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Colorado Renewable Energy Policy Report

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Introduction

Amid the intensifying impacts of a changing climate and the need to substantially reduce greenhouse gas emissions, renewable energy presents a critical area of policy and planning that requires states to reconsider the energy policy status quo. Colorado is at the forefront of these efforts with ambitious targets for emissions reduction and clean energy, and a climate that provides both high solar and wind energy potential. That said, with the governor's prohibition on cap-and-trade programs and the lack of enforceable targets within some of the state's ambitious policies, Colorado's path towards 100% renewable energy is relatively unclear. The following report examines the complexities surrounding the state's energy mandates, emissions reduction and energy justice strategies, and siting and taxation policies to reveal a policy landscape that holds considerable potential to balance the more progressive-leaning goals of the state with the more conservative desires of many of Colorado's rural communities. Further exploring such an approach offers a path towards a more sustainable energy future.

Background

Colorado's Physical, Economic, and Political Geographies

Colorado is the 8th largest state in the U.S. by land area, covering approximately 104,185 square miles. Public lands in Colorado make up roughly 66% (8.3 million acres) of the state's total land area.¹ This includes federal lands managed by agencies like the Bureau of Land Management (BLM) and the U.S. Forest Service, as well as state parks and other public holdings. Colorado's population increased from approximately 4.3 million people in 2000 to over 5.7 million people in 2020, making it one of the fastest-growing states in the country.²

Colorado's top three largest industries by revenue are oil drilling and gas extraction (generating \$37.4 billion in 2022), tourism (generating \$26.9 billion), and new car dealers (generating \$21.5 billion).³ Certain sectors drive a higher share of state GDP and employ more workers than others. Factoring in the current year's growth percentage with the annualized growth percentage over the past five years gives us a deeper understanding of the state's economic situation. The real estate, rental, and leasing sectors; the professional sectors; and the scientific and technical services and information sectors contributed the most to Colorado's GDP in 2022, representing a combined 38.2% of state GDP.

Colorado has seen shifts in its political landscape towards increasing political diversity. While the state has been historically purple (a mix of Democratic and Republican support), it has leaned more toward the Democratic Party in recent years (shown in Figure 1).⁴ Though the state's urban centers generally lean Democratic, its more rural communities that geographically take up much of the state generally vote Republican. In Colorado's 2022 gubernatorial elections, renewable energy emerged as a prominent and vital issue. Governor Jared Polis, who secured re-election that year, played a pivotal role by signing a comprehensive package of bills aimed at advancing renewable energy and addressing the pressing challenge of climate change.

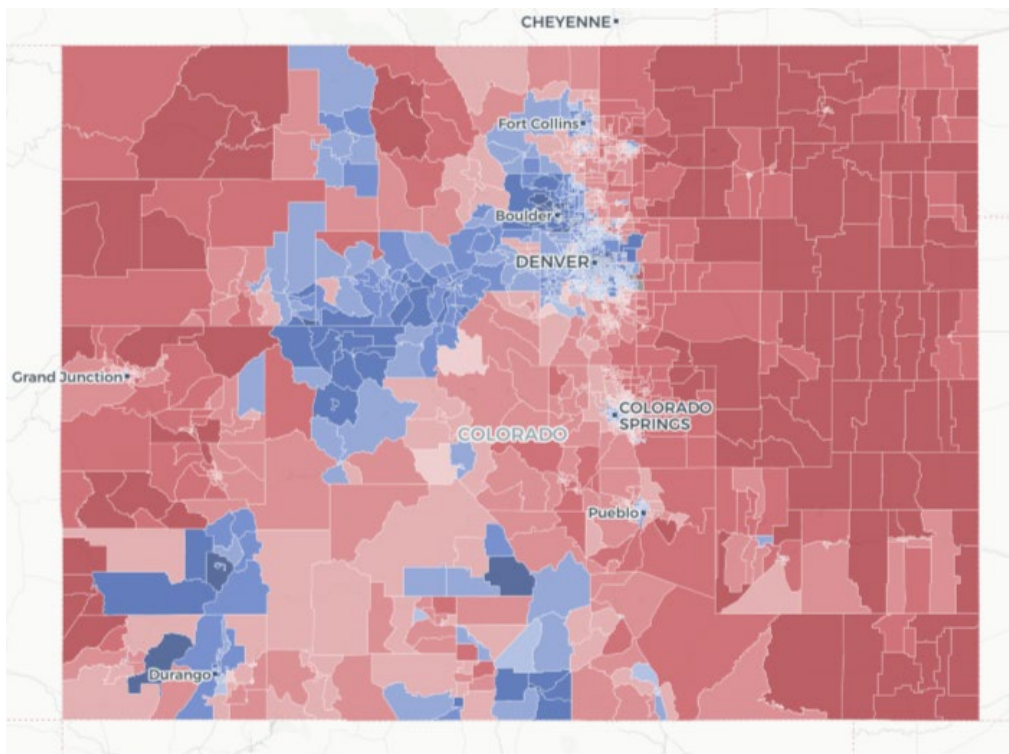


Figure 1. A precinct-by-precinct look at the results of the 2020 presidential election. Precincts represent approximately 1,500 active voters. The darker the shading of the color, the stronger the support was for the winning candidate (blue for Democrats, red for Republicans). Figure from Colorado Secretary of State, U.S. Census Bureau, 2020.

The Colorado Oil and Gas Association has expressed a degree of support for these measures, recognizing the evolving role of the energy industry within the state. With the intention of stepping forward with a collaborative approach to energy policy, this association worked with Colorado authorities to agree to transfer regulatory authority from the federal government to the state for certain injection well regulations.⁵

Colorado's Electricity Sector

Existing electricity mix

Colorado has been using multiple electricity sources, including coal, hydroelectric, natural gas, petroleum, biomass, solar, and wind.⁶ Besides these generating sources, the state has also invested in energy storage such as battery and pumped storage for resiliency. As of June 2023, non-hydroelectric renewables (wind, solar, and others) have become the largest source of electricity generation (Figure 2), producing 1,536,000 MWh of electricity and accounting for about 35% of the total generation in Colorado (Figure 3).

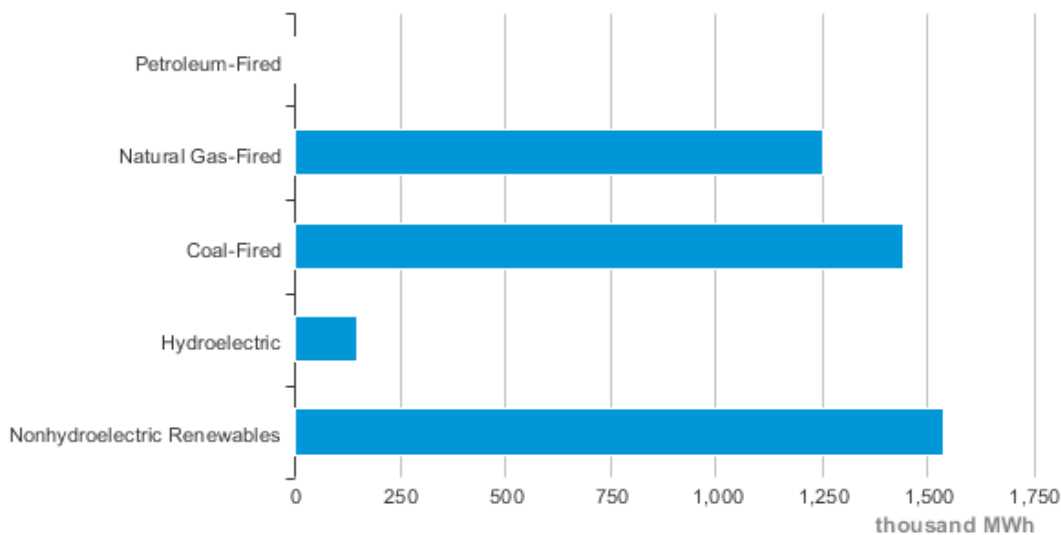


Figure 2. Colorado's net electricity generation by source. Figure from EIA, Jun 2023.

When compared to trends over the last 20 years, non-hydroelectric (solar, wind, biomass) renewable energy generation has increased from nearly 0% in 2000 to more than 30% in 2021 (Figure 3).⁶ The use of coal has dropped from 80% in 2000 to 41% in 2021, largely due to Colorado's plan to retire 2,549 MWh coal-fired generating capacity by 2029 with other natural gas and renewable energy facilities. The use of natural gas has increased from 16% in 2000 to 26% in 2021. Meanwhile, the proportion of hydroelectric, solar, biomass, and petroleum have not varied significantly. Overall generation is rising, though not at a commensurate rate with the state's quickly growing population.

