TOWN OF MOUNTAIN VILLAGE CLIMATE ACTION PLAN

September 2020

lotus
engineering & sustainability

Acknowledgments

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EXECUTIVE SUMMARY

MOUNTAIN VILLAGE: A COMMUNITY FOCUSED ON CLIMATE ACTION

Nestled in the San Juan Mountains and surrounded by natural beauty, abundant outdoor recreation opportunities, and the native wilderness of the Rocky Mountains, the Town of Mountain Village (Town/Mountain Village) is committed to protecting and enhancing the natural environment. Since the Town's incorporation, sustainability has been a top priority for Mountain Village's community and leaders. The Town has participated in regional work to analyze and estimate community greenhouse gas (GHG) emissions since 2010 and has developed and supported many community programs to reduce energy use and community-generated waste, such as the Smart Building Incentive Program and the Compost Incentive Program.

Mountain Village recognizes the urgent need to reduce emissions and prevent the worst impacts of climate change If current emissions levels are not abated, the Town and similar mountain and tourist-based communities across Colorado and the southwest are in danger of experiencing significant changes in precipitation, seasonality, and snowpack as evidenced by historic data.[1]

[1] Environmental Protection Agency. (2017). What Climate Change Means for Colorado. Retrieved from 19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-co.pdf on June 20, 2020.

Recognizing the need to take a more proactive role in reducing global GHG emissions and help to prevent the most dire impacts from climate change, in 2020 Mountain Village decided to build off the Town's past efforts and work towards becoming a carbon-neutral community by 2050. This effort required developing a community-wide GHG inventory in order to understand the specific emissions sources and impacts that the Town could influence, as well as modeling the status-quo emission projections over the coming years. The resulting Climate Action Plan (CAP) for Mountain Village presents the framework for achieving significant emissions reductions in the community between 2020 and 2050.

MOUNTAIN VILLAGE'S 2019 GHG EMISSIONS INVENTORY

Mountain Village's 2019 GHG emissions inventory provides an analysis of community-based activities and shows an emissions total of 72,269 metric tons of carbon dioxide equivalent (mt CO_2e), with a majority of emissions coming from the energy used in buildings. See Figure ES-1 and ES-2.

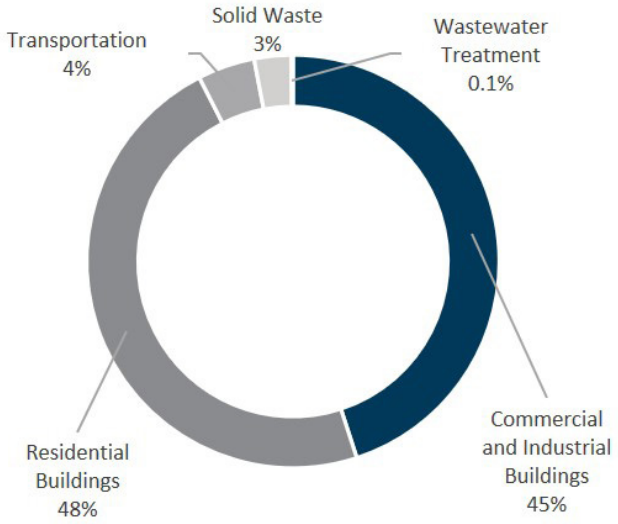

Figure ES-1. Mountain Village's 2019 emissions by sector.

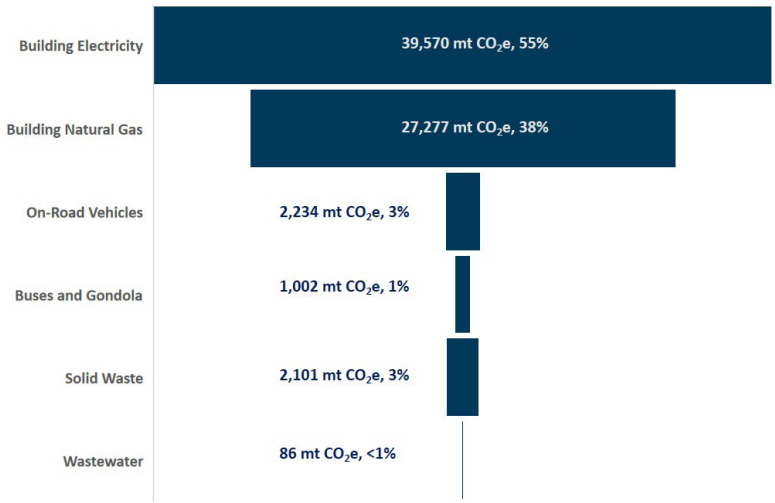

Figure ES-2. Mountain Village's 2019 emissions by source.

The largest share of emissions comes from the use of energy to power, heat, and cool buildings and outdoor systems (such as snow melt systems). Emissions from residential buildings make up 48 percent of the community's total, while commercial and industrial buildings make up 45 percent of the community's total. Due to its small size and abundant transit options, Mountain Village has relatively fewer than average emissions from transportation activities in the community (four percent).[2] Three percent of emissions come from solid waste disposal in landfills. One-tenth of one percent of emissions come from wastewater treatment processes.

[2] Based on Lotus' familiarity with community-generated emissions inventories in Colorado from other work. Transportation in Mountain Village accounts for four percent of the 2019 GHG emissions inventory, compared to an average of around 30 percent of emissions for many communities.

MOUNTAIN VILLAGE'S CLIMATE ACTION PLAN

Mountain Village's top priority is ensuring that the climate action work benefits all community members by enhancing the quality of life and protecting the valued natural resources and surroundings. Through conversations with Town staff and the Town's Green Team Committee, six key community values for the Town's climate action work were identified; see the grey box to the right. By referencing these values throughout the implementation of the climate action strategies and as the Town identifies specific policies and programs that are relevant to pursue, the Town will ensure that its climate action work continues to align with the vision of a future it wishes to maintain for Mountain Village.

MOUNTAIN VILLAGE'S CLIMATE ACTION VALUES

- Promote fiscal responsibility.
- Enhance the quality of life for residents and visitors.
- Support a circular economy and equitable, higher quality, less impactful products.
- Promote cultural and behavioral change through education and engagement programs.
- Support regional food networks and local food sourcing.
- Enhance equity throughout the community.

