

JULY 2020  
**REPORT**

# THE ECONOMIC BENEFITS OF COLORADO'S EASTERN PLAINS RENEWABLE ENERGY INDUSTRY

PREPARED FOR:

**Action22**<sup>inc.</sup>  
*Giving voice to Southern Colorado*



THE WESTERN WAY

PREPARED BY:


**PRO15**  
NORTHEAST COLORADO

  
Development  
Research Partners





# TABLE OF CONTENTS



|  |    |
|--|----|
| EXECUTIVE SUMMARY . . . . .                                | 3  |
| INTRODUCTION . . . . .                                     | 6  |
| STATEMENT ON COVID-19 . . . . .                            | 7  |
| GEOGRAPHIC DEFINITION . . . . .                            | 7  |
| METHODOLOGY . . . . .                                      | 7  |
| REPORT ORGANIZATION . . . . .                              | 10 |
| RENEWABLE AND ADVANCED ENERGY EMPLOYMENT . . . . .         | 11 |
| RENEWABLE FACILITIES IN THE EASTERN PLAINS . . . . .       | 13 |
| WIND & SOLAR PROJECTS . . . . .                            | 13 |
| PROPERTY TAX . . . . .                                     | 14 |
| AVERAGE LEASE PAYMENTS . . . . .                           | 15 |
| ECONOMIC BENEFITS OF RENEWABLE FACILITIES. . . . .         | 16 |
| ECONOMIC BENEFITS OF CONSTRUCTION AND INVESTMENT . . . . . | 16 |
| ECONOMIC BENEFITS OF ANNUAL OPERATIONS BY 2024 . . . . .   | 19 |
| APPENDIX A: PROPERTY TAX REVENUE BY PROJECT . . . . .      | 21 |
| APPENDIX B: PROPERTY TAX REVENUE BY COUNTY . . . . .       | 27 |

# EXECUTIVE SUMMARY

---

Electricity generation and consumption has changed rapidly over the last ten years, driven by steep price drops for generation and technological innovations impacting utilities and consumers alike. After decades of research and development, market development, and production efficiency gains, renewable energy is now a proven and cost-effective way to deliver electricity across the country.

There is concern that the COVID-19 pandemic could negatively impact current and planned renewable energy facility investments and construction. Indeed, the pandemic is creating challenges to both supply and demand. While the risk to current and planned projects from the pandemic is unclear at this time, existing facilities should not be affected. The expectation is that these facilities will continue to provide a steady source of jobs and tax revenue to communities across the eastern plains. These benefits will prove valuable to communities as the pandemic takes a toll on many other sectors including leisure and hospitality, retail, and health care.

For Colorado's eastern plains communities, renewable energy and advanced energy technologies have brought thousands of jobs, and investment has supported communities across the region. The intent of this study is to profile the renewable energy industry in Colorado's eastern plains and measure the economic benefits it provides in terms of construction, investment, employment, and business activity. For the economic benefits estimates, the study not only details construction and operations for the region's existing renewable facilities but offers a prospective look at the benefits realized by 2024. The following bullets highlight key findings and estimates of the size and growth of these benefits.



In 2018, Colorado's eastern plains comprised **95.5 percent of the renewable energy capacity in the state** and represented all the state's wind energy and about 55 percent of the state's solar capacity.



Renewable energy capacity has expanded rapidly in Colorado's eastern plains. In 2010, there was 1,253 MW of nameplate capacity in nine wind facilities in Colorado's eastern plains. By the end of 2020, another 3,707 MW of wind and solar capacity is expected to be operable in the eastern plains. By 2024, the eastern plains' renewable capacity is expected to expand by more than 22 percent, adding 1,109 MW and bringing **the region's wind and solar capacity to 6,069 MW**.



By 2024, the state is expected to add its largest solar facilities and first utility-scale battery storage components with the construction of the 250-MW Neptune solar plant and the 200-MW Thunder Wolf solar plant.



## RENEWABLE AND ADVANCED ENERGY EMPLOYMENT



From 2015 to 2019, renewable and advanced energy employment increased by more than 40 percent in Colorado's eastern plains, growing to an estimated **6,334 workers in 366 business establishments**.



Wind is critical to the eastern plains' employment base, combined with wind facility installation, operations, and maintenance, wind technologies employ about 70 percent of renewable and advanced energy workers on the eastern plains.



Since 2015, job opportunities for **solar installation have increased significantly in the eastern plains. Solar installation jobs have risen from an estimated 42 jobs in 2015 to 151 jobs in 2019.**

## ECONOMIC BENEFITS OF CONSTRUCTION AND INVESTMENT



Renewable energy development on Colorado's eastern plains has brought significant investment to the state. From 2000 to 2024, there will have been an estimated **\$9.4 billion in construction and investment activity** in the eastern plains. By 2024, investment will have increased by 75 percent since 2016.



Although many purchases for renewable energy facilities are made out-of-state, Colorado has benefited from local spending on equipment, construction materials, design, project management, planning, and local workers. As a result, the direct economic benefit in Colorado of **construction and investment in the eastern plains' renewable facilities will total an estimated \$2.7 billion from 2000 to 2024.**



By 2024, thousands of Coloradans will have benefited from work supported by renewable energy investments. An estimated **3,158 state workers will be directly employed** in the construction of the facilities from 2000 to 2024. In addition, components for a handful of the eastern plains' wind facilities have either been manufactured or will be manufactured at Vestas plants in the state. These purchases will directly employ another 2,386 workers by 2024.



**\$5.9B**

Beyond direct output and employment, renewable facility construction and investment has supported many ancillary industries throughout the eastern plains since 2000. Combined, **the total direct and indirect benefits of renewable energy development in Colorado's eastern plains will be an estimated \$5.9 billion in total output** (\$2.7 billion direct output + \$3.1 billion indirect and induced output) produced by 12,819 employees (5,544 direct employees + 7,275 indirect employees) earning a total of about \$706.9 million (\$355.6 million direct earnings + \$351.3 million indirect earnings) from 2000 to 2024.



## ECONOMIC BENEFITS OF ANNUAL OPERATIONS BY 2024



The ongoing operations and maintenance of renewable facilities on Colorado’s eastern plains support long-term employment opportunities for hundreds of people in the state. By 2024, renewable facilities will support the direct employment of an estimated 352 workers.



By 2024, wind energy facilities will provide farmers, ranchers, and other landowners on Colorado’s eastern plains with **\$15.2 million in annual lease payments**, up from an estimated \$7.5 million in 2016.



**\$23.1M** Renewable energy projects will contribute an estimated **\$23.1 million in annual property tax revenue** throughout districts in the eastern plains by 2024, up from an estimated \$7.2 million in 2016.



Therefore, the total direct and indirect benefits in Colorado of **annual renewable energy operations in the eastern plains will be an estimated \$388.6 million in total output** (\$214.6 million direct output + \$174 million indirect and induced output) produced by 1,089 employees (352 direct employees + 737 indirect employees) earning a total of about \$56.7 million (\$21.9 million direct earnings + \$34.8 million indirect earnings) by 2024.



These benefits are likely to occur annually assuming similar business conditions and project parameters.

**SUMMARY OF THE ECONOMIC BENEFIT OF EASTERN PLAINS RENEWABLE ENERGY FACILITIES IN COLORADO**

|   | Direct Impact | Indirect & Induced Impact | Total Impact |
|---|---------------|---------------------------|--------------|
| <b>Construction Activity (2000 to 2024)</b>     |               |                           |              |
| Value of Output (\$M)                           | \$2,749.7     | \$3,102.0                 | \$5,851.7    |
| Earnings (\$M)                                  | \$355.6       | \$351.3                   | \$706.9      |
| Employment                                      | 5,544         | 7,275                     | 12,819       |
| <b>Annual Operations and Maintenance (2024)</b> |               |                           |              |
| Value of Output (\$M)                           | \$214.6       | \$174.0                   | \$388.6      |
| Earnings (\$M)                                  | \$21.9        | \$34.8                    | \$56.7       |
| Employment                                      | 352           | 737                       | 1,089        |

# INTRODUCTION

---

Electricity generation and consumption has changed rapidly over the last ten years, driven by steep price drops for generation and technological innovations impacting utilities and consumers alike. After decades of research and development, market development, and production efficiency gains, renewable energy is now a proven and cost-effective way to deliver electricity across the country. Renewable energy is a rapidly expanding part of the nation's energy portfolio, due in large part to state and local policies and technological advances such as battery storage development. Colorado is among the nation's renewable energy leaders, generating 19.8 percent of its electricity from non-hydroelectric renewable sources in 2018 and ranking 13th among the states<sup>1</sup>. Colorado's portfolio of renewable resources is set to expand considerably by 2024 as the state's energy providers make significant investments in renewables, including Xcel Energy and Tri-State Generation and Transmission. For instance, Xcel Energy has committed to aggressive carbon reduction goals, proposing it will reduce its carbon emissions 80 percent by 2030. Renewable energy technologies will be a critical part of meeting this deadline. Tri-State Generation and Transmission has announced that by 2024, 50 percent of the energy consumed by its members will come from renewable resources.

The cost of renewable energy has declined significantly over the past 10 years, enhancing its viability and boosting investment activity. Since 2009, the average unsubsidized levelized cost of utility-scale wind energy in the United States fell by nearly 70 percent and the cost of crystalline solar photovoltaic fell by 89 percent<sup>2</sup>. Indeed, in many areas of the United States the cost of wind and solar PV plants has fallen below many forms of traditional energy sources such as natural gas combined cycle, coal, and nuclear. Further, vast improvements and cost reductions in battery storage technologies promise increasing adoption in conjunction with solar PV projects. Battery storage mitigates many of the limitations of renewable energy including intermittency and variability. The cost of storage has fallen by 50 percent over the past two years<sup>3</sup>. In addition, renewable and advanced energy sectors across the nation have expanded and added thousands of workers.

For Colorado's eastern plains communities, renewable energy and advanced energy technologies have brought thousands of jobs from installation and maintenance to turbine component manufacturing. Renewable energy investment has supported schools, health districts, and other entities with long-term sources of property tax revenue. In addition, many facilities lease land from local farmers and landowners, providing a valuable source of income. The intent of this study is to profile the renewable energy industry in Colorado's eastern plains and measure the economic benefits it provides in terms of construction, investment, employment, and business activity. For the economic benefits estimates, the study not only details construction and operations for the region's existing renewable facilities but offers a prospective look at the benefits realized by 2024. This study provides an update to a prior study conducted for Pro 15 in 2016 entitled "The Benefits of the Renewable Energy Industry in Eastern Colorado."



# INTRODUCTION CONTINUED

---

## STATEMENT ON COVID-19

There is concern that the COVID-19 pandemic could negatively impact current and planned renewable energy facility investments and construction. The pandemic is creating challenges to both supply and demand. One key issue is timing for claiming federal production tax credits (PTC) and investment tax credits (ITC). Renewable developers were concerned that potential project delays related to the pandemic would disqualify them from claiming these credits. Fortunately, the Internal Revenue Service issued guidance on May 28, 2020 that granted safe harbor deadline extensions for both the PTC and ITC. For wind projects using the PTC, the IRS guidance allows for a one-year safe harbor until 2021 for 2016 and 2017 projects that were impacted by COVID-19 disruptions. For solar projects, the IRS guidance clarified what is known as the three- and one-half month rule to prevent COVID-19 related supply chain slowdowns from impacting when the ITC can be claimed<sup>4</sup>.

While the risk to current and planned projects from the pandemic is unclear at this time, existing facilities should not be affected. The expectation is that these facilities will continue to provide a steady source of jobs and tax revenue to communities across the eastern plains. These benefits will prove valuable to communities as the pandemic takes a toll on many other sectors including leisure and hospitality, retail, and health care.

## GEOGRAPHIC DEFINITION

This report summarizes renewables and advanced energy employment and the benefits of renewable facilities located in Colorado's eastern plains. For the purposes of the report, the eastern plains is defined as those counties in eastern Colorado with utility-scale renewable energy facilities. Utility-scale facilities are defined according to the U.S. Department of Energy's Office of Energy Efficiency & Renewable Energy as those 10 megawatts or larger and generally associated with regulated electric utilities or independent power producers whose primary industry is electric power generation, transmission, and distribution. The eastern plains counties in this analysis are eastern Arapahoe, Baca, Bent, Cheyenne, Elbert, El Paso, Huerfano, Kit Carson, Las Animas, Lincoln, Logan, Prowers, Pueblo, Washington, and Weld counties.

Additionally, this study utilizes economic multipliers from the U.S. Bureau of Economic Analysis Regional Input-Output Modeling System II (RIMS II). Economic multipliers are geographic specific and estimate a broader level of economic activity than the initial dollars spent for construction, capital, business purchases, and employee compensation. This study estimates the multiplier benefits for the state of Colorado.

