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COLORADO'S ENERGY COMPETITIVENESS

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ABOUT THE AUTHORS



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ABOUT COMMON SENSE INSTITUTE

Common Sense Institute is a non-partisan research organization dedicated to the protection and promotion of Colorado's economy. CSI is at the forefront of important discussions concerning the future of free enterprise and aims to have an impact on the issues that matter most to Coloradans. CSI's mission is to examine the fiscal impacts of policies, initiatives, and proposed laws so that Coloradoans are educated and informed on issues impacting their lives. CSI employs rigorous research techniques and dynamic modeling to evaluate the potential impact of these measures on the economy and individual opportunity.

TEAMS & FELLOWS STATEMENT

CSI is committed to independent, in-depth research that examines the impacts of policies, initiatives, and proposed laws so that Coloradoans are educated and informed on issues impacting their lives. CSI's commitment to institutional independence is rooted in the individual independence of our researchers, economists, and fellows. At the core of CSI's mission is a belief in the power of the free enterprise system. Our work explores ideas that protect and promote jobs and the economy, and the CSI team and fellows take part in this pursuit with academic freedom. Our team's work is informed by data-driven research and evidence. The views and opinions of fellows do not reflect the institutional views of CSI. CSI operates independently of any political party and does not take positions.

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INTRODUCTION

The desired transition from traditional fuels to green energy is fraught with tension between the push for lower emission energy and the cost of producing and reliably delivering it. This tension is largely derived from the role public policy plays in market decisions.

To measure and monitor the competitiveness of Colorado's energy system, CSI has developed the Energy Competitiveness Index. This index is featured in our 2024 Free Enterprise Reportⁱ but examined in more detail here.

Colorado is a leading U.S. state in national decarbonization efforts. Those efforts have not come without significant cost and are creating an uncertain future for the production and supply of power generation and energy access across the state. Energy competitiveness is crucial to a state's ability to attract newcomers, keep existing residents, bring in new businesses, and support the expansion of businesses already located in the state. Many of the fastest growing and most productive industries, such as data processing and storage to support growing AI technology and manufacturing, require affordable and reliable energy.

Following legislation in 2019 that established aggressive emission reduction goals, the state government released two reports, detailing their policy objectives to achieve them. On top of that, in the first three years following the passage of the emission reduction targets, the state legislature passed 55 pieces of legislation to incrementally force GhG reductions.ⁱⁱ

The February 2024 release of an updated emission reduction state roadmap was met with concern. Colorado Springs Utilities (CSU) CEO Travis Deal said that the initiatives, "place great strain on CSU and, ultimately, its customers." He further explained, "We just do not have the technology" and "The financial impact of this is going to be extreme."

CSI's energy competitiveness index will continue to monitor and support the examination of the state's energy system changes as they play out for decades to come. The following are some key insights from the index and additional corresponding data.

The U.S. is the largest oil and gas producer in the world and benefits from supply security in both crude oil and natural gas as well as materially lower natural gas prices than the rest of the world. Colorado is a major oil and gas producing state, producing nearly half a million barrels of oil per day and over 5 Billion Cubic Feet per day of natural gas.

Colorado's energy competitiveness considers the cost and reliability of Colorado's energy and therefore the competitiveness of Colorado as a home for both businesses and consumers. The U.S. is the largest oil and gas producer in the world and benefits from supply security in both crude oil and natural gas as well as materially lower natural gas prices than the rest of the world. Colorado is a major oil and gas producing state, producing nearly half a million barrels of oil per day and over 5 Billion Cubic Feet per day of natural gas.

Currently low natural gas commodity prices should lower consumer gas bills, but electricity and utility prices are rising due to rate hikes and burdens placed on the consumer to pay for renewables and clean tech, infrastructure, and decommissioning coal and natural gas power generation. **How competitive Colorado is for energy is directly correlated to Colorado's overall competitiveness.** This is increasingly important in the face of sticky and persistent inflation and rising costs for basic goods including food and housing.

KEY FINDINGS

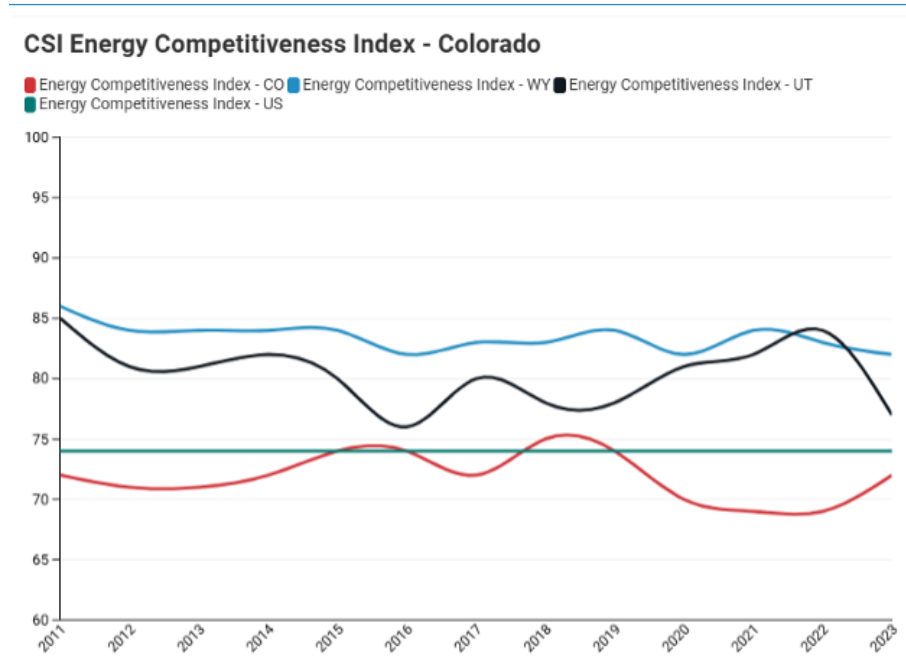
- **Colorado's energy competitiveness is slipping, it declined since 2018 and now ranks 32nd, behind regional competitors of Wyoming 7th, Utah 20th and is below the U.S. average. The drop is due to substantial increases in electricity and natural gas prices and a decline in electrical grid reliability.**
- **The rise in electricity and natural gas prices corresponded with a sharp increase in the share of renewables, specifically wind and solar, which grew from 20% of electricity production in 2018 to 33% in 2023, from 10,807 terawatt hours to 19,152 terawatt hours (1 terawatt = 1 billion kilowatts).** All other renewable sources accounted for less than 2% of electricity production (1,664 terawatt hour) in 2023.
- **Six of the nine index components declined since the 2018 peak. Between 2018 and 2023 electricity and natural gas prices consistently increased across all consumer groups.**
 - › Residential electricity prices increased 16.7% on average, rising to 14.2 cents per KWH from 12.2 cents per KWH.
 - › Commercial electricity prices increased 15.4% on average, rising to 11.6 cents per KWH from 10 cents per KWH.
 - › Industrial electricity prices increased 14.3% on average, rising to 8.5 cents per KWH from 7.5 cents per KWH.
 - › Residential natural gas prices increased 20.8% on average, rising to \$12.01 per mcf (thousand cubic foot).
 - › Commercial natural gas prices increased 36.5% on average, rising to \$10.45 per mcf.
 - › Industrial natural gas prices increased 51.4% on average, rising to \$8.4 per mcf.
- **In 2023 when the share of electricity produced by renewables declined Colorado's prices relative to other states also declined.**
- Colorado utility companies are legally bound to reduce GHG emissions 85% by 2030, from 2005 levels. **CO2 emissions have declined, but they have since rebounded from the COVID period suggesting the aggressive and costly efforts to decarbonize are bearing little fruit with the lowest hanging fruit already snatched.**
- Electricity generation reliability without major event days has decreased 8% since 2018. Electricity generation reliability with major event days has decreased 14.5% since 2018

STATE ENERGY COMPETITIVENESS INDEX

To gauge how well states are performing regarding energy, CSI produces a State Energy Competitiveness Index for all 50 states and the District of Columbia consisting of ten metrics that capture distinct aspects of the energy sector, these include: Nameplate Capacity (Megawatts) per 100,000 Residents, Electricity Reliability – CAIDI (minutes of interruption) W/O Major Event Day (MED) per Capacity, Electricity Reliability – CAIDI (minutes of interruption) With Major Event Day (MED) per Capacity, Electricity Price (cents/kWh) – Residential, Electricity Price (cents/kWh) – Commercial, Electricity Price (cents/kWh) – Industrial, Residential Natural Gas Price, Commercial Natural Gas Price, Industrial Natural Gas Price, and Share of Electricity Produced by Clean Energy. Each metric is ranked relative to all fifty states and the District of Columbia. Then the ten ranked metrics are equally weighted and summed. This value is ranked again to produce an aggregate measure of energy competitiveness as shown in **Figure 1**.

Colorado's Energy Competitiveness Index was 72 in 2011, peaked in 2018 at 75 and then declined to 72 in 2023. An increase in the Energy Competitiveness Index is a positive qualitative change – i.e., the state is more competitive as the index approaches one hundred. The U.S. average is 74 as there are 50 states plus the District of Columbia, of which the average ranking is 26 and the index is $100 - 26 = 74$. Colorado was below the U.S. average in all but two years, 2016 and 2018, between 2011 to 2023.

FIGURE 1 – COLORADO ENERGY COMPETITIVENESS INDEX COMPARED TO NEIGHBORING STATES



The competitiveness index should be interpreted as follows: an increase/decrease in an index indicates increased/decreased competitiveness relative to the other forty-nine states and District of Columbia. Colorado's individual performance may improve, for example, if its electricity prices decrease, however, other states may have seen greater decreases, and this will cause Colorado's competitiveness in energy to decline.

