

Industry Overview

Colorado is uniquely positioned as a leader in the balanced energy economy, with abundant fossil fuels (coal, oil, and natural gas) and renewable energy resources (solar, wind, and biofuels). The state has a strong energy foundation that includes fossil fuels and both renewable energy and energy efficiency technologies, also known as cleantech. A highly educated workforce, research universities, federal laboratories, advanced policy initiatives, and industry collaboration support Colorado's energy industry, attracting economic growth, job creation, technology development, and innovation.

This report evaluates Colorado's energy industry in two subclusters: (1) cleantech and (2) fossil fuels. Combined, the 71,000 direct energy workers earning \$6.4 billion in the state support an additional 179,540 indirect workers earning \$9.2 billion in all industries throughout the state. In total, the energy industry in Colorado supports 250,540 workers in all industries earning \$15.6 billion annually.



The fossil fuels subcluster includes companies involved in the extraction of naturally occurring fuels used to produce energy as well as the generation, transmission, and distribution of energy resources. The cleantech subcluster includes companies developing and delivering products and technologies across solar, wind, biomass, and sustainable transportation sectors that improve operational performance, efficiency, or productivity, while reducing energy costs and energy consumption.

It is often difficult to distinguish how an organization's operations are divided between fossil fuels and cleantech components. For example, research is a critical component of all energy industries, from oil and gas to solar and wind energy. So that the two subclusters may be analyzed independently, all energy research entities are included in the cleantech subcluster while all energy transmission and distribution activities are included in the fossil fuels subcluster, even though a portion of the energy may be coming from renewable resources.

Colorado's fossil fuel extraction has traditionally taken place in western Colorado; however, many companies have Front Range-refining and production facilities and corporate offices in Metro Denver. Like many other recent oil and gas plays in the nation, advances in horizontal drilling and hydraulic fracturing techniques allow for greater production in the Denver-Julesburg Basin and Niobrara formations along the Front Range, drawing significant attention from oil and gas companies. These advances provide substantial economic benefits including capital investment, high-wage job creation, and export possibilities.

Cleantech Economic Profile

The cleantech subcluster includes companies that produce and conserve energy using wind, solar, biomass, fuel cells, hydroelectric resources, and green transportation technologies. Companies that manufacture renewable energy equipment, storage, and power transformers, and businesses that provide engineering and other support services are also included. The subcluster includes energy research companies that provide laboratory testing, scientific and technical consulting services, and institutional research related to the environment, natural resources, and energy. The cleantech subcluster consists of 29, six-digit North American Industry Classification System (NAICS) codes.

Colorado ranked sixth out of the 50 states in cleantech employment concentration in 2014. With direct employment of 23,410 workers, Colorado's cleantech subcluster ranked 10th out of the 50 states in absolute employment.

ENERGY: Colorado Industry Cluster Profile

Cleantech Employment and Company Profile, 2014

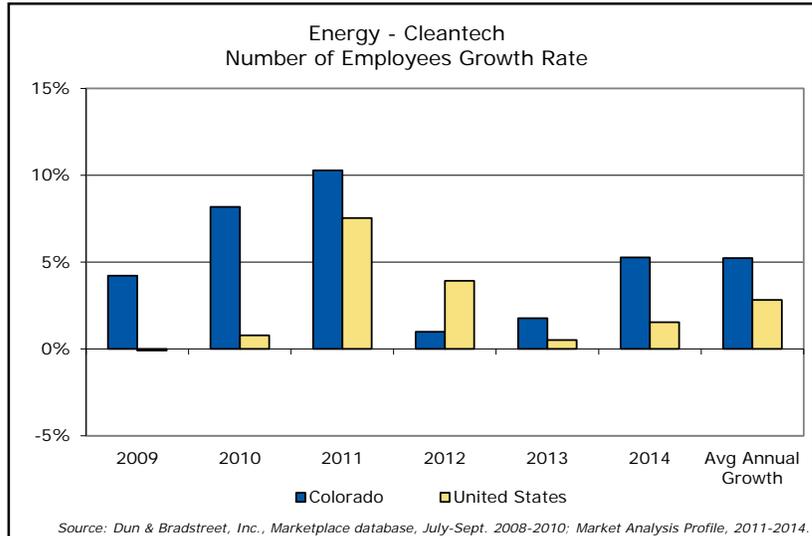
	Colorado	United States
Direct employment, 2014	23,410	789,220
Number of direct companies, 2014	2,020	57,040
One-year direct employment growth, 2013-2014	5.3%	1.5%
Five-year direct employment growth, 2009-2014	29.1%	14.9%
Avg. annual direct employment growth, 2009-2014	5.2%	2.8%
Direct employment concentration	0.9%	0.5%

Sources: Dun & Bradstreet, Inc. Marketplace database, July-Sept. 2008-2010; Market Analysis Profile, 2011-2014; Development Research Partners.

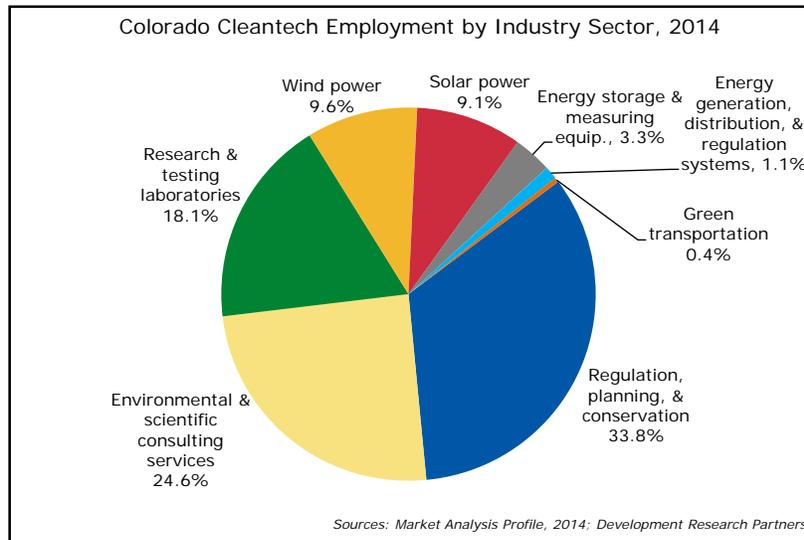
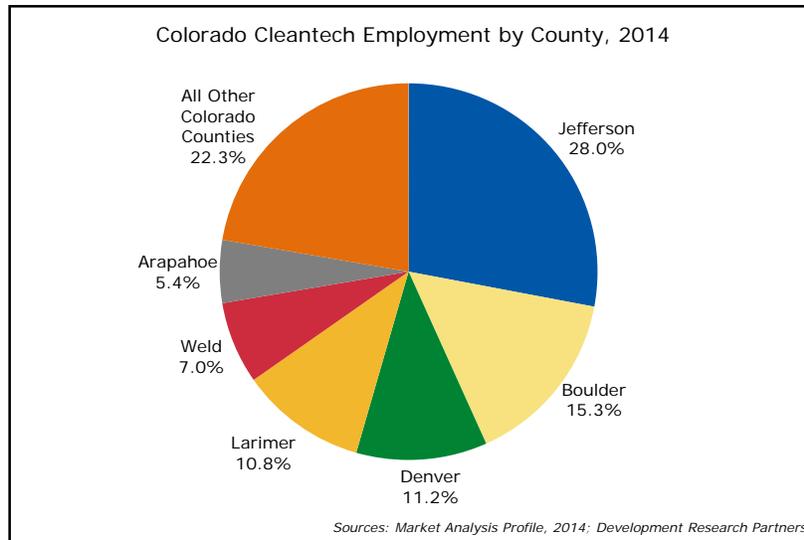
Cleantech Employment

Colorado's cleantech employment (23,410 workers) rose 5.3 percent in 2014 compared with the previous year's level, adding 1,170 new jobs over the same period. National employment levels also grew over-the-year, rising 1.5 percent and adding 11,950 jobs. About 3 percent of the nation's cleantech employment is located in Colorado. Between 2009 and 2014, Colorado's cleantech employment rose 29.1 percent, compared with a 14.9 percent increase nationwide. Cleantech companies employed 0.9 percent of the state's total employment base, compared with a 0.5 percent employment concentration nationwide.

About 2,020 cleantech companies operated in Colorado in 2014, rising 5.3 percent over the prior year. Approximately 80 percent of these companies employed fewer than 10 people, while 0.6 percent employed 250 or more.



ENERGY: Colorado Industry Cluster Profile



Cleantech Overview

Colorado's cleantech industry fosters innovation, commercialization, and economic vitality through collaboration between research universities, industry, educational institutions, and public agencies. The Colorado Energy Research Collaboratory and the Colorado Cleantech Industry Association (CCIA) are two examples of this collaboration.