## METHODOLOGY

### EMPLOYMENT ESTIMATES

This report utilizes a variety of data sources and methods to estimate renewables and advanced energy employment in the eastern plains and the benefits of its renewable energy facilities. Estimates of employment in the eastern plains were developed using an industry cluster approach. Industry clusters

## INTRODUCTION CONTINUED

---

are geographic concentrations of interconnected companies and institutions in a particular field. Industry clusters may consist of industries that share the same or similar workforce, factors of production, or infrastructure. Clusters may also be defined by the production of similar outputs, complementary outputs, or other interdependent relationships. Ideally, clusters also include the institutions and professional organizations that provide research assistance and support the cluster industries.

The cluster of industries that supports renewable and advanced energy in Colorado includes companies that produce and conserve energy using wind, solar, biomass, fuel cells, hydroelectric resources, and green transportation technologies. The cluster also includes companies that manufacture renewable energy equipment, storage, and power transformers, and businesses that provide engineering and other support services. Lastly, the cluster includes energy research companies that provide laboratory testing, scientific and technical consulting services, and institutional research related to the environment, natural resources, and energy. This cluster is herein referred to as renewable and advanced energy and is based on the Metro Denver Economic Development Corporation's (Metro Denver EDC) subcluster definitions for the renewable resources, intellectual resources, and power generation and distribution components of its Energy and Natural Resources industry cluster. These subclusters contain 29, six-digit North American Industry Classification System (NAICS) codes that comprise renewable and advanced energy. These codes are used in conjunction with Dun & Bradstreet's (D&B) Hoovers database and Market Analysis Profile to establish baseline employment by county. The data was supplemented with Quarterly Census of Employment and Wages (QCEW) data from the U.S. Department of Labor, Bureau of Labor Statistics and primary data research to arrive at final employment estimates.

### ECONOMIC IMPACT ANALYSIS DEFINED

Economic impact analysis is the analytical approach used to assess the measurable direct and indirect benefits resulting from a project over a specific time period. Only those benefits that can be measured or quantified are included. Intangible benefits, such as enhancement of community character or diversification of the job base, are not included. The economic benefits are calculated within the framework of two categories of impacts and activities, which are construction and on-going operations.

Further, the economic impact is divided into direct and indirect impacts. The direct impacts include the direct spending for construction of a renewable facility and the direct spending for the on-going operations of the facility, including employee spending. The impact of constructing utility-scale renewable energy facilities has large but temporary impacts on the affected communities during the construction period. The construction impacts include the purchase of construction materials, construction worker earnings and resulting expenditures, and the tax implications of these purchases. The on-going operations and maintenance of the facilities have an annual impact on the affected communities over the life of the project. The on-going operations impacts include annual purchases of operational materials, replacement capital purchases, land-owner payments, employment and earnings, and the tax implications of these annual expenditures. The direct economic benefits of the facilities were estimated using the Jobs and Economic Development Impacts (JEDI) models developed by the National Renewable Energy Laboratory (NREL) and NREL's solar photovoltaic and battery storage





## INTRODUCTION CONTINUED

cost benchmark reports.<sup>5</sup> The analysis also references economic benefits estimated by NREL for the Rush Creek Wind Farm.<sup>6</sup>

The economic impact does not stop with the direct impacts as the spending patterns associated with a renewable energy facility and its employees have multiplicative impacts on the region. Therefore, multiplier analysis is used to trace the impacts on businesses, organizations, and individuals affected by the facilities as this impact works its way through the economy. The indirect and induced jobs and income flows generated are estimated using the RIMS II multipliers as noted above. This is the standard methodology for conducting multiplier analysis. The total economic benefits will be discussed in terms of the direct and indirect values of gross output, payroll or earnings, and employment in Colorado.

Three types of economic benefits are derived from the RIMS II multipliers. First, the direct and indirect impact of the renewable energy facilities on the gross output of the region is estimated. This is the total value produced by local firms and residents resulting from the value of the output produced by an industry directly. Gross output consists of the value of both intermediate goods and final products, so this is a larger value than gross domestic product (GDP). Second, the total direct and indirect employment needed in the region to produce this level of output is determined. These employees may be full-time or part-time, local or non-local workers. Further, the indirect employment supported might represent fractions of jobs, added to reflect whole positions. Third, the analysis presents an estimate for the typical direct and indirect earnings associated with this level of production.

The benefits are detailed not only for the region's existing facilities but also the potential benefits that could be realized in Colorado by 2024 of proposed facilities, assuming that they move forward as planned. The estimates assume that proposed projects move ahead as planned. Any delay or cancellation of the projects included in the analysis will alter the estimated benefits.

### PROJECT PARAMETERS AND STUDY VARIABLES

Development Research Partners utilized several sources of data for this report including company announcements, Colorado Division of Property Taxation, Colorado Department of Labor and Employment, local assessor's offices, Dun & Bradstreet, the NREL, and the U.S. Bureau of Economic Analysis. Development Research Partners made every attempt to collect the necessary information and believe the information

## INTRODUCTION CONTINUED

---

used in this report is from sources deemed reliable but is not guaranteed. Some numbers in the study may not add exactly due to rounding. This analysis estimates the economic and fiscal benefits in nominal dollars.

### REPORT ORGANIZATION

This study is organized in three sections. The first section estimates renewable and advanced energy employment and businesses in the eastern plains counties. These companies include energy producers as well as manufacturers, research and consulting companies, and environmental and renewable energy regulatory agencies. The second section describes the region's wind and solar facilities. This section also details estimated property tax revenues generated by the projects for local tax districts and landowners lease payments. The last section estimates the economic benefits that initial investment in renewable energy facilities brought to eastern Colorado and estimates the on-going annual benefits the facilities provide to the local economy. The study is followed by two appendices detailing the property tax revenue benefits of the renewable energy facilities to individual taxing districts.



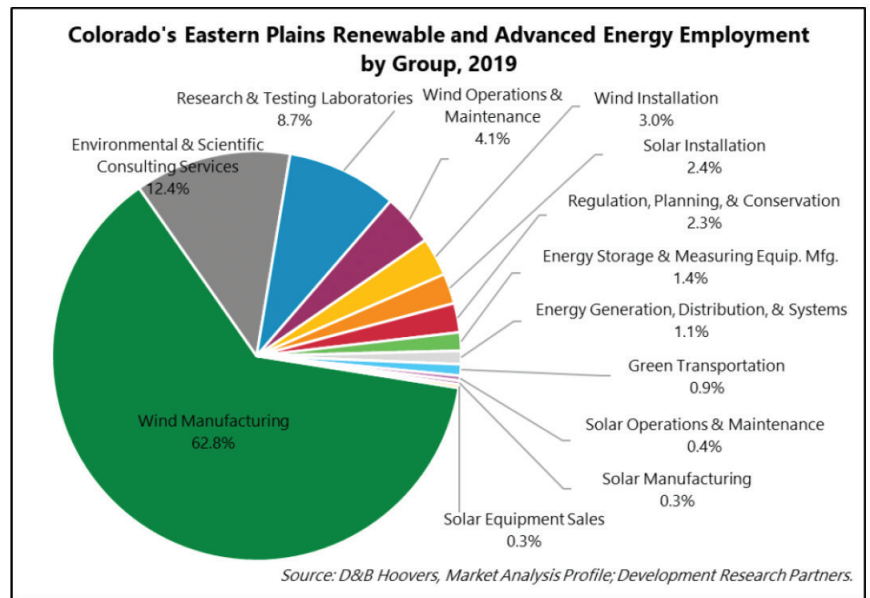


# RENEWABLE AND ADVANCED ENERGY EMPLOYMENT

## RENEWABLE AND ADVANCED ENERGY EMPLOYMENT

In 2019, Colorado's eastern plains' renewable and advanced energy industry groups employed an estimated 6,334 workers in 366 business establishments. As of 2018, all the state's utility-scale wind facilities and about 55 percent of Colorado's solar capacity were located in Colorado's eastern plains. The installation, operation, and maintenance of these facilities supports hundreds of jobs in these largely rural counties. Further, the region is home to Vestas manufacturing facilities and other advanced energy industries that employ thousands more. Since 2015, renewable and advanced energy employment has increased by more than 40 percent in Colorado's eastern plains.<sup>7</sup> Renewable and advanced energy jobs are set to expand significantly over the next few years as several large renewable facilities begin construction and operations.

Vestas is one of the largest employers in Weld and Pueblo counties, manufacturing a full range of wind turbine components including towers, blades, and nacelles. The presence of Vestas contributes to wind manufacturing's large share of the eastern plains' renewable and advanced energy employment base, an estimated 63 percent in 2019. Combined with wind facility installation, operations, and maintenance, wind technologies employ about 70 percent of renewable and advanced energy workers in the eastern plains.



Solar panel installation has been one of the fastest growing occupations in the nation and is projected to grow by 63 percent from 2018 to 2028. Since 2015, job opportunities for solar installation have increased significantly in the eastern plains with projects such as the 30-MW San Isabel solar facility in Las Animas County, the 50-MW Titan solar facility in Arapahoe County, and the 35-MW Grazing Yak solar project in El Paso County. Solar installation jobs have risen from an estimated 42 jobs in 2015 to 151 jobs in 2019. While solar installation, operations, and maintenance jobs comprise just over 3 percent of the renewable and advanced energy employment base in the eastern plains, the share is set to grow as 590 MWs of capacity are added in the state by 2024.

IN 2019, RENEWABLE AND ADVANCED ENERGY INDUSTRIES ON COLORADO'S EASTERN PLAINS **EMPLOYED MORE THAN 6,300 WORKERS** IN 366 BUSINESS ESTABLISHMENTS.

The second-largest group of renewable and advanced energy workers in the eastern plains are employed in environmental and scientific consulting services and research and testing laboratories. These are generally small companies that support the sector through inspection services, consulting, and other services. As shown in Table 1, environmental and scientific consulting services employ 12.4 percent of the employment base and research and testing laboratories employ about 8.7 percent. As shown in Table 2, more than 91 percent of the renewable and advanced energy workforce is employed in El Paso, Pueblo, and Weld counties. Employment in these counties is not only boosted by Vestas' operations, these counties also have the largest population centers of the eastern plains counties and therefore the largest pools of service workers and support jobs. Employment in the other counties is largely driven by wind and solar facility construction and operations.

**TABLE 1: COLORADO'S EASTERN PLAINS RENEWABLE AND ADVANCED ENERGY EMPLOYMENT BY INDUSTRY GROUP, 2019**

| Industry Group                                 | Establishments | Employment   |
|--|----------------|--------------|
| Wind Installation                              | 4              | 192          |
| Wind Manufacturing                             | 3              | 3,976        |
| Wind Operations & Maintenance*                 | 26             | 258          |
| Solar Installation                             | 15             | 151          |
| Solar Manufacturing                            | 1              | 19           |
| Solar Operations & Maintenance*                | 7              | 25           |
| Solar Equipment Sales                          | 2              | 17           |
| Energy Storage & Measuring Equip. Mfg.         | 10             | 91           |
| Green Transportation                           | 1              | 56           |
| Energy Generation, Distribution, & Systems     | 6              | 67           |
| Research & Testing Laboratories                | 117            | 553          |
| Environmental & Scientific Consulting Services | 169            | 783          |
| Regulation, Planning, & Conservation           | 5              | 146          |
| <b>Total</b>                                   | <b>366</b>     | <b>6,334</b> |

Source: D&B Hoovers, Market Analysis Profile; Development Research Partners  
 \*Wind and solar O&M includes estimates for installed capacity as of year-end 2020.

**TABLE 2: RENEWABLE AND ADVANCED ENERGY EMPLOYMENT BY COUNTY, 2019**

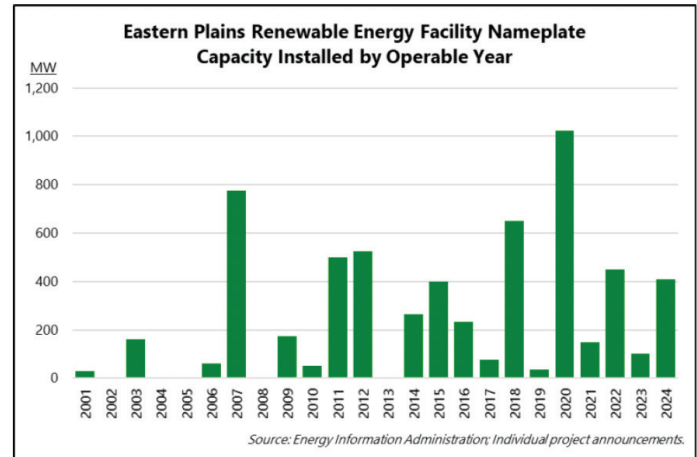
| County       | Establishments | Employment   |
|--------------|----------------|--------------|
| Arapahoe     | 1              | 4            |
| Baca         | 1              | 4            |
| Bent         | 1              | 5            |
| Cheyenne     | 5              | 95           |
| Elbert       | 6              | 53           |
| El Paso      | 194            | 1,132        |
| Huerfano     | 8              | 49           |
| Kit Carson   | 7              | 145          |
| Las Animas   | 8              | 31           |
| Lincoln      | 5              | 33           |
| Logan        | 11             | 118          |
| Prowers      | 4              | 23           |
| Pueblo       | 26             | 1,293        |
| Washington   | 0              | 0            |
| Weld         | 89             | 3,349        |
| <b>Total</b> | <b>366</b>     | <b>6,334</b> |

Source: D&B Hoovers, Market Analysis Profile; Development Research Partners. Note: includes wind and solar O&M estimates for installed capacity as of year-end 2020.

