Denver’s 100% Renewable Electricity Action Plan

EXECUTIVE SUMMARY

August 2020
LETTER FROM THE MAYOR

In 2018, Denver set a goal to achieve 100% renewable electricity community-wide by 2030. The city is proud to release its 100% Renewable Electricity Action Plan (the 100RE Plan) to meet that challenge. The 100RE Plan focuses on the impact Denver makes towards decarbonizing the entire electric system. Denver will prioritize investments in local renewable energy sources, while ensuring affordability and reliability for customers. Achieving 100% renewable electricity will instigate fundamental shifts in traditional grid operations and management. We are well positioned to work with our utility, Xcel Energy, to enable the energy transition.

Denver is confronted with an equally enormous challenge and opportunity. The challenge is to decarbonize the centuries old industries and infrastructure that are the backbone of our economy. The opportunity is to replace those systems with economically, socially, and environmentally sustainable alternatives to create a community in which all Denverites have the opportunity to live, work, and thrive. These issues are compounded by the hardships imposed on Denver’s residents, businesses, and municipal operations by the COVID-19 pandemic.

COVID-19 is exposing discrepancies in our society associated with marginalization and discrimination, economic inequality, overcrowded housing, environmental risks, and limited availability of healthcare. Additionally, protests triggered by the killing of George Floyd have highlighted the racial injustice inherent in our health, education, employment, and criminal justice systems.

Denver is leading the nation in addressing both climate change and structural inequity because we recognize that the transition to a decarbonized economy must be accompanied by societal changes to repair centuries of systemic racism. This moment in history will be regarded as the turning point towards an equitable society that finally acknowledges the direct connection between environmental quality and public health.

The 100RE Plan identifies a set of strategies and opportunities to mitigate the effects of and adapt to a rapidly changing climate. Investments in Denver’s clean energy economy will strengthen our community and solve multiple problems while reducing our carbon footprint. The Renewable Denver Initiative—which will deploy community solar gardens on Denver’s municipal facilities, provide utility bill savings to income-limited households, and expand public access to electric vehicle charging—is just one example of Denver’s investments in the transition to a carbon-free and sustainable economy.

Denver is working hard to ensure a swift economic recovery that produces resilient, sustainable infrastructure and advances equity across our community. The recommendations in this report will directly contribute to the recovery effort. Together, we can achieve an equitable decarbonization of Colorado’s industries and correct our racial and environmental injustices.

Respectfully,

Michael B. Hancock
Mayor
EXECUTIVE SUMMARY

In Denver’s 80x50 Climate Action Plan, the city pledged to achieve 100% renewable electricity community-wide by 2030. Denver recognizes that aggressive and decisive action is needed to achieve this goal. At the same time, Denver must ensure equitable access to the benefits of climate action.

Denver’s 100% Renewable Electricity Action Plan (100RE Plan) was developed over a concurrent time period as Denver’s Climate Action Task Force (referred to as the Task Force). The Task Force was comprised of 26 members of the community from diverse backgrounds. They developed a set of recommendations to strengthen Denver’s work to address climate change equitably. Denver staff from the Office of Climate Action, Sustainability, and Resiliency (CASR) were available as a resource and to provide technical expertise to the Task Force members, including regarding electricity supply.

The collaborative approach and communication between CASR, the 100RE Plan team, and the Task Force enabled the City to establish a clear vision and target for its electricity supply. Specifically,

*Denver’s renewable vision is to enable a rapid and equitable transition to a 100% renewable electric system in Colorado.*

*By 2030, 100% of Denver’s community-wide electricity use will contribute to this vision.*

The above vision and 2030 goal for Denver’s electricity use to “contribute to” a 100% renewable electric system is unique compared to goals to be “powered by” 100% renewable electricity. This is in part due to the recognition that Denver is a part of a larger electric system operated by Xcel Energy in Colorado. *Denver physically cannot be powered by 100% renewable electricity until the entire system is powered by 100% renewable electricity.* Therefore, Denver is focusing on strategies that equitably transition the entire system as quickly as possible.

Renewable Energy Credits, or “RECs”, measure renewable energy production and are “retired” to meet renewable energy goals. Each REC represents one MWh of renewable electricity. RECs were created as a regulatory method for utilities, including Xcel Energy, to meet statutorily defined requirements such as those established by Colorado’s Renewable Energy Standard. RECs retired by the utility benefit all customers by contributing to system-wide decarbonization.