The Collaboratory integrates cutting-edge research with the industry expertise to accelerate the transfer of energy technologies into the marketplace through its four research centers: the Colorado Center for Biorefining and Biofuels (C2B2), the Center for Revolutionary Solar Photoconversion (CRSP), the Center for Research and Education in Wind (CREW), and the Carbon Management Center. Since its launch in 2007, the Collaboratory has shown a 9:1 return on investment using state funding of nearly \$6.3 million to leverage federal and private-sector dollars totaling \$56.2 million and has helped attract several companies to Colorado.

An industry association dedicated entirely to cleantech, the CCIA, provides advocacy, capacity building, and education and training to the cleantech sector. CCIA was one of the first regional cleantech organizations to become a chapter of the national Advanced Energy Economy (AEE) system.

Colorado is a world-class hub for energy research and technology innovation. The state's 30 federal laboratories—one of the highest per-capita concentrations of federal research facilities in the nation—support the state's energy research platform. These laboratories employ over 15,680 direct and indirect workers and generate over \$2.3 billion in annual economic impact to Colorado, contributing significantly to the evolution of the state's high-tech industries.

ENERGY: Colorado Industry Cluster Profile

The National Renewable Energy Laboratory (NREL), a Golden-based federally funded research laboratory, is the U.S. Department of Energy's (DOE) only laboratory committed to the research, development, commercialization, and deployment of renewable energy and energy efficiency. NREL's \$135 million, 182,000-square-foot Energy Systems Integration Facility (ESIF) was named *R&D Magazine's* 2014 "Laboratory of the Year" as a first-of-its kind facility that merges an ultra-energy efficient workplace, one of the world's most energy-efficient, high-performance computing data centers, and sophisticated high-bay laboratory spaces with outdoor test areas. NREL added 28 new Cooperative Research and Development Agreements (CRADAs) in fiscal year 2013, totaling 166 active CRADAs, the highest in the DOE system. In fiscal year 2013, NREL solidified 210 new partnerships including the CRADAs, 20 new license agreements, and more than 60 new patent applications. Since 2002, the 327-acre campus also received more than \$3.9 billion in funding and garnered more than 200 awards and honors for its programs and scientific research.

Cleantech Company Announcements

Colorado is a key location for cleantech companies to grow and thrive. Notable company announcements in 2014 included:

- Woodward was named "Deal of the Year" award winner by the Metro Denver Economic Development Corporation. The company was recognized for its major campus expansion near downtown Fort Collins, which included a 215,000-square-foot industrial Turbomachinery Systems Building, a new corporate headquarters, and an engines technology building. Overall, the expansion will bring more than 900 net, new employees to the redevelopment site.
- Future Earth, a 10-year research initiative to address global environmental change solutions and actions, selected Colorado as the new U.S. headquarters. The center will be managed by the University of Colorado Boulder (CU-Boulder) and Colorado State University (CSU) and is expected to mobilize nearly 60,000 scientists and students.
- Denver-based RavenBrick LLC added a new \$10 million automated manufacturing line to its existing production line. With this addition, the company will increase production from 2,000 square feet of windows a month to 500,000 square feet and could increase employment to 160 workers by 2016.

Solar Energy

Colorado's is a leader in solar energy capacity and development. The state's abundant sunshine, specialized manufacturing base, and research institutions give companies a competitive edge. Key solar energy announcements in 2014 included:

- Xcel Energy and Boulder-based Community Energy unveiled plans to build the state's largest solar farm in Pueblo. One of the largest solar projects in the United States, the \$200 million, 120 megawatts (MW) Comanche Solar project could generate enough power to supply electricity to 31,000 homes and is expected to be operational by mid-2016.
- Panasonic Enterprise Solutions Co. plans to create a hub for its business solutions operations and technology center adjacent to Denver International Airport. The new facility will produce large-scale audio-visual displays and solar panels and could employ up to 400 workers.
- IKEA completed its solar-power system expansion, which more than doubled the size of its existing system at its Centennial store. The store's solar array is the largest rooftop array in Colorado and the system's 4,700 panels could generate 1.7 megawatt-hours of power each year.
- Manitou Springs will provide up to 100 percent of its city facilities' energy needs from community solar. The energy will be generated by 3,000 solar panels from SunShare's newest 2-MW community solar garden in Colorado Springs. Manitou Springs will be the first city in the nation to use community solar for 100 percent of its electric energy needs.
- Denver-based SunShare contracted with two government agencies—Adams County and the City of Arvada—to power its buildings with solar energy from Community Solar Gardens. Adams County will be one of the first counties in the nation to power its buildings with Community Solar energy.
- Xcel Energy and San Jose, Calif.-based SunPower Corp. signed a power purchase agreement to build a 50-MW solar photovoltaic (PV) power plant in the San Luis Valley. The 350-acre plant is expected to be fully operational by 2016 and could produce enough electricity to serve 13,500 Colorado homes.
- Vikram Solar, an Indian manufacturer of solar PV modules, opened its newest international office in Boulder. With a strong footprint in Europe, as well as the home market in India, the new office is the latest in its global expansion.
- SunShare LLC signed its largest, single-customer, power-supply contract with Hyland Hills Park and Recreation District. The 1.4-MW-supply deal is also one of the largest contracts for any community solar developer in the nation and will be completed in early 2015.

ENERGY: Colorado Industry Cluster Profile

- Community solar developer Clean Energy Collective (CEC) launched the City and County of Denver's newest community solar facilities. Developed on a 5-acre site in northeast Denver, the two 500-kW solar arrays could produce enough electricity to power 150 homes and reduce CO2 emissions by 54 million pounds.
- Tempe, Ariz.-based First Solar Inc. invested in Colorado-based Clean Energy Collective and plans to develop community solar offerings to residential customers and businesses. The partnership will explore alternative opportunities to rooftop solar, particularly in areas where customers' rooftops are not accessible.

Wind Energy

A number of economic and policy factors, including declining wind energy production costs and the short-term extension of the federal Production Tax Credit in 2013, continued to support Colorado's wind-energy sector in 2014. Notable wind company announcements in 2014 included:

- Vestas Wind Systems will add 850 temporary workers to its four Colorado factories by the end of 2014 as a result of the company's increased orders for wind turbines. The company was the world leader in new wind turbine installations in 2013, capturing 13.2 percent of the world market's new installations.
- Creative Foam Composite Systems relocated its operations from Longmont to an 84,524-square-foot heavy manufacturing facility in Berthoud and will employ 60 workers with the expansion. The company manufactures core kits for wind turbines.
- Tri-State Generation & Transmission Association signed a 25-year power purchase agreement from a NextEra Energy Resources LLC proposed wind project in eastern Colorado. Under the agreement, Tri-State will purchase 150 MW of output from the Carousel Wind Farm near Burlington, which is slated for completion in 2016.

Biofuels and Bioenergy

Colorado has a burgeoning biofuels and bioenergy sector with potential for significant growth. The state's renewable fuel industry—including conventional and cellulosic ethanol, biodiesel, and advanced biofuels—contributed \$2.7 billion to the state's economy annually and accounted for nearly 10,620 direct and indirect jobs totaling \$642.2 million in wages, according to Fuels America. The industry also supports \$62.3 million in state tax revenue each year. Notable bioenergy company announcements in 2014 included:

- Southwest Airlines signed an agreement with Fort Collins-based Red Rock Biofuels LLC to purchase 3 million gallons of low-carbon, renewable jet fuel. The blended product will be used at Southwest's Bay Area operations with first delivery expected in 2016.
- The U.S. Department of Agriculture (USDA) awarded the Colorado State Forest Service a three-year, \$250,000 grant to develop wood-to-energy projects. The grant will accelerate the development of wood-energy facilities and technologies across the state to address forest health and wildfire concerns.
- The DOE and the USDA awarded associate CSU professor Dr. John McKay a \$1.5 million grant to develop a new biofuel crop. The research will focus on an oilseed feedstock crop that can be grown on less-than-ideal farmland with relatively low fertilizer inputs and limited irrigation.
- Grand Junction-based River City Consultants partnered with Madison, Wis.-based BioCNG LLC to design and build a biogas conditioning system and gas pipeline for the Persigo Wastewater Treatment Plant in Grand Junction. The project is the first of its kind in Colorado and will produce 500 gasoline gallon equivalents per day from Persigo digester gas for natural gas vehicles in the city.
- Boulder-based Carbon Cycle Energy LLC raised \$1.5 million to build facilities for biogas production. The company built the first facility in 2014, with gas production starting in 2015.

Research and Education Announcements

Colorado's universities and research centers support the state's thriving energy cluster, conduct leading-edge energy research, and develop innovative technologies. Key announcements in 2014 included:

- CSU opened the \$18.5 million Powerhouse Energy Campus, which includes the existing 35,000-square-foot Engines and Energy Conversion Lab connected to a four-story, 65,000-square-foot expansion. The Powerhouse also includes office spaces, meeting rooms, research labs, and room for 25 startup companies in an onsite incubator.
- CSU partnered with Front Range Community College to build a small-scale, steam-turbine power plant to train students and conduct energy-related research. The facility will be housed in CSU's Powerhouse

ENERGY: Colorado Industry Cluster Profile

Energy Campus and will contain a steam boiler, turbine generator, condenser, and system controls that can generate up to 20 kilowatts (kW) of electricity.

