

### INDUSTRY CLUSTER STUDIES



# ENERGY & NATURAL RESOURCES

With resources spanning oil and gas, minerals, renewables and water, Colorado is the perfect laboratory for energy innovation and research.









Often called a "center of influence," the Metro Denver EDC was the nation's first regional economic development organization. From Castle Rock to Fort Collins and Golden to Greeley, we represent the nine counties and 66 communities that contribute to our resilient economy and incredible culture. All told, the EDC's service territory makes up two-thirds of the Colorado GDP and approximately three-quarters of the state's population.

Thanks to the leadership and generosity of 250 of Colorado's most influential companies, the EDC works to monitor and advance the Metro Denver economy through corporate attraction and retention; workforce development; domestic and global marketing; investments in infrastructure; and public policy that fosters a pro-business climate.

The data we produce is foundational to the work we do. Publications like our annual Industry Cluster Studies offer the companies we court (as well as the regional partners we support) a deeper understanding of what's happening across Metro Denver, and for certain industries, the state more broadly. We track this data closely – leveraging the intel and insights to not only drive corporate recruitment and investment, but foster competition, build a culture of impact and innovation, strengthen the business community and work to ensure that life and work in Metro Denver are thriving. - Energy & Natural Resources Report -

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04 Cluster Definition

	<b>Cluster Job</b>			
<b>U4</b>	Growth			

F	Major Industry Investments,
J	Expansions & Milestones

	Economic			
UJ	Profile			

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11 Industry Subclusters

**13** Industry Infrastructure Support

15 Workforce Profile



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# ENERGY & NATURAL RESOURCES



Companies Average Wage \*Emp. Ranking 8,560 \$101,280

Direct **Employment:** 87.740

**Direct Employment** Concentration (2020): 2.9% (2.4%)

**5-Year Employment** Growth (2015-2020):

1.9% (-6.2%)

**1-Year Employment** Growth (2020):

-4.6% (-5.6%)

### **Industry Overview**

Colorado is a resource rich state with abundant fossil fuels, renewable resources and other natural resources, from minerals to water. According to the U.S. Energy Information Administration, Colorado has the seventh-highest total energy production, fifth-highest crude oil production, and seventh-highest natural gas production. Colorado ranks among the top 20 states for the percentage of its electricity generated from renewable sources and ranks among the top 10 states for wind and solar employment. Colorado ranked fourth for high-tech employment and its universities, federal research labs and innovation elevate the state's position as a leader in energy technology and advancements. Companies in the Energy & Natural Resources Cluster contribute over \$25 billion in Gross Domestic Product (GDP) to Colorado's economy, support 87,740 jobs, and pay more than \$9.3 million in wages annually.

# **Cluster Definition**

The Energy & Natural Resources Cluster consists of 97, six-digit North American Industry Classification System (NAICS) codes and is split into four subclusters; Natural Resources, Power Generation & Distribution, Renewable Resources, and Intellectual Resources, each of which specializes in distinct aspects of the cluster overall. This definition allows for a comparative analysis of Colorado's Energy & Natural Resources Cluster relative to other states.

### **Cluster Job Growth**

• Employment in the Energy & Natural Resources Cluster declined 4.6% between 2019 and 2020, compared with a 5.6% decline nationwide. The Natural Resources Subcluster has been impacted the most, falling 11% between 2019 and 2020. The only subcluster to post employment increases in 2020 was Intellectual Resources.

• With nearly 87,740 employees in about 8,560 companies, the Energy & Natural Resources Cluster employed 2.9% of the state's total employment base.

• The state ranked ninth among the 50 states for total energy and natural resources employment – up one position from 2019 – and ranked 11th in employment concentration.

• Between 2015 and 2020, the state's Energy & Natural Resources Cluster posted 1.9% employment growth, compared with a 6.2% decline nationwide.

• Among the four subclusters, Natural Resources represented the largest share of employment in the cluster (47.2%). Oil and gas jobs represented the largest share of total employment in the cluster (25%) in 2020, but the share has declined 3 percentage points since 2018.

• Energy-related research represented 8.5% of the total jobs in 2020. This share has risen 2.6 percentage points over the last 2 years alone.

