

**TOWN OF MOUNTAIN VILLAGE
 GREEN TEAM COMMITTEE MEETING
 TUESDAY, NOVEMBER 27, 2018, 2:00 PM
 2ND FLOOR CONFERENCE ROOM, MOUNTAIN VILLAGE TOWN HALL
 455 MOUNTAIN VILLAGE BLVD, MOUNTAIN VILLAGE, COLORADO
 AGENDA**

Item #	Time	
1.	2:00	Call to Order
2.	2:05	Approval of the October 23, 2018 Minutes
3.	2:10	Discussion & Updates Regarding: <ul style="list-style-type: none"> A. Discuss 2019 Meeting Dates & Reminder: Cancellation of December 2018 Meeting (10 Mins) B. Carbon Reduction Analysis for the Food Share Program (Wheels, 20 Mins) C. Recommendation from the Green Team on the Community GHG Inventory (Wheels, 20 Mins) D. Green Team Quarterly Report (20 Mins)
4.	3:20	Next Steps
5.	3:25	Other Business
6.	3:30	Adjourn

**TOWN OF MOUNTAIN VILLAGE
MINUTES OF THE OCTOBER 23, 2018
GREEN TEAM MEETING DRAFT**

The meeting of the Green Team Committee was called to order by Vice-Chair Jonathan Greenspan on Tuesday, October 23, 2018 at 2:02 p.m. in the Mountain Village Municipal Building, 411 Mountain Village Boulevard, Mountain Village, Colorado.

Attendance:

The following Green Team Committee members were present:

Jonathan Greenspan, Vice Chair and Resident Member
Patrick Berry, Town Council Member
Savanna Wagner, At Large Member
Jeff Proteau, Telluride Ski & Golf Company
Heidi Stenhammer, Telluride Mountain Village Owners Association

The following Green Team Committee members were absent:

Bruce MacIntire, Town Council Member
Cath Jett, Resident Member

The following were also in attendance:

Kim Montgomery, Town Manager (Staff)
Jackie Kennefick, Director of Administration/Town Clerk (Staff)
Heather Knox, Eco Action Partners
Kim Wheels, Eco Action Partners
Mike Follen

Consideration of Approval of Minutes:

September 25, 2018 Green Team Committee Meeting Minutes

On a **MOTION** by Patrick Berry and seconded by Jeff Proteau, the Green Team Committee voted 4-0 (Heidi Stenhammer abstained) to approve the September 25, 2018 meeting minutes as presented.

- Agenda Item 3A- Vote on a New Chairperson:
 - On a **MOTION** by Patrick Berry, and seconded by Jonathan Greenspan, the Committee voted unanimously to appoint Cath Jett as the new Green Team Chairperson

- Agenda Item 3B- Proposed 2019 Meeting Dates & Cancellation of December 2018 Meeting:
 - **NEXT STEPS:** Discussion took place regarding future meeting dates. This agenda item will be continued to the next meeting. Direction to staff to circulate via email some options for dates and potentially a different day of the week.

- Agenda Item 3C- Request from Town Council for Recommendations to Reduce Scope of Services and Costs Being Provided by Eco Action Partners for the 2019 Budget.
- Patrick Berry stated that the Town Council reduced overall budgets and that the \$15,000 in contingency was cut

- Heather Knox and Kim Wheels discussed the presented scope of work
 - On a **MOTION** by Jeff Proteau and seconded by Savanna Wagner, the following recommendation was made for the GT budget.

GREEN TEAM BUDGET		Original	Proposed	EAP
	2018	2019	Revised 2019	Cost Per Hour
These services are specific to Mountain Village:	\$ 12,000	\$ 27,950	\$ 17,135	
TMV Community HG Emissions & Energy Use (90 hours)	\$ 5,550	\$ 5,550		\$ 62
- Presentations to Green Team & Town Council, including recommendations				
- Community GHG Inventory Update - 2018 data				
- Annual Community Energy Analysis				
Analysis of Governmental Energy Use - 2018 data (8 hours)	\$ 600	600		\$ 75
- Governmental efficiency, renewable energy & offset project consulting as needed				
Mountain Village Green Team support (70 hours)	\$ 3,600	1785		\$ 51
- Green Team & Staff meetings to support the items below: preparation of items, participation and follow up				
a) MV Composting Incentive Program - assistants to applicants (est 4hr/application)	\$ 1,000	\$ -		\$ 50
- Special GHG Project Calculations and Consulting (approx 10 hours per item below for total of 80 hours)	\$ 6,000	\$ -		\$ 75
a) Analysis of MV Solar Incentive Program				
b) Update Gondola GHG offset calculation				
c) Farm to Table Program: calculate GHG emissions savings				
d) MV Waste contract data: Analyze & utilize annually collected data				
e) Regional calculation of the GHG benefits related to local affordable housing				
f) GHG Analysis of all existing MV heat trace incentive program				
g) Calculation of Solar HERS points tradeoff				
h) MV specific study on GHG emission comparison between snowmelt systems & shoveling/hauling				
MV Planning Staff Support (20 hours)	\$ 1,500	\$ 1,500		\$ 75
- Building Energy Code & REMP Calculation Updates (specific assistance to TMV staff)				
In addition, general code update information is a shared service with other regional building departments.				
These services are shared among regional governments:				
Regional Inventory (without this activity, MV community inventory is not feasible) (34 hours)	\$ 2,500	\$ 2,500		\$ 74
Regional GHG data sharing on EcoAP website (requested at MV Town Council meeting) (5 hours)	\$ 400	\$ 400		\$ 80
Regional Energy & Waste Resource Organization Services				
- Government presentation on Programs (10 hours)	\$ 500	\$ 500		\$ 50
Mountain Village to Highlight MV Programs (40 hours)	\$ 2,000	\$ -		
Regional Energy and Waste Resource Organization for Governments & Community, including (70 hours)	\$ 3,500	\$ 3,500		\$ 50
a) EAP website with resources for community (including links to TMV programs)				
b) Monthly email newsletters				
c) Telephone and in-person support for community members on energy efficiency & renewable energy resources & financial incentives (including: SMPA, Black Hills, state & federal tax programs CPACE & TMV programs)				
d) Recycling outreach information for region				
e) Participation in and sharing information from related regional events, forums and meetings				
Sneffels Energy Board - coordination of meetings notes and communication (22 hours)	\$ 800	\$ 800		
- regional government elected official & staff representation, SMPA staff, & others collaborating regionally on GHG emissions reduction efforts				
- Sharing of statewide collaboration & resources- Sharing of statewide collaboration & resources to assist with local / regional initiatives & projects				
CDPHE Pollution Prevention Advisory Board Assistance Committee participation, which advises on directing RREO grant & rebate funding for the state.				
Green Lights Program	\$ 1,314	\$ 1,400	\$ 1,400	
Bike to Work Participation	\$ 26	\$ 30	\$ 30	
Compost Rebate Program	\$ 5,000	\$ 25,000	\$ 25,000	
Communications/Education	\$ 17,135	\$ 10,000	\$ 10,000	\$5,000 rollover from 2018 budget
CC4CA Membership	\$ -	\$ 2,000	\$ 2,000	
Mountain Village Clean Up	\$ 1,200	\$ 5,000	\$ 5,000	
Food & Beverage				
DJ				
Awards				
Porta Toilets				
Contingency (new programs as developed)*		\$ 15,000	\$ -	
Subtotal Allocation To Date	\$ 36,675	\$ 86,380	\$ 60,565	
Budget	\$ 50,000	\$ 86,380	\$ 60,565	
Funds Remaining	\$ 13,325	\$ -	\$ -	