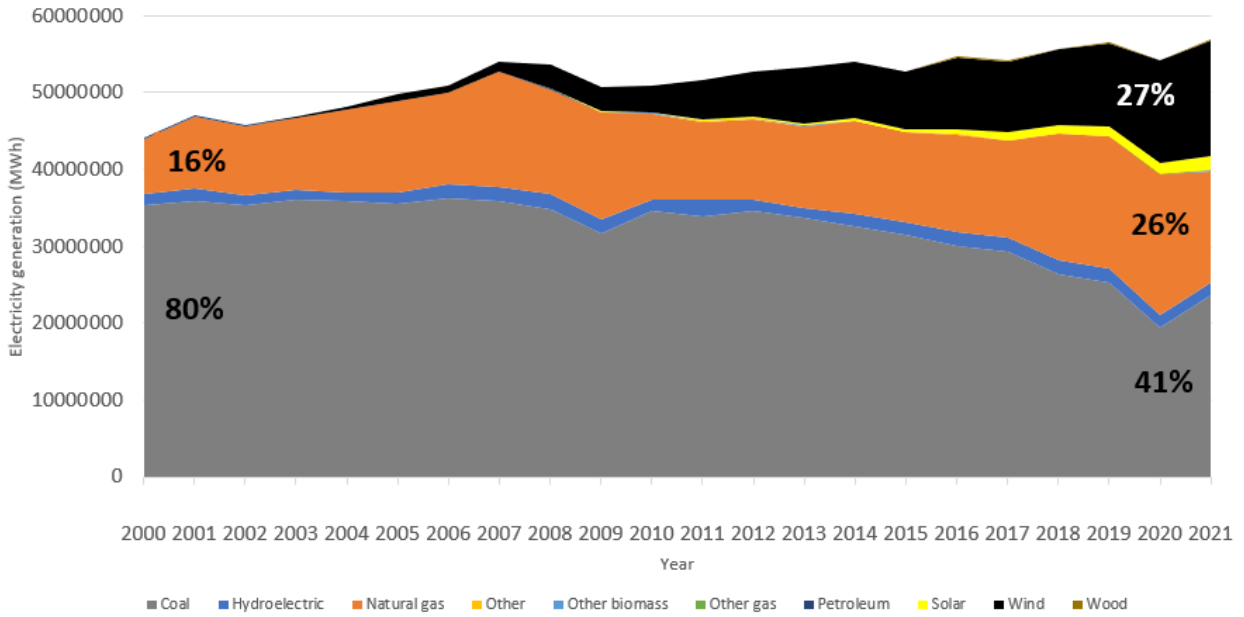


Figure 3. Trends of electricity mix in Colorado from 2000 to 2021. Figure from EIA, 2021.

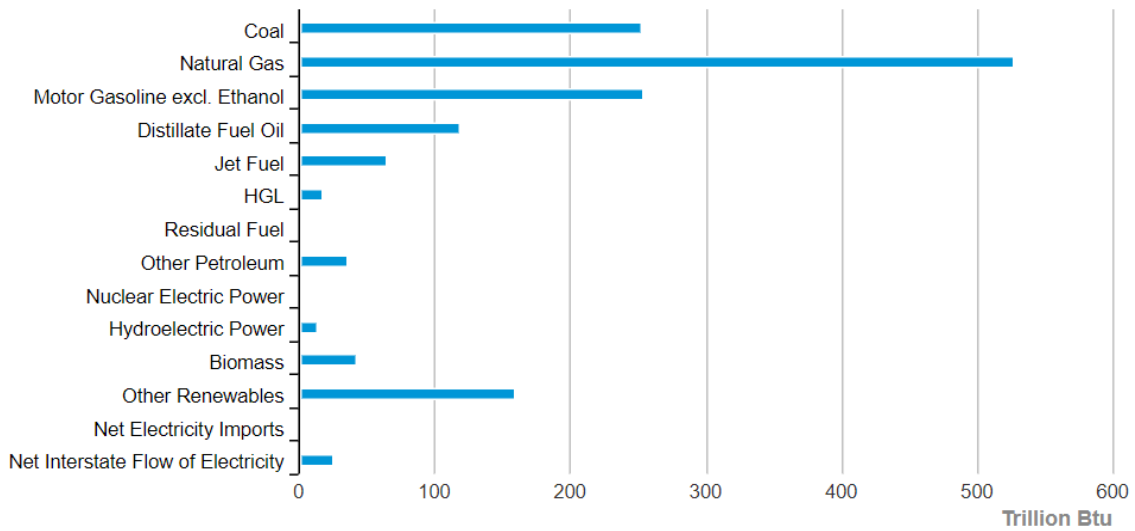


Figure 4. Colorado energy consumption estimates. Figure from EIA, 2021.

Based on data from the Energy Information Administration (EIA), the net import electricity in 2021 in Colorado was zero (Figure 4).⁶ That said, the net interstate flow of electricity was 22.3 trillion Btu, suggesting that more electricity, including associated losses, entered the state than left during 2021.⁶ Colorado does import coals from Wyoming, which is still a major source of electricity generation in Colorado.

Renewable energy capacity and potential

Colorado has significant renewable energy sources, with more than 6.0×10^9 MWh in utility PV potential and 8.0×10^8 MWh in land-based wind potential (Figure 5).⁷ In 2022, wind provided about 28% of the total electricity generation in Colorado and stood as the largest renewable energy source.⁸ The wind generating capacity was 5,136 MW, with 380 MW of wind power capacity planned for implementation by 2024. Though Colorado has not fully developed all its wind potential (less than 1% based on generating capacity and wind potential), the state ranked 7th in the U.S. for installed wind power capacity. Colorado’s wind resources are largely located on the eastern plains and mountain region, where most of the state’s wind turbines are located, as shown in Figure 6 and Figure 7.

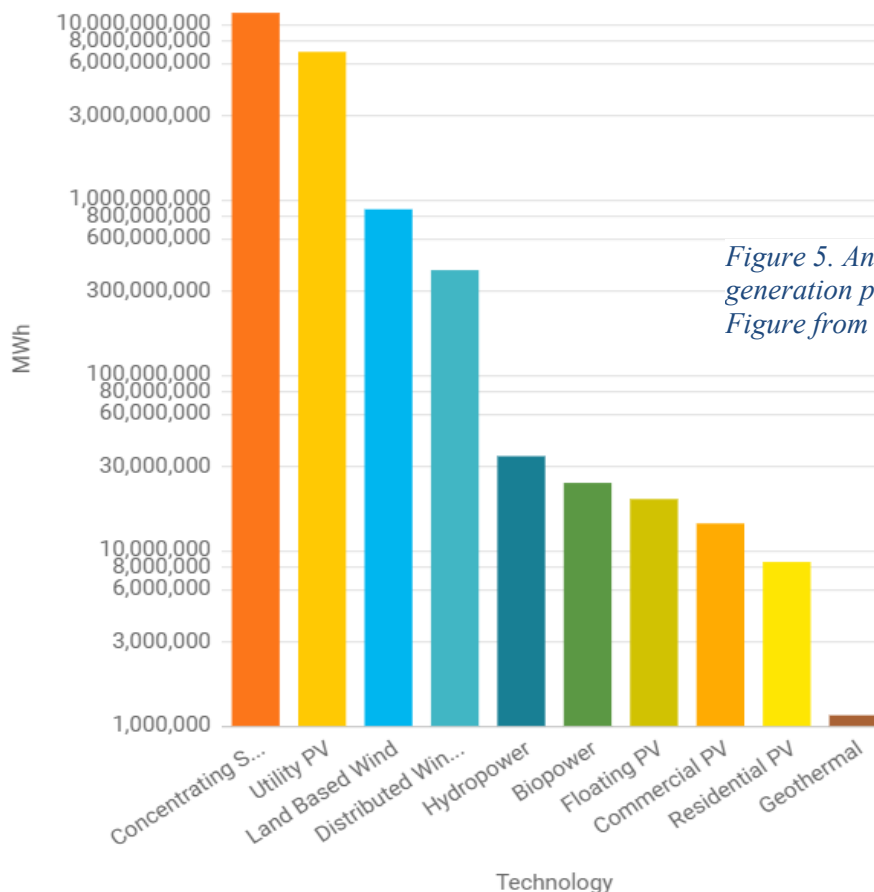


Figure 5. Annual technical generation potential in Colorado. Figure from WINDEXchange.

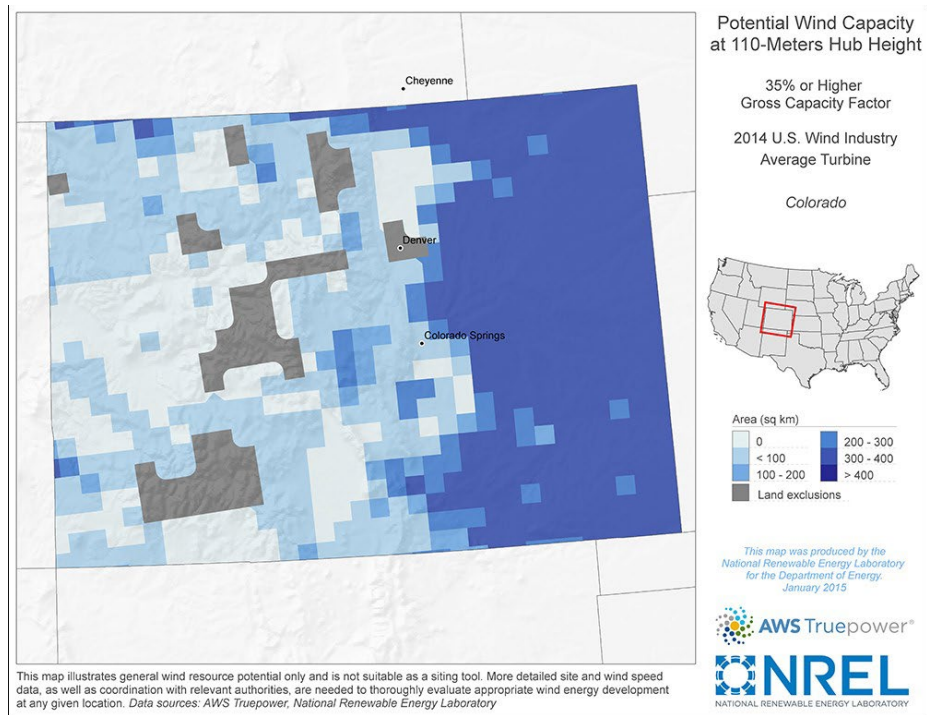


Figure 6. Potential wind capacity at 110-Meters Hub Height. Figure from USGS, 2023.



