



MetroDenverEDC



2023 INDUSTRY CLUSTER STUDY

# ENERGY & NATURAL RESOURCES

METRODENVER.ORG

## ABOUT



The Metro Denver Economic Development Corporation (Metro Denver EDC) is the nation's first regional economic development entity, bringing together the entire nine-county Metro Denver and Northern Colorado region to promote and support the mutual growth of our region's talent and businesses, while also recruiting new talent and new business to join us living a prosperous and elevated life.

Metro Denver is a region on the rise, fueled by the passion of changemakers and boundary breakers that are in it for the long haul. With a culture that's always moving forward, the companies that call this community home are poised to make a real impact - one that goes beyond their own four walls - as we work together to build the best possible future for our region.

As part of the Metro Denver EDC brain trust, our 250+ investors get unmatched access to the decisions, directions and collaboration opportunities that are transforming the landscape of our economy, region and communities.

Join us to make your voice heard, collaborate with the region's top business executives, and be part of leading the changes you want to see happen.

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## 2023 INDUSTRY CLUSTER SCAN

# ENERGY & NATURAL RESOURCES

By The Numbers

## INDUSTRY SNAPSHOT US NUMBERS IN PARENTHESIS



COMPANIES: 10,260  
AVERAGE WAGE: \$104,700  
EMPLOYMENT CONCENTRATION RANKING: 11

Direct Employment: 88,280

Direct Employment Concentration (2022): 3.1% (2.6%)

5-Year Employment Growth (2017 - 2022): 1.4% (-2.2%)

1-Year Employment Growth (2022): 3.5% (3.09%)

# INDUSTRY OVERVIEW

Colorado has one of the most diverse energy economies in the U.S. and is a national leader in both natural and renewable resources. The state's balanced energy approach allows for technological advances across the Energy and Natural Resources sector. Colorado is a top 10 state for installed wind, the fifth-largest crude oil-producer, and is among the top-5 states in LEED-certified energy efficient building space per capita. Significant intellectual capital, world-class research institutions, and industry collaboration drive energy job growth and fuel innovation. The state has some of the most ambitious climate goals targeting a 50% reduction in emissions by 2030 and 90% by 2050. These goals are bolstered by energy-specific policies enacted over the last few years, tax credits, partnerships to build charging stations, and zero-emission vehicle standards. In 2022, Congress passed the Inflation Reduction Act (IRA), which created about \$370 billion in climate and clean energy incentives. The law includes credits preventing methane leaks, developing carbon capture technology, and building electric vehicles, wind turbines, and solar panels.

While the Energy and Natural Resources cluster comprises about 3% of Colorado's workforce, the cluster generates some of the highest per worker income levels in the state. Colorado's Energy and Natural Resources cluster contributes nearly \$18.7 billion in Gross Domestic Product (GDP) or 3.9% of the state GDP. The cluster employs 88,280 workers in nearly 10,770 companies and pays nearly \$8.9 billion in wages annually.

# CLUSTER DEFINITION

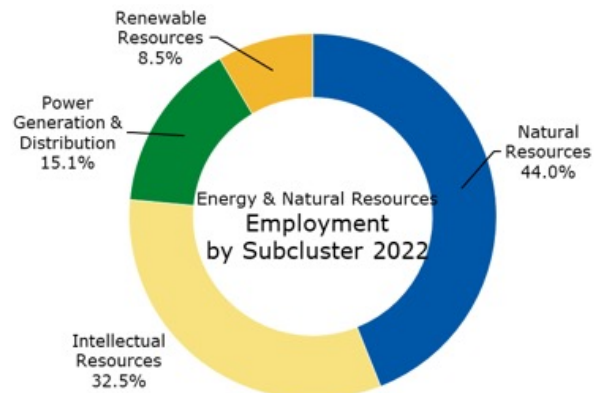
The Energy & Natural Resources cluster consists of 97, six-digit North American Industry Classification System (NAICS) codes including companies comprised of natural resources, power generation and distribution, renewable resources, and intellectual resources. This definition allows for a comparative analysis of Colorado's Energy & Natural Resources cluster relative to other states.

# CLUSTER JOB TRENDS

- » The number of Energy & Natural Resources companies in Colorado has increased every year since 2012, despite volatile employment during this period.
- » Colorado ranked second among the 50 states for concentration of Energy & Natural Resources companies in 2022.
- » Between 2017 and 2022, the number of Energy & Natural Resources companies in Colorado increased 40%.
- » The Energy & Natural Resources cluster employed 3.1% of the state's total employment base.
- » The state ranked 7th among the 50 states for total Energy & Natural Resources employment and ranked 11th in employment concentration.

## Notable Subcluster Trends

- » All four subclusters posted employment increases in 2022, with the largest gains in intellectual resources (+5.4%) and renewable resources (+5.1%).
- » Natural resources was the largest subcluster in terms of employment, representing 44%.
- » Oil and gas (17.3%) and energy generation and distribution (13%) represent the largest employment categories in the Energy & Natural Resources cluster.



Sources: Market Analysis Profile, 2022; Development Research Partners.

<sup>1</sup>The nine-county region is comprised of two principal areas, Metro Denver and Northern Colorado. Metro Denver consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson counties. Northern Colorado consists of Larimer and Weld counties.