* New programs may be funded through the energy mitigation fund

- Agenda Item 3D- Clean-up Day Debrief: Savanna Wagner detailed highlights from her report in the packet including:
 - 90-100 participants in the first year was a great turnout
 - Event was on the front page of Daily Planet
 - Great donations
 - Radio blasts
 - Food was great
 - Enthusiastic participants
 - Budget increased to \$5000 for 2019 from \$1200 in 2018
 - Need to quantify amount of trash – cubic yards or other measurement – tonnage

- How to improve:
 - Pick a date in well in advance
 - Secure sponsors
 - Who can we tap into to help?
 - Back-up plan for rain
 - Provide gloves, a microphone and a detailed schedule for the emcee
 - TSG has a music system and PA that they would provide for the event
 - Choose a more central location
 - Subcommittee for the event Jeff, Savanna, Mike, Zoe, Cath and start planning in January
 - Mike from Boot Doctors could offer additional potential support
 - Better organization of the trash contest
 - Encourage people to bring and use sustainable dining supplies
 - Have a Clean-up day item that we give people – maybe gloves/cups with GT logo

- Agenda Item 3E- Status of Single Use Plastics Ban:
 - **NEXT STEPS:** Discussion took place and may need to slow this down and do more education. Reset and review survey. Get info out to businesses about the proposed ban and the timeframe.

 - Jonathan Greenspan discussed the education of businesses by WECAN (Waste Energy Citizens Action Network).

 - The Ecology Commission is doing this in Telluride – MV will model on their draft ordinance. Kim Montgomery will ask Jim Mahoney to reach out to Telluride Town Attorney Kevin Geiger to review their first draft.

 - Discussion ensued about single use plastics with the Mountain Village Promotional Association and Common Consumption Area.

➤ Agenda Item 3F- Town Shuttle vs Dial-A-Ride

- This agenda Item was not discussed and will be carried over to the next agenda.

Other Business:

- Put together a Green Team calendar of events (work with staff).
- Have a meeting with the Ecology Commission in Telluride to discuss common goals and what each organization is working on. Do this on a regular basis.

There being no further business, on a **MOTION** by Jeff Proteau, and seconded by Savanna Wagner, the Green Team Committee voted unanimously to adjourn the meeting at 3:47 p.m.

Respectfully submitted,

Jackie Kennefick
Town Clerk



Mountain Village Farm-to-Community Program 2018 – Greenhouse Gas Emissions Impact

By: Kim Wheels
EcoAction Partners, Energy Specialist

For: Michelle Haynes
Mountain Village, Planning and Building Director

DRAFT for MV GREEN TEAM: November 27, 2018

Overview:

Mountain Village implemented a “Farm-to-Community” Program for income limited residents during the summer of 2018. Forty shares of food were provided by local food sources and picked up weekly. This 14-week program successfully provided over 4500 pounds of fresh local food to residents, while reducing the food-related carbon footprint for each person. Mountain Village staff requested a calculation to estimate the greenhouse gas emission impact of the program. Reduced grocery store trips to Montrose and Telluride, emissions of the food delivery vehicles for each business and reduced emissions associated with residents eating local food are estimated here.

Results:

60 people in Mountain Village were served each week, which is 4% of the census population. By eating local food versus typical commercially processed & shipped food, these residents saved at least 1.5 metric tons of carbon dioxide equivalent (mtCO_{2e}) of GHG emissions, which is approximately 2% of Mountain Village’s total food emissions (7000 mtCO_{2e}). In addition, an estimated 252.3 mtCO_{2e} emissions was saved due to fewer grocery store trips, which is 4% of Mountain Village’s emissions from total gasoline-related transportation (6000 mtCO_{2e}). The transportation-related emissions impact of the local food providers driving from Norwood & Mancos each week was an increase of approximately 1.8 mtCO_{2e}. The net total GHG emissions impact from the program is estimated to be a reduction of 252 mtCO_{2e} in GHG emissions, or 0.3% of Mountain Village’s total GHG emissions based on the 2017 GHG Inventory.