- CU-Boulder expanded degree options for working professionals interested in specialized graduate education focused on energy and water. Beginning in the fall of 2014, students can earn both a Master of Engineering degree and a Professional Certificate in Renewable and Sustainable Energy or a Professional Certificate in Water Engineering and Management. Partnering to offer courses for the new program are CU's Lockheed Martin Engineering Management Program, Renewable and Sustainable Energy Institute, and Water Engineering and Management program.
- Colorado universities, companies, and nonprofits will receive \$14 million in federal funding over five years to pursue research and use of advanced composite materials. Under the newly announced Institute for Advanced Composites Manufacturing Innovation, Colorado organizations will use advanced composite materials to accelerate clean energy technologies and boost the state's manufacturing industry.
- Colorado School of Mines (CSM) and ConocoPhillips established a center to promote sustainable energy production and water resources. Areas of focus for the ConocoPhillips Center for a Sustainable WE2ST (Water-Energy Education, Science and Technology) at CSM include education, water sustainability challenges, and integrated water resources assessment research, among others.
- Denver Public Schools (DPS) received \$7 million in federal Youth CareerConnect grant funds and \$2.3 million in philanthropic funding to expand access to Science, Technology, Engineering, and Mathematics (STEM) education programming. The funding will further strengthen the STEM partnership between DPS and CSM. Over the next two years, DPS will create new STEM programming at eight high schools that will focus on energy, engineering, health and medicine, digital careers, finance, information technology, and manufacturing.
- The University of Denver broke ground on a new 5-story, 130,000-square-foot STEM building. The \$41 million project will include state-of-the-art classrooms, and instructional and research labs. The building will serve as the home to the new School of Engineering and Computer Science and will accommodate the increase in enrolling students through expanded research and instruction space, flexible classrooms, interdisciplinary centers, community areas, and faculty and administration offices.

Green Transportation

Colorado has prioritized the state's transportation fuels portfolio to promote environmental sustainability and support low energy costs. Among the state's alternative transportation fuels, natural gas has been identified as a viable, low-cost alternative to gasoline and diesel. The state hosts 28 public compressed natural gas (CNG) fueling stations in 18 cities and several private CNG fueling stations. A number of organizations in the state have transitioned their entire fleet, or portions thereof, to run on CNG. For example, the City and County of Denver added 19 CNG garbage and recycling trucks to its fleet in 2014 and opened a new CNG fueling station dedicated to the city's trucks near Alameda Ave. and Interstate 25.

- The DOE awarded NREL and Louisville-based Solid Power LLC a \$3.5 million grant to develop a solid-state, lithium-ion battery for electric vehicles. The battery will require less protective packaging, which reduces the cost and overall vehicle weight to improve driving range.
- CSU was one of 16 universities selected to participate in EcoCAR 3, a national automotive engineering program sponsored by DOE and General Motors. The four-year competition challenges universities to redesign a Chevrolet Camaro into a hybrid-electric car that will reduce environmental impact.
- CSU was selected as one of four universities nationwide that will receive four all-electric, micro vehicles for research projects. The University Electric Vehicles (UEVS) are equipped with a tablet-sized personal computer controlling a variety of electronics and sensors, and can connect to the campus's WiFi network to communicate operational data such as position, speed, and battery charge for projects.
- Golden-based eThos Electric Car Share launched its new all-electric car share service in Metro Denver. The service is one of the first in the nation and the company charges \$7 an hour for its available vehicles, including a Tesla Model S.

ENERGY: Colorado Industry Cluster Profile

Major Cleantech Companies

- Abengoa Solar
www.abengoasolar.com
- AECOM
www.aecom-urs.com
- ARCADIS
www.arcadis.com
- Ascent Solar Technologies, Inc.
www.ascentsolar.com
- Chicago Bridge & Iron Company
www.cbi.com
- Cool Planet Energy Systems
www.coolplanet.com
- GE Energy
www.ge-energy.com
- Gevo Inc.
www.gevo.com
- juwi Wind/Solar
www.juwi.com
- Lightning Hybrids, Inc.
<http://lightninghybrids.com>
- Namasté Solar
www.namastesolar.com
- RavenBrick, LLC
www.ravenbrick.com
- RES Americas, Inc.
www.res-americas.com
- Servion USA Corp.
www.repower.com
- SMA America, LLC
www.sma-america.com
- SolarCity
www.solarcity.com
- Sundrop Fuels, Inc.
www.sundropfuels.com
- Tetra Tech Inc.
www.tetrattech.com
- UQM Technologies, Inc.
www.uqm.com
- Vestas
www.vestas.com
- Woodward
www.woodward.com

Major Renewable Energy Government and Research Facilities

- CO Department of Natural Resources
www.dnr.state.co.us
- CO Department of Public Health & Environment
www.cdphe.state.co.us
- CO Department of Regulatory Agencies
www.dora.state.co.us
- Colorado Energy Research Institute
www.ceri-mines.org
- Colorado Energy Research Collaboratory
www.coloradocollaboratory.org
- Colorado Energy Office
www.colorado.gov/energy
- JILA
<http://jila.colorado.edu>
- National Center for Atmospheric Research
www.ncar.ucar.edu
- National Renewable Energy Laboratory
www.nrel.gov
- National Institute of Standards & Technology
www.nist.gov
- U.S. Bureau of Reclamation
www.usbr.gov
- U.S. Dept. of Energy, Golden Field Office
www.eere.energy.gov/golden
- U.S. Environmental Protection Agency
www.epa.gov
- U.S. Geological Survey
www.usgs.gov
- Western Area Power Administration
www.wapa.gov

Fossil Fuels Economic Profile

The fossil fuels subcluster includes companies that extract naturally occurring mineral liquids, gases, and solids used to produce energy. The fossil fuels subcluster also includes mining machinery manufacturers and companies that provide mining, exploration, and related support services. Companies providing generation, transmission, and distribution of energy resources are also included. The fossil fuels subcluster consists of 29, six-digit North American Industry Classification System (NAICS) codes.

ENERGY: Colorado Industry Cluster Profile

Colorado ranked ninth out of the 50 states for fossil fuels employment concentration in 2014. With direct employment in the fossil fuels subcluster of 47,590 workers, Colorado ranked sixth out of the 50 states in absolute employment. While Colorado's drilling and mining activity tends to be concentrated primarily in the Rocky Mountains, along the Western Slope, and in Weld County, fuel refineries and headquarters facilities are located throughout the Front Range.

Fossil Fuels Employment and Company Profile, 2014

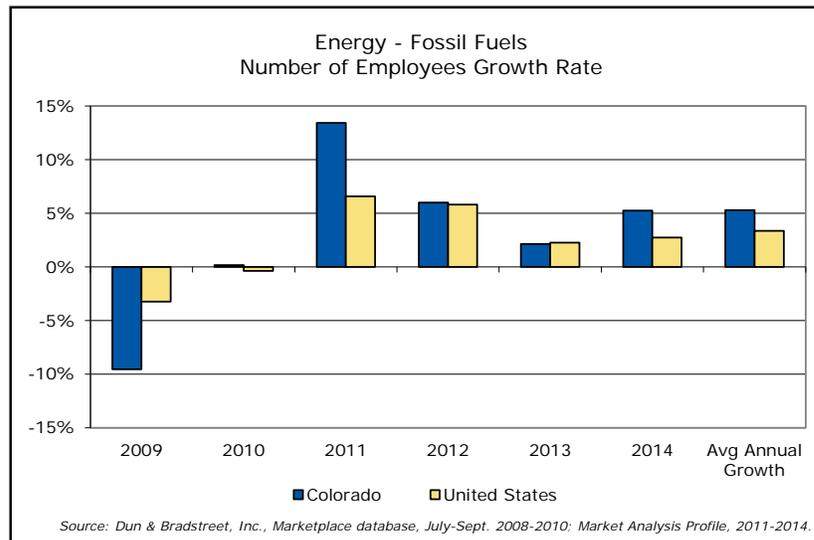
	Colorado	United States
Direct employment, 2014	47,590	1,863,820
Number of direct companies, 2014	2,250	65,500
One-year direct employment growth, 2013-2014	5.3%	2.7%
Five-year direct employment growth, 2009-2014	29.5%	18.0%
Avg. annual direct employment growth, 2009-2014	5.3%	3.4%
Direct employment concentration	1.8%	1.3%

Sources: Dun & Bradstreet, Inc. Marketplace database, July-Sept. 2008-2010; Market Analysis Profile, 2011-2014; Development Research Partners.