# MAJOR INDUSTRY INVESTMENTS, EXPANSIONS & MILESTONES

## Natural Resources

Colorado has substantial conventional fossil fuel resources, with coal, petroleum, and natural gas the overwhelmingly dominant sources of energy production. Colorado is the fifth-largest crude oil-producing state, producing 420,000 barrels per day and the state is the eighth-largest natural gas producer in the nation. While many fossil fuel companies conduct business operations from the Metro Denver region, the majority of the drilling is concentrated along the Western Slope of the Rocky Mountains and in northeastern Weld County. Natural resources companies with headquarter offices in Metro Denver and Northern Colorado include DCP Midstream, Ovintiv, Chevron Corp., and BPX Energy, among others.

## Natural Resources Fun Facts

- » About 53% of Colorado's coalbed and conventional natural gas production in 2022 came from Weld County.
- » Colorado ranks 10th among the 50 states in estimated recoverable coal reserves.
- » About 42% of the net electricity generated in Colorado comes from coal and 26% comes from natural gas.
- » Natural Soda in Garfield County is the second largest producer of sodium bicarbonate in North America.
- » The largest gold producer in the world—Newmont Corp.—is located in Greenwood Village.

Globally, the oil and gas industry experienced significant disruptions in 2022. The invasion of Ukraine by Russia prompted many western European countries to halt imports of Russian natural gas, which triggered the largest shift in international natural gas resources in history. About 70% of liquified natural gas exports from the U.S. were sent to western Europe in 2022, a region that usually receives only about 20% of U.S. exports. An even bigger driver of U.S. natural gas demand came from U.S. power utilities seeking more natural gas for their power plants as they turn away from using coal.





Oil, gas, and coal mining on federal land in Colorado generated \$393 million in revenue in FY2022, the most in 14 years. A combination of increased oil production, higher commodity prices, and new royalty rates and fees led to a 64% increase in revenue in Colorado compared to FY2021, according to figures from the U.S. Department of the Interior. The Biden administration increased the royalty rate for new oil, natural gas, and coal leases to 18.75% from 12.5%, and the Federal Bureau of Land Management raised fees for dozens of types of applications, permits, and renewals. Production on federal lands in Colorado were mixed as both coal and natural gas were down, but oil output was up. Colorado natural gas production dropped 9.5%, while oil output increased 14% compared with 2021. Coal mining on federal land in Colorado was down 17% over-the-year.

Coal output from Colorado's seven active coal mines was 12.33 million tons in 2022, up slightly from the 12.14 produced in 2021 and a significant increase from 2020 when statewide coal production fell to a decades' low of 10.6 million tons, according to state Division of Reclamation, Mining, and Safety reports. The West Elk Mine in North Fork Valley accounted for more than a third of total production and increased by more than 1.1 million tons over-the-year to 4.4 million tons in 2022. Demand for coal among the region's coal-fired power plants rose as utilities used more electricity generated from coal to counter the rising price of natural gas.

In the first half of 2022, crude oil production increased 9% compared to the same period in 2021. As of mid-September 2022, the Colorado Oil and Gas Conservation Commission approved 35 new drilling sites and permitted 773 new wells. This increase came after Colorado oil production fell by more than 10% for two consecutive years in 2020 and 2021, reflecting the slow pace of well drilling following the crash caused by the COVID-19 pandemic, coupled with the naturally falling output of existing oil and gas wells. Wells in the state produced 153.5 million barrels of crude oil in 2021, down from a peak of 192.2 million barrels in 2019 and the lowest annual amount since 2017.

Natural gas production in Colorado also declined between 2020 and 2021. Wells produced 2.175 trillion cubic feet of natural gas in 2021, down 5.5% from 2020 and down 11.7% from the record high in 2019.

In Colorado, the number of drilling rigs operating rose nearly 75% in 2022, but the 21 actively drilling at years' end still lag below the number typically active before the pandemic. Colorado's slow rebound from the COVID-19-era collapse of oil is due in part to the state's reputation of being more demanding of oil and gas operators. State rule reforms that took effect in early 2021 delayed the approval of new drilling locations, however there was an uptick in the Colorado Oil & Gas Conservation Commission's project approvals in late 2022.



## New Project Approvals

- » A 69-well drilling plan by **PDC Energy Inc.** and a 32-well project by **Bayswater Exploration & Production LLC** won approval from the Colorado Oil & Gas Conservation Commission. This was the largest single batch of new drilling approvals since the 2021 state rule reforms. Both companies met the COGCC's tightened standards and have agreed to pipe away oil and natural gas produced by the wells, conduct air emissions monitoring, and take other steps to minimize potential impacts. Construction is already underway on the Bayswater project and the wells are expected to be completed and producing oil and gas by July 2022. The PDC Energy project, called the Kenosha oil and gas development, is expected to begin physical work in 2024.
- » The Colorado Oil & Gas Conservation Commission also approved **PDC Energy's** plan to drill an additional 464 oil and gas wells on 33,427 acres south of Greeley over the next eight years, with the company expected to invest over \$1.5 billion in drilling, building extensive pipeline networks, and taking other steps to minimize pollution and greenhouse gas emissions. The project, known as the Guanella Comprehensive Area Plan, is expected to begin drilling in 2024, with well development through 2028.
- » **Crestone**, a subsidiary of **Civitas Resources Inc.** won approval from the state to drill 151 wells across 37,520 acres of mostly undeveloped land in eastern Aurora. The company estimates the first well will be drilled in late 2023 or early 2024.
- » **Occidental Petroleum** won approval from Colorado regulators for a large-scale oil and gas well development, called the Bronco project, on 34 square miles in Weld County. The Houston-based company will drill as many as 209 new wells as part of the project.
- » The city of Thornton closed a \$33 million deal with Denver-based **Phoenix Capital Group Holdings** to sell the rights to oil and gas it owns in Adams and Weld counties. The company bought 4,000 royalty acres, and is one of the largest such acquisitions in Colorado's Denver-Julesburg Basin.
- » **Bayswater Exploration & Production LLC** bought oil and gas well locations plus operating wells in Weld County from **Nickel Road Operating LLC**. The purchase included 2,752 acres of leased area and 161 acres of mineral rights.
- » The downturn for the oil industry triggered by the pandemic cemented a new business model focus in the industry, as oil and gas companies have responded to pressure from investors to operate more efficiently and have prioritized consolidation. Oil company mergers have shifted or