Calculation values:

- Program served 38 program households, but 40 shares distributed per week. Thus 40 households was used for calculation.
- Program served 57 people in registered households, so based on average of 1.5 people per household and 40 shares, ~60 people were served weekly.
- Assumed each household made fewer trips to Montrose, Telluride & Mountain Village grocery stores throughout the program. Responses from those who filled out pre-program survey were extracted for all participants. Estimated 50% reduction in driving to grocery stores during 14 weeks (post-program data on grocery trips was not collected in survey).
- Program providers drove once per week each from Norwood and Mancos to Mountain Village to deliver food shares.



- The average food carbon footprint for a Colorado person is 1.85 mtCO₂e/year. This can be reduced by 5% annually from purchasing local food (based on a 2008 study: <https://pubs.acs.org/doi/abs/10.1021/es702969f>). Since the program ran 14 weeks, this is 27% of the year, or an impact of 1.35% of the average person's food carbon footprint.
- Vehicle mpg for Mountain Roots in Mancos was not available by time of this report, so it was estimated at average Colorado vehicle mpg from CDPHE (20.1 mpg).
- Vehicle mpg for all participant households was estimated at average Colorado vehicle mpg from CDPHE (20.1 mpg).
- Tail-pipe & Well-to-pump emissions were associated with transportation gasoline.

Unaccounted for benefits

- Participant health: lost weight, healthier food choices
- VCA donations collected to pay for left-over food boxes
- Potential productivity time of participants – time not spent driving & shopping
- Economic support to local small businesses
- Benefits to environment from conscientious environmentally-friendly farming methods and reduced waste
- Enhanced market presence for locally grown and diversity of locally grown food
- Food equality to a demographic that could not otherwise afford a local and organic food share

Unknown variables

- Unknown how many grocery store trips are typically made in conjunction with other errands, and thus may or may not have reduced driving for some households.
- Survey data was not specific as to how many trips to which stores for each household, so this level of detail was estimated.
- Potential impact of participants shifting food habits to consistently purchase local healthy organic food throughout the year is unknown.
- It's very likely the GHG impact of purchasing local food is higher in Mountain Village than in a typical US city, due to the greater distance of commercial food transportation, however a more accurate value for our remote location is not currently available.



Mountain Village 2017 Greenhouse Gas Inventory Report

Prepared by EcoAction Partners

**DRAFT FOR MV GREEN TEAM MEETING
November 27, 2018**

Overview:

In 2018, the Town of Mountain Village contracted with EcoAction Partners to create a Mountain Village-specific Greenhouse Gas Inventory. Working from the baseline regional San Miguel and Ouray County GHG Inventory that EcoAction Partners manages and updates annually, EcoAction Partners modified the calculations to focus on Mountain Village specific data to create the results shown in this report.

History:

The regional GHG Inventory was initially developed by the University of Colorado at Denver with data collection input from EcoAction Partners. It was funded through a matching grant in which Mountain Village, Telluride, San Miguel County, Ridgway, City of Ouray and Ouray County each contributed \$1000. The calculations are in accordance with ICLEI protocol established by 2010. Since then it has been updated to align with the subsequent “Global Protocol for Community-Scale Greenhouse Gas Emission Inventories”.

Mountain Village adopted a goal to reduce overall GHG emissions 20% by 2020, from 2005 baseline levels, however our regional GHG and energy-use baseline began to be tracked in 2010. Thus progress toward this goal is determined based on 2010 data.

Shared regional resources:

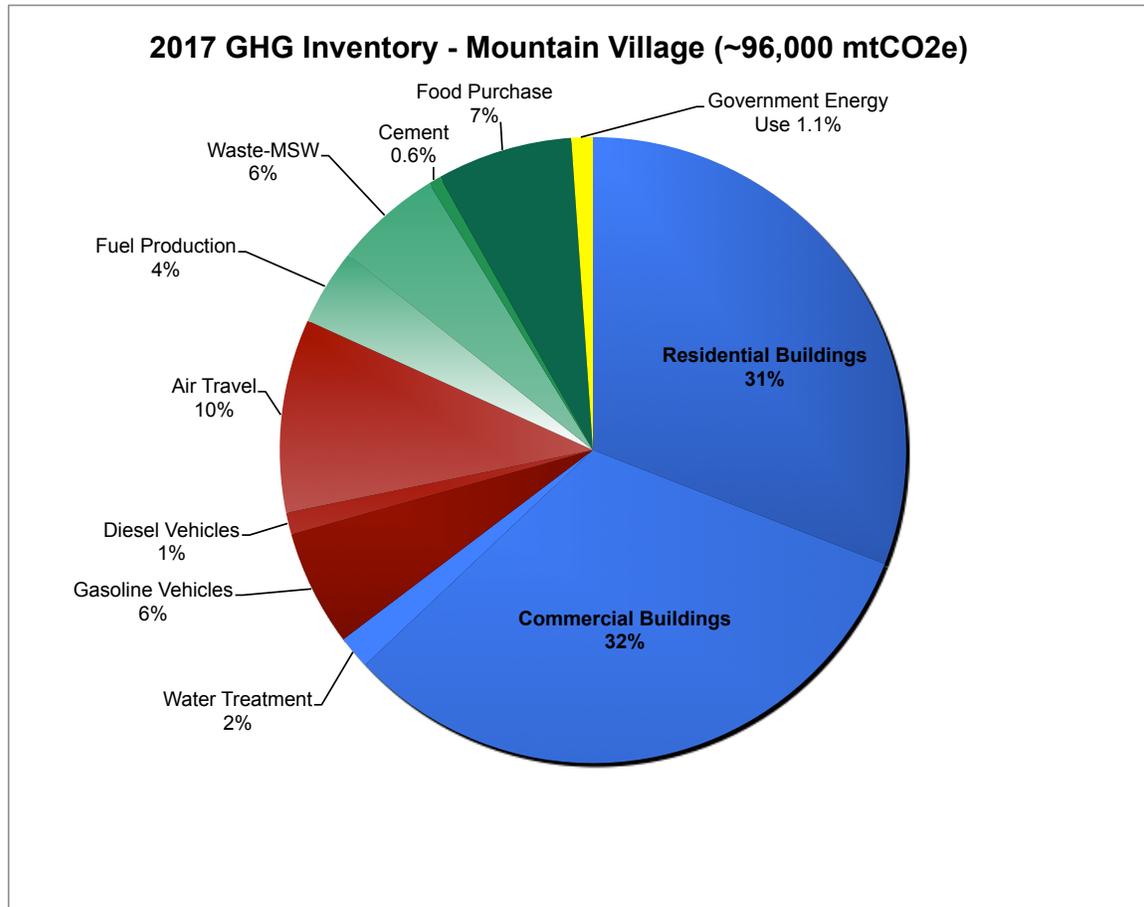
As part of the analysis, Mountain Village desired clear understanding of how GHG emissions associated with shared regional resources were allocated between jurisdictions. Thus, EcoAction Partners created a summary of how these resources have been allocated in the past and coordinated a meeting of representatives from Mountain Village, Telluride, San Miguel County, and Telluride Ski & Golf, to review and discuss allocations for each of these resources. The agreed-upon outcome for each of these are detailed in Appendix A. The resources discussed include:

- Regional airports
- Waste Water Treatment Plant
- Gondola
- Telluride Ski and Golf’s utilities including water use
- Festival impacts
- Transit services



2017 MV GHG Inventory Results

Mountain Village's total GHG emissions for 2017 were approximately 96,000 mtCO₂e (metric tons of carbon dioxide equivalent). The detailed pie chart below breaks those emissions down per category, explained further below the pie chart. See Appendices for more detailed explanation of allocation per jurisdiction and calculation methodologies.



- Government Energy Use – Electricity and natural gas use by Town of Mountain Village government, including building energy use, streetlights, town plaza snowmelt, and other exterior uses. Note: Gondola electricity use is 100% offset by SMPA Green Blocks, so Gondola electricity use does not contribute to GHG emissions. Gondola natural gas use does contribute toward TMV GHG emissions.
- Residential Buildings – electricity and natural gas use for homes, including exterior lighting, snowmelt systems, and patio fireplaces. Renewable electricity associated with net-metered solar systems, SMPA solar farm purchases, and Green Blocks offsets decrease the emissions associated with residential building emissions.
- Commercial Buildings– electricity and natural gas use for commercial buildings and other use, including exterior lighting, snowmelt systems, patio fireplaces, and Mountain Village ski area operations. Renewable electricity associated with net-metered solar systems, SMPA solar farm purchases, and Green Blocks offsets decrease the emissions associated with commercial building emissions.
- Water Treatment – Electricity used by Town of Mountain Village for treatment and pumping of water



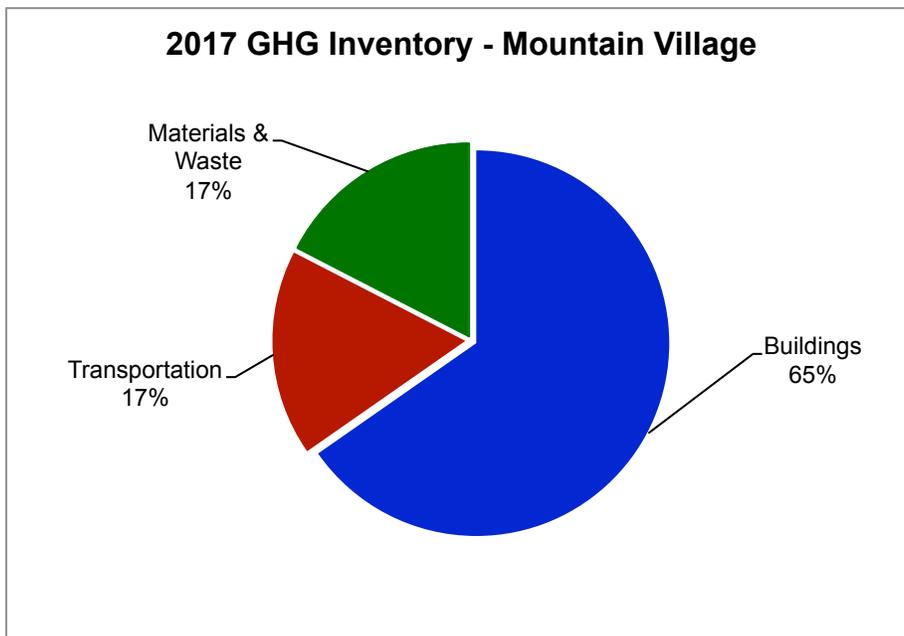
- Gasoline Vehicles – Emissions from gasoline vehicles
- Diesel Vehicles – Emissions from diesel vehicles
- Air Travel – Emissions associated with airplane fuel & enplanements at Telluride Airport & Montrose Regional Airport. (for allocations, See Appendix A)
- Fuel Production – Processing emissions associated with gasoline and diesel fuel before the fuel enters vehicles
- Waste – Emissions associated with Municipal Solid Waste taken to landfill to decompose
- Cement – Emissions associated with cement for Mountain Village, based on Colorado’s total economy
- Food Purchase – Emissions calculated based on Mountain Village’s total population of census and visitors

Additional Items:

These items contribute to reducing MV’s GHG emissions and thus reduced the overall total value to 96,000 mtCO₂e, however they are too small to depict in the above pie chart:

- Open Space Carbon Sequestration – Mountain Village’s dedicated open space is a mixture of grasslands, wetlands and mixed forest. All of these areas sequester carbon and thus reduce GHG emissions by a total of approximately 0.31 mtCO₂e, or 0.3% of MV’s total GHG Inventory.
- SMPA Community Solar Farm – Mountain Village’s total participation in the community solar farm is the equivalent of 0.16 mtCO₂e, or 0.2% of MV’s total GHG Inventory.