**Xcel Energy customers contribute to system-wide decarbonization in a number of ways:**

1. **Paying utility bills:** As Xcel Energy ratepayers, all customers invest in and enable most of the renewable electricity in Colorado’s electric system.

2. **Expanding distributed solar:** Customers can create RECs with on-site solar arrays or subscriptions to community solar gardens that are transferred to Xcel Energy and used to clean the electric system.

3. **Subscribing to utility-scale RE programs:** Customers can subscribe to utility-scale wind and solar projects through the Windsource and Renewable*Connect programs. The renewable resources supported by these programs are located in Colorado and serve Xcel Energy’s customers.

Denver’s objective is to enable as much new renewable electricity as possible and for the associated RECs from that power to be retired into the system. Whether RECs are retired by the utility on behalf of all customers or by individual customers within the system, there is the same net effect on the total renewable content of the overall system. When RECs are sold to third-parties outside of the system it directly detracts from the renewable electricity content of the delivered grid mix and undermines Denver’s ability to reach its goals.
Denver will realize its vision to enable a rapid and equitable transition to a 100% renewable electric system by prioritizing investments in local renewable energy sources.

Denver is embracing strategies that: 1) influence utility electric resource planning to increase the amount of renewable electricity in the system; 2) expand the deployment of distributed solar; and 3) increase subscriptions to renewable electricity options. The City will retain ownership of RECs to the greatest extent possible but will support strategies in which additive RECs are generated, transferred to, and retired by Xcel Energy towards system-wide decarbonization.

Denver’s focus on “contributions to” achieving a 100% renewable electric system in Colorado means that purchases of stand-alone or unbundled RECs are not a suitable option for Denver to achieve its renewable electricity goals. Options to expand distributed solar—such as on-site solar and community solar gardens through which Denverites receive an incentive payment from Xcel Energy for the RECs they create—can make resources available for the City to invest in additional, local renewable electricity capacity.

If Denver sought to purchase enough stand-alone RECs to match 100% of community-wide electricity use, which reached 6.7 million MWh in 2019, it would be prohibitively expensive and would not advance the City’s equity objectives. For example, Denver could ask taxpayers to fund REC purchases through a renewable electricity option—Xcel Energy’s Windsourse program offers bundled RECs at a cost of $15/MWh—to “clean” the 70% of the community’s power supply expected to be provided from non-renewable resources in 2020. This would cost taxpayers $70.3 million in the first year.

To continue to claim that Denver is powered by 100% renewable electricity, stand-alone REC purchase costs would continue to be borne by Denver’s taxpayers year-after-year until Xcel Energy reaches its publicly stated and statutorily mandated requirement that 100% of the electricity delivered to retail customers be carbon-free by 2050. Although Denver would need to purchase fewer RECs over time as the electric grid incorporates more renewable and carbon-free resources, the cumulative cost of those purchases would be expected to reach over $571 million by 2030 and $932 million by 2050.

Denver’s Climate Action Task Force explicitly recommends against such purchases as an option for the City to achieve its clean electricity goals.2

“If hundreds of millions of dollars of taxpayer money becomes available to support Denver’s electricity decarbonization, those resources should be spent by investing locally in carbon-free energy infrastructure that enable co-benefits such as workforce development, utility bill savings, and more resilient public facilities.”

- Denver Climate Action Task Force

Decarbonization of Colorado’s electric system will require active participation in Colorado Public Utility Commission (PUC) proceedings and close collaboration between Denver and Xcel Energy. Xcel Energy is required by §40-2-125.5, C.R.S. to file a plan with the PUC to reduce carbon dioxide emissions associated with retail electricity sales by 80% from 2005 levels by 2030. Denver’s involvement in the development of this plan and cooperation with Xcel Energy can help to meet and exceed the 80% carbon dioxide reduction target.

Denver’s Climate Action Task Force also recommended expanding the scope of the community-wide target to include both renewable and carbon-free electricity options. The City will continue to prioritize, advocate for, subscribe to, and deploy technically proven and economically viable renewable electricity options in pursuit of its 100RE objectives as described in this plan. The City

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1 Stand-alone or unbundled RECs are often sourced from renewable energy generators located anywhere in the nation and are separate from electricity service.

will consider and evaluate the potential of contributions of non-renewable carbon-free technologies as they are introduced through relevant proceedings at the Colorado PUC.\(^3\)

**Denver’s Electricity Landscape and Strategies to Reach 100% Renewable Electricity by 2030**

Denver as an electricity consumer is nested within Xcel Energy and the Colorado electric system. As such, Denver physically cannot be powered by 100% renewable electricity until the entire system is powered by 100% renewable electricity. The City is prioritizing strategies to accelerate that transition.