Figure 7. Colorado's wind turbine location database. Figure from WINDEXchange.

Colorado's abundant solar resources are located mostly on the southern border near New Mexico, as can be seen in Figure 9. The southern area is redder on the resource map, though there are more solar farms built in the north currently (Figures 8 and 9). Based on data from the Solar Energy Industries Association, there were 2995 MW of solar panels installed in 2022, contributing to about 6.8% of the state's electricity generation.⁹ Another 4084 MW of capacity is projected to be built in the coming years. Similar to wind, Colorado hasn't fully developed all of its solar potential either (less than 1% based on generating capacity and solar potential) and ranked 11th in the nation for installed solar capacity.

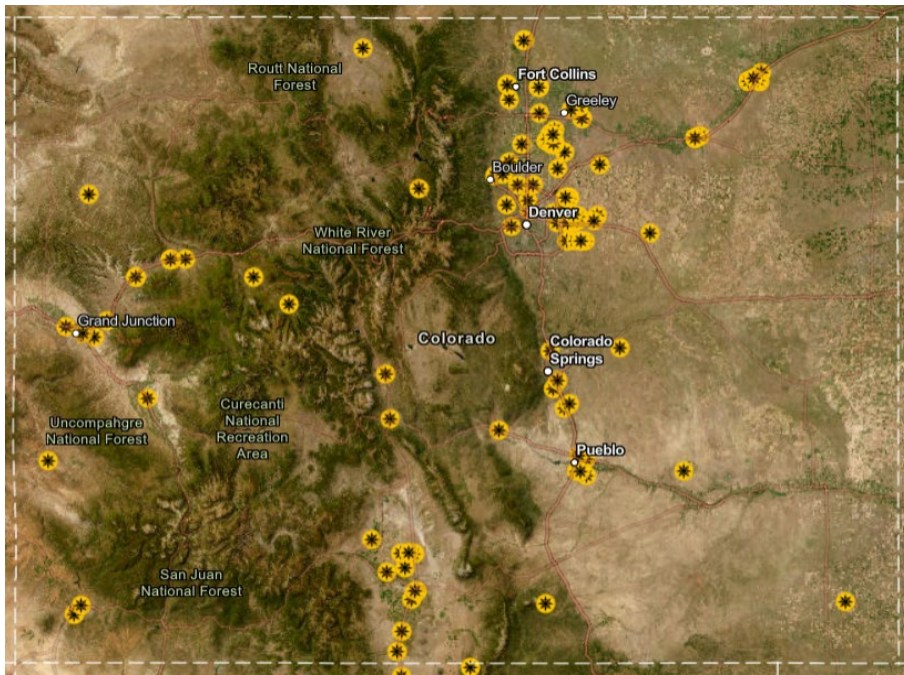


Figure 8. Solar infrastructure in Colorado, each dot representing existing infrastructure.

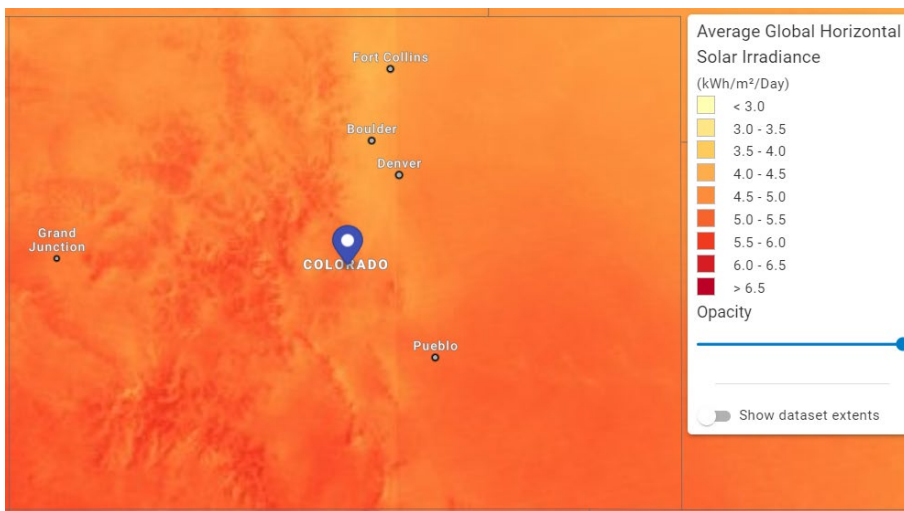


Figure 8. Solar resource map of Colorado, Figure from National Renewable Energy Laboratory, 2023.

Colorado Public Utilities Commission

The Public Utilities Commission (PUC) of the State of Colorado is a branch of the Department of Regulatory Agencies that regulates utilities and facilities encompassing energy (including electric power and natural gas), gas pipeline, rail transit, telecommunications, and transportation.¹⁰ The PUC, comprised of a director and three commissioners appointed by the governor of Colorado, aims to serve the people of Colorado to receive safe, reliable, and reasonably-priced services consistent with the economic, environmental, and social values of the state. Under the PUC's regulation, each utility in Colorado has its own territory where it alone can provide service to residents (Figure 10).

The key actors in electricity generation in Colorado are investor-owned utilities (IOU), public utilities, and cooperative utilities. Colorado has two IOUs: Black Hills Energy and the Public Service Company of Colorado, known as Xcel Energy. Colorado has 29 municipal utilities and 22 rural electric cooperatives, which are not regulated by the PUC as they are not-for-profit corporations.¹¹ In terms of electricity sale in MWh, the top five electricity retailers in Colorado are Public Service Co. of Colorado/Xcel (IOU), City of Colorado Springs (Public), United Power, Inc (Cooperative), Core Electric Cooperative (Cooperative), and Black Hills Colorado Electric, LLC (IOU).⁶

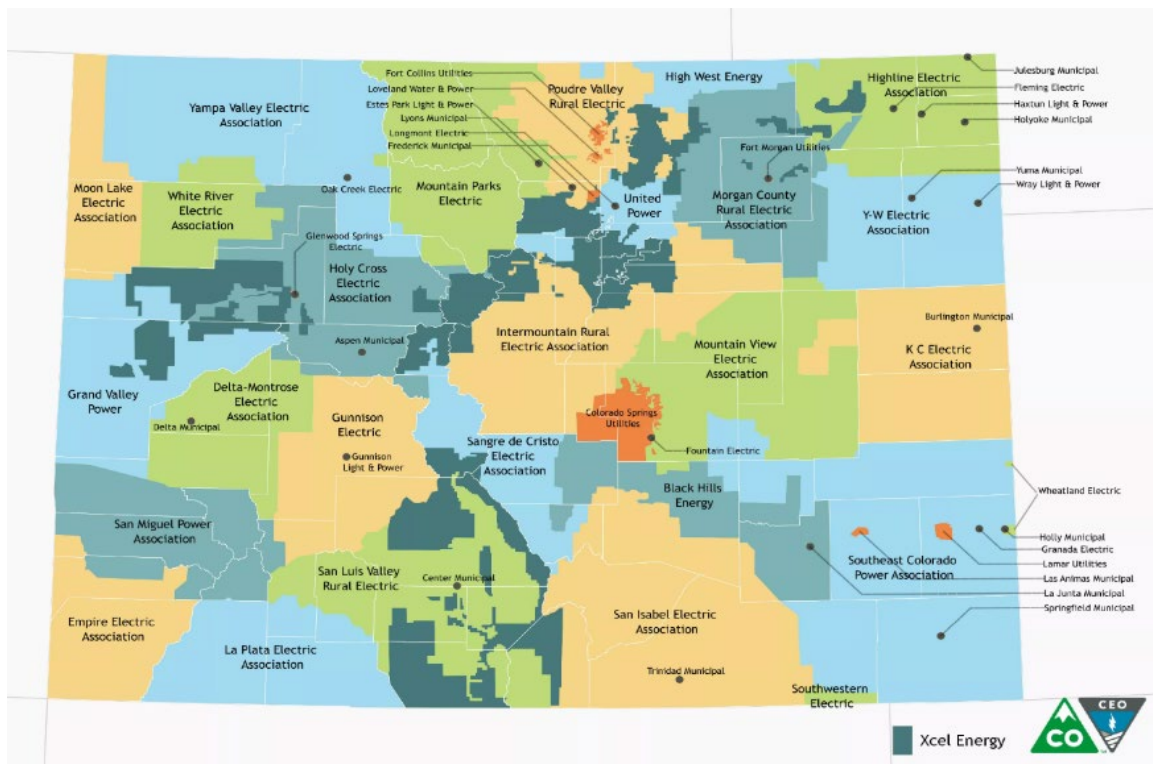


Figure 9. Utility service areas in Colorado. Map from the Colorado Energy Office, 2023.