# Major Industry Investments, Expansions & Milestones

### Natural Resources

Fossil fuels account for the largest share of Colorado's natural resource development. Many of the top independent companies including **Antero Resources, Cimarex Energy, Ovintiv** and **BPX Energy** have headquarter offices in Metro Denver although they have limited to no operations in Colorado. Other major operators such as **Chevron Corp**. (formerly **Noble Energy**) and **Oxy** continue to maintain a large employee base for exploration in Northeast Colorado's DJ Basin.

• **Chevron Corp.** completed the purchase of **Noble Energy** in 2020 in a deal totaling \$13 billion. The acquisition will increase Chevron's oil and gas reserves by about 18%.

• **PDC Energy Inc.** closed on a \$1.7 billion deal to acquire Denver-based **SRC Energy Inc.**, creating the third-largest oil producer in Colorado.

• Liberty Oilfield Services expanded its fracking business in 2020 through a strategic investment by Schlumberger and continues to expand its market share across the U.S. and Canada.

• Denver-based **DCP Midstream LP** added natural gas and liquids capacity, improved automation and centralized control of its networks of pipelines and processing facilities in northern Colorado. The company also owns 50% of the Cheyenne Connector pipeline which was completed in 2020. Linking to the Rockies Express, the additional capacity allows Colorado natural gas producers access to multiple new markets.

### Mining

Colorado is a domestic and international hub for mining, contributing over \$7.1 billion to the state's economy annually. **Colorado School of Mines** in Golden consistently ranks as a top school for mineral and mining engineering.

• **Newmont Goldcorp.** plans to expand the Cripple Creek and Victor Mine in Teller County. Mining will shift in 2021, continuing into deeper ore deposits with plans to extend its Valley Leach Field beginning in 2022.

• **Freeport-McMoRan's** Colorado operations generated nearly \$409 million in economic benefits for the state in 2019. The company is the world's largest producer of molybdenum and their Colorado operations account for 32% of their North America molybdenum production.

### **Renewable Resources**

Colorado continues to attract global renewable and alternative energy innovators. The proximity to both world-class universities and federal labs fosters new technologies and ensures a strong employment pipeline.

- Loveland-based **Lightning eMotors** more than doubled its manufacturing space and ramped up production by more than 600%. The company recently doubled its workforce and plans to go public in 2021 through a reverse merger.
- Denver-based **Sunrun Inc.** acquired Vivint Solar in a deal valued at \$3.2 billion.
- Boulder solar power developer **Juwi** reached a 17-year power purchase agreement with **Colorado Springs Utilities** for the 175-megawatt Pike Solar project.
- Denver solar power developer **Pivot Energy** is partnering with New Jersey-based **Nautilus Solar** to build a 13-megawatt community solar expansion in Metro Denver and southern Colorado.



Newmont's Cripple Creek & Victor gold mine produced 322,000 ounces of gold in 2019. Colorado ranks third for U.S. gold production.

### Power Generation & Distribution

**Xcel Energy** is the power utility for the majority of Colorado's population while **Black Hills Energy** serves the Pueblo area. But there are also 28 municipal utilities and 22 rural electric cooperatives which serve the remainder of the state. In addition, **Tri-State Generation and 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 Authority**, is also based in Lakewood.

- **Xcel Energy** completed construction on the \$743 million, 500-megawatt Cheyenne Ridge Wind Project located in Kit Carson and Cheyenne counties. The 229-turbine facility provided enough energy to power about 270,000 homes, setting a new company record for wind generation.
- **Xcel Energy** completed a new transmission line that will move wind generated electricity from the Eastern Plains to Metro Denver. The Pawnee-Daniels Park line runs 125 miles the Denver Tech Center. The company plans to expand its footprint in its new location.

• **Platte River Power Authority's** 225-megawatt Roundhouse Wind Energy Center located north of the Colorado-Wyoming border began commercial operations. The project triples the amount of wind power Platte River delivers to Estes Park, Fort Collins, Longmont and Loveland.

• **Black Hills Energy** plans to build a 200-megawatt solar project in Pueblo County. Construction could begin as early as 2021 with the project coming online in 2023.



### Intellectual Resources

Colorado has one of the highest per-capita concentrations of federal science, research and engineering facilities in the U.S., including 33 federally funded research facilities. The **National Renewable Energy Laboratory** (NREL) in Golden is the primary U.S. Department of Energy lab for renewable energy and energy efficiency research. NREL contributed \$875 million to the Colorado economy and \$1.4 billion to the national economy in 2019. The agency has over 870 partnerships with industry in 47 states and 29 countries.