# RENEWABLE FACILITIES IN THE EASTERN PLAINS

## WIND AND SOLAR PROJECTS

The first utility-scale wind project to come online in eastern Colorado was the Ridge Crest wind farm in 2000, developed by Terra-Gen. Ridge Crest had a nameplate capacity of about 30 MW and its power was purchased under a long-term agreement with Xcel Energy. As Colorado adopted a renewable energy portfolio standard and encouraged renewable development with tax credits and incentives, wind development quickly increased throughout the decade. By 2010, there was 1,253 MW of



nameplate capacity in nine wind facilities on Colorado’s eastern plains. As technology progressed, supply chains were established and the cost of renewable plants rapidly decreased, causing the state’s renewable capacity to more than triple. By the end of 2020, another 3,707 MW of wind and solar capacity is expected to be operable on the eastern plains. This includes Colorado’s largest solar facility to date, the 120-MW Comanche solar project in Pueblo County. In 2018, the most recent year of data available for operable plants across the entire state, the eastern plains were home to about 55 percent of the state’s solar capacity. Note that proposed and planned facilities by 2024 were only established for the eastern plains and not for the entire state.

By 2024, the eastern plains’ renewable capacity is expected to expand by more than 22 percent, adding 1,109 MW and bringing the region’s capacity to 6,069 MW. The projects will include the Arriba, Mountain Breeze, and Niyol wind projects. Further, the state’s largest solar facilities will be added with the construction of the 250-MW Neptune solar plant and the 200-MW Thunder Wolf solar plant. These projects are expected to include the state’s first battery storage components, improving the reliability of the power source and its viability to meet capacity needs in the state.

Based on estimated assessed valuations for each project, five counties will comprise about two-thirds of the renewable energy in the eastern plains by 2024: Kit Carson (16 percent); Lincoln (14 percent); Logan (13 percent); Pueblo (12 percent); and Weld (11 percent) counties. Independent power producers often form limited-liability companies for each renewable energy project. The eastern plains’ renewable facilities are subsidiaries of companies that include Alliance Power, Avangrid Renewables, BP Energy, EDF Renewable Services, EDP Renewables, Iberdrola, Invenergy, Juwi Americas, Leeward Renewables, NextEra Energy, NGC Partners, Novatus Energy, and Tradewind Energy. Some of the facilities are owned and operated by the state’s utilities including Black Hills Energy, Colorado Springs Utilities, and Xcel Energy.

**IN 2018, COLORADO’S EASTERN PLAINS COMPRISED 95.5 PERCENT OF THE RENEWABLE ENERGY CAPACITY IN THE STATE.**



**TABLE 3: EASTERN COLORADO RENEWABLE ENERGY GENERATION FACILITIES**

| Project                   | Source                     | Owner                              | County                      | Nameplate Capacity | Operable Year |
|---------------------------|----------------------------|------------------------------------|-----------------------------|--------------------|---------------|
| Ridge Crest               | Wind                       | EDF Renewable Services Inc         | Logan                       | 29.7               | 2001          |
| Colorado Green            | Wind                       | Avangrid Renewables LLC            | Prowers                     | 162                | 2003          |
| Spring Canyon             | Wind                       | Invenergy Services LLC             | Logan                       | 60                 | 2006          |
| Cedar Creek               | Wind                       | Leeward Asset Management, LLC      | Weld                        | 300.5              | 2007          |
| Logan                     | Wind                       | Logan Wind Energy LLC              | Logan                       | 201                | 2007          |
| Peetz Table               | Wind                       | FPL Peetz Table Wind Energy        | Logan                       | 199.5              | 2007          |
| Twin Buttes               | Wind                       | Avangrid Renewables LLC            | Bent                        | 75                 | 2007          |
| Northern Colorado         | Wind                       | Northern Colorado Wind LLC         | Logan                       | 174.3              | 2009          |
| Kit Carson                | Wind                       | Kit Carson Windpower LLC           | Kit Carson                  | 51                 | 2010          |
| Cedar Creek II            | Wind                       | AE Power Services LLC              | Weld                        | 248.3              | 2011          |
| Cedar Point               | Wind                       | Cedar Point LLC                    | Arapahoe, Elbert, Lincoln   | 252                | 2011          |
| Busch Ranch               | Wind                       | Black Hills Colorado Electric, LLC | Huerfano                    | 29                 | 2012          |
| Colorado Highlands        | Wind                       | Colorado Highlands Wind LLC        | Logan                       | 96.1               | 2012          |
| Limon I                   | Wind                       | Limon                              | Arapahoe, Elbert, Lincoln   | 200                | 2012          |
| Limon II                  | Wind                       | Limon                              | Lincoln                     | 200                | 2012          |
| Limon III                 | Wind                       | Limon                              | Lincoln                     | 200.6              | 2014          |
| Spring Canyon Expansion   | Wind                       | NRG Yield LLC                      | Logan                       | 62.6               | 2014          |
| Carousel                  | Wind                       | Carousel Wind Farm, LLC            | Kit Carson                  | 150                | 2015          |
| Golden West               | Wind                       | Golden West Power Partners, LLC    | El Paso                     | 250                | 2015          |
| Comanche                  | Solar PV                   | Comanche Solar PV, LLC             | Pueblo                      | 120                | 2016          |
| Clear Spring Ranch        | Solar PV                   | DG Colorado Solar, LLC             | El Paso                     | 10                 | 2016          |
| Peak View                 | Wind                       | Black Hills Colorado Electric, LLC | Huerfano, Las Animas        | 61                 | 2016          |
| San Isabel                | Solar PV                   | San Isabel Solar, LLC              | Las Animas                  | 30                 | 2016          |
| Silicon Ranch Fort Lupton | Solar PV                   | SR Jenkins, LLC                    | Weld                        | 13                 | 2016          |
| Twin Buttes II            | Wind                       | Avangrid Renewables LLC            | Prowers                     | 75                 | 2017          |
| Rush Creek                | Wind                       | Xcel Energy                        | Elbert, Kit Carson, Lincoln | 600                | 2018          |
| Titan                     | Solar PV                   | Titan Solar, LLC                   | Arapahoe                    | 50                 | 2018          |
| Grazing Yak               | Solar PV                   | Grazing Yak Solar, LLC             | El Paso                     | 35                 | 2019          |
| Busch Ranch II            | Wind                       | Black Hills Colorado Electric, LLC | Huerfano, Las Animas        | 60                 | 2020          |
| Palmer                    | Solar PV                   | Colorado Springs Utilities         | El Paso                     | 60                 | 2020          |
| Cheyenne Ridge            | Wind                       | Cheyenne Ridge Wind Project, LLC   | Cheyenne, Kit Carson        | 500                | 2020          |
| Bronco Plains             | Wind                       | NextEra Energy Resources           | Kit Carson                  | 300                | 2020          |
| Crossing Trails           | Wind                       | EDP Renewables North America       | Cheyenne, Kit Carson        | 104                | 2020          |
| Arriba                    | Wind                       | NGC Partners                       | Lincoln                     | 150                | 2021          |
| Neptune                   | Solar PV + Battery Storage | NextEra Energy Resources           | Pueblo                      | 250                | 2022          |
| Thunder Wolf              | Solar PV + Battery Storage | NextEra Energy Resources           | Pueblo                      | 200                | 2022          |
| Spanish Peaks             | Solar PV                   | Juwi Americas                      | Las Animas                  | 100                | 2023          |
| Mountain Breeze           | Wind                       | Leeward Renewable                  | Weld                        | 169                | 2024          |
| Niyol                     | Wind                       | NextEra Energy Resources           | Logan, Washington           | 200                | 2024          |
| Spanish Peaks II          | Solar PV                   | Juwi Americas                      | Las Animas                  | 40                 | 2024          |
| <b>Total</b>              |                            |                                    |                             | <b>6,068.6</b>     |               |

## PROPERTY TAX

Renewable energy projects will contribute an estimated \$23.1 million in annual property tax revenue throughout districts in the eastern plains by 2024. Property tax benefits support counties, schools, health districts, fire departments, and conservation districts. The significant amount of property tax revenue associated with the state’s renewable energy projects funds needed infrastructure in rural areas of the state, reduces dependence on state school financing, and enables many communities to initiate revitalization projects. By 2024, county governments in Colorado’s eastern plains will

BY 2024, RENEWABLE FACILITIES ARE EXPECTED TO CONTRIBUTE AN ESTIMATED **\$23.1 MILLION IN ANNUAL PROPERTY TAX REVENUE** TO DISTRICTS THROUGHOUT THE EASTERN PLAINS.

receive an estimated \$10.1 million each year, school districts will receive more than \$9.9 million, libraries about \$646,000, health districts about \$458,000, and other special districts about \$2 million, as shown in Table 4. Detailed estimates of property tax revenues by district for each project are included in the report appendices.

**TABLE 4: ESTIMATED PROPERTY TAX REVENUE BY COUNTY AND DISTRICT FOR RENEWABLE ENERGY FACILITIES IN EASTERN COLORADO BY 2024**

|              | County              | Health Districts | School Districts   | Library Districts | Other Special Districts | Total               |
|--------------|---------------------|------------------|--------------------|-------------------|-------------------------|---------------------|
| Arapahoe     | \$101,200           | \$0              | \$169,400          | \$3,200           | \$37,000                | \$310,800           |
| Baca         | \$0                 | \$0              | \$0                | \$0               | \$0                     | \$0                 |
| Bent         | \$166,100           | \$0              | \$132,600          | \$0               | \$19,000                | \$317,700           |
| Cheyenne     | \$191,300           | \$175,200        | \$208,000          | \$12,100          | \$33,800                | \$620,400           |
| Elbert       | \$703,000           | \$0              | \$806,200          | \$0               | \$133,500               | \$1,642,700         |
| El Paso      | \$156,500           | \$0              | \$517,300          | \$78,600          | \$124,300               | \$876,700           |
| Huerfano     | \$167,200           | \$55,100         | \$245,400          | \$0               | \$83,900                | \$551,600           |
| Kit Carson   | \$1,965,800         | \$155,300        | \$1,483,500        | \$0               | \$158,700               | \$3,763,300         |
| Las Animas   | \$233,200           | \$43,700         | \$279,000          | \$0               | \$129,500               | \$685,400           |
| Lincoln      | \$1,646,200         | \$0              | \$1,037,600        | \$0               | \$124,100               | \$2,807,900         |
| Logan        | \$1,291,800         | \$0              | \$1,152,800        | \$0               | \$236,200               | \$2,680,800         |
| Prowers      | \$287,000           | \$28,800         | \$249,900          | \$0               | \$0                     | \$565,700           |
| Pueblo       | \$2,514,500         | \$0              | \$3,035,300        | \$431,400         | \$393,500               | \$6,374,700         |
| Washington   | \$146,700           | \$0              | \$131,000          | \$0               | \$18,800                | \$296,500           |
| Weld         | \$557,100           | \$0              | \$489,400          | \$120,500         | \$472,600               | \$1,639,600         |
| <b>Total</b> | <b>\$10,127,600</b> | <b>\$458,100</b> | <b>\$9,937,400</b> | <b>\$645,800</b>  | <b>\$1,964,900</b>      | <b>\$23,133,800</b> |

*Source: County assessor's offices; Colorado Division of Property Taxation; Development Research Partners.*

## AVERAGE LEASE PAYMENTS

Land for renewable energy facilities on Colorado's eastern plains is often leased from local landowners, including farmers and ranchers. In particular, wind projects provide farmers and ranchers with another source of income while they continue with normal agricultural operations. In contrast, solar projects are more land intensive and are often located on land owned by utilities or other public entities. A report from the American Wind Energy Association (AWEA) estimates landowners in Colorado benefited from between \$10 and \$15 million in annual lease payments from the state's wind projects in 2018.<sup>8</sup> Based on estimates from NREL's JEDI model, landowners on Colorado's eastern plains will benefit from an estimated \$15.2 million in annual lease payments from wind projects by 2024. Comparable information for solar facilities is not available.