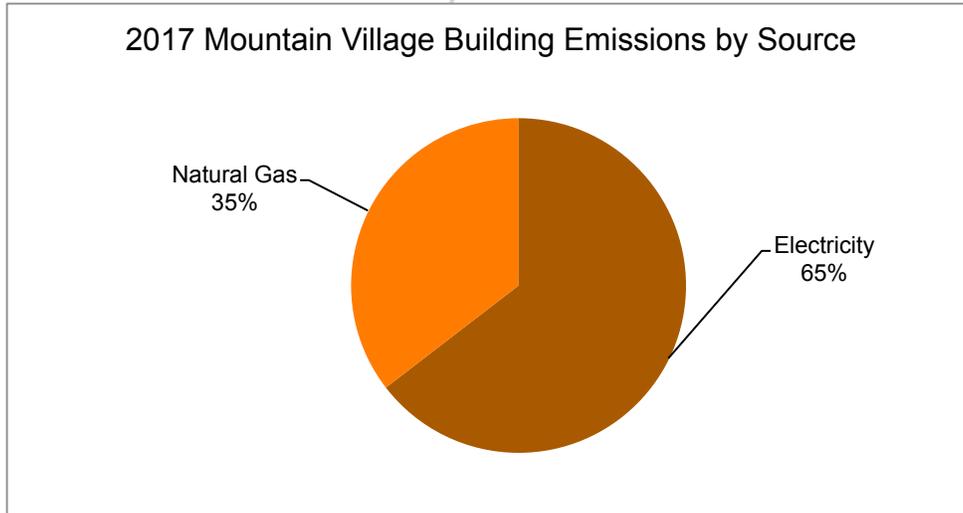
Simplified pie chart



The pie chart above simplifies the Mountain Village Inventory by showing 3 main categories:

1. Buildings – 65%
2. Transportation – 17%
3. Materials & Waste – 17%

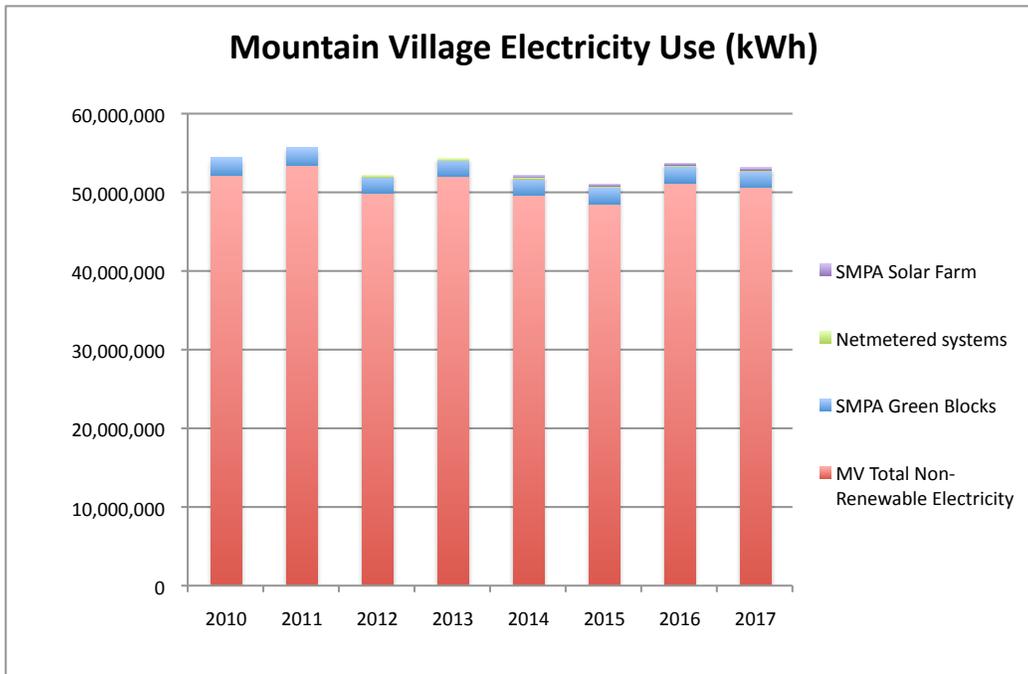
Clearly, building energy consumption is the largest category of GHG emissions. The next pie chart shows just the Building emissions portion of emissions (government, residential, & commercial combined) broken down per utility:



Electricity emissions are impacted by overall usage and the emissions factor, which reflects the amount of renewable energy that is part of our overall electricity mix. This value is provided to SMPA from Tri-State annually, and has been steadily decreasing since 2010, from 2.12 to 1.776 lb-CO₂e/kWh.

Natural gas emissions are also impacted by overall usage and the emissions factor, which is determined how the natural gas is produced. In 2010, Source Gas provided this factor at 5.4 kg-CO₂e/therm. For 2017, the natural gas emissions factor was provided by Black Hills at 5.33 kg-CO₂e/therm.

Natural gas and electricity data is provided annually from the utility companies, broken down by jurisdiction. It's accurate data that is easy to track and analyze progress toward reduction goals. Mountain Village's electricity and natural gas usage have been tracked since 2010, with analysis presented annually by EcoAction Partners to Town Council. The following graphs were presented in July of 2018:





Electricity use associated with MV’s SMPA community solar farm purchases, net-metered solar systems, and SMPA Green Blocks offsets do not contribute to MV’s GHG emissions. Electricity emissions in the pie charts are associated with “MV Total Non-Renewable Electricity” which is over 50,000,000 kilowatt hours annually. Notable is that overall use has decreased since 2010, despite an increase in people, buildings, and overall economy. Continuing to increase renewable energy in our electricity mix and decreasing electricity use through conservation and efficiency, will continue to reduce electricity-related emissions.

