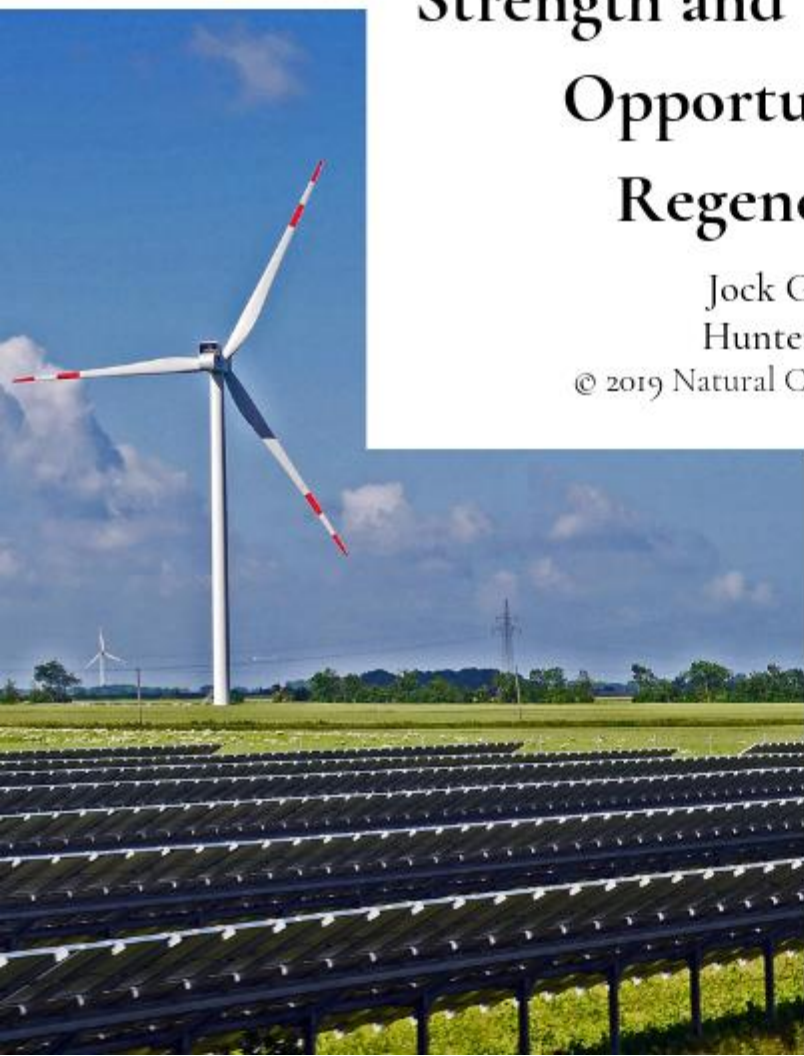


A Snapshot of the Colorado Economy

Key Industries, Areas of
Strength and Weakness, and
Opportunities for
Regeneration

Jock Gilchrist
Hunter Lovins

© 2019 Natural Capitalism Solutions





A Snapshot of the Colorado Economy

Key Industries, Areas of Strength and Weakness, and Opportunities for Regeneration

Jock Gilchrist, Research Fellow
Hunter Lovins, President
Natural Capitalism Solutions

The Boulder-Denver area comprises almost 90 percent of the Colorado economy. It is a dynamic, growing region that is transitioning from a legacy economy of extractive industries to one featuring more regenerative businesses. This shift offers Colorado the opportunity to create a more inclusive, resilient life for all.

Few residents, however, are aware that a transition is underway or that it provides an opportunity. To encourage this conversation, Natural Capitalism Solutions has written this report.

Change is hard. Margaret Mead observed that the only person who likes change is a wet baby. And most babies fuss through the process. Similarly, legacy industries claim that they are responsible for the prosperity of their society and must be sustained. Colorado is no different. Recent efforts to protect the health and safety of citizens and communities by limiting hydraulic fracturing to extract natural gas were defeated by claims that limiting the industry would destroy jobs and cripple the economy.

Natural Capitalism Solutions asked: is this true? What is the real basis of the Colorado economy? Are industries like oil and gas and industrial agriculture as critical to our wellbeing as they claim? Who are the biggest employers? What are the trends? Is it economically possible to transition away from industries that are dangerous and polluting to business practices that are more regenerative? Where are areas for improvement? What niche markets could thrive here? What makes this region, and the Colorado economy, economically unique?

This research is a first step to answering those questions. It presents a survey of key statistics about Colorado and the Boulder-Denver region. It forms a snapshot of where we are, so that we can better chart a course to what we would like to become.

These numbers are taken from publicly available data. Although these are the best available numbers, some are half a decade old. Because they are drawn from different sources, some may seem divergent. But even as a snapshot, this report shows that the legacy industries are fading, while the industries that are more regenerative of human and natural capital are rising.

The report thus gives a sense of the opportunity to facilitate an economic, social, and ecological shift away from industries that drive climate change and endanger our citizens towards business practices that are cleaner, promote healthier lifestyles, and can give Colorado a finer future. Natural Capitalism Solutions is working with the Colorado Regenerative Hub to foster this transition.

As more recent numbers become available, we will update the conclusions, and correlate them with evolving industry data. We welcome your comments, corrections and suggestions for improvement.



Contents

Executive Summary.....	4
Legacy Industries.....	6
Fossil Fuels.....	6
Natural Resources and Mining.....	7
Industrial Agriculture.....	7
Mining and Logging.....	8
More Regenerative Industries.....	9
Clean Energy Technology.....	9
Solar.....	10
Organic Farming and Natural Foods.....	10
Natural Foods Industry.....	11
Organic Farming.....	11
Craft Brewing Industry.....	12
Cannabis.....	13
Horse Industry.....	14
Outdoor Recreation.....	14
Travel and Tourism.....	17
Innovation, Entrepreneurship, and Information Technology.....	17
Arts, Culture, and Entertainment.....	18
Education.....	19
Employment and enrollment.....	19
Impact from Institutions.....	19
Colorado’s Wellness Economy.....	20
Public Transit.....	21
Construction.....	23
Other Industry Sectors.....	23
Sports.....	23
Aerospace.....	24
Aviation.....	24
General Economic Information.....	25
References.....	26
About the Authors.....	36



Executive Summary

This report uses the concept of “regenerative” as a framework for our analysis of Colorado’s economy. “Regenerative” here refers to a system that enhances ecological, economic, and social health.

Regenerative systems incorporate design principles that mimic those found in natural systems. They transcend false dichotomies (e.g. economic health *or* environmental protection; social well-being *or* sound business practices) and outdated narratives (e.g. economic success is based on competition and zero-sum scenarios; we can’t solve climate change and build a prosperous economy at the same time).¹

Our economic analysis assessed Colorado’s economic sectors on a spectrum of more regenerative to less. We began this research with the hypothesis that several regenerative industries, businesses, and systems already exist in the state and make major economic contributions. We also examined whether the historically significant but less regenerative sectors, businesses, and systems are a shrinking share of Colorado’s economic performance. While this report was not written to offer policy or business prescriptions, given the confirmation we found of these hypotheses, we believe that nurturing Colorado’s regenerative systems and ensuring their continued upward trajectory is the best way to achieve a healthy economy, populace, and planet.

Colorado’s is a diverse and unique economy. We surveyed its economic landscape to assess the relative size and strength of most sectors. While our statistics often highlight Metro Denver, with emphasis on the Boulder-Denver region (roughly 85 percent of the state’s economy), we give statewide statistics throughout the report. When relevant, we also offer national statistics. For each industry, we focused on employment size, contributions to GDP, and noteworthy trends. Our statistics paint a picture of key divergences from common claims about Colorado’s economy.

Oil, gas, and mining are often portrayed as the cornerstone of the Colorado economy. This is no longer true. Our research suggests that the relative size and importance of legacy industries like oil, gas, and other mining are often overstated.

It is somewhat hard to pin down the extent to which the extractive industries are no longer core to the state’s economic health, as various sources define the sector differently and so produce different estimates of the industry’s economic impact. For example, the Metro Denver Economic Development Corporation’s Industry Cluster Report puts the “Fossil Fuels” industry cluster at 40,420 direct jobs statewide. Elsewhere on Metro Denver EDC’s website, they adhere more strictly to the North American Industry Classification System, wherein the “Mining” sector (composed of mining, mining support, and oil and gas extraction) directly employs 25,578. And finally, the Colorado Oil and Gas Association, an industry trade group, puts direct employment in the oil and gas sectors at 30,000. Regardless of how you count it, employment in fossil fuels decreased by 8.4% statewide between 2012 and 2017.

Many other industries are underappreciated as essential economic engines but are performing strongly and contributing to Coloradans’ livelihoods. For example, the craft brewing industry employs 22,411 statewide—nearly the size of the oil and gas industry. The University of Colorado’s four campuses in total employ 32,386, putting it on par with oil and gas. And these are dwarfed by clean energy, which directly employs 66,223 Coloradans.

¹ For deeper discussions of regenerative economics, see “Regenerative Capitalism” by John Fullerton, *Doughnut Economics* by Kate Raworth, and *A Finer Future* by Hunter Lovins, Stewart Wallis, Anders Wijkman, and John Fullerton.



The IT-software industry cluster employs 58,190 in nine-country Metro Denver. Arts and culture directly employs 100,631 statewide. Outdoor recreation directly employs 229,000, and when direct, indirect, and induced employment are tallied, supports a whopping 511,000 jobs in the state, constituting 18.7% of Colorado’s labor force. By comparison, oil and gas support 89,000 direct, indirect, and induced jobs, almost six times fewer than outdoor recreation.

The outdoor recreation sector contributes \$35bn to state GDP, IT-software contributes \$14bn, arts and culture contributes \$13.7bn, and mining contributes \$13.4bn. The natural and organic foods sector contributes \$2.5bn, while agriculture and forestry combined contribute \$2.7bn.

Organic farmland in Colorado increased over 4000% between 1997 and 2015, growing from 3,716 acres to 151,571 acres. The legal cannabis industry’s labor force grew 7 times between January 2014 and February 2018 and now employs almost 20,000 statewide. It contributes as much to state and local tax revenue as cigarette and tobacco taxes, and almost 5 times as much as alcohol taxes. IT-software had the fastest employment growth of any Colorado sector between 2012 and 2017, increasing its labor force by 32.2%. The Boulder-Denver region is a hotspot for startups, acquisitions, and VC investment. Metro Denver employs the highest proportion of workers in aerospace of any US metro area.

Beyond the hard numbers, Colorado continues to excel in terms of quality of life for its residents—one of Colorado’s unique economic value propositions. Colorado and Hawaii are the only two states to have ranked in the top 10 for overall well-being every year since Gallup’s rankings began in 2008. Boulder was ranked as having the highest physical well-being in the nation in 2018, and in 2016, Denver was named the best city to live in.

Our research shows that the true strength of Colorado’s economy comes from several established and emerging industries that generate both social and ecological health and economic prosperity. With the right combination of policies and programs, Colorado’s leadership can support these regenerative industries, as they are already our biggest assets. Doing so will continue the state’s ongoing economic transformation away from damaging practices and towards ones that deliver shared prosperity on a thriving planet.

Legacy Industries

Colorado's legacy industries of oil and gas, mining, timber, and industrial agriculture are believed by many and claimed by the industry to be the basis of prosperity in the state, critical to job security and economic well-being. Closer examination of the state's economic statistics shows that these sectors actually represent a small and shrinking part of our economy. They are not sustainable, much less regenerative, and are at risk of further erosion.

Fossil Fuels

The labor force of the fossil fuel industry shrank over the last few years, posting negative employment growth in Metro Denver in 2015, 2016, and 2017, and statewide in 2017. In 2017, Metro Denver employed more laborers in beverage production (e.g. craft brewing, tea, etc) than in oil and gas extraction, mining, and mining support activities combined (Metro Denver EDC, 2018; Metro Denver EDC, 2019). While these industries are more important in such counties as Weld and Garfield, they contribute relatively little to the Metro Denver area.