A final list of strategies for emissions reductions will help the community move towards its 2050 carbon neutrality goal and support its community values. The resulting CAP includes 11 strategies with a collective 33 suggested implementation actions that the Town and the broader Mountain Village community will embark on in the coming years to reduce the community's GHG emissions. If all strategies and targets established in the CAP are achieved, Mountain Village will reduce its emissions by over 85 percent by the year 2050, based on a 2010 emissions baseline. Mountain Village's climate action strategies are:

1. Reduce single-occupancy vehicle use through increased biking, walking, and transit use.
2. Support equitable electric vehicle adoption.
3. Switch government fleet vehicles to electric vehicles.
4. Educate the public on behavior changes.
5. Promote and expand residential energy efficiency programs.
6. Promote and expand commercial energy efficiency programs.
7. Promote fuel switching (i.e., electrification programs for buildings).
8. Reduce energy usage in municipal buildings.
9. Implement policies and programs that support comprehensive renewable energy growth for the community.
10. Support policies to advance a clean energy agenda in the state.
11. Reduce solid waste and increase diversion.

Each climate action strategy includes at least one, if not several, specific implementation actions that are intended to ensure the strategy is impactful, including suggestions on specific programs and policies that may be most effective to employ for the community to reach its goals.

MOUNTAIN VILLAGE: LEADING ON CLIMATE ACTION

Mountain Village is prepared to help prevent the worst effects of climate change and recognizes that by addressing climate change through the implementation of the strategies outlined in this document, the community can improve quality of life and protect the area's treasured natural resources. As Mountain Village embarks upon this work, it will benefit from working collaboratively with its local partners, including utilities, regional organizations, and state and national agencies and entities that are also interested in this work; through collaboration and strategic implementation of this Climate Action Plan Mountain Village can achieve its emission reduction goal while ensuring a healthy, equitable, and livable future.

INTRODUCTION

The Town of Mountain Village (Town/Mountain Village) is committed to creating a healthier, more sustainable, and greener future inclusive of all community members. In 2020, the Town embarked upon multiple efforts to better understand the community's impact on climate change and identify relevant and impactful greenhouse gas (GHG) emissions mitigation strategies, while working to enhance the quality of life in the community.

Lotus Engineering and Sustainability, LLC (Lotus) completed this work and it included developing the Town's 2019 community-wide GHG emissions inventory, completing an additional GHG inventory for municipal operations, identifying trends and changes between past and current emissions inventories, creating inventory management plans so that future inventories can be completed in-house, identifying the community's values and most impactful and realistic strategies for climate action, and modeling emissions under a business-as-usual case scenario. The result is an actionable Climate Action Plan (CAP) that guides the community to reduce its community-wide GHG emissions by 85 percent between 2020 and 2050 (based on a 2010 emissions baseline).

MOUNTAIN VILLAGE: FOCUSED ON CLIMATE ACTION

Mountain Village is committed to addressing environmental sustainability and climate action through Town operations as well as community-based programs and policies. Incorporated in 1995 and with a full-time resident population of almost 1,500 people, the Town sees a significant increase in population in the winter and summer months due to its adjacency to world-class skiing facilities, the Town of Telluride (the two communities are connected via a gondola system), and the recreational offerings of the surrounding ecosystem.

Since the Town's incorporation, sustainability has been a top priority for Mountain Village's community and leaders. In partnership with other communities across San Miguel and Ouray counties, Mountain Village supported the development of a Sustainability Strategy and Action Plan for the region for the years from 2010 through 2020. Through this work, Mountain Village committed to better understanding and reducing its environmental impact through a variety of programs and actions. The Town has participated in regional work to analyze and estimate community GHG emissions since 2010 and has developed and supported many community programs to reduce energy use and community-generated waste, such as the Smart Building Incentive Program and the Compost Incentive Program.

THE CALL TO ACTION

The Intergovernmental Panel on Climate Change's 2018 report on the impacts of a 1.5 degree Celsius (2.7 degrees Fahrenheit) increase in global temperatures illustrates the grave results on ecosystems, human health, and our ability to thrive if we do not act quickly, collectively, and effectively to mitigate GHG emissions.[3]

Globally, cities, towns, and urban areas are estimated to be responsible for approximately 75 percent of global carbon dioxide emissions due to the large amount of concentrated activity occurring in densely populated places. These communities can have broad influence and impact on efforts to address climate change mitigation and adaptation and are an integral part of the solution to the climate crisis.[4] Towns like Mountain Village, while small in population, can have an outsized impact in their role in fighting the climate crisis because of their ability to not only ensure their community is an environmentally sustainable option for travel, but also through educating and influencing visitors to do their part while visiting and after traveling back home.

[3] For more information see https://www.ipcc.ch/sr15/.

[4] For more information see https://www.unenvironment.org/explore-topics/resource-efficiency/what-we-do/cities/cities-and-climate-change.

Across the United States, states and towns like Mountain Village are declaring commitments to carbon reduction. Through intentional action and collaboration with the Town's community and local, regional, and state partners, Mountain Village can do its part in mitigating climate change and ensuring a high quality of life for current and future generations of residents and visitors.

WORKING TOWARDS A MORE SUSTAINABLE FUTURE

In 2020, recognizing the need to take a bigger role in reducing global GHG emissions and prevent the most dire impacts from climate change, Mountain Village decided to build off the Town's past efforts and work towards becoming a carbon-neutral community by 2050. This effort required developing a community-wide GHG inventory to understand the specific emissions sources and impacts that the Town could influence, as well as modeling the status-quo emission projections over the coming years. In addition to these activities, Lotus completed research and met with community representatives, including the Town's active Green Team Committee, to build consensus around the high-level strategies that would be most impactful and realistic for the community to implement over the coming years. The resulting CAP for Mountain Village presents the framework for achieving significant emissions reductions in the community between 2020 and 2050.

The CAP includes 11 strategies with a collective 33 suggested implementation actions that the Town and the broader Mountain Village community will embark on in the coming years to reduce the community's GHG emissions. If all strategies and targets established in the CAP are implemented and achieved, ***Mountain Village will reduce its emissions by over 85 percent by the year 2050, based on a 2010 emissions baseline.***

2019 GREENHOUSE GAS EMISSIONS INVENTORY

METHODOLOGY

Mountain Village's 2019 GHG emissions inventory provides an analysis of community-based activities in the 2019 calendar year that resulted in GHG emissions. The inventory is compliant with the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC protocol), which is a global standard for GHG emission accounting and reporting. The GPC protocol was developed and launched in 2014 and provides a template from which communities can create comparable and standard emission inventories. The GPC protocol defines what emissions must be reported, as well as how those emissions are to be calculated and reported.