Colorado's energy competitiveness (red line), as shown below in Figure 1, declined since 2018 and now ranks 32nd, behind Wyoming 7th, Utah 20th and is below the U.S. average. The significant drop in this competitiveness is due to substantial increases in electricity and natural gas prices and a decline in electrical grid reliability. In comparison to neighboring states of Wyoming and Utah, Colorado's combined (residential, commercial, industrial) electricity prices have increased by 16.6% while Wyoming declined by 1.7% and Utah increased by 9.1%. Wyoming power generation also increased.

BIGGEST MOVING FACTORS IN THE INDEX

The major reasons for Colorado's reduced energy competitiveness since 2018 are increased electricity prices for residential, commercial, and industrial users, as shown in **Figure 2**, and increased natural gas prices for residential (red line), commercial (blue line), and industrial users (black line) as shown in **Figure 3**.

The competitiveness index line shows a direct correlation with the rise in prices and the decline in competitiveness.

From 2018 to 2023:

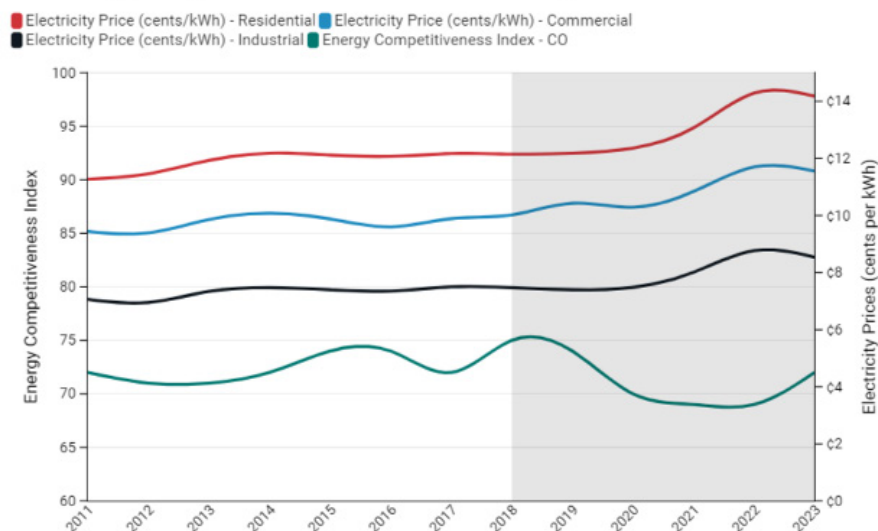
- Residential electricity prices increased 16.7%, 2 cents per kWh.
- Commercial electricity prices increased 15.4%, 1.6 cents per kWh.
- Industrial electricity prices increased 14.4%, 1 cent per kWh.

From 2018 to 2023:

- Residential natural gas prices increased 20.8%, \$2.08 per mcf.
- Commercial natural gas prices increased 36.5%, \$2.80 per mcf.
- Industrial natural gas prices increased 51.4%, \$2.85 per mcf.

FIGURE 2 - ELECTRICITY PRICES AND THE ENERGY COMPETITIVENESS INDEX

CSI Energy Competitiveness Index and Electricity Prices - Colorado



*Shaded area is post peak index

FIGURE 3 - NATURAL GAS PRICES AND THE ENERGY COMPETITIVENESS INDEX

CSI Energy Competitiveness Index and Natural Gas Prices - Colorado

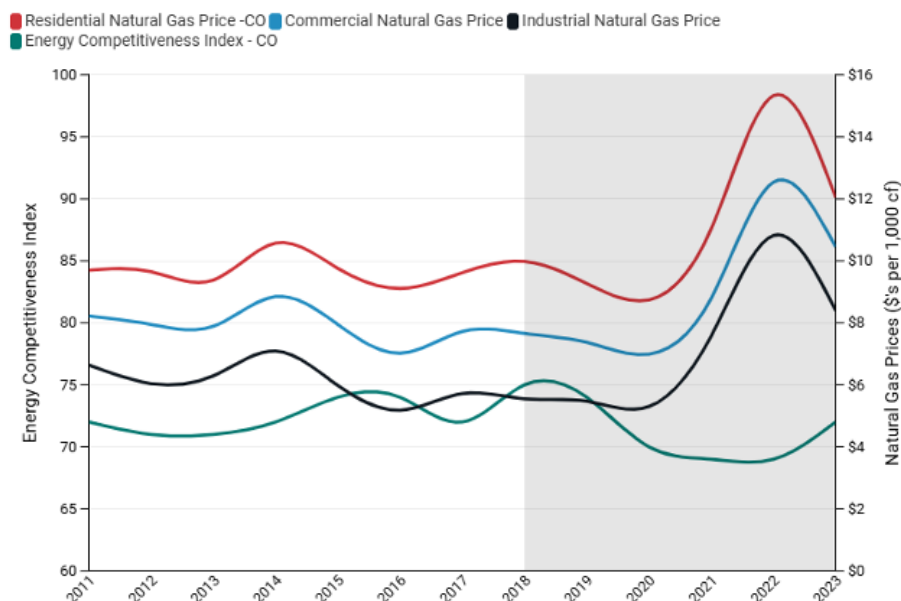


Figure 4 shows the evolution of the ten components included in the Energy Competitiveness Index.

The decrease in the Energy Competitiveness Index from 2018 through 2023 was the result of declines in six of the component competitiveness indices with three increasing and one remaining unchanged.

From 2018 to 2023 the following indices declined:

- Residential Electricity Price (cents per kWh), 76 to 75
- Industrial Electricity Price (cents per kWh), 68 to 66
- Residential Natural Gas Price, 91 to 88
- Industrial Natural Gas Price, 74 to 70
- Electricity Reliability – CAIDI (minutes per interruption with Major Event Day (MED) per capacity), 71 to 58
- Electricity Reliability – CAIDI (minutes per interruption without Major Event Day (MED) per capacity), 79 to 64

Increases since 2018 occurred in the following indices:

- Nameplate Capacity (Megawatts per 100,000 Residents), 65 to 70

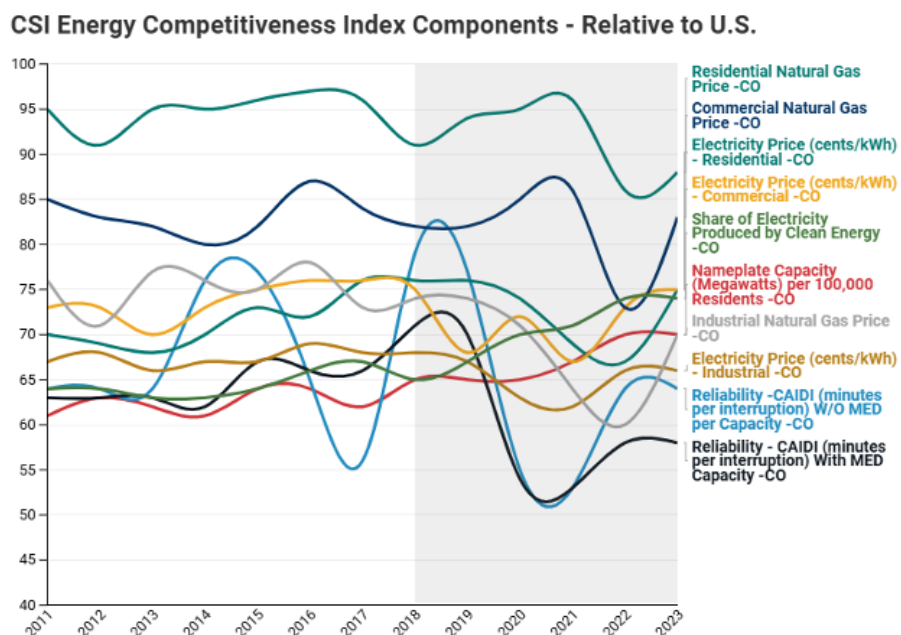
- Commercial Natural Gas Price, 82 to 83

- Share of Electricity Produced by Clean Energy, 65 to 74

- Unchanged since 2018 occurred in the following Component Indices:

- Commercial Electricity Price (cents per kWh), 75 to 75

FIGURE 4 - COLORADO ENERGY COMPETITIVENESS INDEX COMPONENTS



COLORADO RESIDENTIAL ELECTRICITY PRICE (CENTS PER KWH) COMPETITIVENESS

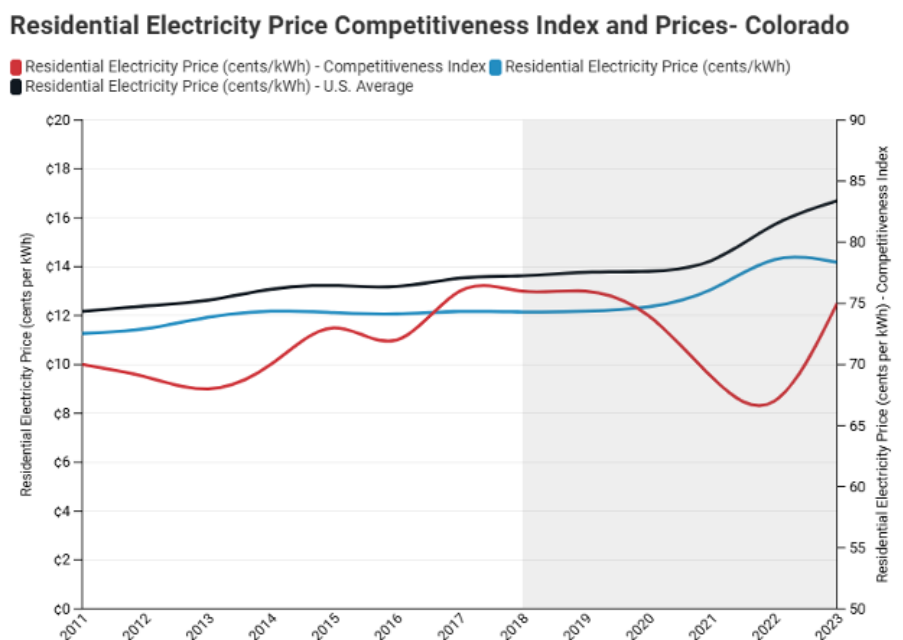
Colorado's relative competitiveness in residential electricity prices is illuminating as it shows a wider problem in the U.S. with rising electricity prices. Colorado's competitiveness increased slightly, but only because U.S. prices increased at a higher rate than Colorado.