- In 2017, fossil fuels employed 28,840 in Metro Denver and 40,420 in Colorado. “Fossil fuels payroll reached nearly \$4.4 billion in 2016” (Metro Denver EDC, 2018).
 - o Notably, the Metro Denver EDC uses a more expansive categorization for their fossil fuels sector. The Colorado Oil and Gas Association themselves actually put direct employment at a lower number: 30,000 statewide (COGA, 2019).
- There are 1,860 fossil fuel companies in Metro Denver and 2,610 in Colorado (Metro Denver EDC, 2018).
- Of the 13 major industries in Metro Denver, fossil fuels was the only one whose employment numbers shrank in 2017 (Metro Denver EDC, 2018).
 - o It lost 0.2% of its labor force, mirroring the trends in the US more broadly. Fossil fuel employment nationwide also shrunk 0.2% in that time period.
 - o In Metro Denver, fossil fuel employment shrunk by 3% in 2015 and 8% in 2016.
 - o Statewide, fossil fuels lost 3.9% of its jobs in 2017.
- While fossil fuel employment in Metro Denver grew by 4.6% between 2012 and 2017, fossil fuel employment statewide contracted by 8.4% in that time period.
 - o Compare this to the cleantech industry, which grew by 20.5% and 21.7% in Metro Denver and Colorado over the same period.
- In 2017, the specific jobs of oil and gas extraction, mining, and mining support activities employed 9,370 in Metro Denver, for 0.58% of Metro Denver's total 1.6 million-person labor force. Statewide, those same activities employed 25,578, making up .98% of the state's labor force (Metro Denver EDC, 2019).
- The U.S. fracking industry, which has a stronghold in Colorado and is conventionally viewed as a successful industry, amazingly, the industry has actually never had a profitable quarter.
 - o While U.S. oil and gas industry produces more barrels per day than ever before, fracking is overleveraged. “Despite significant technological advances—and, more important, an influx of hundreds of billions of dollars of capital—fracking has yet to produce positive cash flows” (IEEFA & Sightline, 2018, p. 2).
 - o “From January 2010 to June 2018, these oil and gas companies collectively spent \$196 billion more on capital projects than they made selling oil and gas. To sustain their operations, they racked up \$46 billion in long-term debt, while raising an additional \$41 billion from equity markets” (IEEFA & Sightline, 2018, p. 3).

- Similarly, the Wall Street Journal analyzed the performance of 50 fracking companies and reported that in the second quarter of 2018, they spent \$2 billion more than they generated (Elliot & Olson, 2018).

Trouble lies ahead for oil and gas in Colorado. Until the US fracking industry has a profitable quarter, the industry will survive only if fresh infusions of investor money can be found. One report says, “investors would be wise to view fracking companies as speculative investments” (IEEFA & Sightline, 2018, p. 4). While the industry hires employees and contributes to local economies, thereby inflating its economic impact, that spending could dry up at any moment if investors reconsider.

Natural Resources and Mining

- The Leeds School of Business 2019 Colorado Business Economic Outlook breaks out a sector called “Natural Resources and Mining.” It has significant overlap with the “Fossil Fuels” sector used by the Metro Denver EDC. Natural Resources and Mining includes oil and gas, coal, natural gas, and other extractive practices.
- The sector had the smallest projected 2019 employment of any examined in the report (30,800). It is dwarfed by sectors such as “Government” (450,200), “Education and Health Services” (346,700), and “Leisure and Hospitality” (348,000) (2018, p. 10).
 - Natural resource extraction employs 1% of Colorado’s workforce. It contributed \$18.3 billion in GDP in 2017. That year, crude oil production reached an all-time high in the state of 132 million barrels.

Industrial Agriculture

Measurements of the agriculture sector, as defined by the Bureau of Economic Analysis, include farm production, forestry, fishing, textile mills and products, apparel, and food and beverage sales, service, and manufacturing (Newton, 2018). In Colorado, farm production contributed \$2.1 billion in both 2016 and 2017, farm representing just 0.64% and 0.61% of Colorado’s GDP in those years (Statista, 2019; Leeds School of Business, 2017; St. Louis Fed, 2018). But agriculture uses 47.5% of Colorado’s land (Department of Numbers, 2018; CO Department of Agriculture, 2017; World Atlas, 2019). Agricultural land use impacts crops, biodiversity, soil health, and communities. The industrial agriculture sector has seen a volatile few years, with beef exports performing strongly but grain prices dropping. Colorado net farm income in 2017 was expected to drop to \$1.16 billion, down from \$1.23 billion in 2016 (Leeds School of Business, 2017).

- A big contributor to the decline is falling cash prices for wheat and corn, the major crop commodities in the state. Grain is abundant in the global market after four years of record production. Recent trade wars have also worsened agricultural markets.
- “Profitability is highly concentrated among only a few sectors of Colorado’s diverse food and agriculture value chain, most notably, cattle feeders.”
 - “Beef accounts for the largest share of Colorado’s ag economy.”
 - “Cattle feeders, who purchase young calves from ranchers and feed them to slaughter weight, had potentially their most profitable six months ever from January to July 2017.”
 - “The cattle sector is so large in proportion to the rest of Colorado agriculture that it leads the way in economic impact. While beef has the largest impact to the farm income bottom line, dairy, egg, and pork producers also showed some gains.”



- In 2018, “projected net farm income is expected to climb slightly to \$1.37 billion, a level still well off the record high of \$1.84 billion recorded in 2011.”
- The total value of Colorado’s farm production in 2017, prior to expenses, was \$6.82 billion: \$4.64 billion from livestock, and \$2.18 billion from crops.
 - o In 2017, the gross value of all farm revenue (including forestry, services, and government payments) was \$8.08 billion, and farm production expenses were \$7.18 billion, for a total farm income of \$901 million. [Leeds School of Business (2017; 2018, p. 17).]
- “Of Colorado’s \$3.7 billion livestock industry, 75% comes from cattle and calves... Colorado is the fourth largest exporter of fresh and frozen beef in the United States” (Colorado Cattlemen’s Association, 2018).
 - o “Whole milk and butter sales have increased since 2013, while reduced fat and low-fat milk sales have declined. Perceptions about the healthfulness of full fat milk and butter, as well as ‘bulletproof’ coffee with butter added, have contributed to this trend. Many factors may contribute to the overall decline of consumption, including fewer children in the population and alternative plant-based ‘milks.’”

There are many other components of the agriculture sector, many of which are far more regenerative than industrial agriculture and are growing. These, along with ways to begin converting large-scale production agriculture to more regenerative practices, are discussed below.

Mining and Logging

The mining and logging sector has overlap with the fossil fuel industry and the natural resources and mining sector, depending on how sources classify their economic data.

- In December 2018, mining and logging employed 32,200 people, a total of 1.15% of the state’s labor force. This represents a decline from its peak employment at 36,400 in December 2014 (Office of Labor Market Information, 2019).



More Regenerative Industries

A common myth is that Colorado's economy is driven by oil and gas, mining, timber extraction and industrial agriculture. Statistics show otherwise.

The economic contributions and employment from extractive industries, while critical parts of the history of Colorado, are dwarfed in size now by more regenerative industries, from entrepreneuring to outdoor recreation, from natural foods to arts and culture. Even craft brewing now generates more jobs than oil and gas extraction. Change is coming to Colorado and it is time for the economy to evolve.

Clean Energy Technology

The Metro Denver Economic Development Corporation defines “clean tech” as companies that produce renewable energy, fuel cells, renewable energy equipment, battery storage, engineering support services, and research and development pertaining to renewable energy.

- From 2012 to 2017, the clean tech workforce grew 20.5% in Metro Denver, faster than the US average of 14.6%, while oil and gas employment fell by 3% in 2015 and 8% in 2016.
- In Metro Denver in 2017, clean tech employment grew by 1%. Fossil fuels shrank by 0.2% (Metro Denver EDC, 2018).
- In 2017, clean tech employed 22,440 in Metro Denver and 26,400 in Colorado (compared to 28,840 oil and gas jobs in Metro Denver).
- There are 1,620 clean tech companies in Metro Denver and 2,140 in Colorado (Metro Denver EDC, 2018).
- In total, in 2016 clean tech employed 1% of Metro Denver's labor force. Fossil fuels employs 1.2% (Metro Denver EDC, 2018). In 2016, the Boulder Metro Statistical Area was home to 292 cleantech companies that employed 4,364 people, and had 4 times the employment concentration compared to the US average (Boulder Economic Council, 2018).
- Colorado has the 4th highest clean tech direct employment concentration in the nation (Metro Denver EDC, 2018).
- “Clean tech payroll reached more than \$2.1 billion in 2016” (Metro Denver EDC, 2018). It has not yet reached the level of the fossil fuels payroll of \$4.4 billion in 2016, but that difference is shrinking as clean tech grows. Between 2016 and 2017, average annual wages in clean tech grew by 2.4% from \$79,690 to \$81,630, while fossil fuel wages shrank by 4.0% from \$111,880 to \$107,410 (Metro Denver EDC, 2017; Metro Denver EDC, 2018).
- “Electricity from renewable sources has more than doubled since 2010 to nearly one-fourth of the state's net electricity generation in 2017” (EIA, 2019).

The Metro Denver Economic Development Corporation's definition of clean tech is narrower than that used by Environmental Entrepreneurs (E²). E² defines the “Clean Energy” sector as all the sectors used by Metro Denver EDC, plus energy efficiency, clean vehicles, and advanced grid technologies. By this definition, there are more than 3.3 million Americans working in solar, wind, energy efficiency and clean vehicles. This would make clean energy one of the fastest-growing job sectors in today's economy. In fact, more Americans work in clean energy than work in agriculture or real estate—or in all of the mining, fossil fuel extraction, pipeline and railroad industries combined (E², 2019).

- A report by E² said that Colorado has 66,223 Clean Energy jobs with workers in all 64 counties. At most, fossil fuels employs 40,420 in Colorado (E², 2017; Metro Denver EDC,



2018). As stated above, other sources put fossil fuel employment at 30,000 or 25,578 (COGA, 2019; Metro Denver EDC, 2019).

- Clean energy jobs grew 6% between 2016 and 2017 (E², 2017).

In 2016, Colorado had the sixth cleanest grid in the country and ranked seventh for clean technology deployment (a composite ranking which measured clean electricity, clean transportation, energy intelligence, and green building) (Clean Edge, 2016). It has gotten substantially better since then. In late 2018, Xcel Energy pledged to become entirely powered by renewable energy by 2050 (Miller, 2018).

Metric	Fossil Fuels	Clean Energy
Direct employment	40,420	66,223
Employment Growth, 2012-2017	-8.4%	21.7%
Employment Growth, 2016-2017	-0.2%	6.0%
*Avg salary, 2016, in \$	111,880	79,690
*Avg salary, 2017, in \$	107,410	81,630
*Salary growth, 2016-17	-4.2%	2.4%

*Sources: Metro Denver EDC, 2018; E2, 2017.
Statistics are for the Metro Denver region only.

- Colorado’s Renewable Portfolio Standard goal of 30% clean electricity by 2020 was one of the most ambitious goals in the nation when it was introduced (Leeds School of Business, 2018), but is now exceeded by California’s pledge of 33% by 2020, 50% by 2030, and 100% by 2045. In response, in 2019, Jared Polis, Colorado’s new Governor, pledged to take the state 100% renewable by 2040.
- In 2016, the clean energy sector generated \$4.6 billion of economic impact in Colorado and \$20.5 million in VC cleantech investments (CCIA, 2019).
- 25,096 workers are employed specifically in electric power generation in the state. Solar and wind are now the two largest segments, with 8,027 and 7,124 jobs respectively. When hydroelectric generation is added in, renewable power employs 64.4% of the workers involved in power generation statewide (U.S. Department of Energy, 2017).

Solar

Colorado’s solar industry employment is expected to grow 7.5% in 2019 (The Solar Foundation, 2019). This mirrors nationwide trends—Wood Mackenzie and the Solar Energy Industry Association forecast 25% growth in solar installations nationwide in 2019 as compared to 2018 (2019).

- In 2018, Colorado employed 6,847 in the solar industry. Of those, 6,248 are employed in Denver, Boulder, and Fort Collins MSAs (The Solar Foundation, 2019).
- “The largest stand-alone energy storage system on an army base is being constructed at Fort Carson, Colorado. The 4.25 MW system will reduce electricity demand at peak periods, increasing the base’s grid resilience” (The Solar Foundation, 2019).
- “Boulder-based Namaste Solar Inc. raised \$3.1 million from more than 91 investors, the second-largest amount ever raised by an employee-owned cooperative in the U.S.” (Metro Denver EDC, 2018).