**BY 2024, WIND ENERGY FACILITIES WILL PROVIDE FARMERS, RANCHERS, AND OTHER LANDOWNERS ON COLORADO'S EASTERN PLAINS WITH \$15.2 MILLION IN ANNUAL LEASE PAYMENTS.**

# ECONOMIC BENEFITS OF RENEWABLE FACILITIES

## ECONOMIC BENEFITS OF CONSTRUCTION AND INVESTMENT

Renewable energy development in Colorado’s eastern plains has brought significant investment to the state. From 2000 to 2024, there will have been an estimated \$9.4 billion in construction and investment activity in the eastern plains. Construction and investment activities benefit the state as developers and contractors hire labor, purchase construction materials and equipment, and invest in infrastructure. Colorado also receives a large benefit from wind turbine components manufactured in the state. Many of the wind turbine components in four of the state’s large wind facilities were manufactured in Colorado by Vestas.

By 2024, wind energy facilities will comprise an estimated 85 percent of the renewable energy investment in the eastern plains while 15 percent will be for solar photovoltaic energy facilities.

**TABLE 5: ESTIMATED INITIAL INVESTMENTS IN EASTERN COLORADO’S RENEWABLE ENERGY GENERATION FACILITIES SINCE 2000**

| Project                   | Source                     | Operable Year | Est. Initial Investment (\$Ms) |
|---------------------------|----------------------------|---------------|--------------------------------|
| Ridge Crest               | Wind                       | 2001          | \$38.7                         |
| Colorado Green            | Wind                       | 2003          | \$174.3                        |
| Spring Canyon             | Wind                       | 2006          | \$101.4                        |
| Cedar Creek               | Wind                       | 2007          | \$616.2                        |
| Logan                     | Wind                       | 2007          | \$339.5                        |
| Peetz Table               | Wind                       | 2007          | \$337.0                        |
| Twin Buttes               | Wind                       | 2007          | \$126.8                        |
| Northern Colorado         | Wind                       | 2009          | \$355.4                        |
| Kit Carson                | Wind                       | 2010          | \$104.3                        |
| Cedar Creek II            | Wind                       | 2011          | \$509.2                        |
| Cedar Point               | Wind                       | 2011          | \$437.5                        |
| Busch Ranch               | Wind                       | 2012          | \$61.9                         |
| Colorado Highlands        | Wind                       | 2012          | \$159.3                        |
| Limon I                   | Wind                       | 2012          | \$350.6                        |
| Limon II                  | Wind                       | 2012          | \$350.6                        |
| Limon III                 | Wind                       | 2014          | \$350.6                        |
| Spring Canyon Expansion   | Wind                       | 2014          | \$105.1                        |
| Carousel                  | Wind                       | 2015          | \$240.0                        |
| Golden West               | Wind                       | 2015          | \$400.0                        |
| Comanche                  | Solar PV                   | 2016          | \$253.0                        |
| Clear Spring Ranch        | Solar PV                   | 2016          | \$17.4                         |
| Peak View                 | Wind                       | 2016          | \$105.0                        |
| San Isabel                | Solar PV                   | 2016          | \$47.4                         |
| Silicon Ranch Fort Lupton | Solar PV                   | 2016          | \$22.6                         |
| Twin Buttes II            | Wind                       | 2017          | \$129.1                        |
| Rush Creek                | Wind                       | 2018          | \$694.0                        |
| Titan                     | Solar PV                   | 2018          | \$58.0                         |
| Grazing Yak               | Solar PV                   | 2019          | \$40.6                         |
| Busch Ranch II            | Wind                       | 2020          | \$87.3                         |
| Palmer                    | Solar PV                   | 2020          | \$69.6                         |
| Cheyenne Ridge            | Wind                       | 2020          | \$582.1                        |
| Bronco Plains             | Wind                       | 2020          | \$435.9                        |
| Crossing Trails           | Wind                       | 2020          | \$151.2                        |
| Arriba                    | Wind                       | 2021          | \$61.9                         |
| Neptune                   | Solar PV + Battery Storage | 2022          | \$432.7                        |
| Thunder Wolf              | Solar PV + Battery Storage | 2022          | \$346.1                        |
| Spanish Peaks             | Solar PV                   | 2023          | \$108.0                        |
| Mountain Breeze           | Wind                       | 2024          | \$245.6                        |
| Niyol                     | Wind                       | 2024          | \$290.6                        |
| Spanish Peaks II          | Solar PV                   | 2024          | \$46.4                         |
|                           |                            |               | <b>\$9,382.9</b>               |

*Source: Development Research Partners; NREL JEDI Model; NREL Solar Cost Benchmark Reports; NREL, "Economic Impacts from Wind Energy in Colorado Case Study: Rush Creek Wind Farm."*



**TABLE 6: EASTERN PLAINS RENEWABLE ENERGY FACILITY CONSTRUCTION ACTIVITY IN COLORADO, 2000 TO 2024**

|   | Total            |
|---|------------------|
| <b>Construction Activity (\$ in millions)</b> |                  |
| Major Equipment                               | \$6,636.4        |
| Construction Materials                        | \$1,493.1        |
| Design, Engineering, Planning, Other Costs    | \$873.6          |
| Wages and Salaries                            | \$291.2          |
| Employee Benefits                             | \$88.6           |
| <b>Total</b>                                  | <b>\$9,382.9</b> |
| Construction Employees (FTE)                  | 4,318            |

### DIRECT ECONOMIC BENEFITS

- A large percentage of the costs associated with renewable energy facilities is for energy generating equipment such as solar panels, inverters, towers, turbines, and nacelles. Battery storage requires additional investment for batteries and inverters. Based on estimates derived from NREL’s JEDI wind model and NREL’s cost benchmark reports, an estimated \$6.6 billion was spent on purchases of major generating equipment (Table 6). While most of the equipment was manufactured by companies located outside of the state, components for a handful of the eastern plains’ wind facilities have either been manufactured or will be manufactured at Vestas’ plants in the state. Therefore, the direct economic benefit in Colorado from purchases of major generating equipment through 2024 will be an estimated \$777.6 million (Table 7).
- Although many purchases of renewable energy generating equipment are made out-of-state, the state has benefited from a large percentage of the construction materials purchases, design, project management, planning, and other costs. Many materials for site preparation and construction are purchased locally. Based on state spending estimates in the JEDI models, the direct economic benefit to Colorado from 2000 to 2024 will be an estimated \$1.7 billion (Table 7).
- An estimated 4,318 full-time equivalent construction workers,<sup>9</sup> earning \$379.8 million in wages and employee benefits, were or will be employed to install the 40 renewable energy facilities constructed from 2000 to 2024 (Table 6). Based on estimates of local labor from the JEDI model and state wage levels, the direct economic benefit to Colorado from these projects will be an estimated \$224.7 million in earnings<sup>10</sup> for 3,158 workers (Table 7).

- In total, the direct economic benefit in Colorado of construction and investment in the eastern plains' renewable facilities will be an estimated \$2.7 billion from 2000 to 2024 (Table 7).

### DIRECT, INDIRECT, AND INDUCED ECONOMIC BENEFITS

- Based on the industry relationships revealed through the RIMS II multipliers for the construction and manufacturing industries in Colorado, \$2.7 billion of direct spending in the state will support an estimated \$3.1 billion in additional output in all industries throughout Colorado by 2024. This includes the value of the local spending by the construction and manufacturing workers (the induced impact) and of the local supplier companies and their employees (the indirect impact) (Table 8).
- The production of the \$3.1 billion in additional output in all industries throughout Colorado will require an estimated 7,275 workers by 2024, referred to as the indirect workers. These workers will have estimated earnings of about \$351.3 million (the indirect earnings) (Table 8).
- Therefore, the total direct and indirect benefits of renewable energy development in Colorado's eastern plains will be an estimated \$5.9 billion in total output (\$2.7 billion direct output + \$3.1 billion indirect and induced output) produced by 12,819 employees (5,544 direct employees + 7,275 indirect employees) earning a total of about \$706.9 million (\$355.6 million direct earnings + \$351.3 million indirect earnings) from 2000 to 2024 (Table 8).
- Construction benefits are temporary, occurring only during construction. The analysis does not indicate whether the direct and indirect employees were residents of Colorado or whether they were nonresidents that commuted into the state.

**TABLE 7: DIRECT ECONOMIC BENEFIT OF EASTERN PLAINS RENEWABLE ENERGY FACILITY INVESTMENTS IN COLORADO, 2000 TO 2024**

|  | Estimated Colorado |
|--|--------------------|
| <b>Direct Economic Benefits (\$ in millions)</b> |                    |
| Major Equipment                                  | \$777.6            |
| Construction Materials                           | \$1,218.3          |
| Design, Engineering, Planning, Other Costs       | \$529.1            |
| Wages and Salaries                               | \$222.4            |
| Employee Benefits*                               | \$2.3              |
| <b>Total Construction Benefits</b>               | <b>\$2,749.7</b>   |
| Construction Employees (FTE)                     | 3,158              |

\*Direct benefit estimated for Colorado includes adjustment for earnings likely to benefit the state.

**TABLE 8: TOTAL ECONOMIC BENEFIT OF EASTERN PLAINS RENEWABLE ENERGY FACILITY INVESTMENTS IN COLORADO, 2000 TO 2024**

|                               | Direct Impact | Indirect & Induced Impact | Total Impact |
|-------------------------------|---------------|---------------------------|--------------|
| <b>Construction Activity</b>  |               |                           |              |
| Value of Output (\$M)         | \$1,972.1     | \$2,441.6                 | \$4,413.7    |
| Earnings (\$M)                | \$224.6       | \$162.1                   | \$386.7      |
| Employment                    | 3,158         | 3,105                     | 6,263        |
| <b>Manufacturing</b>          |               |                           |              |
| Value of Output (\$M)         | \$777.6       | \$660.4                   | \$1,438.0    |
| Earnings (\$M)                | \$131.0       | \$189.2                   | \$320.1      |
| Employment                    | 2,386         | 4,170                     | 6,556        |
| <b>Total Economic Benefit</b> |               |                           |              |
| Value of Output (\$M)         | \$2,749.7     | \$3,102.0                 | \$5,851.7    |
| Earnings (\$M)                | \$355.6       | \$351.3                   | \$706.9      |
| Employment                    | 5,544         | 7,275                     | 12,819       |

Source: Development Research Partners, based on multipliers for Colorado from the U.S. Department of Commerce, Bureau of Economic Analysis, Regional Input-Output Modeling System (RIMS II), U.S. Benchmark I-O and Regional Data for 2007/13 and 2012/17.

Calculation Note: Direct x Multiplier = Total Impact  
Total Impact - Direct Impact = Indirect & Induced Impact  
Numbers may not add exactly due to rounding.

BY 2024, RENEWABLE ENERGY INVESTMENT ON COLORADO'S EASTERN PLAINS WILL HAVE SUPPORTED **\$5.9 BILLION IN ECONOMIC ACTIVITY** IN THE STATE PRODUCED BY 12,819 WORKERS.



## ECONOMIC BENEFITS OF ANNUAL OPERATIONS BY 2024

The economic and fiscal benefits of the renewable energy operations are derived from sales of energy, which in turn fund business purchases such as equipment, parts, operational materials, leases, taxes, and labor. The on-going annual operations of renewable energy facilities in Colorado’s eastern plains benefit the state through employment, maintenance purchases, and other operating costs. These benefits will ramp up as the state adds capacity through 2024.

### DIRECT ECONOMIC BENEFITS

- Based on estimates derived from the JEDI models, NREL’s cost benchmark studies, and current levelized costs, annual purchases of materials and services for the state’s renewable energy facilities will be an estimated \$138.1 million by 2024 (Table 9). Estimates for future facilities are based on current costs and do not factor in projected price changes.
- Many renewable projects lease land from governments and private landowners. For instance, the Palmer solar project in El Paso County is on land owned by the Woodmoor Water & Sanitation district. Another example is cited in a study from NREL estimating the economic benefits of the Rush Creek wind farm. Researchers noted that the lease payments “supported dual income opportunities for farmers and ranchers.” Based on estimates from the JEDI model, lease payments for wind facilities will be an estimated \$15.2 million each year by 2024. Comparable information for the eastern plains’ solar facilities was not available (Table 9).
- Other costs associated with operations and maintenance of the eastern plains’ renewable energy facilities will be an estimated \$9.9 million by 2024 (Table 9).
- Renewable energy facilities provide on-going employment in Colorado’s eastern plains. By 2024, an estimated 352 full-time equivalent employees will be employed at the region’s renewable facilities. Compensation for these employees will be an estimated \$28.3 million in wages and employee benefits. Compensation includes wages and salaries, employee benefits that contribute to direct worker earnings such

**TABLE 9: DIRECT ECONOMIC AND FISCAL BENEFIT OF ANNUAL OPERATIONS OF EASTERN PLAINS RENEWABLE ENERGY FACILITIES IN COLORADO\***

|  | Estimated<br>Colorado |
|--|-----------------------|
| <b>Direct Economic Benefits (\$ in millions)</b> |                       |
| Materials and Services                           | \$138.1               |
| Landowner Payments                               | \$15.2                |
| Other Costs                                      | \$9.9                 |
| Property Tax                                     | \$23.1                |
| Wages and Salaries                               | \$21.7                |
| Employee Benefits                                | \$6.6                 |
| <b>Total Operations Benefits</b>                 | <b>\$214.6</b>        |
| Employees (FTE)                                  | 352                   |

*\*Includes estimates of currently operating facilities and prospective facilities through 2024.*



as supplemental pay, and employee benefits that have minimal local impact such as retirement contributions (Table 9).