combined headquarters and many companies have otherwise cut back to the point that the industry now fills only 10.6% of downtown Denver office space, down from leasing half of the business districts offices in the 1980s and 25% in 2015, according to CBRE.

### Headquarter relocations, Mergers, and Acquisitions

- » **DCP Midstream**, a natural gas processing and pipeline business, moved its headquarters from downtown Denver to the Denver Tech Center. The company's integrated collaboration center, where the company runs its natural gas processing plants, will remain in downtown Denver's Republic Plaza building.
- » **Crusoe Energy** is moving its headquarters from Downtown Denver to a space in Cherry Creek that will approximately double the firm's footprint.
- » **PDC Energy Inc.**, one of Denver's largest oil producers, acquired **Great Western Petroleum LLC**, the largest privately held oil and gas company in the Denver-Julesburg Basin, valued at \$1.3 billion.
- » Denver-based **Whiting Petroleum Corp.** merged with Houston-based Oasis Petroleum Inc. in a deal combining two major North Dakota oil and gas producers into one company valued at \$6 billion, called **Chord Energy**. The Whiting headquarters office in Denver is expected to close in 2023, with many employees being offered the option to transfer to other company locations.
- » Denver-based energy services startup **Greenfield Environmental Solutions Group** acquired Wyoming-based Cannon Oil and Gas Well Services, a company experienced in capping and decommissioning oil and gas wells.
- » Commerce City-based **Offen Petroleum** acquired the wholesale division of **G&S Oil Products**, a fuel distributor and gas station owner based in Centennial.
- » Downtown Denver-based **Centennial Resource Development Inc.** merged with Texas-based Colgate Energy in a stock transaction that will base the combined company in Midland, Texas. The new company will retain Centennial Resource Development's office in Denver as a base for the new company's operations.

### Mining

Mining is historically significant and remains an important player and critical economic driver in Colorado. There are over 80 mining companies headquartered in Colorado, including one of the largest gold mining companies in the world—Newmont Corporation, which operates 12 gold mines in 8 countries.

The mining industry – not including oil and gas – contributes over \$1.2 billion toward Colorado's GDP and Colorado ranked fourth among the states with the highest mineral royalty disbursements. Post-pandemic labor uncertainties and global supply chain inflation has complicated international market conditions, while the continued war in Ukraine and record inflation rates have increased the cost of commodities and raw materials globally. Some of Colorado's mining companies made major changes to projects or operations in 2022:

- » Greenwood Village-based **Newmont Corp.** bought out two other partners, in a pair of deals worth more than \$400 million, to become the sole owner of South America's largest gold mine; the Yanacocha mine in Peru. Due to supply chain unpredictability and global inflation, the company slowed down expansion plans to add large-scale copper extraction at the mine.
- » Australian mining explosives firm **Orica** plans to move its North American headquarters to an office building in Centennial from the 478-acre campus in Aurora where it developed mining explosives and mining-related technologies since 1990. About 100 employees are connected to the campus, which was originally built for double that number. The new location is hoped to improve employee retention and recruiting by being closer to the heart of Metro Denver. Orica will continue to use laboratory buildings and a blast tank on the Aurora property until a new arrangement for those functions is made.





## Renewable Resources

Renewable energy in Colorado is an established and vital engine for industry growth. Federal laboratories, university resources, and a strong innovative culture combine to create one of the fastest growing regions for renewable energy in the nation. Colorado ranked No. 5 among the top cleantech innovation hubs in the nation, according to Saoradh Enterprise Partners' 2022 Cleantech Innovation Hubs Survey. U.S. News & World Report ranked Colorado #8 among the states for wind energy production and the state ranked #13 in the 2022 State Energy Efficiency Scorecard.

## Renewable Energy Facts

- » Wind is the largest component of Colorado's renewable energy mix.
- » 27% of the net energy generated in Colorado comes from wind power.
- » Colorado's renewable electricity net generation has more than tripled since 2010.
- » Colorado ranked seventh among the states in installed wind power capacity in 2021.
- » Colorado ranked among the top-20 states for the percentage of its electricity generated from renewable sources.

Colorado ranked 2nd among the states for sustainability startups, with 12 startups per 100,000 residents, according to a Promoleaf analysis. Among top cities, Boulder ranked No. 1 nationally and was deemed the top city for sustainability startups. Boulder is particularly strong in renewable energy startups, with 60 renewable energy companies per 100,000 residents. Wunder Capital, a late-state startup that develops and manages solar investment funds, and CU's Venture Partners, which helps faculty and researchers build startups out of tech and innovation developed on the campus, have helped establish many of the sustainability startups in Boulder.