Organic Farming and Natural Foods

The Boulder-Denver economy supports a robust network of regenerative businesses that are transforming food systems. Consumers in the area continue to demand healthy options that also enhance ecological health in agriculture. As a result, organic farmland in Colorado increased 40-fold between 1997 and 2015. The Front Range, and Boulder in particular, is home to the highest concentration of natural and organic product companies in the nation. These have an outsized impact on the state economy, showing that we can feed people while improving soil health, preserving production capacity for future generations, and turning a profit at the same time.



Natural Foods Industry

- Many consider Boulder the national epicenter of the Natural Foods Industry. Boulder companies attract capital investment and acquisitions from all around the country (Castle, 2016; Frank, 2016; Wirthman, 2016).
- “Boulder is home to the nation’s largest concentration of natural and organic products companies and has the highest per capita consumption of organic foods in North America, according to the International Federation of Organic Agriculture Movements” (Boulder Economic Council, 2018).
- According to Naturally Boulder’s “Natural and Organic Industry Study,” member organizations contribute \$2.5 billion and 8,278 jobs statewide (Leeds School of Business, 2011).
 - o Compare this to “oil and gas extraction,” which employed 8,412 statewide in 2017 (Metro Denver EDC, 2019).

Organic Farming

- “CO is at the forefront of the organic industry, which includes nearly 270 certified organic farms and ranches with more organic certified acres than any other state” (CO OEDIT, 2013).

- “In 1997, according to a report from the USDA's Economic Research Service, Colorado only had 3,716 acres of organic produce. There were 114,750 acres in 2014, and in 2015 there were 151,571 acres. That's about a 32 percent

Growth in Colorado's Organic Farmland

1997 acres	2015 acres	Total Growth, '97-'15	Average annual growth, '97-'15, in acres	Average annual growth, '97-'15, in percent
3,716	151,571	4079%	8214.17	221%

Source: Fox, 2017.

- increase in acreage in only a year” (Fox, 2017). In addition to the 150,000+ acres of organic farmland, there are an additional “70,000 acres dedicated to organic pastureland and rangeland” (Siegelbaum, 2017).
- “In 2015, Colorado became the No. 9 highest-grossing state for organic sales, selling \$155 million worth of organic products.... The sales from organic produce increased 13 percent from 2014 to 2015. In the U.S., \$6.2 billion worth of organic foods were sold” (Fox, 2017).
- “In three years, Colorado’s organic agricultural industry more than doubled in sales, growing from \$66.2 million in 2012 to \$155.2 million in 2015, according to the U.S. Department of Agriculture’s annual Certified Organic Survey” (Siegelbaum, 2017).
- In 2017, the U.S. organic food market hit \$45.2 billion in sales, growing by a new record increase of 6.4%. Sales of organic non-food products rose by 7.4% to \$4.2 billion, setting another new benchmark. In total, organic sales (which includes food and non-food products), “in the U.S. totaled a new record of \$49.4 billion... reflecting new sales of nearly \$3.5 billion” (OTA, 2018).
- In 2018, the US organic market growth continued apace, reaching \$52.5 billion in sales, representing growth of 6.3% (OTA, 2019).
- The 2017 growth rate for organic food sales was below 2016’s 9% pace, due to slower growth in the organic dairy and egg category. However, it was well above growth in the overall food market, at only 1.1%. Organic continued to increase its penetration into the total food market, and now accounts for 5.5% of the food sold in retail channels in the U.S. (OTA, 2018).



- Studies have shown that areas with high rates of organic activity have lower levels of poverty and higher household incomes:
 - o “The research identifies 225 counties in the United States in organic hotspots—counties with high levels of organic agricultural activity that have neighboring counties with high organic activity—and then looks at how these organic hotspots impact key county-level economic indicators. Organic Hotspots boost household incomes and reduce poverty levels—and at greater rates than general agriculture activity, and even more than major anti-poverty programs. Being an Organic Hotspot increases median household income by over \$2,000. Being an Organic Hotspot lowers a county’s poverty rate by as much as 1.35 percentage points. Organic is the fastest growing sector of the U.S. food industry. Organic food sales increase by double digits annually, far outstripping the growth rate for the overall food market” (OTA, 2018; Federal Reserve Bank of St Louis and the Board of Governors of the Federal Reserve System, 2017).

Other more regenerative agricultural sectors are also gaining in prominence.

- “Every dollar invested in a home landscape yields a return of \$1.35. Large street trees can increase a home’s value up to 15%, so there is no downside in sight for the nursery and green industry as a whole.”
- “Demand for local, ‘Colorado Proud’ food products remains strong. A total of 85% of Coloradans buy Colorado products at least some of the time when shopping or eating out” (Leeds School of Business, 2017).

Craft Brewing Industry

Beverage production generally, and craft brewing in particular, are rising sub-sectors of local agriculture. Coloradans enjoy fresh and innovative beer recipes.

- “The ‘Nine County region,’ stretching north from Denver, is referred to as the ‘Napa Valley of Beer.’ The Beverage Production sector had the highest job growth (at 28.1% of any sector in Colorado between 2011 and 2016” (Metro Denver EDC, 2017).
- At the end of 2016, the industry employed 9,300 in Metro Denver; that number had grown to 9,790 by the end of 2017 (Metro Denver EDC, 2017; Metro Denver EDC, 2018).
 - o Compare this to employment in oil and gas extraction, mining, and mining support, which totaled 9,370 in Metro Denver in 2017 (Metro Denver EDC, 2019).
- The average wage in the beverage production industry (which also includes wine, bottled drinks, and distilled liquors) in Metro Denver in 2017 was \$59,880 (Metro Denver EDC, 2018).
- The Brewers Association is a national trade group for craft brewers, headquartered in Boulder, Colorado. According to the Association, craft brewing directly employs 22,411 in Colorado (2018).
- The industry had a \$3.16 billion economic impact in the state in 2017 (Brewers Association, 2018). Per

Metric	Beverage Production	Oil and Gas Extraction, Mining, and Mining Support
Direct Employment, Metro Denver	9,790	9,370

Sources: Metro Denver EDC, 2018; Metro Denver EDC, 2019.

Metric	Craft Brewing	Oil and Gas Extraction	Oil and Gas Extraction, Mining, and Mining Support
Direct Employment	22,411	8,412	25,578

Sources: Brewers Association, 2018; Metro Denver EDC, 2019.

capita, the economic impact of craft brewing in Colorado is higher than in any other state, at \$764.20.

- Colorado ranks 3rd in annual barrels of craft beer produced (1.52 million) and 2nd in number of craft breweries (396) (Brewers Association, 2018).
- In 2015, the average wage for someone employed in craft brewing was \$27,930 – but this number is artificially low due to the prominence of part-time work in the industry (Leeds School of Business, 2016).

Cannabis

- Since January of 2014, when cannabis legalization took effect, the sector has been responsible for 5.4% of employment growth in Colorado (Felix & Chapman, 2018). As it grows, the industry produces stronger than typical local economic multiplier effects because the entire industry value chain is in-state.
 - “Most [cannabis] industry inputs are sourced locally, unlike many consumer products purchased in the state, leading to relatively high economic multipliers compared to other industries” (Leeds School of Business, 2018).
 - “Because the industry is wholly confined within Colorado, spending on marijuana creates more output and employment per dollar spent than 90 percent of Colorado industries” (Marijuana Policy Group, 2016).
 - The legalization of cannabis generates as much tax revenue for the state as cigarette and tobacco taxes. It has brought the market into the daylight.
- “Colorado hemp farmers are expected to harvest up to 9,000 acres of hemp, compared with just 200 acres in 2014” (Leeds School of Business, 2018).
 - By 2018, there were 31,000 acres of hemp planted in the state (Leeds School of Business, 2019).
- “Annual cannabis sales (medical and adult-use) in Colorado started at \$669 million in 2014, and have grown significantly each year since then, hitting \$1.3 billion in 2016 and on pace to eclipse \$1.5 billion in 2017” (Leeds School of Business, 2018).
- In January 2014, statewide sales were about \$47 million, and now, in 2017, every month of sales is over \$100 million” (Leeds School of Business, 2018).
 - In 2017, total marijuana sales cleared \$1.5 billion, and reached \$1.55 billion in 2018 (CO Department of Revenue, 2019).
- Of all total personal consumption expenditures in the state in 2016 – \$236.6 billion in total – marijuana sales made up 0.55% at \$1.3 billion in sales (compared to 7.2% for groceries sales) (Felix & Chapman, 2018).
- “The state is on pace to collect about \$200 million in [cannabis] taxes and fees in 2017. To put that in context, the state collects about \$44 million in alcoholic beverage taxes per year and \$201 million in cigarette and tobacco product taxes per year” (Felix & Chapman, 2018).
 - In 2018, the state collected \$264 million in cannabis taxes and fees (CO Department of Revenue, 2018). This revenue support public schools and local governments.
- As of February 2018, the sector employed 0.7% of the labor force in Colorado – up from 0.1% in January 2014 (Felix & Chapman, 2018).
- The industry has created almost 20,000 jobs statewide and stimulates almost \$3 billion of annual consumer spending.
- “At the end of 2016, there were about 31,000 credentialed cannabis industry employees in the state, nearly double the 16,000 credentialed employees in December 2014” (Leeds School of Business, 2018).

- In March of 2018, there were 38,000 credentialed employees. Since not everyone with a license works in the industry, “the Marijuana Policy Group estimates that one active license equates to 0.467 full-time equivalent positions.” This means the industry employs about 17,821, which is 17.7% more than the previous year (Felix & Chapman, 2018; Marijuana Policy Group, 2016).
- Leafly estimates 31,486 direct jobs and 44,081 total jobs supported by the cannabis industry in Colorado (2019).
- “Legal marijuana activities generated \$2.39 billion in state output” in 2015 (Marijuana Policy Group, 2016).
- “There are now more than 211,000 cannabis jobs across the United States. More than 64,000 of those jobs were added in 2018. That’s enough people to fill Chicago’s Soldier Field, with 3,000 more tailgating outside” (Barcott, 2019).
- The *Cannabis Jobs Count* report identifies some 211,00 full-time jobs in the legal cannabis sector nationwide. This total increased to 296,000 when indirect and induced employment was included (Barcott & Whitney, 2019).
 - By comparison, 112,000 Americans are estimated to currently work in the textile industry, while only about 52,000 people are employed by the coal mining industry” (Barcott & Whitney, 2019).

Trends in the Cannabis Industry

- “Legal marijuana demand is projected to grow by 11.3 percent per year at least through 2020. This growth is driven by a demand shift away from the black market and by cannabis-specific visitor demand. By 2020, the regulated market in Colorado will become saturated” (Marijuana Policy Group, 2016).
- Nationwide, “legal cannabis is currently the greatest job-creation machine in America. The cannabis workforce increased 21% in 2017. It gained another 44% in 2018. We expect at least another 20% growth in jobs in 2019. That would represent a 110% growth in cannabis jobs in just three years” (Barcott, 2019).

Horse Industry

- The Colorado horse industry provides 5,800 direct jobs and supports 21,000 total jobs (The American Horse Council, 2005).
- “The industry produces goods and services valued at \$956 million,” and, when the multiplier effect is taken into account, the horse industry has a \$1.6 billion impact on the Colorado economy (Heather, 2014; The American Horse Council, 2005).
- There are 102,000 industry participants in the state (owners, employees, and volunteers), and 256,000 horses in the state (The American Horse Council, 2005).

Outdoor Recreation

Colorado is a national treasure for outdoor activity. From skiing to camping, river running to rock climbing, Colorado offers exceptional access to land and beauty. This generates significant economic benefits for the state, outperforming fossil fuels and mining. It does so while also enhancing people’s physical and emotional well-being and their sense of connection to the land and with those with whom they experience it.