To determine if Colorado's change in competitiveness in the price of residential electricity was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 5**.

The index (red line) decreased from 76 in 2018 to 75 in 2023 as the increase in the average price of residential electricity (blue line) increased from 12.5 cents per kilowatt hour in 2018 to 14.18 cents per kilowatt hour in 2023. Despite the increase in price, relative to other states it was not substantial, and the result is a slight decrease in Colorado's residential electricity price competitiveness relative to other states and the District of Columbia.

Residential electricity prices in Colorado increased 16.7% since 2018, Utah's increased 6.5%, and Wyoming's decreased 1.4% by comparison. Data on other neighboring states is provided in the appendix.

FIGURE 5 - RESIDENTIAL ELECTRICITY PRICE (CENTS PER KWH) COMPETITIVENESS INDEX AND METRIC



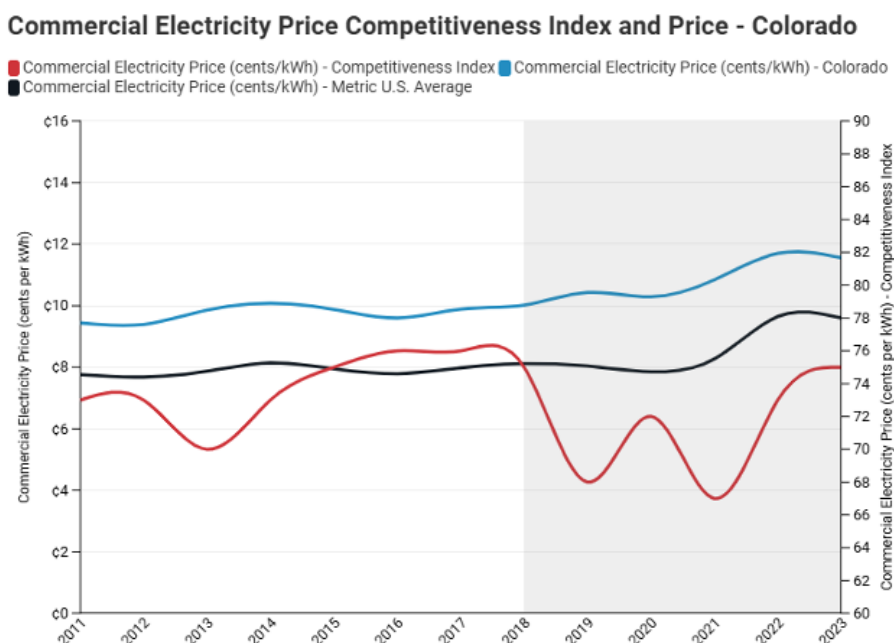
COLORADO COMMERCIAL ELECTRICITY PRICE (CENTS PER KWH) COMPETITIVENESS

To determine if Colorado's change in competitiveness in the price of commercial electricity was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 6**.

The index (red line) was unchanged from 75 in 2018 to 75 in 2023 despite the 15.4% increase in the average price of commercial electricity (blue line) increasing from 10.02 cents per kilowatt hour in 2018 to 11.56 cents per kilowatt hour in 2023. Despite the increase in price, relative to some other states it was smaller, and the result is no change in Colorado's commercial electricity price competitiveness relative to other states and the District of Columbia.

Commercial electricity prices in Colorado increased 15.4% since 2018, Utah's increased 2.0%, and Wyoming's increased 0.5% by comparison. Data on other neighboring states is provided in the appendix.

FIGURE 6 - COMMERCIAL ELECTRICITY PRICE (CENTS PER KWH) COMPETITIVENESS INDEX AND METRIC



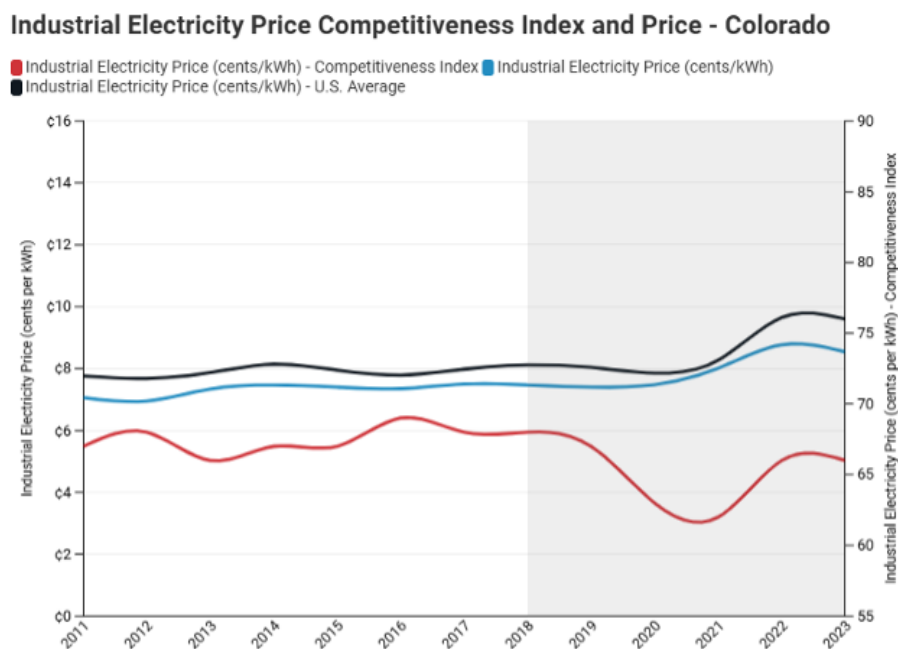
INDUSTRIAL ELECTRICITY PRICE (CENTS PER KWH) COMPETITIVENESS INDEX AND METRIC

To determine if Colorado's change in competitiveness in the price of commercial electricity was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 7**.

The index (red line) decreased from 68 in 2018 to 66 in 2023 despite the 14.4% increase in the average price of industrial electricity (blue line) from 7.47 cents per kilowatt hour in 2018 to 8.54 cents per kilowatt hour in 2023. Despite the increase in price, relative to some other states it was not significant, and the result is a slight deterioration in Colorado's industrial electricity price competitiveness relative to other states and the District of Columbia. Colorado's industrial electricity price is below the U.S. average (black line).

Industrial electricity prices in Colorado increased 14.4% since 2018, Utah's increased 19%, and Wyoming's increased 1.1% by comparison. Data on other neighboring states is provided in the appendix.

FIGURE 7 - INDUSTRIAL ELECTRICITY PRICE (CENTS PER KWH) COMPETITIVENESS INDEX AND METRIC



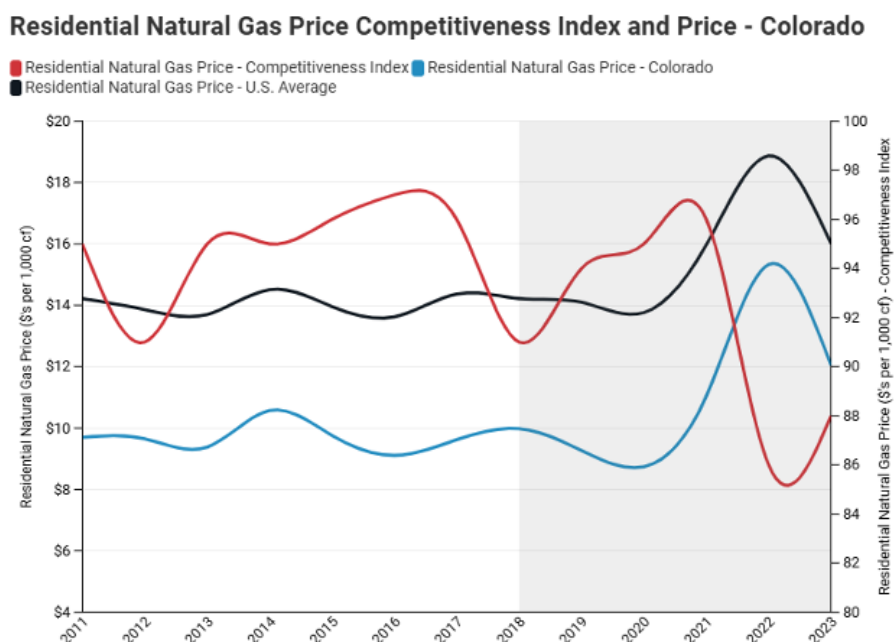
RESIDENTIAL NATURAL GAS PRICE (\$ PER MCF OR THOUSAND CUBIC FEET)

To determine if Colorado's change in competitiveness in the price of residential natural gas was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 8**.

The index (red line) decreased from 95 in 2018 to 88 in 2023 as the result of a 20.8% increase in the average price of residential natural gas (blue line) from \$9.98 per mcf in 2018 to \$12.05 per 1,000 cubic feet in 2023. Due to the price increase, relative to some other states, it was large enough to reduce Colorado's residential natural gas competitiveness (red line) relative to other states and the District of Columbia. The residential price of natural gas is consistently below the U.S. average (black line).

Residential natural gas prices in Colorado increased 20.8% since 2018, Utah's increased 38.1%, and Wyoming's increased 23.3% by comparison. Data on other neighboring states is provided in the appendix.

