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.
- 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
- Construction benefits are temporary, occurring only during construction.

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.
- 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
Construction Activity (2000 to 2024)			
Value of Output ($M)	$2,749.7	$3,102.0	$5,851.7
Earnings ($M)	$355.6	$351.3	$706.9
Employment	5,544	7,275	12,819
Annual Operations and Maintenance (2024)			
Value of Output ($M)	$214.6	$174.0	$388.6
Earnings ($M)	$21.9	$34.8	$56.7
Employment	352	737	1,089