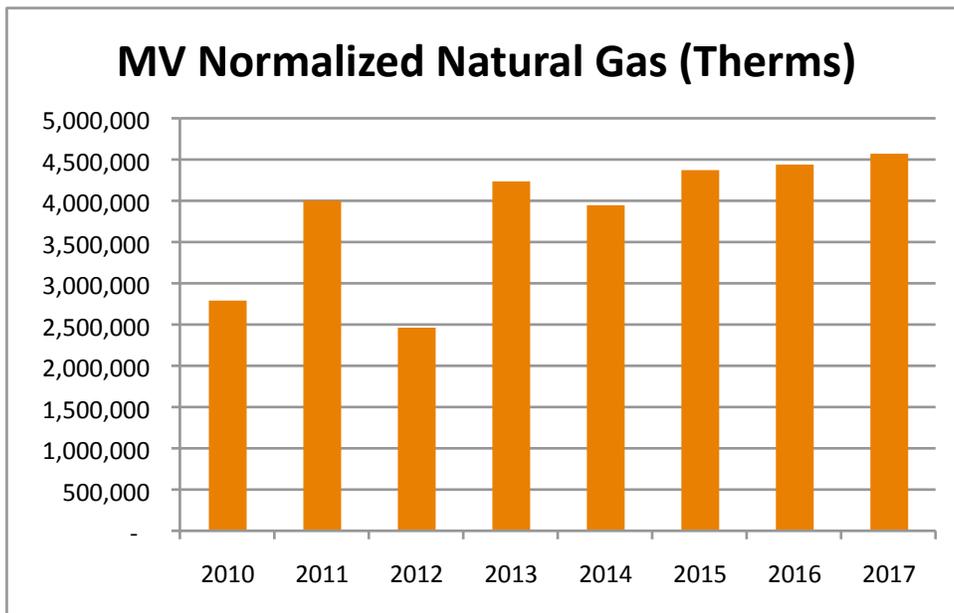
Mountain Village Electricity GHG emissions:

GHG emissions associated with the electricity consumed is calculated using the emissions factor for each year.

2010 – 52,191,724 kWh produced 50,300 mtCO₂e

2017 – 50,622,946 kWh produced 41,000 mtCO₂e

Thus, since 2010, MV has seen an 18.5% reduction in emissions from electricity use.



Natural gas use has been steadily increasing, when adjusted to account for varying winter temperatures. This increase is in line with increased building and snowmelt square footage being constructed in Mountain Village. Overall natural gas use can be reduced through efficiency and conservation measures, addressing new construction through energy efficient building codes and existing buildings through implementing Energy Conservation Measures, such as weatherization, increasing insulation, and improving tuning mechanical heating systems and controls.

Mountain Village Natural Gas GHG emissions:

(In 2010, some of MV’s natural gas use was assigned by Source Gas to San Miguel County. Thus, 2011 data is used for baseline purposes. Actual natural gas use (not adjusted for temperature variations) is used to calculate GHG emissions associated with natural gas consumption:

2011 – 4,509,979 therms produced 24,400 mtCO₂e

2017 – 4,180,000 therms produced 22,200 mtCO₂e



Thus, a 9% decrease in natural gas related emissions is seen comparing 2011 use to 2017. It's important to note that natural gas use is greatly influenced by temperature and snowfall from year to year.

Per Capita Discussion:

Many questions have arisen around analyzing, tracking and comparing GHG emissions on a per population basis. There are many factors to consider in doing so:

- Mountain Village's GHG emissions goal of 20% reduction by 2020 is not based on per capita emissions, but total overall emissions.
- Community GHG Inventories typically follow the GPC protocol, however calculation methodologies selected for each are based on data available, so no two communities inventories are calculated exactly the same. Specific benchmarks that can be identified as comparable between communities are listed in the table below, but not all are provided in other community's GHG Inventory reports.
- In a resort community such as Mountain Village, some emissions categories are appropriate to analyze per capita, while others are influenced greatly by part-time residents and visitor population. Others are somewhere in between. Thus, the most fair "per person" analysis would be to calculate these emissions on a per category basis, not for overall total GHG emissions.
- Mountain Village's per capita emissions in 2017 were 68.8 mtCO₂e/person.
- Mountain Village's emissions per population including visitors were 26.4 mtCO₂e/person.

Aside from Telluride (shown in the Benchmark table below), Aspen is likely the most comparable town to Mountain Village that has recently completed a GHG Inventory. While Aspen's report did not show any of the comparable benchmarks to the table below, a few noteworthy comparable aspects to this Mountain Village GHG Inventory are listed here:

- The City of Aspen's 2014 GHG Inventory reports total emissions of 394,341 mtCO₂e.
- Aspen's 2014 census population was 6,712 residents, so on a per capita analysis: 58.8 mtCO₂e/capita
- 100% of ski area emissions associated with electricity and natural gas used to run lifts and facilities on Aspen Mountain, Aspen Highlands, and Buttermilk ski areas are included in the Aspen GHG Inventory
- 100% of Aspen airport emissions are included in the Aspen GHG Inventory
- Aspen's report uses a more detailed commuter analysis than the MV GHG Inventory and assigns 50% of total vehicle miles traveled of commuter trips to Aspen.

Equivalencies:

- 96,000 mtCO₂e is equivalent to over 105,000,000 pounds of coal burned.
- 96,000 mtCO₂e is also equivalent to the energy used by 10,366 average U.S. homes in one year. (MV has 1675 residences)
- 96,000 mtCO₂e is the amount of carbon that can be sequestered by just over 113,000 acres of U.S. forests in a year.

Question for MV Green Team – are these helpful in putting perspective on MV emissions? If so, is this the right location in the report?