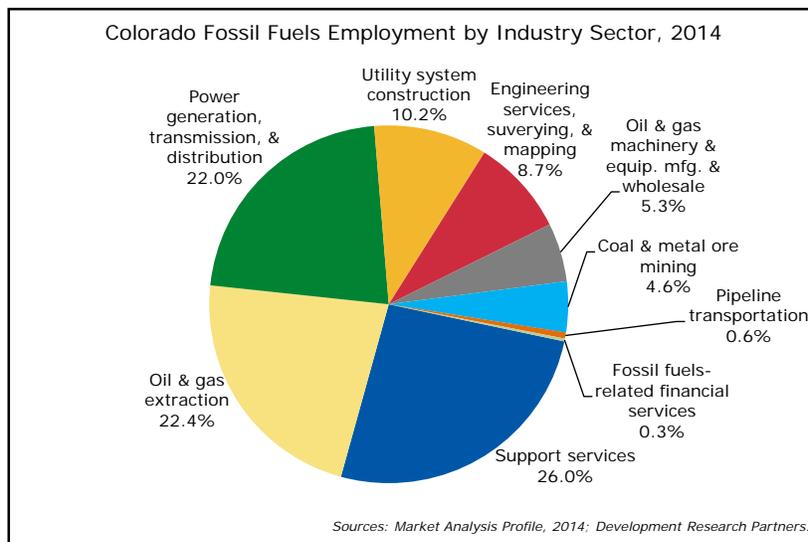
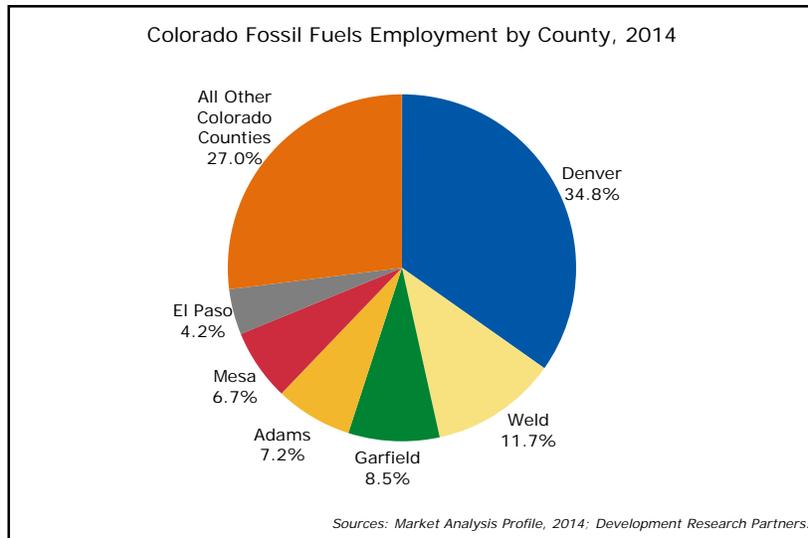
Fossil Fuels Employment

Colorado's fossil fuels employment (47,590 workers) rose 5.3 percent in 2014 compared with the previous year's level, adding 2,380 new jobs during the period. National employment levels also grew over-the-year, rising 2.7 percent and adding 49,630 jobs. Nearly 3 percent of the nation's fossil fuels employment is located in Colorado. Between 2009 and 2014, Colorado's fossil fuels employment rose 29.5 percent, compared with an 18 percent increase nationwide. Fossil fuels companies employed 1.8 percent of the state's total employment base, compared with a 1.3 percent employment concentration nationwide.

About 2,250 fossil fuels companies operated in Colorado in 2014, a 3.1 percent increase over the prior year. Sixty-one percent of these companies employed fewer than 10 people, while 1.1 percent employed 250 or more.



ENERGY: Colorado Industry Cluster Profile



Fossil Fuels Overview

Colorado offers a rich complement of natural resources, including fossil fuel-rich basins and significant quantities of coal, crude oil, and natural gas. 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 Weld County. Colorado's active wells totaled nearly 53,030 as of December 2014, with 62 percent of total active wells located in Weld and Garfield Counties.

Colorado's Niobrara shale formation—located in northeast Colorado's rich Denver-Julesburg Basin (DJ Basin) and extending into parts of adjacent Wyoming, Nebraska, and Kansas—attracted significant investment in 2014. Oil and gas companies invested \$7 billion in 2014 in the 7,000-foot-deep geographic layer, which could hold more than 4 billion barrels of recoverable oil reserves. The increasing activity in the Niobrara has led to substantial economic benefits including job creation, infrastructure development, export possibilities, and technology development.

It is important to note that global oil prices have dropped over 60 percent since June 2014. This significant market change will also change oil and gas development strategies over the next year. Nonetheless, company announcements and new project developments in 2014 included:

- Anadarko Petroleum Corp. plans to drill more than 360 new wells in Weld County. Infrastructure expansion—including the Lancaster plant expected in 2015—and a concentrated acreage position prompted significant growth throughout the company's Colorado operations.

ENERGY: Colorado Industry Cluster Profile

- Noble Energy Inc. plans to invest \$10 billion in the DJ Basin over the next five years and could produce 2.9 billion barrels of oil equivalent.
- Noble Energy Inc. will add 75,300 square feet to its current Greeley site to support its rapid growth in the area. The \$9.4 million addition will include training and fitness facilities and will have space for 170 employees and 90 pumps.
- Taylor, Mich.-based Atlas Oil Co. opened a crude oil-loading facility in Evans. The facility is located on the Union Pacific Railroad, which will increase crude hauling operations from Niobrara and expand the company's frac-fueling business. The company also opened an office in Evans with 20 employees and plans to add workers by the end of 2014.
- Denver-based ARB Midstream LLC plans to build and operate a \$45 million crude oil transloading terminal in Evans. The Niobrara Connector (NiCon) would provide increased crude-by-rail takeaway capacity in the DJ Basin and could accommodate multiple grades of crude oil. NiCon will have three rail loops with the capacity to handle 120 full tank-car unit trains and is slated for completion in early 2015.

Fossil Fuels Company Announcements

Colorado's fossil fuels companies continue to grow and expand. Key company announcements in 2014 included:

- FMC Technologies, Inc. broke ground on a new \$11.9 million facility in Brighton's Energy and Employment Corridor. The company's 50,000-square-foot facility will support at least 110 employees over the next five years and will serve as a site for the company's completion services, fluid control, and surface-wellhead business units.
- Halliburton expanded its Colorado operations and plans to hire 150 workers in response to the company's advertising campaign to attract workers in an increasingly competitive oil and gas industry. The company employs 1,900 workers across the state.
- Badlands NGL LLC, a California startup, will move its headquarters to Denver. In addition, Badlands has proposed building a \$4 billion polyethylene manufacturing plant in North Dakota. The plant will help Colorado-based oil and gas companies working in the booming Bakken field deal with excess natural gas.
- WRS Infrastructure & Environment, Inc. opened a new regional office in Denver. The new location will allow the company to better service the oil and gas, petrochemical, mining, and energy industries in the western U.S.
- Targasco Inc. relocated its headquarters from Knoxville, Tenn. to Greenwood Village. The oil and gas company cited the region's large pool of experienced oil and gas professionals and proximity to significant oil and gas companies as reasons for its location decision.
- Spencer Ogden, an international energy recruitment company, opened a Denver office in October 2014 to capitalize on the region's oil and gas industry. The company could have up to 15 people in its Denver office by the end of 2015.

Pipeline Construction

A number of fossil fuels companies announced significant pipeline construction activity in 2014.

- Xcel Energy opened a new \$110 million, 34-mile natural gas pipeline from Fort Lupton to the Cherokee Generating Station in Denver. The pipeline is in response to Colorado's Clean Air-Clean Jobs Act, which includes the conversion of the Cherokee power plant from coal to natural gas.
- Adams County approved construction of a new crude oil pipeline from Colorado to Oklahoma. The White Cliffs Twin Pipeline will run parallel to an existing pipeline and could transport 150,000 barrels of oil each day. The pipeline will pass through 23 miles in the northeast corner of the county.

Merger and Acquisition Activity

Fossil fuels companies in Colorado announced several mergers and acquisitions in 2014.

- Denver-based Whiting Petroleum Corp. acquired Denver-based Kodiak Oil & Gas in a \$6 billion deal. The merger created the largest crude-oil producer in the Bakken shale of the northern Great Plains.
- WPX Energy Inc. partnered with TRDC LLC, a subsidiary of Houston-based G2X Energy, to jointly develop Trail Ridge properties in the Piceance Basin. TRDC paid \$40 million for 49 percent of WPX's working interest in 100 proved developed producing wells and committed \$170 million to boost natural gas drilling on the Western Slope.



ENERGY: Colorado Industry Cluster Profile

Product Development and Innovation

Several companies continue to drive new product development and innovation in the state's fossil fuels subcluster.