• **NREL** formed the new Energy Conversion and Storage Systems Center (ECaSS) that is dedicated to systems engineering for energy conversion and storage technologies such as battery, hydrogen, geothermal, thermal and water power. At the Flatirons Campus, they completed a 19.9 MW power generation upgrade to increase research around integrating renewable energy systems at scale.



# **Economic Profile**

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.

Energy & Natural Re Employment & Company		
	Colorado	U.S.A.
Direct employment, 2020	87,740	3,892,790
Number of direct companies, 2020	8,560	201,490
One-year direct employment growth, 2019-2020	-4.6%	-5.6%
Five-year direct employment growth, 2015-2020	1.9%	-6.2%
Avg. annual direct employment growth, 2015-2020	0.4%	-1.3%
Direct employment concentration	2.9%	2.4%
% of companies with <10 employees	82.9%	76.1%

### **Energy & Natural Resources Number of Employees Growth Rate**<sup>2</sup>



<sup>&</sup>lt;sup>1</sup> Dun & Bradstreet, Inc., Hoover's Online Database; Market Analysis Profile, 2015-2020; Development Research Partners.

<sup>&</sup>lt;sup>2</sup> Dun & Bradstreet, Inc., Hoover's Online Database; Market Analysis Profile, 2015-2020.

<sup>&</sup>lt;sup>3</sup> Market Analysis Profile, 2020; Development Research Partners.



*Colorado* RANKINGS

# 9th Energy & natural resources direct employment

11th

Energy & natural resources direct employment concentration

<sup>4</sup> Market Analysis Profile, 2020; Development Research Partners.

<sup>5</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.

# Colorado RANKINGS



7th

12th

direct

rank

direct employment employment concentration rank

### **Power Generation** & Distribution

22nd

32nd

direct employment rank

direct employment concentration rank

### Renewable Resources

6th

2nd

direct employment rank



### Intellectual Resources

10th

direct

employment

rank



direct employment concentration rank

# **Industry Subclusters**

The Energy & Natural Resources Cluster is divided into four subclusters: (1) Natural Resources; (2) Power Generation & 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 & Distribution Subcluster consists of 19, six-digit NAICS codes.

**Renewable Resources** includes companies that produce energy from wind, solar, biomass and hydroelectricity; fuel cells and green transportation; 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.

<sup>&</sup>lt;sup>6</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.

<sup>&</sup>lt;sup>7</sup> Dun & Bradstreet, Inc., Hoover's Online Database; Market Analysis Profile, 2015-2020; Development **Research Partners** 



### Energy & Natural Resources Subcluster Employment & Company Profile, 2020<sup>7</sup>

	Natural Resources		Power Generation & Distribution		Renewable Resources		Intellectual Resources	
	СО	U.S.A.	СО	U.S.A.	СО	U.S.A.	со	U.S.A.
Direct employment, 2020	41,440	1,659,320	13,390	1,291,620	7,520	118,370	25,390	823,480
Number of direct companies, 2020	3,470	96,770	1,660	31,560	280	8,510	3,150	64,660
One-year direct employment growth, 2019-2020	-11.0%	-10.7%	-2.2%	-1.4%	-1.0%	-2.4%	5.3%	-1.4%
Five-year direct employment growth, 2015-2020	-10.3%	-13.4%	-0.2%	-3.1%	14.9%	-5.7%	27.2%	6.1%
Avg. annual direct employment growth, 2015-2020	-2.2%	-2.8%	0.0%	-0.6%	2.8%	-1.2%	4.9%	1.2%
Direct employment concentration	1.4%	1.0%	0.4%	0.8%	0.2%	0.1%	0.8%	0.5%
% of companies with <10 employees	78.0%	73.1%	87.8%	71.5%	72.2%	76.0%	87.0%	82.3%

# Industry **Infrastructure Support**













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energy



ENERGY ALLIANCE







### **Workforce Profile**

- According to the 2020 U.S. Energy and Employment Report, over 45% of energy-related employers in Colorado hired new employees over the last year.
- Colorado ranked eighth for solar jobs in 2019 (Solar Foundation's Solar Jobs Census 2019).
- Colorado ranked among the top five states for wind industry employment in 2020 (American Wind Energy Association).
- NREL employs over 4,520 workers in Colorado with an average wage of \$129,460, according to a recent analysis by the University of Colorado Boulder.