Xcel Energy was the first investor owned utility in the country to announce a voluntary target to deliver 100% carbon-free electriciity by 2050 and to produce 80% less carbon on their electric system by 2030 than a 2005 baseline. However, there is still a gap that Denver must close between Xcel Energy’s carbon reduction trajectory and the City’s community-wide renewable electricity goal.

Denver’s renewable electricity contribution metrics adopt a holistic view of the electric system and Denver’s place in it. They include:

- **System Renewables:** The RECs inherent in the electricity Xcel Energy delivers to all retail customers that are not created by, subscribed to, or sold to other customers.
- **Distributed Solar:** The RECs created by Denver customers with on-site solar arrays or subscriptions to community solar gardens that are transferred to Xcel Energy and may be retired towards system decarbonization.
- **Utility-Scale RE Subscriptions:** The RECs retired due to participation in Xcel Energy’s Renewable*Connect and Windsource programs by Denver customers.

Denver’s approach to tracking renewable electricity contributions measures progress towards system wide decarbonization. It ensures that local investments in rooftop solar and community solar gardens are not inadvertently discounted and discouraged. This focus could make resources available for the City to invest in additional renewable electricity capacity to the benefit of both the community and the utility.

System Renewables are expected to account for the majority of Denver’s attainment in 2030. As part of Xcel Energy’s carbon reduction commitments, the utility currently projects it will retire RECs for approximately 60% renewable energy by 2030. Increasing system renewables is critical for the City and requires close collaboration with Xcel Energy and active participation in regulatory proceedings.

Denver has significant untapped distributed energy potential. The City can expand distributed energy resources by strengthening building codes, supporting CSG and rooftop solar programs, and advocating for the expansion of distributed energy resources through PUC proceedings. Approximately 1,150 MW of distributed solar is needed to reach a 30% contribution to Denver’s goal—equivalent to using about 9% of roof space in Denver for solar.

The deployment, integration, and management of distributed energy resources is essential to support increases in electric loads due to the electrification of buildings and transportation systems. The City will pursue strategies and work collaboratively with Xcel Energy to increase energy efficiency programs and use building and transportation loads as grid assets to reduce the amount of grid infrastructure needed to achieve full electrification.

Subscriptions to utility-scale renewable electricity options are necessary to fill any gap below Denver’s target of 100% renewable electricity by 2030. Community engagement and education are expected to drive participation in such programs.

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\(^3\) Denver agrees with the exclusion of fossil and nuclear fuels and their derivatives from consideration as eligible energy resources as per C.R.S. §40-2-124 (1)(a).
Centering Climate Action and Denver’s Electricity Goals in Equity

Equity and community impact are foundational criteria for Denver’s evaluation of climate action strategies. Fundamentally, the objective of Denver’s climate work is to enable an environment in which Denverites can live, work, and thrive for generations. All Denverites have the right to participate in and benefit from the energy transition.

The commitment to equity is a centerpiece of the Task Force’s recommendations.

“The pursuit of equity happens in several ways. Government has historically excluded people of color from decision making processes, so it is critical that processes to make decisions about policies and programs are inclusive and fair. In addition, the benefits or burdens of policies, programs or investments have not always been fair or shared equitably across our City. Looking closely at those impacts and making future corrections is critical. Finally, equity is also about understanding historical patterns of discriminatory action and intentionally correcting for those injustices today.”

- Denver Climate Action Task Force Report

The City agrees with the Task Force that we can reduce greenhouse gas emissions AND advance equity and racial justice. Denver’s clean energy investments can and should strengthen the community.

The economic downturn and pending recovery due to the COVID-19 pandemic is already proven to disproportionately impact people of color. We have an opportunity to build Denver back better, interlacing the recovery across our current economic, racial justice, and climate crises.

The 100RE Plan identifies a set of strategies and opportunities to strengthen our community and solve multiple problems while reducing our carbon footprint.
Denver’s Renewable Vision

Enable a rapid and equitable transition to a 100% renewable electric system in Colorado.

By 2030, 100% of Denver’s community-wide electricity use will contribute to this vision.

Success for Denver’s community-wide renewable electricity goal is based on its contributions towards decarbonizing Colorado’s entire electric system.