- Delta-based Industrial Systems, Inc. unveiled a new hydraulic fracturing water cleanup technology. CLEAN-FRAC™ 1000 is designed to treat and purify up to 1,000 barrels a day of flowback from hydraulic fracturing. The company plans to purchase five more systems in 2014.
- Lakewood-based Pioneer Energy designed a new technology to reduce flared natural gas at oil well sites. The Mobile Alkane Gas Separator (MAGS) converts flare gas into shippable, liquid products and dry methane that can be used by generators. MAGS will be used in North Dakota and Colorado oil field operations.
- CSU researchers developed a new water quality monitoring tool for oil and gas sites in the DJ Basin. Colorado Water Watch collects real-time groundwater quality data from oil and natural gas sites and uploads data every hour to the CSU-operated website.

Major Fossil Fuels Companies

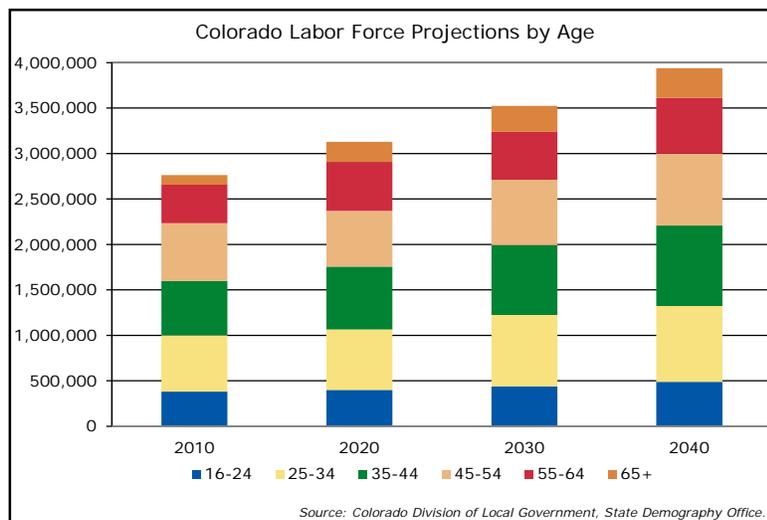
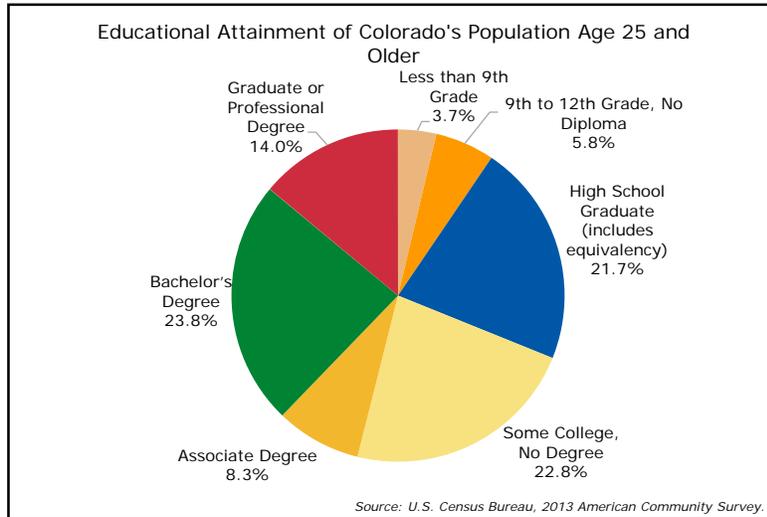
- Anadarko Petroleum Corporation
www.anadarko.com
- Antero Resources
www.anteroresources.com
- Arch Coal, Inc. (West Elk Mine)
www.archcoal.com
- BP America
www.bp.com
- Bill Barrett Corp.
www.billbarrettcorp.com
- Cimarex Energy
www.cimarex.com
- Colorado Springs Utilities
www.csu.org
- ConocoPhillips Co.
www.conocophillips.com
- Crossfire LLC
www.crossfire-llc.com
- DCP Midstream
www.dcpmidstream.com
- Encana Corporation
www.encana.com
- Forest Oil
www.forestoil.com
- Halcón Resources Corp.
www.halconresources.com
- Halliburton
www.halliburton.com
- InfraSource, Inc.
www.infrasourceus.com
- Intermountain Rural Electric Association
www.intermountain-rea.com
- LINN Energy
www.linnenergy.com
- Kinder Morgan
www.kindermorgan.com
- MarkWest Energy Partners, L.P.
www.markwest.com
- Noble Energy, Inc.
www.nobleenergyinc.com
- Northern Pipeline Construction
www.gonpl.com
- Schlumberger Ltd.
www.slb.com
- Shell Exploration and Production
www.shell.com
- SM Energy Co.
www.sm-energy.com
- Suncor Energy Inc.
www.suncor.com
- Superior Energy Services Co.
www.superiorenergy.com
- TransMontaigne Inc.
www.transmontaigne.com
- Tri-State Generation & Transmission Assoc.
www.tristategt.org
- TwentyMile Coal Co. (Peabody Energy)
www.peabodyenergy.com
- United Power
www.unitedpower.com
- Westmoreland Coal Company
www.westmoreland.com
- Whiting Petroleum Corp.
www.whiting.com
- Williams
<http://co.williams.com>
- Xcel Energy
www.xcelenergy.com

ENERGY: Colorado Industry Cluster Profile

Energy Workforce Profile

Many companies choose locations because of the available workforce. With nearly half of Colorado's 5.3 million residents under the age of 35, employers can draw from a large, young, highly educated, and productive workforce. Of Colorado's adult population, 37.8 percent are college graduates and 90.5 percent have graduated from high school. The state has the nation's second-most highly educated workforce as measured by the percentage of residents with a bachelor's degree or higher.

The attractiveness of the state draws new residents through migration. The state's population is expected to grow 53.9 percent from 2010 to 2040, driving a 42.6 percent increase in the state's labor force over the same period. It is important to note the changing composition of the workforce supply as the baby boomers begin to retire, which will pose implications for businesses whose employee pool includes significant numbers of these workers.



ENERGY: Colorado Industry Cluster Profile

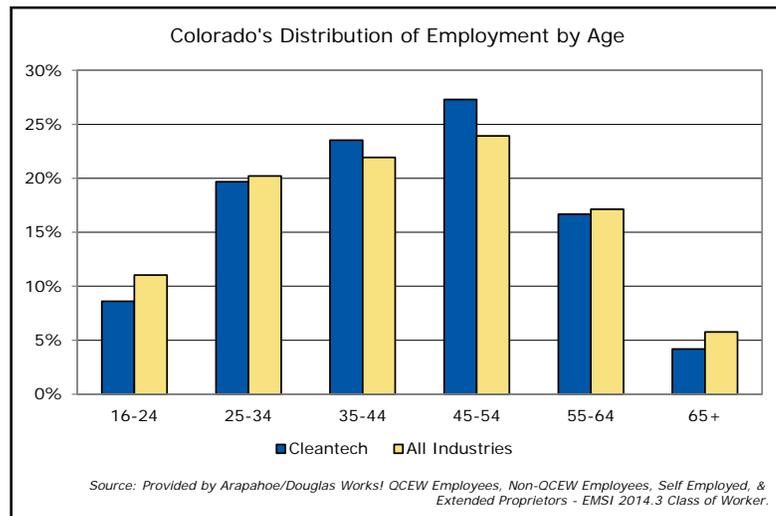
Cleantech Workforce Profile

Age Distribution

Colorado's cleantech industry employs 23,410 people and includes a large pool of talented, well-educated, and highly skilled workers. The age distribution of workers in the cleantech subcluster is similar to the age distribution across all industries. However, the cleantech subcluster has a larger share of employees that are between the ages of 35 and 54 years old, compared with the age distribution of all industries across the state.

The cleantech workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Colorado Cleantech Occupation & Salary Profile

below includes the 10 largest cleantech occupations in the state. For these 10 largest occupations, the chart 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.



Wages

The 2013 average annual salary for cleantech employees was \$77,350 in Colorado, compared with the national average of \$75,500. Colorado's cleantech payroll exceeded \$1.7 billion in 2013.

Colorado Cleantech Occupation & Salary Profile, 2014

10 Largest Cleantech Occupations in Colorado	Total Working Across All Industries (2014)	Number of Available Applicants (2014)	Number of Graduates (2013)	Median Salary	10th Percentile Salary	25th Percentile Salary	75th Percentile Salary	90th Percentile Salary
1. Electricians	15,847	586	675	\$45,981	\$28,745	\$34,937	\$56,273	\$66,423
2. Business operations specialists, all other	40,065	1,041	86	\$64,761	\$33,214	\$45,745	\$86,810	\$111,155
3. Secretaries & administrative assistants, except legal, medical, & executive	71,557	1,285	116	\$33,978	\$21,976	\$27,385	\$41,329	\$48,812
4. Engineers	40,865	1,490	4,128	\$87,175	\$56,184	\$68,920	\$108,472	\$131,360
5. Plumbers, pipefitters, & steamfitters	9,700	108	382	\$43,647	\$28,012	\$33,415	\$52,583	\$61,180
6. Management analysts	24,502	357	9,808	\$65,380	\$42,017	\$53,886	\$79,842	\$93,771
7. Construction laborers	32,639	3,529	19	\$28,647	\$21,431	\$25,381	\$32,214	\$36,813
8. General & operations managers	45,044	2,097	10,096	\$99,222	\$52,242	\$69,284	\$146,999	\$212,139
9. Physical scientists	11,520	401	1,564	\$86,105	\$53,006	\$67,873	\$109,259	\$129,028
10. Life, physical, & social science technicians	8,121	444	985	\$42,992	\$30,578	\$35,423	\$53,968	\$65,160

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: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, Self Employed, & Extended Proprietors - EMSI 2014.3 Class of Worker.