Colorado's PUC is responsible for approving and evaluating utilities' integrated resource plans, clean heat plans, clean energy plans, and distributed energy resource policies. The PUC's regulation has significantly reshaped Colorado's renewable energy portfolio, with renewable electric generation having more than tripled since 2010.¹¹ PUC regulations will continue to impact the development of renewable energy sources, as the retirement of fossil fuel resources and additional renewable power projects are to be implemented before 2030 under the PUC's directive.

Local Narratives

Colorado is on the cutting edge of renewable energy deployment in the US, focusing on attracting innovation and technology to the state. 2019 saw the adoption of the Colorado Legislature's House Bill 1260-19, requiring communities across the state to adopt as well as enforce one of the three newest International Energy Conservation Codes (IECC) when a new building code is adopted or updated.¹² The state's Governor, Jared Polis, signed into law a bill in May that sets a net-zero emissions target as well as implements numerous reforms aimed at accelerating the transition to clean energy.¹³ As reported in the Colorado Sun, a Denver-based news outlet, Colorado is in the midst of a renewable energy boom being driven by decreasing costs and government money from the Inflation Reduction Act.¹⁴ Transmission infrastructure needs to be vastly improved and there is a shortage of workers and electricians to support the boom. Two new solar equipment manufacturing plants creating more than 1,200 jobs were announced in July and June respectively: Meyer Burger's new solar cell manufacturing plant to be located in Colorado Springs, and VSK Energy's solar module manufacturing facility in Brighton.¹⁵

There is growing concern about the cost of these policies. New energy codes requiring solar and electrical hookups in all new buildings have developers concerned about the addition of costs to construction in a market already struggling with affordability.¹⁶ Incentives will be available to mitigate the costs of implementation but communities must now revise their local codes in order to embed clean electrification in development. Another affordability concern is tied to the state's largest electricity supplier, Xcel Energy, which proposed a rate hike to cover costs for the shuttering of five coal-fired power plants. State energy officials are reluctant to grant this demand given Xcel's performance issues and cost-overruns in numerous projects.¹⁷

Fossil Fuels

Even Colorado's oil and gas regulating agency is preparing for a renewable energy-focused future. In July of 2023, the Colorado Oil and Gas Conservation Commission adopted a new title, the Colorado Energy and Carbon Management Commission, along with new duties broadening its scope to include underground natural gas storage, geothermal, and carbon capture and sequestration for the mitigation of carbon dioxide emissions.¹⁸ The state is moving towards an emphasis on geothermal energy, given its strong potential for energy development in this area,

entertaining ideas like the conversion of hot water generated during oil and gas operations into a geothermal energy source.

New rules targeting the oil and gas industry's emissions are being deployed by state regulators in an effort to curb air quality issues and spur a greater transition to renewables.¹⁹ Environmental groups in Colorado are hoping for a phase-out of new oil and gas permits by 2030, targeting a ballot initiative that has the petroleum industry up in arms.²⁰

Community Opposition

A solar project located in Southwestern Colorado, near Durango, is facing significant opposition from the community. From incendiary opinion pieces to deficiencies found by the La Plata County Planning Department in the solar application filed by Primergy for the Hesperus Solar project, the road to the 1,900+ acre project is fraught with difficulties that other solar farm projects are also facing.²¹ It seems that the arguments of the project's detractors use environmental concerns as a primary reason for the project not to move forward, though some opponents say that solar and renewable energy deployment are still important to them, just not in their backyards.²² In neighboring Montezuma County, residents are frustrated with recently opened solar arrays, citing wildlife concerns, the reduction of productive farmland, and projects being sited too close to residential areas.²³ Citizen opposition to a 600-acre solar farm proposed in San Miguel County prompted the commissioners to approve a six-month moratorium prohibiting the development of solar energy projects while the county takes time to update its land use code. While this opposition may call into question how much renewable energy is going online in Colorado, investment and employment numbers tell a different story. The Clean Jobs Colorado Report released in October by E2 indicated that nearly 64,000 workers are employed in the clean energy sector in Colorado.²⁴ Numerous projects are in the pipeline in the coming years.

Colorado's Policy Landscape

Explicit Climate Policy

Compared to other U.S. states, Colorado has adopted a relatively aggressive climate change policy stance over the past couple decades. In 2004, Colorado became the first state to establish a Renewable Energy Standard (RES) by ballot measure,²⁵ requiring investor-owned utilities (IOUs) to generate 30% of their electricity from renewable sources by 2020 and every year thereafter (as outlined in Table 1).²⁶ Colorado's 2004 RES also required municipal utilities serving more than 40,000 customers and cooperative utilities serving fewer than 100,000 meters to reach 10% renewable electricity by 2020 and every year thereafter,²⁷ and includes a solar credit multiplier allowing rural electric cooperatives and municipal utilities to count each kWh of solar as three kWh.²⁸

In 2019, Colorado's RES was updated to require utilities serving 500,000 or more customers to supply 100% of their electricity from clean sources by 2050, so long as doing so proves 'technically and economically feasible' and 'in the public interest.'²⁹ Per the statute, eligible energy resources include recycled energy, renewable energy resources (including solar, wind, geothermal, biomass, certain hydroelectric resources and emissions neutral coal-mine methane) and renewable energy storage. Additionally, the RES includes a 3% distributed generation carveout.

Also in 2019, state representatives passed House Bill 19-1261, also known as the 2019 Climate Action Plan to Reduce Pollution.³⁰ This legislation codifies statewide goals to reduce greenhouse gas emissions at least 26% by 2025, 50% by 2030, and 90% by 2050, as compared to 2005 levels. House Bill 19-1261 also grants the Air Quality Control Commission power to develop regulations for meeting these goals, and appropriates \$281,588 towards policy implementation.³¹ Strengthening enforceability, the policy requires the Air Pollution Control Division to compile statewide greenhouse gas inventories and report them to the General Assembly.

The same year, the Polis Administration published its 2019 Roadmap to 100% Renewable Energy, with a commitment to reach 100% renewable energy by 2040.³² Though ambitious, this renewable energy goal has never actually been codified into law, and thus the state has tailored its emissions reduction plans to meet the requirements under House Bill 19-1261, not the goals in the 2019 Roadmap to 100% Renewable Energy. To plan towards the state's codified emissions reduction targets, the Colorado Energy Office and several other state agencies developed the 2021 Greenhouse Gas Pollution Reduction Roadmap.³³ In accordance with Colorado Revised Statute §24-20-111, which mandates the development of a climate action plan, the 2021 Roadmap lays out sector-based near-term actions to achieve the targets in House Bill 19-1261. A 2.0 version of the plan is currently under development, which will incorporate updated emissions data and near-term actions.

Table 1. Colorado’s key climate policies

Name of policy	Passed	Description
Colorado Revised Statute §40-2-124	2004	Outlines renewable energy standard for qualifying retail and wholesale utilities, requiring IOUs to generate 30% of electricity from renewable sources by 2020, and municipal utilities serving >40,000 customers and cooperative utilities serving <100,000 meters to reach 10% renewable electricity by 2020.
Colorado Revised Statute §40-2-124	2019	Updates renewable energy standard to require utilities serving >500,000 customers to supply 100% of retail sales with clean energy by 2050
Senate Bill 19-236 (Sunset Public Utilities Commission)	2019	Continues the PUC and codifies the implementation of the recommendations within the Colorado Department of Regulatory Agencies’ 2018 evaluation report
House Bill 19-1261 (Climate Action Plan to Reduce Pollution)	2019	Sets goals to reduce emissions 26% by 2025, 50% by 2030, and 90% by 2050 relative to 2005. Requires utilities to file clean energy plans demonstrating 80% emissions reduction by 2030.
House Bill 19-1314 (Just Transition from Coal-based Electrical Energy Economy)	2019	Creates Colorado’s Office of Just Transition and requires the submission of a workforce transition plan no less than six months before the retirement of a coal facility.
Senate Bill 21-246 (Electric Utility Promote Beneficial Electrification)	2021	Requires Xcel Energy and Black Hills Energy to file plans with the PUC that support all cost-effective electrification.
Senate Bill 21-261 (Public Utilities Commission Encourage Renewable Energy Generation)	2021	Raises the allowable capacity of distributed energy generation facilities; exempts selling excess power from distributed generation from regulation as public utilities.
Senate Bill 21-264 (Adopt Programs Reduce Greenhouse Gas Emissions Utilities)	2021	Requires gas utilities to implement clean heat plans that lay out actions to reduce emissions by 22% by 2030 relative to 2015 levels.
Senate Bill 21-272 (Measures To Modernize The Public Utilities Commission)	2021	Requires the commission, when considering any matter, to improve equity for, minimize impacts on, and prioritize benefits to disproportionately impacted communities.
House Bill 21-1238 (Public Utilities Commission Modernize Gas Utility Demand-side Management Standards)	2021	Requires utilities to provide the lowest reasonable cost that includes the federal social cost of carbon and methane, and mandates prioritizing investments in disproportionately impacted communities.
House Bill 21-1266 (Env. Justice Disproportionate Impacted Comm.)	2021	Establishes an environmental justice advisory committee and directs pollution fine revenues toward impacted communities.
Colorado Revised Statute §24-20-111	2022	Creates a climate change position within the executive branch, required to develop a state climate action plan.
Senate Bill 23-198 (Clean Energy Plans)	2023	Updates clean energy plan requirements with interim 46% by 2027 emission reduction utility requirement; directs Air Pollution Control Division to conduct utility check-ins.