According to the industry census published by the Interstate Renewable Energy Council, solar power jobs surged in Colorado in 2021 and set a new industry employment record in the state. The sector employed 7,462 people in 2021, up 9.7% from 2020. Colorado now ranks seventh in solar industry employment.

Companies in the renewable resources subcluster fuel economic growth, create jobs, and foster technology development.

- » **Vestas Wind System AS**, which has several facilities in Colorado, has become the leading global manufacturer of wind turbines, according to analytics company Global Data. Vestas has 13.3 gigawatts of installations and 19% market share. GE Renewable Energy has 11.7 gigawatts of installations and the second largest market share (13.4%).
- » **CS Wind**, a South Korea-based company that produces towers for wind turbines, plans to expand its Pueblo factory, which is already the largest in the world. CS Wind hopes to triple its workforce to more than 1,100 employees and add two new buildings.
- » Green energy technology company **Fortescue Future Industries** is expanding its U.S. operations by opening a green hydrogen center in Golden that is expected to create more than 150 jobs. This project will work in conjunction with the U.S. Department of Energy's **National Renewable Energy Laboratory** facility in Golden.
- » Houston-based **Cemvita Factory Inc.** opened a lab in Westminster where it is using modern biotech engineering techniques to make microbes capable of extracting copper, nickel, zinc, lithium, and iron ore – materials in demand for making battery and renewable energy products. There are currently 10 employees in the 5,500-square-foot office and lab and the company expects to expand to 30 employees by the end of the year.
- » Denver-based **Echelon Energy** launched in 2021 with one employee and has since grown its headcount to about 20. The startup aims to help owners of large businesses reduce their energy and water use and save money in the process.
- » **Occidental Petroleum**, along with partners that include the **National Renewable Energy Laboratory** and the **Colorado School of Mines** have secured a \$9 million grant from the U.S. Department of Energy for a project called Geothermal Limitless Approach to Drilling Efficiencies (GLADE). The team will drill the wells using existing and novel drilling technologies, allowing them to drill to deeper and hotter depths than most existing geothermal, and at a faster rate.
- » Thornton-based solar manufacturer **Ascent Solar Technologies** raised \$50 million in financing that it plans to use to spark new growth in the 17-year-old company. The company employs about 65 people and makes flexible, thin-film photovoltaic solar power products that can be used in applications that are not possible for traditional, stiff solar panels.
- » Lakewood-based energy trading company **United Energy Trading (UET)** joined New York City-based Green Rock Energy Partners' acquisition of the PSA South Hills Landfill



Gas Venture LLC and its renewable natural gas facility that is being built and expected to start production in mid-2023. UET helps manage the sale and logistics of the renewable natural gas generated from the landfill. Production at the facility is expected to exceed 1 million gallons of renewable fuel annually.

Several renewable energy power plants were either completed or underway in 2022:

- » A new solar installation at the **Colorado Mountain College Spring Valley Campus** in Glenwood Springs was powered up in 2022. The 4.5 MW solar array spans 22 acres and is the largest solar battery storage facility in the state.
- » The Johnstown town council approved a use by special review and subdivision plat for **SunCatcher**, a solar energy facility that will be located on 44 acres at the southwest corner of Telep Avenue and Weld County Road 46. The facility will be developed by Denver-based **Pivot Energy** and will consist of 17,000 to 20,000 solar panels to be developed in two phases. Energy generated by the solar farm will be sent to the Xcel Energy grid, then distributed to any Johnstown-area customers who have signed up for the town's community solar program.
- » The Delta County Commissioners are reconsidering a proposed solar-energy farm planned by Denver-based **Guzman Energy**. The 80-megawatt solar installation across 472 acres will be about two miles east of Delta in Western Colorado. The land, which has been a ranch, will still be used for agriculture and an area ranching operation plans to graze 1,000 sheep on the land.
- » **Hesperus Primergy Solar** has proposed a 1,900-acre solar project in La Plata County that would include battery storage and enough energy to power 56,000 homes annually. Construction is expected to begin in September 2024, with commercial operations beginning by the end of 2025.

**Climate Tech:** According to pitchbook, investment in climate-tech startups, particularly those focused on carbon and emissions, held steady in 2022 with strong deal values. As deals slowed overall in the third quarter of 2022, carbon and emissions startups experienced their third-strongest quarter on record, with \$4.8 billion raised and the sector is on track to surpass its 2021 funding levels. With continued focus on reaching ambitious climate goals, several companies related to carbon sequestration and emissions monitoring at oil and gas sites received large amounts of funding and experienced rapid growth in 2022:

- » Denver-based **Crusoe Energy**, a company that captures excess natural gas produced during oil and gas extraction and converts it into electricity used to power modular data centers installed onsite that mine cryptocurrency, closed a \$350 million Series C equity financing round as well as a separate \$155 million line of credit, bringing its total value to \$1.75 billion. The company plans to use the funds to formally launch its high-performance computing business as well as increase its headcount from 150 to more than 250.
- » Denver-based energy tech startup **Project Canary** raised \$111 million in a series B round to fuel the company's growth. Project Canary offers oil and gas producers equipment to monitor for carbon dioxide and methane emissions leaks at their well pads in real time and provide data allowing the companies to find and fix leaks quickly. The company expects to increase its headcount from 75 to 185 in 2023.
- » Snowmass Village-based **Volo Earth Ventures**, a venture firm focused on the climate-tech industry, closed its inaugural fund at \$90 million, which it will use to invest in efforts to reduce carbon emissions. The goal is to invest in startups that are both working to decarbonize supply chains and are offering cost-savings to global corporations. The company is targeting early state startups in North America from the pre-seed stage to Series B rounds. The fund will continue deploying money through 2023.
- » Denver-based natural gas and power company **BVK Corp.** filed to go public and plans to use funds raised in the IPO

to pay off debt it accumulated by making acquisitions and to develop carbon-dioxide capture systems for some of its Barnett Shale natural gas wells, compressing the CO2 emissions, and injecting them into underground geological deposits for permanent storage. The company is pursuing 12 potential CO2 sequestration projects that could collect a total of 30 million metric tons of annual CO2 equivalent emissions that would more than offset the greenhouse gas emissions of BVK's natural gas production. The first two projects are expected to start operating in 2023 and 2025.

- » Boulder-based startup **LongPath Technologies**, which detects emissions from oil and gas operations, raised \$22 million to help prevent more methane leaks. The startup's technology can continuously monitor and quantify methane emissions in the oil and gas industry.
- » Boulder-based **Odyssey Energy Solutions** raised \$5.3 million to streamline renewable energy projects in developing economies across the world. Odyssey provides digital technology and data tools to developers of low-carbon, small-scale energy projects, to help them through the stages of financing, building, and operating the projects.
- » Boulder-based **Copper Labs**, a startup that provides real-time energy-monitoring technology for utilities and consumers, recently raised \$5.5 million in Series A funding. The company plans to double its team of eight over the next year and accelerate adoption of its technology nationwide. The company currently has open roles in sales, engineering, and product and plans to hire locally. A pilot program for its new product is set for this year with commercial deployment anticipated in 2023.
- » Arvada-based **Carbon America**, a startup aiming to commercialize new carbon dioxide capture and sequestration technologies, announced its first project will be collecting carbon dioxide emissions from the Sterling Ethanol and Yuma Ethanol fuel plants and inject them into the first underground sequestration well drilled in the state. The company expects the project will take 18 to 20 months to design, permit, build, and test, with the first underground sequestration to start in the second half of 2024. Carbon

America employs 66 people and is hiring steadily to add more staff, opening a second office in Lakewood. The company aims to have a half-dozen carbon capture and sequestration projects under contract by the end of 2022.

- » Denver-area natural gas pipeline company **Tallgrass Energy** struck a deal with food company ADM to carry pure carbon dioxide gas emissions from a corn processing plant in Columbus, Nebraska, in a repurposed pipeline. It will pump the greenhouse gas into permanent underground storage 400 miles west at a Tallgrass sequestration site southeast of Cheyenne. The ADM carbon sequestration is scheduled to start in 2024.
- » Denver-based **Crusoe Energy**, a company that harnesses natural gas at oil wells to turn it into onsite computing, acquired Arvada-based **Easter-Owens**, a maker of modular data centers and industrial electrical systems. Crusoe also acquired the cryptocurrency-generating assets of North Dakota-based Great American Mining.
- » Denver-based **Project Canary** acquired California-based Aeris Technologies, a company that makes laser-based emissions detection technologies and gas analysis sensors.

Colorado is a leader in low-emission transportation and is committed to adopting alternative fuel vehicles (AFVs) to reduce emissions. Colorado is 1 of 12 states that have adopted the Zero Emission Vehicle (ZEV) program. The state is also pursuing near-complete electrification of vehicles by 2050, with a target of nearly 1 million light-duty electric vehicles in service by 2023 in order to significantly reduce the state's overall greenhouse gas emissions while reducing harmful pollutants.

- » In March 2022, Gov. Jared Polis issued a clean-truck strategy plan touching on how to use state procurement policies, incentives, and infrastructure planning to cut greenhouse gas emissions from these vehicles 45% by 2050.
- » Louisville-based electric vehicle battery company **Solid Power** is expanding operations by building a new 75,000-square-foot factory in Thornton where it will produce commercial quantities of battery electrolyte material. Adding to its Louisville site, the factory will quadruple the company's

manufacturing footprint. Solid Power employs 127 people and expects to add dozens of jobs this year.

- » **Solid Power** has partnered with German car maker BMW Group to establish a pilot battery production line in Germany. BMW will pay Solid Power \$20 million through June 2024 as part of the expanded development agreement and BMW will purchase the electrolyte material needed for the German pilot production line from Solid Power. The agreement will accelerate the installation of BMW's solid-state prototype line as well as work towards both companies' goal of commercializing the cell technology.
- » **Eberspächer Vairex**, formerly Vairex Air Systems, moved from Boulder to a 12,500-square-foot flex space in Lafayette. The new facility is designed to increase the company's production capacity as they experience higher demand for their fuel-celled forklifts. Vairex employs 30 workers in Lafayette and plans to increase its staff to more than 60 by the end of 2023.
- » **Veloce Energy Inc.**, a company developing modular electrification devices, is moving from its north Fort Collins location to the Forge campus in South Loveland. The 16-person company's modular systems are intended to help electric vehicle drivers set up home charging stations without needing to completely rework their existing power lines.
- » **Lightning eMotors** completed a 102,000-square-foot expansion to its manufacturing campus in Loveland, giving the electric vehicle manufacturer more than 226,000 square feet of space. The expansion is part of a \$5 million program to increase quality and consistency throughout the assembly process.
- » Douglas County-based biofuel company **Gevo Inc.** struck contracts with multiple airlines to supply their low-carbon jet fuel it plans to produce from corn. American Airlines plans to buy 100 million gallons annually for five years starting in 2026, Delta Airlines has committed to 75 million gallons starting in 2026, and Irish carrier Aer Lingus will buy 6.3 million gallons annually for five years starting in 2026.