- The national Outdoor Industry Association (OIA) based in Boulder, is “the leading trade association and voice of the \$887 billion outdoor recreation industry in the United States. It serves more than 4,000 manufacturers, distributors, suppliers, sales representatives and retailers in the active outdoor lifestyle” (Boulder Economic Council, 2018).
- According to the OIA’s 2017 Outdoor Industry Study, “Outdoor Recreation in Colorado creates nearly four times as many direct jobs (229,000) as the oil and gas industry (30,000) and the mining industry (19,000) combined.” Outdoor recreation in the state generates \$28 billion of annual consumer spending, 229,000 direct jobs, \$9.7 billion in wages and salaries, and \$2 billion in state and local tax revenue (OIA, 2017).
 - o In 2016, these jobs constituted 8.3% of Colorado’s workforce (BLS, 2019).
- The average salary in Colorado in this industry was \$42,358 (OIA, 2017).
- OR in Colorado supports 511,000 total jobs (direct, indirect, and induced employment) which constitutes 19% of the state’s labor force. “Total economic output associated with outdoor recreation amounts to \$62.5 billion dollars, contributing \$35 billion dollars to the Gross Domestic Product of the state” (Colorado Parks and Wildlife, 2018).

Metric	Outdoor Recreation	Oil and Gas
Direct Employment	229,000	30,000
Total Jobs Supported*	511,000	89,000
Percentage of Labor Force*	18.7%	3%
Contribution to GDP	\$35bn	\$13.5bn
Percentage of GDP	10%	4%

Sources: OIA, 2017; COGA, 2019; Colorado Parks and Wildlife, 2018.

*Includes direct, indirect, and induced employment.

- Colorado’s 2nd congressional district (which includes Boulder) is home to at least 489 outdoor companies. Boulder residents spend \$2.51 billion on OR annually (OIA, 2017).
- Colorado’s 1st congressional district (which includes Denver) is home to at least 189 outdoor companies. Its residents spend \$2.12 billion on OR annually (OIA, 2017).
 - o “Out-of-state visitors to Colorado spend \$12.8 billion on outdoor recreation” (OIA, 2017).
- The OR industry is a national force as well:
 - o It generates 7.6 million jobs—more than computer technology (6.7 million) and construction (6.4 million), and far more than oil and gas at 180,000.
 - o Jobs in the outdoor recreation (OR) sector grew by 63% over the last five years (Colorado Parks and Wildlife, 2018).
 - o More than twice as many “Americans are directly employed by hunting and fishing (483,000) than oil and gas extraction. More American jobs depend on recreational motorcycling and off-roading (867,000) than there are lawyers in the United States (779,000)” (OIA, 2017).
 - o “Spending on snow sports results in more American jobs (695,000) than the extractive industries in the United States (627,000)” (OIA, 2017).
 - o OR generates \$887 billion in annual consumer spending—more than education (\$278 billion), motor vehicles and parts (\$465 billion), and pharmaceuticals (\$466 billion), and almost as much as financial services and insurance (\$921 billion) and hospital care (\$964 billion) (OIA, 2017).

- It generates \$65.3 billion in federal tax revenue, and \$59.2 billion in local and state tax revenue (OIA, 2017).
- “Outdoor recreation is a beloved American pastime... Each year Americans spend more on water sports gear (\$14 billion) than on movie tickets (\$11 billion)” (OIA, 2017).
- Investments that support outdoor recreation infrastructure and programming may significantly:
 - Improve education outcomes from the elementary to collegiate level, as measured by test scores, attention, retention, and high school graduation rates (University of Washington, 2018).
 - “Lower long-term individual and public health care cost by reducing stress and obesity rates, improving physical fitness and strengthening social bonds with family and friends” (OIA, 2017; University of Washington, 2018). Colorado has the lowest obesity rate in the nation, at 22.6% (The State of Obesity, 2018).
 - Reduce crime (University of Washington, 2018; Kondo, Hohl, Han, & Branas, 2016; Weinstein, et al., 2015).
- Boulder is home to a high concentration of world-class, elite, and/or professional athletes, including Ironman Triathlon world record holder Tim Don (Crouse, 2018), five-time Olympic Triathlon world champion Simon Lessing (Boulder Coaching, 2018), and ultrarunner and winner of the Leadville 100 and Western States 100 Clare Gallagher (Clare Gallagher, 2018).
- “In 1967, Boulder became the first city in the United States to tax itself for funds to be used specifically for the acquisition, management and maintenance of open space” (Boulder Convention and Visitors Bureau, 2015).
- “The park system of Denver thus has provided the city an annual revenue of \$7.1 million, municipal savings of \$3.6 million, resident savings of \$517 million, and a collective increase of resident wealth of \$48.7 million” (The Trust for Public Land, 2010).
- Colorado is the leading ski destination in the US. In the 2017-2018 ski season, Colorado captured 22.7% of resort skier visits, more than doubling the next closest state. “Colorado was home to 7 of the country’s 10 most visited ski resorts in 2017-2018” (Leeds School of Business, 2018).
- Unfortunately, climate change, driven by the oil and gas industry, threatens the outdoor recreation industry as well as the larger economy. Climate models of Colorado’s future snowpack suggest that global warming will shorten the ski season by 50% by 2050, which would devastate the ski industry, a key source of recreation and tourism dollars.
 - “While skier visits averaged 55.4 million nationally between 2001 and 2016, skier visits during the five highest snow years were 3.8 million higher than the 2001-2016 average and skier visits were 5.5 million lower than average during the five lowest snow years.”
 - “Low snow years have negative impacts on the economy. We found that the increased skier participation levels in high snow years meant an extra \$692.9 million in value added and 11,800 extra jobs compared to the 2001–2016 average. In low snow years, reduced participation decreased value added by over \$1 billion and cost 17,400 jobs compared to an average season” (POW, 2018, p. 6).
- Ongoing climate change is expected to bring more low-snow years to Colorado.
 - A reduction in Colorado’s snowpack will harm the ski industry and water availability throughout the state. According to the EPA, over the last 60 years, snowpack in April in Colorado has declined by 20% to 60% at most monitoring stations (US EPA, 2016).
 - The EPA also estimates that by 2050, ski season in Colorado will shorten by 10% to 50% due to climate change (Marmaduke, 2018).

- By 2090, ski season could be reduced by up to 80% (Marmaduke, 2018).

Travel and Tourism

- The travel industry in CO, which overlaps somewhat with outdoor recreation, supported 171,000 direct jobs and paid employees \$6.3 billion in 2017 (Colorado Tourism Office, 2018).
 - The travel industry employs almost 6 times as many Coloradans as the oil and gas industry (30,000) (Colorado Tourism Office, 2018; COGA, 2019).
- 2017 was Colorado's 8th straight year of record-setting visitor growth, with 84.7 million US-based visitors and an additional 1 million international visitors. "That 2.8 percent increase in visitors was 40 percent higher than the national average increase of 2.0 percent."
 - Visitors spent \$20.9 billion and generated \$1.28 billion in state and local tax revenue. "To replace those visitor taxes would have required an additional \$228 tax payment from each of Colorado's 5.61 million residents" (Colorado Tourism Office, 2018).
- "Total direct travel spending in Colorado increased by 6.5 percent in 2017, more than twice the national average increase of 3.0 percent" (Colorado Tourism Office, 2018).

Innovation, Entrepreneurship, and Information Technology

With a highly educated workforce and progressive culture, the Denver-Boulder region is a hotspot for innovation, startups, and entrepreneurial activity. As an agile industry creating new solutions to business and social problems, it is well-positioned to lead the way in implementing regenerative practices.

- The information technology and software industry in Metro Denver employs 58,190 workers at 5,550 companies, for 2.5% of the region's direct employment concentration (Metro Denver EDC, 2018).
 - The region is a hub for IT-software employment, with 30% more jobs than the nation's average proportion of employment in this sector.
- The IT-software industry contributes \$14 billion of economic impact in Colorado, and in 2017 reached its highest level of venture capital funding since 2005. Tech-related exports are among Colorado's largest exports, totaling \$100 million. (Metro Denver EDC, 2018).
- Inc. Magazine has named Boulder "America's Startup Capital" and "America's Startup City" (Boulder Economic Council, 2018). Bloomberg Business said Boulder is "America's Best Town for Startups" (Wadhwa, 2010).
- Livability named Boulder the Best City for Entrepreneurs in 2016 (Livability, 2016).
- Boulder has "six times more high-tech start-ups per capita than the nation's average, and twice as many per capita as runner-up San Jose-Sunnyvale in California" (Helm, 2014).
 - Longmont and Lafayette tied for 3rd most startups per capita in the nation in 2018 (McCann, 2018).
- Boulder is home to two of the world's ten fastest supercomputers (Boulder Economic Council, 2018).
- "Boulder MSA has the most highly educated population in the nation, and Colorado is the second-most highly educated state in the nation. Colorado ranks third in the nation for high-tech workers per capita" (Boulder Economic Council, 2018).
- Boulder and Denver ranked first and third respectively among the top ten metro areas for female entrepreneurs (Metro Denver EDC, 2018).

- “According to data from MassInvestor and local VC announcements, \$306 million in venture capital funding was received by Boulder County companies in the first two quarters of 2017, representing 64% of the state total” (Leeds School of Business, 2017).
- The innovation industry was the region’s fastest growing sector by employment from 2015 to 2016 at 9.4% (Metro Denver EDC, 2017).
- It was also the region’s fastest growing sector by employment between 2012 and 2017, expanding by 32.2% during that time (compared to the nationwide average for the industry of 26.1%) (Metro Denver EDC, 2018).

Arts, Culture, and Entertainment

Engaging in art and creative expression improves psychological and physical health outcomes (Stuckey & Nobel, 2010). Interest in the arts is also associated with higher levels of entrepreneurship, contributions to creating patents, and starting businesses (Niemi, 2015). In recent years, the regenerative sector of arts, culture, and entertainment has flourished in Denver-Boulder. It also employs more people and contributes more money to the economy than the oil and gas industries.

- The arts, culture, and entertainment sector includes 36 subsectors including Advertising, Broadcasting, Computer Systems Design, Landscape Architectural Services, Motion Pictures, Museums, and Publishing (ACPSA, 2015).
- Colorado’s Arts and Culture economy employs 100,631 people, adds 4.3% of the value of the state economy, pays its workers a total of \$7 billion, and adds \$13.7 billion to the state economy (NEA, 2018).
 - o Arts and culture contributed more to Colorado’s economy than mining (\$13.4 billion), transportation (\$11.1 billion), and agriculture and forestry (\$2.7 billion) (Nick, 2018).

Metric	Arts and Culture	Mining
Contribution to GDP	13.7bn	13.4bn

Source: Nick, 2018.

- 15 million people attended a cultural activity in 2017, 8.5% more than did in 2015 (CBCA, 2018).
 - o Cultural attendance has grown at twice the rate of Metro Denver’s population growth (CBCA, 2018).
- In 2015, the economic contribution of performing arts was \$256 million, which is 40% greater than the national index (Colorado Creative Industries, 2018).
- Arts and culture had an economic impact of \$573 million in Metro Denver in 2017, a 12% increase from 2015 (CBCA, 2018).
- In 2017 in Metro Denver, arts and culture employed 11,820 people (up 10% from 2015) for total wages and salary of \$183.4 million (up 11% from 2015) (CBCA, 2018).
- Nonprofit arts and culture reached a record high of \$1.9 billion of economic activity in Metro Denver in 2017 (up 8% from 2015) (CBCA, 2018).
- Each year arts and culture draw tourists to Denver who spend \$400 million that wouldn’t have been there otherwise (CBCA, 2018).
- Attendance of cultural events in Denver increased at twice the rate of population growth—so the growth of the industry isn’t just due to the area’s population boom (Wenzel, 2018).
- In Boulder, arts and culture generates \$69.8 million in annual economic activity, supports 1,832 full-time equivalent jobs, and brings in \$4.6 million in revenue local and state governments (AFTA, 2017).
- “During 2015, a total of 5,087 volunteers donated a total of 265,505 hours to the nonprofit arts and cultural organizations that participated in the study about Boulder. This represents a



donation of time with an estimated aggregate value of \$6,255,298 and shows a deep engagement with the city's arts and culture" (Boulder Office of Arts + Culture, 2017).

- Boulder has the 8th highest concentration of artists in the country (Boulder Chamber, n.d.).
- "Boulder has more used bookstores per capita than any other city in the country" (Boulder Convention and Visitors Bureau, 2015).