Clean Heat Plans

Natural gas heating is still the primary home heating source in Colorado and the state’s largest consumer of natural gas.³⁴ Hence, in 2021, Senate Bill 21-264 was passed to require gas utilities to reduce greenhouse gas emissions using clean heat resources 22% by 2030, relative to 2015 levels.⁴¹ Utilities regulated by the PUC were required to file their first version of clean heat plans (CHP) with the PUC by August 2023 to demonstrate progress in meeting Senate Bill 21-264’s target. Utilities must update their CHPs every four years, and should detail how they plan to implement demand-side management (end-user consumption reduction), energy efficiency programs (including adding more insulation to houses at a reduced cost), methane recovery (from waste in landfills), green hydrogen (green electrolysis of water), and beneficial electrification (switching from gas stoves to electric stoves). In addition to CHPs, gas utilities are also required to file gas plans every two years to forecast natural gas usage and identify any potential gas facility growth.

Xcel Energy, the largest utility company in Colorado, submitted its 2024-2028 CHP in August 2023, aiming to reach net zero emissions in its natural gas system by 2050.³⁵ As shown in Figure 11, Xcel plans to reduce its carbon dioxide emissions by 1,610 thousand metric tons by electrifying new construction, retrofitting to avoid investing in natural gas pipe systems, recovering methane using horizontal drilling technology to treat methane and injecting it into natural gas pipelines, blending hydrogen into natural gas, and following rigorous standards to supply natural gas with lower leakage rate.³⁶

Xcel Energy preferred clean heat plan (2024–2028)

Gas utility decarbonization strategy	Projected emissions reductions (000 metric tons)	Budget (\$M)
Electrification	453.4	302.7
Recovered methane	256.4	361.7
Demand-side management	152.3	81.1
Hydrogen**	53.7	25.8
Total	915.8	771.3

Strategies removed from original plan

Carbon offsets	365.0	31.2
Certified natural gas*	329.1	13.2
Total	694.1	44.4

As of Nov. 10, 2023.

* Investments begin in program year 2026.

** Investments begin in program year 2027.

Source: Xcel Energy Inc.

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Figure 10. Breakdown of Xcel’s clean heat plan and budget. Figure from S&P Global, 2023.

However, concerns have been raised regarding the carbon offsetting and certified natural gas strategies Xcel has included in its CHP.³⁶ Though Senate Bill 21-264 does allow utilities to count 5% indirect emission reductions, Xcel has far exceeded this percentage with its carbon offsets and reliance on natural gas. Thus, Xcel is falling back heavily on the supply side of its operations rather than the distribution side to meet the mandated emissions reductions, a questionable strategy in fulfilling the intent of this legislation. Though the Colorado Energy Office and the Colorado Department of Health and Environment's Air Pollution Control Division at first ruled that Xcel's preferred portfolio does not violate Senate Bill 21-264, as of November 2023, the PUC has signaled that other investor-owned gas utilities will not be able to use certified gas or offsets to comply with Colorado Senate Bill 21-264, and Xcel has thus revised and refiled their plan.³⁷

Xcel admits the difficulty in supporting local and system-wide resilience without natural gas. In its analysis, a scenario in which customers use no gas would be more expensive and less reliable than maintaining the use of some gas for now.³⁸ To therefore meet the peak load demand when renewable energy resources undergo uncertainty in extreme cold or hot weather, Xcel has also proposed adding 630 MW of natural gas resources while retiring more than 1,300 MW of natural gas contracts, resulting in a net reduction in natural gas resources.

Clean Energy Plans

In addition to legislation mandating clean heat plans focused on gas distribution, Colorado passed Senate Bill 23-198, requiring utilities to reduce their emissions from Colorado retail electricity sales by at least 80% by 2030, relative to 2005 levels. In accordance with the policy, each utility must submit a clean energy plan (CEP) to the PUC and the Division of Administration in the Department of Public Health and Environment. Modeling portfolios demonstrating how the utilities will achieve the clean energy target and carbon dioxide emissions reductions must also be submitted. Electrification is key to reaching Xcel's goals, and is the most cost-effective strategy for cutting emissions from buildings.³⁹ Xcel's building electrification goal outlined in its CEP has the potential to reduce greenhouse gas emissions by 107,000 metric tons between 2024 and 2026, and reduce natural gas usage by 2 dekatherms over three years.⁴⁰

Xcel submitted its CEP in 2022 and had it approved. In the document, Xcel lays out its plan to provide about 80% of its customers with electricity sourced from renewable energy by investing up to \$15 billion in renewable energy infrastructure, in Colorado.⁴¹ Notably, the utility intends to retire its coal operations by 2031, add 6,500 MW of renewable energy resources (3,400 MW of wind power and 1,970 MW of solar power), and add more distributed energy resources (1,170 MW of battery storage). Xcel notes that these efforts will provide more renewable energy jobs in the state and \$2.5 billion in tax benefits.³⁸ According to Xcel's own analysis in its 120-day report, the utility is on track to meet and exceed the goal of 80% emission reductions by 2030 (as shown in Figure 12).

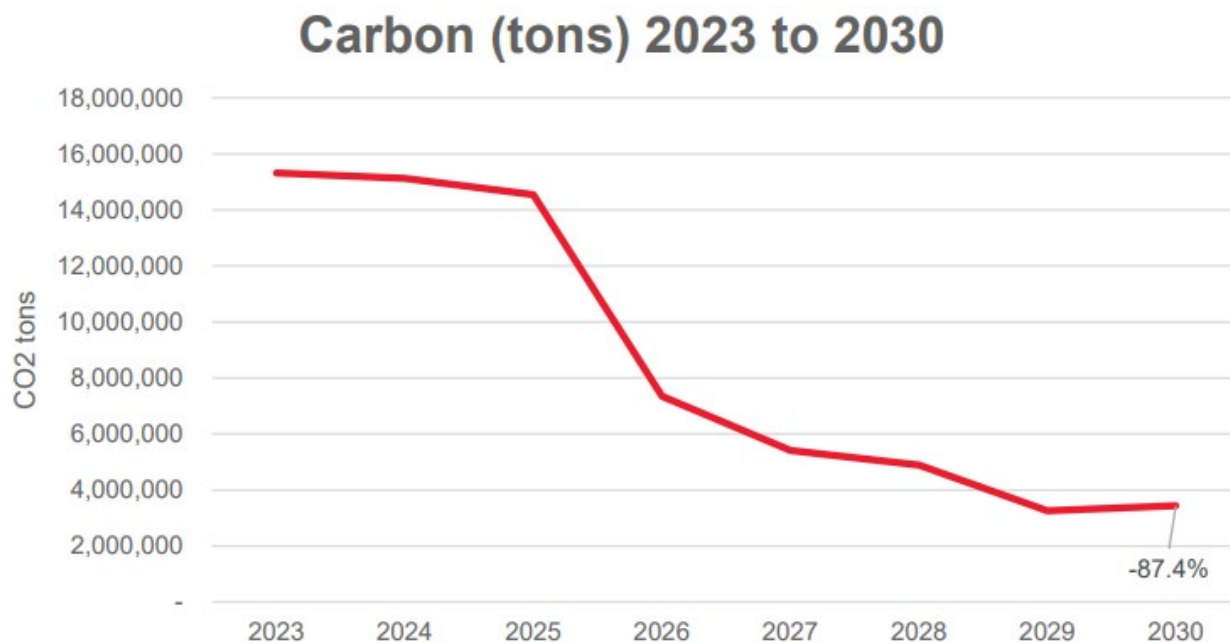


Figure 11. Xcel's modeled portfolio suggests that achieving an 80% reduction in emissions by 2030 is possible. Figure from Xcel's 120-day report, 2023.

Distributed generation and other policy updates

While Colorado's current policies, including net metering, tax exemptions for renewable energy equipment, solar rebates, and federal solar tax credits, all encourage growth of renewable energy,⁴² Senate Bill 21-261 provides further room for the growth of distributed generation.⁴³ This legislation removed the power generation limitation originally preventing solar panels from exceeding 120% of a household's annual usage was removed, and authorized virtual net metering, which exempts people selling excess power from the requirement to be located on their property or on property owned or leased by others in a master meter operation. Further, master meter operations prevent end users from being charged above what they are billed for electricity supplied by the serving electric utility, and allows the net metering monthly credit to be infinitely carried forward. This legislation encourages companies with renewable energy goals to build solar arrays in places that have more solar resources rather than limiting their solar arrays to where the company is located, particularly if this location has fewer solar resources and the energy produced is used where its employees work.⁴⁴ Further, this bill encourages residents to purchase electric vehicles by allowing overproduced energy to be used for vehicle charging, hence helping to promote electrification. The PUC also is adopting rules to encourage cost and benefit sharing between landlords and tenants with regard to new distribution facilities, thus encouraging landlords to install distributed energy projects on their property.

Effectiveness of Colorado's Climate Policies

Colorado has certainly taken a proactive approach to limiting emissions. The state has adopted a diverse range of policies to hold IOUs as well as municipal and cooperative utilities accountable for specific clean energy targets, and has approved emissions reduction mandates specifically geared toward the gas sector. The state also requires planning efforts by both electric and gas utilities that include accounting for the social cost of carbon. Despite this progressive approach, however, Governor Polis issued a 2021 executive order prohibiting cap-and-trade programs in Colorado, restricting market-based approaches to reaching its ambitious targets.⁴⁵ This order reflects Colorado's emphasis on holding each utility accountable in cleaning up its own operations without relying on credit trading to get there – thus paving the way for some utilities to become cleaner than others.