FIGURE 8 – RESIDENTIAL NATURAL GAS PRICE (\$'S PER 1,000 CUBIC FEET) COMPETITIVENESS INDEX AND METRIC



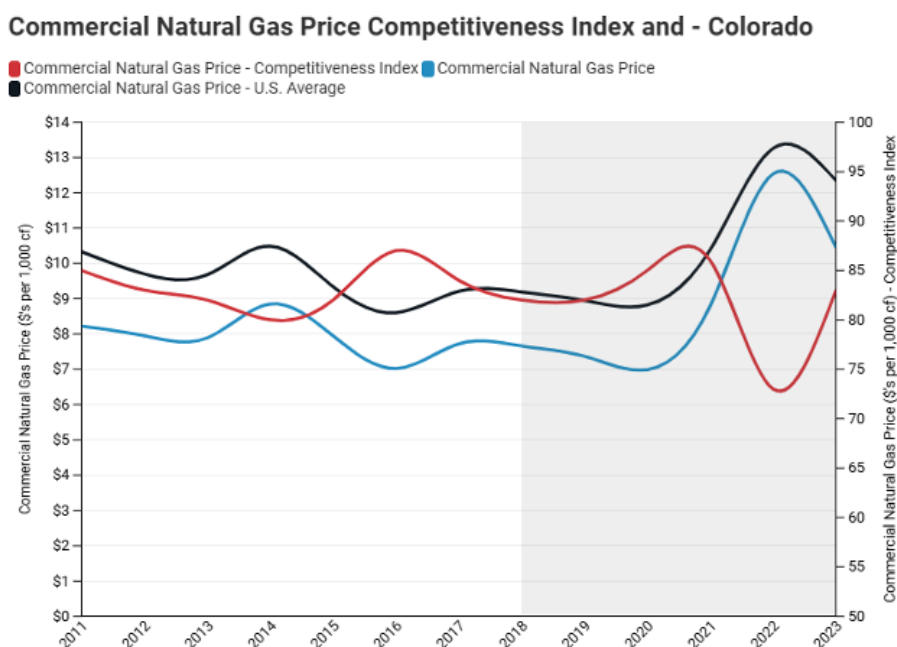
COMMERCIAL GAS PRICE (\$ PER MCF OR THOUSAND CUBIC FEET)

To determine if Colorado's change in competitiveness in the price of commercial natural gas was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 9**.

The index (red line) increased from 82 in 2018 to 83 in 2023 despite a 36.5% increase in the average price of commercial natural gas (blue line) from \$7.66 per mcf in 2018 to \$10.45 per 1,000 cubic feet in 2023. The increase in price was small enough that Colorado's commercial natural gas competitiveness relative to other states and the District of Columbia increased by 1. Colorado's commercial natural gas price has been lower than the U.S. average (black line).

Commercial natural gas prices in Colorado increased 36.5% since 2018, Utah's increased 63.4%, and Wyoming's increased 74.6% by comparison. Data on other neighboring states is provided in the appendix.

FIGURE 9 - COMMERCIAL NATURAL GAS PRICE (\$'S PER 1,000 CUBIC FEET) COMPETITIVENESS INDEX AND METRIC



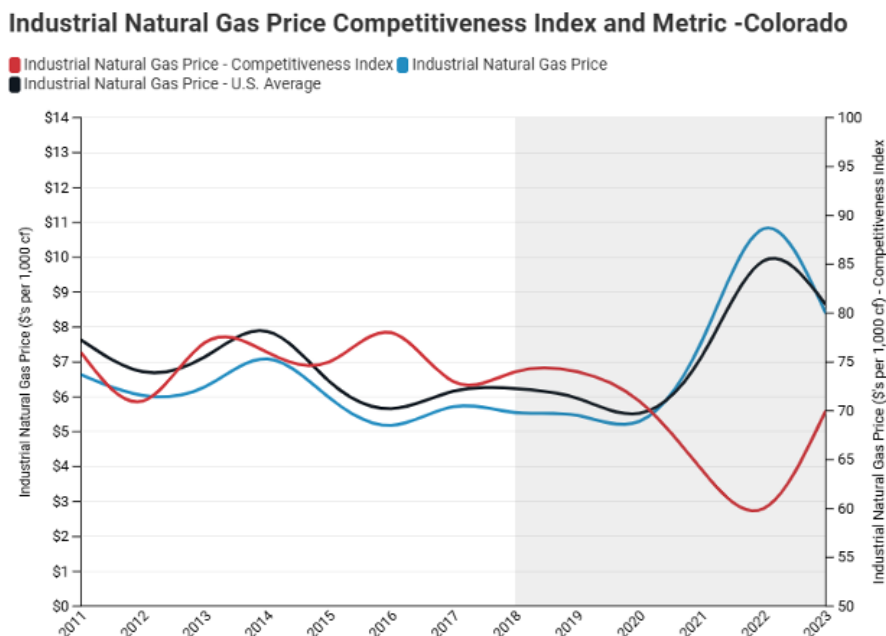
INDUSTRIAL GAS PRICE (\$ PER MCF OR THOUSAND CUBIC FEET)

To determine if Colorado's change in competitiveness in the price of industrial natural gas was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 10**.

The index (red line) decreased from 74 in 2018 to 70 in 2023 as the result of a 51.4% increase in the average price of industrial natural gas (blue line) from \$5.55 per mcf in 2018 to \$8.40 per mcf in 2023. Due to the increase in price relative to other states, it was large enough to reduce Colorado's industrial natural gas competitiveness relative to other states and the District of Columbia. Colorado's industrial natural gas price (blue line) was lower than the U.S. average (black line) until 2020, after which it was higher until 2023.

Industrial natural gas prices in Colorado increased 51.4% since 2018, Utah's increased 104.9%, and Wyoming's increased 174.9% by comparison. Data on other neighboring states is provided in the appendix.

FIGURE 10 – INDUSTRIAL NATURAL GAS PRICE (\$'S PER 1,000 CUBIC FEET) COMPETITIVENESS INDEX AND METRIC



NAMEPLATE CAPACITY (MEGAWATTS PER 100,000 RESIDENTS) COMPETITIVENESS INDEX AND METRIC

From 2018 to 2023 Colorado's nameplate capacity increased from 18,403 MW to 21,158 MW, outpacing the national average resulting in an increase in the index.

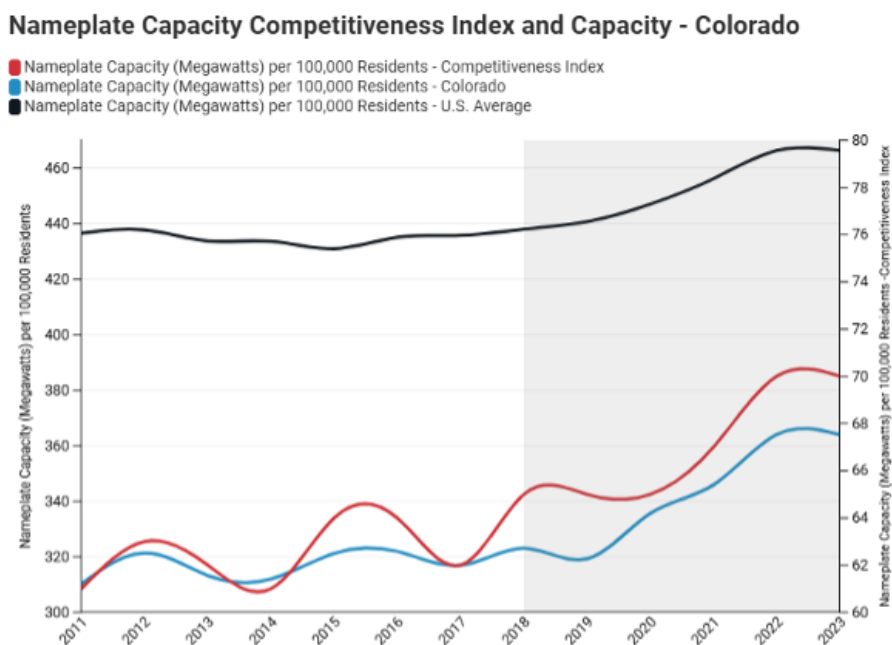
Nameplate capacity is the maximum amount of electricity that can be generated without exceeding design thermal limits and is typically expressed in megawatts (MW).ⁱⁱⁱ CSI divides the nameplate capacity for a state by the state's population and multiplies this by 100,000 to get nameplate capacity per 100,000 residents. In doing so a comparison across states can be performed. The higher the nameplate capacity per 100,000 residents the more competitive a state is.

To determine if Colorado's change in competitiveness for nameplate capacity was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 11**.

The index (red line) rose from 65 in 2018 to 70 in 2023. This was primarily the result of increased nameplate capacity per 100,000 residents (blue line) increasing 12.7% from 323.13 in 2018 to 364.04 in 2023, which was a larger increase than in many other states, causing the index (red line) to rise. The average nameplate capacity per 100,000 residents for the U.S. (black line), increased 6.5% from 437.95 in 2018 to 466.27 in 2023; the increase in Colorado was more than double the U.S. average.

Colorado's nameplate capacity increased 12.7% since 2018, Utah's increased 0.5%, and Wyoming's increased 18.4% by comparison. Data on other neighboring states is provided in the appendix.