Education

Education is a regenerative investment in the future that helps people actualize their potential and live dignified lives. It is an engine for prosperity, so long as it is accessible to all and not too financially burdensome. The Boulder-Denver region is home to world-class educational institutions that have a positive economic impact. These institutions attract and retain an educated workforce of scientists, engineers, artists, and entrepreneurs that enrich the region.

Employment and enrollment

- In 2018, 257,800 Coloradans worked in private and public education (Leeds School of Business, 2018).
- Education employment at the K-12 level is expected to "grow 1.1% in 2018 and 1.5% in 2019"
 - o "In the past 10 years, charter school enrollment has increased 198% while total public school enrollment has increased 9.9%" (Leeds School of Business, 2018).
 - o "The Boulder Valley School District (BVSD) consistently ranks among the top three of Colorado's large Front Range school districts – and often as the top district – as measured by state and national academic rankings... Each year, BVSD's graduates are awarded millions of dollars in scholarships and score well above the state and national averages on the ACT and SAT college entrance exams. BVSD stands as a leader in academic excellence with outstanding classroom teachers, exemplary schools, and programs that support student achievement" (Boulder Economic Council, 2018).
- Private education is growing:
 - o In 2017, employment numbers for the private education sector for 2018 were projected to grow by 1,100 compared to 2017, with growth of another 1,000 jobs in 2019.
 - o Within private schools, nonsectarian ones are growing fastest: they were 13.2% of private schools in 1989-90, 15.7% in 1997-98, and 21.8% in 2015-16.
- Institutions of higher education awarded "65,319 degrees or certificates... during the 2016–17 academic year represented a 5.1% increase over the prior year. Of the degrees earned, 43.3% were bachelor's, 25.9% were certificates, 14.9% were associate's, and 15.8% were graduate or professional degrees."

Impact from Institutions

Colorado's universities make major economic contributions to their regions and the state.

- For example, CU Denver has:
 - o Adds \$3.3 billion to the Colorado economy
 - For every \$1 in direct expense by the university, there is up to an additional \$1.33 in purchased goods and services in Colorado.
 - o Provides 30,000 jobs in Colorado
 - For every job at the university, there is up to an additional 1.4 jobs supported in Colorado (CU Denver, 2018).

- Similarly, the University of Denver “provided a total economic benefit of \$958.2 million in the metro Denver region in FY 2015, which was produced by 7,661 workers earning \$399 million” (Development Research Partners, 2016).
- CU Boulder is the largest employer in Boulder County, with 8,000 faculty and staff and 7,600 student employees.
 - o Its students spend \$318 million each year; visitors of students spend \$16.2 million each year; international students spend \$58 million each year; and CU Boulder itself spends \$342 million each year for goods and services.
 - o The University in total has \$1.8 billion in annual expenditures, 75% of which are spent locally. “41% of sponsored research revenue is directed to local salaries” (CU Boulder, 2018).
- The University of Colorado sponsored a study to determine the economic impact of all four campuses. The CU system directly employs 32,386, and in total supports 53,442 people. When the impact of the CU-run Anschutz Campus Hospitals is included, CU supports a total of 80,458 jobs in the state (Leeds School of Business, 2017).
- “The University of Colorado Boulder is located in a region having the greatest concentration of geophysical researchers in the nation and perhaps the world, which has elevated the department to one of worldwide prominence. It has maintained a reputation of excellence and world-wide acclaim for more than 100 years with its graduate program ranked in the top 20 in the nation, “geosciences” more broadly ranked #2 in the world by the most recent U.S. News and World Reports rankings, and the “earth sciences” discipline at CU Boulder ranked #1 globally by the most recent Shanghai Rankings. As well, the department’s “remote sensing” research is ranked #21 in the world” (CU Boulder, 2018).
- “The Aerospace/Aeronautical/Astronautical Engineering program at the University of Colorado Boulder is ranked the 9th best in the nation; the Atomic/Molecular/Optical Physics Program at the University of Colorado Boulder is ranked as the best in the nation” (Boulder Economic Council, 2018).

Colorado’s Wellness Economy

The purpose of a regenerative economy is different than an extractive economy. Regeneration aims to enhance well-being, not just increase the dollar flow through the economy. A regenerative economy provides well-being for all, in addition to being enhancing the ecology and the economy.

The statistics above show an encouraging economic shift away from polluting industries in Colorado and in Boulder-Denver, and the growth of industries that enhance human and natural well-being. As the numbers below show, the state and Boulder-Denver region are also outperforming when it comes to enabling well-being for residents.

- Gallup started measuring well-being by state in the US in 2008. Since that time, Colorado and Hawaii are the only two states to have ranked in the top 10 for well-being every year (Gallup-Sharecare, 2018).
 - o Colorado ranked 6th overall in 2017, and 5th overall in 2016 (Gallup-Sharecare, 2018).
 - o The survey measures well-being as a composite score from five separate dimensions: purpose, social, financial, community, and physical. Colorado ranked 2nd overall in the physical dimension (Gallup-Sharecare, 2018).
 - o In 2017, 21 states scored lower for well-being than they did the previous year – “easily the largest year-over-year decline” in the survey’s 10-year history. “Not a single state

showed statistically significant improvement compared to the previous year, which is also unprecedented in Well-Being Index measurement.” However, Colorado’s well-being score remained unchanged from 2016 to 2017. This could suggest the state’s well-being is resilient.

- Two of Colorado’s Front Range communities rank in the top 25 for city well-being ranking: Boulder (3rd) and Fort Collins (14th). Colorado is one of only five states to have two or more cities in the top 25 (Gallup-Sharecare, 2018).
 - o Boulder ranked number one for physical well-being (Gallup-Sharecare, 2018).
- In 2011, Boulder and Fort Collins ranked 1st and 3rd in the nation in overall well-being (Witters, 2011).
- Boulder ranked 14th out of 189 cities surveyed on a measure of healthy eating habits among residents (Gallup-Sharecare, 2017).
- “The Boulder County area is a popular destination that receives national media attention for its recreational and cultural amenities, and impressive array of shopping and dining choices. Boulder was recently recognized by National Geographic (Happiest City in the U.S. and one of America’s Top Adventure Towns), Bon Appetit (America’s Foodiest Town), Outdoor magazine (#1 Sports Town), and Bicycling magazine (one of the Best Bike Cities). Longmont was recognized by Livability (#23 of 100 Best Places to Live) and Westword (#3 Most Family-Friendly Communities in Colorado)” (Leeds School of Business, 2017).
- “In recent years, Denver has been storming national rankings lists: Brookings Institution demographer William Frey’s best (2011) and second best (2013) city for attracting millennials; the best city for college graduates (2014, Apartments.com); the largest increase in residents with college degrees (U.S. Census, 2014); the best commercial real estate market (Coldwell Banker, 2015); the second best for launching a startup (2014, Forbes); and, this year, *U.S. News and World Report’s* best place to live” (Woodard, 2016).
- In 2017, NerdWallet said Denver is the 2nd best city for job seekers and U.S. News and World Report said it’s the 2nd best city in which to live (Choose Colorado, 2019).

Public Transit

A robust public transit system is important for ensuring everyone can get around, reducing carbon emissions, and improving the livability of urban areas. Many consider it the most important public amenity near which they want to live. Public transit is faster and more affordable than auto transit in the Metro Denver area. Sitting in your vehicle in congestion on a freeway has an economic cost of \$475 per person, per year (see below).

- Forward-thinking investments in a regional light rail system that integrate Denver with its suburbs and DIA were innovative and revolutionary:
 - o “Using an unprecedented public-private partnership that combines private funding, local tax dollars and federal grants, Denver has done something no other major metro area has accomplished in the past decade, though a number of cities have tried... Even before the new lines opened, 77,000 people were riding light rail each day, making it the eighth-largest system in the country even though Denver is not in the top 20 cities for population” (Woodard, 2016).
 - o Denver’s “RTD is the first transit agency in the country to successfully attract private-sector investment for a light-rail system... Transit, almost by definition, is a revenue-neutral proposition at best and a money loser at worst... This stitched-together financing plan will allow FasTracks to be almost entirely complete by 2018, just one year

after the initial projection made in 2004, before the economy tanked, before the budget shortfalls nearly sank the whole project. In the transit world, that's almost unheard of.” (Johnson, 2014).

- Despite this, public transit ridership in Metro Denver has not increased in the last ten years, with auto ownership rebounding during recovery from the 2008 recession.
- Metro Denver’s residents “own more vehicles and are driving more, creating costly congestion”:
 - There was a 13.5% increase in vehicle miles traveled between 2006 and 2017
 - Per capita vehicle ownership increased slightly from .72 to .74 between 2006 and 2017, mirroring trends at the state and national level
 - The cost of congestion in 2016 was \$475 per year, per person
- Between 2006 and 2016, carpool and transit use decreased for commutes, but working at home and walking to work increased
- 74% of Metro Denver residents drive alone to work
- However, “Downtown Denver and Downtown Boulder employees continue to choose a wider variety of modes to get downtown. Transit mode share into both downtowns is higher than the region as a whole.”
- Access to public transportation is “very important” to Millennials when making their decisions about where to work and live. “80% of those polled said access to public transportation was very important in choosing where to live, while 78% said having their work place near transit was important, much more so than office amenities like a gym, cafeteria, coffee bar, or proximity to restaurants and nightlife options” (Doyle, 2015).
- Regional Transportation District (RTD) serves 8 counties in the Upper South Platte Watershed region: Boulder, Broomfield, Denver, Jefferson, Adams, Arapahoe, Douglas, and Weld. It has:
 - 100,942,072 annual boardings
 - A \$626 million operating budget in 2017
 - A service area population of 3.03 million
 - 2,863 employees (RTD, 2018)
- RTD regularly conducts “Quality of Life” Studies to evaluate its impact on Metro Denver’s residents. According to the most recent report (RTD, 2018):
 - RTD’s rapid transit network has more than doubled, as measured by route-miles, since 2006
 - RTD’s ADA service, called “Access-a-ride,” has grown by 23% since 2006
 - Its rail service increased from 3% to 7% of its total service between 2006 and 2016
 - Retail sales tax revenue grew 35% between 2006 and 2017
 - Metro Denver residents on average spent 47% of their income on housing and transportation in 2015, but residents who lived near transit stations only spent 39% of their income on housing and transportation.
 - RTD’s average weekday service hours increased 10% between 2006 and 2017
 - Customers are highly satisfied with RTD’s overall service (4.22/5) and safety (4.26/5)
 - “The proportion of riders older than 55 has increased from 19% in 2005 to 34% in 2017. The proportion of 35-54-year-old riders has decreased from 51% in 2005 to 37% in 2017.”
 - Auto travel times in downtown Denver increased by 30% between 2012 and 2017, while transit travel times to downtown decreased by 8% in the same time period
 - “In 2017, travelling by transit was 18% less expensive than driving”

- In 2017, the cost to drive to Downtown Denver was \$1.23/mile. The cost to take transit downtown was \$1.01/mile.
- “In 2012, transit was 3% more expensive than driving. In 2017, transit was 18% less expensive than driving.”
- RTD is replacing 500 old, high-emissions buses with new, zero-emissions buses. They are experimenting with next-generation electric hybrid buses. And they use ultra-low sulfur fuels which noticeably reduce emissions of harmful particulate matter pollution (RTD, 2016).

Construction

- Statewide, the construction industry employed 148,605 people in 2015, making up 7.1% of the state’s total employment that year (MEP Alliance, 2017, p. 14).
 - o In March of 2018, total statewide construction employment had grown to 166,873, making up 6.3% of the labor force (BLS, 2018; BLS, 2018).
- “Construction work should increase in the next several years in the region, thanks to an ongoing \$6.9 billion expansion of the Denver area’s mass transit service” (SHRM, 2017).
- Colorado’s construction industry experienced higher year-over-year activity in 2018 and “will see still higher volumes of work in 2019, despite continued labor shortages and growing costs. Construction activity will total \$21.2 billion in 2018 and increase 2.3%, to \$21.6 billion, in 2019. Construction employment increased more than 5% in 2018, totaling more than 171,800 employees...The [authors expect] total construction employment to increase 2.9% to approximately 176,800 workers in 2019” (Leeds School of Business, 2018).
- Denver International Airport is expanding in size and traffic. Major construction projects that started in 2018 include the \$650 million upgrade for the DIA terminal and the DIA Concourse expansions costing a total of \$1.5 billion. DIA served 61.4 million passengers in 2017, making it the 20th busiest airport in the world, and the 5th busiest in North America (Leeds School of Business, 2018).

