles in leading journals such as AIMS Energy, Renewable Energy, National Renewable Energy Laboratory Technical Report, Electricity Journal, Energy Economics, Energy Policy, and many others
- Testified over 80 times in formal proceedings regarding wind, solar and transmission projects
- Raised over $7.7 million in grants
- Raised over $2.7 million in external funding

Bryan A. Loomis
Strategic Economic Research, LLC
Vice President

Education

Master of Business Administration (M.B.A.), Marketing and Healthcare, Belmont University, Nashville, Tennessee, 2017.

Experience

2019-present Strategic Economic Research, LLC, Bloomington, IL
Vice President
(2021-present)
Property Tax Analysis and Land Use Director
(2019-2021)

- Directed the property tax analysis by training other associates on the methodology and overseeing the process for over twenty states
- Improved the property tax analysis methodology by researching various state taxing laws and implementing depreciation, taxing jurisdiction millage rates, and other factors into the tax analysis tool
- Executed land use analyses by running Monte Carlo simulations of expected future profits from farming and comparing that to the solar lease
- Performed economic impact modeling using JEDI and IMPLAN tools
- Improved workflow processes by capturing all tasks associated with economic modeling and report-writing, and created automated templates in Asana workplace management software

2019-2021 Viral Healthcare Founders LLC, Nashville, TN
CEO and Founder

- Founded and directed marketing agency for healthcare startups
- Managed three employees
- Mentored and worked with over 30 startups to help them grow their businesses
- Grew an email list to more than 2,000 and LinkedIn following to 3,500
- Created a Slack community and grew to 450 members
- Created weekly video content for distribution on Slack, LinkedIn and Email

Christopher Thankan
Strategic Economic Research, LLC
Director of Economic Analysis

Education

Bachelor of Science in Sustainable & Renewable Energy (B.S.), Minor in Economics, Illinois State University, Normal, IL, 2021

Experience

2021-present Strategic Economic Research, LLC, Bloomington, IL
Economic Analyst

- Create economic impact results on numerous renewable energy projects Feb 2021-Present
- Utilize IMPLAN multipliers along with NREL's JEDI model for analyses
- Review project cost Excel sheets
- Conduct property tax analysis for different US states
- Research taxation in states outside research portfolio
- Complete ad hoc research requests given by the president
- Hosted a webinar on how to run successful permitting hearings
- Research school funding and the impact of renewable energy on state aid to school districts
- Quality check coworkers JEDI models
- Started more accurate methodology for determining property taxes that became the main process used

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