The GPC includes two different reporting levels, BASIC and BASIC+:

- **BASIC:** The BASIC methodology covers stationary energy, in-boundary transportation, and community-generated waste.
- **BASIC+:** The BASIC+ level includes BASIC emission sources, as well as a more comprehensive coverage of emissions sources such as trans-boundary transportation; energy transmission and distribution losses (i.e., the loss of some amount of electricity during the delivery process from the supplier to the customer); industrial processes and product use (IPPU); and agriculture, forestry and other land uses (AFOLU).

Mountain Village chose to complete a BASIC inventory that includes additional emissions from aviation occurring outside the community. The GHGs accounted for in the inventory include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Emissions are calculated in an inventory workbook created specifically for Mountain Village, and results are totaled as metric tons of carbon dioxide equivalents (mt CO_2e). Accompanying the community inventory workbook, Lotus also created a corporate GHG inventory for Town operations and identified the key drivers of changes in emissions from the original emissions analysis conducted in 2010 through the

current inventory. Lotus also prepared inventory management plans that detail how to collect data and complete an emissions inventory in-house in future years.

The inventory categorizes emissions by scopes, sectors, and sources. Scopes are defined by globally recognized protocols and provide a very high-level view of emissions with combined sectors and sources within. Per the GPC protocol,[5] the following definitions apply to emission scopes (see Figure 1).

- **Scope 1:** GHG emissions from sources located within the boundary.
- **Scope 2:** GHG emissions occurring as a result of the use of grid-supplied electricity, heat, steam and/or cooling within the boundary.
- **Scope 3**: All other GHG emissions that occur outside the boundary as a result of activities taking place within the boundary.

The boundaries of the 2019 GHG inventory were set as Mountain Village's town limits.

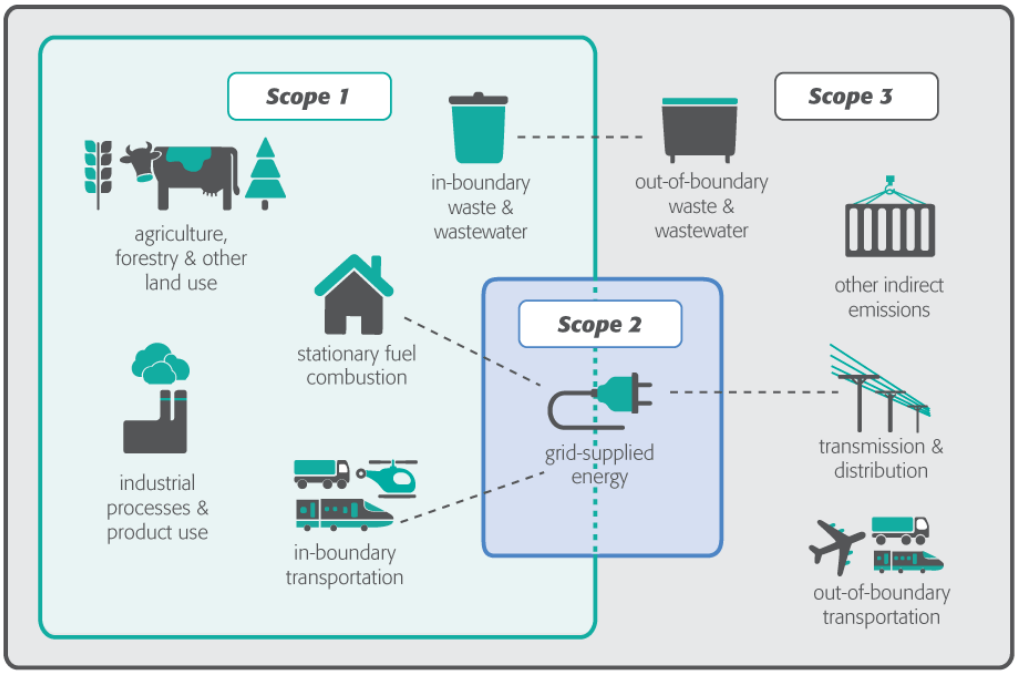

Figure 1. Definitions of emissions scopes.

[5] For more information see https://ghgprotocol.org/sites/default/files/standards_supporting/GPC_Executive_Summary_1.pdf.

KEY FINDINGS FROM THE 2019 INVENTORY

TOTAL EMISSIONS

The inventory showed a 2019 BASIC emissions value of 72,269 metric tons of carbon dioxide equivalent (mt CO_2e). An additional 129 mt CO_2e are attributable to Mountain Village from air travel in the region.

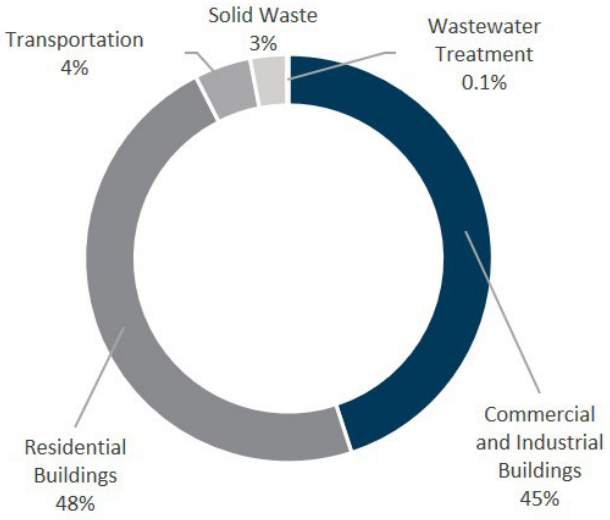

Figure 2. Mountain Village's 2019 emissions by sector.

The largest share of emissions comes from the use of energy to power, heat, and cool buildings and outdoor systems (such as snow melt systems). Emissions from residential buildings make up 48 percent of the community's total, while commercial and industrial buildings make up 45 percent of the community's total. Due to its small size, Mountain Village has a smaller proportion of emissions than typically generated from transportation activities in the community.[6] Three percent of emissions come from solid waste disposal in landfills. One-tenth of one percent of emissions come from wastewater treatment processes. See Figure 2.