## Power Generation & Distribution

Colorado has two investor-owned electric utilities: Xcel Energy and Black Hills Energy. Xcel Energy, the power utility for the Denver metro area and the largest utility provider in the state, serves over 1.5 million customers. Xcel is the first major U.S. utility to set a goal of 100% clean, carbon-free electricity by 2050 and is more than halfway to achieving its goal across its electric system. As a result, Xcel's utility business in Colorado has the highest active use of wind and solar energy among U.S. power companies serving major urban areas. Black Hills Energy serves 297,000 customers in 119 Colorado communities, and Tri-State Generation & Transmission is headquartered in Westminster serving 42 cooperatives in four states with wholesale power. The federal agency that manages hydropower in 15 states, Western Area Power Administration, is based in Lakewood.

Coloradans are also served by 28 municipal utilities and 22 rural electric cooperatives, providing about 16% of the electricity consumed in the state. The largest municipal utilities are Colorado Springs Utilities and Fort Collins Utilities. Rural electric cooperatives provide nearly 30% of the electricity consumed in Colorado.

» The Colorado Public Utilities Commission approved plans for Colorado's Power Pathway, **Xcel Energy's** \$2 billion project that will upgrade the state's high-voltage transmission system. The pathway will consist of loops of up to 650 miles of high-voltage transmission lines as well as four new substations and four expanded substations. According to Xcel, the project will help the company continue on its path

to reducing carbon emissions in Colorado by more than 85% by 2030, deliver low-cost, renewable energy, and improve the grid's resilience and reliability.

» **Xcel Energy** is building a new service center, office, and warehouse facility on 10 acres at HighPoint Elevated, an industrial park in Aurora near Denver International Airport.

## Intellectual Resources

Colorado's Energy and Natural Resources cluster is supported by significant intellectual capital. Colorado has the second-highest per capita concentration of federally funded science and research centers in the nation with over 30 federal laboratories and research institutions, including NREL in Golden. NREL is the U.S. Department of Energy's (DOE) primary national laboratory for renewable energy and energy efficiency research and development and contributes \$875 million to the state's economy annually. Further, Jefferson County is home to the Colorado School of Mines (CSM), the only university in the nation to offer baccalaureate through doctorate degrees in all key energy fields.

» Golden-based **National Renewable Energy Laboratory (NREL)** partnered with Southern California Gas Co. and GKN Hydrogen Corp. to build a hydrogen storage subsystem at NREL's Flatirons Campus in Boulder. The facility will store hydrogen that will be converted into renewable electricity.

» Toyota USA and the **National Renewable Energy Lab** are completing a facility in Arvada to begin producing hydrogen fuel on an industrial scale.



# ENERGY & NATURAL RESOURCES ECONOMIC PROFILE

## Colorado Rankings, 2022<sup>1</sup>

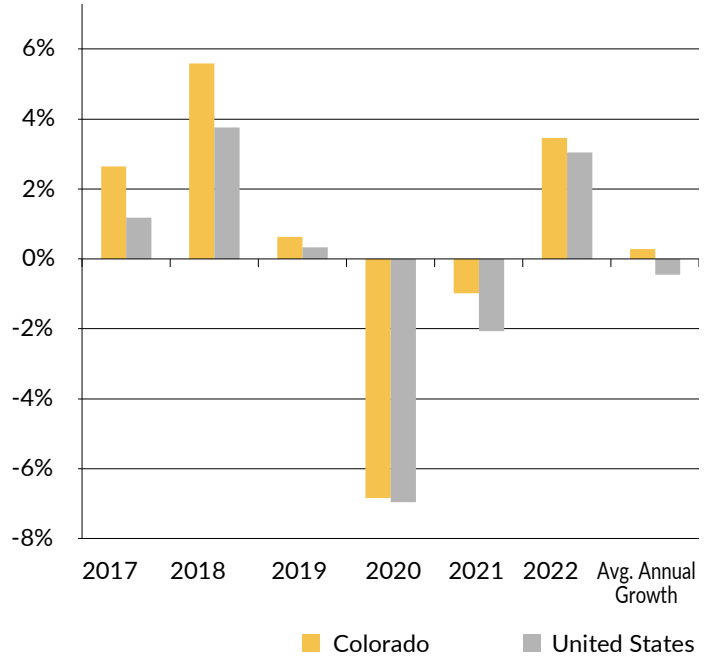
### Energy & Natural Resources Summary

Energy & Natural Resources Direct Employment Rank	7th (up five positions from 2021)
Energy & Natural Resources Employment Concentration Rank	11th (unchanged from 2021)