FIGURE 11 - NAMEPLATE CAPACITY COMPETITIVENESS INDEX AND METRIC



ELECTRICITY RELIABILITY – CAIDI (MINUTES PER INTERRUPTION W/O MED PER CAPACITY) COMPETITIVENESS INDEX AND METRIC

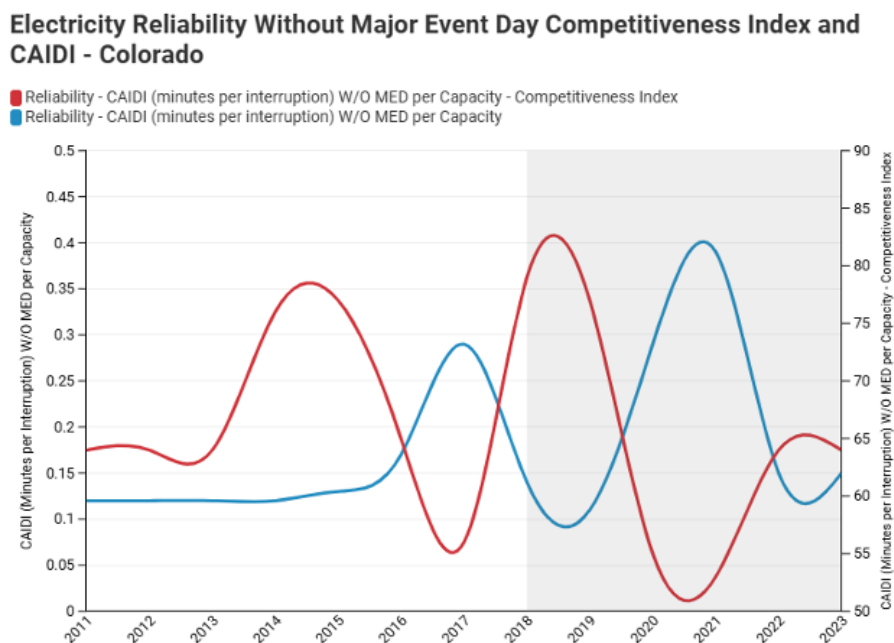
Electricity system reliability is a measure of the electrical system’s ability to deliver electricity continuously. CIS uses CAIDI without Major Event Days (MED) which is defined as the Customer Average Interruption Duration Index. This is the number of minutes it takes to restore non-momentary electric interruptions when there are no catastrophic events that exceed reasonable design or operational limits of an electric power system.

To determine if Colorado’s change in competitiveness for electricity reliability without major event days was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 12**.

The index (red line) was 79 in 2018 and fell to 64 in 2023. This was primarily the result of an 8% increase from 0.136 minutes per 100,000 residents (blue line) in 2018 to 0.147 minutes per 100,000 residents in 2023. As a result, Colorado’s performance relative to other states and the District of Columbia declined.

CAIDI without MED in Colorado increased 8% since 2018, Utah’s decreased 55%, and Wyoming’s decreased 57% by comparison. Data on other neighboring states is provided in the appendix.

FIGURE 12 - ELECTRICITY RELIABILITY CAIDI W/O MED INTERRUPTION COMPETITIVENESS INDEX AND CAIDI



ELECTRICITY RELIABILITY – CAIDI (MINUTES PER INTERRUPTION WITH MED PER CAPACITY) COMPETITIVENESS INDEX AND METRIC

Electricity system reliability is a measure of the electrical system’s ability to deliver electricity continuously. CIS uses CAIDI with Major Event Days (MED) which is defined as the Customer Average Interruption Duration Index. This is the number of minutes it takes to restore non-momentary electric interruptions when there are catastrophic events that exceed reasonable design or operational limits of an electric power system.

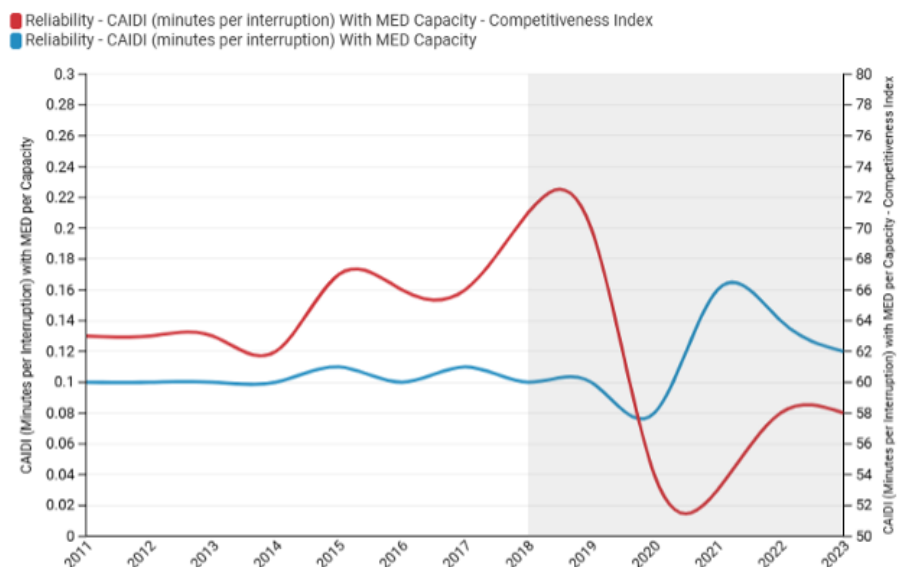
To determine if Colorado’s change in competitiveness for electricity reliability with major event days was the result of a change in its own performance, the metric underlying the competitiveness index is shown in together with the competitiveness index, see **Figure 13**.

The index (red line) declined from 71 in 2018 to 58 in 2023 due to the 14.5% increase in the number of minutes of interruption per 100,000 residents (blue line) from 0.104 minutes per 100,000 residents in 2018 to 0.119 minutes per 100,000 residents in 2023. The deterioration, relative to some other states it was larger, and the result is a deterioration in Colorado’s electricity reliability competitiveness relative to other states and the District of Columbia.

CAIDI with MED in Colorado increased 14.5% since 2018, Utah’s decreased 66.6%, and Wyoming’s decreased 34.7% by comparison. Data on other neighboring states is provided in the appendix.

FIGURE 13 – ELECTRICITY RELIABILITY (CAIDI WITH MED) COMPETITIVENESS INDEX AND METRIC

Electricity Reliability with Major Event Day Competitiveness Index and CAIDI -Colorado



COLORADO ELECTRICITY BY FUEL SOURCE, ELECTRICITY PRICES, AND CO2 EMISSIONS

Colorado's rapid addition of wind and solar power generation, from 10,807 terawatt hours in 2018 to 19,152 terawatt hours in 2023, makes it a leader on wind and solar additions as well as rising electricity prices.

The following figure (**figure 14**) shows the correlation between the rising share of electricity produced from clean energy and the corresponding rise in electricity prices.

This CSI Energy Competitiveness index shows a decline in Colorado's competitiveness in recent years. The pursuit of lowering greenhouse gas emissions at any cost is costing the average Colorado household and the average Colorado business a great deal. Is it worth it? Are CO2 emissions the only goal? And are CO2 emissions declining in Colorado?

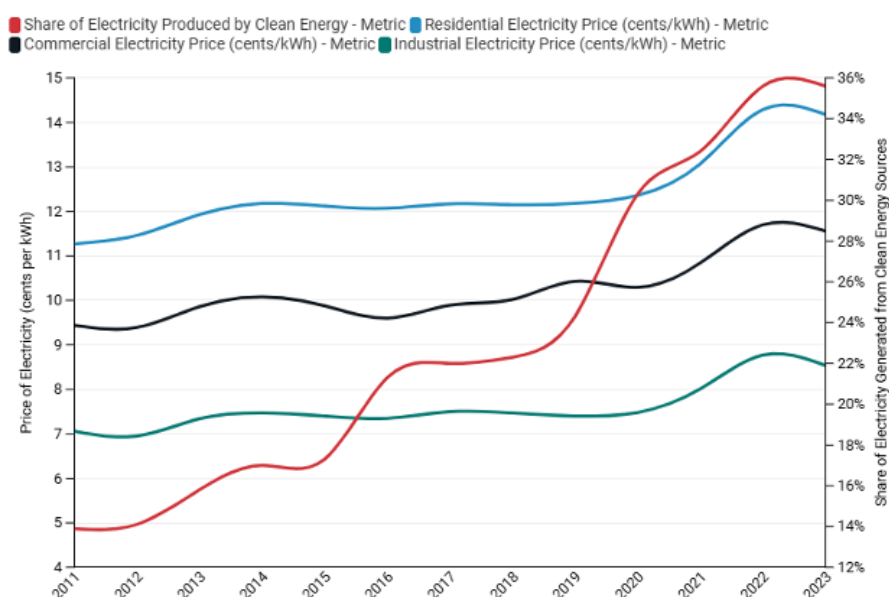
Figure 15 shows global CO2 emissions and Chinese and U.S. CO2 emissions.

The following figure, **Figure 16**, shows Colorado's percentage share of global CO2 emissions, .24%, next to Colorado's CO2 emissions by volume.

CO2 emissions in Colorado declined during the COVID period but have since rebounded. Emissions are only modestly below recent highs. This shows that despite the aggressive efforts to decarbonize, which has come at a significant cost to consumers, the low hanging fruit for emission reduction has already been achieved.