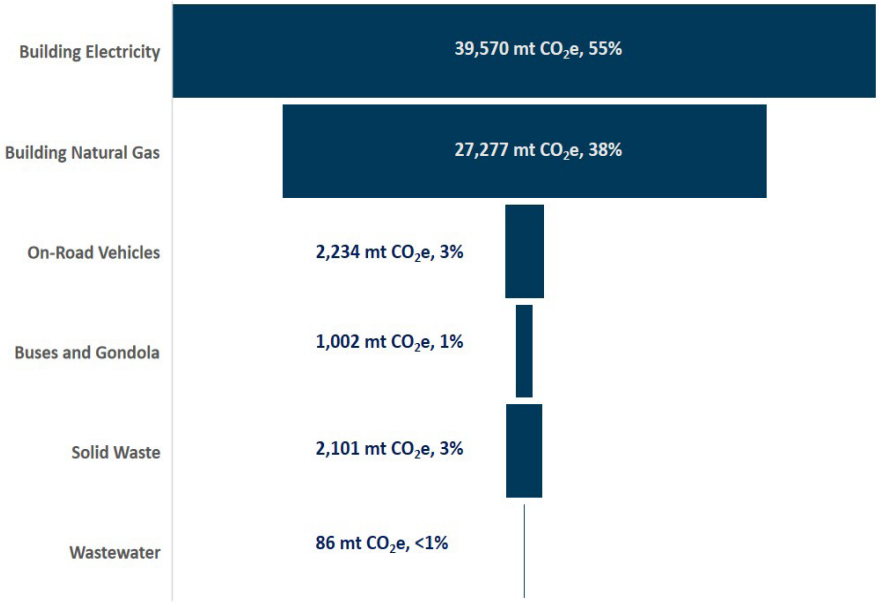

Figure 3. Mountain Village's 2019 emissions by source.

More than half (55 percent) of Mountain Village's emissions were generated from the use of electricity to power buildings. Electricity in Mountain Village is provided by San Miguel Power Association (SMPA), a member-owned electricity cooperative that purchases most of the power it provides members from Tri-State Generation and Transmission (Tri-State). Thirty-eight percent of community emissions are generated from

[6] Based on Lotus' familiarity with community-generated emissions inventories in Colorado from other work. Transportation in Mountain Village accounts for four percent of the 2019 GHG emissions inventory, compared to an average of around 30 percent of emissions for many communities.

the burning of natural gas in the Town, primarily to heat buildings, provide hot water, and operate snowmelt systems. Natural gas in the community is provided by Black Hills Energy. See Figure 3 for a detailed illustration of other emissions by the source activity for Mountain Village.

Mountain Village's emissions per capita are 50.4 mt CO_2e based on a 2019 resident population of 1,434 people. This is higher than average for many communities across the country, but it should be noted that the large number of tourists have a significant impact on the community's energy use and related emissions. When considering tourists in the community,[7] in 2019 the total per capita emissions for all residents plus visitors was 12.7 mt CO_2e, which is much more in-line with leading communities across the state.[8] As Mountain Village continues to monitor its progress towards emission-reduction goals, analyzing the per capita emissions value will allow the Town to better understand how economic and community growth are impacting changes in emissions overall.

BUILDING AND STATIONARY ENERGY EMISSIONS

The stationary energy sector includes emissions from energy used in building systems, snowmelt systems, outdoor lighting, and other energy use tied to stationary sources. This sector also includes emissions generated from the leakage of natural gas during the distribution process. Electricity use produces more than half of the emissions from stationary energy, with residential electricity use making up 32 percent of the pie and commercial electricity use making up 28 percent. Commercial buildings generate 20 percent of stationary emissions from natural gas use, with natural gas use in residential buildings generating 19 percent. See Figure 4.

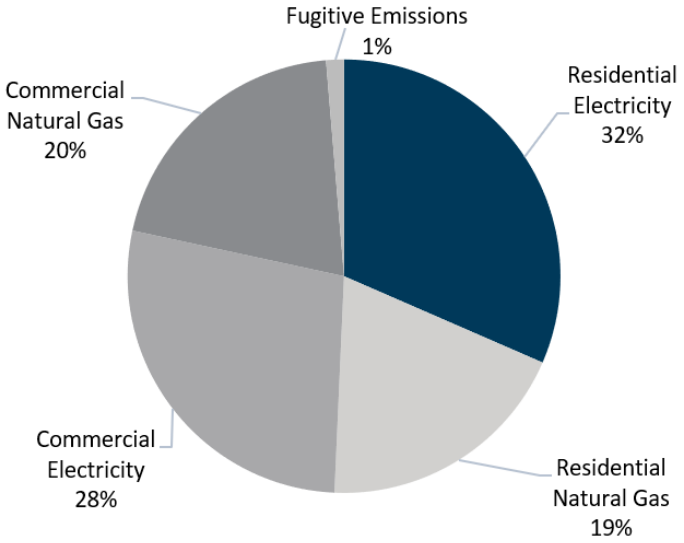

Figure 4. Mountain Village's 2019 building emissions detail.

GPC does not allow communities to subtract negative emissions from the purchase of renewable energy credits (RECs) or other emission offsets in their official inventory, but many communities include information on these offsets or 'avoided emissions' to understand the impact of local decisions.

[7] Based on data provided by Visit Telluride, the average daily population in Mountain Village in 2019 for residents plus visitors was estimated to be 5,693 people.
[8] Based on Lotus' work and research. Boulder's (CO) per capita emissions value is 13.7 mt CO_2e (2019), Denver's (CO) is 11.6 (2019), Fort Collins (CO) is 12 (2017).

In 2019, 1,880 mt CO_2e, (representing just over 2.5 percent of the Town's total emissions) were avoided by the purchase of RECs, community solar subscriptions, or through on-site solar installations in the community. SMPA owns the RECs associated with any on-site solar in Mountain Village, and some customers in the community additionally choose to purchase RECs to offset the impact of their energy use. RECs owned by SMPA are included in the calculation of Mountain Village's electricity emission factor. If the use of on-site solar were to increase in Mountain Village, one could assume that the utility would continue to retain the RECs associated with this renewable production, and therefore, increased solar would contribute to a lower emissions factor (i.e., carbon intensity) of the electricity provided by SMPA, leading to lower emissions from electricity use in future inventories.

As the vast majority (92 percent) of Mountain Village's emissions are generated from energy use in buildings (refer to Figure 4), addressing and reducing energy use powering building systems with less carbon-intensive energy resources will be the Town's most effective approach for reducing community-wide GHG emissions.