Denver is the largest city served by Xcel Energy, representing approximately 25 percent of its total retail sales in Colorado. The City’s choices meaningfully influence the resource makeup and functionality of a 100% renewable electric grid.

Less than 23% of Denver’s community-wide electricity use came from renewable sources on the utility grid or was produced by distributed solar in 2019.

Denver must influence the energy mix of the utility grid and increase local deployments of distributed energy resources, such as rooftop solar, as much and as quickly as possible.


This reliance requires Denver to collaborate with Xcel Energy and participate in regulatory proceedings to influence the City’s energy portfolio and decrease the carbon intensity of its electricity supply.

More than 98% of Denver’s community-wide rooftop solar potential is untapped.

Investing locally in distributed energy infrastructures will enable co-benefits such as workforce development, utility bill savings, more resilient public facilities, and cleaner buildings and transportation.

In 2018, Denver made the pledge to achieve 100 percent renewable electricity community-wide by 2030. The Office of Climate Action, Sustainability, and Resiliency was directed to develop a plan to achieve that transition.
Strategies to Achieve 100% Renewable Electricity

01 Decrease the carbon intensity of the utility grid mix
02 Expand distributed energy resources
03 Lead with municipal infrastructure
04 Educate and engage the community
05 Invest in energy workforce development

Within each strategy, Denver will prioritize opportunities that maximize climate impact and equity, that the City can control or exert meaningful influence over, and where it can overcome challenges to implementation.

Equity
All Denverites have the right to participate in and benefit from the clean energy transition.

Community Impact
Denver’s climate action investments should provide co-benefits for the community.

Climate Impact
Prioritize strategies that result in the largest reduction in greenhouse gas emissions.

Denver’s actions should enable systemic shifts in status quo operations for City government and electric grid operations. They should produce co-benefits such as workforce development, utility bill savings, and more resilient public facilities.

Systemic Change
Shift the status quo

Sustainable Infrastructure
Lead with municipal space

Community Empowerment
Strengthen the community
Influencing the transition to a 100% renewable electric system will require strong leadership, robust partnerships, and coordination with concurrent climate efforts. The following three metrics will track Denver’s influence towards a 100% renewable electric system:

**System Renewables**: Renewable electricity delivered by Xcel Energy to all customers with deductions for REC sales, Renewable Connect, Windsource, and retail distributed solar.

System renewables account for nearly all of Denver’s renewable electricity and are expected to account for the majority of Denver’s 2030 target. Increasing system renewables in the City’s energy portfolio requires collaboration with Xcel Energy and active participation in state regulatory proceedings.

**Distributed Solar**: Distributed solar generation enabled by Denverites through on-site solar and subscriptions to community solar gardens as part of Xcel Energy’s Solar*Rewards programs.

Denver has significant untapped distributed energy potential. The City can expand distributed energy resources by strengthening building codes, hosting community solar gardens, supporting community organizations, and influencing regulatory proceedings to incentivize investments in distributed resources.

**Subscriptions to Utility-scale Renewables**: Electricity purchases by utility customers in the City and County of Denver as part of Xcel Energy’s Renewable Connect and Windsource programs.

Subscriptions to utility-scale renewable electricity options may be necessary to fill any gap below Denver’s target of 100% renewable electricity by 2030. Community engagement and education is expected to be the primary driver to encourage residential and commercial entities to subscribe.
Public Survey Responses – Support for the Energy Transition

88% of survey respondents agree that, “Denver should transition to 100% renewable electricity for all municipal buildings, private buildings, and homes by 2030.”

87% of survey respondents agree that, “Denver should invest in solar power and battery storage systems that enable areas of the electric grid to function independently and remain powered during emergencies.”

92% of survey respondents agree that, “Denver should install solar panels on municipal facilities and prioritize purchasing renewable electricity from projects located in Colorado rather than purchasing Renewable Energy Credits that fund power projects in other states.”

Denverites are willing to make voluntary contributions to climate action efforts

76% of respondents are willing to contribute to climate action efforts through a voluntary contribution on their electricity bill.

This includes,

- local workforce development programs,
- renewable energy projects,
- efficient buildings, and
- clean transportation.

Community Considerations and Priorities

Main challenge to powering your home with 100% RE,

“The up-front costs are prohibitive.”

Critical attribute for a renewable electricity program,

“I want my electricity to come from a local source.”

Top priority for the transition to 100% renewable electricity,

“The transition to 100% RE should occur as rapidly as possible.”

Survey detail provided in Appendix A