- As described in the previous section, the region’s renewable facilities will generate an estimate \$23.1 million in property tax revenue each year for counties, schools, and other tax districts serving the eastern plains. Property taxes represent a cost of business for generating renewable energy (Table 9).
- In total, the direct economic benefit of annual operations for Colorado’s eastern plains renewable energy facilities in the state will be an estimated \$214.6 million by 2024 (Table 9).

BY 2024, RENEWABLE ENERGY FACILITIES ON COLORADO’S EASTERN PLAINS WILL SUPPORT **\$388.6 MILLION IN ANNUAL ECONOMIC ACTIVITY** IN THE STATE PRODUCED BY 1,089 WORKERS.

### DIRECT, INDIRECT, AND INDUCED ECONOMIC BENEFITS

- Based on the industry relationships revealed through the RIMS II multipliers for industries benefiting from the business spending in Colorado, \$214.6 million of direct output will likely support an estimated \$174 million in additional output in all industries throughout the state by 2024. This includes the value of the local spending by the employees (the induced impact) and of the local supplier companies and their employees (the indirect impact) (Table 10).
- The production of the \$174 million in additional output in all industries throughout Colorado will require an estimated 737 workers, referred to as the indirect workers. These workers will have estimated earnings of about \$34.8 million (the indirect earnings) (Table 10).
- Therefore, the total direct and indirect benefits of annual eastern plains renewable energy operations in Colorado will be an estimated \$388.6 million in total output (\$214.6 million direct output + \$174 million indirect and induced output) produced by 1,089 employees (352 direct employees + 737 indirect employees) earning a total of about \$56.7 million (\$21.9 million direct earnings + \$34.8 million indirect earnings) by 2024 (Table 10).
- These benefits are likely to occur annually assuming similar business conditions and project parameters.

**TABLE 10: TOTAL ECONOMIC BENEFIT OF ANNUAL OPERATIONS OF EASTERN PLAINS RENEWABLE ENERGY FACILITIES IN COLORADO\***

|                                   | Direct Impact | Multiplier | Indirect & Induced Impact | Total Impact |
|-----------------------------------|---------------|------------|---------------------------|--------------|
| <b>Operations and Maintenance</b> |               |            |                           |              |
| Value of Output (\$M)             | \$214.6       | 1.8109     | \$174.0                   | \$388.6      |
| Earnings (\$M)**                  | \$21.9        | 2.5880     | \$34.8                    | \$56.7       |
| Employment                        | 352           | 3.0947     | 737                       | 1,089        |

\*Includes estimates of currently operating facilities and prospective facilities through 2024.

\*\*Direct earnings estimate includes wages and a portion of employee benefits.

Source: Development Research Partners, based on multipliers for Colorado from the U.S. Department of Commerce, Bureau of Economic Analysis, Regional Input-Output Modeling System (RIMS II), 2012 U.S. Benchmark I-O Data and 2017 Regional Data.

Calculation Note: Direct x Multiplier = Total Impact

Total Impact - Direct Impact = Indirect & Induced Impact

Numbers may not add exactly due to rounding.

# APPENDIX A PROPERTY TAX REVENUE BY PROJECT

## ESTIMATED PROPERTY TAX REVENUE BY PROJECT, COUNTY, AND DETAILED DISTRICT FOR RENEWABLE ENERGY FACILITIES IN EASTERN COLORADO BY 2024

| Project        | County     | District                                    | 2019<br>Mill Levy | Estimated<br>Tax |
|----------------|------------|---|-------------------|------------------|
| Arriba         | Lincoln    | Lincoln                                     | 35.500            | \$258,400        |
| Arriba         | Lincoln    | School District                             | 28.063            | \$204,300        |
| Arriba         | Lincoln    | Fire  | 3.349             | \$24,400         |
| Arriba         | Lincoln    | Ground Water Management                     | 0.360             | \$2,600          |
| Arriba         | Lincoln    | Cemetery                                    | 0.227             | \$1,700          |
| Bronco Plains  | Kit Carson | Kit Carson                                  | 37.967            | \$827,100        |
| Bronco Plains  | Kit Carson | Arriba-Flagler C-20 School District         | 27.250            | \$474,900        |
| Bronco Plains  | Kit Carson | Hi-Plains R-23 School District              | 34.620            | \$150,800        |
| Bronco Plains  | Kit Carson | Kit Carson County Health Service District   | 3.000             | \$65,400         |
| Bronco Plains  | Kit Carson | Flagler Rural Fire                          | 2.316             | \$50,500         |
| Bronco Plains  | Kit Carson | Fairview Cemetery                           | 0.705             | \$12,300         |
| Bronco Plains  | Kit Carson | Seibert Cemetery District                   | 0.737             | \$3,200          |
| Busch Ranch    | Huerfano   | Huerfano                                    | 21.254            | \$58,000         |
| Busch Ranch    | Huerfano   | School District                             | 31.192            | \$85,100         |
| Busch Ranch    | Huerfano   | Huerfano County Hospital                    | 7.000             | \$19,100         |
| Busch Ranch    | Huerfano   | Fire  | 4.047             | \$11,000         |
| Busch Ranch    | Huerfano   | Library                                     | 4.490             | \$12,200         |
| Busch Ranch    | Huerfano   | Huerfano County Water Conservation          | 2.128             | \$5,800          |
| Busch Ranch II | Huerfano   | Huerfano                                    | 21.254            | \$48,100         |
| Busch Ranch II | Las Animas | Las Animas                                  | 9.392             | \$21,200         |
| Busch Ranch II | Huerfano   | School District                             | 31.192            | \$70,500         |
| Busch Ranch II | Las Animas | Aguilar 6 School District                   | 11.236            | \$25,400         |
| Busch Ranch II | Huerfano   | Huerfano County Hospital                    | 7.000             | \$15,800         |
| Busch Ranch II | Las Animas | Trinidad Ambulance                          | 2.907             | \$6,600          |
| Busch Ranch II | Huerfano   | Fire  | 4.047             | \$9,200          |
| Busch Ranch II | Huerfano   | Library                                     | 4.490             | \$10,200         |
| Busch Ranch II | Huerfano   | Huerfano County Water Conservation          | 2.128             | \$4,800          |
| Busch Ranch II | Las Animas | Spanish Peaks-Purgatoire River Conservation | 0.500             | \$1,100          |
| Carousel       | Kit Carson | Kit Carson                                  | 37.967            | \$237,200        |
| Carousel       | Kit Carson | Burlington School District                  | 27.817            | \$173,800        |
| Carousel       | Kit Carson | Kit Carson County Health Service District   | 3.000             | \$18,700         |
| Carousel       | Kit Carson | Burlington Fire                             | 2.100             | \$13,100         |
| Carousel       | Kit Carson | Fairview Cemetery District                  | 0.705             | \$4,400          |
| Cedar Creek    | Weld       | Weld  | 15.038            | \$232,600        |
| Cedar Creek    | Weld       | RE-3J Keenesburg                            | 19.814            | \$306,400        |
| Cedar Creek    | Weld       | S.E. Weld Fire                              | 10.265            | \$158,800        |
| Cedar Creek    | Weld       | Aims Junior College                         | 6.305             | \$97,500         |
| Cedar Creek    | Weld       | High Plains Library                         | 3.252             | \$50,300         |
| Cedar Creek    | Weld       | Central Colorado Water Conservancy (CCW)    | 1.540             | \$23,800         |
| Cedar Creek    | Weld       | Southeast Weld Conservation                 | 0.000             | \$0              |
| Cedar Creek II | Weld       | Weld  | 15.038            | \$121,400        |
| Cedar Creek II | Weld       | Prairie RE-11 School District               | 5.965             | \$48,200         |
| Cedar Creek II | Weld       | Raymer-Stoneham Fire                        | 2.588             | \$20,900         |
| Cedar Creek II | Weld       | Aims Junior College                         | 6.305             | \$50,900         |
| Cedar Creek II | Weld       | High Plains Library                         | 3.252             | \$26,300         |
| Cedar Creek II | Weld       | Centennial Conservation                     | 0.000             | \$0              |

# APPENDIX A PROPERTY TAX REVENUE BY PROJECT

## ESTIMATED PROPERTY TAX REVENUE BY PROJECT, COUNTY, AND DETAILED DISTRICT FOR RENEWABLE ENERGY FACILITIES IN EASTERN COLORADO BY 2024 CONTINUED

| Project            | County     | District  | 2019<br>Mill Levy | Estimated<br>Tax |
|--------------------|------------|---|-------------------|------------------|
| Cedar Point        | Arapahoe   | Arapahoe  | 14.301            | \$5,600          |
| Cedar Point        | Arapahoe   | Arapahoe County LEA                                 | 4.982             | \$1,900          |
| Cedar Point        | Elbert     | Elbert  | 30.562            | \$92,000         |
| Cedar Point        | Lincoln    | Lincoln   | 35.500            | \$338,500        |
| Cedar Point        | Arapahoe   | Bennett 29J School District                         | 32.296            | \$12,500         |
| Cedar Point        | Elbert     | Limon RE-4B School District                         | 31.896            | \$96,000         |
| Cedar Point        | Lincoln    | Limon School District                               | 17.686            | \$168,700        |
| Cedar Point        | Arapahoe   | Deer Trail Fire                                     | 7.032             | \$2,700          |
| Cedar Point        | Elbert     | Limon Area Fire                                     | 3.000             | \$9,000          |
| Cedar Point        | Lincoln    | Limon Area Fire                                     | 3.000             | \$28,600         |
| Cedar Point        | Arapahoe   | Arapahoe County Library                             | 5.845             | \$2,300          |
| Cedar Point        | Arapahoe   | North Kiowa Bijou Water                             | 0.022             | \$0              |
| Cedar Point        | Elbert     | Upper Big Sandy Water                               | 0.532             | \$300            |
| Cedar Point        | Lincoln    | Upper Big Sandy Water                               | 0.532             | \$400            |
| Cedar Point        | Elbert     | Double El Soil Conservation                         | 0.000             | \$0              |
| Cedar Point        | Elbert     | Agate Soil Conservation                             | 0.000             | \$0              |
| Cedar Point        | Lincoln    | Arikaree Groundwater Management District            | 0.247             | \$800            |
| Cedar Point        | Lincoln    | Genoa Cemetery                                      | 0.168             | \$400            |
| Cheyenne Ridge     | Cheyenne   | Cheyenne  | 15.160            | \$183,700        |
| Cheyenne Ridge     | Kit Carson | Kit Carson  | 37.967            | \$460,000        |
| Cheyenne Ridge     | Cheyenne   | Cheyenne County RE-5 School District                | 15.819            | \$191,700        |
| Cheyenne Ridge     | Kit Carson | Stratton R-4 School District                        | 34.500            | \$62,700         |
| Cheyenne Ridge     | Kit Carson | Bethune R-5 School District                         | 22.440            | \$40,800         |
| Cheyenne Ridge     | Kit Carson | Burlington School District                          | 27.817            | \$235,900        |
| Cheyenne Ridge     | Cheyenne   | Cheyenne County Hospital District                   | 3.884             | \$47,100         |
| Cheyenne Ridge     | Cheyenne   | Keefe Memorial Health Service                       | 10.000            | \$121,200        |
| Cheyenne Ridge     | Kit Carson | Kit Carson County Health Service District           | 3.000             | \$36,300         |
| Cheyenne Ridge     | Cheyenne   | Cheyenne County Fire No. 1                          | 1.250             | \$15,100         |
| Cheyenne Ridge     | Kit Carson | Stratton Fire                                       | 2.275             | \$2,800          |
| Cheyenne Ridge     | Kit Carson | Burlington Fire                                     | 2.100             | \$22,900         |
| Cheyenne Ridge     | Cheyenne   | East Cheyenne County Library                        | 1.000             | \$12,100         |
| Cheyenne Ridge     | Cheyenne   | Fairview Cemetery District                          | 0.463             | \$5,600          |
| Cheyenne Ridge     | Kit Carson | Fairview Cemetery District                          | 0.705             | \$7,700          |
| Cheyenne Ridge     | Kit Carson | Stratton Cemetery District                          | 0.329             | \$400            |
| Cheyenne Ridge     | Cheyenne   | East Cheyenne Recreation                            | 1.000             | \$12,100         |
| Clear Spring Ranch | El Paso    | El Paso   | 7.965             | \$11,700         |
| Clear Spring Ranch | El Paso    | Fountain 8 School District                          | 24.776            | \$36,300         |
| Clear Spring Ranch | El Paso    | Pikes Peak Library                                  | 4.000             | \$5,900          |
| Clear Spring Ranch | El Paso    | Central Colorado Conservation                       | 0.000             | \$0              |
| Colorado Green     | Prowers    | Prowers   | 27.170            | \$135,600        |
| Colorado Green     | Prowers    | Lamar RE-2 School District                          | 23.664            | \$118,100        |
| Colorado Green     | Prowers    | Prowers County Hospital District                    | 2.723             | \$13,600         |
| Colorado Highlands | Logan      | Logan   | 29.941            | \$160,300        |
| Colorado Highlands | Logan      | Frenchman RE-3 School District                      | 28.668            | \$153,500        |
| Colorado Highlands | Logan      | Haxton Fire Protection District                     | 3.404             | \$18,200         |
| Colorado Highlands | Logan      | Logan County Water Conservancy                      | 0.853             | \$4,600          |
| Colorado Highlands | Logan      | Haxton Soil Conservation                            | 0.500             | \$2,700          |
| Comanche           | Pueblo     | Pueblo  | 30.722            | \$189,700        |
| Comanche           | Pueblo     | Pueblo 70 School District                           | 40.035            | \$247,200        |
| Comanche           | Pueblo     | Pueblo Rural Fire Protection                        | 24.268            | \$149,900        |
| Comanche           | Pueblo     | Pueblo City-County Library District                 | 5.271             | \$32,500         |
| Comanche           | Pueblo     | Southeastern Colorado Water Conservancy - Contract  | 0.909             | \$5,600          |
| Comanche           | Pueblo     | Southeastern Colorado Water Conservancy - Operating | 0.035             | \$200            |