Other Industry Sectors

Sports

One of the ways public expenditure on new sports stadiums and teams is justified to taxpayers is by claiming they will bring significant economic benefits to the home city. Sports teams do provide nonquantifiable benefits like city pride, happiness (when they win), community at games, and kinship between fans and residents. However, multiple studies have shown that their impact on local economies is neutral to negative. Many argue that decisions to use taxpayer funds to pay for stadiums are bad investments, especially when they reduce funds for other public goods like housing and tourism – as recently happened in Seattle (Rosenberg, 2018).

- Denver is home to 8 professional sports teams that play 7 different sports (Denver.org, 2018).
- “More than six million fans attend sporting events in Metro Denver each year” (Metro Denver EDC, 2018).
- Studies suggest that sports teams have a neutral economic impact on the cities in which they play:
 - o “At best, professional sports teams and facilities provide non-pecuniary benefits like civic pride, and a greater sense of community, along with consumption benefits to those attending games and following the local team in the media; at worst, residents of cities

with professional sports teams pay a high cost for the privilege, both in terms of large public subsidies and in terms of lost income and employment.”

- “No retrospective econometric study found any evidence of positive economic impact from professional sports facilities or franchises on urban economies... Building new sports facilities and attracting new professional sports teams did not raise income per capita or total employment in any US city. In fact, some research has found a negative economic impact of professional sports on urban economies.”
- “Residents maintain their level of entertainment spending but alter the allocation of this spending toward sport-related spending and away from other close substitutes. Sports redirect spending by residents from one part of the local economy to another” (Coates & Humphreys, 2004).
- U.S. cities that hosted the Super Bowl or Olympics reported little to no increase in airport traffic, retail sales, and hotel occupancy rates (Porter, 1999; Porter & Fletcher, 2002).
- According to Roger Noll, a Stanford economist, “NFL stadiums do not generate significant local economic growth, and the incremental tax revenue is not sufficient to cover any significant financial contribution by the city” (Parker, 2015).
- “A new sports facility has an extremely small (perhaps even negative) effect on overall economic activity and employment. No recent facility appears to have earned anything approaching a reasonable return on investment. No recent facility has been self-financing in terms of its impact on net tax revenues... A stadium can spur economic growth if sports is a significant export industry—that is, if it attracts outsiders to buy the local product and if it results in the sale of certain rights (broadcasting, product licensing) to national firms. But, in reality, sports has little effect on regional net exports. Sports facilities attract neither tourists nor new industry” (Noll & Zimbalist, 1997).

Aerospace

As one of the Boulder-Denver region’s unique economic strengths, the aerospace sector attracts a highly-educated and well-paid workforce to the region.

- Metro Denver is ranked 1st among the 50 biggest metros in the US for employment concentration in the aerospace sector (which includes navigation instrument manufacturing, guided missile and space vehicle manufacturing, satellite telecommunications, and others). Employment in this sector grew 5.5% in 2017. There are 21,090 employees at 130 companies.
- The sector employs 0.9% of the workforce in Metro Denver, compared to 0.2% nationwide.

Aviation

Aviation is a large and growing economic sector. Denver International Airport (DIA) is Colorado’s largest employer and the 5th busiest airport in North America. It brings in travelers from around the globe who want to experience Colorado’s culture, outdoors, and business community. Flying is a carbon intensive form of travel, but DIA has become a global pioneer in airport sustainability in efforts to reduce its ecological footprint.

- Aviation (which includes airport operations, air traffic control, aircraft manufacturing, and others) was Metro Denver’s fastest growing sector in 2017. Its employment increased by 5.7% (compared to a 0.1% increase nationwide). Similarly, between 2012 and 2017, “aviation employment rose 23.1%, compared with 4.1% nationally.”



- Denver International Airport (DIA) is “twice the size of Manhattan Island and is larger than the city boundaries of Boston, Miami, or San Francisco. Approximately 35,000 people work at the airport” (Metro Denver EDC, 2018).
 - o DIA is the state’s single largest employer (CareerOneStop, 2019).
- DIA is the 20th busiest airport in the world, and the 5th busiest in North America (Leeds School of Business, 2018).
- The airport invests heavily in its sustainability initiatives:
 - o It has “one of the largest airport solar installations in the world and is home to five photovoltaic solar arrays, including one solar array used as covered parking at 61st Avenue and Peña Boulevard” (Metro Denver EDC, 2018).
 - o DIA “was the first airport in the nation to receive ISO 14001 Environmental Management System certification in 2004.” The airport also “received the Outstanding Sustainability Infrastructure Development award in 2017 for the Hotel and Transit Center project and once again received the international Airport Carbon Accreditation in 2017” (Metro Denver EDC, 2018).
 - o “The National Renewable Energy Laboratory (NREL), Xcel Energy, Panasonic Enterprise Solutions, LC Fulenwider Inc., and Denver International Airport (DEN) partnered to develop the 382-acre Peña Station NEXT as a transit-oriented, carbon neutral community between the airport and downtown on the Regional Transportation District’s light rail line. The initiative leverages innovative technologies including renewable energy, battery storage, carbon capture, and grid modeling capabilities. The cost-effective, net-zero development infrastructure could be replicated and adopted across the U.S. in future developments” (Metro Denver EDC, 2018).

General Economic Information

- In December 2018, Colorado employed 2,780,000 people in nonfarm, not seasonally adjusted jobs (Office of Labor Market Information, 2019).
- The Northern Colorado region “continues to grow in sectors from manufacturing to food services and continues to have some of the fastest growing metropolitan areas in the country” (Leeds School of Business, 2018).
- Top executive pay appears to be more equal in Metro Denver than the rest of the nation (SHRM, 2017, p. 5).
- 26 of the state’s 29 largest employers are all within the nine-county region of Metro Denver and Northern Colorado, led by DIA, CU Boulder, and Lockheed Martin Space Systems (CareerOneStop, 2019).
- 10 counties along Colorado’s Front Range (which include the Metro Denver region, two Northern Colorado counties (Larimer and Weld), and El Paso county – home to Colorado Springs) account for 85% of Colorado’s GDP in 2015, the most recent year for which data are available (BEA, 2018).
 - o 95% of the economic growth in Colorado between 2012 and 2015 occurred in these 10 counties. The state has 64 counties in total.
 - o In the Boulder-Denver region, Boulder, Denver, Arapahoe, and Jefferson counties were responsible for 54% of the state’s GDP.



References

- ACPSA. (2015). *ACPSA Industry Key*. Retrieved from National Assembly of State Arts Industries: https://nasaa-arts.org/nasaa_research/acpsa-industry-key/
- AFTA. (2017). *The Economic Impact of Nonprofit Arts and Cultural Organizations & Their Audiences in the City of Boulder, CO*. Americans for the Arts. Retrieved from https://boulderarts.org/wp-content/uploads/2017/06/CO_CityOfBoulder_AEP5.pdf
- Barcott, B. (2019, March 4). As of 2019, Legal Cannabis Has Created 211,000 Full-Time Jobs in America. *Leafly*. Retrieved from <https://www.leafly.com/news/industry/legal-cannabis-jobs-report-2019>
- Barcott, B., & Whitney, B. (2019). *Special Report: Cannabis Jobs Count*. Leafly and Whitney Economics. Retrieved from <https://d3atagt0rnqk7k.cloudfront.net/wp-content/uploads/2019/03/01141121/CANNABIS-JOBS-REPORT-FINAL-2.27.191.pdf>
- BEA. (2018). *Prototype Gross Domestic Product by County, 2012-2015*. U.S. Department of Commerce, Bureau of Economic Analysis. Retrieved from https://www.bea.gov/system/files/2018-12/lagdp1218_0.pdf
- BLS. (2018). *Denver Area Economic Summary*. Bureau of Labor Statistics. Retrieved from https://www.bls.gov/regions/mountain-plains/summary/BLSSummary_Denver.pdf
- BLS. (2018). *Private, 1012 Construction, Colorado, 2018 First Quarter, By establishment class size*. (B. o. Statistics, Producer, & US Department of Labor) Retrieved from Quarterly Census of Employment and Wages: https://data.bls.gov/cew/apps/table_maker/v4/table_maker.htm#type=16&year=2018&st=08&hlind=1012&supp=0
- BLS. (2018). *Total Covered, High-Level Industries, Colorado, 2018 First Quarter, All establishment sizes*. (B. o. Statistics, Producer, & US Department of Labor) Retrieved from Quarterly Census of Employment and Wages: https://data.bls.gov/cew/apps/table_maker/v4/table_maker.htm#type=5&year=2018&qtr=1&own=0&area=08000&supp=0
- BLS. (2019, February). *Databases, Tables & Calculators by Subject*. Retrieved from Bureau of Labor Statistics: https://data.bls.gov/timeseries/LASST0800000000000006?amp%253bdata_tool=XGtable&output_view=data&include_graphs=true
- Boulder Chamber. (n.d.). *Arts & Culture*. Retrieved December 18, 2018, from Boulder Chamber: <https://boulderchamber.com/advocacy/arts-culture/>
- Boulder Coaching. (2018). *Simon Lessing*. Retrieved from Boulder Coaching: <http://www.bouldercoaching.com/index.cfm/coaches/simon-lessing/bio/>



- Boulder Convention and Visitors Bureau. (2015). *Boulder Trivia: Fun Facts*. Retrieved from Boulder Colorado USA: <https://www.bouldercoloradousa.com/about-boulder/boulder-trivia/>
- Boulder Economic Council. (2018). *Cleantech*. Retrieved from Boulder Economic Council: <http://bouldereconomiccouncil.org/boulder-economy/key-industries-companies/cleantech/>
- Boulder Economic Council. (2018). *Education*. Retrieved from Boulder Economic Council: <http://bouldereconomiccouncil.org/living-boulder/education/>
- Boulder Economic Council. (2018). *IT/Software*. Retrieved from Boulder Economic Council: <http://bouldereconomiccouncil.org/boulder-economy/key-industries-companies/itssoftware/>
- Boulder Economic Council. (2018). *Natural Products*. Retrieved from Boulder Economic Council: <http://bouldereconomiccouncil.org/boulder-economy/key-industries-companies/natural-products/>
- Boulder Economic Council. (2018). *Outdoor Recreation*. Retrieved from Boulder Economic Council: <http://bouldereconomiccouncil.org/boulder-economy/key-industries-companies/outdoor-recreation/>
- Boulder Office of Arts + Culture. (2017, June 20). *AFTA Arts and Economic Prosperity Study 5*. Retrieved from City of Boulder Office of Arts + Culture: <https://boulderarts.org/afta-arts-economic-prosperity-study-5/>
- Brewers Association. (2018). *Colorado Craft Beer Statistics, 2017*. Retrieved from Brewers Association: <https://www.brewersassociation.org/statistics/by-state/?state=CO>
- Brewers Association. (2018). *Total Economic Impact*. Brewers Association, Boulder, CO. Retrieved from <https://s3-us-west-2.amazonaws.com/brewersassoc/wp-content/uploads/2018/08/State-by-State-Breakdown-2017.pdf>
- CareerOneStop. (2019). *State Profile: Largest Employers*. Retrieved from CareerOneStop: <https://www.careerinfonet.org/oview6.asp?printer=&next=oview6&id=&nodeid=&stfips=08&group=1>
- Castle, S. (2016, February 2). Boulder County's hallowed natural food companies are officially in Wall Street's sights. *Daily Camera*. Retrieved from http://www.dailycamera.com/boulder-business/ci_29511583/boulder-countys-hallowed-natural-food-companies-are-officially
- CBCA. (2018, November 1). *Economic Activity Study*. Retrieved from CBCA: <http://cbca.org/economic-activity-study/>
- CBCA. (2018). *Economic Activity Study of Metro Denver Culture*. Colorado Business Committee for the Arts. Retrieved from <http://cbca.org/wp-content/uploads/2018/11/CBCA-EAS-2018-FINAL.pdf>
- CCIA. (2019). *Industry Strength*. (Colorado Cleantech Industries Association) Retrieved from CCIA: <https://coloradocleantech.com/cleantech-in-colorado/>