TRANSPORTATION EMISSIONS

Mountain Village's transportation system is unique among many of its peers. Due to its small size, the Town experiences less vehicular on-road activity that may be typical of other Colorado communities. In addition to emissions produced from on-road vehicular gasoline and diesel consumption, and electric vehicles (which together comprise over 66 percent of all transportation emissions), the Town operates a public transportation gondola system in collaboration with nearby Telluride. The gondola provides access to the Town center, the ski areas, and Telluride and is used frequently by residents and visitors. In addition to the gondola system, the Town operates a summer bus line and a Dial-A-Ride shuttle service in the winter and summer seasons; due to their frequency of use by visitors to the community, hotel shuttles were also included in the calculation of emissions from transit. As seen in Figure 5, transit activity comprised nearly 31 percent of all transportation emissions in the community.

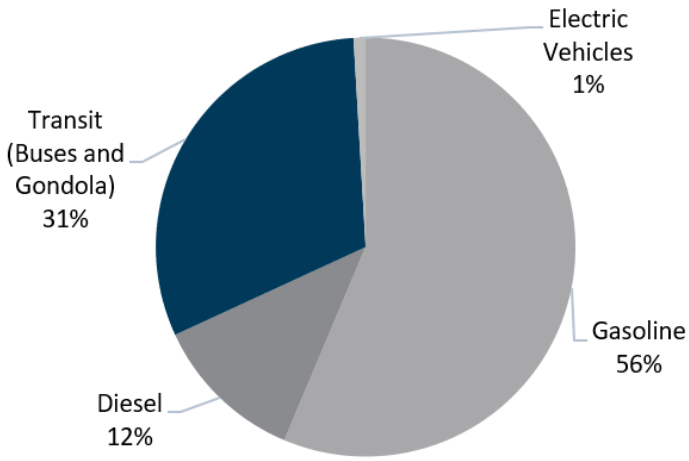

Figure 5. Mountain Village's 2019 transportation emissions detail.

The gondola runs on electricity. The Town purchases RECs and has installed on-site solar systems to offset the energy used for the gondola; these purchases qualify the gondola system as an Environmental Protection Agency (EPA) Green Power Partner.[9]

WASTE AND WASTEWATER EMISSIONS

In the waste and wastewater sector, which comprises three percent of total community emissions, the majority of emissions are from the collection and disposal of solid waste generated and landfilled by the community, which makes up approximately 96 percent of the total emissions from this sector. Currently, large-scale composting activities are not being tracked in the community; backyard composting is difficult to manage locally due to wildlife issues, but the Town's composting incentive program does support home composting by providing residents with the opportunity to receive a free home composting unit.

As is the case with renewable energy, the GPC does not allow communities to subtract emissions avoided through recycling in the community; however, these data points are useful for understanding the full impact of a community's decisions. In 2019, 4,830 mt CO_2e (representing nearly seven percent of the community's total emissions) were avoided from recycling activities. These avoided emissions represent a life-cycle impact and include reduced virgin inputs being needed for new materials and reduced landfill disposal.

[9] For more information see https://townofmountainvillage.com/green-living/energy-use/alternative-energy/.

CLIMATE MITIGATION STRATEGIES

Mountain Village has a goal of becoming a carbon-neutral community by 2050, meaning that the community reduces all emissions to the degree possible and offsets emissions that cannot be reduced through the purchase of RECs or through other measures. Understanding the environmental impact of community activities ensures that as the Town continues to address climate action, it does so in a way that makes a significant impact on overall emissions and supports key community values.

Lotus analyzed common and effective emission-reduction strategies being employed by communities of similar size and character to Mountain Village to identify the primary strategies that may be utilized locally to reduce emissions. Following this research, Lotus presented a list of potential solutions and gathered feedback from Town staff and the Green Team Committee to determine which strategies the Town would like to pursue. Lotus also collected feedback from the Green Team Committee on the community values and attributes of living in and visiting Mountain Village that are considered important to maintain and enhance through the Town's climate action work.

COMMUNITY VALUES FOR CLIMATE ACTION

As community-based emission reduction solutions do not occur in a vacuum, Mountain Village identified the primary community values and attributes that should be enhanced through the Town's emission reduction work. The list to the right represents the values and ideals that Mountain Village's climate action strategies should align with in order to ensure that the entire community benefits from this work. As Mountain Village takes the next steps to identify specific

MOUNTAIN VILLAGE'S CLIMATE ACTION VALUES

- Promote fiscal responsibility.
- Enhance the quality of life for residents and visitors.
- Support a circular economy and equitable, higher quality, less impactful products.
- Promote cultural and behavioral change through education and engagement programs.
- Support regional food networks and local food sourcing.
- Enhance equity throughout the community.

implementation steps for the Town's climate action work, any potential policies and programs should be vetted against this list to ensure that the benefits of the work are not restricted to reducing emissions, but also results in a higher quality of life for the whole community.

OVERVIEW OF GREENHOUSE GAS REDUCTION STRATEGIES

BUSINESS-AS-USUAL MODELING RESULTS

In addition to understanding Mountain Village's current emissions, the Town was also interested in understanding what projected emissions would be based on community growth and a status-quo case scenario from the baseline year of 2010 through 2050. Lotus collected data on past emissions estimates, the anticipated growth of the Mountain Village resident population, and projected emissions factors for electricity to generate an estimate of the change in emissions for the community.

Between 2010 and 2019 Mountain Village reduced its emissions by seven percent; 2010 emissions were 5,593 mt CO_2e higher than the 2019 emissions value. This reduction was likely caused by a combination of community programs and less carbon-intensive electricity from SMPA in 2019 as compared to 2010.

Between 2010 and 2050, Mountain Village's population is anticipated to grow by 184 percent,[10] and under a status-quo case scenario, population growth will cause higher emissions from the building energy, transportation, and waste sectors. The growth in emissions from each sector will be somewhat balanced by fewer emissions coming from electricity use; this is based on announcements from Tri-State, SMPA's wholesale power provider, regarding a goal that the generation utility provide 70 percent carbon-free electricity by 2030.[11] The result of these impacts is a 2050 emissions value that is approximately 14 percent lower than the 2010 emissions value (77,991 mt CO_2e in 2010 and 66,991 mt CO_2e in 2050); see Figure 6.