# APPENDIX A PROPERTY TAX REVENUE BY PROJECT

## ESTIMATED PROPERTY TAX REVENUE BY PROJECT, COUNTY, AND DETAILED DISTRICT FOR RENEWABLE ENERGY FACILITIES IN EASTERN COLORADO BY 2024 CONTINUED

| Project         | County     | District                                  | 2019<br>Mill Levy | Estimated<br>Tax |
|-----------------|------------|---|-------------------|------------------|
| Crossing Trails | Kit Carson | Kit Carson                                | 37.967            | \$172,600        |
| Crossing Trails | Cheyenne   | Cheyenne                                  | 15.160            | \$7,700          |
| Crossing Trails | Kit Carson | Hi-Plains R-23 School District            | 34.620            | \$157,400        |
| Crossing Trails | Cheyenne   | Kit Carson R-1 School District            | 32.404            | \$16,400         |
| Crossing Trails | Kit Carson | Kit Carson County Health Service District | 3.000             | \$13,600         |
| Crossing Trails | Cheyenne   | Cheyenne County Hospital District         | 3.884             | \$2,000          |
| Crossing Trails | Cheyenne   | Keefe Memorial Health Service             | 10.000            | \$5,100          |
| Crossing Trails | Kit Carson | Seibert Fire                              | 4.812             | \$8,800          |
| Crossing Trails | Kit Carson | Vona Fire                                 | 3.204             | \$8,700          |
| Crossing Trails | Cheyenne   | West Cheyenne Fire                        | 1.500             | \$800            |
| Crossing Trails | Kit Carson | Arikaree Groundwater Management District  | 0.247             | \$300            |
| Crossing Trails | Kit Carson | Seibert Cemetery                          | 0.737             | \$1,700          |
| Crossing Trails | Kit Carson | Vona Cemetery                             | 0.635             | \$1,400          |
| Crossing Trails | Cheyenne   | Kit Carson Cemetery                       | 0.250             | \$100            |
| Golden West     | El Paso    | El Paso                                   | 7.965             | \$82,600         |
| Golden West     | El Paso    | Calhan RJ-1 School District               | 27.013            | \$280,000        |
| Golden West     | El Paso    | Calhan Fire                               | 6.402             | \$66,400         |
| Golden West     | El Paso    | Pikes Peak Library                        | 4.000             | \$41,500         |
| Golden West     | El Paso    | Double El Conservation                    | 0.000             | \$0              |
| Grazing Yak     | El Paso    | El Paso                                   | 7.965             | \$26,200         |
| Grazing Yak     | El Paso    | Calhan RJ-1 School District               | 27.013            | \$88,800         |
| Grazing Yak     | El Paso    | Calhan Fire                               | 6.402             | \$21,100         |
| Grazing Yak     | El Paso    | Pikes Peak Library                        | 4.000             | \$13,200         |
| Grazing Yak     | El Paso    | Double El Conservation                    | 0.000             | \$0              |
| Kit Carson      | Kit Carson | Kit Carson                                | 37.967            | \$140,100        |
| Kit Carson      | Kit Carson | Burlington School District                | 27.817            | \$61,600         |
| Kit Carson      | Kit Carson | Bethune R-5 School District               | 22.440            | \$33,100         |
| Kit Carson      | Kit Carson | Kit Carson County Health Service District | 3.000             | \$11,100         |
| Kit Carson      | Kit Carson | Burlington Fire                           | 2.100             | \$7,700          |
| Kit Carson      | Kit Carson | Fairview Cemetery District                | 0.705             | \$2,600          |
| Limon I         | Arapahoe   | Arapahoe                                  | 14.301            | \$2,400          |
| Limon I         | Arapahoe   | Arapahoe County LEA                       | 4.982             | \$800            |
| Limon I         | Elbert     | Elbert                                    | 30.562            | \$48,200         |
| Limon I         | Lincoln    | Lincoln                                   | 35.500            | \$232,900        |
| Limon I         | Arapahoe   | Bennett 29J School District               | 32.296            | \$5,400          |
| Limon I         | Elbert     | Limon RE-4B School District               | 31.896            | \$50,300         |
| Limon I         | Lincoln    | Genoa/Hugo C113 School District           | 24.456            | \$27,800         |
| Limon I         | Lincoln    | Limon School District                     | 17.686            | \$95,900         |
| Limon I         | Arapahoe   | Deer Trail Fire                           | 7.032             | \$1,200          |
| Limon I         | Elbert     | Limon Area Fire                           | 3.000             | \$4,700          |
| Limon I         | Lincoln    | Limon Area Fire                           | 3.000             | \$16,300         |
| Limon I         | Arapahoe   | Arapahoe County Library                   | 5.845             | \$1,000          |
| Limon I         | Arapahoe   | North Kiowa Bijou Water                   | 0.022             | \$0              |
| Limon I         | Elbert     | Upper Big Sandy Water                     | 0.532             | \$400            |
| Limon I         | Elbert     | Double El Soil Conservation               | 0.000             | \$0              |
| Limon I         | Elbert     | Agate Soil Conservation                   | 0.000             | \$0              |
| Limon I         | Lincoln    | Arikaree Groundwater Management District  | 0.247             | \$1,600          |
| Limon I         | Lincoln    | Genoa Cemetery                            | 0.168             | \$200            |
| Limon II        | Lincoln    | Lincoln                                   | 35.500            | \$284,600        |
| Limon II        | Lincoln    | Genoa/Hugo C113 School District           | 24.456            | \$92,600         |
| Limon II        | Lincoln    | Limon School District                     | 17.686            | \$74,900         |
| Limon II        | Lincoln    | Limon Area Fire                           | 3.000             | \$12,700         |
| Limon II        | Lincoln    | Upper Big Sandy Water                     | 0.532             | \$1,400          |

# APPENDIX A PROPERTY TAX REVENUE BY PROJECT

## ESTIMATED PROPERTY TAX REVENUE BY PROJECT, COUNTY, AND DETAILED DISTRICT FOR RENEWABLE ENERGY FACILITIES IN EASTERN COLORADO BY 2024 CONTINUED

| Project              | County     | District  | 2019<br>Mill Levy | Estimated<br>Tax |
|----------------------|------------|---|-------------------|------------------|
| Limon II             | Lincoln    | Arikaree Groundwater Management District            | 0.247             | \$1,000          |
| Limon II             | Lincoln    | Genoa Cemetery                                      | 0.168             | \$900            |
| Limon III            | Lincoln    | Lincoln   | 35.500            | \$273,700        |
| Limon III            | Lincoln    | Genoa/Hugo C113 School District                     | 24.456            | \$139,000        |
| Limon III            | Lincoln    | Arriba-Flagler C-20 School District                 | 27.250            | \$55,200         |
| Limon III            | Lincoln    | Northeast Lincoln Fire                              | 1.542             | \$3,100          |
| Limon III            | Lincoln    | Arikaree Groundwater Management District            | 0.247             | \$1,900          |
| Limon III            | Lincoln    | Genoa Cemetery                                      | 0.168             | \$1,000          |
| Limon III            | Lincoln    | Arriba Cemetery                                     | 0.335             | \$700            |
| Logan                | Logan      | Logan   | 29.941            | \$253,600        |
| Logan                | Logan      | Plateau RE-5 School District                        | 25.384            | \$215,000        |
| Logan                | Logan      | Peetz Fire Protection District                      | 3.447             | \$29,200         |
| Logan                | Logan      | Logan County Water Conservancy                      | 0.853             | \$7,200          |
| Mountain Breeze      | Weld       | Weld  | 15.038            | \$184,500        |
| Mountain Breeze      | Weld       | Pawnee RE-12 School District                        | 9.032             | \$110,800        |
| Mountain Breeze      | Weld       | Pawnee Fire   | 1.250             | \$15,300         |
| Mountain Breeze      | Weld       | Aims Junior College                                 | 6.305             | \$77,400         |
| Mountain Breeze      | Weld       | High Plains Library                                 | 3.252             | \$39,900         |
| Mountain Breeze      | Weld       | West Greeley Conservation District                  | 0.414             | \$5,100          |
| Neptune <sup>1</sup> | Pueblo     | Pueblo  | 30.722            | \$1,291,500      |
| Neptune <sup>1</sup> | Pueblo     | Average School                                      | 36.844            | \$1,548,800      |
| Neptune <sup>1</sup> | Pueblo     | Pueblo City-County Library District                 | 5.271             | \$221,600        |
| Neptune <sup>1</sup> | Pueblo     | Average Special District                            | 3.143             | \$132,100        |
| Niyol                | Logan      | Logan   | 29.941            | \$145,200        |
| Niyol                | Washington | Washington  | 30.251            | \$146,700        |
| Niyol                | Logan      | Frenchman RE-3 School District                      | 28.668            | \$139,100        |
| Niyol                | Washington | Lone Star 101 School District                       | 27.000            | \$131,000        |
| Niyol                | Logan      | Fleming Fire  | 5.996             | \$27,600         |
| Niyol                | Logan      | Haxtun Fire   | 3.404             | \$800            |
| Niyol                | Washington | Otis Rural Fire                                     | 2.125             | \$10,300         |
| Niyol                | Logan      | Lower South Platte Water Conservancy                | 0.500             | \$2,300          |
| Niyol                | Logan      | Logan County Water Conservancy                      | 0.853             | \$4,100          |
| Niyol                | Logan      | Frenchman Groundwater Management                    | 0.114             | \$0              |
| Niyol                | Logan      | Haxton Soil Conservation                            | 0.500             | \$2,400          |
| Niyol                | Logan      | Logan County Pest Control                           | 1.167             | \$5,700          |
| Niyol                | Washington | Washington County Pest Control                      | 1.750             | \$8,500          |
| Northern Colorado    | Logan      | Logan   | 29.941            | \$219,900        |
| Northern Colorado    | Logan      | Frenchman RE-3 School District                      | 28.668            | \$210,500        |
| Northern Colorado    | Logan      | Crook Fire Protection District                      | 7.000             | \$51,400         |
| Northern Colorado    | Logan      | Logan County Water Conservancy                      | 0.853             | \$6,300          |
| Palmer               | El Paso    | El Paso   | 7.965             | \$36,000         |
| Palmer               | El Paso    | Fountain 8 School District                          | 24.776            | \$112,000        |
| Palmer               | El Paso    | Hanover Fire  | 7.217             | \$32,600         |
| Palmer               | El Paso    | Pikes Peak Library                                  | 4.000             | \$18,100         |
| Palmer               | El Paso    | Southeastern Colorado Water Conservancy - Contract  | 0.909             | \$4,100          |
| Palmer               | El Paso    | Southeastern Colorado Water Conservancy - Operating | 0.035             | \$200            |
| Peak View            | Huerfano   | Huerfano  | 21.254            | \$61,200         |
| Peak View            | Las Animas | Las Animas  | 9.392             | \$16,000         |
| Peak View            | Huerfano   | School District                                     | 31.192            | \$89,800         |
| Peak View            | Las Animas | Aguilar 6 School District                           | 11.236            | \$19,200         |
| Peak View            | Huerfano   | Huerfano County Hospital                            | 7.000             | \$20,100         |
| Peak View            | Las Animas | Trinidad Ambulance                                  | 2.907             | \$5,000          |
| Peak View            | Huerfano   | Fire  | 4.047             | \$11,600         |