- Choose Colorado. (2019). *Regions*. Retrieved from Choose Colorado: <https://choosecolorado.com/doing-business/regions/>
- Clare Gallagher. (2018). *Home*. Retrieved from Clare Gallagher: <https://clare.run/>
- Clean Edge. (2016). *2016 U.S. Clean Tech Leadership Index*.
- CO Department of Agriculture. (2017). *Colorado Agriculture from A to Z*. Broomfield: Colorado Department of Agriculture, Markets Division. Retrieved from <https://www.colorado.gov/pacific/sites/default/files/Colorado%20Agriculture%20A%20to%20Z.pdf>
- CO Department of Revenue. (2018). *2018 Annual Report: July 1, 2017 - June 30, 2018*. Colorado Department of Revenue, Denver. Retrieved from https://www.colorado.gov/pacific/sites/default/files/2018_Annual_Report.pdf
- CO Department of Revenue. (2019, February). *Marijuana Sales Reports*. Retrieved from Colorado Department of Revenue: <https://www.colorado.gov/pacific/revenue/colorado-marijuana-sales-reports>
- CO OEDIT. (2013). *Key Industry: Food and Agriculture*. State of Colorado, Colorado Office of Economic Development and International Trade, Denver. Retrieved from <https://choosecolorado.com/wp-content/uploads/2016/06/CO-Food-and-Ag-Profile.pdf>
- Coates, D., & Humphreys, B. (2004). *Professional Sports Facilities, Franchises and Urban Development*. Working Paper, University of Maryland, Baltimore County, Department of Economics. Retrieved from https://economics.umbc.edu/files/2014/09/wp_03_103.pdf
- COGA. (2019). *Colorado Oil & Gas Industry Economic and Fiscal Contributions*. University of Colorado, Denver, Business School, Global Energy Management Program. Denver, CO: Colorado Oil & Gas Association. Retrieved from https://www.coga.org/uploads/1/2/2/4/122414962/coga_economic_fiscal_impacts_-_final.pdf
- Colorado Cattlemen's Association. (2018). *Colorado Cattle Industry*. Retrieved from Colorado Beef Statistics: <https://www.coloradocattle.org/coloradobeefstatistics.aspx>
- Colorado Creative Industries. (2018). *Colorado's Arts Industries Contribute \$13.7B to the State's Economy*. Retrieved from Colorado Creative Industries: <https://coloradocreativeindustries.org/colorados-arts-industries-contribute-13-7b-stateeconomy/>
- Colorado Parks and Wildlife. (2018). *The 2017 Economic Contributions of Outdoor Recreation in Colorado: a regional and county-level analysis*. Retrieved from http://cpw.state.co.us/Documents/Trails/SCORP/2017EconomicContributions_SCORP.pdf



- Colorado Tourism Office. (2018, June 28). *Colorado Tourism Sets All-Time Records for Eighth Consecutive Year*. Retrieved from Come to Life Colorado: <https://www.colorado.com/news/colorado-tourism-sets-all-time-records-eighth-consecutive-year>
- Crouse, L. (2018, April 12). This Man Expects to Run a 2:50 in the Boston Marathon on Monday. *The New York Times*. Retrieved from <https://www.nytimes.com/2018/04/12/sports/tim-don-boston-marathon-ironman.html>
- CU Boulder. (2018). *Economic Impact on Colorado*. Retrieved from University of Colorado Boulder: <https://www.colorado.edu/about/economic-impact-colorado>
- CU Boulder. (2018). *Geological Sciences*. Retrieved from College of Arts and Sciences: <https://www.colorado.edu/artsandsciences/geological-sciences>
- CU Denver. (2018). *Economic Impact Reports*. Retrieved from Office of Program Evaluation and Reporting: <http://www.ucdenver.edu/about/departments/OPFA/Pages/EconImpact.aspx>
- Denver.org. (2018). *Denver's Pro Sports Teams*. Retrieved from Things To Do: <https://www.denver.org/things-to-do/sports-recreation/pro-sports/>
- Department of Numbers. (2018). *Colorado GDP*. Retrieved from Department of Numbers: <https://www.deptofnumbers.com/gdp/colorado/>
- Development Research Partners. (2016). *The Economic and Fiscal Benefits of the University of Denver*. Prepared for the University of Denver. Retrieved from <https://www.du.edu/sites/g/files/lmucqz251/files/2018-06/du-economic-impact-2016.pdf>
- Doyle, S. (2015, November 12). *Millennials Want More Public Transportation*. Retrieved from US PIRG: <https://uspig.org/blogs/blog/maf/millennials-want-more-public-transportation>
- E2. (2017). *Clean Jobs Colorado 2017*. Environmental Entrepreneurs. Retrieved from https://www.e2.org/wp-content/uploads/2017/09/CleanJobsCO_2017.pdf
- E2. (2019). *Clean Jobs America*. Environmental Entrepreneurs. Retrieved from <https://www.e2.org/wp-content/uploads/2019/04/E2-2019-Clean-Jobs-America.pdf>
- EIA. (2019, January 17). *Colorado State Energy Profile*. (US Energy Information Administration) Retrieved from EIA: <https://www.eia.gov/state/print.php?sid=CO>
- Elliot, R., & Olson, B. (2018, August 12). Frackers Burn Cash to Sustain U.S. Oil Boom. *The Wall Street Journal*. Retrieved from <https://www.wsj.com/articles/frackers-burn-cash-to-sustain-u-s-oil-boom-1534078844>
- Federal Reserve Bank of St Louis and the Board of Governors of the Federal Reserve System. (2017). *Harvesting Opportunity: The Power of Regional Food System Investments to Transform Communities*. Retrieved from https://ota.com/sites/default/files/indexed_files/HarvestingOpportunity_FederalReserve_Chapter16_OrganicTradeAssociation.pdf

- Felix, A., & Chapman, S. (2018, April 16). *The Economic Effects of the Marijuana Industry in Colorado*. Retrieved from Federal Reserve Bank of Kansas City: <https://www.kansascityfed.org/publications/research/rme/articles/2018/rme-1q-2018>
- Fox, S. (2017, January 29). More conventional farmers in Weld County are adding organic crops to the mix because demand is hot. *The Tribune*. Retrieved from <https://www.greeleytribune.com/news/more-conventional-farmers-in-weld-county-are-adding-organic-crops-to-the-mix-because-demand-is-hot/>
- Frank, C. (2016, April 2). Natural Foods Industry Growing Wild in Boulder. *Daily Camera*. Retrieved from http://www.dailycamera.com/boulder-business/ci_29714549/natural-foods-industry-growing-wild-boulder
- Gallup-Sharecare. (2017). *State of American Well-Being: 2016 Community Rankings for Healthy Eating*. Gallup-Sharecare Well-Being Index. Retrieved from <https://wellbeingindex.sharecare.com/wp-content/uploads/2017/12/2016-Community-Rankings-for-Healthy-Eating-2017.pdf>
- Gallup-Sharecare. (2018). *State of American Well-Being: 2017 Community Well-Being Rankings*. Gallup-Sharecare Well-Being Index. Retrieved from https://wellbeingindex.sharecare.com/wp-content/uploads/2018/03/Gallup-Sharecare-State-of-American-Well-Being_2017-Community-Rankings_vFINAL.pdf
- Gallup-Sharecare. (2018). *State of American Well-being: 2017 State Well-Being Rankings*. Gallup-Sharecare Well-Being Index. Retrieved from https://wellbeingindex.sharecare.com/wp-content/uploads/2018/02/Gallup-Sharecare-State-of-American-Well-Being_2017-State-Rankings_FINAL.pdf?t=1518473023878
- Heather. (2014, January 28). *National (& Colorado) Impact of Equine Industry on US Economy*. Retrieved from Mountain Homes for Horses: <http://mtnhomes4horses.com/equine-industry-us-economics/>
- Helm, B. (2014, January). How Boulder Became America's Startup Capital. *Inc*. Retrieved from <https://www.inc.com/magazine/201312/boulder-colorado-fast-growing-business.html>
- IEEFA & Sightline. (2018). *Energy Market Update: Red Flags on U.S. Fracking - Disappointing Financial Performance Continues*. Institute for Energy Economics and Financial Analysis, Sightline Institute. Retrieved from http://ieefa.org/wp-content/uploads/2018/10/Red-Flags-on-U.S.-Fracking_October-2018.pdf
- Johnson, F. (2014, October 1). How Denver Leaders Pulled Off a Public Transit Miracle: Voters agreed to tax themselves for a commuter rail network. Then a budget shortfall almost doomed the whole project. Now it's on track to completion. *The Atlantic*. Retrieved from <https://www.theatlantic.com/business/archive/2014/10/how-denver-leaders-pulled-off-a-public-transit-miracle/425583/>



- Kondo, M., Hohl, B., Han, S., & Branas, C. (2016, November 1). Effects of greening and community reuse of vacant lots on crime. *Urban Studies*, 53(15), 3279-3295. Retrieved from <https://doi.org/10.1177/0042098015608058>
- Leafly. (2019). *Cannabis Jobs State-by-State*. Retrieved from <https://d3atagt0rnqk7k.cloudfront.net/wp-content/uploads/2019/03/04110223/CANNABIS-JOBS-APPENDIX-FINAL.pdf>
- Leeds School of Business. (2011). *Natural and Organic Industry Study*. University of Colorado, Boulder, Business Research Division. Retrieved from https://www.naturallyboulder.org/wp-content/uploads/2015/10/2011_natural_and_organic_industry_study.pdf
- Leeds School of Business. (2017). *2018 Colorado Business Economic Outlook*. University of Colorado Boulder, Business Research Division, Boulder.
- Leeds School of Business. (2017). *Colorado 2017 Midyear Economic Update*. University of Colorado Boulder, Business Research Division. Boulder: Colorado Business Review. Retrieved from https://www.colorado.edu/business/sites/default/files/attached-files/cbr_2017_issue_2.pdf
- Leeds School of Business. (2017). *Economic Contribution of the University of Colorado on the State and Counties of Operations*. University of Colorado, Boulder, Business Research Division, Boulder, CO. Retrieved from https://www.colorado.edu/business/sites/default/files/attached-files/cu_impact_study_2017.pdf
- Leeds School of Business. (2018). *Colorado Business Economic Outlook 2019*. University of Colorado Boulder, Business Research Division, Boulder.
- Livability. (2016). *2016 Best Cities for Entrepreneurs*. Retrieved from Best Places to Live: <https://livability.com/best-places/best-cities-for-entrepreneurs/2016>
- Marijuana Policy Group. (2016). *The Economic Impact of Marijuana Legalization in Colorado*. Retrieved from <http://mjpolicygroup.com/pubs/MPG%20Impact%20of%20Marijuana%20on%20Colorado-Final.pdf>
- Marmaduke, J. (2018, January 25). 'This is the weather and climate we fear': Climate change and Colorado's ski slopes. *Coloradoan*. Retrieved from <https://www.coloradoan.com/story/news/2018/01/26/weather-and-climate-we-fearhow-climate-change-alter-skiing-colorado/1038318001/>
- McCann, A. (2018, April 16). *2018's Best and Worst Small Cities to Start a Business*. Retrieved from WalletHub: <https://wallethub.com/edu/best-small-cities-to-start-a-business/20180/>
- MEP Alliance. (2017). *Colorado Construction Industry Economic Impact Study*. Colorado Association of Mechanical and Plumbing Contractors; Rocky Mountain Chapter of the National Electrical Contractors Association; Sheet Metal and Air Condition Colorado Chapter . Retrieved from chrome-extension://oemmnrcbldboiebnladdacbdmfmadadm/https://www.campc.org/wp-content/uploads/2013/11/2017_EconomicImpactStudy-Final.pdf