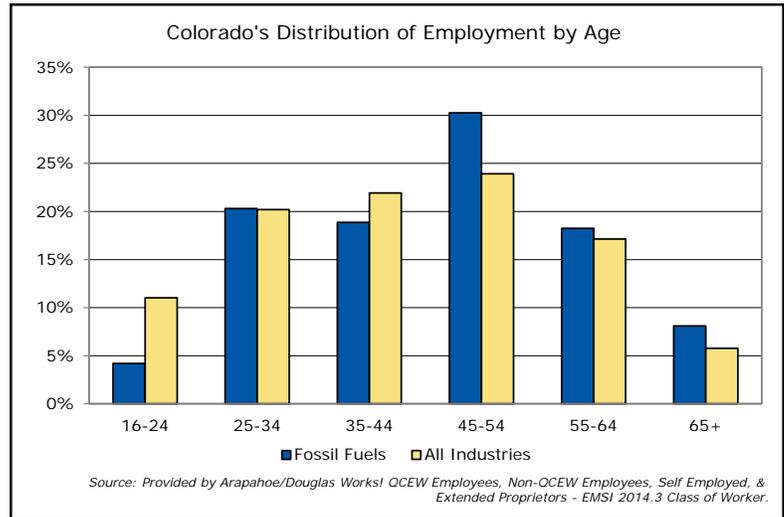
ENERGY: Colorado Industry Cluster Profile

Fossil Fuels Workforce Profile

Age Distribution

Colorado's fossil fuels industry employs 47,590 people and includes a large pool of talented, well-educated, and highly skilled workers. Compared with the age distribution across all industries, the fossil fuels subcluster has a larger share of employees that are older than 45 years old and fewer workers under the age of 24.

The fossil fuels workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Colorado Fossil Fuels Occupation & Salary Profile below includes the 10 largest fossil fuels occupations in the state. For these 10 largest occupations, the chart 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.



Wages

Wages in the fossil fuels subcluster are among the highest across all industry clusters. The 2013 average annual salary for a fossil fuels worker was \$102,470 in Colorado, compared with the national average of \$95,420. Colorado's fossil fuels payroll exceeded \$4.6 billion in 2013.

Colorado Fossil Fuels Occupation & Salary Profile, 2014

10 Largest Fossil Fuels Occupations in Colorado	Total Working Across All Industries (2014)	Number of Available Applicants (2014)	Number of Graduates (2013)	Median Salary	10th Percentile Salary	25th Percentile Salary	75th Percentile Salary	90th Percentile Salary
1. Civil engineers	8,606	169	475	\$77,707	\$53,233	\$63,379	\$94,959	\$110,706
2. First-line supervisors of construction trades & extraction workers	19,653	530	1,128	\$49,280	\$34,646	\$41,054	\$59,824	\$72,194
3. Property, real estate, & community association managers	31,368	382	70	\$32,862	\$25,868	\$30,032	\$38,353	\$42,269
4. Managers, all other	34,815	2,255	10,765	\$47,729	\$34,707	\$40,900	\$55,550	\$62,584
5. Securities, commodities, & financial services sales agents	34,495	37	18	\$50,819	\$35,808	\$41,640	\$66,926	\$86,946
6. General & operations managers	45,044	2,097	10,096	\$99,222	\$52,242	\$69,284	\$146,999	\$212,139
7. Service unit operators, oil, gas, & mining	3,662	82	0	\$41,672	\$30,070	\$34,869	\$52,190	\$68,743
8. Accountants & auditors	43,781	329	1,213	\$61,900	\$40,503	\$49,107	\$79,194	\$99,062
9. Secretaries & administrative assistants, except legal, medical, & executive	71,557	1,285	116	\$33,978	\$21,976	\$27,385	\$41,329	\$48,812
10. Wellhead pumpers	2,836	42	0	\$44,040	\$31,814	\$34,686	\$46,623	\$49,432

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: Provided by Arapahoe/Douglas Works!; QCEW Employees, Non-QCEW Employees, Self Employed, & Extended Proprietors - EMSI 2014.3 Class of Worker.

ENERGY: Colorado Industry Cluster Profile

Education & Training

Colorado's higher education system provides an excellent support system for businesses in the state. There are 28 public higher education institutions in Colorado, consisting of 13 four-year and 15 two-year public institutions offering comprehensive curricula. In addition, there are more than 100 private and religious accredited institutions and nearly 340 private occupational and technical schools offering courses in dozens of program areas throughout the state. Although not exhaustive, a list of the major, accredited educational institutions with the greatest number of graduates for each of the 10 largest energy occupations in Colorado are included below. A directory of all higher education institutions with corresponding websites may be accessed via <http://highered.colorado.gov>.

- Colorado School of Mines
www.mines.edu
- Emily Griffith Technical College
www.emilygriffith.edu
- University of Colorado Boulder
www.colorado.edu
- Colorado State University
www.colostate.edu
- Metropolitan State University of Denver
www.msudenver.edu
- University of Colorado Colorado Springs
www.uccs.edu
- Colorado Technical University Online
www.coloradotech.edu
- Regis University
www.regis.edu
- University of Colorado Denver
www.ucdenver.edu
- Ecotech Institute
www.ecotechinstitute.com
- United States Air Force Academy
www.usafa.af.mil
- University of Denver
www.du.edu

Key Reasons for Energy Companies to Locate in Colorado

Colorado is a top-10 fossil fuels location offering access to one of the most energy rich regions in the United States.

- **Coal** - Colorado produced more than 24 million short tons of coal, or 2.5 percent of the nationwide supply in 2013. Colorado was the 11th-most productive coal mining state and borders Wyoming, the nation's largest producer of coal. (U.S. Department of Energy, Energy Information Administration, 2014)
- **Natural Gas** - Colorado ranked sixth among natural-gas producing states, accounting for 6.6 percent of U.S. natural gas production. The state also had the nation's largest reserve of coalbed methane and accounts for about one-fourth of Colorado's natural gas production. (U.S. Department of Energy, Energy Information Administration, 2014)
 - The Rockies Express Pipeline (REX) is a 1,679-mile natural gas pipeline system that extends from the Piceance Basin in Colorado to Clarington, Ohio with a capacity of 1.8 billion cubic feet per day of natural gas. (U.S. Department of Energy, Energy Information Administration, 2014; Kinder Morgan, 2014)
- **Oil** - Colorado ranked as the 8th-largest crude oil producer in the nation in 2013, producing a record 64.3 million barrels of crude oil. Colorado ranked sixth in the number of active rotary rigs in 2013 and Colorado had the seventh-highest proven oil reserves in the nation totaling 1,170 million barrels in 2013. (U.S. Department of Energy, Energy Information Administration, 2014; Baker Hughes, 2014)
- Nine of the nation's 100 largest natural gas fields and two of the 100 largest oil fields are located in Colorado. (U.S. Department of Energy, Energy Information Administration, 2014)
- With the lowest natural gas prices and total energy costs, Colorado was ranked the least energy-expensive state, with an average monthly energy bill of \$301. (WalletHub, 2014)

Colorado is a top-10 cleantech location with newly enacted requirements for renewable energy generation and access to clean energy resources.