### Energy & Natural Resources Employment & Company Profile, 2022

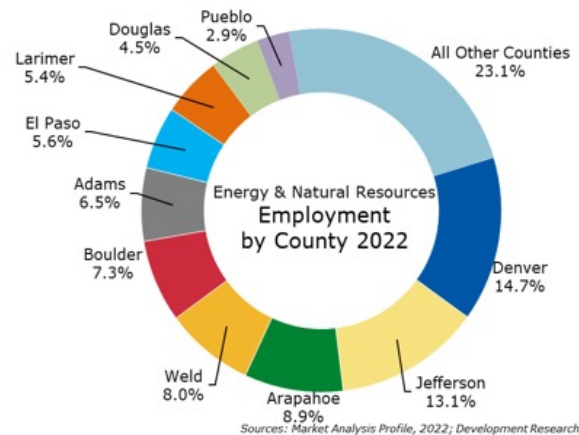
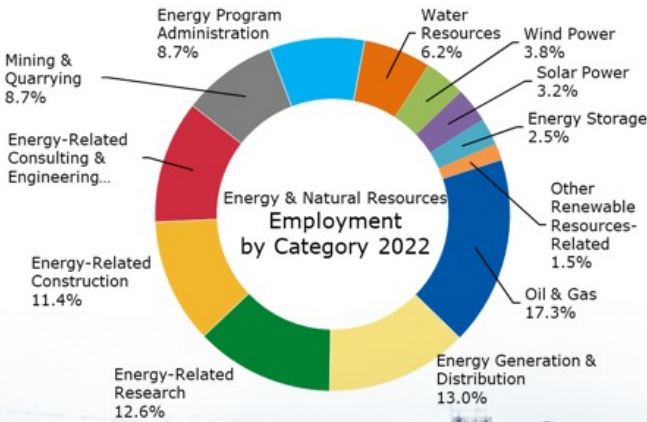
	Colorado	USA
Direct Employment, 2022	88,280	3,872,210
Number Of Direct Companies, 2022	10,770	209,740
One-Year Direct Employment Growth, 2021-2022	3.5%	3.0%
Five-Year Direct Employment Growth, 2017-2022	1.4%	-2.2%
Avg. Annual Direct Employment Growth, 2017-2022	0.3%	-0.5%
Direct Employment Concentration	3.1%	2.6%
% Of Companies With <10 Employees	86.2%	78.6%

## Energy & Natural Resources Number of Employees Growth Rate



Source: Dun & Bradstreet, Inc., Hoover's Online Database; Market Analysis Profile, 2017-2022.

Sources: Dun & Bradstreet, Inc., Hoover's Online Database; Market Analysis Profile, 2017-2022; Development Research Partners.



Sources: Market Analysis Profile, 2022; Development Research Partners.



<sup>1</sup>Direct employment rank based on the number of employees in the industry cluster in a state. Employment concentration rank based on the direct cluster employment in a state expressed as a percent of total employment in all industries in the same state. Rankings are for the 50 states. No multiplier effects are included. 1st = highest for both rankings.

# ENERGY & NATURAL RESOURCES INDUSTRY SUBCLUSTERS

The Energy & Natural Resources cluster is divided into four subclusters: (1) natural resources, (2) power generation and distribution, (3) renewable resources, and (4) intellectual resources.

Natural Resources includes companies that extract naturally occurring minerals, liquids, gases, and solids used to produce energy; mining machinery manufacturers and companies that provide mining, exploration, and related support services; companies involved in mining metallic and nonmetallic minerals, and companies that manage water resources, and improve the use, quality, and flow of water. The natural resources subcluster consists of 51, six-digit NAICS codes.

Power Generation & Distribution includes companies that provide generation, transmission, distribution, and storage of energy resources. The power generation and distribution subcluster consists of 19, six-digit NAICS codes.

Renewable Resources includes companies that produce energy from wind, solar, biomass, fuel cells, green transportation, and hydroelectric resources and companies that manufacture renewable energy equipment. The renewable resources subcluster consists of 18, six-digit NAICS codes.

Intellectual Resources companies provide laboratory testing, scientific and technical consulting services, engineering services, and institutional research related to energy and natural resources. Federal laboratories and firms that provide energy and natural resources-related program administration are also included. The intellectual resources subcluster consists of nine, six-digit NAICS codes.

## Colorado Rankings, 2022<sup>2</sup>

### Subcluster Rankings

Natural Resources	
Natural Resources Direct Employment Rank	7th (unchanged from 2021)
Natural Resources Direct Employment Concentration Rank	11th (up one position from 2021)
Power Generation & Distribution	
Power Generation & Distribution Direct Employment Rank	21th (up three positions from 2021)
Power Generation & Distribution Direct Employment Concentration Rank	29th (up three positions from 2021)
Renewable Resources	
Renewable Resources Direct Employment Rank	7th (unchanged from 2021)
Renewable Resources Direct Employment Concentration Rank	5th (down two position from 2021)
Intellectual Resources	
Intellectual Resources Direct Employment Rank	5th (up four position from 2021)
Intellectual Resources Direct Employment Concentration Rank	7th (up five positions from 2021)

<sup>2</sup>Direct employment rank based on the number of employees in the industry cluster in a state. Employment concentration rank based on the direct cluster employment in a state expressed as a percent of total employment in all industries in the same state. Rankings are for the 50 states. No multiplier effects are included. 1st = highest for both rankings.