FIGURE 14 – SHARE OF ELECTRICITY FROM CLEAN ENERGY AND THE PRICE OF ELECTRICITY - COLORADO

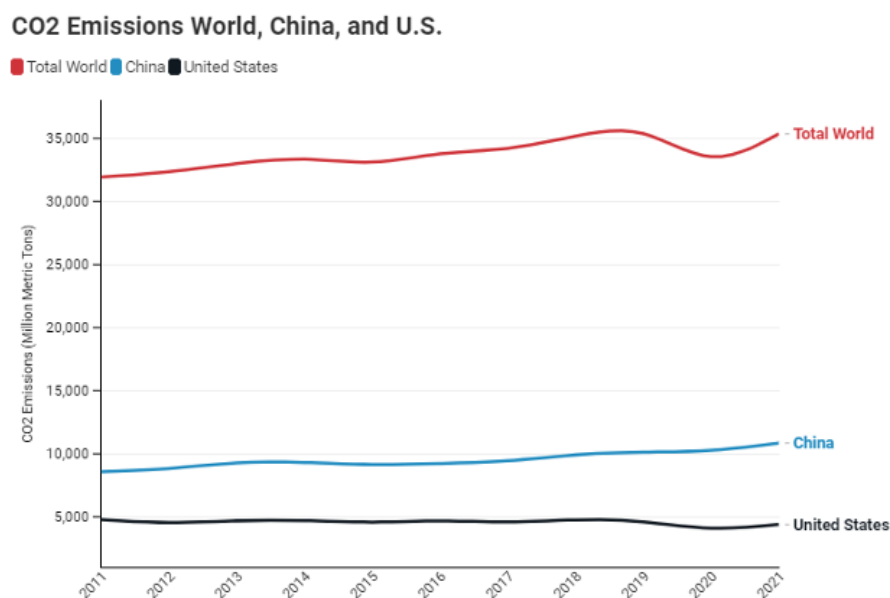
Share of Electricity from Clean Energy and the Price of Electricity -Colorado



More importantly, CO2 emissions do not have state boundaries, nor do they have national ones. Colorado makes up less than 2% of U.S. CO2 emissions and under .3% of global CO2 emissions. One third (31%) of global CO2 emissions come from China alone and these emissions are on the rise because China is still the world's manufacturing powerhouse, making cheap goods with coal fired power generation and cheap labor. China makes the bulk of the world's solar panels and onshore wind turbines, the heart of the energy transition of power generation, with coal and cheap, often forced, labor. This means that as Colorado and other states and countries pursue so called "clean tech" at any cost without addressing lifecycle emissions and impacts of the products they are using, they are enabling higher CO2 emissions in the near term as well as human rights abuses^{iv}.

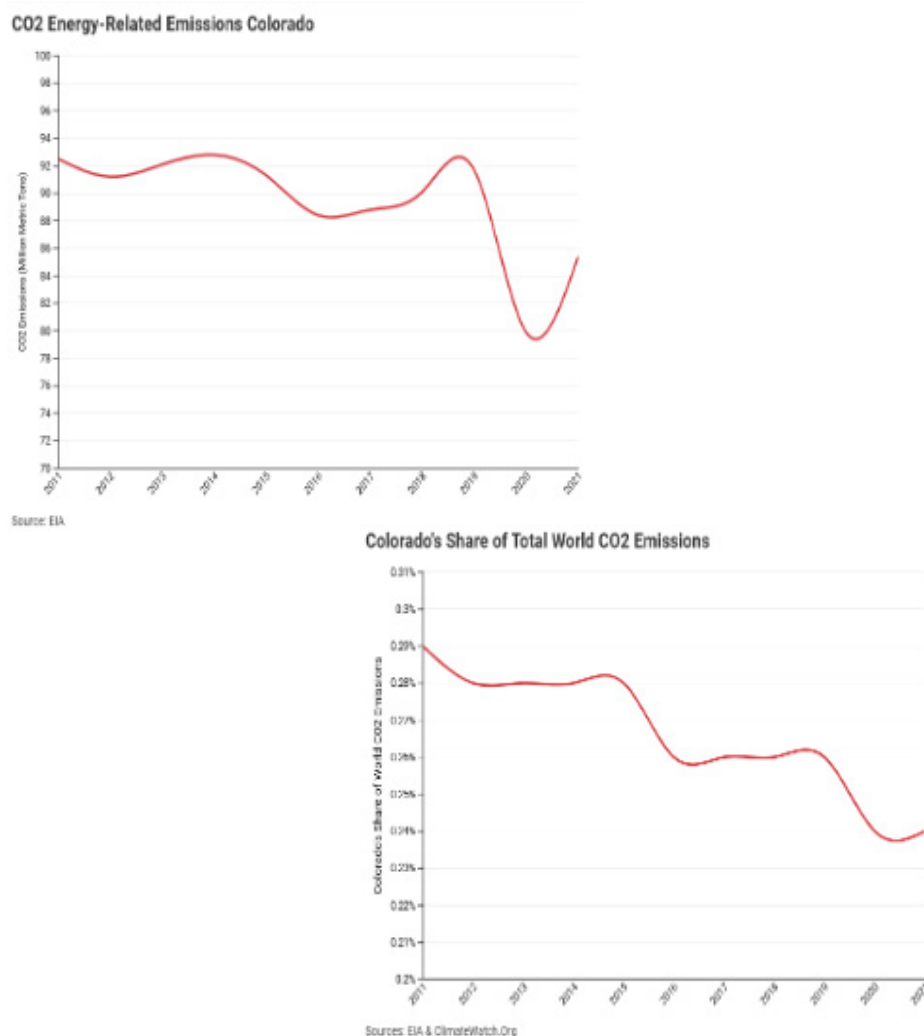
Not only is Colorado sacrificing its economic competitiveness relative to other states, but it is also sacrificing its competitiveness relative to China and enabling CO2 emission growth as manufacturing gets moved to lower cost centers in places like China.

FIGURE 15 - CO2 EMISSIONS WORLD, CHINA, AND U.S.



Source: ClimateWatch.Org

FIGURE 16 - CO2 EMISSIONS COLORADO VS. WORLD

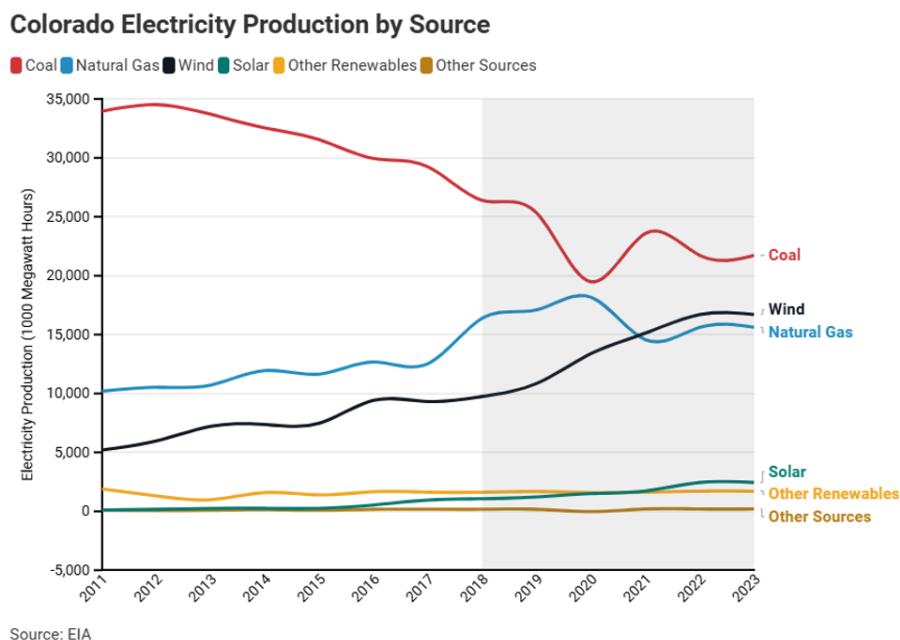


Colorado is aggressively pursuing the policies of reducing carbon emissions through the power sector putting the cost and the burden directly on the Colorado consumer, the Colorado household, the Colorado business, and the Colorado taxpayer, all the while allowing utility companies to rake in profits and pass the cost of these expensive and burdensome plans on the consumer through rate increases. Xcel Energy continues to ask for rate increases as it pays for renewable energy additions and the decommissioning of cheaper and reliable forms of energy like coal. The decommissioning of coal exacerbates the baseload burden on natural gas and allows for price spikes in natural gas to create costly volatility to electric and utility bills for the Colorado household and business. Xcel is currently asking the Public Utilities Commission for a further rate increase on natural gas to pay for the cost of renewable additions. Xcel Energy and other utilities are also seeing record profits.

The share of electricity from wind and solar power has risen from 20% in 2018 to 33% in 2023 and 35.6% today. Despite numerous proclamations from government bureaucrats, politicians, and utilities that electricity prices would decline with no loss of capacity or reliability, residential electricity prices rose 16.7% on average from 2018 to 2023, commercial electricity prices rose on average 15.4%, and industrial electricity prices rose on average 14.3%. At the same time, electricity reliability has declined with more minutes of interruption per generation capacity.

Figure 17 shows Colorado electricity production by source. Colorado has aggressively reduced the amount of coal in the grid, but it has not replaced that with increasing natural gas power generation. Instead, Colorado natural gas power generation has declined from its peak in 2020. Colorado has added a large amount of wind and solar power generation into the grid but has not supported that with redundancy and baseload capacity from either coal or natural gas which would help insulate businesses and consumers from price spikes. This means Colorado's grid is subject to greater variability in terms of reliability and price.

FIGURE 17 - COLORADO ELECTRICITY PRODUCTION BY SOURCE





BOTTOM LINE

Energy competitiveness is crucial for Colorado's economic future. Based on CSI's Energy Competitiveness Index Colorado has been in steady decline since 2018 when the Energy Competitiveness peaked at 75 and since declined to 72. The impacts of policy changes enacted over the past several years are just starting to take effect and will only increase in future years. It will remain critical to consistently monitor outcomes across the state to ensure accounting of full costs and benefits.

APPENDIX/SUPPORTING MATERIAL

Recent Energy Related Legislation (2023 -2024)

Colorado has passed a large amount of legislation designed to reduce greenhouse gas emissions, shift electricity production to renewable energy sources, increase energy efficiency in buildings and residences, and curtail oil and gas production. Here is a list of legislation from 2023 and 2024.