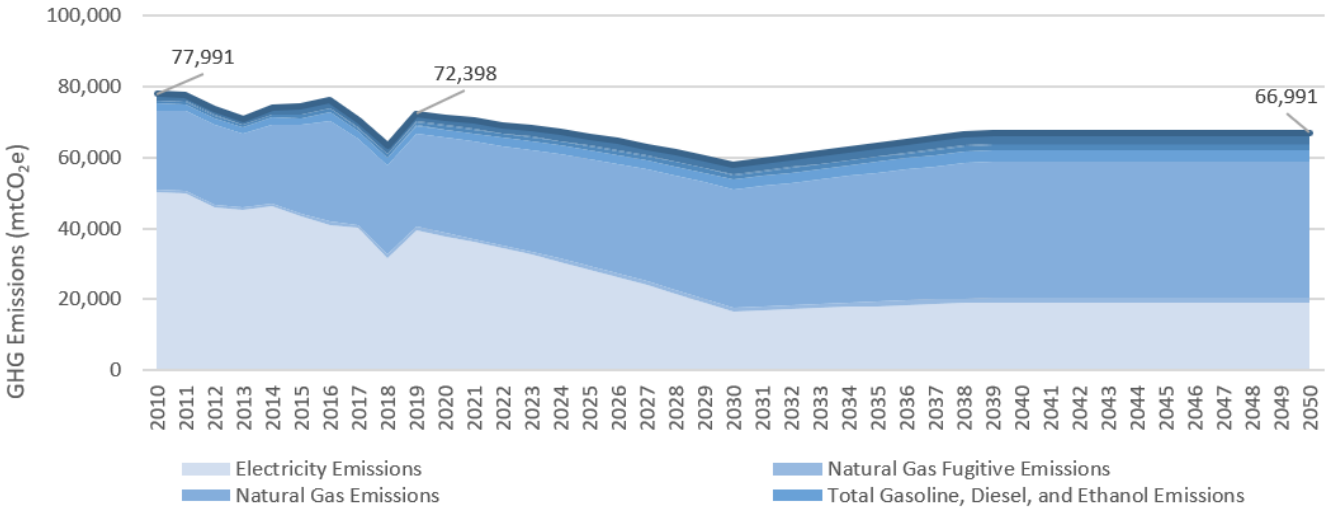

Figure 6. Mountain Village's status-quo emissions projections to 2050.

[10] Based on anticipated population growth for San Miguel County as provided by the Colorado Department of Local Affairs.
[11] Based on conversations with representatives of Tri-State Energy. For more information please see https://energynews.us/2020/01/21/west/tri-state-ceo-says-wholesalers-clean-energy-transition-will-pay-dividends/.

MOUNTAIN VILLAGE: POISED FOR CLIMATE ACTION

The final list of climate action strategies for Mountain Village was compared against the business-as-usual case scenario to understand the quantitative impact of the Town's strategies towards achieving the carbon neutrality goal. It is estimated that, if the Town were to successfully implement the strategies using the participation targets applied in the model, Mountain Village will be able to reduce its 2050 emissions by 85 percent from the 2010 baseline, for a 2050 emissions value of approximately 11,644 mt CO_2e, see Figure 7. If the Town reaches its goal, per capita emissions for residents and visitors in the community will be drop dramatically from 12.7 mt CO_2e to approximately 1.4 mt CO_2e.[12]

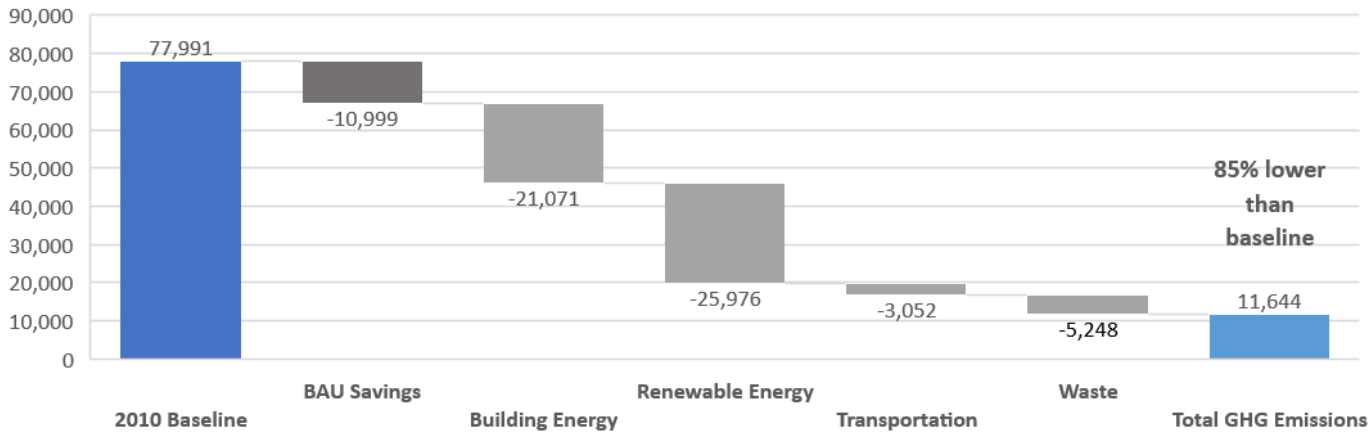

Figure 7. Mountain Village's emission reductions by sector based on CAP strategies.

The final list of high-level climate action strategies for Mountain Village are outlined on the following pages. Using data on current activities in Mountain Village and on energy use and transportation patterns nationally, Lotus estimated the potential for these strategies to reduce community emissions over the coming years. These strategies present a framework for the Town to follow when determining where and how to invest staff time and resources over the coming years. Discussions with Town staff, the Green Team Committee, and other stakeholders helped identify some of the specific actions that the community can take to convert this plan into action, and an important next step will be for Mountain Village to meet with its community of residents and business owners, local leaders, and regional partners to determine the specific implementation details for ensuring this work is completed.

[12] This assumes a 2050 emissions value of 11,644 mt CO_2e and a 2050 population of 8,126, which is the Town's growth cap.

TRANSPORTATION STRATEGIES

There are four transportation strategies for Mountain Village to pursue; the combined impact of these strategies is a four percent reduction in emissions from the 2010 baseline in the year 2050. See Table 1.