Local Benchmark Comparison:

Description of Benchmark	Aspen, CO (2014)	San Miguel County, CO (2017)	Telluride, CO (2017)	Town of Mountain Village, CO (2017)	Units of measurement	Notes
Total GHG Emissions	394,391	244,000	67,500	96,000	mtCO2e	
Avg. Res. electricity use		894	728	1268	kWh/hh/mo	
Avg. Res. Natural gas use		110	73	197	therms/hh/mo	*incl snowmelt systems
Electricity (kWh/sf/yr)		4.70	5.19	5.23	KWh/sf/yr	
Natural Gas/sq.ft/yr		0.28	0.30	0.36	therms/sf/yr	*incl snowmelt systems
Avg. Comm/ Ind./ Pub. Buildings Energy use intensity		227	335	343	Kbtu/ft ² /year	
Vehicle Miles per person per day		17.0	27.0	28.0	VMT/person/day	*per census population
Water		189	168	266	gallons/person/day	*not including snowmaking
Wastewater		118	73	184	gallons/person/day	*per census population
Municipal Solid Waste		6.8	10.0	18.1	lb/person/day	*per census population
GHG Emissions per capita	58.8	30.2	28.6	68.8	Mt-CO2e/person/year	*per census population
GHG Emissions per capita + visitors		17.2	12.5	26.4	Mt-CO2e/person/year	*per capita incl Visitors



**Mountain Village GHG Inventory
Appendix A
San Miguel County Shared Resources Notes**

**SMC Shared Resources Meeting for GHG Inventories
Wednesday July 11, 10-12 at WPL Telluride Room
(Note this document was updated after the meeting with outcomes & findings)**

The aim of this meeting is to reach consensus as to how the GHG emissions associated with each shared resource will be assigned between the Telluride & Mountain Village GHG Inventories. Allocations for Telluride's inventories from 2010-2017 are explained below, along with associated Mountain Village analyses. The SMC inventory includes all jurisdictions (including Telluride & MV) and thus is inclusive of these resources.

Allocation methodologies to consider for each resource:

- Location of utility meters determines how electricity and natural gas values are provided by SMPA and Black Hills Energy
- % of county population
- Is data available to parse resources between communities?
- Allocation of tourist impact to Telluride & Mountain Village versus rest of SMC or greater region?

Regionally Shared Resources

Wastewater Treatment Plant – Telluride & MV & SMC subdivisions

MV: 15% ownership, \$30,000 toward solar PV system, 35% of use

Towns working toward Regional Sewer District (~5 years?)

- Electricity & natural gas: 100% to Telluride
- Biogas emissions (nitrogen & methane) from all 10,000+ visitors: 100% assigned to Telluride
- *Could allocate all of the above based on % of use*

***WasteWater** analysis charts (no impact to GHG Inventory emissions)

35% assigned to MV, 65% assigned to Telluride.

(For improved Telluride analysis – breakout of SMC subdivision population needed)

***Food** GHG emissions are calculated using WWTP population accounting

35% assigned to MV

65% assigned to Telluride, minus SMC subdivision population of 1035

Gondola – eliminates vehicle traffic between MV & Telluride

100% of electricity & offset assigned to MV.

Natural gas & diesel use allocated to MV.

- TMVOA (through TMV electricity bills) purchases Green Blocks to offset electricity use by 100% (in 2017 offset was over by 30,000 kWh & adjusted by TMVOA for 2018 onward), so electricity use does not show up in GHG pie.

Telluride Ski & Golf – operations in MV, Telluride, & County land



*electricity & natural gas allocated per meter location
(provided this way by SMPA & Black Hills Energy for all regional utility use)*

- TSG operations include:
 - Office space & Businesses in MV core
 - The Peaks & other lodging
 - On-mountain operations
 - Conference Center
 - Telluride - Base of Gondola & Lift 7 operations
- *Could ask for TSG assistance in separating utility bills based on location of service, to reassign emissions accordingly*

Regional airports – serve region

- Telluride airport: 100% allocated to SMC, divided 50/50 between Telluride & MV
- 65% of Montrose airport to San Miguel County – group agreed to split 50/50 between Telluride & MV

Vehicle Transportation – data provided per county

Emissions assigned as % population of SMC

- Vehicle registration data & CDOT studies are basis for current Inventory
- Transit Services (some shared among jurisdictions)
- *Traffic count data for Telluride & MV would provide better data specific to community driving, but wouldn't account for distance of travel to each town*

Telluride Festivals – all 3 governments resources utilized

Electricity & water use tied to Telluride Town Park

- Located in Telluride Town Park
- Gondola used
- Camping in outlying areas, with school bus transportation
- People travel to region for festivals
- Benefits all businesses

Mountain Village Sunset Series – MV resources

- Located in Mountain Village
- Gondola used
- Regional benefit

Others – serve region, allocated by location

- Wilkinson Public Library - Telluride
- Telluride Medical Center – Telluride
- Telluride School District – Telluride
- Telluride Mountain School - SMC

Data Gaps

Trash & Recycling –

- Bruin provides data per jurisdiction. Has not provided for 2017. Telluride fined Bruin for lack of 2016 & 2017 data. Bruin data is only part of the waste picture.



- Waste Management – Private company, data not available. Require in contracts? MV contract required it. Is it still being provided?
- 2017 Regional & SMC Inventories – data from EcoAction Partner’s Regional Waste Diversion Study. 2015 data trash & recycling per jurisdiction

Transportation –

- Region 10 study data not applicable. It focuses on gaps in transit services.
- CDOT data tracks highway travel only, not all roads.
- Registered vehicles in counties relies upon average CO annual mileage.
- Off-Road vehicle use is increasing, but not accounted for.

Affordable Housing –

- Regional impacts on transit studies & transportation emissions
- GHG calculation could be done to compare impacts of reducing commute mileage for local employees

Food -

- Population-based calculation, including visitors. Telluride is based on 65% of WWTP, minus estimated SMC subdivision population served by WWTP (~1035). Mountain Village would be 35% of WWTP population.
- A food study would be helpful for more accurate food emissions & tracking reduction associated with farmers markets & programs.

Propane data –

- Estimate from 2010
- Private companies, updated data not currently available



**Mountain Village GHG Inventory
Appendix B
Bases for GHG Inventory Calculations**

GHG Inventory – Bases for calculations

Carbon Emissions Footprint Calculator for Cities™

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The workbook is provided to facilitate future updates to Ouray and San Miguel's Greenhouse Gas (GHG) Emissions Inventory. This inventory was completed for 2010 based on ICLEI/WRI protocols and the Demand-Centered Hybrid Life Cycle Analysis methodology (Ramaswami et al., 2008 - see Resource 3). EcoAction Partners uses the workbook to update our regional GHG Emissions Inventory annually.