- Metro Denver EDC. (2017). *Metro Denver and North Colorado Key Industry Clusters*. Denver. Retrieved from <http://www.metrodenver.org/media/230157/2017-industry-cluster-study-full-report-.pdf>
- Metro Denver EDC. (2018). *Metropolitan Denver Region Industry Clusters*. Metro Denver Economic Development Corporation, Denver. Retrieved from <http://www.metrodenver.org/media/855845/metro-denver-edc-full-report-36.pdf>
- Metro Denver EDC. (2018). *Spectator Sports*. Retrieved from Metro Denver Economic Development Corporation: <http://www.metrodenver.org/lifestyle/spectator-sports/>
- Metro Denver EDC. (2019). *Workforce Employment Stats*. Retrieved from Metro Denver Economic Development Corporation: <http://www.metrodenver.org/mile-high-advantages/workforce/employment-stats/>
- Miller, B. (2018, December 4). Xcel Energy pledges goal of delivering carbon-free electricity by 2050. *The Denver Channel*. Retrieved from <https://www.thedenverchannel.com/news/politics/xcel-energy-pledges-goal-of-delivering-carbon-free-electricity-by-2050>
- NEA. (2018, March). *State-Level Estimates of the Arts' Economic Value and Employment (2001-2015)*. Retrieved from National Endowment for the Arts: <https://www.arts.gov/artistic-fields/research-analysis/arts-data-profiles/arts-data-profile-17>
- Newton, J. (2018, June 12). *Farm Contribution to Agricultural GDP at Record Low*. (AFBF) Retrieved from American Farm Bureau Federation: <https://www.fb.org/market-intel/farm-contribution-to-agricultural-gdp-at-record-low>
- Nick, S. (2018, March 8). *Arts, Culture Contribute \$13 Billion to Colorado Economy*. (KUNC) Retrieved from KUNC: <http://www.kunc.org/post/arts-culture-contribute-13-billion-colorado-economy#stream/0>
- Niemi, L. (2015). *The Arts & Economic Vitality: Relationships Between the Arts, Entrepreneurship & Innovation in the Workplace*. Chestnut Hill, MA: Boston College. Retrieved from <https://www.arts.gov/sites/default/files/Research-Art-Works-BostonCollege.pdf>
- Noll, R., & Zimbalist, A. (1997, Summer). Sports, Jobs, Taxes: Are New Stadiums Worth the Cost? *The Brookings Review*, 15(3), 35-39. doi:10.2307/20080751
- Office of Labor Market Information. (2019). *Current Employment Statistics (CES) Trends for Mining and Logging in Colorado*. (O. o. Information, Producer, & Colorado Department of Labor and Employment) Retrieved from LMI Gateway: <https://www.colmigateway.com/vosnet/analyzer/trend.aspx?enc=xuiA7iw8u+irEDU/A6T2A9kHRhsZYi35nNPACXRPQjtAJE31dUwBfDoTxKC1q9DWP87M0WUUqWDIqB7xS/rf08cWJQWmMYoAQVPDXLsmRk=>
- Office of Labor Market Information. (2019). *Current Employment Statistics for Colorado in December, 2018*. (O. o. Information, Producer, & Colorado Department of Labor and Employment) Retrieved from LMI Gateway:



<https://www.colmigateway.com/vosnet/analyzer/results.aspx?enc=XQuUTvej1suX3Tq+4y+vw==>

- OIA. (2017). *2017 Outdoor Industry Study*. Outdoor Industry Association. Retrieved from <https://outdoorindustry.org/state/colorado/>
- OIA. (2017). *Colorado 1st Congressional District*. Outdoor Industry Association. Retrieved from https://outdoorindustry.org/wp-content/uploads/congressionaldata/COLORADO/OIA-ConDist-Colorado_1.pdf
- OIA. (2017). *Colorado 2nd Congressional District*. Outdoor Industry Association. Retrieved from https://outdoorindustry.org/wp-content/uploads/congressionaldata/COLORADO/OIA-ConDist-Colorado_2.pdf
- OIA. (2017). *The Outdoor Recreation Economy*. Outdoor Industry Association. Retrieved from https://outdoorindustry.org/wp-content/uploads/2017/04/OIA_RecEconomy_FINAL_Single.pdf
- OTA. (2018). *Organic Hotspots*. Retrieved from Organic Trade Association: <https://www.ota.com/hotspots>
- OTA. (2018). *Organic Industry Survey*. (Organic Trade Association) Retrieved from Organic Trade Association: <https://ota.com/resources/organic-industry-survey>
- OTA. (2019). *Organic Industry Survey*. (Organic Trade Association) Retrieved from Organic Trade Association: <https://ota.com/resources/organic-industry-survey>
- Parker, C. (2015, July 30). Sports stadiums do not generate significant local economic growth, Stanford expert says. *Stanford News*. Retrieved from <https://news.stanford.edu/2015/07/30/stadium-economics-noll-073015/>
- Porter, P. (1999). Mega-sports events as municipal investments: a critique of impact analysis. In *Sports economics: current research* (pp. 61-73). Westport: Praeger Publishers. Retrieved from <https://www.cabdirect.org/cabdirect/abstract/20001809162>
- Porter, P., & Fletcher, D. (2002). *Capacity Constraints Limit the Economic Impact of Sporting Events: Lessons from the Olympic Games*. New Orleans, LA.
- POW. (2018). *The Economic Contributions of Winter Sports in a Changing Climate*. Protect Our Winters. Retrieved from <https://protectourwinters.org/download/5778/>
- Rosenberg, M. (2018, September 5). King County Council approves \$135 million in taxpayer funds for Mariners ballpark. *The Seattle Times*. Retrieved from <https://www.seattletimes.com/sports/mariners/king-county-council-approves-135-million-in-taxpayer-funds-for-mariners-ballpark/>
- RTD. (2016, January). *Clean Air Facts and Figures*. Retrieved from RTD: <http://rtd-denver.com/FF-CleanAir.shtml>



- RTD. (2018, March). *Facts and Figures*. (Regional Transportation District) Retrieved from RTD: <http://rtd-denver.com/factsAndFigures.shtml>
- RTD. (2018). *Quality of Life*. Retrieved from <http://rtd-denver.com/documents/QoL-HighLevelReport-0818.pdf>
- SHRM. (2017). *Metro Economic Outlook: Denver*. Society for Human Resource Management. Retrieved from <https://www.shrm.org/hr-today/trends-and-forecasting/labor-market-and-economic-data/Documents/denver.pdf>
- Siegelbaum, M. (2017, February 7). Colorado farmers going organic to meet rising demand. *The Denver Post*. Retrieved from <https://www.denverpost.com/2017/02/07/colorado-farmers-going-organic/>
- St. Louis Fed. (2018, November 19). *Total Gross Domestic Product for Colorado*. (Federal Reserve Bank of St Louis) Retrieved from Economic Research: <https://fred.stlouisfed.org/series/CONGSP>
- Statista. (2019). *Real value added to the Gross Domestic Product (GDP) of Colorado in 2017, by industry (in billion chained 2009 U.S. dollars)*. Retrieved from Statista: <https://www.statista.com/statistics/594399/colorado-real-gdp-by-industry/>
- Stuckey, H., & Nobel, J. (2010, February). The Connection Between Art, Healing, and Public Health: A Review of Current Literature. *American Journal of Public Health*, 100(2), 254-263. doi:10.2105/AJPH.2008.156497
- The American Horse Council. (2005). *Most Comprehensive Horse Study Ever Reveals a Nearly \$40 Billion Impact on the U.S. Economy*. The American Horse Council. Retrieved from https://manesandtailsorganization.org/American_Horse_Council_2005_Report.pdf
- The Solar Foundation. (2019). *Colorado Solar Jobs Census 2018*. The Solar Foundation. Retrieved from <https://www.thesolarfoundation.org/solar-jobs-census/factsheet-2018-co/>
- The State of Obesity. (2018). *Adult Obesity in the United States*. Retrieved from The State of Obesity: Better Policies for a Healthier America: <https://stateofobesity.org/adult-obesity/>
- The Trust for Public Land. (2010). *The Economic Benefits of Denver's Park and Recreation System*. The Trust for Public Land. Retrieved from <http://cloud.tpl.org/pubs/ccpe-denver-park-value-report.pdf>
- U.S. Department of Energy. (2017). *U.S. Energy and Jobs Report State Charts*. U.S. Department of Energy. Retrieved from https://www.energy.gov/sites/prod/files/2017/01/f34/2017%20US%20Energy%20and%20J%20obs%20Report%20State%20Charts%202_0.pdf
- US EPA. (2016). *What Climate Change Means for Colorado*. United States Environmental Protection Agency. US EPA. Retrieved from <https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-co.pdf>



- University of Washington. (2018, August). *Green Cities: Good Health*. Retrieved from Urban Forestry/Urban Greening Research: <http://depts.washington.edu/hhwb/>
- Vital for Colorado. (2018). *Videos and Podcasts*. Retrieved from Vital for Colorado: www.vitalforcolorado.com/videos_and_podcasts
- Wadhwa, V. (2010, April 22). Why Boulder Is America's Best Town for Startups. *Bloomberg Business*. Retrieved from <https://www.bloomberg.com/news/articles/2010-04-22/why-boulder-is-americas-best-town-for-startupsbusinessweek-business-news-stock-market-and-financial-advice>
- Weinstein, N., Balmford, A., DeHaan, C., Gladwell, V., Bradbury, R., & Amano, T. (2015, December). Seeing Community for the Trees: The Links among Contact with Natural Environments, Community Cohesion, and Crime. *BioScience*, 65(12), 1141-1153. Retrieved from <http://repository.essex.ac.uk/15729/1/biv151.pdf>
- Wenzel, J. (2018, November 1). Denver's nonprofit arts and culture activity reached nearly \$2 billion last year, new study finds. *The Denver Post*. Retrieved from <https://www.denverpost.com/2018/11/01/denver-arts-and-culture-nearly-2-billion-2017-cbca-study/>
- Whaley, M. (2017, December 9). Impact on Education helps Boulder Valley students build websites, bikes, futures. *The Denver Post*. Retrieved from <https://www.denverpost.com/2017/12/09/season-to-share-impact-on-education-boulder/>
- Wirthman, L. (2016, September 21). Why Are So Many Natural And Organic Food Companies Based In Colorado? *Forbes*. Retrieved from <https://www.forbes.com/sites/colorado/2016/09/21/why-are-so-many-natural-and-organic-food-companies-based-in-colorado/#41dc331b47f9>
- Witters, D. (2011, March 15). Boulder, Colo., Leads U.S. Metro Areas in Well-Being. *Gallup*. Retrieved from https://news.gallup.com/poll/146645/Boulder-Colo-Leads-Metro-Areas-Wellbeing.aspx?utm_source=alert&utm_medium=email&utm_campaign=syndication&utm_content=morelink&utm_term=All+Gallup+Headlines+-+Healthcare+-+Social+Issues
- Wood Mackenzie/SEIA. (2019). *Solar Market Insight Report 2019 Q2*. Wood Mackenzie and the Solar Energy Industry Association. Retrieved from <https://www.seia.org/research-resources/solar-market-insight-report-2019-q2>
- Woodard, C. (2016, May 9). The Train That Saved Denver: The car-choked city overcame regional distrust to build a major transit system that is remaking the urban core and the suburbs, too. *Politico Magazine*. Retrieved from <https://www.politico.com/magazine/story/2016/05/what-works-denver-rail-system-growth-213905>
- World Atlas. (2019). *Colorado*. Retrieved from World Atlas: <https://www.worldatlas.com/webimage/countrys/namerica/usstates/colandst.htm>



About the Authors

Hunter Lovins is the President and Founder of Natural Capitalism Solutions (NCS), a non-profit formed in 2002 in Longmont, CO. A renowned author and champion of sustainable development for over 35 years, Hunter has consulted on business, economic development, sustainable agriculture, energy, water, security, and climate policies for scores of governments, communities, and companies worldwide. Within the United States, she has consulted for heads of state, departments of defense, energy agencies and hundreds of state and local agencies.

Jock Gilchrist is a Research Fellow with Natural Capitalism Solutions and an MS candidate in Environmental Science and Policy at Johns Hopkins University. His previous research has focused on global electric vehicle policy, ecological rationality, and theory of change within the climate movement. He can be reached at jgilchrist@natcapsolutions.org.

Hayden Hogoboom designed this report's cover art. He can be reached at hayden.hogoboom@colorado.edu.