2024

SIGNED BY GOVERNOR

- HB24-1173 Electric Vehicle Charging System Permits (Governor signed 5/21/2024)
- SB24-212 Local Governments Renewable Energy Projects (Governor signed 5/21/2024)
- SB24-214 Implement State Climate Goals (Governor signed 5/17/2024)
- HB24-1419 Transfer to Stationary Sources Control Fund (Signed by Governor on 4/18/2024)

SENT TO GOVERNOR

- HB24-1370 Reduce Cost of Natural Gas (Sent to Governor on 5/15/2024)
- SB24-207 Access to Distributed Generation (Sent to Governor on 5//13//2024)
- SB24-218 Modernize Energy Distribution Systems (Sent to Governor on 5/10/2024)
- Ozone Mitigation Measures (Sent to Governor on 5/10/2024)

FAILED LEGISLATION

- HB24-1352 Appliance Requirements and Incentives (5/14/2024 Failed)
- HB24-1357 Pipeline Safety (5/14/2024 Failed)

POSTPONED INDEFINITELY

- HB24-1246 Electric Grid Resilience Temporary Carbon Dioxide Regulation (3/13/2024 House Committee on Energy & Environment Postpone Indefinitely)
- SB24-039 Nuclear Energy as a Clean Energy Resource (1/24/2024 Senate Committee on Transportation and Energy Postpone Indefinitely)

2023

SIGNED BY GOVERNOR

- HB23-1216 Natural Gas Pipeline Safety (Governor signed 6/7/2023)
- HB23-1242 Water Conservation in Oil and Gas Operations (Governor signed 6/7/2023)
- SB23-198 Clean Energy Plans (Governor signed 6/5/2023)
- SB23-186 Oil and Gas Commission Study Methane Seepage Raton Basin (Governor signed 6/2/2023)
- HB23-1161 Environmental Standards for Appliances (Governor signed 6/1/2023)
- HB23-1233 Electric Vehicle Charging and Parking Requirements (Governor signed 5/23/2023)
- HB23-1281 Advance the Use of Clean Hydrogen (Governor signed 5/2/2023)
- HB23-1210 Carbon Management (Governor signed 5/22/2023)
- SB23-285 Energy and Carbon Management Regulation in Colorado (Governor signed 5/22/2023)
- HB23-1247 Assess Advanced Energy Solutions in Rural Colorado (Governor signed 5/20/2023)
- HB23-1069 Study Biochar in Plugging of Oil and Gas Wells (Governor signed 5/18/2023)
- SB23-016 Greenhouse Emission Reduction Measures (Governor signed 5/11/2023)
- HB23-1234 Streamlined Solar Permitting and Inspection Grants (Governor signed 5/11/2023)
- HB23-1252 Thermal Energy (Governor signed 5/11/2023)
- SB23-291 Utility Regulation (Governor signed 5/11/2023)
- HB23-1039 Electric Resource Adequacy Reporting (Governor signed 4/25/2023)
- SB23-239 Hazardous Site Response Fund Transfer (Governor signed 4/17/2023)
- HB23-1137 Solar Garden Net Metering Credits Stabilization (Governor signed 4/17/2023)
- HB23-1134 Require Electric Options in Home Warranties (Governor signed 3/31/2023)

POSTPONED INDEFINITELY

- SB23-201 Mineral Resources Property Owners' Rights (Senate Committee on Agriculture & Natural Resources (Postponed Indefinitely 4/20/2023)
- HB23-1080 Reliable Alternative Energy Sources (3/29/2023 House Committee on Energy & Environment Postpone Indefinitely)
- HB23-1163 Revoke Carbon Dioxide Status as a Pollutant (3/23/2023 House Committee on Energy & Environment Postpone Indefinitely)
- SB23-079 Nuclear Energy as a Clean Energy Resource (2/24/2023 Senate Committee on Transportation & Energy Postpone Indefinitely)
- HB23-1127 Customer's Right to Use Energy (2/9/2023 House Committee on Energy & Environment Postpone Indefinitely)

Figure 18 shows the nameplate capacity (megawatts) per 100,000 residents in neighboring states to Colorado. By comparison, the increase in nameplate capacity per 100,000 residents in Colorado was lower than its neighboring states except Utah. All these states increased capacity more than the U.S. average.

FIGURE 18 - NAMEPLATE CAPACITY IN NEIGHBORING STATES

Nameplate Capacity (Megawatts) per 100,000 Residents – Neighboring States														
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Chg. 2011-2023
CO	310	321	313	312	321	322	317	323	319	336	346	364	364	17.3%
KS	481	524	530	528	533	568	592	576	591	621	668	668	668	38.8%
NE	475	478	478	490	490	475	473	493	516	533	549	579	579	22.0%
NM	439	440	418	423	439	445	431	436	451	465	543	557	557	26.8%
UT	283	282	278	312	305	321	316	311	306	308	310	313	313	10.5%
WY	1554	1533	1532	1610	1608	1619	1636	1663	1678	1854	1969	1969	1969	26.7%
U.S.	437	438	434	434	431	435	436	438	441	447	456	466	466	6.8%

Figure 19 shows the reliability of the electrical grid (CAIDI (Minutes per Interruption) with Major Event Day in the states adjacent to Colorado. As of 2023, reliability is better than the U.S. average and only better than in Nebraska among the neighboring states.

FIGURE 19 - CAIDI (MINUTES PER INTERRUPTION) WITHOUT MED IN NEIGHBORING STATES

CAIDI (minutes per interruption) Without MED per Capacity in Neighboring States												
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Chg. 2013-2023
CO	0.162	0.118	0.126	0.167	0.295	0.136	0.110	0.286	0.385	0.147	0.147	-9.2%
KS	0.154	0.118	0.702	0.147	0.191	0.186	0.126	0.050	0.101	0.053	0.053	-65.7%
NE	0.227	0.192	0.145	0.187	0.254	0.309	0.153	0.113	0.187	0.159	0.159	-29.7%
NM	0.134	0.135	0.155	0.101	0.147	0.141	0.159	0.157	0.193	0.134	0.134	-0.1%
UT	0.122	0.109	0.112	0.143	0.115	0.180	0.148	0.109	0.186	0.082	0.082	-33.0%
WY	0.141	0.111	0.089	0.128	0.121	0.137	0.069	0.070	0.063	0.059	0.059	-57.9%
U.S.	0.439	0.429	0.411	0.304	0.293	0.271	0.181	0.195	0.193	0.178	0.178	-59.5%

Figure 20 shows the reliability of the electrical grid (CAIDI (Minutes per Interruption) with Major Event Day in the states adjacent to Colorado. As of 2023, reliability is lower than the U.S average and only better than Nebraska among neighboring states.

FIGURE 20 - CAIDI (MINUTE PER INTERRUPTION) WITH MED PER CAPACITY IN NEIGHBORING STATES

CAIDI (minutes per interruption) Without MED per Capacity in Neighboring States												
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Chg. 2013-2023
CO	0.098	0.110	0.102	0.109	0.104	0.104	0.084	0.161	0.141	0.119	0.119	21.6%
KS	0.097	0.087	0.113	0.122	0.100	0.146	0.088	0.048	0.042	0.039	0.039	-60.2%
NE	0.274	0.211	0.283	0.119	0.189	0.181	0.113	0.088	0.093	0.127	0.127	-53.7%
NM	0.069	0.086	0.117	0.084	0.100	0.101	0.109	0.125	0.111	0.113	0.113	63.3%
UT	0.059	0.066	0.073	0.091	0.072	0.136	0.108	0.061	0.052	0.046	0.046	-22.7%
WY	0.055	0.058	0.047	0.059	0.066	0.067	0.048	0.048	0.048	0.044	0.044	-20.5%
U.S.	0.358	0.348	0.330	0.222	0.158	0.157	0.124	0.123	0.111	0.112	0.112	-68.7%

Figure 21 shows the residential electricity price in neighboring states. Colorado has the highest price among neighboring states, ¢13.77 in 2023 but is lower than the U.S. average, ¢16.70.

FIGURE 21 - RESIDENTIAL ELECTRICITY PRICE IN NEIGHBORING STATES

Residential Electricity Price (cents/kWh) in Neighboring States														
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Chg. 2011-2023
CO	¢11.27	¢11.46	¢11.93	¢12.18	¢12.12	¢12.07	¢12.17	¢12.15	¢12.18	¢12.36	¢13.07	¢14.29	¢14.18	25.8%
KS	¢10.65	¢11.24	¢11.64	¢12.17	¢12.34	¢13.06	¢13.31	¢13.35	¢12.71	¢12.85	¢12.98	¢14.13	¢13.77	29.4%
NE	¢9.32	¢10.04	¢10.31	¢10.40	¢10.60	¢10.84	¢10.97	¢10.70	¢10.77	¢10.80	¢10.75	¢10.93	¢11.03	18.3%
NM	¢11.00	¢11.37	¢11.68	¢12.28	¢12.47	¢12.03	¢12.88	¢12.68	¢12.51	¢12.94	¢13.52	¢14.11	¢13.87	26.2%
UT	¢8.96	¢9.93	¢10.37	¢10.65	¢10.88	¢11.02	¢10.95	¢10.41	¢10.40	¢10.44	¢10.43	¢10.94	¢11.09	23.7%
WY	¢9.11	¢9.85	¢10.16	¢10.50	¢10.97	¢11.13	¢11.37	¢11.29	¢11.18	¢11.11	¢11.17	¢11.10	¢11.13	22.3%
U.S. Avg.	¢12.17	¢12.39	¢12.63	¢13.08	¢13.23	¢13.19	¢13.53	¢13.63	¢13.77	¢13.81	¢14.25	¢15.72	¢16.70	37.3%

Figure 22 shows the commercial electricity price in Colorado and neighboring states as well as the U.S. average. Colorado has the highest price, ¢11.56 among neighboring states in 2023 but is lower than the U.S. average, ¢13.15.