- **Wind** - Colorado ranked 10th in the nation for total installed wind power capacity in 2013 and has the 13th-highest wind resource potential of the states. (American Wind Energy Association, 2013)
- **Biomass** - Colorado has a growing biomass potential with about 5.2 billion kilowatt hours (kWh) of electricity—enough electricity to power more than 1.4 million homes—that could be generated using renewable biomass fuels. (U.S. Department of Energy, Energy Information Administration, 2014)
- **Solar** - Colorado ranked seventh in the nation for solar energy capacity installed in the state in 2013. (Solar Electric Power Association, 2014)

ENERGY: Colorado Industry Cluster Profile

- Southern Colorado is home to four solar energy zones that could produce over 1,800 megawatts of energy when fully developed. (U.S. Department of the Interior, 2014)
- **Water** - Colorado has more than 40 potential hydropower sites that could produce more than 737,975 megawatt-hours annually, enough to power 65,000 homes each year. (Colorado Energy Office, 2014)
- Colorado ranked 15th in the nation in 2012 for the percent of electricity generated from renewable resources. Excluding hydroelectric power, Colorado ranked 10th in the nation for renewable energy generation. (U.S. Department of Energy, Energy Information Administration, 2014)
- Colorado ranked fourth in clean technology leadership in 2014, according to Clean Edge Inc.'s "U.S. Clean Tech Leadership Index." (Clean Edge, Inc., 2014)
- The U.S. Green Building Council ranked Colorado eighth among the top 10 states for Leadership in Energy and Environmental Design (LEED) certification. (U.S. Green Building Council, 2014)
- Colorado received the highest grade among six Southwest states for its policies that support electric vehicles in 2014. (Southwest Energy Efficiency Project, 2014)

Colorado is at the forefront of energy development, with a location that offers:

1. The ability to recruit and retain senior management and scientific talent

- Of Colorado's adult population, nearly 38 percent has completed a bachelor's or higher-level degree, making Colorado the second-most highly educated state in the nation behind Massachusetts. (U.S. Census Bureau, 2013 American Community Survey)
- Colorado ranked seventh in the nation for the number of science and engineering doctorate holders as a percent of the workforce. (National Science Foundation, 2014)
- Colorado ranked ninth in the nation for solar-related jobs and ranked seventh for the number of homes powered by solar in 2013. (The Solar Foundation, 2014)
- Colorado ranked fifth in the nation for the number of wind-related jobs in 2013. (American Wind Energy Association, 2014)
- Colorado ranked fourth for new clean energy and clean transportation jobs during the third quarter of 2014, with more than 1,300 new clean energy jobs announced during the quarter. (Environmental Entrepreneurs, 2014)

2. Proximity to energy-related higher education programs and research centers

- Colorado ranked ninth in the number of science and engineering graduate students per 1,000 individuals ages 25 to 34 years old in 2011. (National Science Foundation, 2014)
- Colorado ranked 10th for research and development (R&D) expenditures per capita among academic institutions in fiscal year 2012. (National Science Foundation, 2014)
- Colorado School of Mines (CSM) in Golden ranked as the nation's top engineering school in 2014. (College Factual, 2014)
- CSM is one of the few universities in the world to offer programs from baccalaureate through doctorate levels in all key fields related to energy and is the only institution in the world that offers doctoral programs in five of the major earth science disciplines. (Colorado School of Mines, 2014)
- Colorado is home to Education Corporation of America's Ecotech Institute, the world's only college entirely focused on training students for careers in cleantech. (Ecotech Institute, 2014)
- The Center for Revolutionary Solar Photoconversion (CRSP) was established in 2008 as a joint research center of the Colorado Energy Research Collaboratory. CRSP conducts basic and applied research that will result in scientific and technological revolutions in solar energy conversion. (Center for Revolutionary Solar Photoconversion, 2014)
- CSU's Natural Gas Initiative is an interdisciplinary group of scientists across its eight colleges offering diverse expertise to focus on collaborative solutions for the responsible production of natural gas. (Colorado State University, 2014)
- Established in 2013, the CSU Energy Institute serves as the nucleus of CSU's energy-related research, education, and outreach. Through its 13 affiliated centers, the Institute aims to increase collaboration with industry and governmental partners to solve energy problems and create new research and educational opportunities. (Colorado State University, 2014)
- The Solar Technology Acceleration Center (SolarTAC) in Aurora is the largest test facility for solar technologies in the U.S. (The Solar Technology Acceleration Center, 2014)

3. Access to the research of a broad collection of federal laboratories and private R&D activities

- Key federal offices located in Colorado include the National Center for Atmospheric Research; the Office of Surface Mining Reclamation and Enforcement; the U.S. Bureau of Land Management; the

ENERGY: Colorado Industry Cluster Profile

U.S. Bureau of Ocean Energy Management, Regulation and Enforcement; the U.S. Bureau of Reclamation; the U.S. Forest Service; the U.S. Department of Energy; the U.S. Environmental Protection Agency; the U.S. Geological Survey; and the Western Area Power Administration.

- Firms with fossil fuel energy R&D programs include Anadarko Petroleum, BP America, Encana, Noble Energy, Shell Exploration & Production, and Suncor Energy.

4. Business organizations and public policy programs designed to encourage industry growth.

- The Colorado Energy Coalition (CEC) is a consortium of leaders and stakeholders dedicated to strengthening the business climate in Colorado supporting all sectors of the energy industry. The CEC's mission is to brand Colorado as the Balanced Energy Capital of the West. (Metro Denver EDC, 2014)
- The Colorado Clean Energy Cluster (CCEC) is an economic development organization dedicated to growing 1,650 clean energy jobs and aims to generate \$325 million in economic activity from clean energy by 2015 in Northern Colorado. CCEC's initiatives include FortZED, the International Cleantech Network, C3E, and Net Zero Water. (The Colorado Clean Energy Cluster, 2014)
- The Advanced Industries (AI) Accelerator Programs were created in 2013 to promote growth and sustainability in Colorado's advanced industries including advanced manufacturing, aerospace, bioscience, electronics, energy and natural resources, infrastructure engineering, and technology and information. The Colorado Office of Economic Development and International Trade offers Proof of Concept, Early-Stage Capital & Retention, Infrastructure Funding, and AI Exports grants. Since inception, the programs have awarded 67 grants totaling \$8.2 million to support these critical industries in their various phases of growth. (The Colorado Office of Economic Development and International Trade, 2014)

Energy Industry Cluster Definition

NAICS Code*	NAICS Description	SIC Code	SIC Description
Fossil Fuels			
211111	Crude petroleum & natural gas extraction	1311	Crude petroleum & natural gas
211112	Natural gas liquid extraction	1321	Natural gas liquids
212111	Bituminous coal & lignite surface mining	1221	Bituminous coal & lignite surface mining
212112	Bituminous coal underground mining	1222	Bituminous coal underground mining
212291	Uranium-radium-vanadium ore mining	1094	Uranium-radium-vanadium ores
213111	Drilling oil & gas wells	1381	Drilling oil & gas wells
213112	Support activities for oil & gas operations	1382	Oil & gas field exploration services
213112	Support activities for oil & gas operations	1389	Oil & gas field services, NEC
213113	Support activities for coal mining	1241	Coal mining services
221111	Hydroelectric power generation	4911	Electric services
221111	Hydroelectric power generation	4931	Electric & other services combined
221111	Hydroelectric power generation	4939	Combination utilities, NEC
221112	Fossil fuel electric power generation	4911	Electric services
221112	Fossil fuel electric power generation	4931	Electric & other services combined
221112	Fossil fuel electric power generation	4939	Combination utilities, NEC
221113	Nuclear electric power generation	4911	Electric services
221113	Nuclear electric power generation	4931	Electric & other services combined
221113	Nuclear electric power generation	4939	Combination utilities, NEC
221121	Electric bulk power transmission & control	4911	Electric services
221121	Electric bulk power transmission & control	4931	Electric & other services combined
221121	Electric bulk power transmission & control	4939	Combination utilities, NEC
221122	Electric power distribution	4911	Electric services
221122	Electric power distribution	4931	Electric & other services combined
221122	Electric power distribution	4939	Combination utilities, NEC
221210	Natural gas distribution	4923	Natural gas transmission & distribution
221210	Natural gas distribution	4924	Natural gas distribution
221210	Natural gas distribution	4925	Mixed, manufactured, or liquefied petroleum gas production and/or distribution
221210	Natural gas distribution	4931	Electric & other services combined
221210	Natural gas distribution	4932	Gas & other services combined