# APPENDIX A PROPERTY TAX REVENUE BY PROJECT

## ESTIMATED PROPERTY TAX REVENUE BY PROJECT, COUNTY, AND DETAILED DISTRICT FOR RENEWABLE ENERGY FACILITIES IN EASTERN COLORADO BY 2024 CONTINUED

| Project                   | County     | District                                    | 2019<br>Mill Levy | Estimated<br>Tax |
|---------------------------|------------|---|-------------------|------------------|
| Peak View                 | Las Animas | Spanish Peaks- and Bon Carbo Fire           | 3.950             | \$6,700          |
| Peak View                 | Huerfano   | Library                                     | 4.490             | \$12,900         |
| Peak View                 | Huerfano   | Huerfano County Water Conservation          | 2.128             | \$6,100          |
| Peak View                 | Las Animas | Upper Huerfano Conservation District        | 0.500             | \$300            |
| Peetz Table               | Logan      | Logan                                       | 29.941            | \$251,700        |
| Peetz Table               | Logan      | Plateau RE-5 School District                | 25.384            | \$213,400        |
| Peetz Table               | Logan      | Peetz Fire Protection District              | 3.447             | \$29,000         |
| Peetz Table               | Logan      | Logan County Water Conservancy              | 0.853             | \$7,200          |
| Ridge Crest               | Logan      | Logan                                       | 29.941            | \$32,000         |
| Ridge Crest               | Logan      | Plateau RE-5 School District                | 25.384            | \$27,200         |
| Ridge Crest               | Logan      | Peetz Fire Protection District              | 3.447             | \$3,700          |
| Ridge Crest               | Logan      | Logan County Water Conservancy              | 0.853             | \$900            |
| Rush Creek                | Kit Carson | Kit Carson                                  | 37.967            | \$128,800        |
| Rush Creek                | Elbert     | Elbert                                      | 30.562            | \$562,700        |
| Rush Creek                | Lincoln    | Lincoln                                     | 35.500            | \$258,000        |
| Rush Creek                | Kit Carson | Arriba-Flagler C-20 School District         | 27.250            | \$92,400         |
| Rush Creek                | Elbert     | Big Sandy 100J School District              | 37.666            | \$473,400        |
| Rush Creek                | Elbert     | Limon RE-4B School District                 | 31.896            | \$186,500        |
| Rush Creek                | Lincoln    | Genoa/Hugo C113 School District             | 24.456            | \$164,700        |
| Rush Creek                | Lincoln    | Arriba-Flagler C-20 School District         | 27.250            | \$14,600         |
| Rush Creek                | Kit Carson | Kit Carson County Health Service District   | 3.000             | \$10,200         |
| Rush Creek                | Kit Carson | Flagler Rural Fire                          | 2.316             | \$7,900          |
| Rush Creek                | Elbert     | Big Sandy Fire                              | 8.000             | \$100,500        |
| Rush Creek                | Elbert     | Limon Area Fire                             | 3.000             | \$17,500         |
| Rush Creek                | Lincoln    | Hugo Fire                                   | 3.500             | \$23,600         |
| Rush Creek                | Lincoln    | Northeast Lincoln Fire                      | 1.542             | \$800            |
| Rush Creek                | Elbert     | Upper Big Sandy Water                       | 0.532             | \$900            |
| Rush Creek                | Elbert     | Double El Soil Conservation                 | 0.000             | \$0              |
| Rush Creek                | Kit Carson | Fairview Cemetery District                  | 0.705             | \$2,400          |
| Rush Creek                | Lincoln    | Arriba Cemetery                             | 0.335             | \$200            |
| San Isabel                | Las Animas | County                                      | 9.392             | \$90,000         |
| San Isabel                | Las Animas | Aguilar 6 School District                   | 11.236            | \$107,600        |
| San Isabel                | Las Animas | Trinidad Ambulance                          | 2.907             | \$27,800         |
| San Isabel                | Las Animas | Spanish Peaks- and Bon Carbo Fire           | 3.950             | \$37,800         |
| San Isabel                | Las Animas | Spanish Peaks-Purgatoire River Conservation | 0.500             | \$4,800          |
| Silicon Ranch Fort Lupton | Weld       | Weld  | 15.038            | \$18,500         |
| Silicon Ranch Fort Lupton | Weld       | Weld County RE-8 School District            | 19.480            | \$24,000         |
| Silicon Ranch Fort Lupton | Weld       | Fort Lupton Fire                            | 9.756             | \$12,000         |
| Silicon Ranch Fort Lupton | Weld       | Aims Junior College                         | 6.305             | \$7,800          |
| Silicon Ranch Fort Lupton | Weld       | High Plains Library                         | 3.252             | \$4,000          |
| Silicon Ranch Fort Lupton | Weld       | Central Colorado Water Conservancy (CCW)    | 1.540             | \$1,900          |
| Silicon Ranch Fort Lupton | Weld       | Northern Colorado Water                     | 1.000             | \$1,200          |
| Spanish Peaks             | Las Animas | Las Animas                                  | 9.392             | \$70,700         |
| Spanish Peaks             | Las Animas | Aguilar 6 School District                   | 11.236            | \$84,600         |
| Spanish Peaks             | Las Animas | Trinidad Ambulance                          | 2.907             | \$21,900         |
| Spanish Peaks             | Las Animas | Spanish Peaks- and Bon Carbo Fire           | 3.950             | \$29,700         |
| Spanish Peaks             | Las Animas | Spanish Peaks-Purgatoire River Conservation | 0.500             | \$3,800          |
| Spanish Peaks II          | Las Animas | Las Animas                                  | 9.392             | \$35,300         |
| Spanish Peaks II          | Las Animas | Aguilar 6 School District                   | 11.236            | \$42,200         |
| Spanish Peaks II          | Las Animas | Trinidad Ambulance                          | 2.907             | \$10,900         |
| Spanish Peaks II          | Las Animas | Spanish Peaks- and Bon Carbo Fire           | 3.950             | \$14,800         |
| Spanish Peaks II          | Las Animas | Spanish Peaks-Purgatoire River Conservation | 0.500             | \$1,900          |



# APPENDIX A PROPERTY TAX REVENUE BY PROJECT

## ESTIMATED PROPERTY TAX REVENUE BY PROJECT, COUNTY, AND DETAILED DISTRICT FOR RENEWABLE ENERGY FACILITIES IN EASTERN COLORADO BY 2024 CONTINUED

| Project                   | County   | District                                 | 2019<br>Mill Levy | Estimated<br>Tax    |
|---------------------------|----------|--|-------------------|---------------------|
| Spring Canyon             | Logan    | Logan                                    | 29.941            | \$130,000           |
| Spring Canyon             | Logan    | Plateau RE-5 School District             | 25.384            | \$110,200           |
| Spring Canyon             | Logan    | Peetz Fire                               | 3.447             | \$15,000            |
| Spring Canyon             | Logan    | Logan County Water Conservancy           | 0.853             | \$3,700             |
| Spring Canyon Expansion   | Logan    | Logan                                    | 29.941            | \$99,000            |
| Spring Canyon Expansion   | Logan    | Plateau RE-5 School District             | 25.384            | \$84,000            |
| Spring Canyon Expansion   | Logan    | Peetz Fire                               | 3.447             | \$11,400            |
| Spring Canyon Expansion   | Logan    | Logan County Water Conservancy           | 0.853             | \$2,800             |
| Thunder Wolf <sup>1</sup> | Pueblo   | Pueblo                                   | 30.722            | \$1,033,300         |
| Thunder Wolf <sup>1</sup> | Pueblo   | Average School                           | 36.844            | \$1,239,200         |
| Thunder Wolf <sup>1</sup> | Pueblo   | Pueblo City-County Library District      | 5.271             | \$177,300           |
| Thunder Wolf <sup>1</sup> | Pueblo   | Average Special District                 | 3.143             | \$105,700           |
| Titan                     | Arapahoe | Arapahoe                                 | 14.301            | \$67,100            |
| Titan                     | Arapahoe | Arapahoe County LEA                      | 4.982             | \$23,400            |
| Titan                     | Arapahoe | Bennett 29J School District              | 32.296            | \$151,500           |
| Titan                     | Arapahoe | Deer Trail Fire                          | 7.032             | \$33,000            |
| Titan                     | Arapahoe | North Kiowa Bijou Water                  | 0.022             | \$100               |
| Twin Buttes               | Bent     | Bent                                     | 30.604            | \$166,100           |
| Twin Buttes               | Bent     | McClave RE-2 School District             | 24.445            | \$132,600           |
| Twin Buttes               | Bent     | Lower Arkansas Valley Water Conservancy  | 1.503             | \$8,200             |
| Twin Buttes               | Bent     | Bent County-Las Animas Cemetary District | 2.000             | \$10,900            |
| Twin Buttes II            | Prowers  | Prowers                                  | 27.170            | \$151,400           |
| Twin Buttes II            | Prowers  | Lamar RE-2 School District               | 23.664            | \$131,900           |
| Twin Buttes II            | Prowers  | Prowers County Hospital District         | 2.723             | \$15,100            |
| <b>Total</b>              |          |  |                   | <b>\$23,133,800</b> |

Source: County assessor's offices; Colorado Division of Property Taxation; Development Research Partners.

Note: Estimates for existing projects based on tax districts that will likely be impacted based on general location of projects from publicly available information. Data shown may not include all districts that will be impacted by the above projects. In cases where exact project locations were not known, average mill levies for tax district types were utilized from the 2018 Annual Report from the Colorado Division of Property Taxation. Actual values and taxes realized will be dependent on realization of prospective projects, final state assessments, final project locations, tax district designations, and mill levies. Estimates represent average revenue over the first 20 years.

# APPENDIX B PROPERTY TAX REVENUE BY COUNTY

## PROPERTY TAX REVENUE BY COUNTY AND TAX DISTRICT FOR RENEWABLE ENERGY FACILITIES IN EASTERN COLORADO BY 2024

| County     | District   | 2019<br>Mill Levy | Estimated<br>Tax |
|------------|--|-------------------|------------------|
| Arapahoe   | Arapahoe   |                   | \$75,100         |
| Arapahoe   | Arapahoe County LEA                                |                   | \$26,100         |
| Arapahoe   | Arapahoe County Library                            |                   | \$3,300          |
| Arapahoe   | Bennett 29J School District                        |                   | \$169,400        |
| Arapahoe   | Deer Trail Fire                                    |                   | \$36,900         |
| Arapahoe   | North Kiowa Bijou Water                            |                   | \$100            |
| Bent       | Bent   |                   | \$166,100        |
| Bent       | Bent County-Las Animas Cemetary District           |                   | \$10,900         |
| Bent       | Lower Arkansas Valley Water Conservancy            |                   | \$8,200          |
| Bent       | McClave RE-2 School District                       |                   | \$132,600        |
| Cheyenne   | Cheyenne   |                   | \$191,400        |
| Cheyenne   | Cheyenne County Fire No. 1                         |                   | \$15,100         |
| Cheyenne   | Cheyenne County Hospital District                  |                   | \$49,100         |
| Cheyenne   | Cheyenne County RE-5 School District               |                   | \$191,700        |
| Cheyenne   | East Cheyenne County Library                       |                   | \$12,100         |
| Cheyenne   | East Cheyenne Recreation                           |                   | \$12,100         |
| Cheyenne   | Fairview Cemetery District                         |                   | \$5,600          |
| Cheyenne   | Keefe Memorial Health Service                      |                   | \$126,300        |
| Cheyenne   | Kit Carson Cemetery                                |                   | \$100            |
| Cheyenne   | Kit Carson R-1 School District                     |                   | \$16,400         |
| Cheyenne   | West Cheyenne Fire                                 |                   | \$800            |
| El Paso    | Calhan Fire  |                   | \$87,500         |
| El Paso    | Calhan RJ-1 School District                        |                   | \$368,800        |
| El Paso    | Central Colorado Conservation                      |                   | \$0              |
| El Paso    | Double El Conservation                             |                   | \$0              |
| El Paso    | El Paso  |                   | \$156,500        |
| El Paso    | Fountain 8 School District                         |                   | \$148,300        |
| El Paso    | Hanover Fire                                       |                   | \$32,600         |
| El Paso    | Pikes Peak Library                                 |                   | \$78,700         |
| El Paso    | Southeastern Colorado Water Conservancy - Contract |                   | \$4,100          |
| Elbert     | Agate Soil Conservation                            |                   | \$0              |
| Elbert     | Big Sandy 100J School District                     |                   | \$473,400        |
| Elbert     | Big Sandy Fire                                     |                   | \$100,500        |
| Elbert     | Double El Soil Conservation                        |                   | \$0              |
| Elbert     | Elbert   |                   | \$702,900        |
| Elbert     | Limon Area Fire                                    |                   | \$31,200         |
| Elbert     | Limon RE-4B School District                        |                   | \$332,800        |
| Elbert     | Upper Big Sandy Water                              |                   | \$1,600          |
| Huerfano   | Fire   |                   | \$31,800         |
| Huerfano   | Huerfano   |                   | \$167,300        |
| Huerfano   | Huerfano County Hospital                           |                   | \$55,000         |
| Huerfano   | Huerfano County Water Conservation                 |                   | \$16,700         |
| Huerfano   | Library  |                   | \$35,300         |
| Huerfano   | School District                                    |                   | \$245,400        |
| Kit Carson | Arikaree Groundwater Management District           |                   | \$300            |
| Kit Carson | Arriba-Flagler C-20 School District                |                   | \$567,300        |