Transportation Strategy	Suggested Supporting Action	Reduction from 2010 Baseline
T1. Reduce single-occupancy vehicle travel through increased biking, walking, and transit use.	T1a. Expand multimodal connectivity.	1%
	T1b. Expand transit-oriented development throughout the community.	
	T1c. Accelerate the development of walkable/ bikeable networks.	
T2. Support equitable electric vehicle adoption.	T2a. Increase the presence of electric vehicle chargers.	3%
	T2b. Transition school buses to use alternative energy sources (i.e., electricity, CNG).	
	T2c. Promote the expansion of EVs in the community.	
T3. Switch government fleet vehicles to electric vehicles.	T3a. Transition municipal fleet to an electric vehicle fleet.	N/A*
	T3b. Consider low-emissions vehicle alternatives for the municipal fleet and equipment where electric vehicles are not a viable option.	
T4. Educate the public on behavior changes.	T4a. Develop a targeted branding and education campaign around reducing single-occupancy vehicle use and investing in EVs.	N/A*

**Strategies for which the emissions reduction potential is assumed to be minimal were not included in the modeling effort.*

Table 1. Transportation strategies for Mountain Village.

The greatest opportunity to reduce transportation emissions comes from support a transition to electric vehicles (EVs) across the community, followed by reducing travel in single-occupancy vehicles. EVs are vehicles that use an electric motor rather than an internal combustion engine (ICE) to power the vehicles. It should be noted that EVs still do produce emissions associated with the electricity that powers them; however, even at current and projected electricity emissions levels for SMPA, the transition to electric vehicles will reduce the community's emissions by three percent by 2050 (assuming 70 percent of vehicles on the road in 2050 are EVs).

If Mountain Village were to be powered by 100 percent renewable energy or offset the community's total electricity use with the purchase of RECs, the emissions savings could be even greater. Mountain Village can encourage greater adoption of EVs in the community through expanding the number and availability of charging stations (currently there are five charging stations); promoting programs and events that expand EV awareness and incentives (such as ride-and-drive events or

group bulk purchasing programs for the community); greening the municipal fleet vehicles when they come up in the replacement cycle; and working with local special districts, including the school district, to help them transition to cleaner and less-polluting vehicles. A crucial component of supporting EV adoption is ensuring there is a local market of service providers to support vehicle sales and maintenance; Mountain Village will benefit from supporting the development of a regional EV market that can provide these services.

Mountain Village has a strong gondola-based transit system that is used for transit between the Town and the ski area and surrounding communities. By encouraging or requiring all new developments and growth in the community to be centered with easy access to transit and multi-modal connectivity options, and by enhancing signage and wayfinding for multimodal connections, the Town can help its community to reduce their time spent traveling alone in a car while prioritizing active transportation alternatives. This effort should include a cohesive branding campaign that educates residents and visitors about transportation options in the community, including the ease of using public transit and bike trails, enhanced route marking and wayfinding for multimodal travel, the availability of EV charging infrastructure, and cost savings and air quality benefits that come with replacing ICE vehicles with EVs.

BUILDING ENERGY STRATEGIES

Mountain Village has identified four strategies to reduce emissions from the building energy sector; see Table 2. Combined, these strategies are anticipated to reduce the community's GHG emissions by approximately 27 percent from the 2010 baseline between now and 2050.

The Town should continue to work with SMPA and local partner agencies to market and expand the available energy efficiency programs for commercial and residential buildings. Requiring or incentivizing building energy benchmarking will ensure that community members better understand and are aware of how their buildings use energy and where there may be opportunities to reduce that energy use. On the commercial side, policies that require or incentivize building retro-commissioning will ensure that building systems continue to operate efficiently and effectively and may also result in energy cost savings for building owners and managers.

Based on conversations with individuals familiar with the Town's current energy programs and codes, continuing to adopt the most recent International Energy Conservation Code (IECC) when it is released and addressing updates in the Town's Renewable Energy Mitigation Program (REMP), which addresses exterior energy use, will be important measures to make sure that the Town continues to reduce building energy use across the community. The impact of the strategies aimed at promoting and expanding energy efficiency programs for both the commercial and residential

sectors is likely to reduce the Town's 2050 emissions by 10 percent from the 2010 baseline.

Building Energy Strategy	Suggested Supporting Action	Reduction from 2010 Baseline
B1. Promote and expand residential energy efficiency programs.	B1a. Implement a residential benchmarking program.	4%
	B1b. Accelerate low-to-moderate-income energy efficiency retrofit programs.	
	B1c. Provide mechanisms to encourage the reduction of energy in moderate-to-high-income households.	
	B1d. Address needed updates in building codes and the REMP program to address snowmelt systems and the calculation of solar offsets.	
B2. Promote and expand a commercial energy efficiency programs.	B2a. Implement a commercial benchmarking program.	6%
	B2b. Provide mechanisms to encourage the reduction of energy in commercial buildings.	
	B2c. Require and incentivize commercial building retro-commissioning.	
	B2d. Address needed updates in building codes and the REMP program to address snowmelt systems and the calculation of solar offsets.	
B3. Promote fuel switching (i.e., electrification programs for buildings).	B3a. Work with building owners to convert commercial and residential buildings from natural gas systems to electric systems and offset electricity use with an on-site solar system or RECs.	18%
B4. Reduce energy usage in municipal buildings.	B4a. Reduce energy use in municipally owned buildings.	N/A*
	B4b. Build net-zero energy municipal buildings.	

Table 2: Building energy strategies for Mountain Village.

**Strategies for which the emissions reduction potential is assumed to be minimal were not included in the modeling effort.*

The Town has been actively working to reduce energy use in municipal buildings over the last several years; because municipal energy use is a small portion of overall community energy use, the strategy to reduce energy use in municipal buildings was not included in the GHG emissions reduction model. Regardless, this work should continue to ensure the Town continues to lead by example.

While the emissions associated with electricity use in the community at this point are relatively high, as Tri-State works towards its carbon-reduction goals electricity will become less carbon intensive over the years. Based on modeled projections, Tri-State's emission factor is expected to decrease between 2019 and 2030; by 2022, the emissions factor is expected to be so low that the use of electricity

for heating and water heating systems will result in fewer emissions than using natural gas for the same purpose. As such, Mountain Village is encouraged to develop programs and incentives that will result in fuel switching in buildings (i.e., transitioning to electrical heating and water heating where applicable).