## Energy & Natural Resources Subcluster Employment and Company Profile, 2022

	Natural Resources		Power Generation & Distribution		Renewable Resources		Intellectual Resources	
	Colorado	USA	Colorado	USA	Colorado	USA	Colorado	USA
Direct Employment, 2022	39,270	1,634,050	13,350	1,273,390	7,470	113,230	27,380	816,900
Number Of Direct Companies, 2022	3,740	97,620	2,410	35,710	310	9,600	3,790	65,500
One-Year Direct Employment Growth, 2021-2022	1.7%	6.9%	3.7%	-0.4%	5.1%	2.0%	2.9%	-0.5%
Five-Year Direct Employment Growth, 2017-2022	-11.9%	-5.0%	0.9%	-3.9%	6.1%	-7.5%	26.6%	3.0%
Avg. Annual Direct Employment Growth, 2017-2022	-2.5%	-1.0%	0.2%	-0.8%	1.2%	-1.6%	4.8%	0.6%
Direct Employment Concentration	1.4%	1.1%	0.5%	0.8%	0.3%	0.1%	1.0%	0.5%
% Of Companies With <10 Employees	80.4%	75.8%	91.3%	75.3%	73.0%	77.0%	90.2%	84.5%



# INDUSTRY INFRASTRUCTURE SUPPORT



Rocky Mountain Chapter



# ENERGY & NATURAL RESOURCES WORKFORCE PROFILE

- » Colorado has the seventh-highest solar jobs per capita in the U.S. and ranked eighth for total solar jobs, according to the Solar Foundation's Solar Jobs Census 2020.
- » Colorado has the third-largest green workforce in the country, with close to 30,000 people working in the green sector, both directly and indirectly doing jobs that impact the environment (EMSI Burning Glass, 2022).
- » Colorado ranked in the top 20 states for clean energy jobs in 2022 (Renewable Energy World, 2022).
- » Since the passage of the Inflation Reduction Act, there have been 850 new jobs in clean energy announced in Colorado (Climate Power, 2022).
- » Colorado School of Mines ranked No. 5 in petroleum engineering, according to the 2022 U.S. News & World Report.
- » Colorado is forecasted to gain nearly 19,000 net new energy-supply jobs between 2019 and 2030 (Forecasting U.S. Clean Energy Job Creation by State; Elements, 2022).
- » The City and County of Denver was awarded \$2.6 million through its Climate Protection Fund to create and expand workforce training programs for clean energy jobs. The office of Climate Action, Sustainability, and Resiliency funded six programs that provide training for various skill levels in renewable energy and green construction.
- » There are 7 Universities and Community Colleges in Colorado that offer Wind Energy workforce training and education programs (WINDEXchange).
- » Solar Energy International (SEI) and the AES Corporation partnered to create a solar training scholarship program that encourages participation in Colorado's solar industry.

## Age Distribution

- » The largest share of workers in the Energy & Natural Resources cluster—representing 25.1%—were between the ages of 35 and 44 years old.
- » There is a larger share of employees in this cluster that are between the ages of 35 and 64 years old (64.7%), compared with the age distribution across all other industries in the state (57.3%).

## Wages

- » The 2021 average annual salary for workers in the Energy & Natural Resources cluster was \$104,850 in the state, which was 4.1% above the national average of \$100,710.
- » The average starting salary for workers in the Energy & Natural Resources cluster was \$52,620 in the state, compared with \$41,260 across all industries.
- » Total payroll was nearly \$9 billion in 2021.

## Occupation & Salary Profile

The Occupation & Salary Profile includes the 10 largest cluster occupations. It details the total number of workers employed in that occupation across all industries, the number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

# COLORADO ENERGY & NATURAL RESOURCES OCCUPATION & SALARY PROFILE, 2022

10 Largest Energy & Natural Resources Occupations in Colorado	Total Working Across All Industries (2022)	Number of Available Applicants (2022)	Number of Graduates (2021)	Median Salary	10th Percentile Salary	25th Percentile Salary	75th Percentile Salary	90th Percentile Salary
Electricians	20,331	366	185	\$58,757	\$36,178	\$46,008	\$74,711	\$80,485
Construction Laborers	29,764	1,363	112	\$37,519	\$26,111	\$32,457	\$47,324	\$50,983
First-Line Supervisors of Construction Trades and Extraction Workers	21,241	141	2,365	\$75,093	\$46,464	\$58,246	\$83,034	\$102,322
Plumbers, Pipefitters, and Steamfitters	10,569	234	1,942	\$58,423	\$35,688	\$44,991	\$62,816	\$80,631
Civil Engineers	12,363	57	740	\$95,407	\$60,345	\$75,419	\$124,065	\$164,988
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	9,996	160	298	\$56,399	\$35,585	\$44,732	\$72,372	\$79,848
Project Management Specialists	27,041	151	22,967	\$96,872	\$52,821	\$69,090	\$124,196	\$155,494
Construction Managers	14,428	203	1098	\$88,226	\$33,967	\$59,311	\$119,551	\$160,178
Operating Engineers and Other Construction Equipment Operators	12,173	324	7	\$48,834	\$37,184	\$46,746	\$60,726	\$63,806
Carpenters	22,028	576	134	\$46,648	\$27,994	\$37,691	\$60,693	\$72,029



Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado's workforce development system's statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - Lightcast 2022.4 Class of Worker.



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