# APPENDIX B PROPERTY TAX REVENUE BY COUNTY

## PROPERTY TAX REVENUE BY COUNTY AND TAX DISTRICT FOR RENEWABLE ENERGY FACILITIES IN EASTERN COLORADO BY 2024 CONTINUED

| County     | District                                    | 2019<br>Mill Levy | Estimated<br>Tax |
|------------|---|-------------------|------------------|
| Kit Carson | Bethune R-5 School District                 |                   | \$73,900         |
| Kit Carson | Burlington Fire                             |                   | \$43,700         |
| Kit Carson | Burlington School District                  |                   | \$471,300        |
| Kit Carson | Fairview Cemetery District                  |                   | \$29,400         |
| Kit Carson | Flagler Rural Fire                          |                   | \$58,400         |
| Kit Carson | Hi-Plains R-23 School District              |                   | \$308,200        |
| Kit Carson | Kit Carson                                  |                   | \$1,965,800      |
| Kit Carson | Kit Carson County Health Service District   |                   | \$155,300        |
| Kit Carson | Seibert Cemetery District                   |                   | \$4,900          |
| Kit Carson | Seibert Fire                                |                   | \$8,800          |
| Kit Carson | Stratton Cemetery District                  |                   | \$400            |
| Kit Carson | Stratton Fire                               |                   | \$2,800          |
| Kit Carson | Stratton R-4 School District                |                   | \$62,700         |
| Kit Carson | Vona Cemetery                               |                   | \$1,400          |
| Kit Carson | Vona Fire                                   |                   | \$8,700          |
| Las Animas | Aguilar 6 School District                   |                   | \$279,000        |
| Las Animas | Las Animas                                  |                   | \$233,200        |
| Las Animas | Spanish Peaks- and Bon Carbo Fire           |                   | \$89,000         |
| Las Animas | Spanish Peaks-Purgatoire River Conservation |                   | \$11,600         |
| Las Animas | Trinidad Ambulance                          |                   | \$72,200         |
| Las Animas | Upper Huerfano Conservation District        |                   | \$300            |
| Lincoln    | Arikaree Groundwater Management District    |                   | \$5,300          |
| Lincoln    | Arriba Cemetery                             |                   | \$900            |
| Lincoln    | Arriba-Flagler C-20 School District         |                   | \$69,800         |
| Lincoln    | Cemetery                                    |                   | \$1,700          |
| Lincoln    | Fire  |                   | \$24,400         |
| Lincoln    | Genoa Cemetery                              |                   | \$2,500          |
| Lincoln    | Genoa/Hugo C113 School District             |                   | \$424,100        |
| Lincoln    | Ground Water Management                     |                   | \$2,600          |
| Lincoln    | Hugo Fire                                   |                   | \$23,600         |
| Lincoln    | Limon Area Fire                             |                   | \$57,600         |
| Lincoln    | Limon School District                       |                   | \$339,500        |
| Lincoln    | Lincoln                                     |                   | \$1,646,100      |
| Lincoln    | Northeast Lincoln Fire                      |                   | \$3,900          |
| Lincoln    | School District                             |                   | \$204,300        |
| Lincoln    | Upper Big Sandy Water                       |                   | \$1,800          |
| Logan      | Crook Fire Protection District              |                   | \$51,400         |
| Logan      | Fleming Fire                                |                   | \$27,600         |
| Logan      | Frenchman Groundwater Management            |                   | \$0              |
| Logan      | Frenchman RE-3 School District              |                   | \$503,100        |
| Logan      | Haxton Fire Protection District             |                   | \$18,200         |
| Logan      | Haxton Soil Conservation                    |                   | \$5,100          |
| Logan      | Haxtun Fire                                 |                   | \$800            |
| Logan      | Logan                                       |                   | \$1,291,700      |
| Logan      | Logan County Pest Control                   |                   | \$5,700          |
| Logan      | Logan County Water Conservancy              |                   | \$36,800         |
| Logan      | Lower South Platte Water Conservancy        |                   | \$2,300          |
| Logan      | Peetz Fire                                  |                   | \$26,400         |
| Logan      | Peetz Fire Protection District              |                   | \$61,900         |
| Logan      | Plateau RE-5 School District                |                   | \$649,800        |



# APPENDIX B PROPERTY TAX REVENUE BY COUNTY

## PROPERTY TAX REVENUE BY COUNTY AND TAX DISTRICT FOR RENEWABLE ENERGY FACILITIES IN EASTERN COLORADO BY 2024 CONTINUED

| County       | District  | 2019<br>Mill Levy | Estimated<br>Tax    |
|--------------|---|-------------------|---------------------|
| Prowers      | Lamar RE-2 School District                          |                   | \$250,000           |
| Prowers      | Prowers   |                   | \$287,000           |
| Prowers      | Prowers County Hospital District                    |                   | \$28,800            |
| Pueblo       | Average School                                      |                   | \$2,788,000         |
| Pueblo       | Average Special District                            |                   | \$237,800           |
| Pueblo       | Pueblo  |                   | \$2,514,500         |
| Pueblo       | Pueblo 70 School District                           |                   | \$247,200           |
| Pueblo       | Pueblo City-County Library District                 |                   | \$431,400           |
| Pueblo       | Pueblo Rural Fire Protection                        |                   | \$149,900           |
| Pueblo       | Southeastern Colorado Water Conservancy - Contract  |                   | \$5,600             |
| Pueblo       | Southeastern Colorado Water Conservancy - Operating |                   | \$200               |
| Washington   | Lone Star 101 School District                       |                   | \$131,000           |
| Washington   | Otis Rural Fire                                     |                   | \$10,300            |
| Washington   | Washington  |                   | \$146,700           |
| Washington   | Washington County Pest Control                      |                   | \$8,500             |
| Weld         | Aims Junior College                                 |                   | \$233,600           |
| Weld         | Centennial Conservation                             |                   | \$0                 |
| Weld         | Central Colorado Water Conservancy (CCW)            |                   | \$25,700            |
| Weld         | Fort Lupton Fire                                    |                   | \$12,000            |
| Weld         | High Plains Library                                 |                   | \$120,500           |
| Weld         | Northern Colorado Water                             |                   | \$1,200             |
| Weld         | Pawnee Fire   |                   | \$15,300            |
| Weld         | Pawnee RE-12 School District                        |                   | \$110,800           |
| Weld         | Prairie RE-11 School District                       |                   | \$48,200            |
| Weld         | Raymer-Stoneham Fire                                |                   | \$20,900            |
| Weld         | RE-3J Keenesburg                                    |                   | \$306,400           |
| Weld         | S.E. Weld Fire                                      |                   | \$158,800           |
| Weld         | Southeast Weld Conservation                         |                   | \$0                 |
| Weld         | Weld  |                   | \$557,000           |
| Weld         | Weld County RE-8 School District                    |                   | \$24,000            |
| Weld         | West Greeley Conservation District                  |                   | \$5,200             |
| <b>Total</b> |   |                   | <b>\$23,133,800</b> |

Source: County assessor's offices; Colorado Division of Property Taxation; Development Research Partners.

Note: Estimates for existing projects based on tax districts that will likely be impacted based on general location of projects from publicly available information. Data shown may not include all districts that will be impacted. In cases where exact project locations were not known, average mill levies for tax district types were utilized from the 2018 Annual Report from the Colorado Division of Property Taxation. Actual values and taxes realized will be dependent on realization of prospective projects, final state assessments, final project locations, tax district designations, and mill levies.

## ABOUT THE WESTERN WAY:

---

The Western Way is a nonprofit organization urging Western conservative leaders to acknowledge actual environmental challenges and deliver efficient, pro-market solutions. The Western Way engages policy makers across the Interior Rocky Mountain West region of our country to provide proactive and constructive solutions that grow our economy and benefit the environment. The Western Way works with leaders from Arizona, Colorado, Idaho, Montana, Nevada, Utah, and Wyoming. To learn more and to stay up to date with The Western Way, please visit <http://www.thewesternway.org>.

## ABOUT RESEARCH DEVELOPMENT PARTNERS:

---

Development Research Partners specializes in economic research and analysis for local and state government and private sector businesses. Founded in 1994, Development Research Partners combines extensive experience in real estate economics and economic development to provide clients with insightful and strategic consulting services in four areas of expertise: Economic and Demographic Research, Industry Studies, Fiscal and Economic Impact Analysis, and Real Estate and Public Finance Economics.

Patricia Silverstein, President & Chief Economist

Lisa Strunk, Senior Economist

10184 West Belleview Avenue, Suite 100 Littleton, Colorado 80127

[www.DevelopmentResearch.net](http://www.DevelopmentResearch.net)

<sup>1</sup> Energy Information Administration, Electric Power Annual, 2018. <sup>2</sup> Unsubsidized levelized cost of energy quantifies the net present value of the cost of a facility over its lifetime including initial capital investment and on-going operations. Reference Lazard's Levelized Cost of Energy Analysis – Version 13.0. <https://www.lazard.com/media/451086/lazards-levelized-cost-of-energy-version-130-vf.pdf> <sup>3</sup> Scott, Mike. "Solar and Wind Costs Continue to Fall as Power Becomes Cleaner." Forbes, April 30, 2020. <https://www.forbes.com/sites/mikescott/2020/04/30/solar-and-wind-costs-continue-to-fall-as-power-becomes-cleaner/#2ef2c7a8785f> <sup>4</sup> Morehouse, Catherine. "Treasury Department Offers Wind Industry Coronavirus Lifeline with Safe Harbor Extension." Utility Dive, May 12, 2020 (Updated May 28, 2020). <https://www.utilitydive.com/news/treasury-department-offers-wind-industry-coronavirus-lifeline-with-proposed/577720/> <sup>5</sup> Reference Fu, Feldman, and Margolis, "U.S. Solar Photovoltaic System Cost Benchmark" reports from the National Renewable Energy Laboratory, Q1 2016 – Q1 2018. Also reference Fu, Remo, and Margolis, "2018 U.S. Utility-Scale Photovoltaics-Plus-Energy Storage System Costs Benchmark, National Renewable Energy Laboratory, November 2018. Reports available at [www.nrel.gov/publications](http://www.nrel.gov/publications). <sup>6</sup> Jeremy Stefek, Anna Kaelin, Suzanne Tegen, Owen Roberts, and David Keyser, "Economic Impacts from Wind Energy in Colorado Case Study: Rush Creek Wind Farm," National Renewable Energy Laboratory, September 2019. <sup>7</sup> Reference Pro 15's "The Benefits of the Renewable Energy Industry in Eastern Colorado," May 2016. <sup>8</sup> American Wind Energy Association, State Wind Energy Facts. "Wind Energy in Colorado," April 2020. <http://www.awea.org/resources/fact-sheets/state-facts-sheets>. <sup>9</sup> A full-time equivalent worker is defined as one person working full time for one year. <sup>10</sup> Earnings represent employee compensation that directly benefits the local economy including wages and salaries and a portion of employee benefits. This includes items such as paid leave, supplemental pay, and health insurance benefits. Employee benefits that are excluded include Social Security, Medicare, unemployment insurance, and retirement, among others.