RENEWABLE ENERGY STRATEGIES

There are two high-level strategies for Mountain Village to increase the share of energy in the community that is low-carbon and renewably sourced; see Table 3. When leveraged on top of other strategies already referenced in the transportation and building sectors (including increasing electric vehicles, reducing energy use in buildings, and fuel switching), the renewable energy strategies are estimated to reduce 2050 emissions by 40 percent below the 2010 baseline.

Renewable Energy Strategy	Suggested Supporting Action	Reduction from 2010 Baseline
R1. Implement policies and programs that support comprehensive renewable energy growth for the community.	R1a. Work with SMPA to identify opportunities to enhance the number of renewables on the cooperative utility's grid, including through community solar.	33%
	R1b. Provide mechanisms (e.g. rebates, education, community solar) to encourage adoption of solar in all sectors.	
	R1c. Continue to source renewable electricity for municipal operations.	
	R1d. Explore the feasibility and applicability of other renewable energy technologies that would be productive in the region.	
	R1e. Encourage greater participation in SMPA's Totally Green program through education and incentives.	
R2. Support policies to advance a clean energy agenda in the state.	R2a. Actively engage in efforts to advance clean energy in Colorado through participation in regional organizations and in statewide legislative work.	N/A*

**Strategies for which the emissions reduction potential is assumed to be minimal were not included in the modeling effort.*

Table 3: Renewable energy strategies for Mountain Village.

Successfully achieving the significant reduction in emissions projected with renewable energy growth will require a concerted effort on the part of the Town and in collaboration with local organizations and SMPA to enhance programs and benefits associated with installing renewable energy or acquiring RECs. Mountain Village may benefit from working with SMPA to enhance the amount of renewables on the cooperative's grid up to SMPA's contractual limit. Currently, SMPA has met the five percent self-generation limit imposed by Tri-State; however, per Tri-State's current rules, SMPA can produce an additional two percent of self-generation via community solar projects, if desired. Mountain Village should explore the development of a community solar garden that would provide power and potential cost savings to Town residents and businesses. Additionally, Mountain Village can develop programs to ease access to solar in the community by making it easier and cheaper to permit systems and by providing education, rebates, and incentives (such as a bulk purchase program).

The Town already powers the gondola system with on-site solar and the purchase of RECs and could further look to install solar and/or purchase RECs to offset use at other municipal buildings as well. SMPA's Totally Green program offers customers the opportunity to invest in renewable energy through a voluntary per-kilowatt hour adjustment on their bill; the Town can help to promote this program and could consider other ways to incentivize residents and businesses to use it.

There is interest throughout the community in exploring other renewable energy technologies outside of solar and conducting a feasibility study on the potential for solar, wind energy, biomass, and other renewable technologies to be utilized in Mountain Village may be worthwhile. Outside of direct investment in renewable energy and offsets, Mountain Village should enhance its participation in regional and state-wide conversations regarding renewable energy. By working locally with utility and municipal partners and on a state-wide level by joining organizations such as Colorado Communities for Climate Action (CC4CA), Mountain Village can leverage its position to help ensure that statewide policies regarding energy use and supply align with state and local GHG reduction goals.

It should be noted that local generation of renewable energy that offsets community electricity use is always preferable. Therefore, the Town should first prioritize the expansion of rooftop and ground-mounted solar systems, as well as the local development of other feasible renewable energy technologies (based on a feasibility study). Following this, the Town should prioritize the development of a community solar project with SMPA. The utilization of RECs to offset energy use should only come after these first two options for increasing renewables in the community have been exhausted.

WASTE STRATEGIES

Mountain Village and the Town's Green Team Committee are actively interested in reducing the amount of waste generated in the community, and the Town has a goal to be 'zero waste' by 2025. Mountain Village has already taken action to limit the amount of single-use plastic waste in the community, and the Planet Over Plastics Coalition is actively working to help businesses locally transition away from single-use plastics. The Town's waste reduction work includes one high-level strategy with multiple discrete actions to support it; see Table 4. This work is anticipated to reduce the community's GHG emissions by approximately seven percent from the 2010 baseline between now and 2050.

Waste Strategy	Suggested Supporting Action	Reduction from 2010 Baseline
W1. Reduce solid waste and increase diversion.	W1a. Develop policies and expand infrastructures that promote waste minimization and recycling for businesses.	7%
	W1b. Develop a purchase policy for green materials at the Town.	
	W1c. Reuse construction site waste and identify efficient use of materials.	
	W1d. Increase recycling collection.	
	W1e. Develop policies, infrastructure, and incentives for providing commercial composting, focusing on food waste.	
	W1f. Set aside gleaned food for those in need.	
	W1g. Develop businesses that mulch yard waste to increase water retention and soil nutrients.	

Table 4: Waste strategies for Mountain Village.

In 2019, the Town's overall diversion rate for municipal solid waste (MSW) was 42 percent, which is higher than both the state of Colorado and national average (both of which are approximately 35 percent); however, the Town will need to significantly ramp up efforts to increase waste diversion to meet its 2025 goal.

Mountain Village should continue to build off of the Town's success with waste diversion programs. There is a significant amount of interest in local food within the community, so leveraging this connection to reduce food waste, provide excess food to those in need, and utilize food waste to create compost for local farms and gardens may be a worthwhile investment of staff and Green Team Committee time and resources. By focusing on source reduction (i.e., encouraging people to buy and consume less) and a waste hierarchy that puts reuse and repurposing above recycling, the Town may help to develop a circular economy locally that reduces the consumption of goods and materials locally, creates local markets, jobs, and wealth, and enhances the value of conservation across the community. While the impact on emissions from waste is relatively small compared to building energy use, the subject of waste and reducing waste is one that nearly all community members and visitors can relate to and participate in. This sector offers prime opportunities for engaging the community and telling the story of Mountain Village's climate action work and how residents and visitors can be involved and support these efforts.

CONCLUSION

As a diverse community in a high alpine environment that sees many tourists pass through, Mountain Village recognizes that by addressing climate change through the implementation of the strategies outlined in this CAP, the community can also enhance the quality of life for all residents and visitors while spurring local innovation. Mountain Village will need to work collaboratively with its local partners, regional organizations, and state and national agencies and entities that are also interested in this work. Through collaboration and strategic implementation of the strategies in this CAP, Mountain Village can achieve its emission reduction goal while ensuring a healthy, equitable, and livable future now and in the years to come.


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