ENERGY: Colorado Industry Cluster Profile

Energy Industry Cluster Definition Cont'd

NAICS Code*	NAICS Description	SIC Code	SIC Description
221210	Natural gas distribution	4939	Combination utilities, NEC
237120	Oil & gas pipeline & related structures construction	1623-00	Water, sewer, & utility lines
237120	Oil & gas pipeline & related structures construction	1623-01	Oil, gas line & compressor station construction
237120	Oil & gas pipeline & related structures construction	1623-9900	Water, sewer, & utility lines, NEC
237120	Oil & gas pipeline & related structures construction	1623-9903	Pipe laying construction
237120	Oil & gas pipeline & related structures construction	1623-9904	Pipeline construction, nsk
237130	(P) Power & communication line & related structures construction	1623-9901	Electric power line construction
237130	(P) Power & communication line & related structures construction	1623-9906	Underground utilities contractor
237130	(P) Power & communication line & related structures construction	1629-0503	Oil refinery construction
237130	(P) Power & communication line & related structures construction	1629-9905	Power plant construction
324110	Petroleum refineries	2911	Petroleum refining
325110	Petrochemical mfg.	2869-04	Fuels
333131	Mining machinery & equipment mfg.	3532	Mining machin & equip., except oil & gas field machin & equip.
333132	Oil & gas field machinery & equipment mfg.	3533	Oil & gas field machinery & equipment
423520	(P) Coal & other mineral & ore merchant wholesalers	5052	Coal & other minerals & ores
486110	Pipeline transportation of crude oil	4612	Crude petroleum pipelines
486210	Pipeline transportation of natural gas	4922	Natural gas transmission
486210	Pipeline transportation of natural gas	4923	Natural gas transmission & distribution
486910	Pipeline transportation of refined petroleum prod.	4613	Refined petroleum pipelines
523910	(P) Misc. intermediation	6792	Oil royalty traders
523999	(P) Misc. financial investment activities	6211-0303	Oil & gas lease brokers
523999	(P) Misc. financial investment activities	6211-0304	Oil royalties dealers
533110	(P) Lessors of nonfinancial intangible assets (except copyrighted works)	6792	Oil royalty traders
541330	(P) Engineering services	8711-03	Petroleum, mining, & chemical engineers
541360	(P) Geophysical surveying & mapping services	1382	Oil & gas field exploration services
Cleantech			
221114**	Solar electric power generation		
221115**	Wind electric power generation		
221116**	Geothermal electric power generation		
221117**	Biomass electric power generation		
221118**	Other electric power generation		
221330	(P) Steam & air-conditioning supply	4961-9904	Steam supply systems, including geothermal
237110	(P) Water & sewer line & related structures construction	1781-9901	Geothermal drilling
238210	(P) Electrical contract. & other wiring install. contractors	1731-0202	Energy management controls
238220	(P) Plumbing, heating & air-conditioning contractors	1711-0403	Solar energy contractor
238310	(P) Drywall & insulation contractors	1742-0204	Solar reflecting insulation film
314994	(P) Rope, cordage, twine, tire cord, & tire fabric mills	2296-03	Cord & fabric for reinforcing fuel cells
325180	(P) Other basic inorganic chemical mfg.	2819-06	Fuels & radioactive compounds
325193	Ethyl alcohol mfg.	2869-0104	Ethyl alcohol, ethanol
333414	(P) Heating equipment (except warm air furnaces) mfg.	3433-9904	Solar heaters & collectors
333611	(P) Turbine & turbine generator set units mfg.	3511	Turbines & turbine generator sets
334413	(P) Semiconductor & related device mfg.	3674-0305	Photovoltaic devices, solid state
334413	(P) Semiconductor & related device mfg.	3674-0306	Solar cells
334413	(P) Semiconductor & related device mfg.	3674-9901	Fuel cells, solid state
334512	Automatic environmental control mfg. for residential, commercial, & appliance use	3822	Environmental controls

ENERGY: Colorado Industry Cluster Profile

Energy Industry Cluster Definition Cont'd

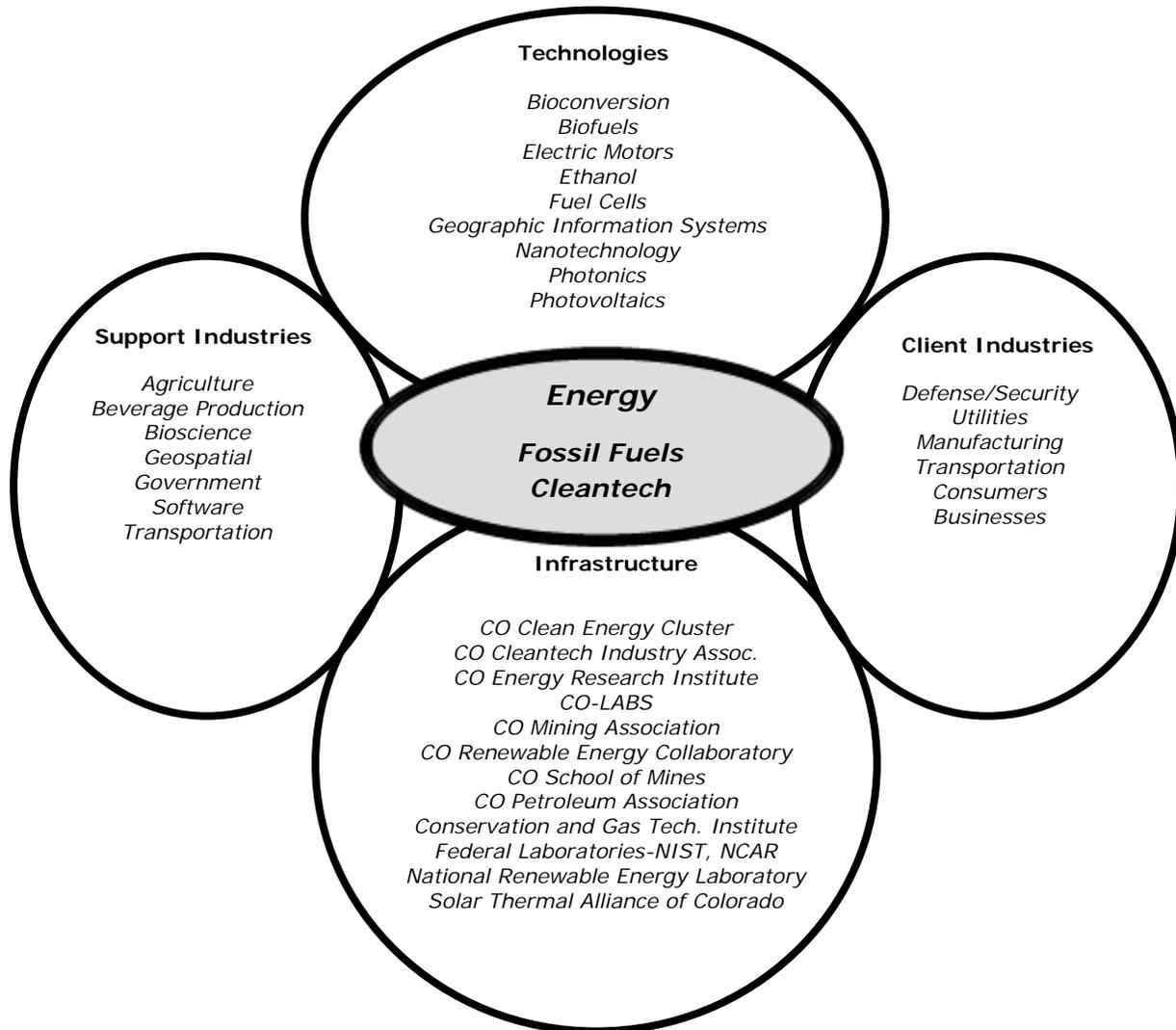
NAICS Code*	NAICS Description	SIC Code	SIC Description
334515	(P) Instrument mfg. for measuring & testing electricity & electrical signals	3825-0305	Electrical power measuring equipment
334515	(P) Instrument mfg. for measuring & testing electricity & electrical signals	3825-0306	Energy measuring equipment, electrical
334519	(P) Other measuring & controlling device mfg.	3829-0218	Solarimeters
335311	(P) Power, distribution, & specialty transformer mfg.	3612	Power, distribution, & specialty transformers
335312	(P) Motor & generator mfg.	3621-03	Control equipment for electric buses & locomotives
335312	(P) Motor & generator mfg.	3621-9909	Windmills, electric generating
335911	Storage battery mfg.	3691	Storage batteries
335999	(P) All other misc. electrical equipment & component mfg.	3629-0102	Electrochemical generators (fuel cells)
336111	(P) Automobile mfg.	3711-0104	Cars, electric, assembly of
336390	(P) Other motor vehicle parts mfg.	3799-0302	Cars, off-highway: electric
423720	(P) Plumbing & heating equipment & supplies (hydronics) merchant wholesalers	5074-0208	Heating equipment & panels, solar
482111	(P) Line-haul railroads	4011-9901	Electric railroads
541380	(P) Testing laboratories	8734-00	Testing laboratories
541380	(P) Testing laboratories	8734-9902	Calibration & certification
541620	(P) Environmental consulting services	8748-9905	Environmental consultant
541620	(P) Environmental consulting services	8999-07	Earth science services
541620	(P) Environmental consulting services	8999-09	Scientific consulting
541690	(P) Other scientific & technical consulting services	8748-9904	Energy conservation consultant
541712	(P) Research & development in the physical, engineering, & life sciences (except biotechnology)	8731-03	Natural resource research
541712	(P) Research & development in the physical, engineering, & life sciences (except biotechnology)	8733-9902	Research institute
924110	(P) Administration of air & water resource & solid waste management programs	9511-00	Air, water, & solid waste management

*(P) indicates that only part of the NAICS industry category is represented in the industry cluster definition.

**The NAICS codes are reviewed every five years for potential revisions to reflect new and emerging industries and to allow for industry changes. In 2012, NAICS code 221119 was reclassified into five new industries to distinguish solar (221114), wind (221115), geothermal (221116), biomass (221117), and other electric (221118) power generation. As a result, 221119 was removed from fossil fuels and reclassified into cleantech. Data is limited or not yet available for these five new industries.

Note: NEC indicates "not elsewhere classified."

Energy Industry Cluster Relationships



For additional information, contact us:



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Economic Development Corporation

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