Colorado's climate policies appear to be driving some progress toward the development of clean energy, as detailed in the Polis Administration's First Term Climate and Clean Energy Action Report.⁴⁶ The document mentions how the Colorado Energy Office completed 90% of the 2021 Roadmap's near-term actions by the end of its 2022 fiscal year, and how the state is on track to close all its coal-fired power plants by 2031. Certainly, the successes of Colorado's RES and other climate policies have garnered significant analysis within academic literature. Some scholars point to Colorado's strong growth in solar electric capacity as proof of the value RES programs hold on solar energy development and renewable resource diversity, and others argue that the state's RES serves as insurance against the risks associated with natural gas price fluctuations.⁴⁷ Still others assert that because cities with 100% renewable energy commitments are more common in highly populated areas with IOUs – necessitating that cities with these commitments rely on IOUs for policy implementation – Colorado's RES has inspired innovation by driving local governments to find new ways to work with IOUs and push for state-level sustainability policies.⁴⁸

However, a handful of scholars approach Colorado's climate legislation from a more critical perspective. Some argue that inconsistent policies for utilities across Colorado – resulting in inconsistent incentive and rebate packages for homeowners – discourage potential solar adopters.⁴⁹ This complexity is particularly notable given that Colorado no longer offers statewide tax credits for residential solar power.⁵⁰ Additionally, the RES's expansive range of qualifying energy resources allows for flexibility in what resources are considered 'clean' under this legislation.⁵¹ Further, the First Term Climate and Clean Energy Action Report never discusses Colorado's progress toward meeting its RES, thus missing an opportunity to discuss policy improvements that could better meet the state's ambitious targets. A Rocky Mountain Institute analysis illustrates how the state will fall about 16% short of its 2030 emissions reduction target if it continues along its current policy path.⁵²

Impacts and perceptions of Colorado's energy policies on renewable energy and justice

In touting the Polis Administration's many 'climate successes,' the First Term Climate and Clean Energy Action Report prominently features Colorado's Office of Just Transition,⁵² the only department of its sort in the United States to date.⁵³ Created as part of House Bill 19-1314,⁵⁴ this office is primarily concerned with improving conditions for formerly coal-dependent communities,⁵⁵ and requires the submission of a workforce transition plan no less than six months before the retirement of a coal facility.⁵⁶ The creation of this office reflects the state's general support for policies aiding displaced miners and other marginalized groups, echoed by later legislation establishing an environmental justice advisory committee and directing pollution fine revenues toward impacted communities (House Bill 21-1266).⁵³ Additionally, Colorado's RES considers the cost burden of compliance on customers, prohibiting IOUs and cooperatives from exceeding 2% of the total electric bill annually for each customer when passing on the net retail rate impact of RES compliance.²⁷

To further address energy justice issues, House Bill 21-1238 requires utilities to provide the lowest reasonable cost, including the federal social cost of carbon (\$46 to \$68 per short ton) and methane (not less than \$1,756 per short ton) in their demand-side management program.⁵⁷ This requirement will help utilities more accurately evaluate whether it is more expensive to run fossil fuel plants long-term or to invest in more renewable energy projects.⁵⁸ Renewable energy plants might require more upfront costs, but after considering the social cost of carbon and methane, investors might be more inclined to invest in wind or solar energy resources. Additionally, the bill mandates prioritizing investments in disproportionately impacted communities, including communities of color, low-income communities, etc. Colorado's PUC evaluates utilities' energy justice considerations within the context of approving their CHPs.

Thus, Colorado's climate policies at least partially prioritize elements of energy justice, potentially resulting in broader public support for renewable energy development. State-led research indicates significant support among Colorado residents for research, policy, and development around renewable energy,⁵⁹ and academic literature devotes considerable attention to the concepts of energy justice and equitable energy transitions,⁶⁰ but little to no scholarship explores energy justice for Colorado residents and workers in particular. Further, though non-profit organizations have written announcements about Colorado's energy justice legislation on their websites,⁶¹ few to none of these articles evaluate and/or provide updates on the progress of these policies. Corroborating the state's claims regarding its energy justice progress thus remains difficult.

Tax Policy

All renewable energy property in Colorado is taxable unless specifically exempt under Colorado law. Colorado does not have any general statewide property tax incentives for renewable energy. However, county and municipal governments can offer incentives – in the form of county or

municipal property tax or sales tax credits or rebates – to a residential or commercial property owner who installs a renewable energy fixture on his or her residential or commercial property.⁶² Notably, a 2023 decarbonization tax credit law, known as House Bill 23-1272, allocates approximately \$200 million in tax incentives over the coming years to support various sustainable energy activities, among them industrial clean energy.⁶³

Commercial/Utility Scale Renewables

Colorado employs specific evaluation approaches for renewable energy facilities depending on their size. Solar and wind energy facilities property used to produce 2 MW or less are assessed locally for property taxes. In addition, locally assessed renewable energy property includes small or low impact hydroelectric facilities, geothermal energy facilities, and biomass energy facilities used to produce 2 MW or less and placed into use prior to January 1, 2010.⁶⁴ In assigning value to renewable energy property, local assessors are required to use the cost approach outlined in the Assessors' Reference Library. Assessors must also examine the sales comparison and income approaches, both described in the Assessor's Reference Library.

All renewable energy systems with greater than 2 MW of generation capacity are valued as public utility property by the Division of Property Taxation. Small or low impact hydroelectric facilities, geothermal energy facilities, and biomass energy facilities that are put into use on or after January 1, 2010 and not primarily designed to supply electricity for consumption on site are state assessed regardless of generation capacity.⁶⁵

A tax administrator is meant to assess the additional construction cost per kilowatt, including any energy storage system capacity. This incremental cost is considered an investment and is not included in the facility's valuation. Tax administrators exclude any added value for renewable energy credits generated by the facility.⁶⁶ For valuation purposes, facility owners or operators must provide the administrator with a copy of the current power purchase agreement by April 1 of each assessment year. If there is no material change in the agreement, a new copy is not required if previously submitted.

Specifically addressing wind energy facilities in Colorado, in state valuations, if equipment costs at a wind facility exceed those of a non-renewable facility of equal capacity, the wind facility's valuation is capped at the non-renewable facility rate. Colorado aims at empowering localities to establish additional property tax incentives to attract wind energy projects.

In the 2021 legislative session, the General Assembly approved Senate Bill 21-293. This bill includes a temporary reduction in assessment rates for non-residential properties dedicated to renewable energy production, lowering the rate from 29.0 percent to 26.40 percent for tax years 2022 and 2023. It is anticipated that this legislation will result in a decrease in local government property tax revenue from renewable energy properties, amounting to \$1.7 million in tax year 2022 and \$1.8 million in 2023.⁶⁷

Assessments for Residential Solar

Independently owned residential solar electric generation facilities (photovoltaic solar systems) are exempt from Colorado property taxation. To qualify for the exemption the solar electric generation facility must be located on residential real property, used to produce electricity from solar energy primarily for use in the residential improvements, and have a production capacity of no more than 100 KW.⁶⁸ This exemption does not extend to the land or buildings. The State Tax Commission recommends local assessors to annually conduct thorough analyses of residential sales during reappraisal years, considering the impact of renewable energy personal property on total residential property values. Energy storage systems connected to the generation system are included as part of the facility.

Under specific conditions tied to economic development, local governments have the authority to implement incentive payments or provide property tax rebates. Whether dealing with new business facilities or existing ones, counties, municipalities, or special districts have the option to engage in negotiations with facility owners for incentive payments. In cases involving existing business facilities, negotiations can be based on verifiable evidence indicating a substantial risk of the facility owner relocating it out of state. These incentives are capped at 100 percent of the personal property taxes paid to the respective county, municipality, or special district.⁶⁹ Agreements made before August 6, 2014, are limited to a maximum duration of ten years, while those established after this date may extend up to thirty-five years. Additionally, various incentives such as income tax credits, real property tax incentives, and sales tax refunds are available to further support economic development efforts.⁴²

Community Solar Gardens

Community solar gardens are rated up to 5 MW, but rules after July 1, 2023 could allow for gardens up to 10 MW. Gardens under 2 MW are locally assessed, while those above are considered state-assessed renewable energy facilities. They are exempt from property taxes for the portion of a community solar garden's electricity capacity used by residential or governmental subscribers or tax-exempt organizations. This exemption applies to tax years between January 1, 2015, and January 1, 2021.

Sales and Use Tax

Colorado exempts all sales, storage, and use of components for generating AC electricity from renewable sources from the state's sales and use tax starting from July 1, 2006. This exemption covers a range of systems, including photovoltaic (PV) systems, solar thermal-electric systems, small wind systems, biomass systems, and geothermal systems. Additionally, sales and use tax exemptions are provided for solar thermal systems from July 1, 2009, to July 1, 2017, and for biogas production systems from May 5, 2014, to July 1, 2019.