• Colorado School of Mines was named by the American Energy Society as one of the nation's elite energy universities in the nation in 2020. Mines and NREL recently launched an innovative Advanced Energy Systems degree program, combining NREL's world-class research in energy systems with Mines' internationally recognized energy research portfolio.

#### Age Distribution

• The cluster has a larger share of employees who are between the ages of 35 and 64 years old (63.9 %), compared with the age distribution across all industries in the state (57.9%).

• Workers between the ages of 35 and 44 years old made up the largest share in the Energy & Natural Resources Cluster.

#### Colorado's Distribution of Employment by Age<sup>8</sup>



15

<sup>&</sup>lt;sup>8</sup> Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2020.3 Class of Worker.
<sup>9</sup> Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2020.3 Class of Worker.

#### Wages

- The 2019 average annual salary for workers in the Energy & Natural Resources Cluster was \$101,280 in the state, compared with the national average of \$95,000.
- The average starting salary for workers in the cluster was \$48,080 in the state, compared with \$37,350 across all industries.
- Total payroll exceeded \$9.3 billion in 2019.

### Colorado Energy & Natural Resources Occupation & Salary Profile, 2020<sup>9</sup>

10 Largest Energy & Natural Resources Occupations in Colorado	Total Working Across All Industries (2020)	Number of Available Applicants (2020)	Number of Graduates (2019)	Median Salary	10th Percentile Salary	25th Percentile Salary	75th Percentile Salary	90th Percentile Salary
1. Electricians	18,410	1,298	153	\$53,654	\$32,380	\$39,709	\$66,560	\$79,236
2. Project management specialists & business operations specialists, all other	53,054	3,742	50	\$79,354	\$44,765	\$57,897	\$106,651	\$138,443
3. Construction laborers	32,240	2,274	14	\$35,581	\$21,799	\$27,092	\$44,462	\$52,800
4. Plumbers, pipefitters, & steamfitters	11,935	842	94	\$51,485	\$32,699	\$39,900	\$63,524	\$79,532
5. First-line supervisors of construction trades & extraction workers	19,687	1,388	525	\$67,831	\$42,298	\$52,947	\$87,458	\$109,365
6. Civil engineers	10,830	764	467	\$86,271	\$55,113	\$68,338	\$115,800	\$148,328
7. Heating, air conditioning, & refrigeration mechanics & installers	8,645	610	306	\$52,320	\$32,960	\$40,355	\$64,271	\$78,930
8. Operating engineers & other construction equipment operators	11,508	812	108	\$50,031	\$35,186	\$42,148	\$58,703	\$64,572
9. General & operations managers	40,993	2,891	11,102	\$109,474	\$49,232	\$69,899	\$173,385	\$249,862
10. Information & record clerks, all other	12,686	895	0	\$43,820	\$30,085	\$35,985	\$52,637	\$62,422

**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.





# **Notable Rankings**

**#1** 

Colorado made an impressive showing in the 2020 U.S. News & World Report's "Best Places to Live" list with Front Range cities ranking #1, #2, #4 and #5.



Colorado was recently named the top state for Women-Led Startups by small business reviewer, Merchant Maverick.



USA Today recently named DEN the Best Large Airport in the U.S.

**#2** 

U.S. News & World Report ranked Colorado as the second-best state economy in the country, after four years maintaining the top spot.



Colorado saw the third largest increase of millennials in the past five years, according to Haven Life. **#2** 

Colorado is the second-best state in the U.S. to retire in, according to a study by WalletHub.

#3

Denver ranked third for STEM job growth, according to the 2020 STEMdex. #2

Milken Institute named Colorado #2 for "Best State for Technology and Science," with a strong entrepreneurial infrastructure and STEM workforce.



A new study by Spanning says Colorado has the fourth-most tech jobs per capita – citing 123,040 tech workers at a median annual wage of \$94,880.



Denver ranked sixth among the "Best U.S. Cities for Remote Workers" in 2020, according to BusinessInsider.com.



Denver took in the #4 spot for U.S. cities that people moved to in 2020, according to Updater.com.



LinkedIn gave Denver the 6th place ranking for cities with the most opportunity for job seekers. Data research provided by Development Research Partners, Inc. Founded in 1994, DRP specializes in economic research for local and state government and private sector businesses, including industry cluster research, industry trends analysis and strategic competitive analysis. www.developmentresearch.net





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