General data:

Census Population – obtained annually from the Colorado DOLA website

Visitor Population

- SMC visitor values are calculated using the Telluride & Mountain Village Wastewater Treatment Plant BOD data.

- Ouray County visitor estimates are obtained from the visitor centers in Ridgway & Ouray

of Households, SF of commercial & residential buildings – these values are not used in overall GHG emissions calculations, but are collected for other benchmarking purposes. The OC & SMC Assessors offices provide this data.

Energy (blue):

Residential & Commercial Building Energy Use:

Electricity

- SMPA provides data annually per community for residential, commercial & irrigation (provided in 1st quarter for previous year). Data is categorized as non-renewable sales, Green Blocks sales, SMPA community solar farm production, & net-metered system production.
- Tri-State emissions factor - provided to SMPA annually based on Tri-State's total mix of electricity sources (provided late in year for the previous year, thus GHG Inventory value is a year behind when presented to governments, but gets updated during the following year.)

Natural Gas

- Black Hills Energy Corporation (previously SourceGas) provides data annually – per community for residential, commercial & irrigation (provided in 1st quarter for previous year).
- Emissions factor – LGOP default factor from 2010

Propane

- based on initial 2010 estimate from regional propane companies, who are not obligated to release information and have not provided data since.
- Emissions factor – LGOP default factor from 2010



Government Energy Use:

Government electricity & natural gas use – provided annually by governments: utility bill data, Green Blocks purchases, renewable system production, REC purchases

Water / Wastewater Treatment Electricity & Natural Gas - provided annually by governments from utility bills

Transit (red):

Vehicle Transportation:

Transportation tail-pipe emissions are calculated using total Vehicle Miles Traveled (VMT), which is derived using two different methods - vehicle registration and average daily traffic. VMT is divided by average regional vehicle fleet fuel economy to calculate fuel consumption, which is used to determine GHG emissions from surface transportation. The Colorado Department of Public Health and Environment (CDPHE) conducts on-road vehicle surveys to characterize the Colorado vehicle mix (95% gasoline, 5% diesel).

Vehicle Registration Method:

- # Vehicles registered in San Miguel & Ouray Counties updated annually
- Vehicle Miles Travelled (VMT) estimate per vehicle / year, per EPA – 12,000

Average Daily Traffic Method:

- Average Daily traffic counts of Vehicle Miles Travelled (VMT) per county per Colorado Department of Transportation (CDOT) studies (2009), based on 342 working days/year

Gasoline (95% per CDPHE)

- 20.1 average MPG per CDPHE (2010)

Diesel (5% per CDPHE)

- 6.3 average MPG per CDPHE (2010)

Airline Transport:

- Annual aircraft fuel (jet fuel and aviation gasoline) used is provided annually from the Telluride Airport and the Montrose Regional Airport (65% of passengers travel to OC & SMC).
- Emissions factors used are from the Department of Energy (DOE).
- Total number of enplanements (passengers) is also tracked to obtain emissions/person.

Emissions values for all fuels are sourced from The Carbon Registry, local government protocol, September 2008.

Materials and embodied energy (transboundary reporting):

This section will count all the GHG emissions associated with producing and transporting key materials to OC & SMC, including food, cement, and fuel. Just like electricity, these materials are produced outside the boundaries of the community but are essential to community life. WRI and ICLEI are continuously updating their guidelines on how to include these trans-boundary emissions, termed "Scope 3 Emissions."



Food:

This calculation was originally based on 2005 BLS Economic Census data for 2009\$ for average annual household dollars spent on food. Recently, due to the relatively large percentage of households in the region that are not fully occupied year-round, and the annual influx of visitors that contribute to our regional food carbon footprint, all GHG Inventories (2010-2016) were converted in 2017 to use the average food carbon footprint for annual mtCO₂e/person found in industry studies published online. This carbon footprint value is used with the regional visitor data (vs census) to calculate our annual food-related emissions.

Waste & Recycling: calculated using EPA WARM methodology

- We have 2 main waste haulers for the region.
- Bruin provides annually updated data for volumes of waste and recycling collected throughout the region.
- Waste Management provided total data in 2010 for collection in Montrose, Delta, San Miguel & Ouray Counties, but has not provided updated data since.
- The Sneffels Waste Diversion Planning Project was completed in December 2016 by EcoAction Partners. It includes an analysis of total volume of waste and recycling. This is the most accurate regional information currently available. Thus OC & SMC total waste data is based on this study.
- Values from the study are used with WARM* emissions data to calculate annual waste & recycling emissions.

**Waste Reduction Model (WARM) was created by the U.S. Environmental Protection Agency (EPA) to help solid waste planners and organizations estimate greenhouse gas (GHG) emission reductions from several different waste management practices.*

Cement:

- Total cement consumed in Colorado in 2007 is multiplied by % of state census population located in OC & SMC.

Fuel Production:

- The fuel production emissions factor represents emissions from the production and shipping of fuels. Also known as Wells-to-Pumps, W2P, or WTP Emissions
- The emissions factor for Gasoline, Diesel, & Jet Fuel is multiplied by the total gallons of each fuel used in the region to obtain overall annual emissions.
- Emissions values for all fuels are sourced from The Carbon Registry, local government protocol, September 2008.

Water & Wastewater Treatment Emissions:

Regional governments provide annual gallons of water treated at each plant. These values are utilized with annual census & visitor data, using ICLEI Protocol for Fugitive Emissions from Wastewater equations (10.2, 10.8 and 10.10)* to calculate annual emissions associated with water and wastewater treatment.

*See ICLEI Local Government Operations Protocol v 1.0 for more information