Eligible components include wind turbine generators, rotors, blades, solar modules, trackers, supporting structures, inverters, towers, foundations, and other balance of system components

such as wiring, control systems, switchgears, and generator step-up transformers. The exemption also covers concentrating solar power components such as mirrors, plumbing, and heat exchangers. Excluded from the exemption are components beyond the step-up transformers at the production site, labor, energy storage devices, or remote monitoring systems. 2.9% home solar system state sales tax exemption. This exemption applies solely to state sales and use taxes and not to taxes imposed by local jurisdictions. However, local governments in Colorado have the authority to exempt renewable energy equipment from sales and use taxes if they choose to do so.⁷⁰

Local government impact from generated tax revenue

The state's utility-scale clean energy capacity, currently at nearly 7,000 MW, generates nearly \$50 million annually in tax and land lease revenue for Colorado's communities. Reategui and Tegen's analysis at the National Renewable Energy Laboratory (NREL) revealed that the development of 1,000 megawatts (MW) of wind power in Colorado had a multifaceted impact. Throughout the construction phase, it created around 1,700 full-time-equivalent jobs, generating a substantial payroll exceeding \$70 million.⁷¹ Furthermore, approximately 300 permanent jobs were sustained in rural areas of Colorado, contributing to an annual payroll surpassing \$14 million. The wind power projects also yielded notable economic benefits, including over \$4 million in annual property taxes and an additional \$2.5 million annually for farmers and ranchers leasing their land to developers. Beyond economic gains, wind power installations generated tax revenues that were instrumental in enhancing local public services, notably improving schools and overall quality of life in rural regions. Moreover, landowners hosting wind turbines on their properties received supplementary income through land lease payments.

Between 2015 and 2020, Colorado exempted the percentage of alternating current electricity capacity of community solar gardens attributed to residential, governmental, and several other property tax-exempt subscribers from property tax, with an anticipated decrease in local government property tax revenue by \$525,200 in FY2015-16 and \$675,200 in FY 2016-17.⁶⁹ That said, since property taxes are evaluated at the county level, a statewide estimate of the value of this community solar exemption is unavailable. In 2021, the assessment rates for nonresidential property used to produce renewable energy were temporarily reduced from 29.0% to 26.4% for tax years 2022 and 2023, with an expected decrease in local government property tax revenue by \$1.7 million in tax year 2022 and \$1.8 million in tax year 2023.

Infrastructure investment

Established in 2013, the statewide New Energy Assistance District serves as a platform for providing financing to commercial and multi-family property owners aiming to incorporate energy efficiency, water conservation, and various renewable energy enhancements in both existing and newly constructed properties.⁷² Business proprietors can seek loans to implement renewable energy upgrades, such as solar power, through the Colorado Commercial Property

Assessed Clean Energy (C-PACE) program. Although C-PACE operates as a public-private partnership program on the state level, local governments must actively choose to participate by enacting an ordinance and establishing an agreement with the state. Loan repayment is facilitated through a voluntary assessment on the property owner's tax bill. Since 2016, the program has extended \$78.8 million in financing across 29 counties in the state.

In 2022, the state legislature began exploring the opportunities and challenges presented by the federal Infrastructure Investment and Jobs Act and Inflation Reduction Act. Through the funding available from the IIJA, Colorado House Bill 1381 created a geothermal energy grant program and appropriated \$12 million in state funding to support grants for installing geothermal systems in new buildings, building community district heating systems, and generating electricity and hydrogen from geothermal energy.

Funding for infrastructure was also made available through House Bill 21-1253 to local government proposed projects to support the development and construction of renewable and clean energy infrastructure in all areas of the state especially in communities in which renewable and clean energy infrastructure is sparse and with consideration to geographical diversity in these awards. This \$5 million Initiative aimed at supporting infrastructure implementation projects in the renewable and clean energy field to help reach Colorado's 2040 100% renewable energy goal.⁷³

Siting Policy

Siting authority in Colorado is a bit murky. Colorado takes a hybrid approach to wind facility siting, meaning that both local and state authorities participate in wind siting decisions. Local governance has 120 days to issue a final verdict on a wind siting application, but the Public Utilities Commission (PUC) must also issue a certificate before construction of new facilities.⁷⁴ Local permits must be issued before the PUC can issue the certificate, but if local authorities deny the application or permits, the applicant can appeal to the commission. There is less documentation of the siting approach for solar or geothermal.

That said, the language of Colorado Revised Statute §40-5-101 does not specify wind facilities, instead using the language of public utilities constructing a new facility, plant, or system. Colorado Revised Statute §29-20-108 states that “The general assembly finds, determines, and declares that the location, construction, and improvement of major electrical and natural gas facilities are matters of statewide concern.” Later on the statute states, “Local government land use regulations must require final local government action on any application of a public utility or a power authority providing electric or natural gas service that relates to the location, construction, or improvement of major electrical or natural gas facilities within one hundred twenty days after the utility's or authority's submission of a preliminary application, if a preliminary application is required by the local government's land use regulations.”

Streamlining permitting and siting are among the goals in the 2021 Greenhouse Gas Pollution Reduction Roadmap, and in May 2023, Colorado passed House Bill-1234 to speed up solar permitting and inspections for residential solar and provide monetary support to local governments in these efforts.⁷⁴ This monetary support comes in the form of a permitting and inspection grant program that allows municipalities and local governments to implement free automated permitting and inspection software for residential solar projects.⁷⁵ This bill demonstrates the state's desire to increase the accessibility of distributed generation for communities around the state, and will also help in meeting the state's ambitious climate goals, which will require adding ten gigawatts of renewable energy sources.

Colorado recognizes the importance of ensuring that transmission infrastructure keeps up with power generation and demand. In 2021, Colorado lawmakers developed the Colorado Electric Transmission Authority (CETA), a political subdivision of the state with the power to engage in transmission planning, identify and establish transmission corridors, engage in issuance and sales of electric transmission bonds, use eminent domain to acquire property or rights-of-way for projects, enter into public and private partnerships for the development of projects, and select a qualified transmission operator to facilitate required acquisition, maintenance, and operation of transmission facilities and their infrastructure, along with other activities.⁷⁶ CETA was created by Colorado's Senate Bill 21-072 and indicated governance by a nine-member board selected by the state.⁷⁷ CETA is not allowed to compete with other entities like Xcel Energy or the Western Area Power Authority, particularly if these entities have indicated they plan to pursue a particular area. Instead, CETA is intended as the state's 'transmission developer of last resort,' should the other entities be unwilling to step forward even after CETA lays out what projects are necessary and where. One of CETA's main goals is ensuring Colorado ends up in the center of a regional grid network or even a national grid by providing input and advise to the U.S. Department of Energy in its designation of National Interest Electric Corridors.

On federal lands within Colorado (further discussed in the following section), siting authority is not limited to the state. On Bureau of Land Management (BLM) lands, for instance, siting authority belongs to BLM and is enabled by the Federal Land Policy and Management Act. BLM's authority is restricted by rules in this legislation and the National Environmental Protection Act, which calls for environmental impact statements and environmental assessments.⁷⁸

Public Lands

Public lands that have long been the site of mining and natural resource extraction present a potential opportunity for the development of renewable energy, and Colorado certainly has an abundance of state and federal land (Figure 13). The Federal Government owns 24.1 million acres, about 36% of the state, with approximately eight million acres owned by the Bureau of Land Management (BLM), 14.5 million acres by the Forest Service (USFS), 175,000 acres by

the Fish and Wildlife Service (USFWS), 665,000 acres by the National Park Service (NPS), and 421,000 acres by the Department of Defense (DOD).⁷⁹ BLM land is the most obvious venue for renewable energy projects given its energy leases with oil and gas interests, and especially given the recreation and conservation uses of other public lands.

Created through an amendment to the Federal Land Policy and Management Act, the 2016 Wind and Solar Rule established a competitive leasing program for wind and solar development on BLM lands.⁷⁸ BLM has laid out three categories of land for renewables: excluded areas, where development is barred; designated leasing areas, where development is highly incentivized; and variance areas, where development is permitted. In 2016, BLM commissioned the National Renewable Energy Laboratory to draft a technical report on Colorado’s renewable energy deployment using a modeling sensitivity and GIS analysis, with the intention of informing BLM’s development of resource management plans and determining regions with capacity for

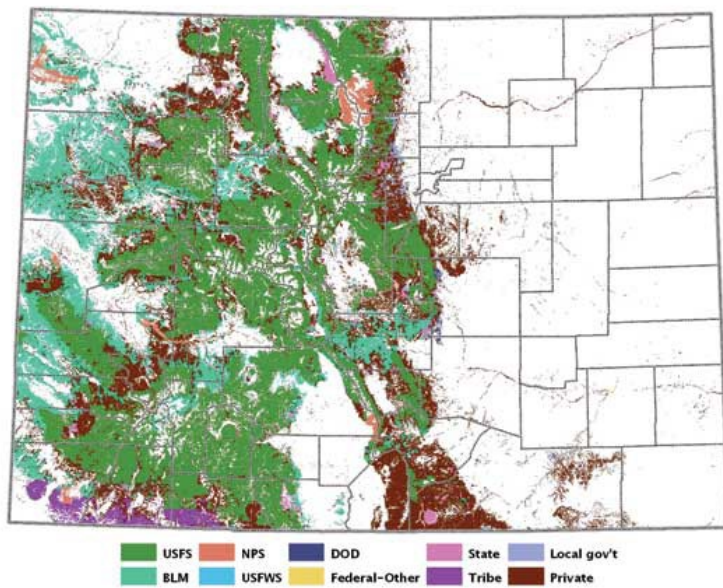


Figure 12. Breakdown of land ownership in Colorado. Map from the Congressional Research Service, 2020.

future utility-scale wind and solar generation. In 2022, the BLM announced its intention to develop an updated Solar Programmatic Environmental Impact Statement to guide development of renewables on western public lands.⁸⁰ The 2012 Impact Statement being updated established Solar Energy Zones in six western states, with the criteria for these zones including suitability for utility-scale production; relatively low conflict with cultural, biological, and historic resources; and connectivity to existing and planned transmission infrastructure.⁸¹

At the state level, the Colorado State Land Board owns, stewards, and leases four million acres – about 6% of the total land in Colorado – of trust land in Colorado as a funding mechanism for public schools. The land trust currently leases land for both solar and wind, amounting to about 302 MW of wind energy and 227 MW of solar energy, or about 10 percent of the state’s total renewable energy generation.⁸² The leasing process requires an application and a fee paid to the Land Board, with leases being granted in a two-stage process: a one to two-year planning lease, and a long-term production lease. A separate acreage adjustment process occurs when the renewable energy proposal is targeting trust land already leased for agriculture. The State Land Board works with private companies and developers to offer ground leases for solar, wind, hydropower, geothermal, and biomass/bioenergy.