FIGURE 22 - COMMERCIAL ELECTRICITY PRICE IN NEIGHBORING STATES

Commercial Electricity Price (cents/kWh)														
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Chg. 2011-2023
CO	¢9.44	¢9.39	¢9.86	¢10.08	¢9.88	¢9.60	¢9.89	¢10.02	¢10.43	¢10.29	¢10.84	¢11.70	¢11.56	22.4%
KS	¢8.78	¢9.24	¢9.68	¢10.13	¢10.10	¢10.47	¢10.59	¢10.66	¢10.29	¢10.40	¢10.52	¢11.70	¢11.29	28.6%
NE	¢7.99	¢8.38	¢8.60	¢8.73	¢8.67	¢8.80	¢8.85	¢8.83	¢8.85	¢8.89	¢8.81	¢8.88	¢9.11	14.1%
NM	¢9.07	¢9.32	¢9.74	¢10.27	¢10.30	¢9.75	¢10.19	¢10.02	¢9.79	¢10.28	¢10.80	¢11.21	¢10.84	19.5%
UT	¢7.35	¢8.06	¢8.32	¢8.53	¢8.62	¢8.75	¢8.64	¢8.23	¢8.26	¢8.27	¢8.13	¢8.44	¢8.39	14.1%
WY	¢7.72	¢8.24	¢8.57	¢8.88	¢9.12	¢9.40	¢9.70	¢9.58	¢9.64	¢9.65	¢9.68	¢9.54	¢9.63	24.8%
U.S. Avg.	¢10.38	¢10.37	¢10.61	¢11.03	¢10.92	¢10.77	¢11.02	¢11.13	¢11.19	¢11.12	¢11.58	¢12.87	¢13.15	26.7%

Figure 23 shows the industrial electricity price in Colorado and neighboring states as well as the U.S. average. Colorado has the highest price ¢8.54 among neighboring states but is lower than the U.S. average ¢9.60.

FIGURE 23 - INDUSTRIAL ELECTRICITY PRICES IN NEIGHBORING STATES

Industrial Electricity Price (cents/kWh) in Neighboring States														
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Chg. 2011-2023
CO	¢7.06	¢6.95	¢7.34	¢7.47	¢7.40	¢7.35	¢7.50	¢7.47	¢7.40	¢7.48	¢8.01	¢8.77	¢8.54	21.1%
KS	¢6.71	¢7.09	¢7.39	¢7.80	¢7.61	¢7.49	¢7.54	¢7.60	¢7.35	¢7.30	¢7.38	¢8.57	¢8.31	23.8%
NE	¢6.43	¢7.01	¢7.44	¢7.47	¢7.59	¢7.69	¢7.66	¢7.60	¢7.65	¢7.38	¢7.26	¢7.24	¢7.44	15.6%
NM	¢6.06	¢5.83	¢6.36	¢6.61	¢6.33	¢5.84	¢6.15	¢5.84	¢5.48	¢5.58	¢6.16	¢6.70	¢5.93	-2.2%
UT	¢5.10	¢5.62	¢5.87	¢6.08	¢6.17	¢6.33	¢6.13	¢5.90	¢5.98	¢5.90	¢6.19	¢6.88	¢7.02	37.7%
WY	¢5.41	¢6.03	¢6.42	¢6.61	¢6.76	¢6.92	¢6.92	¢6.71	¢6.73	¢6.88	¢6.83	¢6.90	¢6.78	25.4%
U.S. Avg.	¢7.76	¢7.68	¢7.87	¢8.14	¢7.95	¢7.79	¢7.98	¢8.12	¢8.04	¢7.85	¢8.27	¢9.65	¢9.60	23.7%

Figure 24 shows the residential price of natural gas in Colorado, neighboring states, and the U.S. average. Only New Mexico has a lower residential price of natural gas than Colorado. Colorado's residential price of natural gas, \$12.05, is lower than the U.S. average, \$16.01.

FIGURE 24 - RESIDENTIAL NATURAL GAS PRICES IN NEIGHBORING STATES

Residential Consumers (Dollars per Thousand Cubic Feet) in Neighboring States														
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Chg. 2011-2023
CO	\$9.70	\$9.65	\$9.38	\$10.57	\$9.76	\$9.11	\$9.62	\$9.98	\$9.27	\$8.74	\$11.04	\$15.33	\$12.05	24.2%
KS	\$12.97	\$12.99	\$13.54	\$14.13	\$13.59	\$13.84	\$14.70	\$13.80	\$13.23	\$13.39	\$16.00	\$20.91	\$15.00	15.7%
NE	\$10.89	\$10.46	\$10.71	\$11.02	\$10.99	\$10.55	\$11.55	\$11.25	\$10.21	\$10.72	\$13.39	\$17.07	\$12.55	15.3%
NM	\$10.67	\$10.45	\$10.96	\$12.09	\$10.50	\$10.10	\$11.00	\$9.50	\$7.84	\$8.53	\$12.37	\$16.13	\$8.99	-15.8%
UT	\$8.70	\$9.14	\$9.14	\$10.08	\$10.04	\$9.52	\$9.42	\$9.34	\$8.20	\$8.48	\$9.53	\$11.07	\$12.90	48.3%
WY	\$10.27	\$9.93	\$10.30	\$11.12	\$11.05	\$10.51	\$11.00	\$10.78	\$10.19	\$11.28	\$13.16	\$17.11	\$13.29	29.5%
U.S. Avg.	\$14.22	\$13.86	\$13.70	\$14.51	\$13.96	\$13.62	\$14.37	\$14.22	\$14.10	\$13.76	\$15.97	\$18.87	\$16.01	12.6%

Figure 25 shows the price of natural gas for commercial customers in neighboring states and the U.S. average. Only Nebraska \$10.12 and New Mexico \$7.53 have lower commercial natural gas prices than Colorado, \$10.45; but is lower than the average U.S. price, \$12.35.

FIGURE 25- COMMERCIAL NATURAL GAS PRICE IN NEIGHBORING STATES

Commercial Natural Gas Prices (Dollars per Thousand Cubic Feet) in Neighboring States														
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Chg. 2011-2023
CO	\$8.22	\$7.95	\$7.89	\$8.85	\$7.95	\$7.02	\$7.72	\$7.66	\$7.37	\$6.99	\$8.80	\$12.54	\$10.45	27.2%
KS	\$10.30	\$9.90	\$10.60	\$11.24	\$10.01	\$10.15	\$10.65	\$10.04	\$9.19	\$9.33	\$11.04	\$14.98	\$13.81	34.1%
NE	\$6.85	\$6.05	\$6.71	\$7.30	\$6.09	\$5.47	\$6.49	\$6.32	\$5.73	\$5.49	\$7.21	\$11.49	\$10.12	47.7%
NM	\$7.34	\$6.48	\$7.20	\$8.23	\$6.67	\$6.07	\$6.84	\$5.61	\$4.72	\$4.87	\$7.78	\$11.47	\$7.53	2.6%
UT	\$7.01	\$7.08	\$7.33	\$7.79	\$7.72	\$7.23	\$7.26	\$7.06	\$6.28	\$6.48	\$7.37	\$8.92	\$11.54	64.6%
WY	\$7.62	\$6.71	\$7.19	\$8.10	\$7.50	\$6.67	\$7.08	\$6.75	\$6.64	\$6.95	\$8.25	\$12.36	\$11.78	54.6%
U.S. Avg.	\$10.33	\$9.70	\$9.68	\$10.49	\$9.34	\$8.60	\$9.21	\$9.19	\$8.95	\$8.82	\$10.39	\$13.26	\$12.35	19.5%

Figure 26 shows price of natural gas for Industrial customers in neighboring states and the U.S. average. Kansas, \$7.05, Nebraska \$6.81, and New Mexico \$5.42 have lower commercial natural gas prices than Colorado, \$8.40; but is lower than the average U.S. price, \$8.65. The increase in price since 2011, 26.4% is double the increase for the U.S. overall, 13.1%.

FIGURE 26 - INDUSTRIAL NATURAL GAS PRICE IN NEIGHBORING STATES

Industrial Natural Gas Prices (Dollars per Thousand Cubic Feet)														
	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Chg. 2011-2023
CO	\$6.64	\$6.04	\$6.29	\$7.09	\$5.98	\$5.18	\$5.72	\$5.55	\$5.47	\$5.30	\$7.58	\$10.82	\$8.40	26.4%
KS	\$5.62	\$4.46	\$5.33	\$6.14	\$4.78	\$4.30	\$4.90	\$5.16	\$4.87	\$3.96	\$5.86	\$8.64	\$7.05	25.5%
NE	\$5.58	\$4.24	\$4.75	\$5.75	\$4.49	\$3.99	\$4.49	\$4.43	\$4.21	\$3.82	\$5.43	\$8.50	\$6.81	22.0%
NM	\$6.23	\$4.97	\$5.54	\$6.21	\$4.69	\$4.09	\$5.11	\$3.89	\$3.56	\$3.15	\$5.92	\$9.50	\$5.42	-13.0%
UT	\$5.50	\$4.70	\$5.22	\$5.89	\$5.89	\$5.45	\$5.49	\$5.21	\$4.93	\$5.02	\$5.42	\$7.98	\$10.67	94.0%
WY	\$5.67	\$4.86	\$4.52	\$5.88	\$5.00	\$3.95	\$4.29	\$3.86	\$3.90	\$4.30	\$6.07	\$10.36	\$10.61	87.0%
U.S. Avg.	\$7.64	\$6.72	\$7.15	\$7.88	\$6.45	\$5.66	\$6.16	\$6.24	\$5.96	\$5.53	\$7.15	\$9.90	\$8.65	13.1%

SOURCES

- i. The Free Enterprise Report assesses the state's competitiveness relative to forty-nine other states and the District of Columbia and provides data and analysis on eight policy areas: education, energy, healthcare, housing, infrastructure, public safety, state budget, and taxes and fees. <https://commonsenseinstituteco.org/2024-free-enterprise-report/>
- ii. <https://commonsenseinstituteco.org/new-energy-laws-regulations-hb19-1261/>
- iii. https://www.eia.gov/tools/glossary/index.php?id=G#gen_nameplate
- iv. <https://www.shu.ac.uk/helena-kennedy-centre-international-justice/research-and-projects/all-projects/forced-labour-lab>