Analysis

Over the past several decades, Colorado has presented itself as a leader on renewable energy policy, and in many respects, has in fact led this charge. The state has set ambitious clean energy and emissions reduction targets, and has even codified stipulations for acknowledging and reporting the social cost of carbon emissions. That said, a closer examination of Colorado's energy mandates and priorities hints at a more complex and arduous path to hitting its energy targets. Governor Polis frequently touts the state's 100% renewable energy by 2040 goal, but in reality, this target has no associated legal mandate, and thus no enforceable plan to ensure the state actually meets this goal.

For one, to meet the wind capacity buildout called for in the 2019 Roadmap to 100% Renewable Energy – a total wind capacity of 37,603 MW by 2040 – Colorado would need to build 7.5 times more wind facilities in the next 17 years than it built in the previous 19 years. Additionally, the plan's solar capacity buildout – approximately 56,276 MW – will represent nearly 53 times Colorado's current solar capacity, and the plan's battery storage buildout will require roughly 23,850 MW of four-hour battery capacity, up more than 2,000 times from the state's 10.2 MW of utility-scale storage in 2021.

Further, although utilities are generally making significant headway towards the 80% reduction in emissions by 2030 required by House Bill 19-1261, progress is far murkier with regard to Senate Bill 21-264, which requires gas utilities to implement clean heat plans that lay out actions to reduce emissions 22% by 2030 relative to 2015 levels. Xcel heavily relied on carbon offsets and the purchase of certified natural gas to reduce emission from natural gas, which is still the primary heating source in Colorado and hence has contributed greatly to emissions. This reality raises concerns regarding whether Xcel's strategies of meeting emissions reduction targets truly contribute to decarbonization in a manner that meets the plan's intent, given that carbon offsets fail to reduce emission at the source or generation stages. Xcel has removed these two strategies from its clean heat plan, without which it will not be capable of reducing as much carbon emissions as laid out in the original plan. Hence a question is left on the success of achieving the goals laid out in the revised clean heat plan without a larger budget. Advancements in decarbonizing technology could help but are quite unpredictable. Further complicating the path toward meeting emissions reduction goals, Governor Polis's 2021 executive order prohibiting cap-and-trade programs in Colorado restricts market-based approaches to reducing emissions. Without relying on credit trading, Colorado utilities are responsible for cleaning up their own operations, thus paving the way for some utilities to become cleaner than others.

Siting authority

Colorado is working to expedite the permitting process for renewable energy projects, but the value of this effort is up for debate. Given that Colorado's siting authority rests with municipalities, the state can do little to ensure that locally controversial projects are approved

despite public opinion. Legislation to streamline renewable energy permitting and inspections would strongly counter the desires of many local governments and residents, given that many of the communities situated in Colorado's most ideal areas for wind or solar are hesitant to support utility-scale renewable energy projects. Countering public opinion in this way might risk further alienating these rural voices – particularly given that many of these voices are politically conservative and often reluctant to embrace renewable energy for climate change mitigation purposes – and ultimately slowing down progress towards renewable energy development. That said, increasing the accessibility of residential solar for a variety of communities may go a long way in altering public perception of renewable energy in general, and longer term, of utility-scale projects, and state efforts are underway to speed up approval for residential-scale solar projects in particular, which could pave the way for greater involvement of the state government in the development of renewable energy projects, and perhaps even greater public acceptance of these efforts.

Energy justice

Another way to improve community acceptance of renewable energy projects would be via community benefit agreements between utilities and the communities in question, but as of yet, Colorado does not require utilities to lay out these agreements as a prerequisite for project approval. That said, requiring these agreements would allow Colorado to tap into a federal source of funding, as the U.S. Department of Energy has made community benefit plans (a non-binding version of community benefit agreements) a prerequisite for all funding opportunities and financing programs introduced as part of the Infrastructure Investment and Jobs Act and the Inflation Reduction Act of 2022.

Encouragingly, Colorado's bill mandates prioritizing investments in disproportionately impacted communities, and the PUC also requires utilities to include the social cost of carbon into demand-side management program. These requirements encourage utilities to invest in renewables in the future to avoid extra cost in the long-term. Health damage for communities of color and low-income communities could be lowered as more renewable energy is put to use in the future.

Financial costs of fulfilling renewable energy mandates and goals

Although Colorado's policies do in many ways prioritize reducing greenhouse gas emissions, the legislation lacks an associated emphasis on what these policy interventions might cost to the residents, and where this money would come from. The process of electrification will necessitate utilities building massive amounts of new wind and solar capacity in a rapid time span, driving additional costs for new transmission lines to bring more of this power online and battery storage to improve reliability. For example, one IOU's plan for transportation electrification outlines an expenditure ranging from \$439 million to \$549 million. Additionally, the same utility is in the process of developing a \$1.7 billion transmission line to accommodate the anticipated growth in renewable energy. These expenses are compounded by others, including the cost of retiring

productive power plants and replacing them with new, non-emitting generation. The costs of this physical infrastructure buildout risk being passed on to consumers – though encouragingly, capped at 2% of each customer’s total annual electric bill at least for the costs to comply with Colorado’s renewable energy standard.

Interestingly, although wind power accounts for around 75% of Colorado's renewable electricity generation, the state largely lacks defined regulations around wind, particularly for large scale utilities. Perhaps this policy flexibility around large-scale utilities is purposeful; policies that are too rigid and defined risk polarizing communities that prefer flexibility to regulate themselves. On the other hand, however, too much policy flexibility might allow Colorado’s rural local governments to obstruct progress towards renewable energy development.

Still, Colorado’s tax policies indicate a desire to balance local desires with state priorities. The state is explicit about its aim to empower localities in establishing property tax incentives to attract renewable energy projects, and though Colorado does not offer any statewide property tax incentives for renewable energy, all renewable energy property in Colorado is taxable unless specifically exempted under Colorado law. For example, Senate Bill 21-293 includes a temporary reduction in assessment rates for non-residential properties dedicated to renewable energy production, lowering the rate from 29.0 percent to 26.40 percent for tax years 2022 and 2023, which aligns well with the updated distributed energy policy that entity can receive credits from renewable energy projects offsite (virtual net metering). Thus, this bill will likely encourage more projects to be built at a lower cost. Additionally, the PUC sanctioned updated regulations for the state's Community Solar Gardens initiative in July 2020. These revised guidelines broadened entry to the program for affordable housing operators, streamlining the process for donating bill credits to lower-income customers, and eliminated restrictions mandating that subscribers reside in the same or neighboring counties as their community solar facility.

Moving forward

Collectively, Colorado’s renewable energy policies are facilitating a significant shift towards renewable energy in the state, but more can be done. As part of this work, current policies provide room to further encourage the growth of renewable energy projects. A critical priority for future efforts must involve getting more communities on board with renewable energy project development in their areas. A number of successful projects exemplify how the state might help build community acceptance of renewable energy projects via benefits plans and agreements or direct payments to neighboring property owners. Utility-scale projects are generally situated in more rural areas, so inevitably rural residents will disproportionately shoulder the burden of hosting these projects. Encouraging or even requiring developers to provide tangible incentives or benefits to the affected communities, like how the U.S. Department of Energy requires benefit agreements to fund projects, would go a long way in cultivating community acceptance.

The effects of climate change will affect individuals at the state, national, and global levels. Though significantly reducing greenhouse gas emissions is laudable, we must also consider Colorado's energy and climate policies in the context of the state's contributions to climate change. In 2021, Colorado emitted approximately 85 million metric tons of carbon dioxide, ranking as the 22nd largest polluter in the country.⁶ Concerningly, an RMI analysis suggests that based on the state's current policy trajectory, Colorado might emit these 85 million metric tons of carbon dioxide in 2030 and miss its target of reducing to 73.4 million tons by 15%. Therefore, like other states, Colorado thus has responsibility to further accelerate its decarbonizing process by adopting more aggressive renewable energy policies to meet its ambitious goals. Crucially, states must formulate impactful policies and implement well-defined plans with clear procedures to tackle climate change. Building on the progress already achieved towards emissions reductions, existing and future bills will play a crucial role in aiding Colorado to reach its target of a 90% reduction in statewide greenhouse gas emissions by 2050.

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